Are Victorian elective surgery cases still converting from overnight to same day cases?

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Abstract

The conversion rate on a diagnosis related group (DRG)-standardised basis of Victorian private overnight (ON) elective surgery cases to same day (SD) cases declined from 4.7% per annum over 1996–97 to 1998–99[6] to 2.5% per annum over 1998–99 to 2002–03. Similar analysis within the Victorian public sector shows a decline from 3.8% per annum over 1996–97 to 1998–99[6] to 1.9% over 1998–99 to 2002–03. Comparison on a DRG-standardised basis shows while the public sector continued to show a higher incidence of elective surgery SD cases than the private sector in 2002–03 (by 1.6%). The difference has declined since 1998–99 when it was 2.4%. DRG-based analysis suggests the conversion rate in both sectors and the difference in SD surgery cases between the two sectors will continue to decline. Future savings in recurrent and capital cost due to ON surgery cases becoming SD cases are likely to be much lower than savings in recent years.

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What is known about the topic?

The "conversion" of elective surgical admissions from overnight stays to same day admissions has been a major driver of reductions in average length of stay in Australian hospitals, and has contributed to decreases in the number of hospital beds per 1000 people.

What does this paper add?

More than one third of the increase in elective same day surgery in Victoria is due to conversion. Conversion was particularly important in the public sector, while the private sector increases were due largely to absolute growth in volume. The rate of conversion in Victorian hospitals has almost halved between 1998–99 and 2002–03, and is likely to continue to decline.

What are the implications?

The era of significant savings in overnight stays, and therefore reduced need for beds, due to conversion of elective surgical cases is over, and projections of the need for overnight beds should be based on this assumption. There will still be significant growth in same day elective surgery cases, but it will be based on population and utilisation changes.

IT HAS BEEN SUGGESTED for a number of years that increasing the proportion of surgical cases performed on a day basis would generate significant financial advantages, and other benefits such as lower rates of hospital acquired infections and less personal and family disruption.[1]

Same day (SD) separations in Australian hospitals and freestanding day facilities have risen from 2.75 million in 1998–99 to 3.58 million in 2002–03, an overall increase of about 830 000.[2] Much of this increase has been in non-surgical diagnosis related groups (DRGs) that have usually or always been undertaken on a day case basis such as renal dialysis, which accounted for 31% of the total increase in SD cases between 1998–99 and 2002–03,[3,4] and chemotherapy.

Some of the increase in day cases has been due to increased SD surgery cases. Both the absolute number and the proportion of cases undertaken as SD cases have been increasing in a number of surgical DRGs. For example, the SD case rate for extracapsular crystalline lens extraction rose from 39.4% of 22 972 separations in 1993–94 to 84.1% of 121 236 separations in 2000–01. Another example is release of carpal and tarsal tunnel where the SD case rate has risen from 54.3% of 17 902 separations in 1993–04 to 84.2% of 25 485 in 2000–01.[5]

It was been shown that from 1996–97 to 1998–99 there was an increase (on an ANDRGv3-standardised basis [Australian national diagnosis related groups]) of 7.7% in Victorian public sector SD

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elective surgery cases due to conversion (cases previously undertaken on an ON basis converting to SD cases).[6] Similar analysis for the Victorian private sector showed an increase of 9.5% over the same period. This was equivalent to an annualised DRG standardised increase in SD cases due to conversion of 3.8% in the public sector and 4.7% in the private sector. No other recent Australian publications quantifying conversion on a DRG-standardised basis have been identified.

In this study, the change in the numbers of cases and rates of conversion in the public and private sectors in Victoria was investigated using DRG-standardised data up to 2002–03. The aims were to determine whether conversion was common to many DRGs; the relative importance of volume change versus conversion in the observed increases; and whether there were different trends in the public and private sectors.

Method

The Victorian Department of Human Services (DHS-Vic) provided unit record (UR) level data for separations in 1998–99. Data elements included ANDRGv3, ARDRGv4 (Australian refined diagnosis related groups), an SD flag, a flag indicating whether the admission was an elective or an emergency case, and a flag to indicate whether the admission was undertaken in the public or private sector. Data for 2002–03 were similar except that the only DRG data available was in ARDRGv4. The data provided by DHS-Vic was totally deidentified in relation to individual patients and individual hospitals.

The admission status flag enabled elective cases and emergency cases to be distinguished. The SD flag enabled SD and overnight cases to be distinguished. Surgical DRGs were distinguished from medical DRGs by considering whether they were part of the surgical or medical group of DRGs within each major diagnostic category (MDC). Clinical aspects of the DRG were also considered when this was necessary. Procedural DRGs from gynaecology were included. Procedural DRGs from obstetrics were excluded, as were procedural DRGs usually undertaken by physicians in disciplines such as gastroenterology and cardiology. Such cases may well be performed outside an operating theatre, not be performed by holders of the Fellowship of the Royal Australasian College of Surgeons (FRACS) or equivalent, and they do not form part of the surgical waiting list.

The data enabled the percentage of elective cases performed on an SD basis in the Victorian public and private sectors in 1998–99 and 2002–03 to be derived for each DRG. Data from these two financial years were used as the basis of analysis because they are respectively the earliest and most recent years from which ARDRGv4-based data were available. The differences between ANDRGv3 and ARDRGv4 precluded DRG standardisation between these DRG versions. Analysis was limited to Victoria because this is the only state from which admission status data was available for the relevant financial years.

No distinction was made in either sector between the various subgroups of patients by payment type (eg, public, private, veteran, compensable etc.). The purpose of this paper was to consider change in SD elective surgery rates between sectors, not to consider the rates by payment class. Detailed analysis of the effects of the increased uptake of private health insurance was outside the scope of this paper.

Given the 1998–99 SD percentage of elective cases in each DRG, it was possible to derive the number of elective cases that would have been performed on an SD basis in 2002–03 if the 1998–99 SD percentage for each DRG applied in 2002–03. This was compared with the actual SD cases in 2002–03 to provide a DRG-standardised basis for determining how much of the change in SD elective surgery cases was due to increased workload and how much was due to ON cases becoming SD cases.

It was also possible to compare SD elective surgery profiles in the public and private sectors by applying the public sector SD norms by DRG to the private sector cases and vice versa. This enabled a DRG-standardised comparison of SD elective surgery cases to be made for both 1998–99 and 2002–03.

The change in the Victorian population on age/sex weighted basis was calculated by combining Australian Bureau of Statistics (ABS) population data[7] with the age/sex weights contained in the 1998–2003 Australian Health Care Agreement (AHCA) between the Commonwealth of Australia and the State of Victoria.[8] The change in weighted popula-

tion was combined with the allowance of 2.1% for annual demand growth contained in this agreement[9] to derive a measure of age/sex weighted demand growth between 1998–99 and 2002–03. This provided a basis of comparing actual growth in surgery to the change anticipated based on population and utilisation growth using AHCA parameters.

Results

Box 1 shows that total Victorian surgical cases rose by 54 183 (11.4%) between 1998–99 and 2002–03. Surgical cases performed in the public sector rose by 2019 (0.9%) and in the private sector by 52 164 (26.8%). Elective surgery cases rose by 53 981 (14.3%) and emergency surgery cases by 202 (0.5%), with virtually all this increase occurring in the private sector. The private sector share of all surgery cases rose from 46.4% to 52.1%. The private sector share of elective surgery cases rose from 50.4% to 56.1%, and of emergency cases from 10.2% to 12.2%.

In the same period, the age/sex weighted Victorian population rose from 4 830 511 to 5 101 368, based on AHCA weights. This is an increase of 5.6%. When this is combined with the AHCA demand growth factor of 2.1% per annum, the projected increase in cases is 14.8%. This is higher by 1.7% than the actual growth of surgery cases between 1998–99 and 2002–03.

Box 2 shows the number of SD and ON elective surgery cases. The proportion of cases undertaken on an SD basis has risen in both the public and private sectors between 1998–99 and 2002–03. The number of ON cases has fallen in the public sector (–7.7%) but risen in the private sector (12.8%) in the context of increased uptake of private health insurance about mid-2000. SD surgical cases have risen by 9.2% in the public sector and by 40.5% in the private sector. The private sector share of SD elective surgery cases rose from 50.3% to 56.6% and the ON case share rose from 50.5% to 55.5%.

However, the data in Box 2 do not indicate what proportion of the increase in SD cases is due to volume growth versus conversion. Box 3 compares the 2002–03 actual distribution of elective surgical SD and ON cases to that expected if the 1998–99 SD rates had applied, using DRG-standardised rates.

Box 3 indicates that 7684 additional cases in the public sector and 10 372 additional cases in the private sector were due to conversion. This equates to an overall increase in SD cases due to conversion of 7.9% in the public sector and 10.5% in the

1 Total Victorian surgery cases in 1998–99 and 2002–03

	Public	Private	Total
1998–99			
Elective	187 064	190 271	377 335
Emergency	37 740	4281	42 021
Total	224 804	194 552	419 356
2002–03			
Elective	189 182	242 134	431 316
Emergency	37 641	4582	42 223
Total	226 823	246 716	473 539
Change (%)			
Elective	2118 (1.1%)	51 863 (27.3%)	53 981 (14.3%)
Emergency	–99 (–0.3%)	301 (7%)	202 (0.5%)
Total	2019 (0.9%)	52 164 (26.8%)	54 183 (11.4%)

2 Victorian elective surgery same day (SD) and overnight (ON) cases, 1998–99 and 2002–03

	1998–99				2002–03			
Sector	**SD**	**ON**	**Total**	**SD rate**	**SD**	**ON**	**Total**	**SD rate**
Public	97 803	89 261	187 064	0.5228	106 768	82 414	189 182	0.5644
Private	99 039	91 232	190 271	0.5205	139 198	102 936	242 134	0.5745
Total	196 842	180 493	377 335	0.5217	245 966	185 350	431 316	0.5703

3 Victorian elective surgery cases — actual and expected same day and overnight cases, 2002–03 (using 1998–99 diagnosis related group-standardised rates)

	SD			ON		
Sector	**Actual**	**Expected**	**Difference**	**Actual**	**Expected**	**Difference**
Public	106 768	99 084	7684 (7.8%)	82 414	90 098	–7684 (–8.5%)
Private	139 198	128 826	10 372 (8.1%)	102 936	113 308	–10 173 (–9.0%)

private sector between 1998–99 and 2002–03 (annual average rate of 1.9% in the public sector and 2.5% in the private sector). The proportions of the increases in each sector that arise from conversion versus growth are shown in Box 4.

These calculations do not take account of the differences in case mix between the public and private sectors. Box 5 compares the numbers of SD elective surgery cases in the public and private sectors to those expected if the DRG-based elective SD rates of the other sector had applied.

There are slightly more SD cases on a DRG-standardised basis in the public sector than in the private sector. The DRG-standardised difference in SD case rates between the two was small in 1998–99 (under 3%) and had become smaller by 2002–03 (1.6%).

The data in Box 3 show there are DRGs where the proportion of cases undertaken on an SD basis has increased from 1998–99 to 2003–03, but it is unclear whether this reflects increases over a few or many DRGs. Box 6 outlines the top fifteen Victorian private sector surgery DRGs by cases and SD rate in 2002–03 and compares these to 1998–99 cases and SD rate (DRGs with low SD rates shaded).

Box 7 is similar to Box 6 except that it considers the fifteen most common elective surgery DRGs in the Victorian public sector in 2002–03 (DRGs with low SD rates shaded).

4 Increases in same day elective surgery due to conversion v demand growth, 1998–99 to 2002–03

Sector	**Conversion**		**Demand growth**	
Public	7684	85.7%	1281	14.3%
Private	10 372	25.8%	29 787	74.2%
Total	18 056	36.8%	31 068	63.2%

These two tables suggest that much of the increase in SD elective surgery cases between 1998–99 and 2002–03 was due to more SD cases in common DRGs, the majority of which were predominantly undertaken on an SD basis in 1998–99. There were 6674 extra SD cases from the top fifteen private sector surgery DRGs — 58.9% of the cases that changed into SD cases. Corresponding figures for the public sector were 3988 cases and 51.9%.

While there have been some changes in rank, nine of the top ten 2002–03 DRGs were also in the top ten DRGs in 1998–99 in both the public and private sectors. This indicates that the relative incidence of cases in individual DRGs tends to change slowly in the absence of major technological innovations. Some change is expected due to factors such as changes in incidence of diseases, demographic change and new techniques of clini-

5 Victorian elective same day (SD) surgery cases, applying diagnosis related group (DRG) SD norms of the other sector

	1998–99		2002–03	
Sector	**Actual**	**Applying 1998–99 elective DRG SD rates of other sector**	**Actual**	**Applying 2002–03 elective DRG SD rates of other sector**
Public	97 803	94 979 (–2.9%)	106 768	104 461 (–1.6%)
Private	99 039	101 227 (+2.2%)	139 198	141 435 (+1.6%)

cal management, but these movements tend to be evolutionary rather than dramatic.

Most of the top fifteen DRGs had an SD rate over 65%. There had been little change in SD rates between 1998–99 and 2002–03 in those DRGs with low SD rates in 1998–99. It will be noted that the largest contributor to the increase in SD cases was DRG C08Z. The SD rate in this DRG is now so large that there is much less scope for conversion of ON cases to SD cases.

Discussion

Growth in total surgical cases

The growth in total Victorian surgical cases was 14.3% between 1998–99 and 2002–03, below the 14.8% growth projected based on AHCA norms. While the drivers of growth may differ in the public and private sectors, this finding is consistent with the view that increased PHI uptake has not led to an increase in surgery cases due to supplier (surgeon)-induced demand, a possibility that has been raised.[10] If there had been significant supplier-induced demand in the private sector it is likely total private sector elective surgery cases would have grown by much more than the 27.3% noted in Box 1, given the growth in the insured population (over 50%) and underlying growth of nearly 15% according to AHCA norms.

The low growth in emergency surgical cases is surprising. A possible explanation is that there has been a decreased tendency by surgeons to admit the most urgent elective cases as emergency cases. This may in part reflect increased PHI uptake allowing some of these patients to be admitted as elective patients into private hospitals. Previously, some of these patients may have been admitted into public hospitals as emergency patients to avoid the risk of becoming cancelled elective admissions.

6 Fifteen most common elective surgery ARDRGs (Australian refined diagnosis related groups), Victorian private sector, 2002–03

		2002–03		1998–99	
ARDRGv4	Description	Cases	SD rate	Cases	SD rate
D40Z	Dental extractions and restorations	20 938	0.9860	14 085	0.9573
C08Z	Major lens procedures	18 725	0.9156	12 537	0.7968
I18Z	Knee procedures	15 952	0.7026	12 364	0.6214
J11Z	Other skin, subcutaneous tissue and breast procedures	10 923	0.9261	6816	0.8677
N07Z	Other uterine and adnexal procedures for non-malignancy	9408	0.8542	7724	0.8340
L41Z	Cystourethroscopy without CC	5305	0.8477	3787	0.8550
G09Z	Inguinal and femoral hernia procedures > 0	5225	0.1192	4457	0.0886
N10Z	Diagnostic curettage or hysteroscopy	5190	0.9416	4255	0.9424
I16Z	Other shoulder procedures	5060	0.0439	3357	0.0700
J10Z	Skin,subcutaneous tissue and breast plastic operating room procedures	4324	0.6795	3736	0.5088
I26Z	Other wrist and hand procedures	4153	0.7549	3612	0.6614
B05Z	Carpal tunnel release	4060	0.9074	2940	0.8231
N11B	Other female reproductive system operating room procedures; < 65 no malignancy; no CC	3834	0.9577	2195	0.9376
D11Z	Tonsillectomy or adenoidectomy	3805	0.2294	3512	0.1805
H04B	Cholecystectomy; no closed common bile duct exploration; no catastrophic or severe CC	3804	0.0042	2987	0.0020

SD = same day. CC = comorbidities and complications

Change in SD elective surgery cases

The significant growth in SD elective surgery cases in the Victorian public sector (8965; 9.2%) and private sector (40159; 40.5%) from 1998–99 to 2002–03 should be viewed in the context of total surgical growth which has been broadly consistent with that predicted by AHCA parameters. Much of this growth arose from increased cases in DRGs that had always contained a substantial proportion of SD cases.

The relative contributions of increased cases and conversion of previously ON cases to growth in SD elective cases differs markedly between the public and private sector. This is expected, given the large growth in private sector cases and the small growth in public sector cases.

Future conversion of ON cases to SD cases

The rate of conversion of ON cases to SD cases in both sectors has slowed over 1998–99 to 2002–03 compared with the rate from 1996–97 to 1998–99. In the private sector the annual rate has reduced from 4.7% to 2.5% over this period, and the corresponding public sector rates were 3.8% and 1.9%. The private sector conversion rate remains higher but in the context of a lower overall SD rate. What is likely to happen in the near future?

The SD rate is already very high in the most common elective surgery DRGs and there is no significant conversion of ON cases into SD cases in those of the top fifteen DRGs currently undertaken predominantly on an ON basis.

The only apparent exception is DRG I18Z, knee procedures. There was a significant conversion in both sectors of ON cases to SD cases in DRG C08Z, major lens procedure, between 1998–99 and 2002–03, but the SD rate for that DRG is now about 93% in both sectors with little scope for further conversion. This is consistent with the view

7 Fifteen most common elective surgery ARDRGs (Australian refined diagnosis related groups), Victorian public sector, 2002–03

		2002–03		1998–99	
ARDRGv4	Description	Cases	SD rate	Cases	SD rate
C08Z	Major lens procedures	12 640	0.9227	9132	0.7747
J11Z	Other skin, subcutaneous tissue and breast procedures	10 935	0.9354	7477	0.8703
N07Z	Other uterine and adnexal procedures for non-malignancies	7068	0.8028	6513	0.7821
N09Z	Conistation, vagina, cervix and vulva procedures	6152	0.9280	7229	0.9095
D11Z	Tonsillectomy or adenoidectomy	5794	0.1971	6630	0.1490
N10Z	Diagnostic curettage or hysteroscopy	5753	0.9531	6785	0.9559
D40Z	Dental extractions and restorations	5461	0.9643	6738	0.9676
L41Z	Cystourethroscopy without CC	5411	0.9205	3907	0.9002
I18Z	Knee procedures	5396	0.7342	6337	0.6872
H04B	Cholecystectomy; no closed common bile duct exploration; no catastrophic or severe CC	4680	0.0254	4775	0.0023
G09Z	Inguinal and femoral hernia procedures >0	4477	0.2546	4441	0.2049
N08Z	Endoscopic procedures for female reproductive system	4390	0.9059	6254	0.8957
I26Z	Other wrist and hand procedures	4049	0.8229	3452	0.7373
D13Z	Myringotomy with tube insertion	3732	0.9244	4286	0.9729
N04Z	Hysterectomy for non-malignancy	3511	0.0020	4361	0.0030

SD = same day. CC = comorbidities and complications?

that the conversion rate of ON elective surgery cases to SD cases will continue to decline on a DRG-standardised basis.

It is plausible to project that the conversion rate will halve over the next 4 years and that by 2006–07 the conversion rate will be about 0.9% in the public sector and 1.2% in the private sector. This estimate is based on the rate of decline in the overall conversion rate in recent years and reflects small changes in conversion rates in the relatively common surgery DRGs. By 2006–07, the difference in the DRG-standardised elective surgery SD rate between the public and private sectors is likely to be under 0.5%, given that in 2002–03 the difference in rates was 1.6% and the private sector conversion rate was about 0.6% higher. Beyond 2006–07 it may well be that the two sectors will have very similar SD rates which will increase at an even lower rate.

There is always the possibility that innovative therapeutic techniques will permit some elective surgery cases now undertaken on an ON basis to be undertaken on an SD basis. If this happens, the above estimates of the conversion rate may prove to be too low. However, such innovations would have to apply to a number of clinically diverse DRGs if they were to significantly increase the ON to SD conversion rate.

Implications

The findings of this study have health planning implications. In 1983–84, cataract removal cases had an average length of stay of 6.4 days.[11] This would have generated 119 840 overnight bed-days in the private sector and 80 896 overnight bed-days in the public sector — a total of 200 736 such days. Victorian Admitted Episodes Dataset data indicate 2368 overnight bed-days were generated by ARDRGv4 CO8Z in 2002–03 — a reduction of 198 368 overnight bed-days compared with those that would have been utilised if 1983–84 norms had applied. This equates to a need for 604 less overnight beds (assuming 90% occupancy over 365 days), a significant capital and recurrent saving.

There is no obvious candidate DRG to generate such overnight bed-day savings in future years. The period when there has been a considerable saving in ON bed-days and a consequent reduction in the need for ON beds due to conversion of ON cases to SD cases has passed. It is now appropriate that any projection of the need for overnight beds assumes no significant conversion of ON cases to SD cases. There will still be significant growth in SD elective surgery cases based on demographic and utilisation changes but not due to the conversion of ON cases to SD cases.

Competing interests

None identified.

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