3 HOSPITAL PERFORMANCE INDICATORS

FRAMEWORK AND DEVELOPMENT

Framework and agreed indicators

As noted in Chapter 1, the Commonwealth Department of Human Services and Health in liaison with the COAG Hospitals Working Group had proposed a set of performance indicators for the hospital sector prior to the establishment of the NHMBWG. These indicators addressed directly three of the seven areas specified in the NHMBWG's terms of reference, and addressed indirectly the remaining areas. The agreed indicators are summarised in Table 3.1, and discussed in detail from page 25 onwards. In October 1994 a working party common to both groups proposed a framework for health sector indicators that was subsequently endorsed by the NHMBWG. The framework's hierarchical structure enabled the Working Group to focus on those higher-level indicators that would give the best insight into hospital performance, and illustrated the relationships between groups of indicators.

Table 3.1: Summary of hospital performance indicators

Category	Indicator
Efficiency	Cost per casemix-adjusted separation
	Cost of treatment per outpatient
	Average length of stay for top twenty Australian National-Diagnosis Related Groups (AN-DRGs)
Productivity	User cost of capital (depreciation + opportunity cost) per casemix-adjusted separation
	Ratio of depreciated replacement value to total replacement value
	Total replacement value per casemix-adjusted separation
Quality	Rate of emergency patient readmission within 28 days of separation
	Rates of hospital-acquired infection
	Rate of unplanned return to theatre
	Patient satisfaction
	Proportion of beds accredited by Australian Council on Healthcare Standards (ACHS)
Access	Waiting times for elective surgery
	Accident and emergency waiting times
	Outpatient waiting times
	Variations in intervention rates
	Separations per 1,000 population

Source: National Health Ministers' Benchmarking Working Group.

The framework is an evolving document, becoming more comprehensive as other aspects of the health system and more levels are included. A copy of the framework as at October 1995 is included as Appendix C.

Development of definitions

The original set of indicators was conceptually sound but lacked development. Many of the indicators had not had data elements identified, or readily available data to illustrate the concept.

In some cases, data items were already provided to the Institute or other Commonwealth agencies, and were collected according to definitions published in the NHDD.

The Institute, working with NHMBWG members, furthered the development of indicator definitions and their underlying data items. Part of this work involved defining the scope and other collection parameters.

In some cases, development work was being undertaken by other groups and it was appropriate to monitor progress in liaison with these groups:

- following AHMAC endorsement of the development of a national set of quality of care indicators, the National Hospital Quality Management Program was developing some indicators in conjunction with the States and Territories;
- the Ambulatory Care Branch in HSH was coordinating projects to develop casemix and performance measurement systems in hospital Accident and Emergency and Outpatient departments;
- various State and Territory health authorities were conducting patient satisfaction questionnaires; and
- the Institute was finalising definitions and collection protocols for data on elective surgery waiting times.

A set of indicators relating to assets and cost of capital was the subject of a study undertaken by Dr Penny Burns. Dr Burns surveyed State and Territory health authorities to identify possible data sources for capital indicators. Following analysis of the survey results, Dr Burns was able to recommend a revised set of capital indicators. A subset of these indicators was selected by the NHMBWG for reporting. Although there appears to be a degree of consistency among the health authorities with respect to asset valuations, this report brings such data together for the first time, and some caution is required in interpreting the data.

Other definitional development work is discussed for each indicator in the sections below, and a general development plan is outlined in Chapter 5.

Validity and reliability

Two important attributes of performance indicators are their validity and reliability. Validity in this context refers to the degree to which the indicator reflects the truth of the phenomenon of interest, and reliability refers to the stability of an indicator when applied by different observers in different places at different times.

It is very difficult to assess the validity of indicators because, as noted above, they are only indicators or pointers to a

performance aspect (or group of aspects) of a provider. An indicator can be considered valid if differences in the value of the indicator correspond with the direction and magnitude of differences in the phenomena of interest. The assessment of validity in this way requires a comparison of the behaviour of the indicator with some external or reference measure of the underlying phenomena. Such analysis may not be possible with the data in hand and will require further research.

Reliability is an easier concept to test, though it still may not be possible to test without additional research. The stability of an indicator will be more certain where data are collected according to agreed, well-tested definitions.

Indicators should not be used in isolation

Superior performance in one area may compromise performance in another area. For example, the most efficient hospital may not be providing care of appropriate quality, as some efficiency measures may lead to poorer care outcomes. Fleming (1991), on the other hand, demonstrated that although the relationship between cost and quality is not simple, quality improvements can be associated with cost savings (under certain conditions).

Indicators should be used in sets, so performance evaluation must consist of analysis of a range of indicators covering multiple aspects of an organisation's activities.

EFFICIENCY

Efficiency describes the relationship between the cost of various inputs and the output produced.

Cost per casemix-adjusted separation

This indicator is defined by the following expression:

$$\frac{\text{recurrent expenditure x IFRAC}}{\text{total separations x average case weight}}$$

where IFRAC (inpatient fraction) is the estimated proportion of total hospital costs related to admitted patients and average case weight is a single number representing the relative costliness of cases for a particular provider (or a group of providers, for example teaching hospitals). The average case weight concept is described more fully in the section 'Adjusting for casemix' below.

This indicator deals with the costs associated with acute admitted patients. The term 'admitted patient' is synonymous with inpatient. Acute in this sense is defined in the NHDD as follows:

'An episode of acute care for an admitted patient is one in which the principal clinical intent is to do one or more of the following:

- manage labour (obstetric);
- cure illness or provide definitive treatment of injury;
- perform surgery;
- relieve symptoms of illness or injury (excluding palliative care);
- reduce severity of illness or injury;
- protect against exacerbation and/or complications of an illness and/or injury which could threaten life or normal functions;
- perform diagnostic or therapeutic procedures.'

Definitions for basic data items

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

Total separations are defined by NHDD item A1. Extracts of the Dictionary are included as Appendix D. 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.

Determining costs for acute 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.

Costs for admitted patients

On the first dimension, it is necessary to exclude costs not directly associated with admitted patient care, notably teaching and research costs and non-inpatient (outpatient) costs.

The data currently available for the indicator do not allow teaching costs to be separated out. This is controlled in part by grouping teaching hospitals together and non-teaching hospitals together. However, this approach does not allow for variations in the proportion of teaching and research costs between teaching hospitals. Nor can it be assumed that the difference in patient costs between teaching and non-teaching

hospitals is due solely to teaching and research functions.

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.

For hospitals where no IFRAC is available, the inpatient costs are estimated by the so-called HASAC conversion (HASAC is an acronym for Health and Allied Services Advisory Council; the full methodology and a discussion of its validity appears in the *Hospital Utilisation and Costs Study* report (Cooper-Stanbury, Solon & Cook 1994, pp. 73–4)). This method equates the cost of 5.753 non-admitted patient services to the cost of one admitted patient bed-day, generating a number of 'extra' bed-days. The ratio of the original number of bed-days to the new total is effectively the inpatient fraction. The HASAC method is used in this report to estimate IFRACs for New South Wales, Tasmania, the Northern Territory and two hospitals in the Australian Capital Territory. Appendix E contains a brief analysis of the use of the HASAC ratio for all jurisdictions. As there are reasons to question the applicability of the HASAC ratio, and because the results are sensitive to the ratio used, the analysis in Appendix E also examines the use of different ratios.

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), no IFRAC was applied, as it has been assumed that all VMO services relate to admitted patients only. This assumption may not hold for all jurisdictions, as VMOs may run outpatient clinics.

Costs for acute admitted patients

It was not possible to isolate the costs of acute admitted patients from all admitted patient costs. Because costs are being estimated per hospital stay—and not per bed-day—most of the non-acute admitted patients (these include 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—so the effect on the results of including them is likely to be not significant.

Adjusting for casemix

Casemix described

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 case weight for a hospital or group of hospitals. The average case weight is calculated as follows:

$$\text{average case weight} = \frac{\sum_{i=1}^{n} (\text{CW}_i \times \text{cases}_i)}{\text{total no. of cases}}$$

where *i* represents each of *n* AN-DRGs (the three 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 case 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 case 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 case weight of 1.08 has an 8% more costly casemix than the national average (by design equal to 1.00).

The average case 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 cases for that group to produce the number of case-weighted separations. The term 'cost per *casemix-adjusted separation*' derives from this use of the number of separations adjusted by relative costliness.

Parameters for case weight estimation

Hospital morbidity data provided to HSH—primarily for the purpose of casemix classification development—were used to estimate average case weights for the groups of hospitals reported here. Version 3 of the classification system was used to allocate patient episodes to AN-DRGs, as this version will be used for the 1993–94 edition of the *Australian Casemix Report* and compatibility of the reports will therefore be enhanced.

Outliers were eliminated using the inter-quartile range trimming algorithm. Outliers are patient episodes with untypical lengths of stay: either very long or very short stays. Outliers are 'trimmed' to avoid misleading results of casemix analyses. Several methods are available for dealing with outliers, and the method of choice depends on the objectives of the analysis. In this report the objective is to obtain accurate estimates of the average length of stay for high-volume AN-DRGs, so the inter-quartile range trimming algorithm was used.

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.

A proposal for dealing with medical costs was endorsed at the March meeting of the NHMBWG. In summary, the method 'converts' actual medical costs to those which would be required if 100% of bed-days were for public patients:

$$\text{ADJUSTED MED} = \frac{\text{ACTUAL MED}}{\text{PUBLIC DAYS}}$$

where ADJUSTED MED is the adjusted medical services expenditure, ACTUAL MED is the actual medical services expenditure, and PUBLIC DAYS is public patient bed-days as a proportion of total bed-days

This approach assumes that all identified medical costs are related to public patients. The approach overestimates the costs in jurisdictions where certain medical costs—such as junior medical officers—are spread across public and private patients.

Results

The results for this indicator are presented in Table 3.2 for all public hospitals in each jurisdiction. Because average case weight estimates were available only at the State level, Table 3.3 presents the results for teaching and non-teaching hospitals without casemix adjustment.

The results were calculated using a number of sources of varying quality. The casemix database managed by HSH was incomplete and contained some anomalies. It is therefore advised that caution be exercised when interpreting any results that use casemix data.

The source data were mapped by HSH to International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) version 12 before being grouped using the mainframe version of AN-DRG version 3.0. Cost weights developed by HSH for AN-DRG version 3.0 were used in determining average case weight.

Recurrent expenditure data were derived from the Institute's National Minimum Data Set collection which is used to produce the *Hospital Utilisation and Costs Study* (HUCS) series. Other sources of expenditure data could have been used, and these are discussed and listed in Appendix F.

The key results shown in the tables are:

- the casemix-adjusted cost per separation for all hospitals combined ranged from $2,208 in South Australia to $3,237 in the Australian Capital Territory, with the national average being $2,327;
- separations from teaching hospitals were on average about $650 more costly than separations from non-teaching hospitals, though this could reflect the different casemix in the two groups; and
- nursing labour was the single largest cost component for all hospitals combined, and accounted for 27.5% of the total recurrent expenditure per casemix-adjusted separation.

It is interesting to note that the average case weight for Australia is 1.02, rather than the expected 1.00 by definition.

This minor anomaly derives from the use of a different set of casemix data to determine the cost weights than was used in producing these estimates.

Figure 3.1 shows the average cost per casemix-adjusted separation for public acute hospitals in 1993–94.

Table 3.2: Cost per casemix-adjusted separation, public acute hospitals, 1993–94

Variable	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Total separations ('000s)	1,190	761	584	327	295	75	53	34	3,319
Average case weight [(a)]	1.07	1.06	0.90	0.94	1.05	0.97	0.93	0.91	1.02
Units of care ('000s) [(b)]	1,276	806	526	307	309	73	49	31	3,378
Total recurrent expenditure ($m)	3,821	2,231	1,481	896	820	253	191	116	9,809
Inpatient fraction (%)[(c)]	71.7	79.3	77.0	74.8	79.8	77.4	77.4	76.9	75.5
Public patient proportion (%)[(d)]	70.8	76.6	86.2	83.9	81.5	79.7	77.0	94.1	76.8
Non-medical labour costs per casemix-adjusted separation ($)									
Nursing	599	640	677	625	657	829	868	888	639
Diagnostic/allied health	168	186	149	179	159	208	295	232	173
Administrative	141	167	124	170	160	121	270	178	150
Other staff	258	205	279	271	206	325	163	370	247
Superannuation [(e)]	83	119	106	22	102	105	60	0	90
Total non-medical labour costs	1,250	1,317	1,334	1,266	1,283	1,587	1,656	1,668	1,299
Other recurrent costs per casemix-adjusted separation ($)									
Domestic services	50	73	78	110	72	123	93	80	69
Repairs/maintenance	74	47	59	88	78	82	20	65	67
Medical supplies	114	112	168	130	133	230	226	135	129
Drug supplies	82	86	110	103	86	169	111	72	92
Food supplies	28	31	29	30	27	29	47	30	29
Administration	92	112	87	88	98	156	163	164	99
Other	149	116	22	28	20	15	148	270	98
Total other recurrent costs	589	576	553	577	514	804	808	817	583
Total excluding medical labour costs	**1,839**	**1,893**	**1,888**	**1,843**	**1,797**	**2,391**	**2,464**	**2,485**	**1,882**
Medical labour costs per casemix-adjusted separation ($)									
Public patients									
Salaried/sessional staff	179	241	226	250	194	235	293	327	212
VMO payments	182	76	72	118	141	98	302	109	129
Private patients (estimated)[(f)]	148	97	48	71	76	85	178	27	103
Total medical labour costs	509	414	346	439	411	419	773	463	444
Total including medical labour costs	**2,348**	**2,307**	**2,234**	**2,283**	**2,208**	**2,809**	**3,237**	**2,948**	**2,327**

(a) Estimates provided by HSH using AN-DRG version 3.0.
(b) Units of care is the product of separations and average case weight.
(c) Inpatient fractions have been estimated using the HASAC method for NSW, Tas, NT and 2 hospitals in ACT. See Appendix E for further analysis of HASAC ratios.
(d) Public patient bed-days as a proportion of total bed-days.
(e) In WA and NT the major superannuation scheme is funded by Treasury and the hospitals do not contribute.
(f) Estimated private patient 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 non-public patients, including private, compensable and ineligible.

Note: These estimates are based on an incomplete database, so caution should be exercised in interpreting the results.

Table 3.3: Cost per separation[a], public acute hospitals, 1993–94

Hospital type and variable	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Teaching									
Total separations ('000s)	502	317	218	168	163	50	na	na	1,418
Total recurrent expenditure ($m)	1,884	1,080	645	575	530	168	na	na	4,883
Inpatient fraction (%) [b]	71.3	78.9	79.1	73.8	77.4	77.0	na	na	75.2
Public patient proportion (%) [c]	66.6	76.0	89.3	79.6	79.2	78.1	na	na	75.1
Non-medical labour costs per separation ($)									
Nursing	629	669	665	635	709	769	na	na	657
Diagnostic/allied health	233	266	177	267	242	215	na	na	236
Administrative	191	219	147	221	204	134	na	na	193
Other staff	307	222	303	261	213	322	na	na	273
Superannuation [d]	88	141	121	33	129	103	na	na	103
Total non-medical labour costs	1,449	1,518	1,413	1,417	1,497	1,542	na	na	1,462
Other recurrent costs per separation ($)									
Domestic services	61	80	69	115	77	120	na	na	76
Repairs/maintenance	124	60	63	98	82	61	na	na	91
Medical supplies	173	179	203	196	189	227	na	na	185
Drug supplies	139	146	140	153	127	109	na	na	140
Food supplies	30	25	28	28	23	29	na	na	28
Administration	102	145	73	100	114	148	na	na	110
Other	178	155	7	7	11	7	na	na	103
Total other recurrent costs	808	789	584	696	623	702	na	na	732
Total excluding medical labour costs	**2,256**	**2,307**	**1,997**	**2,113**	**2,120**	**2,244**	**na**	**na**	**2,194**
Medical labour costs per separation ($)									
Public patients									
Salaried/sessional staff	317	385	263	400	298	270	na	na	329
VMO payments	143	2	102	21	100	76	na	na	84
Private patients (estimated) [e]	230	122	44	108	105	97	na	na	137
Total medical labour costs	690	509	409	530	503	443	na	na	550
Total including medical labour costs	**2,947**	**2,816**	**2,406**	**2,643**	**2,623**	**2,686**	**na**	**na**	**2,744**
Non-teaching									
Total separations ('000s)	688	444	366	159	132	25	53	34	1,901
Total recurrent expenditure ($m)	1,936	1,151	836	321	290	85	191	116	4,927
Inpatient fraction (%)	72.2	79.5	75.4	76.7	84.4	78.2	77.4	76.9	75.9
Public patient proportion (%)	73.6	76.9	84.4	88.6	83.6	82.5	77.0	94.1	78.0
Non-medical labour costs per separation ($)									
Nursing	653	686	573	539	670	876	803	808	646
Diagnostic/allied health	141	148	108	61	67	172	273	212	130
Administrative	122	146	91	94	121	82	250	162	123
Other staff	255	213	221	250	223	300	151	337	236
Superannuation	90	115	80	8	77	101	56	0	84
Total non-medical labour costs	1,262	1,308	1,073	951	1,158	1,531	1,532	1,519	1,219
Other recurrent costs per separation ($)									
Domestic services	48	75	71	91	75	117	86	73	66
Repairs/maintenance	47	43	47	67	82	117	19	59	50
Medical supplies	85	76	120	42	74	216	209	123	91
Drug supplies	50	53	75	36	42	277	102	66	58
Food supplies	30	38	25	29	36	26	43	27	31
Administration	96	99	81	65	90	157	151	149	94
Other	147	100	27	48	34	31	137	246	98
Total other recurrent costs	503	483	446	378	433	940	747	744	489
Total excluding medical labour costs	**1,765**	**1,791**	**1,519**	**1,329**	**1,591**	**2,472**	**2,279**	**2,263**	**1,708**
Medical labour costs per separation ($)									
Public patients									
Salaried/sessional staff	99	162	169	57	78	141	271	298	131
VMO payments	233	137	43	205	206	135	280	99	167
Private patients (estimated)	119	90	39	34	56	59	165	25	84
Total medical labour costs	451	389	251	295	340	336	715	422	382
Total including medical labour costs	**2,216**	**2,179**	**1,770**	**1,625**	**1,930**	**2,807**	**2,995**	**2,685**	**2,090**

(continued)

Table 3.3 (continued): Cost per separation[(a)], public acute hospitals, 1993–94

Hospital type and variable	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Total									
Total separations ('000s)	1,190	761	584	327	295	75	53	34	3,319
Total recurrent expenditure ($m)	3,821	2,231	1,481	896	820	253	191	116	9,809
Inpatient fraction (%)	71.7	79.3	77.0	74.8	79.8	77.4	77.4	76.9	75.5
Public patient proportion (%)	70.8	76.6	86.2	83.9	81.5	79.7	77.0	94.1	76.8
Non-medical labour costs per separation ($)									
Nursing	642	678	609	586	688	804	803	808	650
Diagnostic/allied health	180	197	134	168	166	201	273	212	176
Administrative	151	177	112	159	167	117	250	162	153
Other staff	277	217	251	254	216	315	151	337	252
Superannuation	89	126	95	21	106	102	56	0	92
Total non-medical labour costs	1,340	1,395	1,201	1,189	1,344	1,539	1,532	1,519	1,322
Other recurrent costs per separation ($)									
Domestic services	53	77	71	103	76	119	86	73	71
Repairs/maintenance	79	50	53	83	81	79	19	59	68
Medical supplies	123	119	151	122	139	223	209	123	132
Drug supplies	88	92	99	97	90	164	102	66	93
Food supplies	30	32	26	28	29	28	43	27	30
Administration	99	118	78	83	103	151	151	149	101
Other	160	122	20	26	21	15	137	246	100
Total other recurrent cost	632	610	498	542	539	779	747	744	593
Total excluding medical labour costs	**1,972**	**2,005**	**1,698**	**1,730**	**1,882**	**2,318**	**2,279**	**2,263**	**1,915**
Medical labour costs per separation ($)									
Public patients									
Salaried/sessional staff	192	255	204	235	203	228	271	298	216
VMO payments	195	81	65	111	148	95	280	99	131
Private patients (estimated)	159	103	43	67	80	82	165	25	105
Total medical labour costs	546	439	311	412	430	406	715	422	452
Total including medical labour costs	**2,518**	**2,444**	**2,010**	**2,142**	**2,312**	**2,724**	**2,995**	**2,685**	**2,368**

(a) Costs have not been adjusted for casemix.
(b) Inpatient fractions have been estimated using the HASAC method for NSW, Tas, NT and 2 hospitals in ACT.
(c) Public patient bed-days as a proportion of total bed-days.
(d) In WA and NT the major superannuation scheme is funded by Treasury and the hospitals do not contribute.
(e) Estimated private patient 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 non-public patients, including private, compensable and ineligible.

Note: These estimates are based on an incomplete database, so caution should be exercised in interpreting the results.

Sources: AIHW National Minimum Data Set collection, unpublished; HSH casemix database, unpublished; HSH Medicare Agreements data, unpublished.

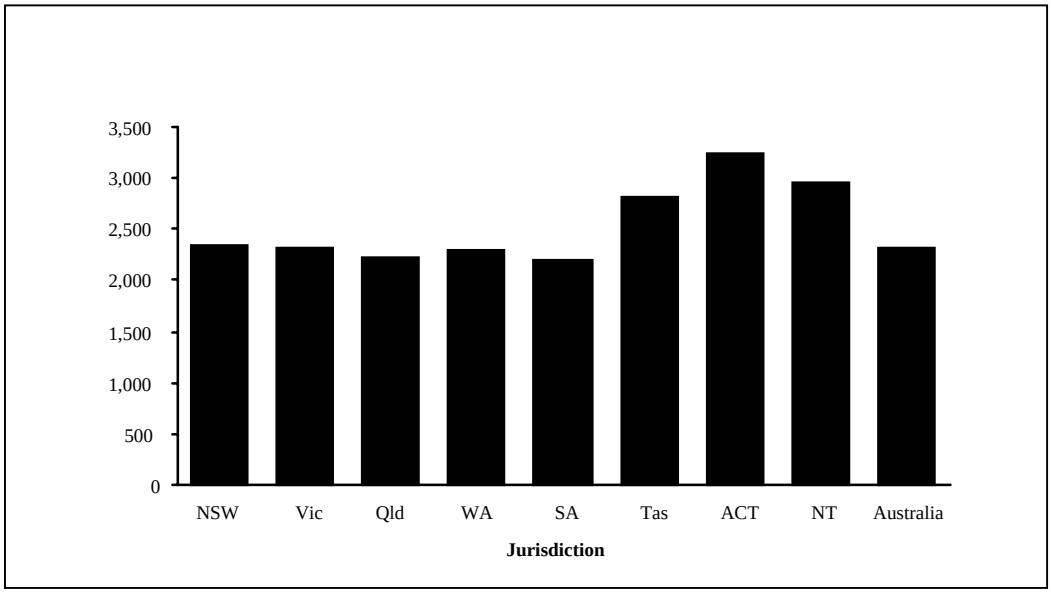

Figure 3.1: Cost per casemix-adjusted separation, public acute hospitals, 1993–94

Cost of treatment per outpatient

This indicator is defined by the following expression:

$$\frac{\text{recurrent expenditure} \times (100 - \text{IFRAC})}{\text{total non - admitted patient services}}$$

Conceptually, this indicator is the complement of the cost per casemix-adjusted separation. For some hospitals, though, costs are not simply split between admitted patients and non-admitted patients, as other services such as an attached nursing home account for part of the total expenditure. Thus the term (100 – IFRAC) in the above expression should properly include another component for services that are neither admitted patient nor non-admitted patient.

In the NHDD, the term 'outpatient services' refers to a group of non-admitted patient services including pathology, radiology, dental, pharmacy and allied health services. As a group, outpatient services are only a subset of non-admitted patient services, with the full set including accident and emergency, community health, district nursing and other outreach services that may be based at an acute hospital. The NHDD refers to the full set of services as non-admitted patient care. The term 'occasion of service' is used to describe a unit of non-admitted patient care (for example an X-ray, a blood test or a consultation).

Although the title of this indicator refers to outpatient, strictly speaking the cost is expressed per occasion of service, in the same way that admitted patient costs are expressed per separation, not per patient. For both admitted and non-admitted care, a patient can have multiple episodes and/or occasions of service during the collection period. Most data collection systems do not treat multiple episodes for the one patient as a single event.

For the cost per separation indicator, differences in hospital costs due to the type of cases treated are accounted for by casemix adjustment. Presently, no nationally comparable adjustment is available for non-inpatient services. It is reasonable to assume that different non-inpatient services have different treatment costs, so that the mix of services in itself

would influence the average cost per service. Several projects are currently being conducted to develop casemix classifications for non-admitted patient care (also referred to as ambulatory care). Use of such classification systems to collect activity and finance data will enable a more sophisticated indicator to be constructed, better complementing the inpatient indicator.

As can be seen, definitions for the fundamental data elements for this indicator have not been firmly established. Because of this, national data are not available to calculate results for this indicator.

Inpatient average length of stay for top twenty AN-DRGs

The average length of stay (ALOS) for admitted patient episodes has long been used by health service managers as a substitute for efficiency. Length of stay is a good predictor of cost, and comparing the ALOS for similar services across two or more providers is a simple way of evaluating relative efficiency.

The ALOS is equal to the arithmetic mean of the length of stay for all patient episodes. It is usually estimated using the following formula:

$$\text{ALOS} = \frac{\text{total occupied bed-days}}{\text{total episodes}}$$

Data for this indicator are presented including and excluding same-day cases. Same-day cases occur when the admission and separation dates are the same. Typically, same-day cases are assigned a length of stay of one day, the same value as cases that involve a stay of one night.

The top twenty AN-DRGs were determined on the basis of the total number of public and private hospital separations nationally. Two sets were calculated, including and excluding same-day cases. All results are determined after trimming using the inter-quartile range method (see page 27).

Results

The results for this indicator were calculated using the casemix database managed by HSH. This database was incomplete and contained some anomalies. It is therefore advised that caution be exercised when interpreting the results.

The average lengths of stay for the top twenty AN-DRGs are shown in Table 3.4 (including same-day cases) and Table 3.5 (excluding same-day cases). Appendix G contains key statistics for the two sets of AN-DRGs.

Results are shown for public and private hospitals. Data were not available for private hospitals in Victoria, Western Australia, the Australian Capital Territory or the Northern Territory. Australian values are therefore estimated on the basis of the available data.

The main features of the results are:

- there was a high degree of consistency in ALOS among the States and Territories in both sectors for the majority of the top AN-DRGs;
- there was no systematic difference between the sectors in the ALOS across AN-DRGs;
- 10 AN-DRGs had sufficiently high same-day utilisation to promote them to the top twenty if same-day cases are included; and
- the top twenty codes accounted for 33.0% of all separations with same-day cases included, or 27.3% with same-day excluded

Table 3.4: Average length of stay (days)[(a)], including same-day cases[(b)], 1993–94

Rank, AN-DRG, description and hospital type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
1 572 Admit for renal dialysis									
Public	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Private	1.0	np	1.0	np	1.0	–	np	np	1.0
Total	1.0	na	1.0	na	1.0	1.0	na	na	1.0
2 674 Vaginal delivery without complicating diagnosis									
Public	3.6	3.9	3.6	3.7	4.0	4.0	3.6	3.7	3.7
Private	5.4	np	5.3	np	5.5	4.9	np	np	5.3
Total	3.8	na	3.9	na	4.4	4.3	na	na	3.9
3 780 Chemotherapy									
Public	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Private	1.0	np	1.0	np	1.0	1.0	np	np	1.0
Total	1.0	na	1.0	na	1.0	1.0	na	na	1.0
4 727 Neonate, admission weight > 2499 g, without significant OR procedure, without problem									
Public	3.7	2.4	3.5	3.8	1.9	2.7	4.0	3.5	3.6
Private	5.3	np	3.5	np	2.7	2.7	np	np	5.1
Total	3.9	na	3.5	na	2.0	2.7	na	na	3.8
5 332 Other gastroscopy for non-major digestive disease, without complications									
Public	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Private	1.0	np	1.0	np	1.0	1.0	np	np	1.0
Total	1.0	na	1.0	na	1.0	1.0	na	na	1.0
6 335 Other colonoscopy without complications									
Public	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Private	1.0	np	1.0	np	1.0	1.0	np	np	1.0
Total	1.0	na	1.0	na	1.0	1.0	na	na	1.0
7 683 Abortion with D&C, aspiration curettage or hysterotomy									
Public	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Private	1.0	np	1.0	np	1.0	1.0	np	np	1.0
Total	1.0	na	1.0	na	1.0	1.0	na	na	1.0
8 099 Lens procedure without vitrectomy, without complications									
Public	1.4	1.3	1.2	1.5	1.3	2.8	1.3	1.2	1.4
Private	1.3	np	1.3	np	1.3	1.4	np	np	1.3
Total	1.3	na	1.3	na	1.3	1.5	na	na	1.3
9 187 Bronchitis and asthma, age < 50, without complications									
Public	2.0	1.9	2.1	2.1	2.1	2.0	2.5	2.3	2.0
Private	2.1	np	2.3	np	2.7	2.4	np	np	2.3
Total	2.0	na	2.1	na	2.2	2.1	na	na	2.0
10 484 Other skin, subcutaneous tissue and breast procedures									
Public	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Private	1.0	np	1.0	np	1.0	1.0	np	np	1.0
Total	1.0	na	1.0	na	1.0	1.0	na	na	1.0

(continued)

Table 3.4 (continued): Average length of stay (days)[(a)], including same-day cases[(b)], 1993–94

Rank, AN-DRG, description and hospital type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
11 128 Dental extraction and restorations									
Public	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Private	1.0	np	1.0	np	1.0	1.0	np	np	1.0
Total	1.0	na	1.0	na	1.0	1.0	na	na	1.0
12 421 Knee procedures									
Public	1.3	1.2	1.3	1.4	1.3	1.3	1.4	1.1	1.3
Private	1.2	np	1.3	np	1.3	1.3	np	np	1.3
Total	1.2	na	1.3	na	1.3	1.3	na	na	1.3
13 943 Other factors influencing health status, age < 80, without complications									
Public	1.6	1.6	1.5	1.8	1.8	1.6	1.4	2.3	1.6
Private	1.4	np	1.2	np	1.9	1.5	np	np	1.4
Total	1.5	na	1.4	na	1.8	1.6	na	na	1.6
14 455 Medical back problems, age < 75, without complications									
Public	3.2	3.0	3.2	3.1	2.9	3.4	2.5	3.5	3.1
Private	2.9	np	2.9	np	2.2	2.8	np	np	2.7
Total	3.1	na	3.1	na	2.5	3.0	na	na	3.0
15 659 Conisation, vagina, cervix and vulva procedures									
Public	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Private	1.0	np	1.0	np	1.0	1.0	np	np	1.0
Total	1.0	na	1.0	na	1.0	1.0	na	na	1.0
16 660 Endoscopic procedures, female reproductive system									
Public	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Private	1.0	np	1.0	np	1.0	1.0	np	np	1.0
Total	1.0	na	1.0	na	1.0	1.0	na	na	1.0
17 122 Tonsillectomy and/or adenoidectomy									
Public	1.7	1.4	1.4	1.5	1.7	2.1	1.2	1.3	1.5
Private	1.4	np	1.2	np	1.6	1.3	np	np	1.3
Total	1.6	na	1.3	na	1.6	1.7	na	na	1.5
18 347 Abdominal pain or mesenteric adenitis, without complications									
Public	1.4	1.3	1.5	1.5	1.5	1.5	1.5	1.6	1.4
Private	1.5	np	1.6	np	1.6	1.5	np	np	1.6
Total	1.5	na	1.5	na	1.5	1.5	na	na	1.5
19 686 Other antenatal admission with moderate or no complicating diagnosis									
Public	1.9	1.7	1.8	1.9	1.8	1.9	2.0	2.3	1.8
Private	2.0	np	1.7	np	2.1	1.9	np	np	2.0
Total	1.9	na	1.8	na	1.8	1.9	na	na	1.8
20 252 Heart failure and shock									
Public	7.2	6.5	6.6	7.0	6.9	7.3	8.0	6.4	6.9
Private	9.3	np	7.5	np	9.1	8.4	np	np	8.4
Total	7.4	na	6.8	na	7.2	7.4	na	na	7.0

(a) Estimates provided by HSH using AN-DRG version 3.0; data trimmed using inter-quartile range method.
(b) Same-day cases are allocated a length of stay of 1.0 days.

Note: These estimates are based on an incomplete database, so caution should be exercised in interpreting the results.

Source: HSH casemix database, unpublished.

Table 3.5: Average length of stay (days)(a), excluding same-day cases, 1993-94

Rank, AN-DRG, description and hospital type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
1 674 Vaginal delivery without complicating diagnosis									
Public	3.6	3.9	3.6	3.7	4.0	4.1	3.7	3.7	3.7
Private	5.4	np	5.3	np	5.5	5.0	np	np	5.4
Total	3.9	na	4.0	na	4.4	4.4	na	na	3.9
2 727 Neonate, admission weight > 2499 g, without significant OR procedure, without problem									
Public	3.7	2.8	3.7	3.8	2.3	3.2	4.0	3.6	3.7
Private	5.3	np	4.2	np	2.8	2.8	np	np	5.2
Total	4.0	na	3.7	na	2.4	3.1	na	na	3.9
3 187 Bronchitis and asthma, age < 50, without complications									
Public	2.1	2.0	2.2	2.2	2.3	2.1	2.5	2.4	2.1
Private	2.2	np	2.4	np	2.8	2.9	np	np	2.5
Total	2.1	na	2.2	na	2.3	2.2	na	na	2.1
4 252 Heart failure and shock									
Public	7.2	6.6	6.4	6.9	6.7	7.2	7.9	6.4	6.9
Private	9.0	np	7.3	np	8.7	8.1	np	np	8.1
Total	7.3	na	6.7	na	7.0	7.3	na	na	7.0
5 122 Tonsillectomy and/or adenoidectomy									
Public	1.9	1.4	1.4	1.6	1.7	2.2	1.2	1.3	1.6
Private	1.4	np	1.2	np	1.6	1.4	np	np	1.4
Total	1.7	na	1.3	na	1.6	1.8	na	na	1.5
6 099 Lens procedure without vitrectomy, without complications									
Public	1.6	1.5	1.5	1.8	1.8	2.9	1.5	1.3	1.6
Private	1.4	np	1.5	np	1.5	1.6	np	np	1.5
Total	1.5	na	1.5	na	1.6	1.8	na	na	1.6
7 177 Chronic obstructive airways disease									
Public	7.2	6.5	6.7	7.2	7.1	7.6	7.7	5.9	7.0
Private	9.0	np	8.1	np	8.8	8.5	np	np	8.4
Total	7.3	na	7.0	na	7.3	7.7	na	na	7.1
8 455 Medical back problems, age < 75, without complications									
Public	4.7	4.2	4.0	4.6	4.2	4.5	3.9	4.4	4.4
Private	4.9	np	3.6	np	3.2	3.8	np	np	4.0
Total	4.8	na	3.9	na	3.7	4.0	na	na	4.3
9 367 Cholecystectomy without common duct exploration									
Public	3.9	3.5	3.1	4.1	3.8	3.5	4.3	4.3	3.6
Private	3.2	np	3.1	np	3.6	3.3	np	np	3.2
Total	3.6	na	3.1	na	3.7	3.4	na	na	3.5
10 347 Abdominal pain or mesenteric adenitis, without complications									
Public	2.0	1.9	1.9	2.0	2.1	2.0	2.0	2.3	2.0
Private	2.2	np	2.1	np	2.3	1.9	np	np	2.1
Total	2.0	na	2.0	na	2.1	2.0	na	na	2.0
11 670 Caesarean delivery, without complicating diagnosis									
Public	6.0	6.2	5.8	6.1	6.3	6.5	6.3	6.6	6.1
Private	7.5	np	7.2	np	8.1	7.2	np	np	7.5
Total	6.3	na	6.3	na	7.1	6.7	na	na	6.4
12 320 Hernia procedures except inguinal and femoral, age > 9									
Public	3.3	2.6	2.3	3.0	3.1	2.8	2.8	2.3	2.9
Private	3.0	np	2.3	np	3.5	3.1	np	np	2.9
Total	3.2	na	2.3	na	3.3	3.0	na	na	2.9
13 686 Other antenatal admission with moderate or no complicating diagnosis									
Public	2.2	2.2	2.0	2.1	2.1	2.1	2.2	2.4	2.1
Private	2.3	np	2.2	np	2.5	2.2	np	np	2.3
Total	2.2	na	2.1	na	2.2	2.1	na	na	2.2
14 274 Cardiac disorder, without AMI, with invasive cardiac investigative procedure, without complicating diagnosis, wit major comorbidities									
Public	1.3	1.5	1.8	1.6	1.4	1.8	1.7	–	1.5
Private	1.4	np	1.8	np	1.3	1.7	np	np	1.5
Total	1.4	na	1.8	na	1.4	1.8	na	na	1.5
15 656 Uterus/adnexa procedure, without malignancy, age > 39 without complications or age < 40 with complications									
Public	6.0	5.3	4.9	5.8	5.9	5.4	6.2	5.6	5.6
Private	5.7	np	5.2	np	6.3	5.4	np	np	5.6
Total	5.9	na	5.1	na	6.1	5.4	na	na	5.6

(continued)

Table 3.5 (continued): Average length of stay (days)[(a)], excluding same-day cases, 1993–94

Rank, AN-DRG, description and hospital type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
16 421 Knee procedures									
Public	2.5	2.3	1.9	1.9	2.4	2.0	2.0	1.9	2.2
Private	1.8	np	1.8	np	2.1	1.8	np	np	1.9
Total	2.0	na	1.8	na	2.1	1.8	na	na	2.0
17 943 Other factors influencing health status, age < 80, without complications									
Public	3.9	3.4	3.1	2.3	4.3	3.5	2.3	4.1	3.1
Private	3.6	np	2.6	np	5.6	5.0	np	np	4.1
Total	3.8	na	3.0	na	4.7	3.7	na	na	3.2
18 349 Oesophagitis, gastroenteritis and other miscellaneous digestive disorders, age 10–74, without complications									
Public	2.3	2.1	2.1	2.2	2.2	2.5	2.6	2.5	2.2
Private	2.7	np	2.4	np	2.8	2.7	np	np	2.6
Total	2.3	na	2.2	na	2.3	2.5	na	na	2.2
19 941 Rehabilitation									
Public	21.4	23.4	20.0	19.0	21.4	17.8	23.4	14.5	22.5
Private	18.9	np	12.5	np	21.1	14.3	np	np	18.5
Total	20.7	na	16.4	na	21.3	17.4	na	na	21.8
20 261 Chest pain									
Public	2.2	2.0	2.3	2.1	2.1	2.5	2.1	2.3	2.2
Private	2.4	np	2.2	np	1.9	2.0	np	np	2.2
Total	2.2	na	2.3	na	2.1	2.4	na	na	2.2

(a) Estimates provided by HSH using AN-DRG version 3.0; data trimmed using inter-quartile range method.

Note: These estimates are based on an incomplete database, so caution should be exercised in interpreting the results.

Source: HSH casemix database, unpublished.

PRODUCTIVITY

Productivity refers to the relationship between the mix of inputs and mix of outputs. It is related to efficiency in that efficiency describes the actual cost of the inputs for a given unit of output.

In developing productivity indicators, the Working Group focused on measures of capital productivity. The labour component of productivity is reported as part of the 'Cost per casemix-adjusted separation' indicator above.

Consultancy on asset valuation

The productivity indicators are, as a group, underdeveloped both in terms of definitions for basic data items and established data collections. This was acknowledged early in the program and a consultancy to examine the issues was let by HSH to Dr Penny Burns of Infrastructure Economics. The terms of reference for the study appear in Appendix B.

Major findings

Major findings of this study were:

- the degree of consistency already achieved by State and Territory health authorities (and indirectly the respective Treasuries) is sufficient for the introduction of benchmarking comparisons;
- States and Territories generally agree on the use of 'deprival value' as the valuation approach for assets. This reduces to 'depreciated replacement value' for most assets which will continue in use;
- the major changes required to available asset information are adjustment for inflation between revaluation periods and bringing the 'equipment' valuations to current values, adjustments for the treatment of leased assets and the separation of capital funding for charitable hospitals; and
- valuation policies are generally consistent, but valuation practices differ both among and within jurisdictions (for example, differences in scope and coverage among jurisdictions, differing practices among hospitals in the same jurisdiction, different approaches to valuing the major asset classes, differing intervals between revaluations and differing depreciation assumptions). Most jurisdictions claim asset registers are not as complete or as accurate as they would like. For these reasons, the estimates need to be considered as indicative only.

Suggested indicators

Doctor Burns suggested a suite of indicators covering condition, capital intensity, capital investment, capital growth and usage, and advised that the indicators should be used in conjunction with each other rather than in isolation.

The NHMBWG considered the proposals in the light of the objectives of the program and the available data, and agreed on three indicators representing the usage, condition and intensity groups, namely:

- user cost of capital per casemix-adjusted separation;
- ratio of depreciated replacement value to total replacement value; and

- total replacement value per casemix-adjusted separation.

These indicators are discussed below.

Definitions and treatment of data

Officers of the State and Territory health authorities were requested to provide data according to basic guidelines prepared by Dr Burns. Where different policies and systems were in place it was not possible to adhere to these guidelines, although efforts have been made to improve the comparability of data after the fact. The definitions outlined below, therefore, lack detail because general concepts are being described rather than precise definitions of the data elements.

Data were requested for the asset classes of buildings and equipment. Land was excluded because of the considerable variations in its value, control and use. Other asset classes such as intangibles were excluded because of the lack of consistency in their valuation and problems in the calculation of depreciation.

User cost of capital per casemix-adjusted separation

This indicator is a measure of capital usage, and is defined as:

$$\frac{\text{depreciation} + \text{opportunity cost}}{\text{casemix - adjusted separations}}$$

Depreciation represents the service potential of an asset consumed during a financial period. Opportunity cost in relation to an asset is the value of the next best alternative that is sacrificed by retaining the asset. Opportunity cost is usually estimated by applying an arbitrary percentage rate—such as the long-term government bond rate—to the depreciated value of the asset. Where results are to be compared, the same rate needs to be used for all jurisdictions. For this report, the rate of 7.0% was used, as it was the rate used most commonly by the State health authorities.

The denominator—casemix-adjusted separations—is discussed on page 26.

Some definitions of the cost of capital include a maintenance component, but this is omitted in this indicator to avoid double counting. In some States, large-scale maintenance is capitalised and hence depreciated. Other maintenance is included in recurrent expenditure.

Results

Indicative values for user cost of capital are shown in Table 3.6. Results are not shown for Australia as the State and Territory values could not be reliably summed.

The results shown for this and the following two indicators represent the first attempt to collect nationally comparable data on the value of hospital assets. Because the items were defined after the collection period, there was only moderate success in achieving consistency.

It was inappropriate to include data for Queensland and the Northern Territory as these jurisdictions are yet to measure assets in current replacement values.

Notes on the data for each State and Territory providing data follow. For all jurisdictions it was likely that asset registers were incomplete, so the data reported should be considered indicative only.

New South Wales

NSW Health financial and accounting policy does not require the separation of plant and equipment, so plant has been reported with equipment in this report.

Physical assets costing less than $5,000 are expended in the year of acquisition. Donated physical assets are capitalised and brought into account at fair market value if the value is $5,000 or more.

The data include facilities under the Area and District Health Services, the NSW ambulance service, the Corrections Health Service and the Central Office of the Department. These facilities are estimated to amount to 1.5–2.0% of the value of buildings, and around 10% of the value of plant and equipment.

The data include the value and depreciation of buildings leased to other entities for the operation of hospital services.

Victoria

Data are based on a survey of all Victorian tertiary, referral, metropolitan and rural base hospitals and a sample of smaller country hospitals that together provided 96% of casemix funded separations.

The values are estimated replacement cost in 1994. Depreciation has been calculated by the straight-line method on the total replacement value.

The scope covers acute care hospitals only—nursing homes are excluded—and includes hospitals providing public beds, including religious and charitable hospitals.

The data include hospital-owned buildings including commercial and leased space; excluded are university-owned buildings, independent research institutes and car parks operated by the private sector.

Data on equipment were collected on items with a value down to $1,000 with estimates made for each item below that value.

Western Australia

Information provided for replacement value for equipment is historical cost.

South Australia

South Australia provided estimates of the total replacement value of all buildings and equipment based on values provided by the SA Audit Commission which estimated that 75% of the total assets value is represented by building assets including plant. The estimates assume that the vast majority of assets are related to hospitals.

Estimates of the depreciated replacement value of buildings were based on the results of a recent valuation exercise showing that the depreciated value was 31% of the total value.

A useful life of 50 years was used for buildings to determine depreciation. Due to the difficulties in estimating the useful life and residual value of equipment, no estimates of depreciated value or depreciation were provided.

Tasmania

Depreciated replacement values were based on the Valuer General's most recent valuation, or, for recent buildings, on actual building costs. No estimates of total replacement value were available for the whole State.

Australian Capital Territory

The information provided in relation to equipment is based on historical cost rather than current replacement values.

Data were not available for one small community hospital.

Ratio of depreciated replacement value to total replacement value

The ratio of depreciated replacement value (DRV) to total replacement value (TRV) is an indicator of the condition of an asset or asset holdings.

Total replacement value is the current replacement cost of an asset. In the case of buildings it is the current building costs with current materials and methods on a greenfield site. Depreciated replacement value is the total replacement value less accumulated depreciation that would have applied from the date of acquisition to the current financial period.

Table 3.6: User cost of capital, public acute hospitals, 1993–94 (indicative)

Asset class	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Buildings									
Depreciated replacement value ($m)	3,896	1,700	np	1,057	605	277	254	np	na
Opportunity cost ($m)[(a)]	273	119	na	74	42	19	18	na	na
Depreciation ($m)	121	102	np	34	39	6	6	np	na
Casemix-adjusted separations ('000s)	1,276	806	na	307	309	73	49	na	na
User charge/separation ($)	309	274	na	351	263	345	473	na	na
Equipment									
Depreciated replacement value ($m)	663	251	np	76	np	39	23	np	na
Opportunity cost ($m)	46	18	na	5	na	3	2	na	na
Depreciation ($m)	97	42	np	11	np	7	3	np	na
Casemix-adjusted separations ('000s)	1,276	806	na	307	na	73	49	na	na
User charge/separation ($)	112	74	na	52	na	137	99	na	na

(a) Calculated as depreciated replacement value x 7.0%.

Note: These data are not based on nationally consistent definitions or methodologies, and can be considered indicative only.

Sources: State and Territory health authorities, mostly unpublished.

The DRV is sometimes used to indicate the condition of an asset, but it is ambiguous: a low DRV may represent a large but old (hence more depreciated) asset holding, or a smaller but almost new asset holding. The ratio DRV:TRV gives a better approximation of condition.

Results

Indicative results of the asset condition measure are shown in Table 3.7. Results are not shown for Australia as the State and Territory values could not be reliably summed.

Table 3.7: Asset condition, public acute hospitals, 1993–94 (indicative)

Asset class	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Buildings									
Depreciated replacement value ($m)	3,896	1,700	np	1,057	605	277	254	np	na
Total replacement value ($m)	4,738	3,654	np	2,001	1,950	np	348	na	na
Ratio DRV:TRV	0.82	0.47	np	0.53	0.31	na	0.73	np	na
Equipment									
Depreciated replacement value ($m)	663	251	np	76	np	39	23	np	na
Total replacement value ($m)	1,028	568	np	149	262	np	41	na	na
Ratio DRV:TRV	0.64	0.44	np	0.51	na	na	0.57	np	na

Note: These data are not based on nationally consistent definitions or methodologies, and can be considered indicative only.

Sources: State and Territory health authorities, mostly unpublished.

Total replacement value per casemix-adjusted separation

This indicator is a measure of capital intensity.

Total replacement value is defined directly above; casemix-adjusted separation is discussed in the section on the first efficiency indicator above.

Indicative results of the capital intensity measure are shown in Table 3.8. Results are not shown for Australia as the State and Territory values could not be reliably summed.

Labour costs per casemix-adjusted separation

This indicator is a measure of labour productivity, and is reported as a component of the cost per separation indicator shown above.

Labour costs for this indicator are defined as the sum of NHDD items E8–E10:

- salaries and wages (including contract staff);
- payments to visiting medical officers; and
- superannuation employer contributions.

Table 3.8: Capital intensity, public acute hospitals, 1993–94 (indicative)

Asset class	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Buildings									
Total replacement value ($m)	4,738	3,654	np	2,001	1,950	np	348	np	na
Casemix-adjusted separations ('000s)	1,276	806	na	307	309	na	49	na	na
TRV/separation ($)	3,714	4,534	na	6,514	6,314	na	7,058	na	na
Equipment									
Total replacement value ($m)	1,028	568	np	149	262	np	41	np	na
Casemix-adjusted separations ('000s)	1,276	806	na	307	309	na	49	na	na
TRV/separation ($)	806	705	na	484	849	na	832	np	na

Note: These data are not based on nationally consistent definitions or methodologies, and can be considered indicative only.

Sources: State and Territory health authorities, mostly unpublished.

This indicator was proposed as a productivity measure as labour costs are a substantial component of the total expenditure. The Working Group noted that it would be desirable for contract staff to be separately identified, but this was not possible under the current definitions. The definitions will need to be amended if such data are to be collected in the future.

QUALITY

Definitions and treatment of data

Quality is a difficult concept to define. In general it relates to the clinician's and patient's perception that care was of a high standard and resulted in desirable outcomes.

The first three indicators in this section relate to the clinical process of care and measure potential adverse outcomes of care. The definitions were developed by the National Hospital Quality Management Program Quality of Care Data Working Party and are presented as drafts only pending the results of validity and reliability testing.

The patient satisfaction indicator is intended to measure the consumer's perception that care was of a high standard.

Rate of emergency patient readmission within 28 days

This indicator is defined by the following expression:

$$\frac{\text{EMERG READM}}{\text{TOTAL ADM}}$$

during the collection period, where EMERG READM is the number of emergency readmissions within 28 days of a previous separation, and TOTAL ADM is the total number of admissions excluding deaths.

For the purposes of this indicator, an emergency admitted patient is defined as a patient requiring immediate treatment (that is, within 24 hours), regardless of the source of referral. Restricting the scope to emergency admitted patients will help filter out unplanned readmissions that may not have been unexpected, such as for some chronic illnesses.

Readmission implies admission to the same hospital from which the patient was separated. The data collection does not require determining whether the readmission is for the same condition, a related condition or a complication of the condition for which the patient was previously admitted. Any readmission to a hospital other than the one from which the earlier discharge occurred is not counted in this indicator.

Results

Table 3.9 presents illustrative results for this indicator, reproduced from the ACHS report on hospital-wide medical indicators data (ACHS 1994). Hospitals that departed from the definitions were excluded from any analyses in that report. The results shown for the Northern Territory were provided by Northern Territory Department of Health and Community Services, based on the ACHS definitions.

Note that the data shown in this section have been collected on the basis of the ACHS definitions, not on the basis of the definitions described in this report. However, the definitions described have been developed from the ACHS definitions, and in most cases the two sets of definitions would produce similar results.

Table 3.9: Rate of unplanned readmission within 28 days, public and private acute hospitals, 1993[a]

Variable	NSW	Vic	Qld	WA	SA	Tas	ACT	NT[b]
Number of facilities	34	16	8	5	12	–	1	1
Number of unplanned readmissions	2561	749	274	263	322	–	18	np
Rate[c]	3.4	3.7	2.0	2.5	3.7	–	0.8	6.3

(a) Hospitals participating in ACHS accreditation program in 1993.
(b) Northern Territory results for 1994–95 were provided by the NT Department of Health and Community Services.
(c) Number of unplanned readmissions per 100 admissions.

Sources: Australian Council on Healthcare Standards, Care Evaluation Program; NT Department of Health and Community Services, unpublished.

Rate of unplanned return to operating room

This indicator is defined as:

$$\frac{\text{UNPLANNED THEATRE RETURNS}}{\text{THEATRE SEPS}}$$

during the collection period, where UNPLANNED THEATRE RETURNS is the number of separations with one or more unplanned visits to an operating room subsequent to a previous procedure during the same admission, and THEATRE SEPS is the total number of separations where one or more procedures were performed.

The number of patients having more than one unplanned return to an operating room would be small. Therefore, the total number of separations where the patient has had one or more unplanned returns to the operating room would be close to the total number of unplanned returns. Also, recording multiple unplanned returns subsequent to a single procedure provides no further useful information.

This indicator has been tailored to capture all visits to an operating room subsequent to complications arising from any procedure/operation whether or not it was performed in an operating room. As such it may not measure actual 'returns' to an operating room in some hospitals, but it helps to standardise data across hospitals where the definition of 'operating room' may differ.

Results

Table 3.10 presents illustrative results for this indicator, reproduced from the ACHS report on hospital-wide medical indicators data (ACHS 1994). Hospitals that departed from the definitions were excluded from any analyses in that report. The results shown for the Northern Territory were provided by Northern Territory Department of Health and Community

Table 3.10: Rate of return to operating room, public and private acute hospitals, 1993[a]

Variable	NSW	Vic	Qld	WA	SA	Tas	ACT	NT[b]
Number of facilities	28	16	9	4	14	1	1	1
Number of returns to operating room	184	151	83	33	46	2	16	np
Rate[c]	0.5	0.7	0.6	0.9	0.5	0.1	0.7	4.2

(a) Hospitals participating in ACHS accreditation program in 1993.
(b) Northern Territory results for 1994–95 were provided by the NT Department of Health and Community Services; there was a definitional problem surrounding the term 'unplanned' that may affect this result.
(c) Number of patients with unplanned return to operating room during the same admission per 100 separations where one or more procedures were performed.

Sources: Australian Council on Healthcare Standards, Care Evaluation Program; NT Department of Health and Community Services, unpublished.

Services, based on the ACHS definitions.

Rates of hospital-acquired infection

Hospital-acquired infection can fall into two categories: rate of post-operative wound infection and hospital-acquired bacteraemia. The following terminology relates to the definitions for these indicators.

Clean operations are those performed in a sterile field, that is, uncontaminated by bacteria.

Contaminated operations include:

- those which breach the gastrointestinal, respiratory and genito-urinary tracts;
- those in which a break in aseptic technique occurs; or
- traumatic wounds.

Dirty operations are those in which a perforated viscus or pus is found. The definition of dirty operations is used to distinguish contaminated from dirty operations. Infections from dirty operations cannot be considered hospital-acquired.

Wound infection is any surgical wound from which purulent material drains or is obtained. Microbiological confirmation is not necessary for the purposes of the indicator 'Rate of post-operative wound infection'. A reaction around suture material is excluded.

Patients having multiple incisions in the same operation (e.g. chest and leg for coronary artery graft surgery) are counted as one patient.

Patients having a separate incision in separate/subsequent operations count as two patients.

Rate of post-operative wound infection

This indicator has two components: wound infection following clean surgery and infection following contaminated surgery.

The date of the principal procedure is used for the date of procedure for this indicator. Where an earlier procedure is not the principal procedure, the condition is likely to be sufficiently severe to require an extended stay in hospital. This allows capture of most post-operative wound infections for this indicator.

No attempt is made to collect data on patients developing a wound infection following discharge. In the future, links may be built with community facilities to allow this collection to take place.

The calculation of the rate of wound infection following clean surgery is defined as:

$$\frac{\text{DAY 5 INFECTION (CLEAN)}}{\text{CLEAN SURGERY SEPS}}$$

during the collection period, where DAY 5 INFECTION (CLEAN) is the number of patients having evidence of wound infection on or after the fifth post-operative day following clean surgery, and CLEAN SURGERY SEPS is the number of patients undergoing clean surgery with a post-operative length of stay equal to or greater than 5 days.

The calculation of the rate of wound infection following contaminated surgery is defined as:

$$\frac{\text{DAY 5 INFECTION (CONTAM)}}{\text{CONTAM SURGERY SEPS}}$$

during the collection period, where DAY 5 INFECTION (CONTAM) is the number of patients having evidence of wound infection on or after the fifth post-operative day following contaminated surgery, and CONTAM SURGERY SEPS is the number of patients undergoing contaminated surgery with a post-operative length of stay equal to or greater than 5 days.

Rate of hospital-acquired bacteraemia

Hospital-acquired bacteraemia is defined as positive blood culture for patients who were afebrile on admission, that is, temperature less that 37.4ºC, who become febrile 48 hours or more after admission.

There is currently no attempt to collect data on patients who develop hospital-acquired bacteraemia following separation. In the future, links may be built with community facilities to allow this collection to take place.

The rate is calculated as:

$$\frac{\text{BACTERAEMIA SEPS}}{\text{SEPS} > 48\,\text{HRS}}$$

during the collection period, where BACTERAEMIA SEPS is the number of separated patients who acquire bacteraemia during a hospital stay, and SEPS > 48 HRS is the number of separations with length of stay of 2 days or more.

Results

Table 3.11 presents illustrative results for this indicator, reproduced from the ACHS report on hospital-wide medical indicators data (ACHS 1994). Hospitals that departed from the definitions were excluded from any analyses in that report. The results shown for the Northern Territory were provided by Northern Territory Department of Health and Community Services, based on the ACHS definitions

Table 3.11: Hospital-acquired infection rates, public and private acute hospitals, 1993[a]

Variable	NSW	Vic	Qld	WA	SA	Tas	ACT	NT[b]
Clean wound infection								
Number of facilities	19	8	9	2	10	1	–	1
Number of clean wound infections	43	37	65	2	9	3	–	np
Rate[c]	1.9	1.8	2.3	3.0	2.5	1.7	–	3.0
Contaminated wound infection								
Number of facilities	17	7	8	2	8	1	–	1
Number of contaminated wound infections	53	31	47	3	23	6	–	np
Rate[d]	2.2	3.7	4.7	3.6	1.8	4.4	–	5.5
Hospital-acquired bacteraemia								
Number of facilities	26	16	7	2	11	2	2	1
Number of hospital-acquired bacteraemia	37	47	31	2	6	4	77	np
Rate[e]	0.04	0.10	0.07	0.10	0.03	0.30	0.20	0.23

(a) Hospitals participating in ACHS accreditation program in 1993.
(b) Northern Territory results for 1994–95 were provided by the NT Department of Health and Community Services.
(c) Number of patients with wound infection on or after fifth post-operative day following clean surgery per 100 patients undergoing clean surgery with post-operative length of stay of 5 or more days.
(d) Number of patients with wound infection on or after fifth post-operative day following contaminated surgery per 100 patients undergoing contaminated surgery with post-operative length of stay of 5 or more days.
(e) Number of separated patients who acquire bacteraemia during a hospital stay per 100 separated patients with length of stay of 48 hours or more.

Sources: Australian Council on Healthcare Standards, Care Evaluation Program; NT Department of Health and Community Services, unpublished.

Patient satisfaction

No agreed definitions currently exist for this indicator. A project concerned with the conceptual development of the area is outlined in Chapter 5.

Illustrative results are shown in Tables 3.12 to 3.15 for New South Wales, Western Australia and the Australian Capital Territory, and for Queensland accident and emergency departments. Because different survey methods were used at different times, these results are not comparable

Table 3.12: Selected patient satisfaction results, New South Wales, 1993–94[(a)]

Variable	General hospitals	All service areas[(b)]
General indicators		
Customer satisfaction index (0–100 scale)	84	85
% customers/clients satisfied	94	94
% customers/clients very satisfied	61	62
% 'definitely recommend' to others	72	73
% saying 'worse than expected'	5	5
Care, treatment and communication (0–100 scale)		
Quality of care and treatment	89	90
Compassionate, reassuring attitude	82	82
Knowing you as an individual person	72	72
Information and instructions	77	79
Introductions	69	72
Staff (0–100 scale)		
Doctors—overall	84	84
Doctors—information and communication	79	79
Nurses—overall	90	90
Nurses—information and communication	82	82
Comfort/meals (0–100 scale)		
Condition/look of room	75	76
Cleanliness of ward toilet/showers	79	79
Restful atmosphere	68	68
Comfort of bedding	69	70
Meals	75	75

(a) Based on 7,722 responses from 34 sites over summer 1993–94.
(b) Includes mental health units and community health centres.

Source: NSW Health Department.

Table 3.13: Selected patient satisfaction results, Western Australia, 1995[(a)]

Variable	Tertiary	Secondary	All hospitals
Overall satisfaction index (maximum 5.00)	4.42	4.58	4.51

(a) Based on 2,332 responses from a State-wide survey of public hospitals in May 1995.

Source: Health Department of Western Australia.

Table 3.14: Selected patient satisfaction results, Australian Capital Territory, 1995[(a)]

Variable	Total
Overall satisfaction	
% very satisfied	60
% fairly satisfied	36
% not too satisfied	1
% not at all satisfied	3
Satisfaction index by area of activity (0–100 scale)	
Inpatients	82
Same day	87
Emergency	83
Outpatients	88

(a) Based on survey at principal hospital.

Source: ACT Department of Health and Community Care.

Table 3.15: Selected patient satisfaction results, Queensland accident and emergency departments, 1994[(a)]

Variable	Total
Overall satisfaction	
% very satisfied	51
% fairly satisfied	36
% not too satisfied	8
% not at all satisfied	5
Overall satisfaction index (0–100 scale)	77
Satisfaction with quality of care and treatment	
% very satisfied	63
% fairly satisfied	28
% not too satisfied	6
% not at all satisfied	3

(a) Based on 1,898 responses across 20 public hospital accident and emergency departments during part of 1994.

Source: Queensland Health Department.

Proportion of facilities accredited by ACHS

This indicator is a stand-in general measure of the quality of care processes, in that success in the ACHS program requires demonstrated adherence to quality assurance practices.

The indicator is calculated as the ratio of accredited hospitals to all hospitals in the jurisdiction. For this indicator, private hospital data are reported to complement the public hospital data.

Because participation in the ACHS program is voluntary, this indicator may merely reflect the policy or resources of hospitals regarding participation. An improvement on this indicator would be a comparison of the number of facilities achieving accreditation with the number applying.

In 1993–94 the ACHS awarded accreditation for 1 year, 3 years or 5 years, with the longer duration reflecting the confidence of the ACHS survey team in the ability of the hospital to maintain the quality of care processes. The results for this indicator are shown by duration of accreditation.

Results

Table 3.16 presents results provided by ACHS on the proportion of hospital facilities awarded accreditation. Figure 3.2 shows the proportion of all facilities accredited.

In general, the proportions are higher in the private sector. This probably reflects the fact that in some jurisdictions accredited private hospitals can attract higher health insurance fund rebates than non-accredited facilities.

Table 3.16: Proportion of facilities accredited by ACHS (%), public and private acute hospitals, as at 30 June 1994

Hospital type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Public									
Metropolitan	64	68	19	47	71	67	100	–	58
Non-metropolitan	49	31	2	22	33	–	na	–	25
Total public	53	43	4	26	40	24	100	–	32
1 year[(a)]	4	2	1	3	3	12	–	–	3
3 years	46	36	3	23	37	12	100	–	28
5 years	3	4	–	–	–	–	–	–	2
Total	53	43	4	26	40	24	100	–	32
Private									
Metropolitan	81	54	50	47	84	100	–	100	66
Non-metropolitan	100	24	65	150	29	75	na	na	58
Total private	86	45	59	57	74	88	–	100	64
1 year	7	2	6	5	5	–	–	–	4
3 years	69	40	49	52	64	88	–	100	54
5 years	10	4	4	–	5	–	–	–	5
Total	86	45	59	57	74	88	–	100	64
Total acute hospitals									
Metropolitan	73	59	33	47	80	80	60	50	63
Non-metropolitan	56	29	12	25	32	20	na	–	30
Total acute	64	44	16	32	51	44	60	17	42
1 year	5	2	2	4	3	8	–	–	3
3 years	54	38	13	28	46	36	60	17	36
5 years	5	4	1	–	2	–	–	–	3
Total	64	44	16	32	51	44	60	17	42

(a) 1 year, 3 years or 5 years is the duration of accreditation awarded.

Source: Australian Council on Healthcare Standards, unpublished.

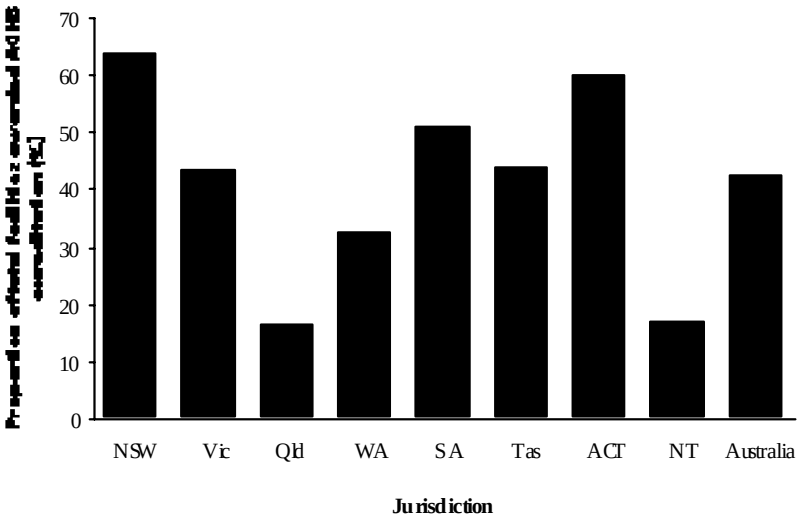

Figure 3.2: Proportion of facilities accredited by ACHS (%), public and private acute hospitals, as at 30 June 1994

ACCESS

Access relates to the capability of the health system to provide appropriate, affordable and timely care according to need.

Waiting times for elective surgery

The data used for this indicator have been extracted from the waiting times data set prepared by the Institute for the *National Report on Elective Surgery Waiting Lists for Public Hospitals 1994* (Mays 1995).

The waiting times collection in 1994 represented the first attempt to collect data in a nationally consistent manner. Health authorities were not able to apply all draft definitions in a similar way, so the 1994 data set has some anomalies. Many issues regarding the definitions and their application have been debated following the publication of those data. Changes to definitions effective July 1995 should see more consistent waiting times data available after the completion of the 1995–96 collection.

This indicator comprises three sets of performance measures regarding waiting times for elective surgery:

- clearance time;
- proportion of patients waiting inappropriately at census; and
- proportion of patients admitted after waiting inappropriately.

Clearance time is defined as the number waiting at a point in time (the census count) divided by the mean number cleared (admitted and removed) from the waiting list per month. It can be conceived as the length of time that it would take to clear all patients from the waiting list if the rate of clearance remained constant and no more patients were added to the list. Clearance time is a prospective measure, and should not be considered as equal to the average waiting time.

An inappropriate wait is described as waiting longer than considered appropriate for the urgency categorisation of the patient. At the time the data for this indicator were collected, there was national consensus to use two levels of urgency:

- category 1: admission desirable within 30 days; and
- category 2: admission desirable within 31 days or more (there is no time limit on category 2 patients).

There is an in-principle agreement by all States and Territories to the adoption of a nationally consistent three-tier urgency categorisation system. It is anticipated that this system will be used in the 1996 national report on elective surgery waiting lists.

An inappropriate wait for category 1 patients is therefore 31 days or more. Because there is no time limit on category 2 patients, it is difficult to define an inappropriate waiting time. A period of 12 months was selected as it represented a compromise between the differing views on the subject. In this report, category 2 patients are reported together with category 1 patients.

The formula for inappropriate wait at census for category 1 patients is:

$$\frac{\text{CAT1} > 30 \text{ DAYS (CENSUS)}}{\text{CAT1 (CENSUS)}}$$

where CAT 1 > 30 DAYS (CENSUS) is the number of category 1 patients waiting over 30 days at census, and
CAT 1 (CENSUS) is the number of category 1 patients on the waiting list on the census date.

The formula for category 2 patients is similar, substituting waiting > 12 months on the census date.

The formula for category 1 patients admitted after waiting inappropriately is:

$$\frac{\text{CAT1 > 30 DAYS (ADM)}}{\text{CAT1 (ADM)}}$$

where CAT 1 > 30 DAYS (ADM) is the number of category 1 patients admitted who waited over 30 days, and CAT 1 (ADM) is the number of category 1 patients admitted.

The formula for category 2 patients is similar, substituting admitted after waiting > 12 months.

The clinical specialty groups reported were determined by consensus during the development of the waiting times definitions. Specialty is the area of clinical expertise held by the doctor who will perform or has performed the elective surgery.

Results

The results of a one-month data collection in 1994 are presented in this section. Several caveats apply to these data:

- the survey period was only one month—the numbers and attributes of patients admitted during this period may not be typical of patients admitted over a longer period;
- categorisation of patients by clinical urgency was implemented to varying degrees and with variable consistency; and
- the data do not cover all public hospitals in each State and Territory. Table 3.17 indicates the coverage of waiting list data in this period. Data for Queensland were not available for the original collection.

Clearance time

Table 3.18 and Figure 3.3 show average clearance time by clinical specialty for each jurisdiction reporting in 1994.

The main features of this table are:

- the average clearance time for Australia was estimated as 2.3 months. This is the average time it would take to treat all patients on the waiting list if the present rate of clearance prevailed and no more patients were added to the list;
- the average clearance time for all patients ranged from 1.8 months in New South Wales to 9.9 months in the Northern Territory; and
- there was a high degree of variation in clearance time for clinical specialties among the jurisdictions.

Table 3.17: Coverage of waiting times data, public acute hospitals, 1994

Variable	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Proportion of total separations provided by hospitals which contributed waiting times da									
	99	67	na	50	62	99	100	100	na

Source: Mays 1995.

Table 3.18: Average clearance time (months), public acute hospitals, 1994

Clinical specialty	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Cardio-thoracic surgery	1.1	1.0	np	1.1	1.1	2.0	0.4	np	1.1
Ear, nose and throat	2.9	3.2	np	5.0	4.8	4.6	4.9	np	3.6
General surgery	1.3	1.9	np	2.6	2.6	2.1	4.9	np	1.7
Gynaecology	1.2	1.9	np	1.0	1.9	2.8	3.0	np	1.6
Neurosurgery	0.8	1.4	np	0.8	0.9	1.4	8.7	np	1.1
Ophthalmology	3.3	2.7	np	5.5	2.1	3.4	4.8	np	3.2
Orthopaedic surgery	2.7	3.3	np	5.0	3.9	6.0	5.4	np	3.3
Plastic surgery	1.6	5.1	np	4.0	3.5	5.8	5.2	np	3.4
Urology	2.0	2.9	np	4.5	2.2	3.3	11.0	np	2.7
Vascular surgery	1.5	2.6	np	1.3	2.0	1.5	7.4	np	1.9
Other	–	1.6	np	1.8	2.5	0.4	–	np	1.0
All patients	1.8	2.6	np	3.3	2.8	2.5	5.0	9.9	2.3

Notes:

1. Clearance time is a prospective measure of the capacity of the system to remove patients from waiting lists. It should not be considered as the average waiting time.
2. The survey period was only one month—the numbers and attributes of patients admitted during this period may not be typical of patients admitted over a longer period of time.
3. Categorisation of patients by clinical urgency was implemented to varying degrees and with variable consistency.
4. The data do not cover all public hospitals in each State and Territory.

Source: Mays 1995.

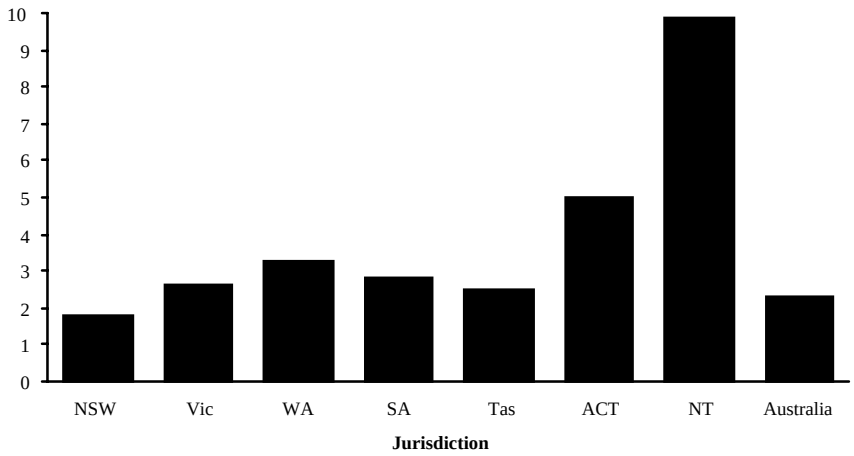

Figure 3.3: Average clearance time, public acute hospitals, 1994

Inappropriate waits

Tables 3.19 and 3.20 present data on inappropriate waiting times, determined at census or on admission. Data for Victoria are not comparable, as a different method for calculating waiting times was used in that State.

Key results in these tables are:

- at the time of census, 9% of patients had waited more than 12 months;

- 20% of plastic surgery patients nationally had waited more than 12 months at census, and less than 1% of cardiac surgery patients had waited more than 12 months at census;
- across all specialties the highest proportion of long-wait patients at census was in the Australian Capital Territory (26%) and the lowest in New South Wales (5%);
- of all patients admitted from waiting lists, only 2% had waited more than 12 months;
- 40% of category 1 patients nationally had waited more than 30 days, ranging from 27% in the Australian Capital Territory to 67% in Western Australia; and
- of all category 1 patients admitted from waiting lists, 13% had waited more than 30 days.

Table 3.19: Performance measures for all elective surgery patients, public acute hospitals, 1994

Variable and clinical specialty	NSW	Vic [(a)]	Qld	WA	SA	Tas	ACT	NT	Australia
Proportion of patients waiting over 12 months at census									
Cardio-thoracic surgery	–	2	np	3	2	–	np	np	–
Ear, nose and throat	8	8	np	25	16	32	np	np	11
General surgery	3	8	np	20	7	19	np	np	7
Gynaecology	–	4	np	4	5	14	np	np	5
Neurosurgery	2	3	np	12	3	18	np	np	6
Ophthalmology	6	3	np	22	2	15	np	np	6
Orthopaedic surgery	7	9	np	17	10	13	np	np	8
Plastic surgery	13	16	np	29	20	32	np	np	20
Urology	3	7	np	24	17	30	np	np	11
Vascular surgery	12	7	np	6	28	22	np	np	17
Other	–	8	np	22	20	2	np	np	2
All patients	5	8	np	21	12	20	26	23	9
Proportion of patients admitted after waiting over 12 months									
Cardio-thoracic surgery	–	–	np	–	–	–	np	np	–
Ear, nose and throat	2	2	np	13	6	23	np	np	4
General surgery	–	2	np	4	2	4	np	np	1
Gynaecology	–	1	np	–	2	6	np	np	1
Neurosurgery	–	–	np	1	1	6	np	np	1
Ophthalmology	1	1	np	13	1	1	np	np	1
Orthopaedic surgery	2	6	np	7	4	9	np	np	2
Plastic surgery	1	5	np	4	5	12	np	np	6
Urology	–	3	np	–	3	15	np	np	2
Vascular surgery	1	6	np	–	2	–	np	np	1
Other	–	–	np	4	–	1	np	np	–
All patients	1	3	np	5	3	6	26	8	2

(a) Victorian data are not comparable because of a different method of calculating waiting time.

Notes:
1. The survey period was only one month—the numbers and attributes of patients admitted during this period may not be typical of patients admitted over a longer period of time.
2. Categorisation of patients by clinical urgency was implemented to varying degrees and with variable consistency.
3. The data do not cover all public hospitals in each State and Territory.

Source: Mays 1995.

Table 3.20: Performance measures for category 1 patients, public acute hospitals, 1994

Variable	NSW	Vic[(a)]	Qld	WA	SA	Tas	ACT	NT	Australia
Proportion of patients waiting over 30 days at census (%)									
All patients	36	1	np	67	np	45	27	52	40
Proportion of patients admitted after waiting over 30 days (%)									
All patients	13	0.3	np	17	np	11	np	25	13

(a) Victorian data are not comparable because of a different method of calculating waiting time.

Notes:
1. The survey period was only one month—the numbers and attributes of patients admitted during this period may not be typical of patients admitted over a longer period of time.
2. Categorisation of patients by clinical urgency was implemented to varying degrees and with variable consistency.
3. The data do not cover all public hospitals in each State and Territory.

Source: Mays 1995.

Accident and emergency waiting times

No national definition exists for this indicator, though a number of hospitals are collecting waiting times data using the triage system developed by the Australasian College of Emergency Medicine. As part of this system, indicator thresholds have been nominated. These thresholds suggest the proportion of patients within each urgency category that should be attended within the prescribed waiting time.

Table 3.21 summarises the triage categories, waiting times and indicator thresholds.

Results

No national data were available for this indicator. Results for the fourth quarter of 1994–95 from a sample of hospitals were available for New South Wales (45 hospitals) and Tasmania (1 hospital). These results are shown in Table 3.22.

Outpatient waiting times

No national definition exists for this indicator. Notionally, outpatient waiting time refers to the interval between being referred for treatment in an outpatient unit and the date an appointment is available.

This indicator will complement the data collected on waiting times for elective surgery. Part of the development of definitions in this area involves the

Table 3.21: Accident and emergency waiting time categories

Triage category	Waiting time	Threshold
Resuscitation	immediately	98
Emergency	within 5 minutes	95
Urgent	within 30 minutes	90
Semi-urgent	within 60 minutes	90
Non-urgent	within 2 hours	85

Source: Australasian College of Emergency Medicine.

Table 3.22: Accident and emergency waiting times, public acute hospitals, fourth quarter 1994–95

	Percentage of patients attended within recommended time period	
Triage category	**NSW[(a)]**	**Tas[(b)]**
Resuscitatio	68	99
Emergency	47	100
Urgent	55	81
Semi-urgent	68	78
Non-urgent	90	92

(a) Sample of 45 hospitals.
(b) One hospital only.

Sources: State health authorities, unpublished.

development of a nationally consistent classification system for outpatient occasions of service. Until such a system exists, there is no way of determining what is a clinically appropriate waiting time for an outpatient service. Development projects in this field are currently being undertaken by HSH and various State health authorities.

Variations in intervention rates

This indicator is a measure of access, insofar as variations in intervention rates for small geographical areas reflect the collective decisions of medical practitioners who refer patients for surgical treatment in hospital.

The intervention rate is defined as:

$$\frac{\text{HOSP SEPS}}{\text{1,000 persons}}$$

where HOSP SEPS is the number of hospital separations for the selected procedure. The number of hospital separations is based on the location of the patient's usual residence and not where the hospital is located. Similarly, the population used in the denominator is the population of the area where the patient usually resides. The use of patient's usual residence assumes that the doctor referring the patient for surgical treatment is also located in the same area.

Intervention rates are calculated by combining public and private hospital data, as a low rate of public hospital separations may simply reflect the service arrangements of public and private hospitals in the area.

Sentinel procedures

Sentinel procedures are common, mostly elective, and considered to be discretionary, that is, there are often conservative or non-surgical treatment alternatives. The sentinel procedures selected for this indicator were proposed by the Hospitals Working Group when the indicators were first being developed.

Procedures performed in Australian hospitals are coded using the International Classification of Diseases, Version 9, Clinical Modification (ICD-9-CM). This system is also used in hospitals in a number of other countries, allowing international comparisons of morbidity and other aspects of hospital activity.

Appendix H contains a table of ICD-9-CM procedure codes for each of the sentinel procedures in this report.

Principal and other procedures

Hospitals may record up to 16 procedures for any one patient episode. Usually the first listed procedure is known as the principal procedure (the procedure accounting for the most resources). For most of the sentinel procedures, the vast majority of separations had the sentinel procedure coded as the principal procedure.

The notable exception to this is the lens insertion procedure. An artificial lens is usually inserted following a cataract extraction. The insertion can take place at the same time as the cataract extraction – in which case the cataract operation is the principal procedure – or at a later time, in which case the lens insertion is the principal procedure. Approximately 5% of lens insertions in the analysis data set were coded as the principal procedure.

It was not feasible to consider all additional procedures recorded for the episode: only the second procedure in each morbidity record was analysed. While this will underestimate the true intervention rate, it should not affect the comparisons, as there is no expectation that different practices exist in the States and Territories with respect to the order of coded procedures.

For all States and Territories, data for principal and second procedures were added before calculating rates.

Age and sex standardisation

It is possible that variations in intervention rates are due to differences in the age and sex structure of the populations being analysed. To account for this the rates are age- and sex-standardised against a reference population.

The rates presented in this report were adjusted using direct standardisation, by applying age- and sex-specific rates to a standard population. The standard population used was the total Australian population as at 30 June 1991. The usual convention of using age- and sex-specific rates for five-year age groups has been followed according to the following formula:

$$\text{standardised rate} = \frac{\sum (R_i \times P_i)}{\sum P_i}$$

where R_i is the age- and sex-specific rate for age group *i*, and P_i is the standard population in age group *i*.

If the same reference population is used each time the analysis is done (say over a number of years or for different regions in the same year, as in this report) then the rates are directly comparable and any differences in the rates will be independent of differences in the population structure.

Test of significance

Intervention rates for a region may appear to be considerably different from the rates for another region, but these differences may just be due to random variation. To determine whether the rate for a particular region was significantly different from the rate for another region, a measure of statistical significance was applied (see Appendix I).

Rates were calculated for each region and for all other regions combined. For example, the rate for tonsillectomy for New South Wales was calculated as 1.8 separations per 1,000 population, and the rate for Australia excluding New South Wales was 2.3. The difference is represented as a percentage: the rate for New South Wales was 22.0% lower than

the rate for the other regions combined. The * symbol in Table 3.23 indicates that the difference is significant at the 1% significance level. Where no such symbol is shown, it indicates that there is no evidence to suggest that the rates are different.

Results

Table 3.23 presents the results for the five jurisdictions that provided consistent data for the public and private sectors in 1992–93. Private hospital data were not available for the Northern Territory, and morbidity data for Victorian private hospitals were not sufficiently complete to permit reliable estimation of rates for these procedures. Rates for these jurisdictions are therefore not reported. Queensland private hospital data were available to the Institute under a different coding system for half the period, so rates were calculated by the Queensland Health Department using the same methodology. Queensland data have not been used in the calculation of comparison rates. The results in the table show the age-standardised rates for each jurisdiction compared with the rate for all other jurisdictions combined. The * symbol indicates that the difference is significant at the 1% significance level.

When this indicator was proposed, it was expected that sufficiently detailed and uniform data would be available to enable the calculation of intervention rates for small geographical areas (namely statistical subdivisions – an intermediate level in the ABS Australian Standard Geographical Classification system). Unfortunately, the data provided to the Institute were not uniformly coded for area of usual residence, hence rates have been calculated only at the State and Territory level. Related to this, rates have been calculated by location of service provider, not by location of patient's residence. This will affect those jurisdictions that experience a high degree of cross-border flow of patients.

Notable results in the table include:

- no State or Territory had rates significantly different from the comparison rates for all selected procedures;
- the greatest percentage difference above the comparison rate was for hip replacements in the Australian Capital Territory (72.8%); and
- the greatest percentage difference below the comparison rate was for lens insertion in Western Australia (43.7% below).

Separations per 1,000 population

This indicator is defined as:

$$\frac{\text{total number of separations}}{\text{1,000 persons}}$$

where separations are defined by NHDD item A1.

Rates have been calculated for public and private hospitals, and it is assumed that each sector serves the whole of the State or Territory population.

The results are also disaggregated by patient accommodation status (based on NHDD item P16). The groups used are public patients, private patients and other patients. The 'other' category includes nursing home type patients, Department of Veterans' Affairs patients, and compensable and ineligible patients.

Data were not available to adjust for cross-border flows or for the age and sex structure of the populations.

Table 3.23: Separation rates for sentinel procedures, public and private hospitals combined, 1992–93

Sentinel procedure and variable	NSW	Vic[a]	Qld[b]	WA	SA	Tas	ACT	NT[c]	Australia[d]
Appendicectomy									
Separations[e]	9,780	na	4,324	2,860	2,442	665	354	na	16,101
Standardised separation rate[f]	1.7	na	1.4	1.7	1.7	1.4	1.1	na	1.7
Standardised rate for other States[g]	1.6	na	na	1.7	1.7	1.7	1.7	na	na
Difference (%)[h]	3.1	na	na	2.7	5.5	-13.6	-32.7	na	na
Significance of difference[i]	–	na	na	–	–	*	*	na	na
Coronary artery bypass graft									
Separations	8,229	na	2,067	1,581	2,235	552	–	na	12,597
Standardised separation rate	1.3	na	0.7	1.0	1.4	1.1	–	na	1.3
Standardised rate for other States	1.1	na	na	1.3	1.2	1.3	–	na	na
Difference (%)	16.6	na	na	-20.1	15.6	-8.6	–	na	na
Significance of difference	*	na	na	*	*	–	–	na	na
Caesarean									
Separations	14,930	na	9,513	4,722	4,387	1,143	1,071	na	26,253
Standardised separation rate	2.6	na	3.1	2.8	3.1	2.6	3.3	na	2.7
Standardised rate for other States	3.0	na	na	2.7	2.7	2.7	2.7	na	na
Difference (%)	-13.3	na	na	5.5	18.4	-5.1	23.0	na	na
Significance of difference	*	na	na	*	*	–	*	na	na
Cholecystectomy									
Separations	13,604	na	6,349	3,253	3,723	962	550	na	22,092
Standardised separation rate	2.2	na	2.1	2.0	2.4	2.0	2.1	na	2.2
Standardised rate for other States	2.2	na	na	2.2	2.1	2.2	2.2	na	na
Difference (%)	1.2	na	na	-9.4	12.5	-7.8	-4.1	na	na
Significance of difference	–	na	na	*	*	–	–	na	na
Endoscopy									
Separations	130,408	na	55,534	25,006	25,285	10,419	4,808	na	195,926
Standardised separation rate	21.0	na	18.0	15.5	16.2	21.5	19.6	na	19.4
Standardised rate for other States	16.8	na	na	20.1	20.0	19.3	19.4	na	na
Difference (%)	25.4	na	na	-22.7	-19.0	11.7	1.2	na	na
Significance of difference	*	na	na	*	*	*	–	na	na
Hip replacement									
Separations	5,255	na	1,864	1,591	1,600	537	279	na	9,262
Standardised separation rate	0.8	na	0.6	1.0	0.9	1.0	1.5	na	0.9
Standardised rate for other States	1.0	na	na	0.8	0.9	0.9	0.9	na	na
Difference (%)	-20.3	na	na	18.8	8.0	22.7	72.8	na	na
Significance of difference	*	na	na	*	*	*	*	na	na
Hysterectomy									
Separations	11,149	na	5,684	4,020	3,509	873	592	na	20,143
Standardised separation rate	1.8	na	1.8	2.4	2.3	1.8	2.0	na	2.0
Standardised rate for other States	2.2	na	na	1.9	1.9	2.0	2.0	na	na
Difference (%)	-19.6	na	na	24.8	18.9	-8.1	-0.7	na	na
Significance of difference	*	na	na	*	*	–	–	na	na
Lens insertion									
Separations	23,949	na	7,313	3,185	6,416	2,164	675	na	36,389
Standardised separation rate	3.7	na	2.4	2.1	3.7	4.1	3.8	na	3.5
Standardised rate for other States	3.1	na	na	3.7	3.4	3.4	3.4	na	na
Difference (%)	17.1	na	na	-43.7	9.0	21.0	9.6	na	na
Significance of difference	*	na	na	*	*	*	–	na	na
Tonsillectomy									
Separations	10,476	na	5,462	3,655	4,039	685	577	na	19,432
Standardised separation rate	1.8	na	1.7	2.1	2.9	1.5	1.8	na	2.0
Standardised rate for other States	2.3	na	na	2.0	1.9	2.0	2.0	na	na
Difference (%)	-22.0	na	na	8.2	58.7	-28.2	-7.9	na	na
Significance of difference	*	na	na	*	*	*	–	na	na

(a) Morbidity data for Victorian private hospitals for 1992–93 were not sufficiently complete to permit reliable estimation of rates for these procedures.
(b) Comparison rates were not able to be calculated; private hospital data are estimated on the basis of 6 months collection to 30 June 1993.
(c) Morbidity data for the NT private hospital were not available.
(d) Total of NSW, WA, SA, Tas and ACT only.
(e) Number of separations from public and private acute hospitals, for principal and second procedure
(f) Age-standardised rate per 1,000 population.
(g) Age-standardised rate for other States and Territories combined.
(h) Difference between State rate and comparison rate, expressed as a ratio of the rate to the comparison rate.
(i) Measure of statistical significance: *= 1%, –= rates not statistically different.

Sources: AIHW National Minimum Data Set survey program, unpublished; Qld Health Department, unpublished

Results

Table 3.24 presents the admission rates for public and private hospitals for same-day and overnight patients.

Detailed data on the numbers of separations by accommodation status were not available, but will be close to the numbers of admissions for acute hospitals.

Highlights of the table include:

- nationally there were 257.6 total admissions per 1,000 population, comprising 89.4 same-day admissions per 1,000 population and 168.2 overnight admissions;
- approximately 73% of total admissions were to public hospitals;
- total admissions per 1,000 population ranged from 226.5 in the Australian Capital Territory to 283.4 in South Australia;
- the highest private sector share was in Tasmania (34.6%) and the lowest in the Northern Territory (19.6%); and
- for public acute hospitals, the highest rate of public patient admissions was in the Northern Territory (73.3%) and the lowest in Tasmania (53.2%).

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Figure 3.4 shows the number of admissions to acute hospitals per 1,000 population by patient accommodation status

Table 3.24: Admissions per 1,000 population by patient accommodation status[(a)], public and private acute hospitals, 1993–94

Hospital type and region	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Same-day admissions									
Public hospitals									
Metropolitan									
Public patients	46.3	51.5	71.1	56.8	63.5	48.0	66.3	36.3	53.6
Private patients	14.1	10.5	9.4	10.5	15.0	6.4	11.1	4.7	12.0
Other patients	4.8	1.3	0.4	1.1	0.7	4.7	0.5	0.4	2.5
All patients	65.3	63.2	81.0	68.4	79.2	59.1	78.0	41.3	68.1
Non-metropolitan									
Public patients	45.6	47.5	44.5	32.0	41.3	28.7	na	22.8	43.2
Private patients	8.5	12.2	5.6	5.0	8.4	0.6	na	6.0	7.8
Other patients	9.8	1.0	0.3	0.8	1.3	2.1	na	0.9	3.1
All patients	63.8	60.7	50.5	37.9	51.0	31.3	na	29.7	54.1
All public hospitals									
Public patients	46.2	50.5	56.7	50.1	57.6	40.6	66.3	29.0	50.5
Private patients	12.8	10.9	7.4	9.0	13.3	4.2	11.1	5.4	10.7
Other patients	6.0	1.2	0.4	1.0	0.8	3.7	0.5	0.6	2.7
All patients	65.0	62.6	64.4	60.1	71.7	48.5	78.0	35.1	63.9
Private hospitals[(b)]	22.5	30.7	29.3	17.3	26.5	27.6	20.1	13.0	25.6
All same-day admissions	87.4	93.3	93.7	77.4	98.2	76.1	98.1	48.0	89.4
Overnight admissions									
Public hospitals									
Metropolitan									
Public patients	80.5	77.0	110.5	87.5	100.9	97.4	74.4	136.1	86.1
Private patients	25.3	19.5	15.7	14.7	20.0	17.5	24.1	5.5	20.8
Other patients	9.2	2.4	0.8	3.4	2.4	11.9	2.0	3.2	5.1
All patients	114.9	98.9	127.0	105.6	123.3	126.8	100.6	144.8	111.9
Non-metropolitan									
Public patients	158.9	103.1	104.6	136.6	119.8	74.2	na	140.2	121.8
Private patients	30.2	30.2	18.6	20.4	27.8	2.8	na	9.0	24.2
Other patients	12.4	3.1	1.5	4.7	3.0	6.4	na	2.6	5.3
All patients	201.5	136.4	124.8	161.7	150.7	83.4	na	151.8	151.3
All public hospitals									
Public patients	98.5	83.6	107.3	100.8	106.0	88.5	74.4	138.3	96.8
Private patients	26.4	22.2	17.3	16.3	22.1	11.9	24.1	7.4	21.8
Other patients	10.0	2.6	1.2	3.8	2.6	9.8	2.0	2.9	5.1
All patients	134.9	108.4	125.8	120.8	130.7	110.1	100.6	148.6	123.8
Private hospitals	36.0	44.6	53.6	49.2	54.6	56.3	27.9	31.7	44.4
All overnight admissions	170.9	152.9	179.4	170.0	185.3	166.4	128.4	180.3	168.2
Total admissions									
By type of hospital									
Public hospitals	199.8	171.0	190.2	180.9	202.3	158.6	178.6	183.7	187.6
Private hospitals	58.5	75.3	82.9	66.5	81.1	83.9	47.9	44.7	70.0
All hospitals	258.3	246.2	273.1	247.4	283.4	242.5	226.5	228.3	257.6
By patient accommodation status									
Public patients	144.7	134.1	164.0	150.9	163.6	129.1	140.8	167.3	147.3
Private patients	97.7	108.4	107.5	91.8	116.5	100.0	83.2	57.4	102.6
Other patients	15.9	3.8	1.6	4.8	3.4	13.5	2.5	3.5	7.8
All patients	258.3	246.2	273.1	247.4	283.4	242.5	226.5	228.3	257.6

(a) Refer NHDD item P16, see Appendix D.
(b) Private hospital data not available by region.

Sources: AIHW National Minimum Data Set survey program, unpublished; ABS Cat. No. 4390.0.

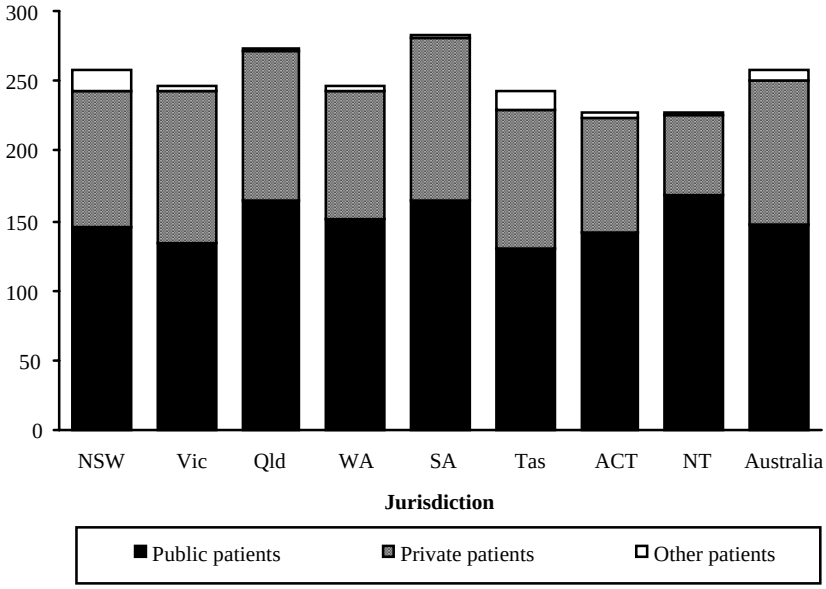

Figure 3.4: Admissions per 1,000 population by patient accommodation status, public and private acute hospitals, 1993–94