Independent Hospital Pricing Authority

National Hospital Cost Data Collection: Private Hospital Report

Round 23 (Financial year 2018-19)

4 February 2021



National Hospital Cost Data Collection, Private Hospital Report, Round 23 (Financial year 2018-19)

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1

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Contents

Tab	les and figures	3
Disc	claimer	4
1.	Executive summary	5
2.	Introduction	7
3.	Scope and methodology	.10
4.	Results	.14
Арр	endix A: Methodology	.34
Арр	endix B: Private sector costing approaches	.36
Арр	pendix C: Standard error range for the Round 23 private sector NHCDC	.38
Арр	pendix D: Cost weight tables by AR-DRG Version 10.0	.39
Арр	pendix E: Cost weight tables by AR-DRG Version 9.0	.40
Арр	pendix F: Cost weight tables by AR-DRG Version 8.0	.41
Арр	pendix G: Cost weight tables by AR-DRG Version 7.0	.42
Арр	pendix H: Cost weight tables by AR-DRG Version 6.0x	.43
Арр	pendix I: Cost bucket matrix	.44

Tables and figures

List of Tables

Table 1. Summary of private hospital participation, Round 13 to Round 23.	8
Table 2. Comparison of separations and hospitals, Round 13 (2008-09) to Round 23 (2018-19)	14
Table 3. Top 20 DRGs ranked by highest cost weight, Round 23 compared to Round 22	17
Table 4. Top 20 DRGs ranked by highest volume of population adjusted separations	19
Table 5. Top 20 DRGs ranked by highest cost weighted separations	21
Table 6. Top 20 DRGs ranked by average length of stay (ALOS)	23
Table 7. Breakdown of cost by cost-bucket group, Round 23 compared to Round 22	25
Table 8. Top 20 DRGs for operating room/specialist procedure suites cost bucket	27
Table 9. Top 20 DRGs for critical care cost bucket	29
Table 10. Top 20 DRGs for prostheses cost bucket	31
Table 11. Top 20 DRGs for miscellaneous (Misc.) cost bucket	33
Table 12. Number of DRGs by standard error range	38
Table 13. Round 23 (2018-19) national consolidation cost weight tables – V10.0	39
Table 14. Round 23 (2018-19) national consolidation cost weight tables – V9.0	40
Table 15. Round 23 (2018-19) national consolidation cost weight tables – V8.0	41
Table 16. Round 23 (2018-19) national consolidation cost weight tables – V7.0	42
Table 17. Round 23 (2018-19) national consolidation cost weight tables – V6.0x	43

List of Figures

Figure 1. Top 20 DRGs ranked by highest cost weight, Round 23 compared to Round 22	16
Figure 2. Comparison of top 20 DRGs by highest volume of population adjusted separations, Round 23 compared to Round 22	18
Figure 3. Comparison of top 20 DRGs by highest cost-weighted separations, Round 23 compared to Round 22	20
Figure 4. Comparison of top 20 DRGs by average length of stay, Round 23 compared to Round 22	22
Figure 5. Breakdown of cost by cost-bucket group, Round 23 compared to Round 22	25
Figure 6. Cost bucket matrix	44

Disclaimer

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1. Executive summary

The private sector National Hospital Cost Data Collection (NHCDC) is a voluntary collection that produces a range of hospital cost and activity information by Australian Refined Diagnosis Related Groups (AR-DRG). This report includes the findings from the Round 23 (financial year 2018-19) of the NHCDC for admitted acute care provided by 108 overnight private hospitals and represents 65 per cent of private hospital activity.

Changes in Round 23

The Round 23 private sector NHCDC data collection process was facilitated by IHPA. This included stakeholder engagement, validation and data set consolidation.

Round 23 has two notable changes from previous rounds:

- The data was grouped using AR-DRG version 10.0 the most current version of the acute care classification in addition to AR-DRG versions 6.0x, 7.0, 8.0 and 9.0.
- Hospitals were invited to submit subacute and mental health (care type 11.0) data for the first time. However, findings for these new streams are not included in this report due to insufficient participation.

Participation

Ten hospital groups have participated in Round 23 (2018-19), which decreased by one group in comparison to Round 22.

The Round 23 dataset included 108 private hospitals and 2,234,143 separations. This represents 65.1 per cent of the total in scope hospital separations. The number of participating hospitals decreased by four (3.6 per cent) compared to Round 22, and the number of sample separations increased by 60,296 (2.8 per cent) as a result of general increases in activity. Analysis of the data confirmed that the sample was representative of the population and was therefore determined by IHPA to be fit-for-purpose. Full details can be found in <u>Table 1</u>.

Key findings

The data from the Round 23 private sector NHCDC was analysed to identify the top 20 AR-DRGs by a range of factors. These rankings were compared to the rankings from the Round 22 data. Overall, there was a high level of consistency between the AR-DRGs appearing in the top 20 in Round 22 and Round 23. This was most apparent when considering population-adjusted separations and cost weighted separations (95 per cent and 90 per cent consistency respectively), followed by cost weight and average length of stay, both of which observed 70 per cent consistency between the Rounds.

Methodology

In Round 23 (2018-19), Private hospitals were invited to submit costed data of 2018-19 in scope activity, this included admitted acute, subacute and mental health streams.

Submitted data was validated by IHPA in accordance with the Data Request Specifications (DRS) that IHPA prepared and distributed to participants. IHPA performed Quality Assurance (QA) checks to ensure accuracy and suitability of the data submission.

The validated data was then used to produce the Round 23 NHCDC national costed data set, private hospital report and individualised reports including cost weight tables for each participating hospital group.

Considerations

The following factors can have a material impact on the reported costs and cost weights, and should be considered when interpreting the information in this report:

- Application of the Australian Hospital Patient Costing Standards (AHPCS) v4.0.
- Mapping of general ledger to the appropriate and consistent cost buckets.
- Allocation of cost centres to care areas.
- Variability in allocating costs using feeder systems (patient level data) versus service weights.

2. Introduction

Purpose of this report

The purpose of this report is to provide an overview of costs reported to the Round 23 private sector NHCDC. The Round 23 private sector NHCDC is a voluntary collection that produces a range of hospital cost and activity information.

The information is grouped by AR-DRG, a classification system that provides a means of relating the number and types of patients treated in a hospital to the resources required by the hospital, as represented by a code¹. The AR-DRG is derived from a range of data collected on admitted patients, including diagnosis and procedure information, classified using ICD-10-AM².

This report documents the data, processes, methodology and results for admitted acute care provided by overnight private hospitals. The results of the collection are expressed as national cost weights by AR-DRG version 10.0. Cost weight tables are provided in AR-DRG versions 10.0, 9.0, 8.0, 7.0 and 6.0x in the Appendices.

Format of this report

This report includes AR-DRG aggregated data, cost weights and other cost relativities. The AR-DRG information is displayed for the top 20 AR-DRGs ranked as follows:

- highest volume of population-adjusted separations
- highest cost weighted separations
- highest Average Length of Stay (ALOS)
- highest cost weight
- highest cost weight by each reported cost bucket.

For definitions of the cost buckets please refer to the 'Read Me' tab attached to Appendices D-H.

History of the private sector NHCDC

Round 1 of the private sector NHCDC was conducted in 1996-97 with 23 hospitals and 240,000 episodes being represented. The collection has grown steadily since that time, although no publication was released for Rounds 8, 9, or 14 due to low participation rates. No collection was carried out for Rounds 10 and 15 as the sector elected to bypass that year and move directly to the following Round. Round 19 was bypassed due to the expectation that achieving a sufficient participation rate would not be met due to competing priorities of participants.

Table 1, below, sets out the participation rate for Round 23 and the last seven published Rounds.

¹ Department of Health, <u>A Users Guide for the Collection of HCP and PHDB</u> (Version 1.2- May 2010) - page 38, viewed 15 January 2021

² Department of Health, <u>A Users Guide for the Collection of HCP and PHDB</u> (Version 1.2- May 2010) - page 38, viewed 15 January 2021

Summary	Round 13 2008-09	Round 16 2011-12	Round 17 2012-13	Round 18 Round 2 2013-14 2015-16		Round 21 2016-17	Round 22 2017-18	Round 23 2018-19
Number of hospitals	110	105	95	96	91	105	112	108
Sample Separations	1,648,989	1,775,059	1,650,816	1,697,311	1,781,699	1,923,310	2,173,847	2,234,143
Participation rate* (%)	70.8	65.7	59.9	60.0	58.4	59.3	65.9	65.1
AR-DRG version	5.1	6.0x	6.0x	6.0x	8.0	9.0	9.0	10

Table 1. Summary of private hospital participation, Round 13 to Round 23.

* Participation rate refers to the percentage of sample separations compared to the population separations.

Private hospital statistics for Round 23 (2018-19)

603 private hospitals reported to the Private Hospital Data Bureau (PHDB) in 2018-19³, a net increase of 20 from 2017-18. These hospitals submitted 4.7 million patient separations in 2018-19, with 19.4 per cent of these separations reported by day facilities. 3.3 million of these separations, or 71.8 per cent, were same-day separations. Additionally, 4.2 million patient separations, or 90.3 per cent, were classified as acute care or newborn care. Total patient separations submitted to the PHDB increased by 3.2 per cent between 2017-18 and 2018-19.

These separations amounted to 10.2 million patient days of care in 2018-19, or an average length of stay of 2.2 days. Of these, acute care and newborn care patients accounted for 8.5 million patient days, or 83.3 per cent.

Changes in Round 23

Participants were invited to submit data for the subacute and mental health (care type 11) for the first time in Round 23. However, findings for these new streams are not included in this report due to insufficient participation. This is discussed further in Section 3.

Public and private sector differences

This report does not compare the average cost per separation between the public and private sectors as the scope of costs between the two sectors is different. Many of the cost items present in the public sector such as medical specialist costs, including pathology and imaging, are not equally represented in private hospital general ledgers. These costs are generally not reported for the private sector because the majority of hospitals do not provide these services directly and patients pay for these services separately.

Confidentiality of data

Due to the commercial nature of the sector, all participating hospitals in Round 23 are requested to sign a confidentiality agreement before any final reports are released.

In this report, cost weight information will not be presented (masked) if there is insufficient volume. If a cost weight for a DRG is based on fewer than five separations, the figures for this cost weight have been replaced by asterisks (*****). If the number of contributing hospitals for a particular DRG is fewer than three, the figures for this cost weight have been replaced by dashes (-----).

³ Department of Health, <u>The PHDB Annual Report 2018-19</u>, viewed 25th January 2021

Considerations when interpreting the information in this report

The following factors can have a material impact on the reported costs and cost weights and should be considered, in addition to the changes in Round 22:

- Application of the AHPCS v4.0.
- Mapping of general ledger to the appropriate and consistent cost buckets.
- Allocation of cost centres to care areas.
- The variability in allocating costs using feeder systems (patient level data) by participants verses service weights.

3. Scope and methodology

Scope

The scope of the Round 23 private sector NHCDC includes acute patients admitted to overnight private hospitals in Australia who were discharged in the financial year 2018-19. This includes patients that were admitted to a hospital, were classified under the AR-DRG and had a care type of admitted acute, qualified newborn⁴, mental health or other admitted patient care (see 'In scope care types'). Any references to admitted acute in this report relate to these care types unless stated otherwise.

For this report, an overnight hospital was considered in scope if it performed at least 200 admitted acute separations in the relevant year.

Participants were invited to submit subacute data for the first time for Round 23. Ultimately, the results of the analysis using this data is not included in this report due to insufficient participation, which would lead to potentially inappropriate or biased representation of the cost profile for subacute activity in the population.

Round 23 was the first round in which some hospital groups began coding and submitting admitted mental health episodes under care type 11.0. Prior to the introduction of care type 11.0, admitted mental health episodes were classified as admitted acute. The reporting in Round 23 combined mental health activity with other admitted acute activity due to insufficient volume to report on mental health separately. The inclusion of mental health as part of admitted acute in Round 23 enables direct comparisons to be made to Round 22.

IHPA will continue to work with the sector to improve the data collection so that subacute and mental health can be reported separately in future Rounds.

In scope care types

Separations for admitted acute care and newborn care with qualified care days are in scope, and are included in the calculation of the AR-DRG cost weights. The costs associated with unqualified neonate separations⁵ have been included in the costs of the maternal separations (as described below for the neonatal adjustment).

Admitted acute care type 1.0 is care in which the clinical intent or treatment goal is to:

- manage labour (obstetric)
- cure illness or provide definitive treatment of injury
- perform surgery
- relieve symptoms of illness or injury (excluding palliative care)
- reduce severity of an illness or injury
- protect against exacerbation and/or complication of an illness and/or injury which could threaten life or normal function
- perform diagnostic or therapeutic procedures⁶.

⁴ Australian Institute of Health and Welfare, <u>Data Dictionary, METeOR ID: 584408</u>, date viewed 23 December 2020;

⁵ These are separations with care type 7.0 (new born care), with zero qualified days in the neonate DRGs (Major Diagnostic Category 15 newborns and other neonates)

⁶ Department of Health, <u>A Users Guide for the Collection of HCP and PHDB</u> (Version 1.2- May 2010) - page 28, viewed 15 January 2021

Newborn care type 7.0 is initiated when the patient is born in hospital or is nine days old or less at the time of admission. Newborn care continues until the care type changes or the patient is separated:

- Patients who turn 10 days of age and do not require clinical care are separated and, if they remain in the hospital, are designated as boarders.
- Patients who turn 10 days of age and require clinical care continue in a newborn episode of care until separated.
- Patients aged less than 10 days and not admitted at birth (e.g. transferred from another hospital) are admitted with newborn care type.
- Patients aged greater than 9 days not previously admitted (e.g. transferred from another hospital) are either boarders or admitted with an acute care type.
- Within a newborn episode of care, until the baby turns 10 days of age, each day is either a qualified or unqualified day.
- A newborn is qualified when it meets at least one of the criteria detailed in Newborn qualification status.

Within a newborn episode of care, each day after the baby turns 10 days of age is counted as a qualified patient day. Newborn qualified days are equivalent to acute days and may be denoted as such.⁷

Mental health care type 11.0⁸ is care in which the primary clinical purpose or treatment goal is improvement in the symptoms and/or psychosocial, environmental and physical functioning related to a patient's mental disorder. Mental health care:

- Is delivered under the management of, or regularly informed by, a clinician with specialised expertise in mental health.
- Is evidenced by an individualised formal mental health assessment and the implementation of a documented mental health plan.
- May include significant psychosocial components, including family and carer support.

Other admitted patient care (care type 88⁹) is care that does not meet the definitions for other care types but deemed in scope for this report.

Reporting requirements

The Australian Hospital Patient Costing Standards Version 4.0¹⁰ (AHPCS) guide the hospitals with costing processes for their NHCDC submissions to ensure a consistent treatment of costs between hospitals nationally. Version 4.0 of the AHPCS was released in February 2018 and applied for the first time in Round 22 of the NHCDC.

The AHPCS prescribe the set of line items and cost centres used for mapping hospital costs in the costing process. These costs are then allocated to, and reported under, the NHCDC-defined 'cost buckets' (see Appendix I: Cost bucket matrix). Cost buckets represent different combinations of the NHCDC line items and cost centres and can be considered as cost pools within the hospital.

⁷ Department of Health, <u>A Users Guide for the Collection of HCP and PHDB</u> (Version 1.2- May 2010) - page 30-31, viewed 15 January 2021

⁸ Australian Institute of Health and Welfare, <u>Data Dictionary. METeOR ID: 584408</u>, date viewed 23 December 2020;

⁹ Australian Institute of Health and Welfare, <u>Data Dictionary, METeOR ID: 584408</u>, date viewed 23 December 2020;

¹⁰ Independent Hospital Pricing Authority, Australian Hospital Patient Costing Standards Version 4.0, viewed 15 January 2021

Work in Progress Patients

A work in progress (WIP) patient is a patient who was discharged within the reporting period for Round 23, but who was admitted prior to the reporting period. Patients who have not been discharged in 2018-19 are out of scope.

In Round 23, all WIP patients were admitted in 2017-18 and discharged in the 2018-19. These records are in scope and they have been included in the results.

Data adjustments

The following adjustments were applied to the dataset during the NHCDC process.

Neonate adjustment

The costs for newborn infants with zero qualified days, in respect of care type 7 (newborn care) were allocated to the delivery AR-DRGs of mothers at the same hospital.

The definition of unqualified days in the National Health Data Dictionary¹¹ relates to the first nine days of a newborn's life, unless the newborn is a second or subsequent live born infant or it requires intensive care. The adjustment for unqualified days for Round 23 was conducted in a similar way to that in Round 22.

Market share adjustment process

To ensure appropriate representation in the report, market share was determined for each hospital group. This was calculated as the relevant group's share of the PHDB separations amongst all participating hospital groups. The market share was then compared to the submitted data to determine if any hospital groups submitted more separations than their market share would warrant, and if so, whether this would lead to an inappropriate representation. An adjustment was made in Round 23 to better align the share for hospital groups in the NHCDC to their market share.

Population adjustment process

To ensure the results reflect the full range of Australia's private hospitals, an estimation process was adopted to create representative national costing and activity figures from sample data. The estimation process produces population data by estimating "strata weights" based on admitted acute separations. These are applied to the sample data so that the admitted acute separations equal the total population figures. The weights are calculated based on the number of separations in each hospital group in the submitted data and nationally, as per the total population in PHDB.

The total population was determined as the number of acute separations in 2018-19 obtained from PHDB. All private acute hospitals in Australia (excluding private day hospital facilities) with more than 200 admitted acute separations during the financial year were included.

The number of hospitals in the population file for Round 23 is 262.

DRG flipping adjustment process

The data set was reviewed for DRG flipping. DRG flipping occurs when the cost weight of a lower complexity DRG within the related adjacent DRG is greater than the one with higher complexity. For example, DRG flipping would occur if the cost weight for the lower complexity group E40B was greater than the cost weight of the higher complexity group E40A.

¹¹ Australian Institute of Health and Welfare, Data Dictionary, METeOR ID: 327254, viewed 15 January 2021

A small number of instances of DRG flipping were identified in Round 23. Each instance was analysed and investigated by the key stakeholders to ensure the appropriate treatment had been applied. This included review of the patient data. In each circumstance it was confirmed that the recorded costs were an accurate reflection of the services provided, therefore no adjustments were made.

Pharmaceutical Benefits Scheme (PBS) funding data issue

Some pharmaceutical items have their cost subsidised by the PBS rebate. It was identified in Round 23 that different hospital groups may be treating the inclusion of PBS rebate inconsistently within the costed data. Initial investigations with the hospital groups suggest that this is likely due to differing access to PBS information and hence its application in the costing process. Under the AHPCS V4.0, no adjustment should be made to offset the PBS rebates when reporting costs.

No adjustment made for this issue for Round 23 due to the limited information available. IHPA will continue investigating this issue with each hospital group to identify the appropriate action and adjustments required in Round 24. Therefore, the reader should interpret results in this cost report with caution particularly for DRGs with PBS-funded drugs, such as chemotherapy.

4. Results

Participation

The population of separations in Round 23 is defined as all admitted acute separations performed at 262 in scope overnight private hospitals in 2018-19, which is 3,430,288 separations.

The number of sample separations in Round 23 was 2,234,143, which represents a 2.8 per cent increase in the sample separations compared to Round 22 (shown in <u>Table 2</u>). In Round 23, the participation rate was 65.1 per cent of separations, which is a marginal decrease of 0.8 percentage points compared to Round 22.

The average number of sample separations submitted per participant increased by 1,278 separations (from 19,409 to 20,687) between Round 22 and Round 23. The average number of separations per population hospital (all hospitals including non-participating hospitals) also increased by 411 separations (from 12,682 to 13,093) between Round 22 and Round 23.

In the table below, Change in separations (%) represents a comparison to the previous Round.

Key Statistic	Round 16 2011-12	Round 17 2012-13	Round 18 2013-14	Round 20 2015-16	Round 21 2016-17	Round 22 2017-18	Round 23 2018-19
Sample separations	1,775,059	1,650,816	1,697,311	1,781,699	1,923,310	2,173,847	2,234,143
Change in separations (%)	7.6	-7.0	2.8	5.0	7.9	13.0	2.8
Sameday separations [^]	n/a	n/a	n/a	1,021,254	1,145,180	1,276,764	1,333,671
Population separations	2,703,667	2,753,670	2,827,996	3,051,681	3,242,411	3,297,288	3,430,288
Participation rate (%)	65.7	59.9	60.0	58.4	59.3	65.9	65.1
Sample hospitals	105	95	96	91	105	112	108
Change in sample hospitals (%)	-4.5	-9.5	1.0	-5.2	15.4	6.7	-3.6
Population hospitals	248	244	235	246	251	260	262
Sample hospitals to population hospitals (%)	42.3	38.9	40.9	37.0	41.8	43.1	41.2
Average separations per participating hospital	16,905	17,377	17,680	19,579	18,317	19,409	20,687
Average separations per population hospital	10,902	11,286	12,034	12,405	12,918	12,682	13,093
Average Length of Stay	2.5	2.5	2.4	2.3	2.3	2.3	2.3
Change (%)	-2.3	0.8	-3.2	-4.9	-3.4	0.9	1.3
Percentage of sameday separations (%)	n/a	n/a	n/a	57.3	59.5	58.7	59.7
Overnight Average Length of Stay	unknown	4.4	4.4	4.2	4.1	4.1	4.3

Table 2. Comparison of separations and hospitals, Round 16 (2011-12) to Round 23 (2018-19)

* Figures may not reconcile due to rounding.

^ Sameday separations are a subset of sample separations. Sameday separation data was not available prior to Round 20.

Some of the variation between Round 22 and Round 23 may be due to a change in casemix that can be attributed to a decrease in the number of participating hospitals from 112 to 108. The change in casemix should be considered when interpreting the results.

Analysis of Top 20 DRGs

Analysing the top 20 DRGs provides insight into the consistency between Rounds; allows identification of trends; and, highlights the DRGs that are driving costs. This section of the report provides an analysis of the top 20 DRGs by the following categories:

- highest cost weight
- highest number of population-adjusted separations
- highest cost weighted separations
- highest ALOS including minimum and maximum range.

Additional analysis of the cost buckets (operating room/specialist procedure suites, critical care, prostheses and miscellaneous) has been undertaken to identify the top 20 DRGs for each of these buckets.

Top 20 DRGs ranked by highest cost weight

Key findings

As shown in <u>Figure 1</u>, below, the highest cost weight DRG was A13A (Ventilation >=336hours, Major Complexity). As illustrated in <u>Table 3</u>, this was also the DRG with the highest cost weight in Round 22. Of the five highest cost weight DRGs, four are closely related to ventilation (including one for neonate), reflecting the resource-intensive nature of these groups.

The DRGs in <u>Table 3</u> were high cost but had low volume, representing only 0.1 per cent of the total population-adjusted separations (or 4,340 population-adjusted separations out of 3,430,288 total separations). Despite this small volume they accounted for 2.3 per cent of the total population cost weighted separations.

Consistencies between Round 23 and Round 22

70.0 per cent (14) of the top 20 DRGs for Round 23 were also in the Round 22 results, with the top two DRGs remaining the highest cost weight DRGs in both Rounds. P03A (Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Major Complexity) and P61Z (Neonate, AdmWt <750g W/O Significant GI procedure) are third and fourth highest cost weight DRGs in Round 23 but did not have a rank in Round 22 as they were masked (having either fewer than five separations or fewer than three hospitals with that DRG).

Many of the DRGs in the top 20 list are recurring as they have high patient complexity and resource utilisation.

Differences between Round 23 and Round 22

There were six new DRGs in the top 20 list in Round 23:

- P03A (Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Major Complexity)
- P61Z (Neonate, AdmWt <750g W/O Significant GI procedure)
- P03B (Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Minor Complexity)
- P04B (Neonate, AdmWt 1500-1999g W Significant GI/Vent>=96hrs, Minor Complexity)
- R06A (Autologous Bone Marrow Transplant, Major Complexity).
- F07A (Other Cardiothoracic/Vascular Interventions W CPB Pump, Major Complexity)

P03A, P61Z and P03B were not included in the analysis in Round 22 as fewer than three hospitals reported those DRGs. The remaining three DRGs were all just outside the top 20 in Round 22, sitting at ranks 21, 26 and 22 respectively. This suggests they are consistently high cost weight DRGs.





Note: A missing Round 22 bar indicates that the DRG was masked due to having fewer than five separations or fewer than three hospitals reporting that DRG.

Table 3. Top 20 DRGs ranked by highest cost weight, Round 23 compared to Round 22

Top 20 Round 22	Rank Round 23	DRG	DRG Description	Cost weight (a)	No. of weighted seps (b)	Cost weighted seps (c)=(a)x(b)	Number of days (d)	ALOS (days) (e)=(d)/(b)	Std error	% of total seps	% of CW seps	Cost weight Round 22	Rank Round 22	No. of weighted seps Round 22
Yes	1	A13A	Ventilation >= 336 hours, Major Complexity	53.05	98	5,199	6,056	62.0	4.02	0.0%	0.2%	46.15	1	69
Yes	2	A13B	Ventilation >= 336 hours, Minor Complexity	39.25	107	4,200	4,826	45.1	2.28	0.0%	0.1%	32.65	2	116
No	3	P03A	Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Major Complexitv	37.46	53	1,985	3,353	63.2	3.33	0.0%	0.1%			
No	4	P61Z	Neonate, AdmWt <750g W/O Significant GI procedure	33.62	26	874	1,465	55.7	7.27	0.0%	0.0%			
Yes	5	A14A	Ventilation >= 96 hours & < 336 hours, Major Complexity	30.74	211	6,486	9,505	45.1	1.74	0.0%	0.2%	29.89	3	205
No	6	P03B	Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Minor Complexitv	21.93	43	943	1,661	38.9	3.13	0.0%	0.0%			
Yes	7	A40Z	ECMO	20.71	14	290	292	21.4	11.88	0.0%	0.0%	16.53	10	23
No	8	P04B	Neonate, AdmWt 1500-1999g W Significant GI/Vent >= 96 hrs, Minor Complexitv	19.40	31	601	1,107	35.9	2.86	0.0%	0.0%	12.62	21	39
Yes	9	A14B	Ventilation >= 96 hours & < 336 hours, Intermediate Complexity	19.06	374	7,128	9,268	24.8	0.72	0.0%	0.2%	19.95	5	373
Yes	10	F01A	Implantation and Replacement of AICD, Total System, Major Complexity	16.70	421	7,031	4,134	9.8	0.35	0.0%	0.2%	17.99	6	371
Yes	11	F04A	Cardiac Valve Interventions W CPB Pump W/O Invasive Cardiac Invest, Maior Comp	16.54	320	5,293	6,808	21.3	0.48	0.0%	0.2%	16.98	8	279
No	12	R06A	Autologous Bone Marrow Transplant, Major Complexity	16.29	75	1,222	2,320	31.0	2.20	0.0%	0.0%	11.79	26	64
Yes	13	102A	Microvascular Tissue Transfers or Skin Grafts, Excluding Hand, Major	16.28	61	993	2,826	46.2	1.76	0.0%	0.0%	17.82	7	36
Yes	14	F03A	Cardiac Valve Int W CPB Pump W Invasive Cardiac Investigation, Major Complexitv	16.27	275	4,474	5,926	21.5	0.50	0.0%	0.1%	14.29	12	215
Yes	15	A14C	Ventilation >= 96 hours & < 336 hours, Minor Complexity	15.60	188	2,933	3,918	20.9	0.74	0.0%	0.1%	13.86	16	226
Yes	16	A15A	Tracheostomy, Major Complexity	15.48	17	263	431	25.6	1.66	0.0%	0.0%	19.99	4	27
No	17	F07A	Other Cardiothoracic/Vascular Interventions W CPB Pump, Major Complexitv	14.78	44	650	887	20.3	1.19	0.0%	0.0%	12.49	22	66
Yes	18	109A	Spinal Fusion, Major Complexity	14.51	623	9,040	10,846	17.4	0.36	0.0%	0.3%	14.48	11	626
Yes	19	106Z	Spinal Fusion for Deformity	14.09	1,343	18,923	12,542	9.3	0.27	0.0%	0.6%	13.92	15	1,235
Yes	20	P64A	Neonate, AdmWt 1250-1499g W/O Significant GI/Vent >= 96 hrs, Major Complexity	13.56	17	231	687	40.7	1.84	0.0%	0.0%	16.54	9	39
14	Sub-tota	l, top 20 h	ighest cost weight	18.15	4,340	78,759	88,856	20.5		0.1%	2.3%			
in	All DRGs	5		1.00	3,430,288	3,430,288	7,939,576	2.3		100%	100%			
Top 20	Top 20, %	6 of all DR	lGs		0.1%	2.3%	1.1%							

Notes (a) For cost weight (cost bucket specific) calculations please refer to Appendix D: Cost weight tables by AR-DRG Version 10.0 (b) Separations shown are strata weighted (e) ALOS means Average Length of Stay

Top 20 DRGs ranked by highest volume of population-adjusted separations

Key findings

<u>Table 4</u> and <u>Figure 2</u> show the DRGs with the highest population-adjusted separations for Round 23. This is a measure of the volume of separations in the entire Australian overnight private hospital population (the separations in the Round 23 sample, adjusted using weights to reflect the whole population).

<u>Table 4</u> shows that for Round 23, R63Z (Chemotherapy) was ranked as having the most population-adjusted separations, consistent with the Round 22 ranking. <u>Table 4</u> also shows that the top 20 DRGs represented 43.8 per cent of the total population-adjusted separations (1,501,019 population-adjusted separations out of 3,430,288 total separations). However, these DRGs represented only 17.9 per cent (613,792) of the total population cost weighted separations. This indicates that these DRGs were high volume and low cost.

The ALOS for these top 20 DRGs is 1.2 days compared to the population average of 2.3 days, as the majority of these DRGs were same-day procedures.

Consistencies between Round 23 and Round 22

All except one of the DRGs in top 20 DRGs for Round 23 were included in the top 20 for 22 (see Table 5). Furthermore the top five in Round 23 are the same as the top five from Round 22. This was expected given the high frequency of treatments required for R63Z (Chemotherapy) and the demand for haemodialysis, colonoscopies and endoscopies as day procedures.

Differences between Round 23 and Round 22

While there has been some movement in the rank of individual DRGs, there are otherwise very few changes between Round 22 and Round 23. J11B (Other Skin, Subcutaneous Tissue and Breast Interventions, Minor Complexity) was new in the top 20 list in Round 23, and sat just outside the top 20 in Round 22 (at rank 22). The marginal movement between the Rounds indicates a high level of consistency in the number of high-volume DRGs.



Figure 2. Comparison of top 20 DRGs by highest volume of population adjusted separations, Round 23 compared to Round 22

Table 4. Top 20 DRGs ranked by highest volume of population adjusted separations

Top 20 Round 22	Rank Round 23	DRG	DRG Description	Cost weight (a)	No. of weighted seps (b)	Cost weighted seps (c)=(a)x(b)	Number of days (d)	ALOS (days) (e)=(d)/(b)	Std error	% of total seps	% of CW seps	No. of weighted seps Round 22	Rank Round 22	Cost weight Round 22
Yes	1	R63Z	Chemotherapy	0.20	275,016	55,003	275,029	1.0	0.001	8.0%	1.6%	259,662	1	0.19
Yes	2	G48B	Colonoscopy, Minor Complexity	0.30	164,136	49,241	169,757	1.0	0.001	4.8%	1.4%	162,058	2	0.30
Yes	3	L61Z	Haemodialysis	0.11	130,393	14,343	130,400	1.0	0.000	3.8%	0.4%	117,511	3	0.10
Yes	4	G46B	Complex Endoscopy, Minor Complexity	0.35	113,659	39,781	121,125	1.1	0.001	3.3%	1.2%	113,123	4	0.35
Yes	5	Z40Z	Other Contacts W Health Services W Endoscopy	0.23	102,496	23,574	104,252	1.0	0.001	3.0%	0.7%	104,991	5	0.24
Yes	6	U60Z	Mental Health Treatment W/O ECT, Sameday	0.08	79,800	6,384	79,800	1.0	0.000	2.3%	0.2%	34,341	16	0.08
Yes	7	G47C	Gastroscopy, Minor Complexity	0.22	79,204	17,425	84,070	1.1	0.001	2.3%	0.5%	79,245	6	0.24
Yes	8	D40Z	Dental Extractions and Restorations	0.43	69,662	29,955	70,149	1.0	0.001	2.0%	0.9%	74,058	7	0.43
Yes	9	Z64B	Other Factors Influencing Health Status, Minor Complexity	0.15	67,880	10,182	69,059	1.0	0.002	2.0%	0.3%	69,073	8	0.17
Yes	10	C16Z	Lens Interventions	0.49	55,103	27,000	55,242	1.0	0.001	1.6%	0.8%	59,371	9	0.54
Yes	11	F42B	Circulatory Dsrds, Not Adm for AMI W Invasive Cardiac Inves Int, Minor Comp	0.79	43,538	34,395	60,482	1.4	0.003	1.3%	1.0%	41,200	12	0.86
Yes	12	168B	Non-surgical Spinal Disorders, Minor Complexity	0.48	43,326	20,796	81,538	1.9	0.003	1.3%	0.6%	40,569	13	0.48
Yes	13	I18B	Other Knee Interventions, Minor Complexity	0.55	40,600	22,330	42,586	1.0	0.002	1.2%	0.7%	44,026	10	0.54
Yes	14	G10B	Hernia Interventions, Minor Complexity	0.97	38,937	37,769	48,377	1.2	0.003	1.1%	1.1%	39,364	14	0.98
Yes	15	104B	Knee Replacement, Minor Complexity	3.93	35,066	137,809	165,428	4.7	0.006	1.0%	4.0%	33,710	17	4.03
Yes	16	E63B	Sleep Apnoea, Minor Complexity	0.19	35,015	6,653	35,123	1.0	0.001	1.0%	0.2%	42,244	11	0.19
Yes	17	I16Z	Other Shoulder Interventions	1.40	34,230	47,922	41,397	1.2	0.004	1.0%	1.4%	36,198	15	1.37
Yes	18	L44B	Cystourethroscopy for Urinary Disorder, Minor Complexity	0.26	32,626	8,483	34,074	1.0	0.001	1.0%	0.2%	32,080	19	0.26
Yes	19	N07B	Other Uterus and Adnexa Interventions for Non-Malignancy,	0.42	30,711	12,899	31,524	1.0	0.002	0.9%	0.4%	29,902	20	0.42
No	20	J11B	Other Skin, Subcutaneous Tissue and Breast Interventions, Minor Complexity	0.40	29,621	11,848	30,560	1.0	0.002	0.9%	0.3%	29,221	22	0.40
19	Sub-tota	l, top 20 hi	ghest volume of population-adjusted separations	0.41	1,501,019	613,792	1,729,972	1.2		43.8%	17.9%			
in	All DRGs	5		1.00	3,430,288	3,430,288	7,939,576	2.3		100%	100%			
Top 20	Top 20, 🤋	% of all DR	Gs		43.8%	17.9%	21.8%							

Notes

(a) For cost weight (cost bucket specific) calculations please refer to Appendix D: Cost weight tables by AR-DRG Version 10.0
 (b) Separations shown are strata weighted
 (e) ALOS means Average Length of Stay

Top 20 DRGs ranked by highest cost weighted separations

Key findings

<u>Table 5</u> and <u>Figure 3</u> present the top 20 DRGs ranked by highest cost weight separations. A cost-weighted separation refers to the number of population-adjusted separations multiplied by the cost weight for that DRG. It measures the total cost, or resource utilisation, associated with that DRG.

<u>Figure 3</u> shows that the highest cost weight DRG was I04B (Knee Replacement, Minor Complexity). This procedure is a common procedure within the private sector and it is frequently ranked amongst the highest cost weighted DRGs.

Table 5 sets out the top 20 highest cost weight DRGs. These predominantly fall into two groups:

- Procedures requiring high cost prostheses (such as orthopaedic, neurological or cardiac procedures).
- High volume procedures (such as colonoscopy, endoscopy, caesarean section or chemotherapy).

The top 20 DRGs by cost weighted separations represented 30.2 per cent of the total population cost-weighted separations (1,034,275 cost-weighted separations out of 3,430,288 total separations). These DRGs represented 26.5 per cent of the total population-adjusted separations, reflecting the combination of high volume and high cost DRGs.

Consistencies between Round 23 and Round 22

As shown in <u>Table 5</u>, the top three DRGs by cost-weighted separations were ranked in the same order in both Round 22 and Round 23. The top two DRGs were orthopaedic procedures with a high volume of separations, above average length of stay average and high cost prostheses (I04B: Knee Replacement, Minor Complexity and I33B: Hip Replacement for Non-Trauma, Minor Complexity). The third DRG, I09C (Spinal Fusion, Minor Complexity), is a high cost procedure that has observed year-on-year growth in volume.

Differences between Round 23 and Round 22

As can be seen in <u>Table 5</u>, two new DRGs entered the top 20 in Round 23 (F04C: Cardiac Valve Interventions W CPB Pump W/O Invasive Cardiac Invest, Minor Comp and O01B: Caesarean Delivery, Intermediate Complexity). This movement is a result of a 4.5 percent increase in cost weight in a context of an increased volume of population-adjusted separations.



Figure 3. Comparison of top 20 DRGs by highest cost-weighted separations, Round 23 compared to Round 22

Table 5. Top 20 DRGs ranked by highest cost weighted separations

Top 20 Round 22	Rank Round 23	DRG	DRG Description	Cost weight (a)	No. of weighted seps (b)	Cost weighted seps (c)= (a)x(b)	Number of days (d)	ALOS (days) (e)=(d)/(b)	Std error	% of total seps	% of CW seps	Cost weighted seps Round 22	Rank Round 22	No. of weighted seps Round 22	Cost weight Round 22
Yes	1	104B	Knee Replacement, Minor Complexity	3.93	35,066	137,809	165,428	4.7	0.01	1.0%	4.0%	135,851	1	33,710	4.03
Yes	2	133B	Hip Replacement for Non-Trauma, Minor Complexity	4.43	24,832	110,006	108,747	4.4	0.01	0.7%	3.2%	109,736	2	23,804	4.61
Yes	3	109C	Spinal Fusion, Minor Complexity	6.68	10,580	70,674	54,515	5.2	0.04	0.3%	2.1%	68,090	3	10,270	6.63
Yes	4	F24B	Interventional Coronary Procs, Not Adm for AMI, Minor Comp	2.35	24,643	57,911	38,582	1.6	0.01	0.7%	1.7%	52,273	6	22,629	2.31
Yes	5	K11B	Major Laparoscopic Bariatric Interventions, Minor Complexity	2.25	24,795	55,789	55,770	2.2	0.01	0.7%	1.6%	53,397	5	22,722	2.35
Yes	6	R63Z	Chemotherapy	0.20	275,016	55,003	275,029	1.0	0.00	8.0%	1.6%	49,336	9	259,662	0.19
Yes	7	I10B	Other Back and Neck Interventions, Minor Complexity	2.48	21,871	54,240	68,649	3.1	0.02	0.6%	1.6%	54,515	4	21,806	2.50
Yes	8	O01C	Caesarean Delivery, Minor Complexity	1.99	26,872	53,475	123,071	4.6	0.00	0.8%	1.6%	50,537	7	25,784	1.96
Yes	9	G48B	Colonoscopy, Minor Complexity	0.30	164,136	49,241	169,757	1.0	0.00	4.8%	1.4%	48,617	10	162,058	0.30
Yes	10	116Z	Other Shoulder Interventions	1.40	34,230	47,922	41,397	1.2	0.00	1.0%	1.4%	49,591	8	36,198	1.37
Yes	11	G46B	Complex Endoscopy, Minor Complexity	0.35	113,659	39,781	121,125	1.1	0.00	3.3%	1.2%	39,593	11	113,123	0.35
Yes	12	G10B	Hernia Interventions, Minor Complexity	0.97	38,937	37,769	48,377	1.2	0.00	1.1%	1.1%	38,577	12	39,364	0.98
Yes	13	J06B	Major Interventions for Breast Disorders, Minor Complexity	1.84	20,422	37,576	47,147	2.3	0.01	0.6%	1.1%	37,028	14	20,571	1.80
No	14	F04C	Cardiac Valve Interventions W CPB Pump W/O Invasive Cardiac Invest, Minor Comp	9.07	3,796	34,430	31,004	8.2	0.05	0.1%	1.0%	29,082	21	3,366	8.64
Yes	15	F42B	Circulatory Dsrds, Not Adm for AMI W Invasive Cardiac Inves Int, Minor Comp	0.79	43,538	34,395	60,482	1.4	0.00	1.3%	1.0%	35,432	16	41,200	0.86
Yes	16	F12B	Implantation and Replacement of Pacemaker, Total System, Minor Complexity	4.34	7,685	33,353	17,495	2.3	0.02	0.2%	1.0%	37,186	13	7,589	4.90
Yes	17	109B	Spinal Fusion, Intermediate Complexity	9.35	3,464	32,388	29,227	8.4	0.09	0.1%	0.9%	30,127	19	3,257	9.25
Yes	18	O60B	Vaginal Delivery, Intermediate Complexity	1.51	20,755	31,340	86,136	4.2	0.01	0.6%	0.9%	30,074	20	20,184	1.49
Yes	19	F01B	Implantation and Replacement of AICD, Total System, Minor Complexity	11.87	2,601	30,874	5,289	2.0	0.08	0.1%	0.9%	36,003	15	2,539	14.18
No	20	O01B	Caesarean Delivery, Intermediate Complexity	2.39	12,677	30,298	72,902	5.8	0.01	0.4%	0.9%	28,580	23	12,426	2.30
18	Sub-total,	top 20 high	est cost weighted separations	1.14	909,576	1,034,275	1,620,128	1.8		26.5%	30.2%				
in	All DRGs			1.00	3,430,288	3,430,288	7,939,576	2.3		100%	100%				
Top 20	Top 20 cos	st weighted	separations, % of all DRGs		26.5%	30.2%	20.4%								

Notes

(a) For cost weight (cost bucket specific) calculations please refer to Appendix D: Cost weight tables by AR-DRG Version 10.0 (b) Separations shown are strata weighted (e) ALOS means Average Length of Stay

Top 20 DRGs ranked by average length of stay (ALOS)

Key findings

<u>Table 6</u> and <u>Figure 4</u> show that the DRG with the highest ALOS (63.2 days) is P03A (Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Major Complexity). This DRG was masked in Round 22 as it had fewer than three hospitals in the sample data. It replaces A13A (Ventilation >= 336 hours, Major Complexity) which was ranked number one in Round 22 and currently ranked as the DRG with the highest cost weight. DRGs with a high cost weight are expected to have a high ALOS, and vice versa.

The majority of DRGs within the top 20 are not unexpected as they are either intermediate or major complexity DRGs with long lengths of stay. As shown in <u>Table 6</u>, these DRGs represent 0.1 per cent of the total population-adjusted separations (3,733 population-adjusted separations out of 3,430,288 total separations). They also represented 1.2 per cent (42,147 cost-weighted separations) of the total population cost-weighted separations.

Consistencies between Round 23 and Round 22

70.0 per cent (14) of this Round's top 20 DRGs were also in the top 20 in Round 22. Three of the top five were also previously top five in Round 22. The remaining two did not have a rank in Round 22 due to having fewer than three hospitals in those DRGs. This suggests that the list of DRGs that have high ALOS has remained relatively consistent.

Differences between Round 23 and Round 22

The differences between the top 20 rankings in Round 22 and Round 23 were largely due to the nature of the DRGs with a high ALOS which tend to have a very broad range and can vary from very short (including same-day separations) to very long (several months). These DRGs also tend to be low in volume, leading to more volatile results.

Six DRGs are new to the top 20 list in Round 22. Three of them did not have a ranking in Round 22 due to having fewer than three hospitals in those DRGs, including the top ranked P03A. The remaining three were just outside the top 20, with ranks 23, 25 and 27 respectively, suggesting that they are DRGs with consistently high average lengths of stay.



Figure 4. Comparison of top 20 DRGs by average length of stay, Round 23 compared to Round 22

Note: A missing Round 22 bar indicates that the DRG was masked due to having fewer than five separations or fewer than three hospitals reporting that DRG.

Table 6. Top 20 DRGs ranked by average length of stay (ALOS)

Top 20 Round 22	Rank Round 23	DRG	DRG Description	ALOS (days) (a)	Min LOS	Max LOS	Cost weight	No. of weighted seps (b)	Cost weighted seps	Std error	% of total seps	% of CW seps	ALOS Round 22	Rank Round 22	Number of days
No	1	P03A	Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Major Complexity	63.2	28	94	37.46	53	1,985	3.33	0.0%	0.1%			3,353
Yes	2	A13A	Ventilation >= 336 hours, Major Complexity	62.0	19	186	53.05	98	5,199	4.02	0.0%	0.2%	72.3	1	6,056
No	3	P61Z	Neonate, AdmWt <750g W/O Significant GI procedure	55.7	1	97	33.62	26	874	7.27	0.0%	0.0%			1,465
Yes	4	102A	Microvascular Tissue Transfers or Skin Grafts, Excluding Hand, Major Complexity	46.2	15	184	16.28	61	993	1.76	0.0%	0.0%	51.0	2	2,826
Yes	5	A14A	Ventilation >= 96 hours & < 336 hours, Major Complexity	45.1	5	229	30.74	211	6,486	1.74	0.0%	0.2%	46.4	3	9,505
Yes	6	A13B	Ventilation >= 336 hours, Minor Complexity	45.1	16	112	39.25	107	4,200	2.28	0.0%	0.1%	41.2	4	4,826
Yes	7	P64A	Neonate, AdmWt 1250-1499g W/O Significant Gl/Vent >= 96 hrs, Major Complexity	40.7	29	55	13.56	17	231	1.84	0.0%	0.0%	37.9	7	687
No	8	P03B	Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Minor Complexity	38.9	1	69	21.93	43	943	3.13	0.0%	0.0%			1,661
Yes	9	K01A	GIs for Diabetic Complications, Major Complexity	38.3	7	148	11.24	104	1,169	0.99	0.0%	0.0%	40.9	5	3,986
Yes	10	P04B	Neonate, AdmWt 1500-1999g W Significant Gl/Vent >= 96 hrs, Minor Complexity	35.9	7	59	19.40	31	601	2.86	0.0%	0.0%	30.7	12	1,107
No	11	U66A	Eating and Obsessive-Compulsive Disorders, Major Complexity	33.0	1	154	5.56	161	895	0.42	0.0%	0.0%	25.6	25	5,312
Yes	12	T01A	Infectious and Parasitic Diseases W GIs, Major Complexity	31.9	2	198	11.87	288	3,419	0.60	0.0%	0.1%	31.4	11	9,200
Yes	13	P65A	Neonate, AdmWt 1500-1999g W/O Significant GI/Vent >= 96 hrs, Extreme Comp	31.2	8	46	12.64	39	493	1.67	0.0%	0.0%	32.1	9	1,210
Yes	14	R03A	Lymphoma and Leukaemia W Other GIs, Major Complexity	31.2	1	315	9.65	146	1,409	0.75	0.0%	0.0%	31.8	10	4,547
No	15	R06A	Autologous Bone Marrow Transplant, Major Complexity	31.0	17	59	16.29	75	1,222	2.20	0.0%	0.0%	26.0	23	2,320
Yes	16	F11A	Amputation, Except Upper Limb and Toe, for Circulatory Disorders, Major Comp	30.8	4	85	12.51	51	638	1.51	0.0%	0.0%	40.8	6	1,574
Yes	17	R01A	Lymphoma and Leukaemia W Major GIs, Major Complexity	27.8	1	168	10.90	117	1,275	1.17	0.0%	0.0%	27.0	18	3,250
Yes	18	P64B	Neonate, AdmWt 1250-1499g W/O Significant GI/Vent >= 96 hrs, Minor Complexity	27.6	1	41	8.09	41	332	0.78	0.0%	0.0%	28.4	15	1,122
No	19	U61A	Schizophrenia Disorders, Major Complexity	27.6	1	203	5.80	378	2,192	0.50	0.0%	0.1%	24.9	27	10,417
Yes	20	U63A	Major Affective Disorders, Major Complexity	27.4	1	143	4.50	1,687	7,592	0.12	0.0%	0.2%	29.0	14	46,197
14	Sub-tota	l, top 20 a	verage length of stay	32.3			11.29	3,733	42,147		0.1%	1.2%			120,620
in	All DRGs	6		2.3			1.00	3,430,288	3,430,288		100%	100%			7,939,576
Top 20	Top 20 c	ost weight	ted separations, % of all DRGs					0.1%	1.2%						1.5%

Notes

(a) For cost weight (cost bucket specific) calculations please refer to Appendix D: Cost weight tables by AR-DRG Version 10.0 (b) Separations shown are strata weighted (e) ALOS means Average Length of Stay

Analysis of cost buckets

The private sector NHCDC has analysed and reported on the cost buckets below since Round 17 (2012-13):

- Operating Room/Specialist Procedure Suites
- Critical care
- Prostheses
- Miscellaneous (representing the remainder of the cost buckets see Appendix B: Private sector costing approaches for the list of cost buckets).

The same cost buckets are reported in Round 23. The key findings were:

- The percentage of overall cost in the OR and SPS cost bucket decreased by 0.5 per cent between Round 22 and Round 23.
- The percentage of overall cost in the miscellaneous cost bucket increased by 0.8 per cent between Rounds, comprising 48.3 per cent of overall costs in Round 23.
- The percentage of overall costs in the critical care cost bucket increased marginally by 0.3 per cent with a 0.7 per cent decrease observed in the prosthesis cost bucket compared to Round 22. These two cost buckets made up the smallest percentage of overall costs.
- The top 20 DRGs within each cost bucket were similar between Round 22 and Round 23. The OR and SPS cost bucket showed the most consistency between Rounds (85.0 per cent), whilst the miscellaneous cost bucket showed the least (65.0 per cent).

Differences between Round 23 and Round 22

<u>Table 7</u> and <u>Figure 5</u> illustrate the differences between the cost buckets in Round 22 and Round 23. As can be seen in <u>Figure 5</u>, there was minimal movement between the Rounds which is expected given that participants undertook their own costing in Round 22 and continued in Round 23.

Changes in cost buckets may be due to:

- Improvements in the accuracy of cost allocations through quality improvement of the participant's feeder data and/or allocation statistics.
- Changes in service weights between Rounds.
- Increases in same-day theatre related separations.

<u>Figure 5</u> sets out the breakdown of costs by cost-bucket group in Round 23 compared to Round 22. The proportion of costs in each cost-bucket remained largely consistent with less than one per cent movement observed in any cost-bucket in Round 23 compared to Round 22.



Figure 5. Breakdown of cost by cost-bucket group, Round 23 compared to Round 22

Table 7. Breakdown of cost by cost-bucket group, Round 23 compared to Round 22

Cost Bucket	Round 22 2017-18	Round 23 2018-19	Movement
Operating Rooms and Specialist Procedure Suites	28.5%	28.0%	-0.5%
Critical Care	5.3%	5.6%	0.3%
Prostheses	18.8%	18.1%	-0.7%
Miscellaneous	47.5%	48.3%	0.8%
Total	100.0%	100.0%	0.0%

Operating room/specialist procedure suites cost bucket

Key findings

<u>Table 8</u> shows that the highest operating room/specialist procedure suites cost weight DRG was A40Z (ECMO). This DRG was ranked number two in Round 22. It is noted that this DRG only had 14 population-adjusted separations in Round 23.

The top DRGs ranked by their operating room/specialist procedure suites cost weights presented in <u>Table 8</u> have a lower percentage of their total cost belonging to the operating room and specialist procedure suites buckets (20.7 per cent) than the average DRG (28.0 per cent). This indicates that they have a sufficiently high overall cost to be a top ranking DRG despite only a relatively smaller share of their cost coming from the operating room/specialist procedure suites bucket.

There were three DRGs which were lower in cost overall, but had a high share of their costs allocated to the operating room/specialist procedure suites cost buckets. These were:

- J01B (Microvas Tiss Transf for Skin, Subcut Tiss & Breast Dsrds, Minor Complexity) which had 47.9 per cent of its total cost belonging to the operating room/specialist procedure suites cost bucket
- J01A (Microvas Tiss Transf for Skin, Subcut Tiss & Breast Dsrds, Major Complexity) which had 32.0 per cent of its total cost belonging to the operating room/specialist procedure suites cost bucket
- A15C (Tracheostomy, Minor Complexity) which had 30.5 per cent of its total cost belonging to the operating room/specialist procedure suites cost bucket.

Consistencies between Round 23 and Round 22

85.0 per cent (17) of the top 20 DRGs by operating room/specialist procedure suites costs in Round 22 were present in the top 20 of Round 23. Two of the DRGs in the top three of Round 22, A40Z (ECMO) and I02A (Microvascular Tissue Transfers or Skin Grafts, Excluding Hand, Major Complexity), remained in the top three of Round 23.

Differences between Round 23 and Round 22

There were three new entrants to the top 20 in Round 23. These were:

- H01A (Pancreas, Liver and Shunt Interventions, Major Complexity)
- F11A (Amputation, Except Upper Limb and Toe, for Circulatory Disorders, Major Comp)
- F07B (Other Cardiothoracic/Vascular Interventions W CPB Pump, Intermediate Complexity)

These DRGs were all highly ranked in Round 22, with ranks of 21, 23 and 28 respectively.

As shown in <u>Table 8</u>, these DRGs represent 0.2 per cent of the total population-adjusted separations (6,311 population-adjusted separations out of 3,430,288 total separations), so there is a degree of volatility in the results. Despite that, the results remain relatively consistent between Round 22 and Round 23.

Table 8. Top 20 DRGs for operating room/specialist procedure suites cost bucket

Top 20	Rank	DRG	RG DRG Description		d No. of Overall A weighted cost (ALOS		% of AR-DRG total cost			OR and	Rank	
Round 22	Round 23			SPS cost weight	weighted seps (b)	cost weight (c)	(days) (d)	OR and SPS	Critical care	Prosth- esis	Miscell- aneous	SPS cost weight Round	Round 22
				(a)		()						22	
Yes	1	A40Z	ECMO	4.66	14	20.71	21.4	22.5%	37.6%	12.8%	27.1%	3.77	2
Yes	2	102A	Microvascular Tissue Transfers or Skin Grafts, Excluding Hand, Major Complexitv	3.69	61	16.28	46.2	22.7%	6.2%	9.0%	62.1%	3.90	1
Yes	3	A13A	Ventilation >= 336 hours, Major Complexity	3.66	98	53.05	62.0	6.9%	60.4%	3.6%	29.2%	3.02	6
Yes	4	A14A	Ventilation >= 96 hours & < 336 hours, Major Complexity	3.50	211	30.74	45.1	11.4%	47.8%	5.7%	35.1%	2.59	12
Yes	5	A15B	Tracheostomy, Intermediate Complexity	3.19	74	11.27	15.9	28.3%	29.5%	4.8%	37.5%	3.45	4
Yes	6	A15A	Tracheostomy, Major Complexity	3.16	17	15.48	25.6	20.4%	36.1%	7.3%	36.1%	3.13	5
Yes	7	J01A	Microvas Tiss Transf for Skin, Subcut Tiss & Breast Dsrds, Major Complexity	3.16	44	9.86	15.9	32.0%	15.7%	6.2%	46.1%	3.76	3
Yes	8	J01B	Microvas Tiss Transf for Skin, Subcut Tiss & Breast Dsrds, Minor Complexity	3.07	571	6.41	7.6	47.9%	5.3%	9.0%	37.8%	2.92	8
Yes	9	F03A	Cardiac Valve Int W CPB Pump W Invasive Cardiac Investigation, Major Complexity	3.06	275	16.27	21.5	18.8%	21.0%	23.4%	36.7%	3.01	7
Yes	10	F07A	Other Cardiothoracic/Vascular Interventions W CPB Pump, Major Complexity	2.88	44	14.78	20.3	19.5%	34.0%	11.7%	34.8%	2.44	17
Yes	11	F04A	Cardiac Valve Interventions W CPB Pump W/O Invasive Cardiac Invest, Maior Comp	2.80	320	16.54	21.3	17.0%	31.4%	18.5%	33.2%	2.81	9
Yes	12	F05A	Coronary Bypass W Invasive Cardiac Investigation, Major Complexity	2.74	289	12.20	18.3	22.4%	36.5%	7.2%	33.9%	2.58	13
No	13	H01A	Pancreas, Liver and Shunt Interventions, Major Complexity	2.64	306	12.70	24.8	20.8%	24.0%	7.9%	47.2%	2.24	21
No	14	F11A	Amputation, Except Upper Limb and Toe, for Circulatory Disorders, Major Comp	2.51	51	12.51	30.8	20.1%	14.0%	5.1%	60.9%	2.22	23
Yes	15	A15C	Tracheostomy, Minor Complexity	2.47	46	8.08	10.7	30.5%	29.1%	4.8%	35.5%	2.66	11
Yes	16	F05B	Coronary Bypass W Invasive Cardiac Investigation, Minor Complexity	2.46	1,296	8.81	12.1	27.9%	31.4%	6.1%	34.6%	2.43	18
Yes	17	F03B	Cardiac Valve Int W CPB Pump W Invasive Cardiac Investigation, Minor Complexity	2.43	755	10.97	12.5	22.1%	16.1%	32.2%	29.6%	2.51	16
Yes	18	106Z	Spinal Fusion for Deformity	2.42	1,343	14.09	9.3	17.2%	4.7%	58.0%	20.1%	2.55	14
Yes	19	F06A	Coronary Bypass W/O Invasive Cardiac Investigation, Major Complexity	2.40	400	11.02	15.9	21.8%	38.1%	7.6%	32.5%	2.25	20
No	20	F07B	Other Cardiothoracic/Vascular Interventions W CPB Pump, Intermediate Complexity	2.38	116	10.17	13.5	23.4%	25.6%	15.3%	35.7%	2.16	28
17	Sub-tota	l, top 20 high	est OR and SPS cost weight	2.65	6,331	12.82	15.7	20.7%	24.7%	23.0%	31.7%		
in	All DRGs	i		0.28	3,430,288	1.00	2.3	28.0%	5.6%	18.1%	48.3%		
Top 20	Top 20, %	% of all DRGs	3		0.2%								

Notes (a) For cost weight (cost bucket specific) calculations please refer to Appendix D: Cost weight tables by AR-DRG Version 10.0 (b) Separations shown are strata weighted (d) ALOS means Average Length of Stay

Critical care cost bucket

Key findings

<u>Table 9</u> demonstrates that the highest critical care cost weight DRG was A13A (Ventilation >=336hours, Major Complexity). This was ranked number one in Round 22 and is expected to be highly ranked given its complex and resource intensive nature.

As seen in <u>Table 9</u> the DRGs listed in the top 20 were expected to be within this ranking given that most of them include either mechanical ventilation or are neonatal DRGs.

The DRGs with the highest critical care costs were low-volume, high complexity DRGs.

Consistencies between Round 23 and Round 22

75.0 per cent (15) of the top 20 DRGs by critical care costs in Round 22 were also present in the top 20 of Round 23. All top four DRGs in Round 22 have remained in the top four in Round 23. These four DRGs are all closely related and reflect the highly resource-intensive nature of the DRGs.

Differences between Round 23 and Round 22

As set out in <u>Table 9</u>, there were five new DRGs entering the top 20 critical care cost weights in Round 23. These were:

- P03A (Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Major Complexity)
- P03B (Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Minor Complexity)
- P61Z (Neonate, AdmWt <750g W/O Significant GI procedure)
- P05B (Neonate, AdmWt 2000-2499g W Significant GI/Vent >= 96 hrs, Minor Complexity)
- F07A (Other Cardiothoracic/Vascular Interventions W CPB Pump, Major Complexity).

P03A, P03B and P61Z were masked in Round 22 for having fewer than three hospitals with that DRG. P05B and F07A were highly ranked in Round 22 (rank 29 and 26 respectively). All are low volume DRGs, and as such may be particularly prone to year-on-year variation.

Table 9. Top 20 DRGs for critical care cost bucket

Top 20	Rank	DRG DRG Description		Critical No. of Overall ALOS			ALOS		% of AR-DR	Critical	Rank		
Round 22	Round 23			care cost weight (a)	weighted seps (b)	cost weight (c)	(days) (d)	OR and SPS	Critical care	Prosth- esis	Miscell- aneous	care cost weight Round 22	Round 22
Yes	1	A13A	Ventilation >= 336 hours, Major Complexity	32.04	98	53.05	62.0	6.9%	60.4%	3.6%	29.2%	28.69	1
Yes	2	A13B	Ventilation >= 336 hours, Minor Complexity	26.23	107	39.25	45.1	4.4%	66.8%	2.4%	26.3%	20.04	2
Yes	3	A14A	Ventilation >= 96 hours & < 336 hours, Major Complexity	14.70	211	30.74	45.1	11.4%	47.8%	5.7%	35.1%	14.43	3
Yes	4	A14B	Ventilation >= 96 hours & < 336 hours, Intermediate Complexity	9.93	374	19.06	24.8	10.8%	52.1%	7.4%	29.7%	10.04	4
No	5	P03A	Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Major	9.72	53	37.46	63.2	0.1%	25.9%	0.1%	73.9%		
Yes	6	P64A	Complexity Neonate, AdmWt 1250-1499g W/O Significant GI/Vent >= 96 hrs, Major	9.35	17	13.56	40.7	0.0%	68.9%	0.0%	31.1%	5.82	10
Yes	7	P04B	Complexitv Neonate, AdmWt 1500-1999g W Significant GI/Vent >= 96 hrs, Minor Complexitv	8.74	31	19.40	35.9	0.0%	45.0%	0.0%	55.0%	6.29	9
Yes	8	A40Z	ECMO	7.79	14	20.71	21.4	22.5%	37.6%	12.8%	27.1%	6.83	8
Yes	9	A14C	Ventilation >= 96 hours & < 336 hours, Minor Complexity	7.64	188	15.60	20.9	8.6%	48.9%	7.9%	34.6%	7.90	7
Yes	10	E40A	Respiratory System Disorders W Ventilator Support, Major Complexity	7.12	52	12.09	21.1	2.5%	58.9%	0.8%	37.9%	8.83	6
Yes	11	P65A	Neonate, AdmWt 1500-1999g W/O Significant GI/Vent >= 96 hrs, Extreme	6.62	39	12.64	31.2	0.0%	52.4%	0.0%	47.6%	5.36	11
No	12	P03B	Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Minor Complexity	5.93	43	21.93	38.9	0.1%	27.0%	0.0%	72.9%		
No	13	P61Z	Neonate, AdmWt <750g W/O Significant GI procedure	5.72	26	33.62	55.7	0.0%	17.0%	0.0%	83.0%		
Yes	14	A15A	Tracheostomy, Major Complexity	5.59	17	15.48	25.6	20.4%	36.1%	7.3%	36.1%	9.13	5
No	15	P05B	Neonate, AdmWt 2000-2499g W Significant GI/Vent >= 96 hrs, Minor	5.36	31	10.36	22.4	0.0%	51.7%	0.0%	48.3%	3.22	29
Yes	16	F04A	Cardiac Valve Interventions W CPB Pump W/O Invasive Cardiac Invest, Major Comp	5.19	320	16.54	21.3	17.0%	31.4%	18.5%	33.2%	5.13	14
No	17	F07A	Other Cardiothoracic/Vascular Interventions W CPB Pump, Major Complexity	5.03	44	14.78	20.3	19.5%	34.0%	11.7%	34.8%	3.53	26
Yes	18	F40A	Circulatory Disorders W Ventilator Support, Major Complexity	4.78	27	10.33	17.0	3.4%	46.2%	0.7%	49.6%	4.28	18
Yes	19	F05A	Coronary Bypass W Invasive Cardiac Investigation, Major Complexity	4.45	289	12.20	18.3	22.4%	36.5%	7.2%	33.9%	4.55	16
Yes	20	F06A	Coronary Bypass W/O Invasive Cardiac Investigation, Major Complexity	4.19	400	11.02	15.9	21.8%	38.1%	7.6%	32.5%	4.25	19
15	Sub-tota	l, top 20 high	est critical care cost weight	9.03	2,380	19.62	27.5	11.2%	46.0%	6.7%	36.1%		
in	All DRGs	6		0.06	3,430,288	1.00	2.3	28.0%	5.6%	18.1%	48.3%		
Top 20	Top 20, %	% of all DRGs	3		0.1%								

Notes (a) For cost weight (cost bucket specific) calculations please refer to Appendix D: Cost weight tables by AR-DRG Version 10.0 (b) Separations shown are strata weighted (d) ALOS means Average Length of Stay

Prostheses cost bucket

Key findings

As seen in <u>Table 10</u>, the highest cost weight DRG in both Round 23 and Round 22 was F01A (Implantation and Replacement of AICD, Total System, Major Complexity), primarily due to the high cost of the defibrillator prostheses. The prostheses cost weight for this DRG decreased between Rounds, from 12.55 in Round 22 to 11.35 in Round 23, a change of 1.2 cost weights (or 9.6 per cent).

All DRGs in the top 20 by prostheses cost have a higher percentage of the total cost belonging to the prostheses bucket than the average for all DRGs. The average percentage of costs belonging to the prosthesis bucket for all DRGs is 18.1 per cent, compared to 53.1 per cent for the DRGs in the top 20 table, indicating that the majority of the cost of these DRGs comes from the cost of the prostheses. Significant variation in the range of prostheses cost was observed, ranging from 18.5 per cent for F04A (Cardiac Valve Procedures W CPB Pump W/O Invasive Cardiac Invest, Major Comp) to 85.5 per cent for F01B (Implantation and Replacement of AICD, Total System, Minor Complexity).

These high cost prostheses procedures only represented 1.3 per cent of the total populationadjusted separations (43,069 population-adjusted separations out of 3,430,288 total separations).

Consistencies between Round 23 and Round 22

80.0 per cent (16) of the top 20 DRGs were included in the Round 22 results, with the same DRGs appearing in the top 6 of both Rounds in the same order. This indicated that these DRGs are consistently high in prostheses costs.

Differences between Round 23 and Round 22

<u>Table 11</u> shows that four new DRGs entered the top 20 prostheses cost weights in Round 23. These were:

- F03B (Cardiac Valve Int W CPB Pump W Invasive Cardiac Investigation, Minor Complexity)
- F04C (Cardiac Valve Interventions W CPB Pump W/O Invasive Cardiac Invest, Minor Comp)
- F17A (Insertion and Replacement of Pacemaker Generator, Major Complexity)
- B02B (Cranial Interventions, Intermediate Complexity)

These four DRGs were all highly ranked in Round 22, ranging from rank 22 to 29, suggesting they are consistently DRGs that have high prostheses cost.

Table 10. Top 20 DRGs for prostheses cost bucket

Top 20	Rank	DRG	DRG Description	Prostheses	No. of	Overall	ALOS		% of AR-D	RG total co	st	Prostheses	Rank	
Round 22	22 23			cost weight (a)	weighted seps (b)	cost weight (c)	(days) (d)	OR and SPS	Critical care	Prosth- esis	Miscell- aneous	cost weight Round 22	Round 22	
Yes	1	F01A	Implantation and Replacement of AICD, Total System, Major Complexity	11.35	421	16.70	9.8	9.4%	9.7%	68.0%	12.9%	12.55	1	
Yes	2	F01B	Implantation and Replacement of AICD, Total System, Minor Complexity	10.14	2,601	11.87	2.0	8.9%	1.3%	85.5%	4.3%	11.83	2	
Yes	3	106Z	Spinal Fusion for Deformity	8.18	1,343	14.09	9.3	17.2%	4.7%	58.0%	20.1%	7.93	3	
Yes	4	109A	Spinal Fusion, Major Complexity	6.81	623	14.51	17.4	16.0%	10.1%	46.9%	27.0%	6.40	4	
Yes	5	D01Z	Cochlear Implant	6.20	1,030	7.78	1.4	13.3%	0.3%	79.6%	6.8%	6.19	5	
Yes	6	109B	Spinal Fusion, Intermediate Complexity	4.98	3,464	9.35	8.4	19.4%	5.0%	53.2%	22.4%	4.83	6	
Yes	7	I11Z	Limb Lengthening Interventions	4.83	142	7.25	3.7	17.3%	0.1%	66.6%	16.0%	3.55	10	
Yes	8	101A	Bilateral and Multiple Major Joint Interventions of Lower Limb, Major	3.90	483	11.04	17.6	18.6%	10.3%	35.4%	35.8%	4.01	7	
Yes	9	F03A	Cardiac Valve Int W CPB Pump W Invasive Cardiac Investigation, Major	3.81	275	16.27	21.5	18.8%	21.0%	23.4%	36.7%	3.11	15	
Yes	10	101B	Bilateral and Multiple Major Joint Interventions of Lower Limb, Minor	3.76	3,480	6.99	5.9	20.8%	2.9%	53.8%	22.6%	3.81	8	
Yes	11	109C	Spinal Fusion, Minor Complexity	3.74	10,580	6.68	5.2	20.5%	3.3%	56.0%	20.3%	3.69	9	
No	12	F03B	Cardiac Valve Int W CPB Pump W Invasive Cardiac Investigation, Minor Complexity	3.53	755	10.97	12.5	22.1%	16.1%	32.2%	29.6%	2.82	22	
Yes	13	132A	Revision of Knee Replacement, Major Complexity	3.37	585	9.65	18.0	15.9%	7.8%	34.9%	41.4%	3.04	17	
No	14	F04C	Cardiac Valve Interventions W CPB Pump W/O Invasive Cardiac Invest, Minor Comp	3.28	3,796	9.07	8.2	19.2%	20.2%	36.1%	24.5%	2.64	25	
Yes	15	F04B	Cardiac Valve Interventions W CPB Pump W/O Invasive Cardiac Invest,	3.15	1,565	11.19	11.7	19.1%	24.7%	28.1%	28.1%	2.89	19	
Yes	16	F04A	Cardiac Valve Interventions W CPB Pump W/O Invasive Cardiac Invest, Maior Comp	3.05	320	16.54	21.3	17.0%	31.4%	18.5%	33.2%	3.21	13	
No	17	F17A	Insertion and Replacement of Pacemaker Generator, Major Complexity	2.87	246	4.40	2.9	15.7%	4.3%	65.3%	14.7%	2.78	24	
Yes	18	F12A	Implantation and Replacement of Pacemaker, Total System, Major Complexity	2.87	2,073	6.21	7.9	16.1%	13.2%	46.1%	24.6%	3.39	11	
No	19	B02B	Cranial Interventions, Intermediate Complexity	2.86	1,603	8.04	10.3	19.9%	12.3%	35.5%	32.2%	2.58	29	
Yes	20	F12B	Implantation and Replacement of Pacemaker, Total System, Minor Complexity	2.85	7,685	4.34	2.3	17.3%	5.0%	65.6%	12.1%	3.27	12	
16	Sub-total	l, top 20 high	est prostheses cost weight	4.23	43,069	7.97	6.5	17.8%	8.4%	53.1%	20.7%			
in	All DRGs	;		0.18	3,430,288	1.00	2.3	28.0%	5.6%	18.1%	48.3%			
Top 20	Top 20, %	6 of all DRGs	3		1.3%									

Notes

(a) For cost weight (cost bucket specific) calculations please refer to Appendix D: Cost weight tables by AR-DRG Version 10.0
 (b) Separations shown are strata weighted
 (d) ALOS means Average Length of Stay

Miscellaneous cost bucket

Key findings

As in previous Rounds, the miscellaneous cost bucket was the most volatile in rankings of all the cost buckets. The volatility may be driven by the sample size, different hospitals participating and a different approach to costing being used by the participating hospitals.

<u>Table 11</u> shows that the highest cost weight DRG in this cost bucket was P61Z (Neonate, AdmWt <750g W/O Significant GI procedure).

The DRGs listed in the top 20 were to be expected given that they are high cost, low volume treatments and have appeared in the top 20 of previous tables throughout this report.

These DRGs represented only 0.1 per cent of the total population-adjusted separations (2,748 population-adjusted separations out of 3,430,288 total separations).

Consistencies between Round 23 and Round 22

65.0 per cent (13) of the top 20 DRGs were included in the Round 22 results, which is the lowest level of consistency between Rounds seen across the four cost buckets analysed in this report.

Differences between Round 23 and Round 22

The seven new DRGs in the top 20 in Round 23 were:

- P61Z (Neonate, AdmWt <750g W/O Significant GI procedure)
- P03A (Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Major Complexity)
- P03B (Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Minor Complexity)
- F21A (Other Circulatory System GIs, Major Complexity)
- P65A (Neonate, AdmWt 1500-1999g W/O Significant GI/Vent >= 96 hrs, Extreme Comp)
- G01A (Rectal Resection, Major Complexity)
- H01A (Pancreas, Liver and Shunt Interventions, Major Complexity).

P61Z, P03A and P03B were masked in Round 22 for having fewer than three hospitals with that DRG. The remaining four DRGs were all highly ranked in Round 22, ranging from rank 22 to 34.

Table 11. Top 20 DRGs for miscellaneous (Misc.) cost bucket

Top 20	Rank	DRG	DRG Description	Miscella	No. of	Overall	ALOS		% of AR-DR	G total cost	:	Miscellan	Rank
Round 22	22 23			neous cost weight	weighted seps (b)	cost weight (c)	(days) (d)	OR and SPS	Critical care	Prosth- esis	Miscell- aneous	eous cost weight	Round 22
				(a)								Round 22	
No	1	P61Z	Neonate, AdmWt <750g W/O Significant GI procedure	27.90	26	33.62	55.7	0.0%	17.0%	0.0%	83.0%		
No	2	P03A	Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Major Complexitv	27.67	53	37.46	63.2	0.1%	25.9%	0.1%	73.9%		
No	3	P03B	Neonate, AdmWt 1000-1499g W Significant GI/Vent >= 96 hrs, Minor Complexity	15.98	43	21.93	38.9	0.1%	27.0%	0.0%	72.9%		
Yes	4	A13A	Ventilation >= 336 hours, Major Complexity	15.47	98	53.05	62.0	6.9%	60.4%	3.6%	29.2%	12.38	1
Yes	5	R06A	Autologous Bone Marrow Transplant, Major Complexity		75	16.29	31.0	1.0%	20.0%	0.3%	78.6%	9.48	7
Yes	6	A14A	Ventilation >= 96 hours & < 336 hours, Major Complexity	10.79	211	30.74	45.1	11.4%	47.8%	5.7%	35.1%	11.09	3
Yes	7	P04B	Neonate, AdmWt 1500-1999g W Significant GI/Vent >= 96 hrs, Minor Complexity	10.66	31	19.40	35.9	0.0%	45.0%	0.0%	55.0%	6.31	17
Yes	8	A13B	Ventilation >= 336 hours, Minor Complexity	10.34	107	39.25	45.1	4.4%	66.8%	2.4%	26.3%	9.65	5
Yes	9	102A	Microvascular Tissue Transfers or Skin Grafts, Excluding Hand, Major Complexity	10.11	61	16.28	46.2	22.7%	6.2%	9.0%	62.1%	11.22	2
Yes	10	K01A	GIs for Diabetic Complications, Major Complexity	8.16	104	11.24	38.3	13.5%	10.0%	3.9%	72.6%	9.58	6
Yes	11	T01A	Infectious and Parasitic Diseases W GIs, Major Complexity	8.12	288	11.87	31.9	8.4%	21.0%	2.2%	68.4%	7.24	10
Yes	12	R03A	Lymphoma and Leukaemia W Other GIs, Major Complexity	7.83	146	9.65	31.2	6.4%	8.1%	4.3%	81.2%	7.89	9
Yes	13	F11A	Amputation, Except Upper Limb and Toe, for Circulatory Disorders, Major Comp	7.62	51	12.51	30.8	20.1%	14.0%	5.1%	60.9%	8.30	8
Yes	14	R01A	Lymphoma and Leukaemia W Major GIs, Major Complexity	7.54	117	10.90	27.8	10.5%	13.9%	6.5%	69.2%	7.21	11
Yes	15	R06B	Autologous Bone Marrow Transplant, Intermediate Complexity	7.21	102	7.41	20.9	2.0%	0.0%	0.7%	97.3%	6.83	14
Yes	16	R60A	Acute Leukaemia, Major Complexity	6.68	331	7.18	22.6	0.9%	5.7%	0.4%	93.1%	7.03	12
No	17	F21A	Other Circulatory System GIs, Major Complexity	6.08	95	7.84	27.2	8.3%	12.4%	1.7%	77.5%	5.23	28
No	18	P65A	Neonate, AdmWt 1500-1999g W/O Significant GI/Vent >= 96 hrs, Extreme Comp	6.02	39	12.64	31.2	0.0%	52.4%	0.0%	47.6%	5.42	23
No	19	G01A	Rectal Resection, Major Complexity		464	11.39	26.3	19.9%	22.3%	5.1%	52.7%	5.58	22
No	20	H01A	Pancreas, Liver and Shunt Interventions, Major Complexity	6.00	306	12.70	24.8	20.8%	24.0%	7.9%	47.2%	4.93	34
13	Sub-tota	l, top 20 high	nest miscellaneous cost weight	8.61	2,748	15.99	32.3	9.7%	32.6%	3.8%	53.9%		
in	All DRGs	6		0.48	3,430,288	1.00	2.3	28.0%	5.6%	18.1%	48.3%		
Top 20	Top 20, %	% of all DRGs	5		0.1%								

Notes (a) For cost weight (cost bucket specific) calculations please refer to Appendix D: Cost weight tables by AR-DRG Version 10.0 (b) Separations shown are strata weighted (d) ALOS means Average Length of Stay

Appendix A: Methodology

There are eight stages of the private sector NHCDC which are outlined below.

Stage 1: Stakeholder engagement

IHPA sought costed data directly from private hospitals for the private sector NHCDC. Participants were requested to provide a methodology that outlined their costing processes. All participants demonstrated that they have appropriate costing methodologies.

Stage 2: Data collection

At the commencement of the data collection phase, a Data Request Specification (DRS) for Round 23 of the private hospital NHCDC was prepared and distributed to all participants. Participants performed their own data collection.

Stage 3: Data preparation

Participants performed their own quality assurance checks on their data to verify that it was appropriate to use in their costing process.

Stage 4: Costing

The costing phase involved participants performing episode-level costing using commercial costing software.

Stage 5: Data submission

IHPA required that the participating hospital groups submit data in accordance with the DRS, along with a data quality checklist which set out the hospital costing process. The various costing methodologies used by private sector hospitals are outlined in Appendix B: Private sector costing approaches.

Participants were informed of the timeframes for the costed data collection and provided access to a secure data portal to upload and submit their data. The participating hospitals were provided a data transfer guide to help navigate through the process and to communicate processing timeframes.

Stage 6: Data validation and quality assurance

Participants were required to submit their costed data as csv files which passed data checks documented in the DRS. IHPA only accepted data with zero critical errors and which represented at least 90 per cent of the submitted hospital establishment's total in scope activity.

Where the costed data did not meet the DRS requirements, participants were asked to review the files and make the necessary changes before resubmitting the data.

Once the data was validated, quality assurance (QA) reports were produced to assist participants in confirming the accuracy and suitability of the data submission. These included checks in areas with potential to have a material impact on results, such as zero or negative cost buckets, extreme high or low cost separations, and DRG flipping¹². If the QA reports identified uncharacteristic traits, the participant was asked to investigate and either adjust the data or justify the deviation. Once all uncharacteristic traits were justified, the participant confirmed their data was final.

¹² DRG flipping occurs when the cost weight of a lower complexity DRG within the related adjacent DRG is higher than the one with more complexity.

On finalisation of the valid costed data submission, participants were required to submit a data quality statement. The data quality statements informed IHPA of the key matters that may impact each participant's data submission and provided assurance that the data was fit for purpose. IHPA then consolidated the data submission into a national costed data set.

Stage 7: Data analysis (including adjustments)

The national costed data set was reviewed to ensure that the separations were in scope. PHDB was used to develop a national estimate of both the number of in scope private hospitals and the number of in scope separations in 2018-19.

The data was also examined by hospital group and compared against PHDB, in order to ensure that no hospital group was over represented in the data set in a way that would potentially bias the analysis. An adjustment was made to the activity data in Round 23 to more closely align the cost profile of each hospital group in the NHCDC to that of the population activity. Population activity is defined as all in scope private hospital episodes that take place within the financial year.

An overall participation rate was calculated relative to population activity. Hospital groups were consulted to ensure they were satisfied with the level of participation in the Round. The separations in the submitted data were then scaled up using estimated weights to be reflective of the population activity.

The national costed data set was then reviewed to identify DRG flipping, whereby when the cost weight of a lower complexity DRG within the related adjacent DRG is higher than the one with more complexity. No adjustments were required for DRG flipping in Round 23.

Based on the adjustments described above the cost weight tables were produced, verified and compared to the Round 22 results.

Stage 8: Reporting

The national costed data set was then used to produce the Round 23 private hospital NHCDC report.

Appendix B: Private sector costing approaches

Costing methodologies

Hospital costing is the process of identifying the resources and inputs used during an episode and applying the costs of those inputs to the different types of clinical procedures and treatments provided to each patient in a hospital.

From Round 20, the participating hospitals have been required to undertake their own costing and during Round 20 and Round 21 they were asked to provide a summary of their costing methodology process as well as the process they used to submit the costing data. During Round 23, participating hospitals have been asked to indicate which of the costing methodologies (outlined below) they have used.

There are two main methodologies that are adopted by participants for hospital cost allocations: cost modelling or patient costing. In recent Rounds of the NHCDC, hospital groups have moved away from cost modelling to patient costing approaches, although some hospital groups continue to use cost modelling for specific cost buckets.

Patient costing: Patient costing (also known as bottom-up costing) uses activity feeder systems to provide actual resource consumption. For example, a prostheses system within a hospital will record what type of prostheses has been implanted into a patient and the cost of the implant. This data is used to allocate costs to patients from the Prostheses patient care area. Patient level costing yields results that are closer to the true cost of an encounter within a hospital, however due to the dependency on feeder systems, perfect patient level costing can be difficult to achieve.

Cost modelling: Cost modelling (also known as top down costing) takes the total admitted acute costs for patient areas (such as Wards) and allocates costs to encounters based on an assumed level of consumption using service weights. Service weights are the relative costs of a service for each type of patient care product. Service weights are applied to apportion costs to patient groups defined by their DRG (in the case of admitted acute care).

Data sources

The following categories of patient level data components are utilised during the costing process:

Financial data: This includes the general ledger cost centres and account codes, along with mapping of those cost centres to patient care areas and standardised line items. This data set excludes revenue cost centres and/or account codes.

Activity data: This includes the encounter level data (such as patient ID, encounter ID, date of birth etc.) and transfer information identifying the patient's pathway through the hospital via transfers between areas such as operating rooms and wards.

Feeder data: This includes data that identifies patient consumption of hospital products or services within a patient care area. For example, a prostheses feeder might list the prosthetic items received by a patient and the cost of each. This feeder data is used to allocate costs in the general ledger as it identifies how much of the prostheses products each encounter consume.

Where no feeder data is available, patient care area costs are allocated using service weights.

Cost bucket or cost components

The cost of a separation of admitted acute care is reported by allocating patient level costs to a set of pre-defined cost buckets/cost components. The cost buckets are listed as follows:

- 1. Ward Medical
- 7. Pharmacy
- 2. Ward Nursing
- 3. Non-clinical Salaries
- 4. Pathology
- 5. Imaging
- 6. Allied Health

- 8. Critical Care
- 9. Operating Rooms
- 10. Supplies
- 11. Specialist Procedure Suites
- 12. On-costs
- 13. Prostheses
- 14. Hotel
- 15. Depreciation
- 16. Patient Travel

Please note that Emergency Department cost bucket is excluded for the private sector NHCDC cost buckets as this collection is for admitted acute only. Patient Travel was newly added in Round 22 with the change to Australian Hospital Patient Costing Standards (AHPCS) version 4.0, but had no costs in it, and so was not included in the analysis. It is now included in Round 23 as hospital groups have submitted cost in this cost bucket.

Once each of the cost buckets is calculated for an individual patient, the patient's total cost of care is derived as the sum of the above components.

AR-DRG grouping

All 108 hospitals submitted data costed in AR-DRG version 10.0.

Cost weights

A cost weight for a selected AR-DRG is calculated as the average cost for that DRG, expressed as a weight relative to the overall average cost across all AR-DRGs. The national cost weight across all AR-DRGs is equal to 1.00, with higher cost AR-DRGs having a cost weight higher than 1.00. The weight is an indicator of the complexity of the care of the patient and thus the resourcing intensity required. This is often referred to as the casemix of a patient or hospital.

Costing standards

Costing was performed in compliance with the AHPCS v 4.0.

Appendix C: Standard error range for the Round 23 private sector NHCDC

Standard errors, reported against DRG cost weights included in Analysis of Top 20 DRGs and Appendix D: Cost weight tables by AR-DRG Version 10.0, give an indication of the reliability of cost weights. A large standard error indicates a high level of variation in the underlying sample data for that particular DRG, and therefore the cost weight presented is a less reliable estimate of the true underlying cost of a separation in that DRG.

Table 12 summarises the reliability of DRG cost weights by grouping the standard errors into a number of ranges. Numbers of DRGs and separations falling into standard error ranges provide insight into the global impact of estimation error on cost weights.

Standard error range	Number of DRGs	Separations	Percentage of DRGs (%)	Percentage of total separations (%)
0.000 - 0.039	276	3,097,985	36.2%	90.3%
0.040 - 0.099	168	234,955	22.0%	6.8%
0.100 - 0.149	94	50,384	12.3%	1.5%
0.150 - 0.199	33	11,058	4.3%	0.3%
0.200 - 0.399	88	25,054	11.5%	0.7%
0.400 +	104	10,748	13.6%	0.3%
Total*	763	3,430,184	100.0%	100.0%

Table 12. Number of DRGs by standard error range

* The standard error for some DRGs cannot be estimated due to low separation counts in the sample.

Total may not add to the sum of the rows due to rounding.

The results above show that 58.2 per cent (36.2 per cent + 22.0 per cent) of DRGs have cost weight estimates with a standard error range of less than 0.1. Approximately 97.1 per cent (90.3 per cent + 6.8 per cent) of separations are within the subset of DRGs that have a standard error of less than 0.1.

Appendix D: Cost weight tables by AR-DRG Version 10.0

Table 13. Round 23 (2018-19) national consolidation cost weight tables - V10.0

Please refer to Excel file for details

Appendix E: Cost weight tables by AR-DRG Version 9.0

Table 14. Round 23 (2018-19) national consolidation cost weight tables - V9.0

Please refer to Excel file for details

Appendix F: Cost weight tables by AR-DRG Version 8.0

Table 15. Round 23 (2018-19) national consolidation cost weight tables - V8.0

Please refer to Excel file for details

Appendix G: Cost weight tables by AR-DRG Version 7.0

Table 16. Round 23 (2018-19) national consolidation cost weight tables - V7.0

Please refer to Excel file for details

Appendix H: Cost weight tables by AR-DRG Version 6.0x

Table 17. Round 23 (2018-19) national consolidation cost weight tables - V6.0x

Please refer to Excel file for details

Appendix I: Cost bucket matrix

Figure 6. Cost bucket matrix

Cost Bucket Matrix			Line Items																				
		SW Nurs	SW AH	SW Other	SW Med	SW VMO	GS	MS	Corp	lmag	Path	Blood	Phrm N_PBS	Phrm PBS	Oncsts	Pros	Hotel	Dprc B	Dprc E	Lease	Cap	Excld	Pat Trav
	Allied	Allied				Alli	ied	Allied	llied		Dath		Dharr										
	Clinical	Ward Nurs	Allied	Non Cinci	Ward	l Med	Ward	l Spls		Imag			Phim										
entre Group	Imag	Imag				Ir	mag	Path		ath	Imag												
	Path			Path			Pa	ath		Imag)	i dui	Path										
	Crtcl		Crtcl				Crtcl			Crtcl													
	OR										OR				Oncsts	Pros	Hotel	Dprc			Excld	Pat Trav	
ost C	Phrm		Phrm					Phrm			Phrm												
o	ED		ED			ED SPS				ED													
	SPS		SPS							SPS													
	Other Serv	-	Non Cincl d Nurs Allied Non Cincl Ward Med					Non Cinci			Non Cli	ncl											
	Non- Patient	Ward Nurs						Vard Sp	ols	Imag	P	ath	Pł	ırm									

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