‘

Private Sector National Hospital Cost Data Collection

Cost Report

Round 17 (2012-2013)

Overnight Private Hospitals

17 December 2014

DRG Version: AR-DRG 6.0x

List of abbreviations

1. Abbreviation Description
2. AHPCS Australian Hospital Patient Costing Standards
3. AIHW Australian Institute of Health and Welfare
4. ALOS Average length of stay
5. AR-DRG Australian refined diagnosis related group
6. CM Cost modelled
7. DoHA Department of Health and Ageing
8. DRG Diagnosis related group
9. IHPA Independent Hospital Pricing Authority
10. LOS Length of stay
11. MDC Major diagnostic category
12. NHCDC National hospital cost data collection
13. NHDD National Health Data Dictionary
14. PC Patient costed
15. PHDB Private Hospital Data Bureau
16. PwC PricewaterhouseCoopers Australia
17. SPS Specialist procedure suites

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# Executive Summary

## Purpose of this report

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 or DRG). PricewaterhouseCoopers Australia (PwC) were engaged by the Independent Hospital Pricing Authority (IHPA) to provide the collection, processing and reporting of services in relation to Round 17 (12 months ending 30 June 2013) of the NHCDC for acute admitted care provided by overnight private hospitals.

This report documents the data, processes, methodology and results for acute admitted care[[1]](#footnote-2) provided by overnight private hospitals. The scope of the collection is in relation to those hospitals with at least 200 acute admitted separations in the 2012-13 financial year. Emergency department costs are excluded.

## Background to the Private Sector NHCDC

1. The first Australian national private sector cost study was conducted as part of the 1991-92 National Cost Study. 29 private sector facilities were involved in this initial study which evolved to become the National Hospital Cost Data Collection (NHCDC). Its objective is to provide Australian governments and the health care industry with a nationally consistent method of costing all types of hospital activity and publishing meaningful results which are used for benchmarking, funding and planning hospital based services.

Round 1 commenced in 1996-97 with voluntary participation for both the private and public sector. The private sector collection has grown steadily in representation from the initial 23 hospitals and 240,000 episodes in Round 1. Since the first round, there have been a number of years where no publication was released due to the Commonwealth deciding that the low participation rates in these rounds created an unacceptable risk of invalid or unreliable results or bypassed as agreed with the sector. The last two publications were for Round 16 (2011-12) and Round 13 (2008-09).

1. While there are a variety of additional data sets on private hospital sector activity, such as Hospital Casemix Protocol (HCP), Private Hospital Data Bureau (PHDB), National Admitted Patient Collection (APC), and Private Health Establishments Collection (PHE) – the Private Sector NHCDC is unique insofar as it reports on the costs of service by classified activity.

## Reporting format

Prior to Round 16, the DRG-level information showed average costs by DRG, split by direct and overhead, and for seventeen cost buckets. As part of the Round 16 publication, it was agreed with private hospital representatives that the DRG-level information would be restricted to the publication of total cost weights, and cost weights for a selection of grouped cost buckets (Operating Room & Specialist Procedure Suites, Critical Care, and other cost buckets grouped into a category called “Miscellaneous”). For Round 17, as discussed and agreed with private hospital representatives, the public report in Round 17 has been expanded to show the cost weights for prostheses separately.

## Key findings and features of the Round 17 Sample

This year’s sample consisted of 95 hospitals and represented 60% of the separations in the population. Across the sample the total acute admitted separations was 1.65 million, which is a decrease of 7% compared to Round 16 last year. The average length of stay of the sample increased from 2.51 days to 2.53 days for Round 17. Additionally, six of the top 20 DRGs with the highest cost weight were neonate DRGs. The ranking of the top 20 DRGs that are estimated to consume the most resources by private hospitals (defined as the top 20 cost-weighted separation DRGs) have remained consistent since Round 16.

In Round 17 there were changes in the rankings of DRGs with the highest cost weights. These changes are likely due to the use of feeder data by many hospitals this year. Prosthetics and critical care costs were in many cases allocated directly from feeder data in this Round instead of service weights in Round 16. Since the service weights are based on public sector results, and there are many differences between private and public sector cost results and practices, the use of the feeder data is more likely to lead to DRG cost weights that are more reflective of the private sector in the current round.

In 2012/13, the DRG with the highest cost weight of 50.39 was DRG P61Z “Neonate, AdmWt <750 g”. The average length of stay for this DRG was 84 days. The DRG with the highest number of separations (population-adjusted) of 207,697 was R63Z “Chemotherapy”. This DRG has a low cost-weight (0.21) and the average length of stay was 1.2 days. The DRG that accounted for the highest proportion of hospital costs was I04B “Knee Replacement W/O Catastrophic or Severe CC”. There were 24,615 separations (population-adjusted) with this DRG. The cost weight for this DRG is 5.5 and the average length of stay is 5.7 days. The table below illustrates the top five AR-DRGs in regards to cost weight, volume and level of consumption.

Table 1 AR-DRG Rankings

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Rank** | **DRG** | **Description** | **Cost Weight** | **Number of Seps** | **Cost Weighted Seps** | **ALOS** |
| **DRGs with the highest cost-weight** | | | | | | |
| 1 | P61Z | Neonate, AdmWt <750 g | 50.39 | 21 | 1,065 | 84.0 |
| 2 | A06A | Tracheostomy W Ventilation >95 hours W Catastrophic CC | 43.27 | 277 | 11,989 | 52.5 |
| 3 | P62Z | Neonate, AdmWt 750-999 g | 39.45 | 41 | 1,614 | 64.8 |
| 4 | F01A | Implantation or Replacement of AICD, Total System W Catastrophic CC | 28.76 | 300 | 8,621 | 7.6 |
| 5 | P06A | Neonate, AdmWt >2499 g W Significant OR Procedure W Multi Major Problems | 27.69 | 28 | 788 | 36.6 |
| **DRGs with the highest number of separations** | | | | | | |
| 1 | R63Z | Chemotherapy | 0.21 | 207,697 | 44,363 | 1.2 |
| 2 | G48C | Colonoscopy, Sameday | 0.21 | 110,786 | 23,341 | 1.1 |
| 3 | L61Z | Haemodialysis | 0.12 | 105,160 | 12,105 | 1.0 |
| 4 | Z40Z | Endoscopy W Diagnoses of Other Contacts W Health Services, Sameday | 0.19 | 78,499 | 14,603 | 1.1 |
| 5 | Z64B | Other Factors Influencing Health Status, Sameday | 0.20 | 72,613 | 14,235 | 1.2 |
| **DRGs with the highest number of cost-weighted separations\*** | | | | | | |
| 1 | I04B | Knee Replacement W/O Catastrophic or Severe CC | 5.50 | 24,615 | 135,355 | 5.7 |
| 2 | I03B | Hip Replacement W/O Catastrophic CC | 6.54 | 18,684 | 122,186 | 6.0 |
| 3 | I09B | Spinal Fusion W/O Catastrophic CC | 8.35 | 9,801 | 81,805 | 6.1 |
| 4 | F01B | Implantation or Replacement of AICD, Total System W/O Catastrophic CC | 23.46 | 2,268 | 53,217 | 2.2 |
| 5 | O01C | Caesarean Delivery W/O Catastrophic or Severe CC | 1.67 | 29,303 | 48,914 | 4.8 |

1. **Notes**
2. a) See the Glossary in Appendix A
3. b) “Number of seps” means the number of separations in 2012/13, population adjusted.
4. c) See the Glossary in Appendix A
5. d) ALOS means “Average length of stay”
6. \* Cost-weighted separations calculated as number of separations times the cost weight for the DRG shown. Reflects relative resource consumption.

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# Introduction

## Purpose of this report

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 or DRG). The AR-DRG code is a patient classification scheme that provides a means of relating the number and types of patients treated in a hospital to the resources required by the hospital[[2]](#footnote-3). An individual AR-DRG represents a class of patients with similar clinical conditions that require similar hospital services. This report documents the data, processes, methodology and results for acute admitted care[[3]](#footnote-4) provided by overnight private hospitals. The results of the collection are expressed as national cost weights by AR-DRG version 6.0x, and associated analytical tables.

## Format of the report

In 2012 a series of consultations were conducted to determine the views of the private sector around publication options for the NHCDC. These consultations were in the form of workshops and undertaken with key informants from the private hospital sector and peak bodies.

Consultation with the sector highlighted concern with commercial sensitivity of the published data, in particular the perceived negative impact it may have on negotiations with private health insurers. These concerns impacted on sector participation in the past and it was recommended that future publication be amended from Round 16 (2011-12) onwards.

Addressing these concerns, IHPA communicated to the private sector that the private NHCDC results would contain materially reduced detail. The Round 17 publication would only include DRG information, cost weights and other cost relativities. The report would no longer contain the seventeen cost components, direct and overhead cost breakdowns or the total average cost of the DRG.

Specifically, this report contains the Round 17 private sector national cost weights by AR-DRG 6.0x. A “cost weight” for a selected DRG is calculated as the average cost for that DRG, expressed as a weight relative to the overall average cost across all DRGs. The national cost weight across all DRGs is equal to 1.00, with higher cost DRGs having a cost weight higher than 1.00 (e.g. A06A: Tracheostomy W Ventilation >95 Hours W Catastrophic Cc with a cost weight of 43.1), and lower cost DRGs having a cost weight lower than 1.00 (e.g. J67B Minor Skin Disorders, Same day with a cost weight of 0.20).

As discussed and agreed with private hospital representatives, this report has been expanded to separate prosthesis costs into a separate bucket. DRG information will now be displayed in the following 5 cost weight buckets:

* Total cost per AR-DRG;
* The combined costs of Operating Room and Specialist Procedure Suites (“SPS”);
* Critical Care, which covers costs incurred in both intensive and coronary care units;
* Prostheses; and
* Miscellaneous, which combines the costs of Ward Medical, Ward Nursing, Non-clinical salaries, Pathology, Imaging, Allied Health, Pharmacy, Depreciation, On-costs, Hotel and Supplies.

## Scope of this collection

The scope of the collection is all acute-admitted separations with a discharge date in 2012/13, performed at private overnight hospitals with at least 200 acute admitted separations in 2012/13. This defines the population from which the sample is drawn. Emergency department costs are excluded.

Admitted episodes of care in hospitals are classified according to a data element called a “Care Type”, which is defined in the AIHW National Health Data Dictionary. [[4]](#footnote-5) The care types are acute care (admitted care), rehabilitation care (admitted care), palliative care, geriatric evaluation and management, psychogeriatric care, maintenance care, newborn care, other admitted patient care, organ procurement - posthumous (other care) and hospital boarder (other care)

Acute admitted care (including newborn care) consumes the vast majority of hospital resources. In 2012/13, 93**%** of separations and 86% of patient days relate to acute admitted care in the private sector, and 96% of separations and 82% of patient days in the public sector.[[5]](#footnote-6)

Separations are defined as in or out of scope based on three variables – the date of discharge for the separation, the care type of the separation, and a non-missing DRG.

* Care type:

The costs and separations associated with acute admitted care and newborn care with qualified care days are included in the calculation of the DRG-level cost weights. The costs associated with unqualified neonate separations[[6]](#footnote-7) have been included in the costs of care on an adjusted basis: the costs of care have been allocated back to the delivery DRGs of the birth-giving mothers and the counts of the care type newborn care, with zero qualified care days, have been removed. This approach is consistent with other forms of national reporting on acute admitted care by the Australian Institute of Health and Welfare, and it is consistent with the treatment of acute admitted and neonate care in the National Efficient Price determination[[7]](#footnote-8). A further discussion of the treatment of neonate separations and costs is provided in Section 3.6;

* Discharge date:

Separations discharged in the financial year 1 July 2012 to 30 June 2013 are included. There were a small number of costed separations reported by one of the self-costed hospitals, with a discharge date of 30 June 2012. These separations were removed from the calculation of the DRG cost weights;

* Non-missing DRG:

Thirteen separations from one of the self-costed hospitals had a missing DRG. These separations were removed prior to the calculation of cost weights.

The costs in-scope associated with patient care are specified in the Australian Hospital Patient Costing Standards v2.0 – 1 March 2011 (“AHPCS v2.0”).[[8]](#footnote-9) These costs are defined as “all expenditure incurred by or on behalf of the hospital related to day to day delivery of services”[[9]](#footnote-10). This includes an allocation of costs that could be incurred outside the hospital but relate to the delivery of services (e.g. shared service functions). The standards also discuss the types of costs that are excluded from patient costing, such as commercial business entities that might include activities such as operating a retail florist business, commercial parking, and child care centres. Hospitals were requested to submit costs that comply with the AHPCS v2.0 to support consistency in the input data used to calculate the cost weights.

Some of the self-costed hospitals allocated costs to the Emergency Department cost bucket. Emergency Department (“ED”) costs are out of scope for Round 17, so the ED costs for these hospitals were removed.

## History of the Private Sector NHCDC

1. Round 1 of the NHCDC was conducted in 1996-97 with 23 hospitals and 240,000 episodes being represented. Since then, the collection has grown steadily although no publication was released for round 8, 9, or Rounds 14 due to low participation rates. No collection was carried out for Round 10 or Round 15 (2010-11) as the sector elected to bypass that year and move directly to the following round. The table below shows the participation rate for Round 17 and the last five published rounds.

Table 2 Summary of private hospital participation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1. **Round #** | | | | | |
|  | 1. **R7** 2. **(03-04)** | 1. **R11** 2. **(06-07)** | 1. **R12** 2. **(06-07)** | 1. **R13** 2. **(08-09)** | 1. **R16** 2. **(11-12)** | 1. **R17** 2. **(12-13)** |
| 1. Number of hospitals | 1. 113 | 1. 82 | 1. 109 | 1. 110 | 1. 105 | 1. 95 |
| 1. Sample separations | 1. 1,240,388 | 1. 1,297,147 | 1. 1,607,678 | 1. 1,648,989 | 1. 1,775,059 | 1. 1,650,816 |
| 1. Percentage of population separations | 1. 65% | 1. 59% | 1. 72% | 1. 71% | 1. 66% | 1. 60% |
| 1. AR-DRG version | 1. 4.2 | 1. 4.2 | 1. 4.2 | 1. 5.1 | 1. 6.0x | 1. 6.0x |

## Public and private sector differences

1. This report does not seek to 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 Salaries, Pathology, Pharmacy, Imaging or Allied Health are not equally represented in Private Hospital general ledgers. For example, imaging and pathology 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. Many patients make private arrangements and they are charged on a fee-for-service basis. As a result, these costs are not captured in a hospital’s general ledger. Medical costs are also generally charged direct to patients by providers on a fee-for-service basis. Training of medical officers is generally not a feature of the private sector, and accordingly salaried medical officers are not represented within the cost files unless there is an intensive care unit or emergency department, where an around-the-clock medical practitioner is required.

## Confidentiality of data

1. Due to the commercial nature of the sector, all participating hospitals in Round 17 are assured that hospital level data will not be released in any form without the prior, written permission of the organisation from which the data originated. Where a cost weight reported for a DRG is based on less 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 less than three, the figures for this cost weight have been replaced by dashes (-----).

## Reliances and limitations

Data checks and reasonableness tests have been performed at three stages of the costing process: at data submission, during the costing process and on the aggregated data at the end of the process. However, this information has not been audited. The collection also required signoffs from hospitals during the costing process. A description of the checks is provided throughout this report.

The following areas can have a material impact on the reported costs and cost weights. The costing process relies on information provided by hospitals in the following areas:

Hospitals were requested to report costs that comply with the AHPCS v2.0. A review of the extent to which the costs reported by hospitals comply with the AHPCS v2.0 was out of scope of this project, and no tests of procedures have been performed to validate that the costs reported by hospitals comply with those standards.

The mapping of cost general ledger accounts to cost areas was performed by the participant hospitals.

Product fractions: this fraction is assigned to each cost centre by participant hospitals and denotes the proportion of costs related to each of the hospitals products. These fractions have a significant effect on the reported results as the fractions determine the cost base that is to be allocated to patients.

A small number of hospitals have participated by submitting costed data using their own costing systems. Many of these hospitals are experienced in hospital costing and the costed results are critically reviewed by their internal management. It has been assumed that the hospitals have performed the costing process in accordance with the AHPCS v2.0.

There are a small number of patients that were admitted prior to 1 July 2012, and discharged in 2012/13. These patients are called WiP patients as their episode crosses a financial year boundary. Adjustments for these WiP patients will not be made. That is, 2012/13 costs have been allocated to WiP patients without special adjustment for the period of the episode occurring in the prior financial year as the adjustments are expected to be immaterial yet require considerable effort to determine. For DRG cost-weight reporting purposes, only those patients who were discharged in the 2012/13 financial year have been included.

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# Methodology

## Identifying the minimum sample size

1. Prior to the commencement of the Round 16 collection, the minimum number of separations, number of hospitals and number of hospital groups required to participate was calculated based on data received from the Independent Hospital Pricing Authority (IHPA), the Department of Health, and Private Health Data Bureau dataset (PHDB).
2. The methodology that was adopted was described in Section 3 of the Round 16 report. A copy of that methodology is provided in Appendix B - Analysis performed to determine the minimum sample size. Based on this analysis:

* approximately 60% of all separations would be required in order to achieve a robust sample;[[10]](#footnote-11)
* the collection should include at least 90 hospitals and 10 hospital ‘groups’ (of 2 or more hospitals) to be representative.

These minimum targets were used as the condition on which the Round 17 collection would go ahead. Hospitals were requested whether they had an intention to participate. The indicative participation rate exceeded the 60% and 90 hospital threshold requirements for the collection to proceed.

## Costing methodologies

1. 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.
2. There are two main methodologies adopted for hospital cost allocations: cost modelled or patient costed:

### Patient costing (PC)

1. Patient costed sites are hospitals that provide a calculated cost of care at the patient level for each episode of care. This is done using actual patient level consumption data if practical. For example, Direct Pathology costs may be based on the actual number of pathology tests performed for each patient. If actual patient consumption is impractical to measure, allocation methods are required. The PC method of costing is often referred to as a ‘bottom up’ method of costing because cost aggregates are devised from individual items of patient consumption[[11]](#footnote-12).

### Cost modelling (CM)

1. Cost modelling makes minimal use of measures of resource consumption by individual patients, and aims to estimate mean costs for classes of patients (e.g. by DRG). Cost modelled sites are hospitals that ‘model’ their cost centres using service weights, which are pre-determined statistics and service consumption weights. Service weights are applied to apportion costs to patient groups defined by their DRG (in the case of acute admitted care). This is also known as ‘top down’ costing because the hospital starts with an aggregate cost and apportions it across cost centres based on assumptions about relative resource utilisation which are set at the DRG level.

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.

## Stages and Phases of the private sector NHCDC

The three stages of the collection were:

**Stage 1 - Data collection:** At the commencement of the data collection phase a data specification guide was prepared and distributed to all participants. Hospitals were informed of their data collection window and provided access to a secure website to upload and submit all relevant files such as the patient activity data items, general ledger data and mapping files. Participants electing to perform their own costing provided data at the separation level with the allocated cost.

**Stage 2 – Pre-costing checks and review:** All participating hospitals were issued a pre-costing reasonableness and validation report. This phase comprised detailed pre-costing reasonableness and quality review checks by the costing team and alerting the hospital of any unexpected or unusual results so they can be corrected prior to costing. If hospital results fell outside the expected range of values, the hospital had the option to correct the data items and resubmit their data until all the issues are resolved or agreed by the hospital.

**Stage 3 - Costing:** The costing phase comprised of performing episode level costing using specialised costing software (PPM2) for all participating hospitals. After costing was completed, detailed checks were performed on the costed datasets.

Once the review was complete, the costed results for each hospital were shared with the hospitals to review and provide feedback. If unexplained variances were present in the costed reports, the costing staff reviewed the data that was submitted and contacted the hospital for further investigation where required. The approach to resolve issues identified during the checks were agreed with hospitals.

Each of these three Stages is described in more detail in Appendix C - Further detail on the costing process.

## Costing approach for Round 17

1. For the Round 17 collection, focus was placed on improving the costing methodology by using feeder system data to allocate costs for the major patient care areas in private hospitals, such as prosthetics, operating rooms, critical care and ward nursing costs. Service weights were used to allocate costs to the smaller cost buckets, such as pharmacy, pathology (if any), and imaging (if any). In this round, the following categories of patient level data components have been utilised during the costing process:
2. Financial data: This includes the general ledger cost centres and accounts, along with mapping of those cost centres to patient care areas and standardised line items.
3. Activity data: This includes the encounter level data (such as patient ID, encounter ID, date of birth etc.) and transfer information identifying when patients have transferred between operating rooms and wards.
4. Allocation data: This includes data used to allocate overhead cost centres to patient care areas (such as allocation of Finance or IT department costs to wards and other patient care areas).
5. Feeder data: This includes data that identifies patient consumption of hospital products or services within a patient care area. For example, a prosthesis feeder might list the prosthetic items received by a patient and the cost of each. This feeder can be used to allocate costs in the general ledger as it identified how much of the prosthesis products each encounter consumed.

### Allocation of patient care area costs to encounters:

1. After overheads are allocated, patient care areas are allocated to encounters. As each patient care area provides a different product or service to patients (known as intermediate products) then the method used to allocate these costs changes. A list of allocation methods for the Round 17 collection is provided below:

* **Ward Nursing costs**– allocated using fractional bed days. The ‘fractional bed days’ value is derived from the patient transfer file which details the time and date in which patients were transferred in and out of wards.
* **Prostheses costs –** allocated using a prosthesis listing. This identifies the direct cost of the prosthesis used by a patient during their encounter. If no prosthetics listing is provided by the hospital, and no information was made available from PHDB or HCP, these costs are allocated using service weights.
* **Operating room –** allocated using theatre minutes, provided directly from a feeder system. If no operating room data is provided, and no information was made available from PHDB or HCP, these costs are allocated using service weights.
* **Critical care** – allocated using Intensive Care Unit or Critical Care minutes (ICU or CC minutes), provided directly from a feeder system or patient transfer records. If no critical care data is provided, and no information was made available from PHDB or HCP, these costs are allocated using service weights.
* **Other patient care areas:** service weights were adopted.

### Cost components (“cost buckets”)

1. In the NHCDC, the cost of an episode of acute admitted care is reported by allocating patient level costs to a set of pre-defined cost components or “cost buckets”. The cost buckets are listed as follows:

Ward Medical

Ward Nursing

Non-clinical Salaries

Pathology

Imaging

Allied Health

Pharmacy

Critical Care

Operating Rooms

Emergency Departments

Supplies

Specialist Procedure Suites

On-costs

Prostheses

Hotel

Depreciation

1. Once each of the cost buckets are calculated for an individual patient, the patient’s total cost of care is derived as the sum of the above components. The definition of cost buckets are included in the Australian Hospital Reference Manual previously released by Department of Health and Ageing (DoHA), and now by IHPA. A description of the cost buckets is provided in Appendix E - Costs included in the cost buckets.
2. DRG Version 6.0x
3. Round 17 data in this report is presented in DRG version 6.0x. However, some of the sites costed provided data in an earlier version of the DRG classification system. For these sites, the patient data was regrouped (reclassified) to DRG version 6.0x using the original diagnosis and procedure codes recorded by the hospital. This process ensures consistency across the reporting process, as there are some additions, removals and amendments to the DRG classification system between each version released.
4. Service weights

The AR-DRGv6.0x service weights were used in Round 17, which are derived from patient-costed sites in public sector hospitals.

1. Costing standards

Costing was performed in compliance with AHPCS v2.0.

## Changes in methodology compared to the Round 16 (2011/12) collection

A mix of patient-costing and cost modelling has been adopted for Round 17. The changes adopted in Round 17 represent less reliance on service weights compared to Round 16, and an increase in reliance on the measures that represent the resources consumed for each separation:

**Use of feeder data:** The cost modelling approach in Round 16 allocated costs in wards to separations on the basis of fractional bed days, while all other cost centres were allocated to encounters based on service weights. In Round 17, a number of patient level data source or feeder systems were introduced. It was recommended hospitals submit data for prosthesis, operating room and critical care feeder data to improve accuracy of the cost allocation. Hospitals were also able to select the PHDB or HCP submissions as alternative source systems of feeder data.

**Allocation of overheads to patient care areas:** While the majority of hospitals in Round 17 chose not to submit overhead allocation statistics, participating hospitals were able to provide allocation statistics for allocating costs of overhead cost centres to patient care areas. If no allocation statistics were provided, overheads were allocated to patient care areas using a ‘share of total expenses’ method.

**Product fraction:** While the scope of R17 Private Sector is limited to acute inpatients only, as many hospitals provide additional products to patients (such as outpatient or emergency department services) it is important to separate out costs relating to those products. As such, participants are asked to enter patient fractions (PFRACs) to indicate how much of each cost centre’s cost relates to each of the hospital products instead of the Inpatient Fraction (IFRAC) used in Round 16.

**General ledger data:** Negative expense accounts were accepted as part of the hospital general ledger submission.

**Changes in reporting:** As discussed and agreed with the private hospital representatives, the public report in Round 17 has been expanded to separate prosthesis costs into a separate bucket. DRG information will now be displayed in the following 5 cost weight buckets:

Total costs

Operating Room and Special Procedure Suites

Critical Care

Prosthesis; and

Miscellaneous (Including Ward Medical, Ward Nursing, Non-clinical salaries, Pathology, Imagining, Allied Health, Pharmacy, Depreciation, On-costs, Hotel and Supplies.)

## Analysis and reporting

1. The costing dataset was constructed from the combined hospital costed outputs. The following adjustments were applied to the dataset:

### Neonate adjustment

The costs for newborn infants with zero qualified days, in respect of care type 7 (newborn care), and neonate DRGs were allocated to the delivery DRGs of mothers at the same hospital. The definition of unqualified days is provided in the National Health Data Dictionary[[12]](#footnote-13): “unqualified days” relates to the first 9 days of a newborn’s life, unless the newborn is a second or subsequent live born infant or it requires intensive care. This adjustment has been performed consistent with the methodology adopted and applied to the public sector collection for Rounds 14 and 15 as inputs to the National Efficient Price weights.[[13]](#footnote-14)

### Population adjustment process

To ensure the results reflect the full range of Australia’s private hospitals, an estimation process is adopted to create representative national costing and activity figures from sample data. The estimation process produces ‘population’ data by estimating weights, on the basis of acute admitted separations, that are applied to the sample data so that the acute admitted separations equal the total population figures.

The methodology adopted for Round 17 is the same as that adopted in Round 16. As part of consultations with the private hospital sector for Round 16 it was agreed that a market-based approach would be adopted to weight the sample so that the weighted separations and costs of the larger participants did not exceed their actual markets shares based on separation counts.

In order to compile a study and strata file that is required for the population estimation process, the number of acute hospital separations for 2012-13 for each hospital was obtained from the PHDB. All private acute hospitals in Australia (excluding private day hospital facilities) with more than 200 acute admitted separations during the financial year are included in the population file. An issue with the PHDB file was that a number of hospitals missed a monthly PHDB submission. This means that the PHDB was not complete and unsuitable for estimating the population without some form of adjustment for the missing data. Our approach to adjust for missing data was as follows:

If a hospital participated in Round 17, then the number of separations was based on the number of costed acute admitted separations;

If a hospital did not participate in the NHCDC, then the number of separations was based on the PHDB. If one of these hospitals missed a monthly PHDB submission, then an annualised estimate at hospital level was taken based on analysis of the average number of separations from the other monthly submissions.

The number of hospitals in the population file for Round 17 is 244.

The population separations have increased by 1.8% from Round 16 to Round 17 (see Table 3 for more detail.)

# Summary of results

## Summary of Round 17 Sample to Population

The population of hospitals for the NHCDC is defined as all multi-day private hospitals with at least 200 acute admitted separations. In Round 17 (2012/13), there were 244 hospitals eligible to participate. Of these 244 hospitals, 95 participated in Round 17, which represents 39% of the population of in-scope hospitals. This compares to a hospital participation level of 42% for Round 16 (2011-12).

The population of separations is defined as all acute admitted separations performed at these hospitals, which was 2,753,670 in 2012/13. Further detail is provided in Section 2.3. The number of in-scope sample separations in Round 17 was 1,650,816 which represent 60% of the population of in-scope separations. This is a decrease of 6% in coverage compared to the Round 16 sample in which there was 66% coverage.

Over the years, participation levels have varied from 59% of separations (Round 11, 2006/07) to a peak of 72% of separations in Round 12 (2007/08).

Table 3 Comparison of separations and hospitals, Round 7 (2002/03) to Round 17 (2012/13)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **R7**  **02/03** | **R11**  **06/07** | **R12**  **07/08** | **R13**  **08/09** | **R16**  **11/12** | **R17**  **12/13** |
| Sample separations | | 1,240,388 | 1,297,147 | 1,607,678 | 1,648,989 | 1,775,059 | 1,650,816 |
| % increase | | 28% | 5% | 24% | 3% | 8% | -7% |
| Population separations | | 1,903,975 | 2,192,314 | 2,248,324 | 2,328,814 | 2,703,792 | 2,753,670 |
| % sample to population | | 65% | 59% | 72% | 71% | 66% | 60% |
| Sample hospitals | | 113 | 82 | 109 | 110 | 105 | 95 |
| % increase | | 36% | -27% | 33% | 1% | -5% | -10% |
| Population hospitals | | 221 | 229 | 229 | 226 | 248 | 244 |
| % sample to population | | 51% | 36% | 48% | 49% | 42% | 39% |

The average length of stay of the sample in Round 17 was 2.53 days, which is 0.5% higher than Round 16 (2011-12) when the average length of stay was 2.52.

Table 4 Average length of stay (ALOS) of Sample Separations, Round 7 (2002/03) to Round 17 (2012/13)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Round 7 2002/03** | **Round 11 2006/07** | **Round 12 2007/08** | **Round 13 2008/09** | **Round 16 2011/12** | **Round 17 2012/13** |
| Average length of stay | | 2.97 | 2.88 | 2.62 | 2.57 | 2.52 | 2.53 |
| % change | |  | -3.0% | -9.0% | -1.9% | -2.2% | +0.5% |

## Comparison of cost-bucket break-down to Round 16

In Round 16 the private hospital sector agreed to the publication of cost weights for total costs, operating rooms and specialist procedure suites (combined), critical care, and “other” (representing the remainder). In Round 17 the sector agreed to the publication of cost weights for total costs, operating rooms and specialist procedure suites (combined), critical care, prostheses, and “miscellaneous” (representing the remainder). “Miscellaneous” represents the combined costs for ward nursing, supplies, on-costs, non-clinical costs, depreciation, hotel, pharmacy, allied health, ward medical, pathology, and imaging. The definition of cost buckets are included in the Australian Hospital Reference Manual previously released by Department of Health and Ageing (DoHA), and now by IHPA.

In Round 17, operating rooms and specialist procedure suites (“ORSPS”) represented 20.5% of costs, which is a 1.8% increase compared to Round 16. Critical care in Round 17 is 5.8% compared to 5% in Round 16, and the remainder of costs is 73.7% in Round 17 compared to 76.3% in Round 16. These movements are likely to represent the changes and the improvements in the costing allocation process for Round 17 compared to Round 16: in Round 16, ORSPS and critical care costs were allocated using service weights. In Round 17, feeder systems for ORSPS and critical care for actual minutes were adopted if available, otherwise service weights were adopted.

In Round 17, the sector requested the prostheses cost weights to be published. Across all DRGs, prostheses costs represent a large proportion at 22.9% of total costs.

Table 5 Breakdown of cost by cost-bucket group, Round 17 versus Round 16

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Round 16** | **Round 17** |  |
| **Cost-bucket group** | **2011-12** | **2012-13** | **Change** |
| Operating rooms and Specialist Procedure Suites | 18.7% | 20.5% | 1.8% |
| Critical Care | 5.0% | 5.8% | 0.8% |
| Remainder | 76.3% | 73.7% | -2.6% |
| Round 17 breakdown of "Remainder" |  |  |  |
| Miscellaneous | n/a | 50.9% |  |
| Prostheses | n/a | 22.9% |  |
| **Total** | **100.0%** | **100.0%** | **0.0%** |

## DRG Analysis

### The twenty DRGs ranked by highest cost weights

1. DRGs with the highest cost weights are those DRGs that have the highest average cost per separation. The DRG with the highest cost weight in Round 17 is DRG P61Z “Neonate, Admission Weight less than 760grams”. This DRG has a long average length of stay of 84 days. The cost weight for this DRG is 50.39, which means that the average cost of this DRG is 50.39 times the average separation cost across all DRGs in the private sector. Six of the Top 20 cost weight DRGs relate to neonates with ranks 1, 3, 5, 6, 8 and 12. A further 4 DRGS are those that are classified in the Major Diagnostic Grouping as “High Cost Procedures”. These are ranked 2, 9, 13, and 17. A number of the remaining high-cost DRGs relate to cardiac procedures and spinal fusion procedures. 18 of the top 20 DRGs are surgical, and two are classified as medical, both of which are Neonate DRGs (P61Z, and P62Z).
2. Twelve of the Round 17 top 20 cost-weight DRGs were also in the Round 16 Top 20. There are two Round 17 DRGs (P61Z and P05Z) for which no data was received last year and consequently no cost weight produced. The changes in the Top 20 rankings between Round 16 and Round 17 are likely due to the use of feeder data by many hospitals this year. Prosthetics and critical care costs were in many cases allocated directly from feeder data in this Round instead of service weights in Round 16. Since the service weights are based on public sector results, and there are many differences between private and public sector cost results and practices, the use of the feeder data is more likely to lead to DRG cost weights that are more reflective of resource consumption in the private sector. Furthermore, the top DRGs have high standard errors. Movements are therefore expected year-to-year for high-cost / low-volume DRGs.
3. The DRG with the highest number of separations was F01B “Implantation or replacement of AICD (Automatic Implantable Cardioverter-Defibrillator), Total system without catastrophic complications and/or co-morbidities”. In 2012/13, this DRG had a cost weight of 23.46, and there was an estimated 2,268 separations.
4. The top 20 cost-weight DRGs account for 5.0% of total resources in 2012/13, but represent only 0.3% of total separations.

Table 6 DRGs with twenty highest cost weights, AR-DRG 6.0x, Round 17 (2012/13)

DRGs with twenty highest cost weights, AR-DRG 6.0x, Round 17 (2012/13)

1. **Notes:** DRGs with fewer than 5 separations or 3 participating hospitals are excluded from the above table.
2. (b) Separations shown are weighted using the methodology described in Section 3.5
3. (e) ALOS means average length of stay

Figure 1 below highlights the cost-weight (height) and volume (width) of these twenty DRGs and plots them relative to the cost weight and volume of all other DRGs, illustrating the significant difference in cost-weight for these DRGs. The in-set area focuses specifically on the top-20 DRGs, where the width of each bar represents the number of separations. (The main chart has been truncated on the vertical axis for clarity.) From this chart and Table 6, the top 20 cost-weight DRGs that had relatively higher separation volumes were F01B (Implantation Or Replacement Of Aicd, Total System W/O Catastrophic Cc), A06B (Trach W Vent >95 Hours W/O Cat Cc Or Trach/Vent >95 Hours W Cat Cc), I06Z (Spinal Fusion W Deformity) and I09A (Spinal Fusion W Catastrophic Cc).

The inset area of figure 1. Figure 1 Twenty highest cost-weight AR-DRGs – plot of cost weight versus number of separations



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### Twenty DRGs with the highest number of separations in 2012/13

The DRG with the highest number of population-weighted separations is R63Z Chemotherapy (207,697, 7.5% of the total of 2,753,670). Five of the top 20 by volume DRGs are from the Major Diagnostic Category “Diseases and disorders of the digestive system”). These are: G48C (Colonoscopy SameDay, ranked 2), G46C (Complex Gastroscopy SameDay, ranked 6), G47C (Other Gastroscopy SameDay, ranked 7), G10B (Hernia procedures w/ Cc, ranked 13) and G11Z (Anal And Stomal Procedures, ranked 17). The top 20 frequency DRGs account for 44% of separations in 2012/13, and are estimated to consume 17% of resources in the overnight private hospital sector (based on cost weighted separations). A high proportion of separations in these DRGs are same-day separations with low cost weights (and therefore lower average cost). The exception to this is O60B and O01C (vaginal and caesarean delivery DRGs without catastrophic or severe complications). 19 of these DRGs were ranked in the top 20 highest volume in Round 16. The ranks are very similar to the Round 16 ranks. This means that there has been little movement in the profile of DRGs in 2012/13 compared to 2011/12. The DRGs comprise a mixture of Medical DRGs, Surgical DRGs, and Other DRGs.

Table 7 Twenty highest volume (number of separations) DRGs, AR-DRG 6.0x, Round 17 (2012/13)

Twenty highest volume (number of separations) DRGs, AR-DRG 6.0x, Round 17 (2012/13)

**Notes:** DRGs with fewer than 5 separations or 3 participating hospitals are excluded from the above table. (b) Separations shown are weighted using the methodology described in Section 3.5 (e) ALOS means average length of stay

Figure 2 illustrates the relationship between separation counts for these top 20 (44% of total separations), versus resources consumed (17%, as measured by “cost weighted separations”).

Figure 2 Twenty DRGs with the highest number of separations in 2012/13:

Figure 2 illustrates the relationship between separation counts for these top 20 (44% of total separations), versus resources consumed (17%, as measured by “cost weighted separations”).

Figure 3 plots the top 20-volume DRGs against all other DRGs, comparing both volume and cost weight. The darker bars in the main chart show that these high-volume DRGs have relatively low cost weights compared to other DRGs. The in-set focuses only on the top-20 by volume, where the wider bars represent the higher volume DRGs such as Chemotherapy, and the height of each bar represents the cost-weight. Taller DRGs are those with the relatively higher cost weights (such as Caesarean Delivery w/o Catastrophic or Severe Cc).

Figure 3 Twenty highest volume DRGs – plot of cost weight versus number of separations (illustrates that most of them have relatively low cost-weights)



### The twenty DRGs with the highest volume x cost-weight (“cost-weighted separations”) in 2012/13

These DRGs are those that account for the highest proportion of total costs in the private overnight sector. Cost-weighted separations are calculated as the total number of separations multiplied by the cost weight. The percentage distribution of cost-weighted separations represents the percentage distribution of hospital costs incurred in delivering patient care.

The top 3 DRGs that account for the highest proportion of hospitals costs incurred in 2012/13 are:

* I04B “Knee Replacement W/O Catastrophic Or Severe Cc” representing 135,355 cost weighted separations (4.9%), cost weight of 5.50, and average length of stay of 5.7 days;
* I03B “Hip Replacement W/O Catastrophic Cc”, representing 122,186 cost weighted separations (4.4%), cost weight 6.54, and average length of stay 6.0 days; and
* I09B “Spinal Fusion W/O Catastrophic Cc”, representing 81,805 of cost weighted separations (3.0%), cost weight 8.35, and average length of stay 6.1 days.

Combined, these 3 DRGs represent 339,346 cost weighted separations which is 12.3% of total cost weighted separations of 2,753,670. Therefore, these 3 DRGs alone account for 12.3% of total hospital costs in 2012/13.

Nineteen of this year’s top-20 DRGs were ranked in the top 20 in Round 16, indicating that the DRGs accounting for a significant proportion of total hospital costs in 2012/13 also accounted for total hospital costs in 2011/12. Overall, this group of DRGs accounts for 33% of total hospital costs in 2012/13, 25% of total separations, and 21% of total patient days.

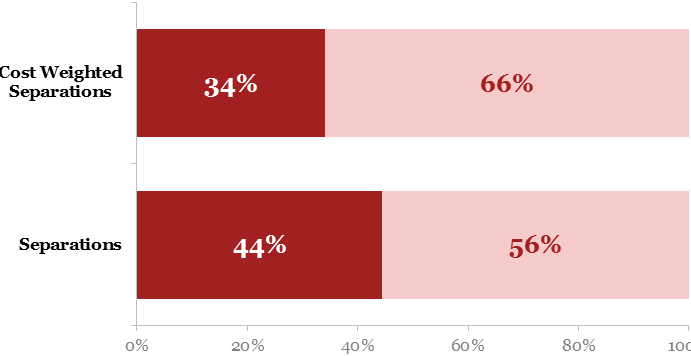
Table 8 DRGs with the twenty highest number of cost-weighted separations, AR-DRG 6.0x, Round 17 (2012/13)

DRGs with the twenty highest number of cost-weighted separations, AR-DRG 6.0x, Round 17 (2012/13)

**Notes:** DRGs with fewer than 5 separations or 3 participating hospitals are excluded from the above table. (b) Separations shown are weighted using the methodology described in Section 3.5 (e) ALOS means average length of stay

Figure 4 illustrates the relationship between separation counts for these top 20 (44% of total separations), versus resources consumed (25%, as measured by “cost weighted separations”).

Figure 4 Twenty DRGs with the highest number of cost-weighted separations



Top 20 DRGs by cost weighted separations

Remaining DRGs

1. The DRGs in this group consist of a mixture of high / medium / low cost weight DRGs, as highlighted by the spread of dark red areas in Figure 5 below. The height of each bar represents the cost weight, while the width of each bar represents the number of separations. Figure 5 below highlights the cost-weight and volume of these DRGs (dark red) and plots them relative to the cost weight and volume of all other DRGs.

Figure 5 Twenty DRGs with the highest number of cost-weighted separations – plot of cost weight versus number of separations



### DRG Analysis – Miscellaneous Group of Costs

1. Miscellaneous combines the costs of Ward Medical, Ward Nursing, Non-clinical salaries, Pathology, Imaging, Allied Health, Pharmacy, Depreciation, On-costs, Hotel and Supplies. The total cost weight across all DRGs is 0.51, which means that miscellaneous costs represent 51% of total costs in 2012/13.
2. The DRG with the highest miscellaneous cost weight is A06A “Tracheostomy W Ventilation >95 Hours W Catastrophic Cc”. The cost weight is 13.28, i.e. these costs are 13.28 times the average cost across all separations and cost buckets. This DRG has a high proportion of costs (61%) incurred in the critical care cost bucket.
3. The next 2 DRGs are A07z (Allogenic bone marrow transplant, miscellaneous cost weight 11.58, representing 96% of total cost) and B60A (Acute paraplegia/quadriplegia, miscellaneous cost weight 10.07, representing 90% of total cost).
4. DRGs with high miscellaneous cost weights are characterised by significantly longer length of stay than the overall average of 2.5 days, and significantly higher proportion of critical care costs (46% of total cost) compared to all DRGs (critical care being 6% of total cost). Eleven of the DRGs are surgical DRGs, with the remaining nine being medical DRGs.
5. Twelve of the top-20 miscellaneous cost-weight DRGs were ranked in the top 20 for Round 16. There has been some movement in the ranking of miscellaneous cost weights. These movements reflect the refinements to the costing allocation process for Round 17, which better reflect the costs for the private sector, compared to Round 16 which placed greater reliance on public sector service weights.

Table 9 Twenty DRGs with the highest cost weight for Miscellaneous costs, AR-DRG 6.0x, Round 17 (2012/13)

Twenty DRGs with the highest cost weight for Miscellaneous costs, AR-DRG 6.0x, Round 17 (2012/13)

1. **Notes :** (a) For cost weight (cost bucket specific) calculations please refer to the "Appendix A: Glossary of NHCDC terms". DRGs with fewer than 5 separations or 3 participating hospitals are excluded from the above table. (b) Separations shown are weighted using the methodology described in Section 3.5 (c) Cost weight for total costs (e) ALOS means average length of stay (f) Derived from the cost weights shown in Appendix F, divided by the overall cost weight shown in (c).

### DRG Analysis – Operating room and Specialist Procedure Suite (“ORSPS”) cost weights

1. Across all DRGs, the ORSPS cost weight is 0.21, which means that ORSPS costs on average represent 21% of total costs incurred. The 20 DRGs with the highest ORSPS cost weights are all surgical DRGs. DRG J01A (“Microvas Tiss Transf For Skin, Subcutaneous Tiss & Breast Disd W Cat/Sev Cc”) has an ORSPS cost weight of 2.52, which means that the average ORSPS cost for this DRG is 2.52 times the overall average cost of all separations. This DRG has an average length of stay of 11.7 days. J01B (“Microvas Tiss Transf For Skin, Subcutaneous Tiss & Breast Disd W/O Cat/Sev Cc”) is ranked 2 and I06Z (“Spinal Fusion W Deformity”) is ranked 3. These DRGs are characterised by a combined average length of stay of 13.5 days which is significantly longer than the overall average length of stay of 2.5 days. Overall, the proportion of costs incurred in the critical care cost bucket for this group of DRGs is 23%, which is higher than 6% for all DRGs.

Table 10 Twenty DRGs with the highest cost weight for Operating rooms and Specialist Procedure Suites, AR-DRG 6.0x, Round 17 (2012/13)

Twenty DRGs with the highest cost weight for Operating rooms and Specialist Procedure Suites, AR-DRG 6.0x, Round 17 (2012/13)

**Notes:** (a) For cost weight (cost bucket specific) calculations please refer to the "Appendix A: Glossary of NHCDC terms". DRGs with fewer than 5 separations or 3 participating hospitals are excluded from the above table. (b) Separations shown are weighted using the methodology described in Section 3.5 (c) Cost weight for total costs (e) ALOS means average length of stay (f) Derived from the cost weights shown in Appendix F, divided by the overall cost weight shown in (c).

### DRG Analysis – Critical Care cost weight

1. Ten of the top 20 DRGs with the highest critical care cost weight are neonate DRGs.
2. The DRG with the highest critical care cost weight of 40.39 is for P61Z “Neonate, Admwt <750 G”. The overall cost weight for this DRG is 50.39 therefore the critical care cost bucket is a significant proportion (80%, equal to 40.39 / 50.39) of the total costs incurred for this DRG. This DRG had an average length of stay of 84 days.
3. For all DRGs, critical care costs represent 6% of total costs. However, for this group of high critical care cost-weight DRGs, critical care costs represent a significant proportion (56% for the top-20) of total costs incurred. These DRGs have a combined average length of stay of 28.2 days, significantly higher than the 2.5 average across all DRGs.
4. There has been some movement in the rankings since Round 16, with only 10 of the 20 shown below ranked in the top 20 last year. These changes are likely due to the use of feeder data by many hospitals this year for critical care costs, compared to the use of service weights last year. Since feeder data has been used for critical care costs by many hospitals, the current round is likely to be more reflective of relative resource usage for the private sector than Round 16.

Table 11 Twenty DRGs with the highest cost weight for Critical Care costs, AR-DRG 6.0x, Round 17 (2012/13)

Twenty DRGs with the highest cost weight for Critical Care costs, AR-DRG 6.0x, Round 17 (2012/13)

**Notes:** (a) For cost weight (cost bucket specific) calculations please refer to the "Appendix A: Glossary of NHCDC terms". DRGs with fewer than 5 separations or 3 participating hospitals are excluded from the above table. (b) Separations shown are weighted using the methodology described in Section 3.5 (c) Cost weight for total costs (e) ALOS means average length of stay (f) Derived from the cost weights shown in Appendix F, divided by the overall cost weight shown in (c).

### DRG Analysis – Prosthesis cost weight

1. The prostheses cost weight for all DRGs is 0.23, i.e. prostheses costs represent 23% of total costs, making it one of the larger cost buckets for the overnight private hospital sector.
2. All of the Top-20 prostheses cost-weight DRGs are surgical DRGs. The 3 highest-ranked DRGs are:

* F01A “Implantation or Replacement of AICD (Automatic Implantable Cardioverter-Defibrillator), Total System W Catastrophic Complications and/or co-morbidities”, the highest prostheses cost-weight rank. The prostheses cost for this DRG is 21.69 times the overall average cost per separation for all DRGs, while the overall cost weight for this DRG is 28.76. Therefore, the prostheses cost bucket is a significant proportion (75% = 21.69 / 28.76) of the costs for this DRG. The average length of stay is 7.6 days;
* F01B “Implantation or Replacement of AICD, Total System W/O Catastrophic CC (catastrophic complications and/or co-morbidities)”, the 2nd highest-ranked DRG for the prostheses cost weight at 19.61. For this DRG, prostheses costs represent 84% of the total cost. The average length of stay (“ALOS”) is 2.2 days which is shorter than the ALOS for all DRGs and is notably shorter than the ALOS of 7.6 days for DRG F01A;
* I06Z “Spinal Fusion w Deformity”, the 3rd highest-ranked DRG for the prostheses cost weight at 9.57. For this DRG, prostheses costs represent 61% of the total cost. The ALOS is 10.0 days.

1. For the 20 highest-ranked prostheses cost weight DRGs, prostheses costs represent a significant proportion of total costs (68%). There has been some movement in the rankings since Round 16, with 15 of this year’s top 20 ranked in the top 20 last year. These changes are likely due to the use of feeder data by many hospitals this year for prosthetics costs, compared to the use of service weights last year. Since feeder data has been used for prostheses costs by many hospitals, the current round is likely to be more reflective of relative resource usage for the private sector than Round 16.

Table 12 Twenty DRGs with the highest cost weight for Prostheses costs, AR-DRG 6.0x, Round 17 (2012/13)

Twenty DRGs with the highest cost weight for Prostheses costs, AR-DRG 6.0x, Round 17 (2012/13)

**Notes:** (a) For cost weight (cost bucket specific) calculations please refer to the "Appendix A: Glossary of NHCDC terms" (b) Separations shown are strata weighted. (c) DRG cost weight across all cost buckets. (e) ALOS means average length of stay

### Conclusions

In summary:

* Six of the 20 highest-ranked DRGs by overall cost weight are neonate DRGs. The highest cost-weight DRG is P61Z “Neonate, Admission Weight less than 760grams”. DRGs with the 20 highest cost-weights represent 5.0% of total costs but only 0.3% of separations;
* Five of the top 20 by volume DRGs are from the Major Diagnostic Category “Diseases and disorders of the digestive system”). The DRG with the highest volume in 2012/13 is R63Z Chemotherapy. DRGs with the 20 highest-ranked volume represent 44% of all separations in 2012/13, and 23% of total costs. A high proportion of these separations are same-day separations;
* The 3 highest-ranked DRGs by cost-weighted separations represent 12.3% of total hospital costs in 2012/13: I04B “Knee Replacement W/O Catastrophic or Severe CC”, I03B “Hip Replacement W/O Catastrophic CC”, and I09B “Spinal Fusion W/O Catastrophic CC”. Nineteen of these DRGs were ranked in the top 20 in Round 16, indicating that the DRGs accounting for a significant proportion of total hospital costs in 2012/13 also accounted for total hospital costs in 2011/12;

The DRG profile for Round 17 is relatively consistent with the Round 16 DRG profile, as 19 of the 20 highest-ranked DRGs by volume were also ranked in the top 20 in Round 16. However, when DRGs are ranked by total costs or by cost buckets, there has been more movement between rounds. Since feeder data has been used for by many hospitals this year, the current round is likely to be more reflective of relative resource usage for the private sector than Round 16.

#### Glossary of NHCDC terms

1. **Actual data:** The hospital data received by the NHCDC that is used as the sample data to produce national average costs. Actual data (or sample data) is used in the estimation process as defined by the NHCDC (see Estimated).
2. Note: As actual data is a sample only; caution should be taken when comparing this data as it is not necessarily representative of the population.
3. **Acute inpatient:** An admitted patient whose illness is acute, and has one or more problems which require short–term health care in an admitted patient setting.
4. In the Casemix context, episodes of care which can appropriately be classified by AR–DRG, and which do not meet the definitions for rehabilitation, palliation, or non–acute admitted patient.
5. **Admitted patient**: A patient who has been formally admitted to a hospital.
6. Further, admitted patients are categorised by care type into acute, rehabilitation, palliation, and non-acute.
7. **Adjacent DRGs**: Adjacent DRGs consist of one or more DRGs generally defined by the same diagnosis or procedure code list. DRGs within adjacent DRGs have differing levels of resource consumption and are partitioned on the basis of several factors, including complicating diagnoses/procedures, age and/or the patient clinical complexity level (PCCL).
8. The fourth character of a DRG code represents the severity of a DRG. A severity code of "A” indicates the highest consumption of resources; a severity code of "B" indicates the next highest consumption of resources; code "C" indicates the next highest consumption of resources; and severity code "D" indicates the least consumption of resources within a DRG.
9. A severity code of "Z" indicates that there is no split for the DRG. Therefore the adjacent DRG data for DRG with a severity code of "Z" has no change to the cost by volume.
10. **ALOS**: See average length of stay.
11. **AR–DRG**: See Australian Refined Diagnosis Related Groups.
12. **Australian Refined Diagnosis Related Groups (AR–DRGs):** A variant of the DRG system designed specifically for use in Australia. The national standard. The current version in use is Version 6.0x, which recognises 702 categories of DRG.
13. **Average cost**: In the costing context, the total cost of production divided by the number of products in a period. Also known as full average cost.
14. **Average Length of Stay (ALOS):** The ALOS is calculated by dividing the number of days by the number of separations for each DRG. The calculation of ALOS includes all days and separations. That is, no trimming is applied when calculating this statistic. In other national reporting, length of stay is adjusted to remove leave days, however this adjustment was not applied in this report because most hospitals did not supply leave days.
15. **Care type**: The overall nature of a clinical service provided to an admitted patient during an episode of admitted care (e.g. acute, rehabilitation, palliative, psychogeriatric, maintenance, newborn and other admitted patient care).
16. **Cost buckets:** Also known as ‘cost components’, cost buckets determine the detail of the reporting framework for NHCDC products. For a complete list of the cost buckets and what they include and exclude, see the Definitions chapter in the Hospital Reference Manual.
17. **Cost centre (CC):** An accounting entity where all costs associated with a particular type of activity can be recorded. Sometimes abbreviated to CC.
18. **Cost modelling (CM):** A popular for a type of product costing which makes minimal use of measures of resource consumption by individual patients, and aims only to estimate mean costs for classes of patients. CM sites are hospitals that ‘model’ their cost centres using pre-determined statistics and ‘weights’ in order to apportion their costs across product groups and types. This is also known as ‘top down’ costing because you start with an aggregate cost and apportion it across cost centres.
19. **Cost weight (total)**: The average cost across all AR–DRGs for the total cost is chosen as the reference value, and given a weight of 1. A cost weight of an AR-DRG is calculated as the average total cost for that AR-DRG divided by the reference value. The formula to calculate the cost weight is:
20. *Example for AR-DRG = "XXX"*
    1. Average Cost across All DRGs = $80   
       Total Average Cost for DRG:XXX = $100  
       "XXX" Total Cost Weight = $100/$80 = 1.25
21. **Cost weight (specific cost bucket)**: A cost weight for an AR-DRG for a specific cost bucket is calculated as the average cost for that AR-DRG and relevant cost bucket, divided by the reference value. The reference value equals the total average cost across all AR-DRGs, as per that used in the Cost Weight (Total Costs).The formula to calculate the cost weight is:

Where:

*c* is the specific cost bucket or combination of cost buckets

1. *Example for AR-DRG = "XXX*

Average Cost across all DRGs = $80   
Total Average Cost for DRG:XXX = $100  
Critical Care Average Cost for DRG: XXX = $40  
"XXX" Critical Care Cost Weight = $40/$80 = 0.5

1. **Cost-weighted separations:** This is calculated as the DRG cost weight (total costs), multiplied by the number of separations for a given DRG, and aggregated across a set of DRGs. It is an indicator of the relative resource consumption of acute care hospitals. The formula to calculate cost-weighted separations is:

Where:

*ni* is the number of separations in the *ith* DRG

*k* is the number of DRGs (in AR-DRGv6.0x it is 702)

*CWi* is the cost weight (total cost) for the *ith* DRG

1. **Critical Care Unit:** A patient care area in a hospital which is staffed and equipped to handle patients at particular risk due to high severity of illness. Includes intensive care units, neonatal intensive care units and coronary care units.
2. **Direct cost centre**: In the product costing context, cost centres are generally classified as either overhead or direct product. The latter type is also known as ‘Direct Cost Centres’.
3. Direct products are those able to be delivered directly to the customer. The main types of direct products are patient episodes of care. Direct product cost centres therefore include all those which provide their services to patients rather than to other cost centres (as is the case for overhead cost centres). Examples are nursing, emergency department, and imaging.
4. **Estimated data:** The total costs are estimated by, increasing within each stratum, the sample of hospitals data to the estimated volumes for the total population. The aim is to minimise bias in the collection caused by the sample of the participating hospitals, by weighting the sample results according to the known characteristics of the population.
5. **Grouper**: An analytical tool (usually a computer program) which supports the assignment of patient care episodes to Casemix classes.
6. **ICU**: Intensive Care Unit. See Critical Care Unit.
7. **Indirect costs:** Used in several ways to designate costs which are not easily able to be related to specific products. In the standard product costing method, costs which are passed to cost centres from overhead cost centres.
8. **Inpatient:** See admitted patient.
9. **Intensive Care Unit (ICU):** See Critical Care Unit.
10. **Length of stay (LOS):** The number of days an inpatient spends in hospital. It is calculated in different ways for different purposes. The most common involves subtracting the admission date from the discharge date. In other national reporting, length of stay is adjusted to remove leave days, however this adjustment was not applied in this report because most hospitals did not supply leave days.
11. **Overhead costs:** In the product costing context, cost centres are generally classified as either overhead or direct products (patient care). An overhead cost centre provides its services to other cost centres rather than directly to patients (as is the case for patient care cost centres). Examples are building costs and linen services.
12. **Patient costing (PC):** A generic term for a type of product costing which makes use of
13. measures of resource consumption by individual patients, and aims to estimate costs for each individual patient care episode. PC sites are hospitals that are able to calculate the cost of care at the patient level. Generally, this is done using actual patient level consumption data.
14. The PC method of costing is also known as a ‘bottom up’ method of costing because cost aggregates are devised from individual items of patient consumption.
15. **Service weights:** The relative costs of a service for each type of patient care product. For example, the relative costs of imaging or nursing across all ARDRGs. Also known as service weights.
16. **Separations:** The NHDD version 15.0 defines a separation as “the process by which an episode of care for an admitted patient ceases”.
17. **Standard error:** Standard errors, reported against DRG cost weights in tables across the Cost Weights Report, indicate the reliability of cost weights in terms of variation in costs and variation from the sample design.
18. **Weighted separation:** see cost-weighted separation.

#### Analysis performed to determine the minimum sample size

1. Prior to the commencement of the Round 16 collection, the minimum number of separations, number of hospitals and number of hospital groups required to participate was calculated based on data received from the Independent Hospital Pricing Authority (IHPA), the Department of Health, and Private Health Data Bureau dataset (PHDB).

This Appendix describes the methodology and analysis performed to derive the minimum sample size requirements for the collection.

Data analysis

1. In determining the minimum participation level, the following datasets were received and reviewed:
2. The published cost weight tables for Round 13;
3. A summary of the NHCDC sample for Round 13 and Round 14, by hospital and DRG, for the overnight sector;
4. From the Private Hospital Data Bureau dataset(PHDB): a summary of the population levels of activity, showing the total number of separations by hospital in-scope for the collection (at least 200 separations), for Round 13 and Round 14, for the overnight sector;
5. From the PHDB dataset: a summary of the population levels of activity, average length of stay, and standard deviation of the length of stay, by hospital and DRG, for all private hospitals, i.e. for private overnight hospitals and private day hospitals.
6. Item 1 above was obtained from the Department of Health and Ageing (DoHA) website[[14]](#footnote-15). Items 2 and 3 above were provided by IHPA. Item 4 above was provided by DoHA.
7. In order for the NHCDC sample to be representative of the patient population and the population of private hospitals, minimum participation levels have been specified in terms of:
8. Separation sample size expressed as a percentage of the population levels of activity, where “population” is defined as the total number of separations for hospitals in-scope for the collection. The minimum separation sample size considered to provide sufficient reliability consistent with common statistical practice and historical publication practices was based on the following parameters:
   1. Standard deviation of costs per DRG;
   2. Margin of error in the estimated average cost per DRG; and
   3. Statistical confidence that the estimates fall within the specified margin of error.
9. Parameters (b) and (c) above were informed by reviewing the minimum sample size considered robust enough for publication in the Round 7 to 13 collections and parameter (a) was derived from the Round 13 cost weights.
10. The minimum number of hospitals that are required to participate, in aggregate and by hospital characteristic, to ensure that the collection is representative of the population of private hospitals; and
11. The minimum number of hospital groups that are required to participate, to ensure that the results represent the population of private hospitals.

Percentage of population separations

A key objective of the collection is to produce estimated costs and cost-weights by classified activity. The percentage of population separations that is required in a sample depends upon the tolerable “margin of error”, statistical confidence[[15]](#footnote-16) required, and the standard deviation of costs. To obtain an estimate of the average episode cost of a given DRG, say “k”, within a margin of error *m* and with *x%* confidence, the required sample size for DRG(k) is:

1. A dataset with a lower margin of error, higher statistical confidence, and higher standard deviation, will require a larger sample size. The standard deviation of each DRG varies, and so the sample size required for each DRG (given the same parameters for error and confidence) will vary. However, given that the NHCDC collection is a voluntary one, it will be impossible to achieve target samples for each DRG. Hence, the sample sizes across all DRGs were aggregated. In performing this aggregation, two weighting methods were investigated:
2. Number of separations by DRG;
3. Total cost by DRG (number of separations per DRG multiplied by the average cost per DRG).
4. The two approaches resulted in similar minimum samples sizes for overnight and day-only hospitals. For overnight hospitals, a weighting by number of separations resulted in a slightly higher aggregate minimum sample size than weighting the results by total cost.

Results

1. For overnight hospitals, the summary findings of this exercise were that:

* approximately 60% of all separations would be required in order to achieve a robust sample;[[16]](#footnote-17)
* the collection should include at least 90 hospitals and 10 hospital ‘groups’ (of 2 or more hospitals) to be representative.

These minimum targets were used as the condition on which the collection would go ahead. Hospitals were requested whether they had an intention to participate. The indicative participation rate exceeded the 60% and 90 hospital threshold requirements for the collection to proceed.

#### Further detail on the costing process

##### Stage 1 – The data collection phase

1. Steps of the data collection phase for the Round17 private sector collection include:

R17 Data specifications document: hospitals were provided a data specification document detailing data required for participation and the format of the data to be submitted. The data requirements were discussed and agreed with the Round 16 participants and other hospital groups during the focus group, which was held on 11 December 2013.

References to the Australian Hospital Patient Costing Standards (Version 2.0 – 1 March 2011) were included where relevant to guide hospitals on the scope of costs to be included.

Guidance was also provided on:

1. how to map hospital cost centres and accounts to the NHCDC line items and cost buckets;
2. the type of activity to be included in the collection;
3. the types of costs to be included in the collection;
4. the allocation of costs based on the proportion of acute admitted patient activity (use of patient fractions);
5. submitting cost allocation data used for overhead cost allocation;
6. submitting feeder data used to allocate Critical Care, Prosthetics and Operating Theatre costs; and
7. examples of these requested data items.

Data submission templates: hospitals were provided data submission templates to guide them through what was required for submission. The templates provided participants with consistent data requirements so that the submitted data could be interpreted in a consistent manner.

Website portal for data submissions: hospitals were provided access to a secure website to submit data which enabled them to upload each of the data inputs. The data collection website contains data validation checks and reasonableness checks which flagged any issues at the point of submission. A real-time summary of hospitals’ data during the data submission process meant that hospitals could correct data anomalies at the time of submission. A confirmation/override was required by the user if the results fell outside of the range.

Election to use the Private Hospital Data Bureau (PHDB) and Hospital Casemix Protocol (HCP) activity data: Access was granted to use the data submitted by private hospitals to the Private Hospital Data Bureau and Hospital Casemix Protocol. Hospitals were given the option to use their PHDB or HCP submissions for the purpose of the Round 17 NHCDC submissions of patient activity and feeder data such as admission records, Prosthetics charges, Operating Theatre and Critical Care minutes.

Hospitals were able to access and review the PHDB and HCP datasets via the data collection website and make further changes to these datasets for Round 17 submissions.

A number of hospitals elected to submit their own activity data, rather than to use the submitted PHDB or HCP data, to ensure that the most recent and up to date patient records were used in the costing.

Allocation of overheads to patient care areas: In round 17, participating hospitals were able to provide allocation statistics for allocating costs of overhead cost centres to patient care areas. This represents a change in requirement and costing approach from Round 16 NHCDC. However, the majority of the hospitals did not submit this information and overhead costs were allocated to each patient care area based on that area’s share of the total expenses.

Self Costed Sites: As part of round 17 collection, a small number of hospitals have also participated by submitting costed data using their own costing systems. Many of these hospitals are experienced in hospital costing and have robust systems and reports which are critically reviewed by their internal management. During the data collection phase, discussions were held with all hospitals performing their own costing to understand their key assumptions, while also reviewing their mapping of accounts and costs buckets for consistent reporting for the collection.

##### Stage 2 – Pre-costing checks and review

All participating hospitals were provided with a validation and reasonableness report for them to review before the costing final submission. The reports were distributed to the hospitals for detailed review and resubmission if necessary. Below are some examples of the checks included in these reports:

1. **Initial indicators:** Examples include missing activity, spread of activity during the year, benchmark against R16 data - total costs, average cost per episode, total & average LOS, proportion of encounters that are classed as error DRGs;
2. **Reasonableness tests:** Examples include care area & Line Item mapping – highlight line items & areas with no costs, average cost per hour for operating theatres, critical care areas and general nursing areas, prosthetics cost allocation – total allocated cost $ vs Actual charge etc;
3. **Variability tests:** Examples include Length of Stay by DRG check – highlight each encounter LOS per DRG vs average LOS etc.;

These tests were aimed at identifying where there may be critical errors and highlight these early in the costing process.

1. The reports were also provided to the self-costed hospitals to review the reports for any unexpected or unusual results. Once satisfied with the results of the report, the hospitals finalised their submission for the collection.

##### Stage 3 – Costing

###### Changes in methodology compared to the Round 16 (2011/12) collection

Some identified differences in processes and assumptions are detailed below:

**Use of feeder data:** The cost modelling approach in Round 16 allocated costs in wards to separations on the basis of fractional bed days, while all other cost centres were allocated to encounters based on service weights. In Round 17, a number of patient level data source or feeder systems were introduced. It was recommended hospitals submit data for prosthesis, operating room and critical care feeder data to improve accuracy of the cost allocation. Hospitals were also able to select the PHDB or HCP submissions as alternative source systems of feeder data.

**Allocation of overheads to patient care areas:** While the majority of hospitals in Round 17 chose not to submit overhead allocation statistics, participating hospitals were able to provide allocation statistics for allocating costs of overhead cost centres to patient care areas.

**Product fraction:** While the scope of R17 Private Sector is limited to acute inpatients only, as many hospitals provide additional products to patients (such as outpatient or emergency department services), it is important to separate out costs relating to those products. As such, participants are asked to enter patient fractions (PFRACs) to indicate how much of each cost centre’s cost relates to each of the hospital products instead of the Inpatient Fraction (IFRAC) used in Round 16.

**General ledger data:** Negative expense accounts were accepted as part of the hospital general ledger submission.

**Changes in reporting:** As discussed and agreed with private hospital representatives, the public report in Round 17 has been expanded to separate prosthesis costs into a separate bucket. DRG information will now be displayed in the following 5 cost weight buckets:

Total costs

Operating Room and Special Procedure Suites

Critical Care

Prosthesis; and

Miscellaneous (Including Ward Medical, Ward Nursing, Non-clinical salaries, Pathology, Imagining, Allied Health, Pharmacy, Depreciation, On-costs, Hotel and Supplies.)

###### Hospital-level quality review checks

During the costing process, checks were performed at the hospital level, for the following:

Consistency between encounter data and ward transfer data;

All DRGs are valid DRGs based on DRGv6.0x;

Identification and removal of duplicate encounter and transfer records;

Reconciliation of allocated costs to the general ledger;

Overhead allocation by cost centre and cost bucket;

Identification of separations with negative costs;

Identification of separations costs lower than $20;

Reporting and investigation of the top and bottom 50 separations for episode cost, average cost per day, and length of stay;

Statistical outliers by DRG, based on analysis of percentile bands from the Round 16 collection;

If a hospital participated in Round 16, a comparison of costs to the previous collection by cost bucket;

A comparison of the hospital’s costs by cost bucket, compared what would be expected from the Round 17 collection.

###### Issues encountered during the data collection and costing phases

Below is a list of issues associated with the Round 17 collection:

*Activity information*

* Not all of the patient records were submitted to the Private Hospital Data Bureau (PHDB) or Hospital Casemix Protocol (HCP) collection;
* Inability to link all ward transfer records to encounter records;
* Inaccurate or non-existent ward transfer data (i.e. either transfer time is set to midnight or transfer data was created from the encounter data)

*Feeder data*

* Not all of the patient records were submitted to the Private Hospital Data Bureau (PHDB) or Hospital Casemix Protocol (HCP) collection;
* Duplications and mismatches were identified between the Private Hospital Data Bureau (PHDB) or Hospital Casemix Protocol (HCP) data submissions;
* A reasonable number of PHDB/HCP patient records with less than 7 minutes of recorded theatre time were identified during data submission and costing process. The majority of Round 17 participating hospitals were impacted by this issue.
* A number of hospitals submitted feeder data containing negative duration (theatre and critical care) or theatre/critical care duration exceeding the total episode LOS.

*General ledger data*

* Inconsistent General Ledger structures and the impact on account and cost centre mapping, e.g. some hospitals allocated costs into patient care cost centres directly, whereas some have distinct overhead cost centres. Similarly, there is variation in the level of detail in General Ledger data, e.g. some hospitals only have one cost centre for both a ward and operating theatre, or one cost centre for operating rooms and specialist procedure suites. This is a feature of the variation in hospital structures and must be borne in mind when interpreting the cost weight results;

*Costing assumptions and process*

* Version 6.0x service weights for the public sector (derived from the 2013 National Efficient Pricing dataset for patient costed sites) were used. These weights did not have a weight for Specialist Procedure Suites). The service weights for Operating Rooms were used for Specialist Procedure Suites costs and allocated across all DRGs at a patient episode level. Theatre minutes were not used to allocate Special Procedure Suites costs as separate SPS theatre duration is not available in PHDB or HCP collection.
* DRG average duration is used for records containing negative theatre duration.

The majority of these issues have been raised in previous rounds and the approach to resolve these issues was agreed with each hospital.

###### Feedback provided to hospitals

1. After going through the quality review checks, results from the costing process were sent back to hospitals for review and comment. This reporting included:

* The cost of each encounter, split by cost bucket;
* A profile of the hospital’s activity and cost data, including:
  + Captured occupancy levels per day and month for overnight patients;
  + The number of same-day patients per day and month;
  + LOS by all DRGs,
  + Ward activity (transfer records) and percentage of cost allocation
  + Allocated cost by Care areas and Line Items,
  + Prosthetics cost allocation check,
  + The direct and overhead split by cost bucket.

These reports provided hospitals with overall data to enable a review of the reasonableness of the draft results and to provide comments or queries before the results were finalised.

#### Standard error range, Round 17 Private sector

1. Standard errors, reported against DRG cost weights in tables across the Cost Weights Report, indicate the reliability of cost weights in terms of variation in costs and variation from the sample design. The following tables summarise the reliability of DRG cost weights by grouping the standard errors into a number of ranges.
2. Numbers of DRGs and separations falling into standard error ranges in column 2 provide insight into the global impact of estimation error on cost weights.

Table 13 Number of DRGs by Standard Error range, AR-DRG 6.0x, Private Sector, Round 17

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Number of DRGs** | **Separations** | **Percentage of DRGs**  **(%)** | **Percentage**  **of Total Separations (%)** |
| 0.000 - 0.039 | 230 | 2,423,702 | 33% | 88% |
| 0.040 - 0.099 | 147 | 203,559 | 21% | 7% |
| 0.100 - 0.149 | 87 | 64,449 | 13% | 2% |
| 0.150 - 0.199 | 47 | 22,940 | 7% | 1% |
| 0.200 - 0.399 | 101 | 30,141 | 15% | 1% |
| 0.400 + | 80 | 8,836 | 12% | 0% |
| **Total\*** | **692** | **2,753,627\*** | **100%** | **100%** |

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

1. The results above show that 54% (33% + 21%) of v6.0x DRGs have cost weight estimates with a standard error range of less than 0.1. Almost 95% of separations are within the subset of DRGs that have standard error less than 0.1.

#### Costs included in the cost buckets

1. **1. Ward Medical**: This is also known as Medical Clinical Services, includes the salaries and wages of all medical officers including sessional payments. Note that medical costs may also be found in other buckets that have a medical salary and wages component e.g. Imaging, Pathology, Critical Care, Operating Rooms, Emergency Department, Specialist Procedure Suites, Allied Health and Pharmacy.
2. **2. Ward Nursing**: This bucket includes Nursing salaries and wages reported in Clinical Service areas.
3. **3. Non-clinical Salaries**: This cost bucket includes all other costs of service provision for each inpatient separation.
4. **4. Pathology**: Pathology cost bucket includes costs of diagnostic clinical laboratory testing for the diagnosis and treatment of patients and associated salaries.
5. **5. Imaging**: The Imaging cost bucket covers the area of diagnostic and therapeutic imaging produced under the direction of a qualified technician and reported by a medical practitioner and associated salaries.
6. **6. Allied Health**: The Allied Health cost bucket includes clinical services which are delivered by qualified Allied Health professionals who have direct patient contact in areas like audiology, physiotherapy, podiatry etc.
7. **7. Pharmacy**: The Pharmacy cost bucket covers the area of the hospital responsible for the provision of pharmaceuticals. This includes the purchase, production, distribution, supply and storage of drug products and clinical pharmacy services.
8. **8. Critical Care**: The Critical Care cost bucket covers the Intensive Care Unit and Coronary Care Units.
9. **9. Operating Rooms**: The Operating Rooms cost bucket covers the area of a hospital where significant surgical procedures are carried out under surgical conditions under the supervision of qualified medical practitioners. The operating room must be equipped to deliver general anaesthesia and conform to the College of Anaesthetists and the Faculty of Intensive Care standards.
10. **10. Emergency Department (ED)**: The ED cost bucket covers the area of the hospital where patients who present in an unscheduled manner can be triaged, assessed and treated. The ED must conform to the requirements of the Australian Council on Healthcare Standards trauma guidelines, with the capacity to provide complex, multi-system life support (including mechanical ventilation and invasive cardiovascular monitoring) for a limited period of time.

**11. Supplies**: ‘Supplies’ is an abbreviation for the Supplies and Ward Overheads cost bucket. It includes costs for goods and services, medical and surgical supplies, ward overheads and clinical department overheads. In other words, it includes all costs attributed to a ward that are not included in any other cost buckets.

1. **12. Specialist Procedures Suites (SPS):** The SPS includes costs equipped specifically to provide an environment where diagnostic and therapeutic procedures can be performed under the direction of suitably qualified medical practitioners. Does not include Operating Room costs.
2. **13. On-costs:** The On-costs cost bucket includes superannuation, termination payments, workers compensation, long service leave etc.
3. **14. Prostheses:** The Prostheses cost bucket includes the costs of all prostheses appearing on hospital accounts and costs incurred by the hospital but have not been included in their accounts.
4. **15. Hotel:** The Hotel Services cost bucket includes such items as food service, linen, grocery supplies and recorded as overheads.
5. **16. Depreciation:** The Depreciation cost bucket includes depreciation for items that are durable, able to support production for an appreciable period of time and purchased outright or donated.

More details on these costs are available in the Hospital Reference Manual on the [Casemix website](http://www.health.gov.au/casemix).

#### Cost weight tables by DRG

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##### Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report

*Private Sector Estimated - National Consolidated Cost Weights*

###### List of Caveats and Notes for the Round 17 National Hospital Cost Data Collection (NHCDC) Private Cost Weight Tables

**Comparing private hospitals to public hospitals**

Direct comparison of total patient costs cannot currently be made between private and public hospitals. Private hospital treatment may include medical, pharmacy, and pathology costs that are not included in existing private hospital cost information. These costs are included in public cost information.

**Private NHCDC**

1. For the NHCDC Private sector data note:
   1. the Private Hospitals Data Bureau data may have been supplied inconsistently by some private hospitals and as a result

national definitions such as care type may not be recorded consistently;

* 1. hospitals may not have provided the general ledger data in the requested format; this may result in some inappropriate allocation

of costs i.e. large direct costs such as pharmacy included in overhead cost centres instead of pharmacy cost centres;

* 1. a mixture of patient costing and cost modelling approaches have been adopted for Round 17. Refer to the main report,

Section 3.4, which describes the costing allocation processes and methodology;

* 1. the version 6.0x service weights have gaps - these weights did not have a weight for Specialist Procedure Suites.

The service weights for Operating Rooms were adopted.

**Confidentiality Rules**

2 To protect the patient and hospital confidentiality:

a. DRGs with less than 5 separations are marked '\*\*\*\*\*' in the cost weight table; and

b. if the number of contributing hospitals for a particular DRG is less than 3, DRGs are marked ' -----' in the cost weight table.

**Introductory Notes to Cost Weights**

These notes provide assistance in interpreting the cost weight tables that follow.

For further information, see Glossary of the National Hospital Cost Data Collection Cost Report Round 17 (2012-13) For Overnight Private Hospitals.

Further detail of NHCDC terms can be found in the Australian Hospital Patient Costing Standards (v2.0), which is found at

http://www.ihpa.gov.au/internet/ihpa/publishing.nsf/Content/Australia-Hospital-Patient-Costing-Standards.htm

**Additional notes**

The sample separations submitted to the NHCDC have been population adjusted in all tables and cost weights except where noted. Hospitals with less than 200 acute separations or classed as same day facilities were excluded from both sample and population hospitals. Seven separations were removed before calculating the cost weights. These separations had costs that were inconsistent with their DRG, and had significant influence on the DRG cost weight and the cost weight relative to adjacent DRGs. One very high cost separation was excluded from DRG A06C (Ventilation >95 hours W/O Catastrophic CC), 3 low cost separations were excluded from DRG P66A (Neonate, AdmWt 1500-1999 g W/O Significant OR Proc W Multi Major Problems), and 3 high cost separations were excluded from DRG P66B (Neonate, AdmWt 1500-1999 g W/O Significant OR Procedure W Major Problem).

Care should be taken when comparing average costs between the public and private sectors as cost components differ between sectors. Please refer to the National Hospital Cost Data Collection Cost Report Round 17 (2012-13) for Overnight Private Hospitals for more detail. Slight differences may occur between figures in the tables displayed in the Round 17 Cost Report and figures displayed in the attached Cost Weight reports due to rounding.

**Cost Weight Table Columns**

The following is a brief explanation of each of the ‘cost bucket’ columns displayed in the Cost Weight Report.

**AR-DRG:** AR-DRGs or Australian Refined Diagnosis Related Groups is a patient classification scheme that provides a clinically meaningful way of relating the number and types of patients treated in a hospital to the resources required by the hospital.

**AR-DRG Description:** Descriptive text for the AR-DRG code.

**Number of Seps:** This column displays the number of separations. A separation is termed to be one complete episode of care for a given patient. Separations are population-adjusted.

**Number of Days:** Number of Days is the sum of lengths of stay of the separations for a given DRG. Length of stay was calculated as the difference between Admission Date and Separation Date, subject to a minimum of 1 day. In other national reporting, length of stay is adjusted to remove leave days, however this adjustment was not applied in this report because most hospitals did not supply leave days.

**ALOS:** The ALOS is calculated by dividing the number of days by the number of separations for each DRG. The calculation of ALOS includes all days and separations.

**Cost Weight (Total Costs):** The average cost across all AR–DRGs for the total cost is chosen as the denominator for the costs weights, and given a weight of 1. A cost weight of an AR-DRG is calculated as the average total cost for that AR-DRG divided by the average cost across all DRGs..

Example for AR-DRG = "XXX"

*Average Cost across All DRGs = $80*

*Total Average Cost for DRG:XXX = $100*

*"XXX" Total Cost Weight = $100/$80 = 1.25*

**Cost Weight (specific cost bucket):** A cost weight for an AR-DRG for a specific cost bucket is calculated as the average cost for that AR-DRG and relevant cost bucket, divided by the average total cost across all DRGs.

Example for AR-DRG = "XXX"

*Average Cost across All DRGs = $80*

*Total Average Cost for DRG:XXX = $100*

*Critical Care Average Cost for DRG: XXX = $40*

*"XXX" Critical Care Cost Weight = $40/$80 = 0.5*

Cost-bucket specific cost weights are shown for:

**Oper. room and Spec Proc Suites**

This column is an abbreviation for "Operating room and Specialist Procedure Suites". It displays the cost weight for the combined costs, per DRG, of Operating room and Specialist Procedure Suites.

*Operating Rooms* reports costs for a health care facility under sterile conditions, where significant surgical procedures are carried out under the direction of suitably qualified medical practitioners.

*Specialist Procedure Suites* includes costs equipped specifically to provide an environment where diagnostic and therapeutic procedures can be performed under the direction of suitably qualified medical practitioners. Does not include Operating Room costs.

**Critical Care:**  The Critical Care column displays the cost weight for critical care costs. These costs are the combination of intensive care and coronary care costs.

**Prostheses:** The Prostheses column displays the cost weight for prostheses costs.

**Miscellaneous**: This column reports the cost weight for the combined costs of all other cost buckets:

**Ward Medical**: Also known as Medical Clinical Services, this bucket includes the salaries and wages of all medical officers including sessional payments.

**Ward Nursing**: This bucket includes Nursing salaries and wages reported in Clinical Service areas.

**Non-clinical Salaries**: This cost bucket includes all other costs of service provision for each inpatient separation.

**Pathology:** This contains the costs recorded from diagnostic clinical laboratory tests for the diagnosis and treatment of patients and associated salaries.

**Imaging**: This contains the costs for diagnostic and therapeutic images produced under the direction of a qualified radiographer or suitably qualified technician and reported by a medical practitioner (radiologist) and associated salaries.

**Allied Health:** Includes clinical services that are delivered by qualified Allied Health professionals who have direct patient contact in areas like audiology, physiotherapy, podiatry etc.

**Pharmacy**: Covers the area of the hospital responsible for the provision of pharmaceuticals. This includes the purchase, production, distribution, supply and storage of drug products and clinical pharmacy services.

**Supplies**: ‘Supplies’ is an abbreviation for the Supplies and Ward Overheads cost bucket. It includes costs for goods and services, medical and surgical supplies, ward and clinical department overheads. In other words, it includes all costs attributed to a ward that are not included in any other cost buckets.

**On-costs**: Includes superannuation, termination payments, workers compensation, long service leave etc.

**Hotel**: Includes such items as food service, linen, grocery supplies and recorded as overheads.

**Depreciation:** Includes depreciation for items that are durable, able to support production for an appreciable period of time and purchased outright or donated.

**Standard Error**: Standard errors indicate the reliability of cost weights in terms of variation in costs and variation from the sample design.

**No. of Hosps**: This column displays the number of sample hospitals which reported data for a particular AR-DRG.

Additional information

Any additional information can be accessed at the IHPA website:

[www.ihpa.gov.au](http://www.ihpa.gov.au)

Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 1 of 16)

Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 2 of 16)Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 3 of 16)

1. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 4 of 16)
2. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 5 of 16)
3. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 6 of 16)

Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 7 of 16)

1. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 8 of 16)
2. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 9 of 16)
3. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 10 of 16)
4. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 11 of 16)
5. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 12 of 16)
6. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 13 of 16)
7. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 14 of 16)
8. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 15 of 16)
9. Private Sector - Estimated Round 17 (2012-13) AR-DRG 6.0x Report (part 16 of 16)

1. Section 3.6 describes how acute admitted separations have been identified. [↑](#footnote-ref-2)
2. DOHA (Department of Health and Ageing) 2011, Data Definitions Manual [↑](#footnote-ref-3)
3. Section 3.6 describes how acute admitted separations have been identified. [↑](#footnote-ref-4)
4. e.g. refer to the 15th edition [↑](#footnote-ref-5)
5. Australian Institute of Health and Welfare (AIHW), Australian Hospital Statistics 2010-11, Cat No, HSE117. [↑](#footnote-ref-6)
6. 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) [↑](#footnote-ref-7)
7. E.g. refer to Table 3 of IHPA’s “Technical Specifications 2014–15 National Pricing Model” Version 1.0 February 2014 [↑](#footnote-ref-8)
8. <http://www.health.gov.au/internet/main/publishing.nsf/Content/Australia-Hospital-Patient-Costing-Standards>, accessed 15 April 2013 [↑](#footnote-ref-9)
9. Page 19 of Australian Hospital Patient Costing Standards v2.0 – 1 March 2011 [↑](#footnote-ref-10)
10. Defined as 95% confidence level and 4% acceptable margin of error for the overall average cost. The 95% confidence level and 4% margin of error parameters were informed by considering participation levels in historic publications that were considered acceptable for publication. [↑](#footnote-ref-11)
11. DoHA, Hospital Reference Manual for Round 11 (2006-07) [↑](#footnote-ref-12)
12. AIHW National Health Data Dictionary, 15th edition [↑](#footnote-ref-13)
13. Advice from IHPA [↑](#footnote-ref-14)
14. <http://www.health.gov.au/internet/main/publishing.nsf/Content/Round_13-cost-reports>, accessed 3 April 2012 [↑](#footnote-ref-15)
15. In this context: the probability that an estimate falls within the margin of error of the true mean. [↑](#footnote-ref-16)
16. Defined as 95% confidence level and 4% acceptable margin of error for the overall average cost. The 95% confidence level and 4% margin of error parameters were informed by considering participation levels in historic publications that were considered acceptable for publication. [↑](#footnote-ref-17)