

Length of stay benchmarking in the Australian private hospital sector

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Abstract

Length of stay (LOS) benchmarking is a means of comparing hospital efficiency. Analysis of private cases in private facilities using Australian Institute of Health and Welfare (AIHW) data shows inter-state variation in same-day (SD) cases and overnight average LOS (ONALOS) on an Australian Refined Diagnosis Related Groups version 4 (ARDRGv4) standardised basis. ARDRGv4 standardised analysis from 1998–99 to 2003–04 shows a steady increase in private sector SD cases (~1.4% per annum) and a decrease in ONALOS (~4.3% per annum). Overall, the data show significant variation in LOS parameters between private hospitals.

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LENGTH OF STAY (LOS) BENCHMARKING measures relative facility efficiency and changes in health sector efficiency. Different authors have used different methodologies to benchmark LOS, leading to different conclusions about LOS changes. Comparisons made without considering the type of cases being treated are misleading at the industry and facility level given the effects of changing demography, utilisation and clinical practice. The purpose of this paper is to analyse private hospital LOS from 1998–99 to 2003–04.

Methods

Dataset

Australian Refined Diagnosis Related Groups version 4 (ARDRGv4) is currently the most appropriate classification system upon which to base LOS benchmarking. It has been derived from extensive clinical and statistical analysis and should be available for every Australian hospital separation. However, ARDRGv4 is not useful for psychiatric

What is known about the topic?

Length of stay benchmarking is used to measure relative hospital efficiency.

What does this paper add?

This review of Australian private hospital length of stay data from 1998–99 to 2003–04 found substantial variation among the states and among hospitals in overnight length of stay and proportion of same-day cases. Diagnosis related group (DRG) benchmarks were calculated for state and facility, which suggested there is potential for efficiency improvements among Australian private hospitals.

What are the implications for practitioners?

This study highlights the need to differentiate between same-day and one-night cases in calculating overnight length of stay and suggests that when calculated on a DRG basis length of stay benchmarking can be an effective tool to analyse hospital efficiency.

or rehabilitation separations, as psychiatric diagnosis related groups are underpinned by a wide range of principal diagnoses and severity is not well defined. These issues have been discussed in Australian¹ and overseas² publications. The two overnight Rehabilitation ARDRGv4s contain cases in significantly different clinical subgroups,³ and different subgroups are undertaken in private sector rehabilitation facilities. Cases in psychiatry, drug and alcohol and rehabilitation DRGs were excluded for these reasons. In addition, cases in non-theatre error DRGs were excluded as the type of case was unclear.

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Same-day (SD) and one-night cases in the same ARDRGv4 should be distinguished. Both have an LOS of one, but there are cost differences. The average ward cost of each day in hospital was \$304 in 2002–03. This was calculated by dividing the total costs of the ward, hotel and oncost cost buckets by the bed-days of cases in the Department of Health and Ageing *National Hospital Cost Data Collection Round 7 — Private Hospitals*.⁴ There are also significantly higher payments under many health fund/private facility contracts if a case is performed on a one-night rather than an SD basis. The same-day case proportion (SDCP) is a measure of LOS efficiency in many ARDRGv4s.

Australian Institute of Health and Welfare (AIHW) data from 1998–99 to 2003–04 on private separations from private hospitals were used to derive LOS benchmarks. These were the years for which ARDRGv4 data were available. Data elements provided for each case included ARDRGv4, LOS, SD case flag, a public/private sector flag and payment status (public, private, veteran, etc). Data distinguishing insured and non-insured private patients were first available in 2001–02, so to ensure consistency all private patients were included in this study. Other payment classes were excluded. The data were de-identified in terms of patient and facility and for this reason it was not possible to differentiate between private hospitals and private day centres. It was anticipated that virtually all data on overnight cases related to hospitals.

Private sector data from the Northern Territory and the Australian Capital Territory were not available for some of the earlier years analysed. From 2002–03 onward data for Tasmania, ACT and NT were aggregated as “Other” for reasons related to privacy. The two territories and Tasmania were included in this analysis for 2003–04 benchmarking against the national norms of that year. Data were not available for the 6 years considered to allow quantification of changes in LOS over this period for Tasmania and the two territories either on an individual jurisdiction or aggregate basis.

Calculations

The benchmark SDCP is calculated for each DRG for each state (or nationally) as follows:

Benchmark state SDCP_{DRG} = state SD cases in DRG / state total cases in DRG

The Benchmark overnight average LOS (ONALOS) is calculated for each state (or nationally) as follows:

Benchmark state ONALOS_{DRG} = state total overnight bed-days in DRG / state overnight cases in DRG

The benchmark number of SD cases in each DRG at a given facility is calculated as follows, using the state or national SDCP rates:

Benchmark SD cases = cases in DRG * benchmark SDCP_{DRG}

The benchmark overnight bed-days in each DRG is calculated using the state SDCP and ONALOS parameters for state-based comparisons and the national parameters for national comparisons:

Benchmark overnight bed days in DRG = cases in DRG * (1 – benchmark SDCP_{DRG}) * benchmark ONALOS_{DRG}

It should be noted that:

Benchmark ON cases in DRG = cases in DRG – benchmark SD cases = cases in DRG * (1 – benchmark SDCP_{DRG})

The total SD cases in a facility if the benchmark SDCPs applied is calculated by summing the benchmark SD cases over all relevant DRGs. The higher the actual SD cases compared with those calculated on SDCP benchmarks, the more efficient a facility in regard to SD cases.

Similarly, the actual overnight bed-days is compared with the total overnight bed-days calculated assuming DRG benchmarks applied. The lower the actual overnight bed-days compared with those calculated, the more efficient a facility in regard to overnight bed-days.

Two of the DRG benchmarks used to compare facilities are based on national data and data from the facilities' state. A third benchmark is based on target SDCP and ONALOS for each ARDRGv4. The target SDCP is the highest state private sector SDCP for an ARDRGv4. The target ONALOS is the lowest state ONALOS in that ARDRGv4. Data is excluded from any state with under 30 cases in an ARDRGv4, as is any ARDRGv4 where fewer than

two states can be compared. This is to avoid target parameters based on states where there are too few cases to ensure the SDCP and ONALOS are statistically well based.

One advantage of deriving target parameters from state rather than facility data is the greater statistical power of larger case numbers. Another is avoiding targets based on facilities with very low ONALOS but where special factors apply.

Results

State comparison: 2003–04 SD cases and overnight bed-days — national benchmarks

Box 1 indicates the difference between actual SD cases and overnight bed-days in 2003–04 and

those expected if 2003–04 national ARDRGv4 private sector benchmarks had applied.

Comparison by state: 2003–04 SD cases and overnight bed-days — target benchmarks

Box 2 indicates the difference between actual SD cases and overnight bed-days in 2003–04 and those expected if ARDRGv4 target parameters had applied. Cases in Box 2 are lower than in Box 1 as low-volume ARDRGv4s are excluded.

Changes in private sector LOS parameters

Box 3 compares the 2003–04 SD cases to those that would have occurred if the SDCPs for each ARDRGv4 from 1998–99 to 2002–03 had

1 Comparison of 2003–04 actual and expected same-day cases and overnight bed-days applying national benchmarks

State	Actual same-day cases	Expected same-day cases	Difference	Percent difference	Actual overnight cases	Actual overnight bed-days	Expected overnight bed-days	Difference	Percent difference
NSW	389 153	379 568	–9 585	–2.5%	203 969	889 105	892 727	3 622	0.4%
OTH	44 554	46 733	2 179	4.9%	37 413	178 483	158 837	–19 646	–11.0%
QLD	319 292	316 730	–2 562	–0.8%	177 551	800 970	846 679	45 709	5.7%
SA	107 082	111 127	4 045	3.8%	74 304	337 872	325 675	–12 197	–3.6%
VIC	363 701	362 920	–781	–0.2%	197 602	901 264	917 238	15 974	1.8%
WA	112 096	118 740	6 644	5.9%	84 925	379 305	346 273	–33 032	–8.7%
Total	1 335 878	1 335 818	–60	0.0%	775 764	3 486 999	3 487 429	430	0.0

NSW = New South Wales. OTH = other. QLD = Queensland. SA = South Australia. VIC = Victoria. WA = Western Australia.

2 Comparison of 2003–04 actual and expected same-day cases and overnight bed-days applying target benchmarks

State	Actual same-day cases	Expected same-day cases	Difference	Percent difference	Actual overnight cases	Actual overnight bed-days	Expected overnight bed-days	Difference	Percent difference
NSW	389 143	407 724	18 581	4.8%	203 937	888 771	712 523	–176 248	–19.8%
OTH	44 552	50 819	6 267	14.1%	37 401	178 362	128 262	–50 100	–28.1%
QLD	319 264	337 021	17 757	5.6%	177 407	798 498	684 076	–114 422	–14.3%
SA	107 080	118 981	11 901	11.1%	74 284	337 720	263 088	–74 632	–22.1%
VIC	363 690	386 197	22 507	6.2%	197 534	900 355	734 188	–166 167	–18.5%
WA	112 089	127 566	15 477	13.8%	84 911	379 120	280 178	–98 942	–26.1%
Total	1 335 818	1 428 309	92 491	6.9%	775 474	3 482 826	2 802 313	–680 513	–19.5%

NSW = New South Wales. OTH = other. QLD = Queensland. SA = South Australia. VIC = Victoria. WA = Western Australia.

3 Expected 2003–04 same-day cases and percentage reduction if based on benchmarks of earlier years

State	2003–04 same-day cases	2002–03 benchmarks applied, no. (%)	2001–02 benchmarks applied, no. (%)	2000–01 benchmarks applied, no. (%)	1999–00 benchmarks applied, no. (%)	1998–1999 benchmarks applied, no. (%)
NSW	389 143	386 064 (–0.8%)	372 969 (–4.2%)	372 320 (–4.3%)	365 885 (–6.0%)	361 870 (–7.0%)
QLD	319 264	316 427 (–0.9%)	312 501 (–2.1%)	308 635 (–2.5%)	303 183 (–5.1%)	298 709 (–6.5%)
SA	107 080	105 457 (–1.5%)	103 918 (–3.0%)	101 313 (–4.3%)	98 554 (–8.0%)	96 329 (–10.0%)
VIC	363 690	360 973 (–0.8%)	358 142 (–1.5%)	352 859 (–2.4%)	348 229 (–4.3%)	342 825 (–5.7%)
WA	112 089	111 271 (–0.7%)	109 732 (–2.1%)	107 293 (–3.8%)	103 866 (–7.3%)	100 518 (–10.3%)
Total	1 291 324	1 280 193 (–0.9%)	1 257 262 (–2.6%)	1 242 420 (–3.8%)	1 219 717 (–5.6%)	1 200 250 (–7.1%)

NSW = New South Wales. OTH = other. QLD = Queensland. SA = South Australia. VIC = Victoria. WA = Western Australia.

4 Expected 2003–04 overnight bed-days and percentage increase if based on benchmarks of earlier years

State	2003–04 overnight bed-days	2002–03 benchmarks applied, no. (%)	2001–02 benchmarks applied, no. (%)	2000–01 benchmarks applied, no. (%)	1999–00 benchmarks applied, no. (%)	1998–99 benchmarks applied, no. (%)
NSW	889 105	920 938 (3.6%)	964 514 (8.5%)	1 000 055 (12.5%)	1 051 634 (18.3%)	1 102 701 (24.0%)
QLD	800 970	868 121 (8.4%)	869 157 (11.9%)	910 507 (13.7%)	925 920 (15.6%)	939 122 (17.3%)
SA	337 872	357 292 (5.8%)	361 599 (7.0%)	375 156 (11.0%)	396 597 (17.4%)	411 942 (21.9%)
VIC	901 264	944 854 (4.8%)	980 941 (8.8%)	1 045 511 (16.0%)	1 039 494 (15.3%)	1 095 032 (21.5%)
WA	379 305	388 977 (2.7%)	397 774 (4.9%)	411 333 (8.4%)	431 515 (13.8%)	450 115 (18.7%)
Total	3 308 516	3 480 180 (5.2%)	3 600 985 (8.8%)	3 742 562 (13.1%)	3 845 120 (16.2%)	3 998 911 (20.9%)

NSW = New South Wales. OTH = other. QLD = Queensland. SA = South Australia. VIC = Victoria. WA = Western Australia.

applied in 2003–04. It also notes the percentage reduction in SD cases that would have occurred in 2003–04 if norms from earlier years had continued to apply.

Box 4 compares the 2003–04 overnight bed-days to those that would have occurred if the SDCPs and ONALOS for each ARDRGv4 from 1998–99 to 2002–03 had applied in 2003–04. It also notes the percentage increase in overnight bed-days that would have occurred in 2003–04 if LOS norms of earlier years had continued to apply.

Box 5 shows two measures of LOS from 1998–99 to 2003–04 without DRG standardisation. Total bed-days were derived by adding overnight bed-days to SD cases using LOS = 1 for SD cases.

These were divided by total cases to calculate average LOS (ALOS). The ONALOS is derived by dividing overnight bed-days by overnight cases.

Box 6 indicates the change in ALOS and ONALOS in 2003–04 if the LOS parameters of earlier years as outlined in Box 5 had applied.

These results differ from comparable AIHW tables⁵ as they exclude psychiatric and rehabilitation cases, which commonly have a long LOS compared with acute cases.

Intrahospital comparisons

Box 7 and Box 8 are based on hospitals with over 1000 relevant Australian Health Service Alliance (AHSA) separations in 2003–04. Day centres are excluded. Case numbers are not given lest some

hospitals might be identified. Western Australia is not included, as very few Western Australian private hospitals had over 1000 AHSA separations in 2003–04.

Box 7 shows the range of variation in the ratio of actual SD cases to those expected applying ARDRGv4 benchmarks. The 10th percentile and 90th percentile of the range of values are illustrated.

Box 8 is similar to Box 7 except that it illustrates the range of variation in actual to expected overnight bed-days.

Discussion

Other LOS benchmarking

A study published in 2000 compared LOS in the public and private sector, comparing public and private sector efficiency.⁶ It concluded that rela-

tive efficiency varied according to which groups of DRGs were included. The convention LOS = 1 for SD cases was used and it is unclear whether analysing SD and overnight cases separately would have led to different conclusions.

Another study published in 2002 included analysis of LOS changes as part of a broader review of trends in hospital services over a number of years.⁷ This paper considered LOS changes both including and excluding SD cases but did not indicate that the comparisons were DRG standardised.

The AIHW has developed a relative stay index (RSI) that measures the relative number of bed-days generated compared with those expected based on national LOS data. This is derived on an ARDRGv4.2 adjusted basis. It includes only acute care type cases and excludes SD-case only DRGs, some DRGs where cases are almost invariably

5 Average length of stay (ALOS) and overnight average length of stay (ONALOS) for acute ARDRGv4s*

	2003–04		2002–03		2001–02		2000–01		1999–00		1998–99	
State	ALOS	ONALOS	ALOS	ONALOS	ALOS	ONALOS	ALOS	ONALOS	ALOS	ONALOS	ALOS	ONALOS
NSW	2.16	4.38	2.19	4.43	2.23	4.41	2.30	4.55	2.42	4.75	2.51	4.94
QLD	2.25	4.77	2.38	4.76	2.44	4.76	2.48	4.90	2.66	5.03	2.82	5.16
SA	2.45	4.38	2.60	4.76	2.66	4.69	2.80	4.90	3.01	5.00	3.10	5.10
VIC	2.25	4.64	2.35	4.70	2.43	4.76	2.58	5.02	2.66	5.04	2.93	5.55
WA	2.49	4.08	2.50	4.47	2.54	4.41	2.54	4.39	2.70	4.54	2.77	4.58
Total	2.28	4.50	2.35	4.62	2.40	4.61	2.49	4.78	2.62	4.90	2.79	5.15

* With no ARDRGv4 standardisation and day case length of stay = 1. NSW = New South Wales. OTH = other. QLD = Queensland. SA = South Australia. VIC = Victoria. WA = Western Australia.

6 Change in average length of stay (ALOS) and overnight average length of stay (ONALOS) in 2003–04 if length of stay parameters of earlier years had applied

	2002–03		2001–02		2000–01		1999–00		1998–99	
State	ALOS	ONALOS	ALOS	ONALOS	ALOS	ONALOS	ALOS	ONALOS	ALOS	ONALOS
NSW	1.3%	1.1%	3.2%	0.7%	6.5%	3.9%	12.0%	8.4%	16.2%	12.8%
QLD	5.8%	–0.2%	8.4%	–0.2%	10.2%	2.7%	18.2%	5.5%	25.3%	8.2%
SA	6.1%	8.7%	8.6%	7.1%	14.3%	11.9%	22.9%	14.2%	26.5%	16.4%
VIC	4.4%	1.3%	8.0%	2.6%	14.7%	8.2%	18.2%	8.6%	30.2%	19.6%
WA	0.4%	9.6%	2.0%	8.1%	2.0%	7.6%	8.4%	11.3%	11.2%	12.3%
Total	3.1%	2.7%	5.3%	2.4%	9.2%	6.2%	14.9%	8.9%	22.4%	14.4%

NSW = New South Wales. OTH = other. QLD = Queensland. SA = South Australia. VIC = Victoria. WA = Western Australia.

7 Range of ratios of private hospital actual 2003-04 same-day cases, with 2003-04 ARDRGv4 benchmarks applied

State	State private benchmark		National private benchmark		Target benchmark	
	10th percentile	90th percentile	10th percentile	90th percentile	10th percentile	90th percentile
NSW	0.787	0.997	0.883	1.037	0.801	0.964
QLD	0.987	1.011	0.872	1.013	0.778	0.950
SA	0.941	1.020	0.886	0.969	0.827	0.942
VIC	0.879	1.010	0.879	1.008	0.811	0.946

ARDRGv4 = Australian refined diagnosis related groups, version 4. NSW = New South Wales. QLD = Queensland. SA = South Australia. VIC = Victoria

8 Range of ratios of private hospital actual 2003-04 overnight bed-days, with 2003-04 ARDRGv4 benchmarks applied

State	State private benchmark		National private benchmark		Target benchmark	
	10th Percentile	90th Percentile	10th Percentile	90th Percentile	10th Percentile	90th Percentile
NSW	0.851	1.123	0.847	1.142	1.018	1.443
QLD	0.890	1.064	0.849	1.024	1.052	1.249
SA	0.861	0.991	0.909	1.036	1.103	1.250
VIC	0.833	1.097	0.831	1.090	1.041	1.374

ARDRGv4 = Australian refined diagnosis related groups, version 4. NSW = New South Wales. QLD = Queensland. SA = South Australia. VIC = Victoria

undertaken on an SD basis and cases with an LOS over 120 days.⁸ The RSI is based on using LOS = 1 for both day cases and one-night cases. RSI also standardises based on a cubic regression of age and it is unclear whether this is a useful addition to the age splits that occur between some ARDRGv4s.

These methodologies differ within themselves and with the methodology suggested in this paper, likely resulting in different results.

Interstate variation

Based on SDCP benchmarks for each DRG, Western Australia has the lowest (5.9% below) and New South Wales the highest number (2.5% above) of SD cases relative to national private sector norms. Based on SDCP and ANALOS benchmarks for each DRG, the state with the highest number of overnight bed-days is the "Other" group (11.0% above) and Queensland is the lowest (5.7% below).

The target benchmark indicates anticipated improvements in efficiency. The state nearest the target benchmark for SD cases is NSW (4.8% below); the state most distant is the "Other" group (14.1% below). The state nearest the target benchmark for overnight bed-days is QLD (14.3% above); and the state most distant is the "Other" group (28.1% above). There is scope for further increases in SD cases and reductions in overnight bed-days on a casemix-adjusted basis given these results.

It may well be that some of the variation between states is related to payment models in use. Case payments have been increasingly introduced in the private sector in the eastern seaboard states and South Australia since the late 1990s but have not yet been widely introduced into WA. Western Australia has the lowest SD case numbers and the highest ONALOS for any of the individual states for which data are available. This may relate to the

“per diem” payment model as the predominant payment model used in that state. It is also notable from Box 4 that since 2000–01, when case payments started to disseminate much more widely in the private sector outside WA, the decline in ONALOS has been lowest in WA. The effect of payment model incentives on private hospital behaviour in regard to LOS has been discussed elsewhere.⁹

Changes between years

Box 3 compares the 2003–04 SD cases with those that would have occurred if the SDCP for each DRG in earlier years had applied. Nationally, there would have been 7.1% fewer SD cases in 2003–04 applying 1998–99 benchmarks, 5.6% fewer applying 1999–2000 benchmarks, 3.8% fewer applying 2000–01 benchmarks, 2.6% fewer applying 2001–02 benchmarks and 0.9% fewer applying 2002–03 benchmarks. This suggests that SD cases have increased by about 1.4% per year over the period of this study on an ARDRGv4 adjusted basis.

This relatively low increase in SD cases on a casemix-adjusted basis is consistent with the increase in SD cases mainly arising from ARDRGv4s historically performed predominantly on an SD basis, such as chemotherapy and GI endoscopy. This will have little effect on the expected number of cases treated on an SD basis after casemix standardisation as it would be expected that virtually all these additional cases would be SD cases. While there was some increase in total SD cases from overnight cases converted to SD cases in some DRGs, this contribution is relatively small and declining. Similarly, the SDCP has been relatively stable in most DRGs.¹⁰ An increase in total SD cases should not be confused with an increase in the number of SD cases in a given year compared with that expected if the SDCP norms of earlier years applied. The former considers case numbers alone, the latter considers casemix and whether changes in SDCP at the DRG level have also contributed to the increase in SD cases.

Part of the increase in SDCP that has occurred in some DRGs could reflect transfer of cases from

doctors’ rooms to a day-patient basis. Factors that drive such a change include concerns about medical liability and avoiding expenditure on equipment and facilities used infrequently. Any such change is most likely to affect the SDCP in DRGs where there are a mixture of day and overnight cases. Such changes will not affect DRGs where the SDCP has been close to 1.00 for some years, as there is little scope for increase. It is also unlikely to affect DRGs where the SDCP has remained close to 0.00, as it is clinically unlikely that cases in DRGs predominantly performed on an overnight basis in hospital would become SD cases in a doctor’s rooms.

Box 4 compares 2003–04 overnight bed-days to the overnight bed-days that would have occurred in 2003–04 if the SDCP and ONALOS norms for each DRG from 1998–99 to 2002–03 had applied. Nationally, there would have been 20.9% more overnight bed-days in 2003–04 applying 1998–99 benchmarks, 16.2% more applying 1999–2000 benchmarks, 13.1% more applying 2000–01 benchmarks, 8.8% more applying 2001–02 benchmarks and 5.2% more applying 2002–03 benchmarks. The largest decrease in overnight bed-days was in NSW (24.0%).

These findings suggest national overnight bed-days decreased by an average of 4.3% per year from 1998–99 to 2003–04 on an ARDRGv4 adjusted basis. This is larger than the 3.1% per annum decrease derived from the ONALOS data in Box 6. These differences are larger in some states and reinforce the need to consider changes in DRG as part of LOS comparisons. Similarly, the changes in ALOS and ONALOS are different, suggesting the need to consider both the SDCP and ONALOS as part of LOS comparisons to ensure LOS reductions do not reflect a disproportionate increase in SD case numbers rather than actual LOS reductions. The percentage of private sector cases undertaken on an SD basis increased from 54.8% in 1998–99⁸ to 62.5% in 2003–04.⁵ This factor alone would have decreased the ALOS by 0.3 days between 1998–99 and 2003–04 based on the assumption there were no changes in casemix, including a disproportionate increase

in cases in DRGs predominantly undertaken on an SD basis. The limited information available suggests that overall hospital variation in ONALOS arises from differences in many DRGs.

Interhospital LOS variation

Box 7 illustrates the variation among hospitals in actual and expected SD cases. Box 8 illustrates the range of variation among large hospitals in overnight bed-days. Hospitals have a casemix-adjusted LOS fairly widely spread around their relevant state benchmark although many are relatively close to that benchmark. None exceeded the target benchmarks for either SD cases or overnight bed-days.

The hospital with the lowest SD cases in Box 7 would need to increase its SD cases by 17% to equal the hospital with the highest SD cases based on the national benchmarks for each DRG. The hospital with the highest overnight bed-days would need to decrease these by 27% to equal the hospital with the lowest overnight bed-days based on national benchmarks for each DRG.

There is scope for significant improvement in LOS efficiency in some hospitals, but much less scope at others. It could be argued that it is inappropriate to consider efficiency of the private sector as a whole given this variation and it is more appropriate to consider the efficiency of individual private hospitals. This benchmarking reflects data from one private hospital alliance only, and it is possible that different LOS parameters may be found in relation to funds whose payment models contain different incentives in regard to LOS.

Other issues

This study has focused on the efficiency of private patients in private hospitals, hence the ARDRGv4 benchmarks are applied to that group of patients. The principles underlying the methodology could be applied to other types of patients and will remain valid when ARDRGv5 becomes the classification system in general use.

Analysis of Victorian public sector data has shown a significant variation in LOS between elective and emergency cases in the same DRG.¹¹

Comprehensive private sector data on whether admissions were elective or emergency were not available from the AIHW. These data were first supplied in 2000–01 and the AIHW cautioned that data quality was variable.¹² For this reason it is not possible to differentiate between elective and emergency admissions over the period of this study.

There are increased numbers of private cases in the rehabilitation DRGs. This may be contributing to the reduction in ONALOS. However, the AIHW data show that the numbers of overnight rehabilitation cases remained small in comparison to the total overnight cases in the private sector and changed little as a percentage of total overnight cases from 2002–03 to 2003–04 (2.1% of overnight cases in 2002–03 and 2.2% in 2003–04). It is doubtful whether such a small change in cases would influence ONALOS significantly.

What is more difficult to determine is whether earlier referral and transfer of such cases could significantly alter ONALOS. Between 2002–03 and 2003–04, AIHW data indicated the national ONALOS for ARDRGv4 I03C (hip replacement without complication) fell from 8.41 days to 8.10 days, a fall of 3.7%. Similarly, the ONALOS for ARDRGv4 I04b (knee replacement without complication) fell from 8.14 days to 7.86 days, a fall of 3.4%. These are the type of DRGs which would be anticipated to give rise to significant numbers of transfers to rehabilitation facilities, but the fall in ONALOS in these DRGs is less than the overall fall in ONALOS (5.2%) between 2002–03 and 2003–04 as noted in Box 4. This finding is inconsistent with the premise that increased use of rehabilitation facilities is a significant contributor to the fall in ONALOS.

Another possible factor leading to reduction in ONALOS is more expeditious transfer of patients requiring nursing home care from private hospitals to such facilities. Private Health Insurance Administration Council data from 1998–99 to 2003–04 indicate that the percentage of overnight bed-days that arose from nursing home-type patients in private hospitals fell from 2.3% of overnight bed-days in private hospitals in 1998–99¹³ to 0.5% of such bed-days in 2003–04.¹⁴ This

change may in part reflect a reduced tendency to change patient classification from acute to nursing home-type in view of the lower benefits paid for such cases, but a fall of 1.8% in acute bed-day utilisation due to this factor is small compared with the total bed-day reduction of 20.9% noted in Box 4.

Conclusion

LOS benchmarking should be undertaken on a DRG-standardised basis, set against benchmarks from appropriate datasets, and should distinguish SD and overnight cases. It can then be used to compare LOS parameters between states and facilities, and analyse changes in LOS parameters over time.

Competing interests

Brian Hanning is the Medical Director of Australian Health Service Alliance (AHSA,) which is referred to in the paper.

References

- 1 Buckingham W, Burgess P, Solomon S, et al. Developing a casemix classification for mental health services. Volume 1: main report. Canberra: Commonwealth Department of Health and Family Services, 1998: 203.
- 2 Horn S, Chambers A, Sharkey P, Horn R. Psychiatric severity of illness: a case mix study. *Med Care* 1989; 27: 69-84.
- 3 Eagar K, Green J, Gordon R. A national classification system and payment model for private rehabilitation services. Wollongong: Centre for Health Service Development (CHSD), University of Wollongong, 1999: 56-65.
- 4 Department of Health and Ageing. National Hospital Cost Data Collection (NHCDC), Round 7 (2002-2003) Cost Report, Private Sector Estimated Cost Weights. Canberra: Commonwealth of Australia, 2004. Available at: http://www.health.gov.au/internet/wcms/publishing.nsf/Content/health-casemix-costing-fc_r7.htm (accessed May 2006).
- 5 Australian Institute of Health and Welfare (AIHW). Australian Hospital Statistics 2003-04. Table 2.3. Health Services Series No 23. Canberra: AIHW, 2005: 17, 16. (AIHW cat. no. HSE 37.)
- 6 Badham J, Brandrup J. Length of stay comparisons for private and public hospitals. *Aust Health Rev* 2000; 23(3): 162-70. Available at: http://www.aushealthreview.com.au/publications/articles/issues/ahr_23_3_010700/ahr_23_3_162-170.asp (accessed Nov 2006).
- 7 Hargreaves J, Grayson N, Titulaer I. Trends in hospital service provision. *Aust Health Rev* 2002; 25(5): 2-18. Available at: http://www.aushealthreview.com.au/publications/articles/issues/ahr_25_5_171002/ahr_25_5_02-18.asp (accessed Nov 2006).
- 8 Australian Institute of Health and Welfare (AIHW). Australian Hospital Statistics 2002-03. Health Services Series No 22. Canberra: AIHW, 2004: 295-6, 18. (AIHW Cat. No. HSE 32.)
- 9 Hanning BWT. Combining DRGs and per diem models in the private sector: the Equitable Payment Model. *Aust Health Rev* 2005; 29: 80-6. Available at: http://www.aushealthreview.com.au/publications/articles/issues/ahr_29_1_0205/ahr_29_1_080-086.asp (accessed Nov 2006).
- 10 Hanning BWT. Are Victorian elective surgery cases still converting from overnight to same day cases? *Aust Health Rev* 2005; 29: 178-84. Available at: http://www.aushealthreview.com.au/publications/articles/issues/ahr_29_2_0505/ahr_29_2_178-184.asp (accessed Nov 2006).
- 11 Hanning B. Admission status: a cause of heterogeneity within some acute DRGs. Proceedings of the 12th Casemix Conference in Australia; 2000 Aug 28-30; Cairns: 30-3.
- 12 Australian Institute of Health and Welfare (AIHW). Australian Hospital Statistics 2001-02. Health Services Series No 20. Canberra: AIHW, 2003: 101. (AIHW cat. no. HSE 25.)
- 13 Private Health Insurance Administration Council (PHIAC). Operations of the registered health benefit organizations 1998-99. Table 13, Total Hospital Benefits Paid year ended 30 June 1999. Canberra: PHIAC, 1999. Available at: http://www.phiac.gov.au/publications/ar_previous/excel/1999t9to19.xls (accessed Aug 2006).
- 14 Private Health Insurance Administration Council (PHIAC). Operations of the Registered Health Benefit Organizations 2003-04. Figure 16, Total Hospital Benefits Paid 2003-04. Canberra: PHIAC, 2004. Available at: http://www.phiac.gov.au/publications/ar_previous/excel/2004partb.xls (accessed Aug 2006).

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