

# Funding of South Australian public hospitals

JOHN MOSS

John Moss is Senior Lecturer, Department of Public Health, Adelaide University

## Abstract

*Since the 1994-95 financial year, inpatient episodes of care in South Australian public hospitals have been funded according to their casemix. This paper describes the current funding system, sets it in some context and examines what can be established about hospital performance.*

## The geographic and demographic context

South Australia is the fifth most populous State, with an estimated resident population at 31 December 1999 of 1,496,182, which was 7.9 per cent of the Australian total. Of these people, slightly more than one million or 73.2 per cent of the State total lived in Adelaide, which is the fifth largest city in the nation (Australian Bureau of Statistics 2001a). This is the highest proportion of any State's population living in its capital city. Adelaide's population supports virtually a full range of technologically advanced hospital services.

Outside of Adelaide, the dispersed pattern of settlement largely reflects the moderate rainfall and the resultant type of agriculture, with the most populous urban centres being the industrial city Whyalla (23,382 persons in 1996) and Mount Gambier (22,037 persons in 1996) (Australian Bureau of Statistics 2001b). Most South Australian rural hospitals thus have a comparatively small bed establishment, and patients requiring specialized management are often referred to Adelaide. Almost all of the State north of Port Augusta is classified as remote or very remote by the Commonwealth Department of Health and Aged Care (1999).

In 1996-98, life expectancy at birth for males was 76.0 years and for females was 81.6 years. In 1999, 6.5 per cent of the population was aged 75 years and over, making this the State with the highest proportion of elderly people. At the 1996 Census, the indigenous population was 22,051, which was 1.5 per cent of the State's total population. 21.3 per cent of the State's population was born overseas, compared with 23.3 per cent for Australia as a whole (Australian Bureau of Statistics 2001b). In 1998-99, the State's total population growth rate was a low 0.40 per cent (Australian Bureau of Statistics 2001a).

In 1998, the South Australian perinatal mortality rate was 7.2 per thousand, which was the lowest for any State or Territory. The age-standardised mortality rates were 7.68 and 4.69 per thousand for males and females respectively, both close to the figures for Australia overall (Australian Institute of Health and Welfare 2000).

During the past decade, the performance of the South Australian economy has been of concern. Following the collapse of the State Bank, the State Government has made a priority of reducing the public sector budget deficit, and has regarded the private sector as the engine of economic growth.

The structure of the State economy is broadly similar to that of Australia overall. In 1998-99, South Australia produced 11.2 per cent of the total Australian gross value of agricultural commodities, and 9.1 per cent of total Australian manufacturing turnover. In 1998-99, the Gross State Product per head of mean population was \$27,169 and was 6.8 per cent of the national Gross Domestic Product. The unemployment rate in May 2000 was 8.6 per cent compared to the Australian figure of 6.7 per cent, and the unemployment rate for 15-19 year olds looking for full-time work was 29.8 per cent (compared to 22.2 per cent) (Australian Bureau of Statistics 2001b).

## The structure of the Department of Human Services

The Department of Human Services (DHS) is the South Australian government body with oversight of public sector health service provision, assuming this responsibility from the South Australian Health Commission on 6 July 2000. The Human Services portfolio was established by the Liberal Government in October 1997 to integrate health, housing, family and community services, ageing and disability services. DHS undertakes the functions of the former South Australian Health Commission plus the former Department for Family and Community Services, the housing activities of the former Department of Housing and Urban Development, the South Australian Housing Trust, the South Australian Community Housing Authority, HomeStart Finance, and the Institute of Medical and Veterinary Science.

The Department reports to two ministers: the Minister for Human Services; and the Minister for Disability Services and Minister for the Ageing. The Minister for Human Services is empowered to give directions to incorporated hospitals and health centres except about the employment of a particular person, clinical decisions relating to the treatment of any particular patient, and land or any other asset not held by the Crown.

The DHS Central Office comprises ten divisions: Aboriginal Services, Country and Disability Services, Metropolitan Services, and Statewide, plus Asset Services, Corporate Services, Financial Services, Information Management Services, Strategic Policy and Planning, and Strategic Procurement. Support for South Australia's eight largest public hospitals (all in the Adelaide metropolitan area) is one responsibility of the Statewide Division. Planning for public hospital provision takes the metropolitan area as a single geographical entity, with collaboration between hospitals encouraged. Funding of 66 country hospitals is one responsibility of the Country and Disability Services Division, through seven geographic Regions.

## State program budget structure

Under the 2001-02 budget for the State of South Australia, total accrual expenditure on non-commercial sector outputs is expected to be \$7,666 million. The combined budget for the Department of Human Services is \$2,852 million, which is 33.1 per cent of the State total. Of this, \$1,618 million (or 56.7 per cent) has been allocated to Hospital Based Treatment Services (Table 1). A further \$248 million has been allocated to capital investment under the Human Services portfolio.

**Table 1: Department of Human Services, South Australia, net expenditure summary by output class**

Portfolio expenditure by output class	Estimated result 2000-01 (\$ million)	Budget 2001-02 (\$ million)
Promotion and Protection of Health and Well-being	71.7	78.9
Personal Financial Assistance	123.5	133.39
Housing Services	364.1	376.19
Community Based Care	431.8	459.0
Accommodation and Support	174.3	179.3
Hospital Based Treatment Services	1,513.8	1,618.4
Coordination and Advice	1.5	1.5
<b>Total</b>	<b>2,680.7</b>	<b>2,846.6</b>

Source: Government of South Australia. 2001-2002 South Australian Budget Papers: Portfolio Statements vol 2, pp 6.4 and 6.28. URL: <http://www.statebudget.sa.gov.au/portfoliovol2.html>.

In 1998-99, Commonwealth Government sources (including the Department of Veterans' Affairs) contributed 50.6 per cent of the funding for South Australian public hospitals, and the State Government 44.9 per cent

(Table 2). Private health insurance funds contributed 1.5 per cent. Other parties, including Workers' Compensation and Compulsory Third Party Motor Vehicle Insurance, contributed 1.8 per cent. Individuals contributed 1.4 per cent out of their own pockets.

**Table 2: Sources of funds for South Australian public and private hospitals 1998-99**

Funding Source	Expenditure (\$ million)			
	Public hospitals*		Private hospitals	
<b>Government sector</b>				
Commonwealth Government	513	(45.5%)	36	(12.9%)
Department of Veterans' Affairs	57	(5.1%)	11	(3.9%)
State government	506	(44.9%)	-	-
<b>Government sector total</b>	<b>1,076</b>	<b>(95.4%)</b>	<b>47</b>	<b>(16.8%)</b>
<b>Non-government sector</b>				
Health Insurance funds	17	(1.5%)	187	(66.8%)
Individual out-of-pocket expenses	16	(1.4%)	14	(5.0%)
Other parties	20	(1.8%)	31	(11.1%)
<b>Non-government sector total</b>	<b>52</b>	<b>(4.6%)</b>	<b>233</b>	<b>(83.2%)</b>
<b>Total hospital funding</b>	<b>1,128</b>	<b>(100.0%)</b>	<b>280</b>	<b>(100.0%)</b>

\* Includes public psychiatric hospitals

Minor discrepancies between sums of components and totals are due to rounding.

Source: Australian Institute of Health and Welfare (AIHW) 2001b. Health Expenditure Bulletin no.17: Australia's Health Services Expenditure to 1999-00. AIHW cat. no. HWE 18, Canberra. Table B15, p 82. URL: <http://www.aihw.gov.au/publications/hwe/heb17/heb17.pdf>

Since the introduction by the Commonwealth Government of Lifetime Health Cover, the proportion of South Australians with private health insurance has risen from around 31 per cent to 46 per cent (Table 3). This proportion has consistently been slightly higher than for Australia as a whole.

**Table 3: Coverage of hospital insurance tables offered by registered health benefits organisations, persons and percentage of South Australian population and percentage of Australian population**

Quarter ended	South Australia		Australia
	Coverage '000	% Population	% Population
30 Jun 1999	465	31.2%	30.6%
30 Sep 1999	472	31.6%	31.0%
31 Dec 1999	477	31.9%	31.3%
31 Mar 2000	492	32.9%	32.2%
30 Jun 2000	651	43.5%	43.0%
30 Sep 2000	697	46.5%	45.7%
30 June 2001	692	46.0%	44.9%

Source: Private Health Insurance Administration Council (PHIAC) URL: [http://www.phiac.gov.au/phiac/fr\\_index.htm](http://www.phiac.gov.au/phiac/fr_index.htm). Lifetime Health Cover introduced 1 July 2000.

## Hospital provision

South Australia has an equivalent number of metropolitan public hospital beds per 1,000 population to Queensland and more than New South Wales, Victoria and Western Australia. The state's available beds in rural regions and in remote regions appear to be at the highest rate of all the Australian jurisdictions (Table 4).

**Table 4: Number of South Australian and Australian public acute and psychiatric hospitals and available beds per 1,000 population by location, 1999-00**

	South Australia		Australia	
	Public hospitals	Public beds per 1,000 persons	Public hospitals	Public beds per 1,000 persons
Metropolitan	15	2.8	192	2.6
Rural	52	4.7	394	3.3
Remote	13	8.0	162	4.9
<b>Total all regions*</b>	<b>80</b>	<b>3.4</b>	<b>748</b>	<b>2.9</b>

\* Includes psychiatric hospitals and beds.

Source: Australian Institute of Health and Welfare (AIHW) 2001a. Australian Hospital Statistics 1999-00. AIHW cat. no. HSE 14. Canberra: AIHW (Health Services Series). Table 3.4. URL: <http://www.aihw.gov.au/publications/hse/ahs99-00/ahs99-00.pdf>

## Public hospital utilisation

### Age-related public hospital utilisation

South Australian public hospital age-specific separation and bed day utilisation rates are lowest between 5-14 years, thereafter increasing with age, at first slowly, then more rapidly from about age 55 onwards (Table 5). There is also an increase amongst women during their child-bearing years.

**Table 5: Rate of South Australian public hospital separations and bed day utilisation per thousand persons, grouped by age and gender, 1999-00**

Age Group	Separation rate/ 1,000 Females/year	Separation rate/ 1,000 Males/year	Patient bed day rate/ 1,000 Females/year	Patient bed day rate/ 1,000 Males/year
< 1 year	504	670	2,687	3,414
1-4 years	148	203	297	359
5-14 years	68	82	143	163
15-24 years	217	101	557	379
25-34 years	333	137	907	522
35-44 years	210	148	588	468
45-54 years	195	208	552	625
55-65 years	274	320	917	1,122
65-74 years	405	542	1,895	2,479
75-84 years	504	766	3,839	4,828
> 85 years	537	849	6,216	8,731
<b>All ages</b>	<b>254</b>	<b>227</b>	<b>1,027</b>	<b>950</b>

Source: Australian Institute of Health and Welfare (AIHW) 2001a. Australian Hospital Statistics 1999-00. AIHW cat. no. HSE 14. Canberra: AIHW (Health Services Series). Tables 6.2 and 6.5. URL: <http://www.aihw.gov.au/publications/hse/ahs99-00/ahs99-00.pdf>

\* Population as at 31 December 1999.

These South Australian all age rates are each higher than their equivalents for Australia as a whole, which are 214 (female) and 192 (male) separations per thousand; and 893 (female) and 811 (male) occupied bed days per thousand. Except for females 85 years and older, the South Australian public hospital age-specific separation rates are consistently higher than for Australia as a whole. Except for females 45-54 years and 85 years or older, and males 35-44 and 55-65 years, the South Australian age-specific public hospital occupied bed day rates are higher than for Australia as a whole.

In South Australia, the public sector sustains the majority of the inpatient care load. In 1999-00, public hospitals provided 69.3 per cent of the hospital separations and 73.5 per cent of the hospital bed days (Table 6).

**Table 6: Separations and patient bed days by accommodation status and hospital sector, South Australia, 1999-00**

Accommodation status	Separations	Bed days
Public hospitals		
Eligible public patient	314,897	1,262,629
Eligible private patient	25,560	107,967
Eligible Department of Veterans' Affairs patient	15,367	86,720
Eligible other patient	3,429	18,720
Ineligible patient	767	2,851
<b>Total</b>	<b>360,020</b>	<b>1,478,887</b>
Private hospitals		
Eligible public patient	3,098	14,821
Eligible private patient	144,886	486,018
Eligible Department of Veterans' Affairs patient	4,034	15,884
Eligible other patient	7,519	15,415
Ineligible patient	257	708
<b>Total</b>	<b>159,794</b>	<b>532,846</b>

Source: Australian Institute of Health and Welfare (AIHW) 2001a. Australian Hospital Statistics 1999-00. AIHW cat. no. HSE 14. Canberra: AIHW (Health Services Series). Tables 5.1 and 5.4. URL: <http://www.aihw.gov.au/publications/hse/ahs99-00/ahs99-00.pdf>

The South Australian public hospital separation rate at 224.4 per thousand population is 14.2 per cent higher than for Australia overall (Table 7). South Australian public hospital patient bed days at 781.1 per thousand population are 5.5 per cent higher than for Australia overall.

**Table 7: Total separations and same day separations by hospital type, South Australia; and directly age-standardised separations per thousand population and patient days per thousand population by hospital type, South Australia and Australia, 1999-00**

South Australia (Australia in brackets)	Total separations	Same day separations	Separations per 1,000 population**	Patient days per 1,000 population**
Public hospitals*	356,428	168,765	224.4 (196.5)	781.1 (740.2)
Private free-standing day hospital facilities	8,925	8,925	5.1 (14.1)	5.1 (14.1)
Other private hospitals	150,869	69,033	89.7 (87.3)	291.3 (293.7)

\* Excludes psychiatric hospitals

\*\* Figures are directly age-standardised to the Australian population at 30 June 1991.

Source: Australian Institute of Health and Welfare (AIHW) 2001a. Australian Hospital Statistics 1999-00. AIHW cat. no. HSE 14. Canberra: AIHW (Health Services Series). Table 4.2. URL: <http://www.aihw.gov.au/publications/hse/ahs99-00/ahs99-00.pdf>

## Public hospital funding arrangements

A method of casemix-based funding of recurrent expenditure in South Australian public acute hospitals was introduced for the 1994-95 financial year. Currently, metropolitan public hospitals (individually) and country regions are funded for the target amount of patient activity (inpatient and non-admitted) to be undertaken. This method is used to allocate recurrent budgets. The capital investment program is budgeted separately.

The amount of recurrent funds available for public hospitals is determined by the annual appropriation from the Treasury to the Department of Human Services. This is based on the previous year's allocation, allowing (in part or in toto) for adjustments in Award salaries and wages and price indexation - and, in several recent years, after subtracting a percentage to enhance cost efficiency. The Department then uses a combination of variable casemix payments and fixed payment grants to adjust the target amount of activity to fit its financial appropriation.

The activity target is a minimum requirement. If an activity target is not reached, funding may be reduced at marginal cost, which is taken to be 65 per cent of the full price for each lost unit of activity. Under ordinary circumstances, there are no extra funds for a hospital exceeding its activity target. Each hospital is allocated a global budget. If a hospital overspends, the amount is carried forward as a debit to the following year's budget - and may or may not be eventually written off by the Department.

The hospitals are provided with the accounting calculations underlying their budget in detail - down to the level of the individual AR-DRG. Accounting is mainly on a cash rather than an accrual basis. The hospitals have considerable discretion in the way they allocate their target activity and expenditure between their different divisions and types of activity: they might choose to replicate the casemix funding model or to adjust from the base of the previous year's expenditure. The hospital's discretion is subject to certain rules, for example limiting an expansion in intensive care unit activity or capping outpatient activity or, in the country regions, governing fee-for-service medical payments.

Casemix funding is thus part of the method by which the Department of Human Services sets public hospital budgets and also a management tool within the hospital for meeting the budget. Casemix funding should be distinguished from casemix payment, in which an actual financial transaction would be recorded for each patient admission/separation.

An overview of the public hospital inpatient funding arrangements in South Australia follows. A more detailed description can be found in the Department of Human Services' manual entitled "*Casemix 2000-2001: Funding for Health - Hospitals*".

## Inpatient funding

During the year, hospital casemix staff code inpatient separations according to the International Classification of Diseases (ICD-10-AM). In doing so, they rely on the treating medical officer having listed and sequenced diagnoses and significant procedure descriptions from supporting documentation in the patient's case notes. This coding is retrospective, i.e. it applies to the known facts on separation rather than prospectively to the presumptive diagnosis on admission.

The ICD-10-AM codes are grouped according to Version 4.1 of the Australian Refined Diagnosis Related Groups (AR-DRGs). This information is then fed into the computerised database known as the Integrated South Australian Activity Collection (ISAAC) to derive summary statistics of the volume of activity.

AR-DRG is a classification of hospital activities, and hence of how much effort has been expended (throughput) - rather than (as rhetoric across the nation would commonly have it) of output produced. No measure is made of the outcome or benefit for the patient, for instance in terms of a gain in health-state utility, such as might be measured in quality-adjusted life-years (QALYs) - there would be major conceptual and technical difficulties in doing so.

To each code in the AR-DRG classification, cost weights derived (since 2000-01) from SA public acute hospital data are applied. Cost weights express the relative amount of resources consumed between different AR-DRGs. Cost weights are averages. Cost weights reflect historic relativities, and their use assumes that prospective cost relativities will not have departed appreciably from the past.

The administrative price of a (typical) patient episode of care is the product of the cost weight multiplied by the benchmark price. An adjustment for the volume and complexity of services is made by setting the benchmark price at different amounts for hospitals of differing degrees of complexity, which also corresponds to the volume of services and to the urban/rural location (Table 8).

**Table 8: Volume of and benchmark prices for weighted acute patient separations at South Australian public hospitals, financial year 2000-01**

Hospital	Total number of EquiSeps	Benchmark price per weighted separation
Non FFS hospitals	317,996	\$1,946
FFS hospitals in the Adelaide metropolitan area plus fee-for-service	4,375	\$1,681
FFS hospitals in country areas plus fee-for-service	76,000	\$1,660

FFS Medical costs paid under a Fee for Service arrangement.

Source: Government of South Australia. 2001-2002 South Australian Budget Papers: Portfolio Statements vol 2, p 6.24 URL:

<http://www.statebudget.sa.gov.au/portfoliovol2.html> and Department of Human Services, South Australia. Casemix 2000-2001: Funding for Health - Hospitals.

A separation is the discharge, transfer or death of a hospital inpatient.

The volume of clinical activity is expressed in terms of "EquiSeps", a shorthand for Inlier Equivalent Separations. The availability of cost weights ensures that the total activity budget and the total dollar budget can be thought of as equivalent (see Box 1). The resource allocation for the coming year can thus be expressed both as an activity target and as a capped dollar budget.

### Box 1: Some simple mathematics of casemix funding

As the name implies, an EquiSep is one hospital separation at unit cost weight. For example, 2 separations each at a cost weight of 1.7 would amount to 3.4 EquiSeps.

Generalizing for inlier separations:

$$\text{Number of inlier EquiSeps} = \sum (\text{number of inlier separations}_i \times \text{cost weight}_i)$$

And,

$$\text{Total inlier budget allocation} = \text{Number of inlier EquiSeps} \times \text{benchmark price}$$

Hence,

$$\text{Number of inlier EquiSeps} = \frac{\text{total inlier budget allocation}}{\text{benchmark price}}$$

Thus, there are two ways of calculating the number of inlier EquiSeps: from a separations database or from the total inlier budget allocation.

This reasoning can be extended to cover all types of acute separations, by incorporating the relevant weighting into an equation analogous to that for inliers. The total EquiSeps is the sum over all these types of acute separation.

A further adjustment is made via the “unexplained severity index” assigned to each public hospital as a whole. This index is a further attempt to account for how patients of higher complexity and severity tend to cluster in certain hospitals.

### Further details on inpatient funding

In essence, casemix funding relies on determining the average price for each separation by multiplying the benchmark price by the cost weight applicable. The cost weight itself is an average, which relies on the validity of the casemix classification in reflecting resource use homogeneity and clinical relevance. Fine details of the basic casemix model can thus entail variation to either the benchmark price or the cost weight or the casemix classification (Table 9).

In practice, the amount of resources used for the clinical management of a set of patients classified under one AR-DRG code may not follow a tight statistical distribution. Some patients require a much longer stay than the average for the relevant AR-DRG and some a much shorter stay. These are known as long stay outliers and short stay outliers respectively, with the two points of separation being known as trim points.

In South Australian public hospitals, trim points are set by the L3/H3 method (i.e. a short stay trim point one third of the average length of stay, and a long stay trim point three times average length of stay for that DRG, but with a short stay trim point only where the ALOS is 4 days or more). Reduced payments are set for short stay outliers, in terms of the weighted occupied bed day (plus theatre where applicable). Long stay outliers are paid per weighted occupied bed day. Where the actual cost of treatment is more than \$30,000 above the usual AR-DRG reimbursement, a high cost outlier pool is available for the excess. Nursing home type (also known as maintenance) occupied bed days are paid net per diem in public acute hospitals.

Funding for short stay outlier and acute inlier Aboriginal and Torres Strait Islander (ATSI) patients is increased by 30 per cent over the usual rate. Seasonal funds are made available for the winter bed strategy to meet the increased demand related to respiratory illness, and when necessary for additional emergency activity.



**Table 9: Further details of the South Australian casemix funding arrangements for inpatient stays in public acute hospitals**

Item	Funding Basis	Rate in 2000-01
Short stay outliers	Per diem	Non-FFS hospitals: \$577 per weighted obd; Metropolitan FFS hospitals: \$495 ditto; Country hospitals; \$499 ditto.
	Plus short stay theatre payment where applicable	Metropolitan hospitals: \$170 per weighted theatre separation; Country hospitals: \$172 ditto
Long stay outliers	Per diem	Metropolitan: \$223 per weighted obd; Country: \$225 ditto.
High cost outliers	Capped high cost outlier pool	When actual cost is \$30,000 above usual AR-DRG reimbursement
Nursing home type (maintenance) occupied bed days	Per diem	Metropolitan: \$135 net per weighted obd; Country: \$136 ditto.
Aboriginal and Torres Strait Islander patients	Percentage increase on usual funding rate	30 per cent
Intensive care patients	Per diem AR-DRG cost weights not used	\$1,988 per obd in teaching hospitals; \$2,601 per obd in paediatric ICU; \$1,466 per obd for ventilated patients in Whyalla and Mount Gambier Hospitals
Operating theatre	Casemix-based cost weight and benchmark price	\$170 in metropolitan hospitals; \$172 in country hospitals
Small country hospitals, with low activity levels and relatively high fixed costs	Minimum budget	Grant to bring casemix-based funding up to minimum budget level

obd occupied bed day

FFS Medical costs paid under a Fee-for-Service arrangement.

Source: Department of Human Services, South Australia. Casemix 2000-2001: Funding for Health - Hospitals

## Grants

Public acute hospitals are complex organisations, providing a variety of services, including patient care, health professional education and biomedical research. These give rise to various fixed costs which are not readily accounted for by a variable casemix-based payment. Hence, the casemix funding model includes a set of fixed payments grants (Table 10). As experience with casemix funding accumulates, attempts are being made to allocate some of these grants on an activity basis.

**Table 10: Fixed payment grants by purpose and basis, 2000-01**

Type of Grant	Purpose	Basis
Teaching:		
Nursing	Graduate nurse training & on-going education & development of nursing staff	Various rates per nurse participating
Medical Officers	Training and supervision; supervision of undergraduate medical students	Various rates and amounts
Other Health Professionals	Professional training and supervision	5.0 per cent of salaries & wages costs
Research	Infrastructure funding for programs/projects supported by NHMRC grants	44.15 cents per NHMRC dollar
Clinical Development	Employment of scientific officers and salaried medical officers	Grant shared by metropolitan hospitals; grant to IMVS
Special Grants	For activity not recorded in hospital patient activity data, or where classification system not appropriate, or where service not related to routine hospital operations	Various site-specific grants
Commonwealth Funded Programs	<ol style="list-style-type: none"> <li>1. Funded under casemix arrangements but reported separately</li> <li>2. Funded independently of casemix</li> <li>3. Mixed acute and community-based service projects</li> </ol>	<ol style="list-style-type: none"> <li>1. Casemix</li> <li>2. Special grant</li> <li>3. Acute admissions funded by casemix; community-based services by special grant</li> </ol>
Rural Access Grant	16 small rural hospitals with low activity volumes where casemix based payments would be insufficient to cover fairly estimated total costs	Grant covers gap between casemix budget and actual budget
Remote Area Allowance	Locality allowance to staff working in remote areas	Loading to recognise higher wage allowances
Multi Purpose Service Program	Joint Commonwealth/State agreement applying to Ceduna	Predetermined funding

NHMRC National Health and Medical Research Council

IMVS Institute of Medical and Veterinary Science

Source: Department of Human Services, South Australia. Casemix 2000-2001: Funding for Health - Hospitals.

## Non-admitted patient funding

With outpatient and emergency attendances, an episode of care is not so readily definable over time as it is for inpatients. A clinic-based classification is used for the South Australian acute public hospitals. Payment rates are set per item of service.

South Australian hospital-based outpatient services have been funded on an output basis since the introduction of casemix funding in 1994-95. The current classification and associated cost weights are from a local multi-site study conducted by Coopers and Lybrand during 1997-98. A generic clinic classification covers outpatient clinics and allied health departments: there are 79 types of clinics represented and each actual clinic has to be mapped to this generic clinic list. The emergency department classification is based on the national five-level triage scale and disposition (home, admitted or died) and type of hospital.

**Table 11: Volume of and benchmark prices for weighted non-admitted patient occasions of service at South Australian public hospitals, financial year 2000-01**

	Number of weighted occasions of service (estimated result)	Benchmark price per weighted outpatient occasion of service \$
<i>Metropolitan Hospitals:</i>		
Outpatient	1,058,000	83.33
Emergency	595,000	94.26
<i>Country Hospitals:</i>		
Non-admitted patient	200,000	84.03

Source: Government of South Australia. 2001-2002 South Australian Budget Papers: Portfolio Statements vol 2, p 6.25 URL: <http://www.statebudget.sa.gov.au/portfoliovol2.html> and Department of Human Services, South Australia. Casemix 2000-2001: Funding for Health - Hospitals.

### Aggregate measures of public hospital performance

In this section, aggregate measures of public hospital performance are assessed relative to that of comparable hospitals across the nation as a whole.

The South Australian public hospital average length of stay, at 3.8 days for all separations and 6.2 days when same-day separations are excluded, is slightly lower than for Australia overall (Table 12).

**Table 12: Summary of ALOS including and excluding same day separations, by hospital type, South Australia and Australia, 1999-00**

	South Australia		Australia	
	Average length of stay (days)		Average length of stay (days)	
	All separations	Excluding same-day separations	All separations	Excluding same-day separations
Public acute hospitals*	3.8	6.2	3.9	6.4
Private free-standing day hospital facilities	1.0	not applicable	1.0	not applicable
Other private hospitals	3.5	5.6	3.5	5.9
All hospitals	3.9	6.5	3.8	6.6

\* Excludes psychiatric hospitals

Source: Australian Institute of Health and Welfare (AIHW) 2001a. Australian Hospital Statistics 1999-00. AIHW cat. no. HSE 14. Canberra: AIHW (Health Services Series). Table 4.2. URL: <http://www.aihw.gov.au/publications/hse/ahs99-00/ahs99-00.pdf>

The number of patient days per thousand population in South Australian public acute hospitals was 5.5 per cent higher than for comparable hospitals in Australia overall in the latest year for which information is available (Table 13). For the same hospitals, the average cost weight of separations, which is an indicator of the relative complexity and resource of admissions within hospitals, was fractionally lower in South Australia.

**Table 13: Summary of directly age-standardised patient days per 1,000 population and average cost weight of separations, by hospital type, South Australia and Australia, 1999-00**

	South Australia		Australia	
	Patient days per 1000 population**	Average cost weight of separations	Patient days per 1000 population**	Average cost weight of separations
Public acute hospitals*	781.1	0.98	740.2	0.99
Private free-standing day hospital facilities	5.1	0.71	14.1	0.56
Other private hospitals	291.3	1.06	293.7	1.05
All hospitals	1,162.2			

Source: Australian Institute of Health and Welfare (AIHW) 2001a. Australian Hospital Statistics 1999-00. AIHW cat. no. HSE 14. Canberra: AIHW (Health Services Series). Table 4.2. URL: <http://www.aihw.gov.au/publications/hse/ahs99-00/ahs99-00.pdf>

\* Excludes psychiatric hospitals

\*\* Figures are directly age-standardised to the Australian population at 30 June 1991.

When compared with their peer group across the nation, South Australian public hospitals generally achieve a lower cost per casemix-adjusted separation - except for the group of three large metropolitan non-principal referral hospitals Table 14).

**Table 14: Public hospital peer group by cost per casemix-adjusted separation, 1999-00**

Public hospital peer group (number of SA hospitals in brackets)	Cost per casemix-adjusted separation	
	South Australia \$	Australia \$
Principal referral and specialist women's and children's (4)	2,693	2,831
Large metropolitan (3)	2,572	2,450
Medium (2,000 to 10,000 acute weighted separations) (15)	2,449	2,685
Small rural and remote acute (19)	2,392	2,832
Non-acute (28)	\$334 per patient day	\$338 per patient day

Source: Australian Institute of Health and Welfare (AIHW) 2001a. Australian Hospital Statistics 1999-00. AIHW cat. no. HSE 14. Canberra: AIHW (Health Services Series). Table 2.4. URL: <http://www.aihw.gov.au/publications/hse/ahs99-00/ahs99-00.pdf>

Calculations subject to several assumptions.

## Time trends

Over the five years 1995-96 to 1999-00, directly age-standardised separations per thousand population from South Australian acute public hospitals have increased marginally, and have consistently been at least 10 per cent higher than for equivalent hospitals in Australia overall; and this trend appears to be increasing, with the most recent figure being 14.2 per cent (= 224.4/196.5 in Table 15). Over the same period, directly age-standardised patient days of stay per thousand population have declined by 15.1 per cent, with the South Australian figure always somewhat higher than that for Australia overall. Average length of stay (ALOS), either including or excluding same day separations, has declined over the five years, and the South Australian figure has typically been slightly lower than that for Australia overall. Over the same period, the average cost-weight of separations has not departed conspicuously from the comparable figure for Australia overall.

**Table 15: Selected aggregate statistics on inpatients in acute public hospitals, South Australia and Australia by year**

Year	South Australian acute public hospitals* (Australian acute public hospitals* overall in brackets)				
	Age-stand. separations per 1,000**	Age-stand. patient days per 1,000**	ALOS excl same day	ALOS (days)	Average cost weight separations***
1995-96	216.5 (196.7)	920.5 (905.2)	6.4 (7.0)	4.3 (4.6)	n.a. (1.02)
1996-97	219.9 (196.6)	899.0 (824.1)	6.3 (6.5)	4.1 (4.2)	1.02 (1.02)
1997-98	231.0 (201.2)	915.7 (813.6)	6.8 (7.0)	4.0 (4.0)	0.99 (1.00)
1998-99	224.0 (198.7)	795.6 (751.3)	6.2 (6.3)	3.8 (3.9)	0.99 (0.99)
1999-00	224.4 (196.5)	781.1 (740.2)	6.2 (6.4)	3.8 (3.9)	0.98 (0.99)

\* Includes the Department of Veterans' Affairs hospitals in 1998-99 and 1999-00.

\*\* Directly age-standardised to the Australian population at 30 June 1991.

\*\*\* AN-DRG version 3.0 for 1995-96; AN-DRG version 3.1 for 1996-97 and 1997-98; AR-DRG version 4.0/4.1 for 1998-99; AR-DRG version 4.1 for 1999-00. n.a. not available. Note that there are breaks in the time-series between 1995-96 and 1996-97, and between 1997-98 and 1998-99.

Source: Australian Institute of Health and Welfare (AIHW) 2001a. Australian Hospital Statistics 1999-00. AIHW cat. no. HSE 14. Canberra: AIHW (Health Services Series); and earlier issues in this series. Table 4.2. URL: <http://www.aihw.gov.au/publications/hse/ahs99-00/ahs99-00.pdf>

### Influence of socio-economic disadvantage and of rurality

The Social Health Atlas of Australia (Glover et al. 1999) provides information on indirect age-sex standardised acute hospital separation ratios (SSR) for 1995-96. While the ratio was slightly higher for Adelaide compared to other capital cities (93 compared to 92), the SSR was 149 for the rest of the State compared with 121 for comparable regions of Australia as a whole (Table 16). This was the highest SSR for the rural and remote regions of any State. Conversely, South Australia shared with Western Australia the lowest SSR for private hospital admissions for rural and remote regions, except for the Northern Territory outside Darwin which had more extreme ratios than for any State.

For both major urban centres and non-metropolitan regions across Australia, pages 363 and 366 of the Social Health Atlas demonstrate that total admissions and acute public hospital admissions show a gradient increasing with quintile of socio-economic disadvantage of area of residence. The Atlas also reports scores on the Australian Bureau of Statistics' (ABS) Socio-Economic Indexes for Areas (SEIFA) Index of Relative Socio-Economic Disadvantage (IRSD): of the Australian capital cities, Adelaide had the most adverse score on this measure in 1996; and the South Australian rural and remote areas had a more adverse score than the comparable regions in the four most populous states. Across Adelaide, Map 6.3 of the Social Health Atlas shows that the northern suburbs had a higher SSR for acute public hospitals and the eastern suburbs a lower SSR than for Australia overall - as would be expected from their respective socio-economic status measures.

**Table 16: Age-sex standardised acute hospital separation ratios (SSR), South Australia and Australia overall, 1995-96**

	South Australian SSRs (Australian SSRs in brackets)		
	Public acute	Private hospitals	Both public acute & private hospitals
Capital city	93 (92)	116 (108)	101 (97)
Rest of State	149 (121)	55 (81)	118 (108)
Whole of State	108 (100)	100 (100)	105 (100)

\* Includes same day admissions other than for renal dialysis.

Source: Glover J, Harris K, Tennant S. A social health atlas of Australia. 2nd ed. Volume 1: Australia. Adelaide: Public Health Information Development Unit, University of Adelaide, 1999: pages 200 and 204. URL: <http://www.publichealth.gov.au/atlas.htm>

These observations suggest that lower socio-economic status may play a role in South Australia's acute public hospital admission rates being higher than for Australia as a whole. Rural and remote distance and disadvantage may also be implicated, not only because of the impact of lower socio-economic status on health, but also because of referral to metropolitan rather than local hospitals, and because of the paucity of private hospitals outside the metropolitan area.

## Staff numbers and salaries

The ratio of average full time equivalent staff per thousand population is higher in South Australian public acute and psychiatric hospitals than in all other jurisdictions except the Northern Territory (Table 17). This also holds true for salaried medical officers and for all nurses. In contrast, the average salary of full time equivalent staff in the same hospitals is lower in South Australia than in any other jurisdiction - both for staff overall and for salaried medical officers.

**Table 17: Average full time equivalent staff per thousand population and average salary of full time equivalent staff, public acute and psychiatric hospitals, South Australia and Australia, 1999-00**

	FTE staff per 1,000 population*		Average salary of FTE staff	
	South Australia	Australia	South Australia	Australia
Salaried medical officers	1.05	.88	\$79,717	\$97,269
Total nurses	4.91	4.15	\$46,125	n.a.
All staff	10.44	9.20	\$46,044	\$50,981

\* Population as at 31 December 1999.

n.a. not available, because the Tasmanian figure is not available; however the South Australian figure is lower than in any other jurisdiction.

Source: Australian Institute of Health and Welfare (AIHW) 2001a. Australian Hospital Statistics 1999-00. AIHW cat. no. HSE 14. Canberra: AIHW (Health Services Series). Table 3.6 and 2.5. URL: <http://www.aihw.gov.au/publications/hse/ahs99-00/ahs99-00.pdf>

## Discussion

Australia has been ranked in the middle-to-upper echelons in expectation of life amongst countries at a similar level of economic development (Australian Institute of Health and Welfare 2000), and second out of 191 countries in the World Health Organization's (admittedly controversial) measurement of Disability Adjusted Life Expectancy (DALE) (Mathers et al. 1999). These levels of national health status have been achieved while allocating to mainstream health services about the average amount of resources for the OECD as a percentage of Gross Domestic Product (Anderson and Poullier 1999). South Australians experience at least comparable health status to that of the nation as a whole (Australian Institute of Health and Welfare 2000). Although not grounds for complacency, some combination of plain luck, economic development, physical and social environment, health policy and (probably in this rank order) fair access to effective health services can be implicated.

The perennial debates over public hospital funding have been about whether the total amount of expenditure is sufficient to meet real need across the population, and whether the Commonwealth and the States are meeting their respective obligations. Neither of these issues is within the scope of the present paper. What can be addressed is whether casemix funding has influenced the underlying situation for better or for worse. Ultimately, this has to be a matter of judgement, since an extensive and intensive evaluation design arguably may not have been feasible and in the event has not been forthcoming.

The South Australian casemix based system of public hospital funding is built on a set of administrative prices based on historical average case-weighted expenditure, combined with political judgement regarding overall affordability. Public hospital boards and management are encouraged to focus on activity rather than (as previously) on resource input. They are required to maintain historical activity levels.

The usefulness of a funding model can be envisaged as a function of the signals it sends to organizations and personnel, encouraging them to respond in ways which enhance economic efficiency - and other relevant social goals, such as equity of access to needed services. Casemix classification can also enhance quality assurance activities.

Casemix-based funding directs the attention of clinicians and hospital managers to their costs of production. This represents a major advance in the use of information for management over that available under input-based funding. However, in practice, casemix funding can be a blunt instrument because these decision makers may not have sufficient control over their costs. For instance there is an on-going debate as to what proportion of a hospital's costs are truly variable, as when some staff are on long-term contracts or when expertise is not conveniently divisible into fractions of a person. There remains also the question as to the extent of the diffusion of the casemix-based funding model within the public hospitals to operational units, i.e. the extent to which these hospitals are using casemix to set budgets below divisional level, rather than relying on the traditional imperative on the wards to minimize length of stay.

The major public hospitals bear the teaching function on behalf of the whole health system, including the private sector. They also provide a range of health services that currently do not sit comfortably within a variable casemix-based payment model. Hence the basic model has been augmented by a set of fixed payment grants.

Compared to the other States, South Australia has a higher bed provision (especially in the rural and remote regions), and a higher age-standardised level of inpatient activity (see Box 2). This is offset by a lower average length of stay and cost per casemix-adjusted separation. Medical and nursing staff are more numerous but their salary rates are lower.

**Box 2: Summary of South Australian public hospital statistics compared to Australia as a whole.**

Available beds per thousand population	Metropolitan slightly higher, Rural and remote much higher
Age-standardised separations per thousand population	At least 10 per cent higher
Age-standardised patient days per thousand population	Somewhat higher
Average cost weight of separations	Similar
Average length of stay	Slightly lower
Cost per casemix-adjusted separation	Generally lower
Medical and nursing FTE numbers per thousand population	Higher
Medical and nursing salaries	Much lower

Source: Summarized from tables above.

The bed provision and inpatient activity levels may well be associated with South Australia having the nation's oldest population and an adverse socio-economic status (SES) profile. The higher rural and remote bed provision may also reflect the greater distance between settlements.

Casemix classification provides an opportunity, although the information is not as yet not fully available in the public domain because of commercial confidentiality, to examine factors influencing hospital performance, not merely those internal to the hospital production process, but also external social and environmental factors impinging on the degree of risk amongst presenting patients.

**Conclusion**

The South Australian experience of casemix-based funding for public hospitals has illustrated how the process by which the benchmark price is set can be as important as the casemix classification system itself in determining the hospital budget. Finding ways to increase community and provider involvement in the arrangements for

benchmark price setting therefore may be as useful in achieving acceptance of this funding system as may further refinement of the casemix classification.

The routine use of a casemix classification for all patients has enhanced the ability of both funders and providers to analyse factors affecting hospital performance. Perhaps the full potential of the signals for more efficient service delivery has yet to be realised. Partly this is due to the complexity of the classification, and to the need to insert into the calculations adjustment factors and fixed payment grants to take account of the complex environment of any major public hospital. The impact on hospital performance of socio-economic and demographic factors external to the hospital deserves more regard.

There is now an explicit focus on the amount of therapeutic activity rather than as previously on resource inputs, but relating resource use to the achievement of health outcomes still has a long way to go. Meanwhile, it would be worth confirming that the value of the information obtained has outweighed the transaction costs incurred in casemix funding. On-going challenges include involving the community more directly in the use of this information for setting priorities, and incorporating explicit quality benchmarks more directly into the actual funding process.

## Acknowledgements

Onno van der Wel from the Health Costing and Evaluation Unit, Department of Human Services, South Australia helped me with access to documents in the public domain. Chris Ellershaw from the Intergovernment Relations Branch, Department of Human Services, South Australia clarified some aspects of the data. Martin Basedow kindly read a draft of the manuscript. John Glover gave permission to extract the information in Table 16 from the Social Health Atlas of Australia. As always, sole responsibility for any error or omission lies with the author.

## References

- Anderson GF and Poullier JP 1999, 'Health spending, access and outcomes: Trends in industrialized countries', *Health Affairs*, vol 18, no 3, pp 178-192.
- Australian Bureau of Statistics 2001a, *Australian demographic statistics. (ABS cat. no. 3101.0)*, AusInfo, Canberra. URL: <http://www.abs.gov.au/ausstats/abs%40.nsf/7884593a92027766ca2568b5007b8617/77ee7ed06dc9236bca2568bd0012e582!OpenDocument> (Accessed 9 October 2001).
- Australian Bureau of Statistics 2001b, *South Australia: A Statistical Profile 2001, (ABS cat. no. 1368.4)*, AusInfo, Canberra.
- Australian Institute of Health and Welfare (AIHW) 2000, *Australia's Health 2000, AIHW cat. no. 19*, AIHW, Canberra.
- Australian Institute of Health and Welfare (AIHW) 2001a, *Australian Hospital Statistics 1999-00, AIHW cat. no. HSE 1*, AIHW, Canberra. URL: <http://www.aihw.gov.au/publications/hse/ahs99-00/ahs99-00.pdf> (Accessed 18 September 2001).
- Australian Institute of Health and Welfare (AIHW) 2001b, *Health Expenditure Bulletin no.17: Australia's Health Services Expenditure to 1999-0, AIHW cat. no. HWE 18*, AIHW, Canberra. URL: <http://www.aihw.gov.au/publications/hwe/heb17/heb17.pdf> (Accessed 18 September 2001)
- Commonwealth Department of Health and Aged Care 1999, *Measuring Remoteness: Accessibility/Remoteness Index of Australia (ARIA), (Occasional Papers: New Series No. 6)*, Canberra, DHAC. URL: <http://www.health.gov.au/pubs/hfsocc/ocpanew6.pdf>
- Glover J, Harris K, Tennant S 1999, *A social health atlas of Australia. 2nd ed. Volume 1: Australia*, Public Health Information Development Unit, University of Adelaide. URL: <http://www.publichealth.gov.au/atlas.htm>



Government of South Australia 2001, *2001-2002 South Australian Budget Papers: Portfolio Statements, Volume 2*, Information SA, Adelaide. URL: <http://www.statebudget.sa.gov.au/portfoliovol2.html>

Mathers CD, Sadana R, Salomon JA, Murray CJL and Lopez AD 1999, 'Healthy life expectancy in 191 countries', *Lancet*, vol 357, pp1685-1691.

Private Health Insurance Administration Council 2001, *Coverage of Hospital Insurance Tables by State*. URL: [http://www.phiac.gov.au/phiac/fr\\_index.htm](http://www.phiac.gov.au/phiac/fr_index.htm) (Accessed 21 September 2001)

South Australia. Department of Human Services 2000, *Casemix 2000-2001: Funding for Health - Hospitals*, Adelaide.