Round 17 Independent Financial Review of the National Hospital Cost Data Collection

January 2015

Independent Hospital Pricing Authority

Executive summary

The independent financial review

The Independent Hospital Pricing Authority (IHPA) commissioned PwC to conduct an independent financial review of the Public Sector Round 17 National Hospital Cost Data Collection (NHCDC) to assess the accuracy and completeness of the data provided by jurisdictions, with a specific focus on hospitals' financial reconciliations and consistency with Version 2 of the Australian Hospital Patient Costing Standards (AHPCS).

The IHPA asked jurisdictions to nominate hospitals or Local Health Networks (LHNs) to participate in the review, in line with a sampling framework provided by PwC. A total of 15 hospitals or LHNs were nominated across the eight jurisdictions participated in the review.

A data collection template was prepared for collecting data at the hospital and jurisdiction level. The template aimed to reconcile the costs from the audited financial statements through to the final costing output. Participants also received a questionnaire asking for information on their quality assurance procedures and how they captured specific costs in the General Ledger (GL). Jurisdictions returned the completed templates and questionnaires in advance of site visits.

A peer review process was also designed and conducted, with jurisdictions nominating representatives to participate in the site visits. The aim of this process was to share information, processes, challenges and solutions in hospital costing.

Focusing on transparency, the review extended to include a review of IHPA's process of receiving and storing the data, which included reviewing the nominated hospitals' data through to submission in the national database.

The review took place in July and August 2014. Each jurisdiction and nominated hospital or LHN underwent a site visit, attended by members of the PwC team, an IHPA representative and, where possible, a peer review representative. The review's observations are based on a combination of the submitted data and the site visits.

Focus for this review

In addition to the financial and activity reconciliations mentioned above, the Round 17 review focused on understanding the allocation methodologies for three selected feeder systems – pharmacies, theatres and ward nursing – exploring how they allocated costs to patients and which linking rules they used. Each jurisdiction's chapter summarises the methodology the Round 17 review used, and the findings section outlines the consistency of feeder allocation methodologies across all participating jurisdictions, hospitals and LHNs/LHDs.

Summary of findings

The project team observed that jurisdiction-wide methodologies and control procedures had improved compared to the Round 16, as hospital managers are now using the data to inform hospital operations, rather than purely for NHCDC submissions.

In particular, the team noticed:

- changes to the work in progress (WIP) costing for Western Australia and NSW hospitals, resulting in better alignment with the AHPCS

- improved Emergency Department (ED) and Outpatient (OP) costing methodologies in South Australia and NSW respectively

- increased quality assurance procedures in SA, NSW and Tasmania

- a new GL structure in Tasmania, better aligning the cost centre structure with clinical departments, making it easier to identify cost pools that can be allocated to specific groups of patients

- greater involvement of Northern Territory hospital staff in the costing process, which has improved the quality of data that goes into costing

- improved feeder data linking rules in the Australian Capital Territory, and a formalising of the cost file specifications

- the IPACost tool has been removed from jurisdictional submission process, in line with jurisdiction feedback from the Round 16 submission process

- an increase in quality assurance checks and IHPA feedback to jurisdictions after the jurisdictions submit their data as part of the review, including detailed spreadsheets identifying records that failed critical or warning tests

- improved reconciliations against jurisdictions' publicly released audited Financial Statements compared to Round 16; in Round 17 all jurisdictions were able to provide reconciliations back to their audited Financial Statements

- the IHPA's updated process when entering data into the national database was clear and well documented, and the IHPA was able to provide a greater level of feedback to jurisdictions on the results of the data quality checks it performed on their submitted data.

The review's findings around the three sample feeder systems are summarised below.

- **Pharmacy:** The review participants allocated pharmacy costs to patients in a generally consistent manner. Out of the 15 sites reviewed, all but two NSW and two Queensland sites allocated imprest drugs to wards and then onto patients and linked dispensed drugs directly to patients. There was some variation in the rules participants used to link dispensed drugs to patients; however, the general practice was to have a short deviation in service date time for inpatients and ED patients, and a large deviation window for outpatients.

  There was some variation in the proportion of unlinked pharmacy costs among the participants, ranging from 2.1% to 15.5%. Most participants allocated these records to a 'virtual patient' and removed the costs from their submission to the IHPA.

  Where relevant, most of the participating sites noted that the split between the 'PharmPBS' and 'PharmNPBS' line items were a 'best effort' split given that the GL and/or pharmacy systems may not have been established to differentiate between the funding source of the drugs.

- **Theatre:** Participating sites allocated theatre costs to patients in a generally consistent manner. Twelve of the 15 participants split theatre costs into several intermediate products and allocated those cost pools using different time-based units (such as transfer in/out times of the recovery unit). Two sites in NSW used service weights because an issue with their theatre management system caused data quality issues, and one WA site used total time to allocate all theatre costs.

  Given that most patients entering the theatre are admitted patients, unlinked proportions were very low for most participants (less than 0.2%). One participant in NSW had 32% of theatre activity unlinked, but this was due to data quality issues with the feeder system.

- **Ward nursing:** Participants allocated ward nursing costs to patients in a generally consistent manner. Four of the 15 participants (three in QLD and one in SA) used a nursing dependency system and the remaining 11 participants allocated ward nursing costs using fractional bed days calculated using patient transfer files. Only participants in SA noted any unlinked records for ward nursing costs.

The noted a number of other observations, summarised below.

- **Participants used a range of costing methodologies to allocate ED and OP costs to patients.** Many jurisdictions plan to improve these methodologies in future rounds of review; however, the difficulty often arises from a lack of quality data that appropriately differentiates resource consumption between patients. We recommend that the IHPA identify acceptable allocation methodologies for costing these products, taking feeder data requirements into consideration. These recommended methods could be documented in future versions of the AHPCS, providing guidance to jurisdictions in their efforts to improve data capture and costing methodologies.

- **Some participants noted incorrect line item allocations**, particularly in areas such as 'Corp costs' and the split between Pharmaceutical benefits scheme (PBS) and Non-PBS pharmacy costs. We recommend that the AHPCS include additional guidance on what types of costs should be recorded against which line items, including scenarios where some costs are already incorporated in the GL and others where they are allocated to the GL during the costing process.

- **Teaching, training and research (TTR) costs continue to represent a fair portion of hospital costs**, but are currently not allocated to any hospital activity and are not consistently identified across hospitals. As a result, there is limited visibility regarding the overall proportion of these costs and the costing of this product. We understand that the IHPA is currently developing a costing classification system, and we recommend that future versions of the AHPCS include guidance on how to separate out and allocate TTR costs.

- **Hospitals continue to use product fractions (PFRACs)** – 11 of the 15 participants used them for their Round 17 submission – and variable practices for reviewing them. We recommend that the IHPA discuss best practice processes for developing, reviewing and updating PFRACs, and include this as guidance in the next version of the AHPCS.

Structure of the report

This report provides an overall summary and findings by jurisdiction, and includes a number of recommendations for the IHPA and the jurisdictions to consider in future rounds of review, with the aim of improving the consistency and transparency of NHCDC submissions.

Report sections	Details
Introduction	Outlines the purpose, scope and methodology of this financial review
Findings of the review	Provides a summary of findings from this review, along with recommendations for improvements in future rounds
Hospital chapters	Explores the costing process of participating hospitals and the jurisdictions
IHPA process review	Discusses the IHPA's process for receiving and reviewing data, and storing the costed dataset in the national database
Peer review	Outlines the peer review process, its purpose and the learnings it produced
Appendix A	Contains a list of attendees at the hospital site visits

The chapters for each hospital are structured to explain how costs recorded in the GL move through the costing process, setting out all included and excluded amounts, and the allocation of overheads. These chapters discuss each hospital's methodologies for allocating products, along with details of the three sample feeders. They also include information about the quality assurance procedures participants perform to review their costings and the role jurisdictions play before submitting data to the IHPA. Finally, the hospital chapters also include a reconciliation of sample encounters between the IHPA's receipt of data and each hospital's costing software.

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Acronyms and abbreviations

Acronym/abbreviation	Description
ABF/ABM	Activity-Based Funding/Activity-Based Management
AHPCS	Australian Hospital Patient Costing Standards
AHS	Area Health Service
AR-DRG/DRG	Australia Refined Diagnostic Related Group
CCU/ICU	Critical Care Unit/Intensive Care Unit
ED	Emergency Department
FTE	Full-time equivalent (employee)
GL	General Ledger
HHS	Hospital and Health Service
HIE	Health Information Exchange (NSW database for storing clinical data)
IHPA	Independent Hospital Pricing Authority
LHD/LHN	Local Health District/Local Health Network
LOS	Length of stay
MBS	Medicare Benefits Scheme
NBA	National Blood Authority
NHCDC	National Hospital Cost Data Collection
OP	Outpatients
PAS	Patient Administration System
PBS	Pharmaceutical Benefits Scheme
PCCL	Patient Clinical Complexity Loading
PFRAC/IFRAC	Product fraction / Inpatient fraction
PPM2	PowerPerformance Management Version 2 (Hospital costing software)
PwC	PricewaterhouseCoopers
QA	Quality Assurance
RVU	Relative Value Unit
THO	Tasmanian Health Office
TTR	Teaching, Training and Research
UQB	Unqualified babies
URG	Urgency Related Group
WIP	Work In Progress

1   Introduction

1.1   Overview and scope

The Independent Hospital Pricing Authority (IHPA) commissioned PwC to conduct an independent financial review ('the financial review' or 'the review') of the Public Sector Round 17 National Hospital Cost Data Collection (NHCDC) for the 2012/13 financial year.

The scope of the financial review was to:

- assess the accuracy and completeness of hospitals' financial reconciliations and compare the data from the financial system to the costing system

- assess consistency between the jurisdictions of the application of Version 2 of the Australian Hospital Patient Costing Standards (AHPCS) in the following areas:

  - o   SCP1.003 – Scope of hospital activity

  - o   SCP2.002 – Expenditure in scope

  - o   SCP2A.002 – Teaching costs

  - o   SCP2B.001 – Research costs

- review the data flow from the time the jurisdiction's uploads participating hospitals' information to the data submission portal, through to that data being stored in the IHPA's national database.

The project team developed some key reconciliations and tests to reconcile costs as they move through the costing process, and to match the data sets in the national database to the participating jurisdictions' and hospitals' records. These key tests are:

- Test 1: Agree the costing General Ledger (GL) to the audited financial statements.

- Test 2: Agree and understand how the costing GL is allocated to hospital products, and agree to the total costed hospital products.

- Test 3: Agree the total costed hospital products the jurisdiction submitted against the dataset in the national database.

- Test 4: Agree five sample patients from the IHPA against the total costs to the hospital's costing system.

As this is not an audit, no assurance on the completeness or accuracy of the costing has been provided. The outcomes and results rely heavily on the representations and data submissions made by hospital costing teams and jurisdiction representatives.

Procedures performed were limited to reviewing supporting schedules, agreeing to financial statements, discussions with costing teams and obtaining extracts from costing systems.

1.2   Participating hospitals

Each of the eight jurisdictions were asked to participate and nominate hospitals or local health networks (LHNs) according to the following sampling frame:

- Queensland (QLD), New South Wales (NSW) and Victoria (VIC) were asked to nominate three hospitals based on the following criteria:

  - one large or medium metropolitan hospital with a teaching capacity

  - one regional or remote hospital

  - one specialist hospital *or* one hospital that had demonstrated improvements since the Round 15 or Round 16 NHCDC financial review.

- South Australia (SA) and Western Australia (WA) were each asked to nominate two hospitals based on the following criteria:

  - one large or medium metropolitan hospital

  - one regional/remote or specialist hospital *or* one hospital that had demonstrated improvements since the Round 15 NHCDC financial review.

- The Australian Capital Territory (ACT), the Northern Territory (NT) and Tasmania (TAS) were each asked to nominate one hospital meeting any of the criteria listed above.

In total, a sample of 15 sites (hospitals or LHNs) was selected to participate in the financial review. VIC was only able to nominate two participating sites instead of the three requested. Table 1 below sets out the nominated hospitals within each jurisdiction, and how they addressed the sampling criteria.

Table 1: List of participating sites

Jurisdiction	Participating hospital	Criteria within sampling framework
ACT	Canberra Hospital	• Had not previously participated in an NHCDC financial review • Major urban hospital • Costing system: PowerPerformance Management Version 2 (PPM2)
NT	Katherine Hospital	• Had not previously participated in an NHCDC financial review • Non-major rural hospital • Costing system: Combo CC
NSW	South Western Sydney LHD	• Had not previously participated in an NHCDC financial review • Includes major urban hospitals • Costing system: PPM2
	Mid North Coast LHD	• Had not previously participated in an NHCDC financial review • Includes major and non-major regional hospitals • Costing system: PPM2

Jurisdiction	Participating hospital	Criteria within sampling framework
	Sydney LHD	• Had not previously participated in an NHCDC financial review • Includes major urban hospitals • Costing system: PPM2
QLD	Wide Bay HHS (Bundaberg)	• Had not previously participated in an NHCDC financial review • Non-major regional hospital • Costing system: Transition II
	Sunshine Coast HHS	• Had not previously participated in an NHCDC financial review • Major urban hospital • Costing system: Transition II
	Townsville HHS	• Had not previously participated in an NHCDC financial review • Major regional hospital • Costing system: Transition II
SA	Flinders Medical Centre	• Had not previously participated in an NHCDC financial review • Major urban hospital • Costing system: PPM2
	Noarlunga Hospital	• Had not previously participated in an NHCDC financial review • Major regional hospital • Costing system: PPM2
TAS	Royal Hobart Hospital	• Previously reviewed hospital (Round 15) • Major urban hospital • Costing system: Combo CC
VIC	Western Health	• Had not previously participated in an NHCDC financial review • Major urban hospital • Costing system: PPM2
	Barwon Health	• Had not previously participated in an NHCDC financial review • Non-major urban hospital • Costing system: User Cost
WA	Swan District Hospital	• Had not previously participated in an NHCDC financial review • Major urban hospital • Costing system: PPM2
	Royal Perth Hospital	• Had not previously participated in an NHCDC financial review • Major urban hospital • Costing system: PPM2

1.3 Methodology

The project team gathered information required for the financial review via:

- a data collection template and questionnaire distributed to hospitals and jurisdictions

- site visits with the hospital costing team and jurisdiction representatives

- follow-up discussions to address outstanding issues

- online research, using resources such as jurisdiction and hospital websites, and jurisdiction and IHPA policies available online.

The project team distributed and gathered the data collection templates in advance of the site visits, and participants were given the opportunity to provide additional information following these visits. The NHCDC representative from each jurisdiction reviewed their chapter prior to it being included in this report.

1.3.1 Data collection template and questionnaire

For Round 17, all quantitative data requests were contained in one data collection template. It included a tab for the participating hospital or LHN to complete, requesting information on the process of GL cost extraction, cost allocation and submission of data to the jurisdiction. A second tab requested information about how the jurisdiction adjusted the dataset before submitting it to the IHPA.

Each site also received a questionnaire, asking:

- the costing teams about their quality assurance and reconciliation procedures regarding the activity and cost data,

- the finance teams about the structure of the GL, and how selected costs were treated in the GL.

These templates aimed to reconcile the costs within the publicly available financial statements against the costed output, and to reconcile the costs submitted to IHPA against the submitted activity levels. Table 2 provides more information on the template and questionnaire.

Table 2: Data collection template and questionnaire details

Document	Contents
Data collection template	The first tab requested: • a brief description of the costing methodology for major hospital products (with more detail gathered during the site visits) • a breakdown of LHN costs reported in the publicly released financial statements, and how this links with the GL used for costing • any inclusions in or exclusions to the GL prior to costing • a breakdown of costs between direct and overhead costs • a list of feeder systems used for various hospital areas and how they were used to allocate costs • a detailed breakdown of records linked to hospital products for three sample feeder systems • a final split of total costs and activity by hospital product, including any adjustments made before submission to the IHPA.

Document	Contents
	The second tab requested: • the split of costs and activities by hospital product that the participating site submitted to the jurisdiction • a list of cost and activity adjustments the jurisdiction made before submitting the data to the IHPA • a final list of costs and activity by hospital product that the jurisdiction submitted to the IHPA.
Questionnaire	The questionnaire was divided into two sections: • The first section asked the costing team to document some of the quality assurance and reconciliation procedures it applied to the final activity and cost data. • The second sections requests asked the finance team at the site to document how particular costs are treated in the GL. This year the questionnaire focused was put on salary- related expenditure – such as superannuation, payroll tax and leave liabilities.

Participants had some flexibility in how they completed the template and questionnaire, to accommodate different costing processes across jurisdictions. For example, work in progress (WIP) adjustments might be processed by the participating site or by jurisdictional staff, so respondents could document WIP adjustments on the first or second tabs of the data collection template.

1.3.2   Site visits

Site visits were scheduled at the jurisdictional level and at each participating site. Appendix A includes a list of all attendees at each site meeting.

A review team made up of representatives from PwC and IHPA visited each participating site, and a peer also attended some sites (see Section 12 – Peer review). The review team discussed the overall costing process and worked through the data collection templates. During this meeting, participating sites explained any exclusions from or inclusions in their data and provided additional materials relevant to the financial review.

Some jurisdictions elected to host the site visit at the jurisdiction's department office, usually if jurisdictional staff performed the costing.

Jurisdiction meetings focused on the jurisdiction's processes and controls, and any adjustments to the dataset the jurisdiction made before submitting it to the IHPA. Jurisdictions were also able to discuss policies they had changed following the previous financial review(s) and any planned improvements for the future.

1.3.3   Follow-up discussions to address outstanding issues

Where there were discrepancies in the data or the review team did not collect all relevant information during the site meetings, the review team sent out additional questions or data requests for the jurisdictions to respond to.

1.3.4   Online resources

The review team obtained publicly released financial statements from the various department or LHN websites, along with contextual information about the participating sites.

2 Findings of the review

This section summarises the findings of the Round 17 NHCDC financial review – including overall observations based on site visits at jurisdictions and hospitals, as well as specific findings related to the review methodology used by each site. Acknowledging that most of the jurisdictions have improvement plans in place for future rounds, we have recommended that these, together with existing improvement plans, have the potential to enhance the value of the cost data collection.

2.1 Summary of findings

2.1.1 Improvements from previous rounds

As many jurisdictions continue to move into activity-based funding (ABF) and further towards activity-based management (ABM), they are placing a greater focus on data quality. This has improved the methodologies and control procedures in place for Round 17, and also increased the interest in and use of data to help manage hospital activities and finances.

There have been several major improvements to the Round 17 dataset, including:

- **Improvements in the treatment of WIP patients in NSW and WA**. The following improvements have been noted:

  - In Round 17 NSW submitted WIP episode costs where the patient was discharged during 2012/13 and admitted in 2011/12. The episode costs that were calculated for the 2011/12 period were escalated as prescribed by IHPA and added to the costs calculated for 2012/13. For Round 16, only costs related to FY 2011/12 were included.

  - In Round 16, only WA patients who were discharged during the year were allocated costs. Costs were allocated based on their total activity, regardless of whether the activity was in the previous financial year or the current one. For example, if a patient was admitted for four days during Round 15 and six days during Round 16, that patient would be allocated Round 16 costs for 10 days of activity.

    For Round 17, WA allocated costs to all patient activity within the Round 17 period regardless of the discharge date. Patients who were still admitted by the end of the financial year were allocated costs and will be submitted to IHPA in the year they are discharged.

- **Patient-level costing for ED patients in SA.** In Round 16, ED patients in SA were costed as a desktop exercise, using service weights and length of stay. For Round 17, SA allocated ED costs based on duration of encounter (from the time the patient first saw a doctor through to their discharge).

- **Improvements in the costing methodologies for NSW outpatients** and the submission of outpatient data to the NHCDC. Outpatient activity in NSW was costed but not submitted in Round 16. For Round 17, NSW costed outpatients utilising occasion of service level data where available.

- **Increased quality assurance procedures in NSW, SA and TAS.** For NSW, this included increased QA checks and the ability for LHDs to constantly submit their costing data, review the QA results, address any issues and resubmit the data. SA performed additional checks for feeder data (such as looking for unreasonable surgery start and end times). TAS increased its review over the costed dataset to include minimum and maximum time in theatre, ED and outpatients.

- **Implementation of a new GL structure in TAS.** This better aligned the cost centre structures to clinical departments, enabling a more detailed identification of cost pools to be allocated to a specific group of patients.

- **Improvements in feeder data linking rules in ACT** and formalised cost file specifications.

- **Removal of the IPACost tool from the submission process.**

- **An increase in IHPA the quality assurance checks and feedback** provided to jurisdictions when they submit data.

- **Improved reconciliations to the publically released audited financial statements.** All jurisdictions were able to reconcile their results back to the audited financial statements.

2.1.2 Sample feeder systems

For this review, IHPA selected three feeder systems for a more detailed review, to better understand the data used to allocate costs and where most of the costs end up after linking. This will also help determine how consistent costing methodologies are around the country.

The three sample feeders for this review were for pharmacy, theatre and ward nursing.

Pharmacy

Most participating sites use a very similar overall approach when allocating pharmacy costs to patients. All (except two NSW and two QLD sites listed below) identified the difference between imprest and dispensed drugs and used the following methodology to allocate costs:

- Imprest drugs, which tend to cost less, were linked to wards. The total cost was then allocated to patients who stayed in the wards, based on their length of stay. Two QLD sites were able to allocate imprest drugs directly to the patient, where MedStation automated medication systems were used in the ward.

- Dispensed drugs, which tend to cost more, were linked directly to patients – admitted, ED or outpatients. Two NSW sites used service weights to allocate dispensed drugs to patients.

The linking rules for pharmacy costs varied between the participating sites, which is to be expected given the different ways systems are established, differing hospital policies and different data entry practices across the sites. The tolerance for date and time matching was relatively short for inpatients and ED patients, and longer for outpatients. For example, inpatients and ED patients were linked to pharmacy records within one day either side of their episode dates, whereas outpatients were linked within 30 days before or after the service event date.

Figure 1: Relationship between number of records and proportion of unlinked services
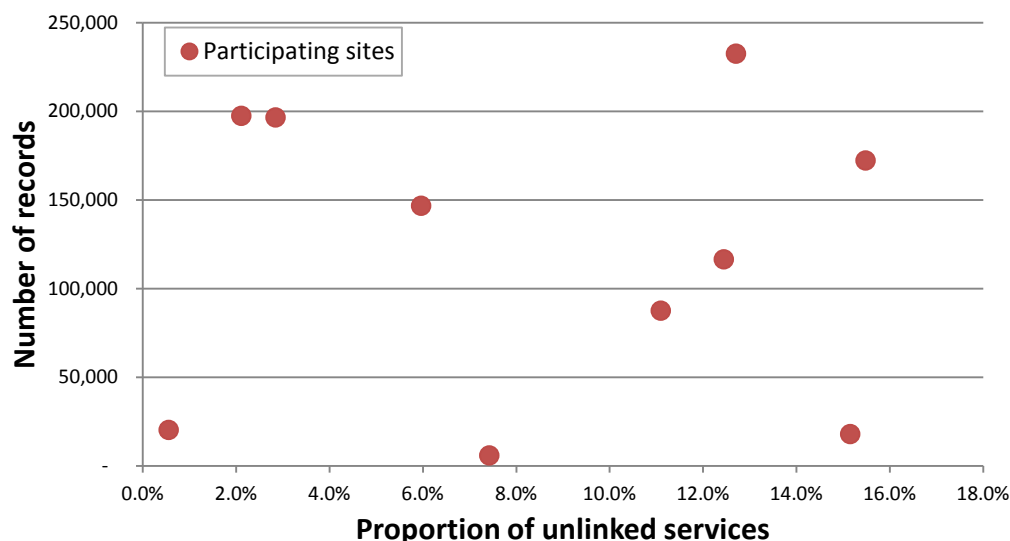
The proportion of system records that remain unlinked during the costing process varied considerably across the participating sites, from as low as 0.6% to as high as 15.5%.

There is no apparent relationship between the number of records in the feeder system (that is, the number of drugs dispensed) and the proportion of services that cannot be linked to a patient.

There are limited options for dealing with unlinked pharmacy services and most sites mapped unlinked services to a 'virtual patient', which they then excluded from their submission to IHPA. Diagnostic testing such as imaging and pathology has 30-series Tier 2 clinics that unlinked services may be mapped to. As no such clinics exist for pharmacy, unlinked pharmacy services are often allocated a portion of the cost, mapped to a virtual patient and then removed from the IHPA dataset submission.

All jurisdictions except NSW and VIC identified that costs recorded between the 'PharmPBS' and 'PharmNPBS' (Non-PBS or S100 drugs) line items, as set out in the AHPCS, are a 'best estimate' only, and are not a reflection of drug classifications. Jurisdictions have various methodologies for splitting these costs, including splitting total pharmacy costs 50/50 or creating a list of high-cost drugs and mapping them to the 'PharmPBS' line item. It is worth noting that NSW has not signed up to the PBS and as such, so not record any cost to the PBS line item. All pharmacy costs are recorded under the 'PharmNPBS' line item. VIC's state wide rules identify PBS, non-PBS and S100 line items.

Theatre

Participating sites used relatively consistent methodology to allocate theatre costs to patients. Table 3 lists the methodologies used to allocate theatre costs and the sites that used them.

Table 3: List of theatre allocation methodologies used by participating sites

Methodology	Participating site using this methodology
Multiple intermediate product details – such as theatre preparation time, operation time and recovery time – are recorded. Multiple start and end times are recorded in the hospital feeder system and used to allocate costs.	• Canberra Hospital (ACT) • Sydney LHD (NSW) • Katherine Hospital (NT) • Townsville HHS (QLD) • Sunshine Coast HHS (QLD) • Wide Bay HHS (Bundaberg) (QLD) • Flinders Medical Centre (SA) • Noarlunga Health Service (SA) • Royal Hobart Hospital (TAS) • Barwon Health (VIC) • Western Health (VIC) • Swan District Hospital (WA)
All theatre costs are allocated based on total time (including anaesthetic start and end time, total surgical time and recovery time).	• Royal Perth Hospital (WA)
Total theatre costs are allocated based on service weights.	• South West Sydney LHD (NSW) • Mid North Coast LHD (NSW)

Given the nature of theatre and the patients who use this service, most participating sites linked all theatre services to inpatients. Some sites use their Patient Administration System (PAS) to record theatre times, which means the patient must be recorded as an admitted patient in order to receive surgery. Due to this process, participating sites linked records directly to patients using an encounter number or had very tight linking rules (up to 24 hours).

Only one site had a high proportion of unlinked services, due to a data quality issue with the feeder system. This meant that approximately 32% of theatre activity at the site remained unlinked and was excluded from the submission to the IHPA. All other sites that used a theatre recorded either very low or no unlinked services (less than 0.2%).

There is a slight difference in the methods different participants used to allocate theatre costs; however, most used theatre minutes broken down by intermediate product such as preparation time, theatre time and recovery time. Some participants incorporated the actual number and type of staff members who were present in the surgical theatre, which increased the surgery time weighting for patients who had several clinicians in theatre for the operation.

Ward nursing

Participating sites were also relatively consistent in their approach to allocating ward nursing costs to patients. Table 4 lists the methodologies used to allocate ward nursing costs, and the sites that used them.

Table 4: List of ward nursing allocation methodologies used by participating sites

Methodology	Participating site using this methodology
A nursing dependency system records nursing activity per patient. Nursing time is used as a driver of ward nursing costs allocated to patients	• Flinders Medical Centre (SA) • Townsville HHS (QLD) • Sunshine Coast HHS (QLD) • Wide Bay HHS (Bundaberg) (QLD)
Total annual nursing costs sit in the ward cost centre and are allocated to patients on a fractional bed-day basis, calculated using ward transfer files.	• Canberra Hospital (ACT) • Katherine Hospital (NT) • Sydney LHD (NSW) • South West Sydney LHD (NSW) • Mid North Coast LHD (NSW)

Methodology	Participating site using this methodology
	• Noarlunga Hospital (SA) • Royal Hobart Hospital (TAS) • Barwon Health (VIC) • Western Health (VIC) • Royal Perth Hospital (WA) • Swan District Hospital (WA)

All participants that allocated ward nursing costs using fractional bed days noted that the feeder system used is also the hospital PAS, so patients were required to have an admitted episode number. As such, 100% of transfer files linked to patient activity except in SA, as noted on page 85.

QLD used a state wide system that involves nurses recording processes and procedures performed on the patient (for example, dressing a wound). The HHSs receive a centrally developed set of RVUs, which provides a standard amount of time expected to perform those processes and procedures. HHSs can tailor the RVUs given any local differences in practices, and they then use this RVU to allocate costs to each patient (for example, a wound dressing would have taken 20 minutes).

Given the investment required to implement and maintain a nursing dependency system, many jurisdictions continue to use fractional bed days to allocate costs to patients, and few are planning to switch to a nursing dependency system or other feeder data in the near future. It's worth noting that the ward nursing cost bucket accounts for around 20% of the total cost of a DRG (based on the Round 16 public sector cost weights).

2.1.3   Observation from the Round 17 review

Variation in costing of ED and OP

Many jurisdictions are still developing their costing methodologies for ED and OP, so there is some variation in the methodologies for ED- and OP-specific costs. The common feedback from jurisdictions during the site visits was that patient-level ED or OP activity data is limited. All participating sites linked diagnostics, pharmacy and theatre feeder systems to ED and OP patients.

Table 5 and Table 6 outline the methodologies used by the participating sites.

Table 5: ED cost allocation methodologies used by participating sites

Methodology	Participating site using this methodology
ED costs are allocated using IHPA price weights.	• Royal Perth Hospital (WA) • Swan District Hospital (WA) • Canberra Hospital (ACT)
ED costs are allocated using state-based RVUs or cost modelling (which may be locally updated).	• Townsville HHS (QLD) • Sunshine Coast HHS (QLD) • Wide Bay HHS (Bundaberg) (QLD) • Royal Hobart Hospital (TAS) • Katherine Hospital (NT)
ED costs are allocated based on duration, weighted by triage.	• Sydney LHD (NSW) • South West Sydney LHD (NSW) • Mid North Coast LHD (NSW)
ED costs are allocated using time (such as time first seen by doctor through to discharge).	• Barwon Health (VIC) • Western Health (VIC) • Flinders Medical Centre (SA) • Noarlunga Hospital (SA)

Note that the above methodologies only relate to the allocation of ED-specific costs and are not indicative of the methodology used for all costs, such as pharmacy, imaging, pathology and so on.

Eight of the 15 participating sites used some kind of RVU or cost modelling to allocate patient ED costs. This results in a range of methods used to creating the final unit, which is then used to allocate costs to patients.

Table 6: Outpatient cost allocation methodologies used by participating sites

Methodology	Participating site using this methodology
OP costs are allocated based on scheduled appointment time, length of the actual appointment or some other occasion of service-level data.	• Flinders Medical Centre (SA) • Noarlunga Hospital (SA) • Barwon Health (VIC) • Western Health (VIC) • Royal Hobart Hospital (TAS) • Sydney LHD (NSW) • South West Sydney LHD (NSW) • Mid North Coast LHD (NSW)
OP costs are allocated using statewide RVUs (which may be locally updated).	• Townsville Hospital (QLD) • Sunshine Coast Hospital (QLD) • Wide Bay HHS (Bundaberg) (QLD)
OP costs are allocated based on total clinic costs divided by total activity.	• Canberra Hospital (ACT)
OP costs are allocated using IHPA's Tier 2 price weights.	• Royal Perth Hospital (WA) • Swan District Hospital (WA)
OP costs are allocated using service weights.	• Katherine Hospital (NT)

Note that the above methodologies only relate to the allocation of OP-specific costs and are not indicative of the methodology used to allocate all costs, such as pharmacy, imaging and pathology.

Despite the variation in costing methodologies used, outpatient costing methodologies have improved noticeably since Round 16. The challenge in further developing this costing methodology is the lack of reliable data being captured at the patient level in sufficient detail to differentiate individual patient service events. Further investment in hospital systems and data capturing processes would increase the data available for allocating costs.

Recommendation: *IHPA should discuss acceptable methods for costing these products, including a discussion of minimum data requirements. These methods could be documented in future versions of the AHPCS, providing guidance to hospitals that are aiming to improve their data capture and costing methodologies.*

Accuracy of cost allocation to the NHCDC line items

The AHPCS detail a list of standard line items that hospital accounts should be mapped against: GL 2.003 – Account Code Mapping to Line Items. During the course of this review, many participants noted that their allocation of costs to specific line items (such as the split between 'PharmPBS' and 'PharmNPBS') was not accurate. This was due to various reasons, including where accounts and cost centres were not set up to appropriately split these costs. Another example was where participants mapped all allocated overheads from outside the hospital GL to the 'Corp' line items. Often, these costs were brought into the hospital GL and mapped to other line items (such as to the 'SWOther', for salaries).

Some participants were not aware of all the requirements around using line items. For example, many participants had 'corporate' costs distributed throughout the hospital GL instead of in the LHN GL. These costs were not flagged as corporate costs in the allocation process, reducing the total costs reported as 'corporate costs'.

Recommendation: The IHPA should provide additional guidance to participating sites on what types of costs should be mapped against the various line items.

Recommendation: The IHPA should give some detailed examples of how to apply the line items, such as in scenarios where overhead costs are already integrated into the GL, and where costs are allocated down during the costing process.

Costing of teaching, training and research

Teaching, training and research (TTR) is a major hospital product with no classification system. As such, there is little guidance on how it should be costed, other than in aggregate. Some participants noted that they have cost centres specifically for teaching, and others do not. Given that the standards specify:

> *"Teaching costs should be allocated to "teaching" where direct clinical teaching is clearly the purpose of the cost centre and within other cost centres where there is a robust and justifiable method of identification of actual teaching activity."*

<div align="right">SCP 2A.002 – Teaching Costs</div>

Hospitals and LHNs did one or both of the following:

- If they had direct teaching (or research) cost centres, these were mapped as teaching (or research). They mapped and allocated all other costs according to their cost centre purpose (for example, medical cost centres that contained some TTR expenditure were allocated to patients). This relies heavily on the assumption that only direct teaching costs sit within those cost centres and that no direct teaching costs are present in any other cost centre.

- If they did not have direct TTR cost centres, they developed PFRACs or performed some modelling to allocate costs from other cost centres to a TTR product. PFRACs, while they may be reviewed, are often reviewed in conjunction with activity data, which does not adequately represent TTR activity given that little data is captured. Participants use 'best guess' estimates in these circumstances.

Recommendation: Continue to develop a TTR classification to better understand the activities being delivered, which will support the classification and the costing standards. Having greater clarity over what TTR activity is occurring and how to cost it will enable more consistent TTR costing across jurisdictions.

Product fractions (PFRACs)

Where hospitals have cost centres that contain costs for more than one product (such as medical costs that need to be allocated to both inpatients and ED patients), the hospitals developed a PFRAC to split those costs. Eleven of the 15 participants used PFRACs for the Round 17 costing. Some participants reported they had performed detailed PFRAC reviews along with activity data, while others reviewed by exception.

Recommendation: Jurisdictions could consider a review process for the PFRACs they use, involving clinical staff who oversee service delivery in the relevant cost centres.

Recommendation: The IHPA and stakeholders should collaborate to determine what is best practice for reviewing PFRACs used in hospital costing.

3   Australian Capital Territory

3.1   ACT overall

Canberra Hospital and Calvary Hospital make up the ACT Local Health Network (ACT LHN). ACT Health conducts the costing process for both sites at the jurisdiction level, with input from the hospitals. The hospitals review costing once a year for the purpose of compiling the NHCDC submission, using the PPM2 costing system.

Within the ACT Government Health Directorate, one financial GL covers the Directorate, Canberra Hospital, Calvary Hospital and other health care facilities within the ACT LHN. The facilities directly provide GL files to the ACT Health team, which then reviews the GL costs, identifying those related to services provided for other facilities or programs, and reallocating them. This process is explained further in Section 3.2.2 below.

ACT Health maintains a shared Patient Administration System (PAS) for the Territory. The Department of Health's costing team extracts activity information from the shared PAS and other feeder systems to inform the costing process. Checks and validations are performed on the data for completeness before it is entered into the costing system.

3.1.1   Changes since Round 16

After the Round 16 Independent Financial Review, ACT Health identified a need to review and improve the timeframes that were being used for linking feeder systems. Previously, the majority of feeder systems were set up with a linking rule of +/-30 days. The jurisdiction undertook a review of all feeder systems' linking rules to identify more relevant timeframes. These changes are expected to produce more accurate results, although in some cases may result in a higher number of unlinked services to prior periods. The changes were processed to take effect during Round 17.

The second change this year is that cost file specifications have been formalised and provided to hospitals in an effort to improve the quality of the data collection. These specifications cover both activity and financial data and include items like treatment of pharmaceutical offset or returns accounts, so that the GL is not submitted with negative value cost centre costs.

Costing is currently performed annually in the ACT, however, ACT Health is considering moving to a quarterly costing cycle. The fact that the GL is not fully 'closed off' until the end of the financial year acts as a barrier to a more frequent costing cycle, as the financial data would not be complete during mid-year costings.

3.2   Canberra Hospital

3.2.1   Site overview

Canberra Hospital provides acute and ambulatory care, along with aged care and community health services. As a tertiary-accredited hospital with connections to the Australian National University, it also has a strong research focus. As the largest hospital in the ACT, it provides a high volume of ancillary services across the Territory. For example, Canberra Hospital is responsible for providing all community mental health services across the ACT.

The demographics within the ACT tend to have a high proportion of patients whose care is subsidised by the Department of Veterans' Affairs (DVA patients), with a recent trend of younger patients in this category. The Canberra Hospital also has extensive aged care services catering for a growing number of older patients.

The table below is a summary of costs beginning with total expenses from the GL through to the total costs submitted to IHPA with the various adjustments made during the process. A variance of $86,000 was noted in item D, which was due to the inclusion of WIP adjustments in the breakdown provided of

costs by hospital product. A further $46,000 variance was identified in the total costs submitted to IHPA, which represents less than 0.0.1% of total costs.

Table 7: Financial overview of Canberra Hospital, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$1,083,790	Total costed products	$814,746
B. Adjustments to the GL		E. Final adjustments	
Inclusions	-	WIP - Carried forward patients	$3,061
Exclusions	($269,128)	WIP - Patients not discharged by year end	($2,975)
Total hospital expenses	**$814,662**	Removal of TTR	($17,603)
		Removal of sexual health costs	($4,071)
C. Allocation of costs		Removal of OOS costs not linked to activity	($33,343)
Patient care areas (direct)	$573,215		
Overhead areas (indirect)	$241,445		
Total hospital expenses	**$814,660**	**Total costs submitted to IHPA**	**$759,770**
Variance	$2	Variance	($46)
D. Allocation of costs to patients			
Acute	$433,601		
Outpatients	$99,613		
Emergency	$63,422		
Sub-acute	$46,077		
Mental health	$36,399		
Teaching and training	$9,031		
Research	$8,572		
Other	$118,030		
Total costed products	**$814,746**		
Variance	$86		

3.2.2   Financial data

General Ledger (Item A)

ACT Health's costing team completes the costing at the jurisdictional level. As mentioned above, the ACT maintains one GL for the whole Health Directorate, with Canberra Hospital representing a high proportion of it.

The total expenses per the Health Directorate's financial statements for FY 2012/13 were $1.1bn. This includes costs incurred for services Canberra Hospital provided on behalf of Calvary Hospital and other services (such as state-wide imaging services), as well as costs incurred for primary care, aged and community care services.

Table 8: Treatment of specific cost items

Cost item	Included in hospital's GL and costed	Allocated from dept or jurisdiction and costed	Not in GL or included in costing
Superannuation	✔		
Defined benefit scheme			✔
Professional indemnity insurance		✔	
Workers' compensation	✔		
Annual leave costs	✔		
Long service leave costs	✔		
PBS rebates			✔
Trade discounts on pharmaceuticals			✔

Table 8 above lists specific costs that were reviewed to understand their treatment in the GL and the costing process. Once these costs are allocated to final cost centres they are distributed to patients using that cost centre's allocation methodology. Key cost treatments to note include:

- The ACT has 2,227 full-time equivalent (FTE) employees (approximately 37% of the ACT Health workforce) who are on a defined benefit scheme. Canberra Hospital makes varying contributions for those employees to ACT Treasury, which sit in the hospital GL and are included in the costing. ACT Treasury is responsible for managing the funds in the scheme and assumes the risk for any shortfall. No additional costs related to this scheme are passed through to the hospital GL.

- Superannuation and leave costs are included in the hospital GL, which includes (at the cost centre level) the costs of the Canberra Hospital employees who are on a defined benefits retirement scheme.

- Comcare Australia externally insures workers compensation at Canberra Hospital with the appropriate expenses included in the hospital GL.

- Pharmaceutical Benefits Scheme (PBS) drug rebates and trade discounts are not offset against the expense item in the hospital GL.

- Assets are revalued every three years in line with jurisdictional requirements and the depreciation in the GL is adjusted accordingly.

Inclusions and exclusions (Item B)

A number of costs not relating to Canberra Hospital services are excluded from the GL. This occurs at two different stages in the costing process:

1. An amount of $90,620,434 is excluded at the point of entering costs from the GL into the costing system. A detailed breakdown of this amount was obtained with the vast majority relating to Policy & Government Relations, DDG Strategy and Corporate costs and other costs incurred at the ACT Health Directorate level that are not direct hospital costs.

2. An amount of $178,507,069 is excluded after the cost allocation process is undertaken. These costs relate to other services provided outside of Canberra Hospital (primarily Calvary Hospital).

The resulting costs identified as relating to Canberra Hospital total $814,660,159.

Allocation of overheads (Item C)

For the Canberra Hospital costing, over 86 different allocation statistics (and their corresponding data) were built for Round 17, to allocate overhead costs correctly to the patient level. These ranged from FTE-based statistics, utilisation data (built at the cost-centre level), statistics built on finance data and specific statistics for specialised costing of certain services. These statistics were chosen using the guidance of the AHPCS, but when data was available that added further granularity to the allocation of overheads, then this data was used.

Distribution of costs between hospital products (Item D)

Certain cost centres are set up to include costs that cover more than one hospital product, such as medical costs. The process to split these costs between the relevant products is as follows:

- Medical costs are allocated between outpatient and inpatient services based on a product fraction. This fraction is updated annually by the Canberra Hospital Financial Operations Support Unit, which asks the department managers to confirm the allocation is correct.

- The medical costs allocated to inpatient activities are then split between theatre and ward costs based on a product fraction. This fraction is only updated every 2-3 years, which did not occur in Round 16 or 17.

- TTR costs are determined by a questionnaire sent each year to the doctors asking them to estimate how much time they spend on TTR activities. In the past, the team received a response from only 10% of the doctors, which has doubled to 20% this year. Costs identified from these responses are separated and not allocated to patients; however, due to the low response rate it is likely that the teaching and training costs reported to IHPA are understated.

3.2.3 Activity information and costing methodology

Overview

ACT Health is able to extract activity information from the PAS and a large number of other feeder systems such as operating theatre, allied health, ED, imaging, pharmacy and pathology systems. The names of these feeders were submitted to IHPA, but have not been included in this report as this data was considered commercial-in-confidence information.

Table 9 below outlines the costing methodology for the various hospital products.

Table 9: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Patient-level costing is conducted for acute inpatients, allocating costs using data from various feeder systems. A patient-level costing approach is also conducted for sub-acute episodes; however, sub-acute episodes are not costed at the phase level.
	Theatre costs – the feeder system captures theatre time as well as pre and post-theatre and recovery time.
	Pharmacy – a relative weighting of the actual Medicare Benefits Schedule (MBS) or drug charge is applied against the GL cost before the allocation is made. Costs are then split between imprest and direct disbursements based on discussions with the pharmacist. The drugs that are directly disbursed to patients are allocated to the patient episode and imprest ward drugs are allocated to the relevant cost centre or ward. Pharmacy costs are split between S100, PBS and non-PBS costs.
	Prostheses – the feeder data contains an episode number and a medical record number, which is matched to the patient episode. Similarly to pharmacy costs, actual costs are obtained from the supplier and their relative weight is applied to the GL cost before allocation begins. Approximately 5.2% of these episodes were unable to be linked to patients.
	Imaging – imaging files are created centrally for the whole of the ACT and the feeder system extract contains a patient episode number (where the patient was classified as an ED patient, inpatient or outpatient). These costs are directly allocated where possible.
	Pathology – as is the case with imaging, pathology files are created centrally for the whole jurisdiction with the feeder file containing a medical record number, which is linked to the patient episode number. A technical issue with the pathology feeder was identified

Hospital product	Allocation overview
	in Round 17, which meant 28% of the recorded activity was not linked to a patient.

Critical care – a ward transfer file is used that indicates if the patient was transferred to critical care (treating the critical care unit (CCU) and intensive care unit (ICU) as the same ward). Nursing and clinical costs are allocated using fractional bed days.

Nursing – each ward has a unique cost centre where the cost is recorded. Transfer files from patients staying in the ward are used to calculate fractional bed days.

Allied health – the allied health booking system generates an extract with the medical record number, episode number and clock-on and clock-off times. These are used, together with a proxy (or relative value unit), to estimate the time each allied health professional spent with the patient.

Blood – as the jurisdiction is responsible for negotiating the contract with the National Blood Authority (NBA), 5% of the costs are removed (representing the jurisdiction 'corporate' cost) before the allocation begins. Feeder data for blood is then obtained from pathology and costs are linked to patient records. |
| Emergency Department | A relative value unit is derived using the URG price weights to allocate the nurse and medical staff time in ED. There is no differentiation between patients in the waiting room, cubicles or beds, however, this differentiation is planned for Round 18.

Canberra Hospital has an 'Emergency Medical Unit', which is treated as a normal admitted ward. This ward has its own nurses and these costs are allocated to the patient using fractional bed days. There is no sharing of nursing staff between ED and this ward; however, doctor time is shared and may not be correctly split for Round 17. |
Outpatients	Volume data is sourced from a booking system, which provides the number of outpatient service events for the period. The costs, which are contained in outpatient cost centres (or fractioned into these cost centres), are spread over the recorded service event volume.
Mental health	Admitted mental health patients are costed in line with other admitted patients.
Teaching, training and research	As mentioned above, the costs allocated to TTR are separated out based on feedback from a clinician survey conducted each year. These TTR costs are allocated to a 'dummy patient' and are allocated their share of overheads.
Other	Organ procurement – if the patient is alive when the procedure takes place, then the cost is captured as an acute inpatient. However, if the organ procurements occur once the patient is deceased, then these costs are allocated to a dummy patient and not submitted.

3.2.4   Feeder data for sample areas

Overview

As part of the costing process, different methodologies will be utilised to allocate costs at a patient level. The recommended methodology in the AHPCS is to use a feeder system, which uses direct patient activity data to allocate costs; however, if this is not available then service weights or RVUs could be used. The Canberra Hospital uses a range of feeder systems and methodologies to allocate costs to patients. Three specific feeder systems are analysed below.

Pharmacy

In relation to Pharmacy costs, Canberra Hospital uses actual data from the pharmacy system (MBS or other costs) to apply the relativity to the GL expense.

The costs are split between drugs that are dispensed directly to patients and those that are imprest on the ward. The imprest drugs are allocated to the whole ward (using fractional bed days) and the directly dispensed drugs are allocated to the patient episodes.

The hierarchy used in the linking rules is first inpatients, then to ED, and finally to outpatients. The range used to link service events with patient episodes is first ten days before the admission and after the discharge date for inpatients. If that fails, then seven days before admission and three days after discharge for ED. If that fails, then thirty days before or after the outpatient date and time. The results of this linking are shown in Table 10 below.

Table 10: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**232,437**
b. Number of records validated against internal costing/business rules	232,437
c. Number of records loaded into costing system	232,437
Number of records linked to inpatients	190,504
Number of records linked to emergency	697
Number of records linked to outpatients	11,678
Number of records linked to other activity	14
Number of unmatched records	-
Number of feeder system occasions of service	29,544

It is noted that 29,544 service events could not be linked to classified activity and became individual occasions of service. These were not submitted to IHPA.

Theatre

Canberra uses a specific theatre feeder, which records various data points of the patient operations, such as start and end date and time, date and time of anaesthetics, and date and time of first cut. Data is extracted from the system and linked to the patient encounter. Theatre costs incorporate both pre-surgery and time in recovery costs.

The same linking hierarchy as for Pharmacy is applied, however with a different acceptable day range. For theatre, records are first linked to inpatients if the data of service was a maximum of five days before

the admission date or after the discharge date. If that fails, then it is linked to ED patients with a maximum of one day before and one day after. If that fails, the records become an occasion of service and are allocated costs but not submitted. The results of these linking rules are shown in Table 11 below. It is noted that 102 service events could not be linked to classified activity and were not submitted to IHPA.

Table 11: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**63,855**
b. Number of records validated against internal costing/business rules	63,818
c. Number of records loaded into costing system	63,818
Number of records linked to inpatients	63,568
Number of records linked to emergency	148
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	102

Ward nursing

Canberra Hospital uses activity data from the PAS, which includes the patient's admission and discharge date and time, and transfers between wards. This is used to allocate nursing time to the relevant products. Nursing costs per fractional bed day are calculated hourly, factoring in the number of nurses on duty at the time and the number of beds utilised at that point in time.

3.2.5   The costed dataset

QA process

A series of quality assurance and validation checks are performed on both the financial and activity data. ACT Health sets the guidelines in which to report hospital GL files, which includes mappings to the NHCDC 'Line Item'. The costing team (at ACT Health) ensures that the PPM2 'Area' mappings align with the NHCDC cost buckets. There is also a review of which costs are classified as hospital service costs and which are jurisdiction/other costs (that are excluded from the costing and submission process).

Validation of the activity data is performed against the ACT Health Internal Metadata specifications. For service files generated, validation of the episode and patient number against the internal 'Master' file occurs to ensure that a valid episode number is recorded against the patient identifier.

A series of reconciliations are performed. These include:

- a cost centre and line item check pre and post-cost allocation

- comparing the dollars from year to year to check against major changes in financial reporting processes

- reviewing the total and average costs allocated to products via internally built reports (these replaced the IPACost tool), to ensure the correct dollar amounts are being allocated to the right area.

Adjustments

The only adjustments made to the costed records were for WIP. These included:

- $3,060,773 of prior year costs that were added to the acute submissions relating to episodes that were admitted in prior years and discharged in the current year

- $2,974,693 of costs that were removed from the acute submissions relating to episodes that were not discharged during the current year.

Work in progress (Item E)

Adjustments are made for patients whose stay at the hospital crosses financial years. Figure 2 below illustrates the four combinations of admission and discharge dates that can occur.

Figure 2: Treatment of WIP patients

Scenario	<--- Previous years	2012/2013 (R17)	Future ---> years	Cost allocation approach		Submitted to IHPA	
				AHPCS Preferred	Followed	IHPA Preferred	Followed
Scenario 1				Allocate	Yes	Submit	Yes
Scenario 2				Allocate	Yes	Submit	Yes
Scenario 3				Allocate	Yes	Do not submit	Yes
Scenario 4				Allocate	Yes	Do not submit	Yes

- Admission date
- Discharge date

The costs that are carried forward to future rounds only include costs for intermediate products, including items like pharmacy, pathology and imaging. The clinical costs (doctor and nursing salaries) are not adjusted in the WIP adjustments for Round 16 or 17 and are only allocated to patients that were discharged during the round. This is because the ward transfer files that are generated only covering discharged patients.

The impact of this is that the scenario 1 patients are allocated a higher proportion of the clinical costs than they should be, and the WIP patients from previous years or those removed from the current year are allocated less costs.

In Round 17, Canberra Hospital patients in each of these scenarios were treated in the following ways:

- Scenario 1 patients were allocated FY 2012/13 costs and were submitted to IHPA

- Scenario 2 patients were allocated FY 2012/13 costs and were submitted to IHPA

- Scenario 3 and 4 patients were allocated FY 2012/13 costs and were not submitted to IHPA in Round 17. These patients will be submitted in a future round when they are discharged.

3.2.6   Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. No variances were noted from the reconciliation, which is listed in Table 12 below.

Table 12: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$2,350.64	$2,350.64	-
2	Acute	$4,797.97	$4,797.97	-
3	Admitted ED	$6,247.40	$6,247.40	-
4	Outpatient	$132.20	$132.20	-
5	Sub-acute	$249,277.17	$249,277.17	-

3.3 Jurisdictional overview

3.3.1 Overview of process

ACT Health is responsible for the costing process of Canberra Hospital and the other ACT facilities. Therefore, there is no additional process than that discussed in Section 3.2.

3.3.2 Adjustments to costed dataset

In addition to the WIP adjustment mentioned in Section 3.2.5, adjustments are made for the:

- removal of TTR costs ($17,602,825) and activity (12 dummy records), as these were not submitted to IHPA in Round 17

- removal of Occasions of Service (OOS) costs ($33,342,821) and activity (437,232 records) as these records were unable to be linked to patients and therefore were not submitted to IHPA

- removal of sexual health costs ($4,070,591) as these costs could not be reported to IHPA (at the request of the Canberra Hospital Sexual Health Service).

3.3.3 Reconciliation with IHPA

Table 13 below compares the total costs and activity records submitted by the jurisdiction with the total costs and activity records that were received by IHPA. A total variance of $126,000 and 162 records were identified and represent less than 0.02% of total submission.

Table 13: Reconciliation of total costs and activity submitted

Item	Activity	Costs ('000s)
Submitted by jurisdiction		
Acute	69,716	$433,515
Sub-acute	2,766	$46,077
Emergency Dept	65,821	$63,422
Outpatients	261,975	$99,613
Other	642,577	$117,016
Total	1,042,855	$759,644
Data received by IHPA	1,043,017	$759,770
Variance	*162*	*$126*

4   New South Wales

4.1   New South Wales overall

Each of the Local Health Districts (LHD) or Specialty Health Networks (SHN) in NSW is responsible for preparing, processing and submitting patient-level costing to the NSW Ministry of Health (the Ministry). The NSW patient-level costing submission – the District and Network Return (DNR) – is a single submission used for a number of purposes, such as in developing the State Price and the NHCDC submission. Having a single submission helps to maintain consistency between a number of data collections, such as the NHCDC, the Public Hospitals Establishment Collection and the Health Expenditure Report.

All LHDs and SHNs use the PPM2 costing application to prepare their data for the DNR. GLs are reported at the LHD or SHN level. The ABF Taskforce manages state wide QA and reconciliation procedures, and is responsible for formatting and consolidating the LHD/SHN patient-level costing data before it is submitted to the IHPA. The ABF Taskforce issues guidance to the LHDs and SHNs to help achieve consistent costing outputs across the state. Costing is performed at the six- and 12-month points of the fiscal year, allowing LHDs and SHNs to identify and correct any errors before the full-year submission.

Entire LHDs – rather than individual hospitals – were nominated for review, so the data presented in this review includes all the facilities within these LHDs. Three LHDs participated in this review:

- Sydney Local Health District (SLHD)

- Mid North Coast Local Health District (MNCLHD)

- South West Sydney Local Health District (SWSLHD).

4.1.1   Changes since Round 16

The most notable change in NSW since Round 16 was the establishment of patient-level costing of non-admitted encounters. Reporting of non-admitted patient-level activity is progressing at varying rates across the different LHDs/SHNs, which accounts for the significant variation in patient-level activity submitted for the Round 17 NHCDC.

4.2   Sydney Local Health District
4.2.1   Site overview

The Sydney LHD is the health district that provides coverage to the inner Sydney metropolitan area. Its central location includes a diverse cultural and socio-economic patient demographic, with patients ranging from very low to very high socio-economic backgrounds.

Its major facilities include Concord Hospital, Royal Prince Alfred Hospital, Balmain Hospital, and Canterbury Hospital. Of these facilities, the Royal Prince Alfred reports the highest volume of acute, ED and elective surgery episodes. Canterbury Hospital has had an increase in ED presentations as well as maternity-related cases.

The table below is a summary of costs beginning with total expenses from the GL through to the total costs submitted to IHPA with the various adjustments made during the process. No variances were noted between the GL and the financial data submitted to IHPA.

Table 14: Financial overview of Sydney LHD, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$1,382,852	Total costed products	$1,401,779
B. Adjustments to the GL		E. Final adjustments	
Inclusions	$18,927	WIP - Carried forward patients	$32,362
Exclusions	-	WIP - Patients not discharged by year end	($160,195)
Total hospital expenses	**$1,401,779**	Costed products of non-ABF facilities	($162,225)
		Costed products of ABF facilities	($95,782)
C. Allocation of costs			
Patient care areas (direct)	$1,071,747		
Overhead areas (indirect)	$330,032	**Total costs submitted to IHPA**	**$1,015,938**
Total hospital expenses	**$1,401,779**		
Variance	-	**Variance**	-
D. Allocation of costs to patients			
Acute	$710,579		
Outpatients	$139,416		
Emergency	$89,356		
Sub-acute	$32,578		
Mental health	$61,452		
Teaching and training	-		
Research	-		
Other	$368,398		
Total costed products	**$1,401,779**		
Variance	-		

4.2.2 Financial data

General Ledger (Item A)

Financial statements are published at the LHD/SHN level in NSW. The templates have been completed for all facilities within the Sydney LHD. The total expenses per the financial statements for FY 2012/13 were $1.38 billion. This reconciled to the total expenses of the GL.

Table 15: Treatment of specific cost items

Cost item	Included in hospital's GL and costed	Allocated from dept or jurisdiction and costed	Not in GL or included in costing
Superannuation	✔		
Defined benefit scheme	✔		
Professional idemnity insurance		✔	
Public liability insurance		✔	
Workers' compensation	✔		
Annual leave costs	✔		
Long service leave costs	✔		
PBS rebates			✔
Trade discounts on pharmaceuticals			✔

Table 15 above identifies specific costs that were reviewed to understand their treatment in the GL and the costing process. Once these costs are allocated to final cost centres they are distributed to patients using the allocation methodology of that cost centre. Key cost treatments to note include:

- Superannuation contributions and defined employee benefit contributions are paid by the LHD from the cost centre where the staff member has their ordinary salaries and wages paid from. The same approach is taken for annual leave and long service leave liabilities.

- The NSW Government has an insurance and risk management scheme covering all the Government's insurance risks. This scheme is the NSW Treasury Managed Fund. Workers Compensation is managed through this scheme. Premium expense is distributed to each LHD/SHN and is included in their GL. In SLHD, this expense is recorded in the GL as an overhead cost centre and is allocated to direct cost centres during the overhead allocation process.

- NSW is not subscribed to the PBS so no revenue is received for those drugs.

- Asset valuations are undertaken every three years. An upward revaluation of land and buildings was done at 31 December 2012, resulting in an increased depreciation expense of $10.7 million.

Inclusions and exclusions (Item B)

Sydney LHD reported two inclusions to their GL costs for costing purposes:

- Medical indemnity costs of $16.94 million

- Visiting medical officer (VMO) insurance premiums of $1.99 million.

These values were calculated and provided by the Ministry of Health for inclusion into the GL for costing to comply with AHPCS. No exclusion of costs was noted.

Allocation of overheads (Item C)

Overheads are allocated based on allocation statistics guidance provided by the Ministry. Following the classification of cost centres, an appropriate allocation statistic such as FTEs or bed days is chosen in accordance with the AHPCS. Overhead costs for Sydney LHD amounted to $330.0 million or 23.5% of total costs.

Distribution of costs between hospital products (Item D)

PFRACS were used in Round 17 for cost centres that provided services to more than one hospital product. After classifying cost centres based on the services provided, the costing staff will consult with clinical managers to determine an appropriate allocation proportion between the hospital products. This happens for each cycle of the DNR preparation which is six monthly.

4.2.3 Activity information and costing methodology

Overview

A number of feeder systems are used across the LHD to allocate costs to patients across all care settings. As previously stated the most significant change in Round 17 was the inclusion of non-admitted patient level data in the DNR.

The table below outlines the costing methodology for the various hospital products.

Table 16: Allocation methodologies for hospital products

Hospital product	Allocation overview

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Inpatients were allocated costs using various feeder systems, which indicate consumption of hospital resources or services. Acute patients were classified under AR-DRGs and sub-acute under AN-SNAP. The actual charge of pathology tests attributed to patients was used for allocating total pathology costs. Standard costs from imaging feeder (GE RIS / ISIS), pharmacy feeder (iPharmacy), and a blood product feeder (Cerner PATHNET) were used to allocate cost of these services to patients. Bed days was used to allocate ward medical costs, while time in the ward derived from transfer files was used to allocate ward nursing costs. Acute patients are costed at the episode level, utilising data from the HIE system and various feeder systems. Sub-acute patients are also costed at the patient level. Palliative care is costed to the phase level (stable, unstable, deteriorating and terminal). Other sub-acute patients are costed at the care type level.
Emergency Department (ED)	ED costs are allocated using duration weighted for triage and mode of separation. ED encounters are allocated costs using feeder systems such as pathology and imaging.
Outpatients	All outpatient services are assigned a Tier 2 class. Outpatients are costed using PFRACS developed for cost centres following consultation from business managers. Costs are allocated using occasion of service level data and then reported at the service event level.
Mental Health	Mental health patients are costed according to the same methodology as acute and sub-acute inpatients.
Teaching, training and research	Cost centres that perform direct teaching, training and research activities are mapped as such. On top of these costs are any costs from cost centres where the business manager fractioned out (during the PFRAC process) any costs related to direct training or research. These costs are costed to a virtual patient in the costing system and are not submitted to IHPA.
Other	Where applicable, Organ and boarder costs are costed as part of the DNR.

4.2.4 Feeder data for sample areas

Overview

Through the costing process, different methodologies will be utilised to allocate costs to a patient level. The recommended methodology in the AHPCS is using a feeder system, which uses direct patient activity data to allocate costs; however if this is not available then service weights or RVUs could be used. Some allocation methodologies at Sydney LHD of note include:

- Blood product costs are allocated directly to patients using information from a separate file received from Pathology. Any waste is allocated across all patients.

- Ward Medical costs are allocated based on the fractional bed days of the patient.

- At Concord Hospital, prosthetics costs are allocated directly to patients using actual costs data from the TMIS feeder. All other facilities in the LHD use an RVU to allocate prosthetic costs to patients.

Pharmacy

Sydney LHD uses iPharmacy, which records consumption of pharmacy products by patients. Dispensed drugs are allocated to those patients who consumed the drugs.

Dispensed drugs are linked to patients based on their medical record number and date of service. It is first linked to ED patients, then to inpatients and finally to outpatients. The linking rules cycle through the products in that order, first linking feeder records to activity where the date of service is an exact match with that of the patient activity record. This then increases to one hour of the date of service, then one day. This increased to a maximum of one day for ED patients and inpatients, and 30 days for outpatients.

Imprest drugs are allocated to wards, and are then distributed to patients based on fractional bed days.

Table 17: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**300,500**
b. Number of records validated against internal costing/business rules	300,496
c. Number of records loaded into costing system	300,496
Number of records linked to inpatients	221,819
Number of records linked to emergency	9,451
Number of records linked to outpatients	44,016
Number of records linked to other activity	-
Number of unmatched records	25,210
Number of feeder system occasions of service	-

Approximately 74% of source records could be linked to inpatient encounters, while almost 15% were matched to outpatient encounters. Unlinked records made up 8.4% of source records, which were allocated costs and excluded from the submission.

Theatre

Sydney LHD uses TMIS (Theatre Management Information System), which records various data points of the patient operation, such as theatre anaesthesia, theatre operating and theatre recovery. Data is extracted from the TMIS system and links to the patient encounter. Anaesthetic costs are allocated based on anaesthesia time; medical and nursing costs are allocated based on operating and recovery minutes.

Table 18: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**44,314**
b. Number of records validated against internal costing/business rules	44,309
c. Number of records loaded into costing system	44,309
Number of records linked to inpatients	29,490
Number of records linked to emergency	-
Number of records linked to outpatients	257
Number of records linked to other activity	-
Number of unmatched records	14,562
Number of feeder system occasions of service	-

In Round 17, nearly two thirds of theatre feeder records were matched to inpatient encounters, while a third were unable to be matched. This was due to a system fault with TMIS, which impacted data quality.

Ward Nursing

Sydney LHD PAS data is uploaded and stored in the LHD's Health Information Exchange (HIE). The HIE includes data on the patient's encounter in hospital, such as the admission and discharge date and time, and transfers between wards. Data is extracted from the system and links directly to the patient encounter. As Table 19: Outcome of ward nursing feeder linking below demonstrates, there were 142,917 records extracted from the HIE and all were linked directly to inpatient episodes.

A weighted LOS is used as the basis of allocating costs. For example, the HDU and ICU cost centres have weightings of 1:2 and 1:1 respectively to reflect the increased intensity of resources consumed in these critical care units.

Table 19: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**142,917**
b. Number of records validated against internal costing/business rules	142,917
c. Number of records loaded into costing system	142,917
Number of records linked to inpatients	142,917
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

4.2.5   The costed dataset

QA process

The QA processes are performed in accordance with the methods outlined in the Jurisdiction section of this chapter. The reconciliation schedule that is submitted to the ABF Taskforce is reviewed by the Manager of the Management Accounting team. A secondary review is completed by the internal audit function. For Round 17, this internal audit stated all audit tests had been conducted and no material errors were identified.

Standard validation checks within PPM2 are also run over the costed data, such as reconciling total costed allocated to patients with total costs loaded to the system. The ABF Taskforce also provides custom QA scripts to the LHD, which help extract and report on costed datasets using the state wide definitions and accounts.

The DNR Module in PPM2 incorporates a number of validation rules some of which are fatal and some are warnings. Fatal validations must be addressed before the DNR expense file can be generated.

The DNR submission process incorporates a draft submission period during which a reasonableness spreadsheet is produced by the ABF Taskforce to report average cost by product (ie DRG, URG, AN-SNAP and Tier 2) for each facility against peer group and state averages. Any adjustments required as a result of issues identified in the reasonableness spreadsheet were made by the costing team in PPM2, before making another DNR submission.

The approval process that the LHD has adopted is that a Costing Officer from the LHD Performance Unit and a Management Accountant from the LHD Finance Department are primarily responsible for managing the DNR including reviewing the outputs. Once the Costing Officer and Management Accountant are satisfied that the DNR is complete they will present the information to the two Directors in their Divisions for their review/comments. Once these two Directors have endorsed the DNR it is presented to the Chief Executive of Sydney LHD for review/comment and final signed off on the DNR prior to submission to the Jurisdiction.

Adjustments

Adjustments to the dataset such as those required for WIP patients and other out of scope costs are made by the jurisdiction before submitting to IHPA. These adjustments have been outlined in the adjustments section of the Jurisdictional overview chapter.

Work in progress (Item E)

Adjustments are made for patients whose stay at the hospital crosses the financial year. The diagram below illustrates the four combinations of admission and discharge dates that can occur. Sydney LHD uses a WIP flag in their costing datasets to identify WIP patients.

Figure 3: Treatment of WIP patients

Scenario	<--- Previous years	2012/2013 (R17)	Future ---> years	Cost allocation approach		Submitted to IHPA	
				AHPCS Preferred	Followed	IHPA Preferred	Followed
Scenario 1				Allocate	Yes	Submit	Yes
Scenario 2				Allocate	Yes	Submit	Yes
Scenario 3				Allocate	Yes	Do not submit	Yes
Scenario 4				Allocate	Yes	Do not submit	Yes

● *Admission date*
● *Discharge date*

For Sydney LHD in Round 17, patients in each of these scenarios were treated the following ways:

- Scenario 1 patients were allocated FY 2012/13 costs for their full length of stay. These encounters were submitted.

- Scenario 2 patients were allocated costs from both the current and previous financial years (back to FY 2011/12 only). Costs from the previous round were escalated in accordance with the AHPCS. The previous round escalation and consolidation with the current round costs was undertaken by the ABF Taskforce. These encounters were submitted to IHPA.

- Scenario 3 patients were allocated FY 2012/13 costs for the portion of their stay that fell within the year. These patients were then set aside and will be submitted to IHPA in future rounds.

- Scenario 4 patients were allocated FY2012/13 costs. As these patients had not been discharged by the end of the financial year, they were not included in the submission to IHPA

4.2.6   Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. The table below lists the results of the reconciliation, which identified no variances.

Table 20: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$53,998.55	$53,998.55	-
2	Acute	$55.79	$55.79	-
3	Outpatient	$184.04	$184.04	-
4	Rehabilitation	$1,865.81	$1,865.81	-
5	Rehabilitation	$5,166.63	$5,166.63	-

4.3 Mid North Coast Local Health District
4.3.1 Site overview

The MNCLHD is considered a health district in rural and regional NSW. It is comprised of three key networks: Coffs Harbour Base (Coffs Network), Port Macquarie Base (Port Macquarie Network) and Kempsey (Hastings-Maclean Network). Of the 19 sites included in this LHD, 4 are ABF facilities. The district services cover 200,000 people of which approximately 15% are over 65. There is a large Aboriginal and Torres Strait Islander (ATSI) population around the Kempsey area.

MNCLHD uses PPM2 to perform their costing. The single most significant change to costing from the previous Round 16 was the patient level costing of non-admitted patients.

The table below is a summary of costs beginning with total expenses from the GL through to the total costs submitted to IHPA with the various adjustments made during the process. No variances were noted between the GL and the financial data submitted to IHPA.

Table 21: Financial overview of Mid North Coast LHD, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$483,005	Total costed products	$486,196
B. Adjustments to the GL		E. Final adjustments	
Inclusions	$3,191	WIP - Carried forward patients	$5,676
Exclusions	-	WIP - Patients not discharged by year end	($59,739)
Total hospital expenses	**$486,196**	Costed products of non-ABF facilities	($106,056)
C. Allocation of costs		Costed products of ABF facilities	($30,872)
Patient care areas (direct)	$456,156		
Overhead areas (indirect)	$30,039	**Total costs submitted to IHPA**	**$295,205**
Total hospital expenses	**$486,196**	**Variance**	-
Variance	-		
D. Allocation of costs to patients			
Acute	$249,120		
Outpatients	$10,008		
Emergency	$55,158		
Sub-acute	$26,949		
Mental health	$19,182		
Teaching and training	-		
Research	-		
Other	$125,778		
Total costed products	**$486,196**		
Variance	-		

4.3.2 Financial data

General Ledger (Item A)

Financial statements are published at the LHD level in NSW. The total expenses per the financial statements for FY 2012/13 were $483.0 million. No variance was noted between total expenses per the financial statements, and the GL used for costing. Further, MNCLHD applies the same treatment of costs as SLHD. Please see Section 4.2.2 for more details on specific cost items identified and treatment by MNCLHD.

Inclusions and exclusions (Item B)

MNCLHD reported two inclusions to their GL costs for costing:

- Medical indemnity costs of $5.7 million

- VMO insurance premiums of $2.1 million.

These amounts were calculated and provided by the Ministry of Health to comply with APHCS. Medical indemnity costs have been allocated to salary staff, while the VMO insurance premiums are allocated based on an allocation statistic.

An item for a shared services charge to NNSWLHD amounting to $4.6 million was adjusted in the GL for costing. This adjustment is reflected in the DNR Reconciliation Schedule. This adjustment is also reflected in the NNSWLHD DNR to ensure the system as a whole reports the total expense. These shared services costs are the result of historical arrangements and are gradually being phased out.

Allocation of overheads (Item C)

Overheads are allocated based on allocation statistics guidance provided by the Ministry. Following the classification of cost centres, an appropriate allocation statistic such as FTEs or bed days is chosen in accordance with the AHPCS.

Overhead costs for MNCLHD amounted to $30.0 million or 6.2% of total costs.

Distribution of costs between hospital products (Item D)

PFRACS were used in Round 17 for cost centres that provided services to more than one hospital product. After classifying cost centres based on the services provided, the costing staff consulted with the business managers and the finance director of each facility to determine an appropriate allocation proportion between the hospital products. This happens for each cycle of the DNR preparation which is six monthly.

4.3.3   Activity information and costing methodology

Overview

The table below outlines the costing methodology for the various hospital products.

Table 22: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Admitted patients (acute and sub-acute) are costed using various patient level activity data (feeder data) representing actual consumption of hospital resources and services where possible. Acute patients are classified under AR-DRGs and sub-acute under AN-SNAP.
	The transfer file from the patient administration system is used to develop a patient level encounter profile. Areas such as Critical care, ICU, Ward Nursing and Ward Medical use this fractional bed day information as a cost driver.
	Allied health uses procedure codes to allocate costs.
	MNC LHD team noted some challenges with the statewide implementation of Surginet theatre management system. As a result, instead of actual theatre utilisation or operating minutes,

Hospital product	Allocation overview
	MBS codes were used to determine weightings for different procedures for allocating surgical costs.
	The actual charge of pathology tests are utilised (using Cerner billing information) for allocating pathology costs.
	Pharmacy and imaging cost were allocated using service weights as data issues were identified in the feeder records.
	Palliative care in the sub-acute setting is costed in four phases: Stable, unstable, deteriorating and terminal.
	Other admitted sub-acute patients are costed using the same costing methodology as other hospital services.
Emergency Department (ED)	ED costs are allocated using duration weighted for triage and mode of separation. ED encounters are allocated costs using feeder systems such as pathology and imaging.
Outpatients	All outpatient services are assigned a Tier 2 class. Outpatients are costed using PFRACS developed for cost centres following consultation from business managers. Costs are allocated using occasion of service level data and then reported at the service event level.
Mental Health	Mental health patients are costed according to the same methodology as acute and sub-acute inpatients.
Teaching, training and research	Cost centres that perform direct teaching, training and research activities are mapped as such. On top of these costs are any costs from cost centres where the business manager fractioned out (during the PFRAC process) any costs related to direct training or research. These costs are costed to a virtual patient in the costing system and are not submitted to IHPA.
Other	Where applicable, Organ and boarder costs are costed as part of the DNR.

4.3.4   Feeder data for sample areas

Overview

As part of the costing process, differing methodologies are utilised to allocate costs to a patient level. The recommended methodology in the AHPCS is using a feeder system, which uses direct patient activity data to allocate costs; however if this is not available then service weights or RVUs could be used.

MNCLHD feeder systems were used for Pathology, ED and Outpatient Clinics in Round 17. A feeder system did exist for Imaging and Theatre however it was not used in this round due to irregularities in the data such as completeness and reconciliation issues.

Critical care, ICU, Ward Nursing and Ward Medical used patient transfer files to build a patient level profile of an encounter. Transfer activities were used for Ward Nursing Ward Medical and Critical Care costs using duration (fractional bed days) to allocate costs respectively.

Allied health, pharmacy costs and blood products were allocated using service weights in Round 17.

Some allocation methodologies of note include:

- The patient's length of stay is used to allocate ward medical cost

- MNCLHD utilised the NSW developed service weights to allocate prosthetic costs. These service weights were developed by ABF Taskforce utilising patient level prosthesis cost data from those LHD/SHNs that had patient level prosthesis data in Round 16.

Pharmacy

No pharmacy feeder existed for MNCLHD resulting in pharmacy costs being allocated to patients using a service weight.

Theatre

The Surginet feeder was not used in Round 17 due to the identification of data discrepancies. Instead, MBS codes were used to determine weightings for different procedures for allocating surgical costs.

Ward Nursing

Fractional bed days/LOS (derived from the ward transfer activities recorded in the hospital PAS) were used to allocate nursing (general ward, HDU and CCU) costs.

Table 23: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**146,550**
b. Number of records validated against internal costing/business rules	146,550
c. Number of records loaded into costing system	146,550
Number of records linked to inpatients	146,550
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

4.3.5 The costed dataset

QA process

MNCLHD performs the same state wide QA processes as set out by NSW Health. Descriptions of these processes can be found in sections 4.2.5 and 4.5.1.

Adjustments

Adjustments to the dataset such as those required for WIP patients and other out of scope costs are made by the jurisdiction before submitting to IHPA. These adjustments have been outlined in Section 4.5.2 and explain the impact on both costs and activity.

Work in progress (Item E)

The adjustments that were made for patients whose stay at the hospital crosses the financial year is consistent with approach taken at SLHD. Please see Section 4.2.5 for more details.

4.3.6   Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. The table below lists the results.

Table 24: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$5,134.68	$5,136.48	-$1.81
2	Acute	$553.85	$554.05	-$0.19
3	Outpatient	$138.38	$138.38	-
4	Sub-acute (Maintenace)	$8,014.57	$8,014.57	-
5	Sub-acute (Rehab)	$8,018.71	$8,018.71	-

Variances between the jurisdiction's records and the data received by IHPA were noted for two of the records sampled. For both of these records, the variance was 0.04% of the encounter cost.

4.4 South Western Sydney Local Health District
4.4.1 Site overview

The SWSLHD operates six acute hospitals, which are Liverpool Hospital, Bankstown-Lidcombe Hospital, Bowral Hospital, Campbelltown Hospital, Camden Hospital, and Fairfield Hospital. Braeside Hospital is a sub-acute facility. Of these facilities, Liverpool Hospital is the major health service for South Western Sydney, which provides state wide services in areas such as critical care and trauma, neonatal intensive care and brain injury rehabilitation.

The LHD also operates 14 community health centres providing a range of community based treatment, palliative care and rehabilitation services. SWSLHD provides coverage for seven Local Government Areas from Bankstown to Wingecarribee. SWSLHD services a rapidly growing and culturally diverse demographic of over 800,000 people. Its catchment area is diverse covering significant residential, suburban and rural areas that are experiencing rapid population growth. A large proportion of the population is culturally and linguistically diverse.

SWSLHD performs the costing function half yearly using the PPM2 costing software. Once the costing process is completed by the Performance Unit at SWSLHD, the cost and activity information is submitted to the Jurisdiction. The DNR is signed off by the LHD CEO for submission to the ABF Taskforce.

The table below is a summary of costs beginning with total expenses from the GL through to the total costs submitted to IHPA with the various adjustments made during the process.

Table 25: Financial overview of South West Sydney LHD, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$1,391,091	Total costed products	$1,411,267
B. Adjustments to the GL		E. Final adjustments	
Inclusions	$20,176	WIP - patients not discharged by year end and carried forward patients	$29,877
Exclusions	-	Costed products not submitted	($103,634)
Total hospital expenses	**$1,411,267**	Costs excluded for ABF	($301,100)
		Non ABF costed products	($52,557)
C. Allocation of costs		**Total costs submitted to IHPA**	**$983,853**
Patient care areas (direct)	$1,062,130	*Variance*	-
Overhead areas (indirect)	$349,137		
Total hospital expenses	**$1,411,267**		
Variance	-		
D. Allocation of costs to patients			
Acute	$724,732		
Outpatients	$30,836		
Emergency	$103,431		
Sub-acute	$79,766		
Mental health	$77,251		
Teaching and Research	-		
Other	$395,251		
Total costed products	**$1,411,267**		
Variance	-		

4.4.2 Financial data

General Ledger (Item A)

Financial statements are published at the LHD level in NSW. The total expenses per the financial statements for FY 2012/13 were $1.39 billion. A variance of $47,609 (which represents 0.003% of total expenses) was noted between total expenses per the financial statements and the GL used for costing. This expense was related to Special Purpose Funds and not General Funds (GFs). As only GFs are allocated at a patient level, there was no impact on the NHCDC. Further, SWSLHD applies the same treatment of costs as SLHD. Please see Section 4.2.2 for more details on specific cost items identified and treatment by SWSLHD.

Inclusions and exclusions (Item B)

A total of $20.2 million was added to the extracted GL before uploading the total hospital costs into the costing system. This included medical indemnity costs, which amounted to $20.5 million and a negative adjustment of $0.3 million for the transfer of costs related to shared services with another LHD. These values were calculated and provided by the Ministry of Health for inclusion into the GL for costing to comply with the AHPCS. No exclusions were made for Round 17.

Allocation of overheads (Item C)

Overheads are allocated based on allocation statistic guidance provided by the Ministry. Following the classification of cost centres, an appropriate allocation statistic such as number of FTEs or bed days is selected in accordance with the AHPCs. Total overhead costs for SWSLHD amounted to $349.1 million, which represents 24% of total costs.

Distribution of costs between hospital products (Item D)

PFRACS were used in Round 17 for cost centres that provided services to more than one hospital product. After classifying cost centres based on the services provided, the costing staff consulted with the business managers and the finance director of each facility to determine an appropriate allocation proportion between the hospital products. This happens for each cycle of the DNR preparation which is six monthly.

4.4.3 Activity information and costing methodology

Overview

A number of feeder systems are used across the LHD to allocate costs to patients across all care settings. The table below outlines the costing methodology for the various hospital products.

Table 26: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Inpatients are allocated costs using various feeder systems, which indicate consumption of hospital resources or services. Acute patients are classified under AR-DRG and sub-acute patients under AN-SNAP.
	Non-surgical medical costs, critical care and nursing costs are allocated using patients LOS (fractional day/hours) in a ward. Fractional bed days/LOS are derived from the ward transfer activities recorded in the hospital PAS.
	The actual charge of pathology tests are utilised (using Cerner billing information) for allocating pathology costs. Standard costs from Cerner imaging system (Cerner – RIS) are used to allocate imaging costs to patient.
	In Round 17, service weights were used to allocate pharmacy costs to patients. SWSLHD team also noted some challenges with the implementation of Surginet theatre management system. As a result, service weights were used for allocating theatre and surgical implants/prostheses costs.
	Admitted sub-acute patients are costed using the same costing methodology as other hospital services.
Emergency Department (ED)	ED costs are allocated using duration weighted for triage and mode of separation. ED encounters are allocated costs using feeder systems such as pathology and imaging.
Outpatients	All outpatient services are assigned a Tier 2 class. Outpatients are costed using PFRACS developed for cost centres following consultation from business managers. Costs are allocated using occasion of service level data and then reported at the service event level.
	However, due to limited data availability, only 17 clinics had patient level data for the full 12 months. The remainder of non-admitted patient activity was costed as aggregate activity.
Mental Health	Mental health patients are costed according to the same methodology as acute and sub-acute inpatients. All overheads including overhead costs from mental health cost centres are grouped into facility overheads and allocated to patient care areas including mental health services.
Teaching, training and research	Cost centres that perform direct teaching, training and research activities are mapped as such. On top of these costs are any costs from cost centres where the business manager fractioned out (during the PFRAC process) any costs related to direct training or research. This was reviewed by external contractors.
	These costs are costed to a virtual patient in the costing system and are not submitted to IHPA.
Other	Organ procurement and boarder costs are costed as part of the

Hospital product	Allocation overview
DNR.	

4.4.4 Feeder data for sample areas

Overview

As part of the costing process, differing methodologies are utilised to allocate costs to a patient level. The recommended methodology in the AHPCS is using a feeder system, which uses direct patient activity data to allocate costs; however if this is not available then service weights or RVUs could be used. A variety of methods are used to allocate costs at SWSLHD including the following areas: imaging, pathology, emergency department, outpatient clinic, and blood products.**Pharmacy**
SWS LHD used pharmacy service weights in Round 17 to allocate costs to patients, which were provide by the Ministry. As such, no sample feeder data was provided for the Pharmacy.

Theatre

Service weights were also used for allocating theatre costs in Round 17 as Surginet was in the process of being implemented. Therefore, no sample feeder data was provided for the Theatre. These service weights were also provided by NSW Health.

Ward Nursing

Fractional bed days/LOS were used to allocate nursing (general ward, HDU and CCU) costs. This was derived from the ward transfer records in the hospital PAS.

Table 27: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**184,604**
b. Number of records validated against internal costing/business rules	184,604
c. Number of records loaded into costing system	184,604
Number of records linked to inpatients	184,604
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

There were 184,604 records extracted from the PAS and all were linked directly to inpatient episodes.

4.4.5 The costed dataset

QA process

SWSLHD performs the same state wide QA processes as set out by NSW Health. Descriptions of these processes can be found in sections 4.2.5 and 4.5.1.

Adjustments

Adjustments to the dataset such as those required for WIP patients and other out of scope costs are made by the jurisdiction before submitting to IHPA. These adjustments have been outlined in section 4.5.2 and explain the impact on both costs and activity.

Work in progress (Item E)
The adjustments that were made for patients whose stay at the hospital crosses the financial year is consistent with approach taken at SLHD. Please see Section 4.2.5 for more details.

4.4.6   Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. The table below lists the results of the reconciliation, in which no variances were noted.

Table 28: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$473,009.51	$473,009.51	-
2	Acute	$3,871.46	$3,871.46	-
3	Admitted Emergency	$54.16	$54.16	-
4	Outpatient	$139.06	$139.06	-
5	Rehabilitation	$3,645.55	$3,645.55	-

4.5 Jurisdictional overview

4.5.1 Overview of process

In Round 17, NSW focused on improving the quality of the DNR and the costing of non-admitted patient activity. In order to achieve this, the Ministry provides guidance in the form of state wide standards (Cost Accounting Guidelines) to each of the LHD/SHNs, provides oversight and practical assistance to costing officers in the LHD/SHNs. The ABF Taskforce have developed and implemented tools and strategies that all LHD/SHNs are required to use. These include:

- standard extracts for the Non Admitted Patient data (from the WebNAP Reporting Server),

- a database called 'The Extractor' which extracts the admitted patient and emergency department patient, encounter, service, transfer, diagnosis and procedure files from the HIE data warehouse in a standard format

- the development of PPM2 standard reports that are available for LHD/SHNs to run and check prior to DNR submission

- the development of fatal and warning validations in the DNR Module in PPM2, of which the fatal validations must be addressed to enable the production of the DNR expense file

- a draft submission period that encourages LHD/SHNs to submit DNR expense files as many times as is required to identify and address material issues

- the "Reasonableness Spreadsheet" to report average cost by product (ie DRG, URG, AN-SNAP and Tier 2) for each facility against peer group and state average that can be used by costing teams in the LHD/SHNs to assess the quality of their DNR at an aggregate level

- data quality checks identifying individual patient records requiring review. These checks are based on the NHCDC data quality checks as well as a series of checks that are particularly pertinent to NSW.

Once a final DNR is submitted and signed off by the LHD/SHN Chief Executive, the ABF Taskforce does not alter the submitted results in any way. Any change that needed to be made will require a resubmission and new sign off from the Chief Executive.

4.5.2 Adjustments to costed dataset

The following adjustments for each of the LHDs were made to the dataset before submission was made to IHPA.

Sydney LHD

- A cost inclusion of $32.4 million for the escalation of previous rounds costs to be submitted for WIP patients. This amount included negative cost adjustments.

- A cost exclusion of $160.2 million for WIP patients not yet discharged from ABF facilities.

- A cost exclusion of $95.8 million for costed products such as out of scope products not requiring submission to IHPA as detailed in the AHPCS, or aggregate level costs such as TTR in ABF facilities.

- A cost exclusion of $162.1 million for costed products of non-ABF facilities not requiring submission.

The impact of these adjustments on activity submitted across the hospital products is listed below:

- Acute – 5,333 encounters excluded

- Outpatients – 11,975 encounters excluded

- Emergency – 47 encounters excluded

- Sub-acute – 497 encounters excluded

- Mental Heath – 12 encounters excluded

- Other – 135 encounters excluded.

Mid North Coast LHD

- A cost inclusion of $5.7 million for the escalation of previous rounds costs to be submitted for WIP patients. This amount included negative cost adjustments.

- Cost exclusions for WIP patients not discharged at the end of the year amounted to $59.7 million.

- Cost exclusions of $30.9 million for costed products such as out of scope products not requiring submission to IHPA as detailed in the AHPCS or aggregate level costs such as TTR in ABF facilities.

- Cost exclusions for non-ABF facilities amounted to $106.1 million.

The impact of these adjustments on activity submitted across the hospital products is listed below:

- Acute – 6,104 encounters excluded

- Outpatients – 50,574 encounters excluded

- Emergency – 26,307 encounters excluded

- Sub-acute – 1,251 encounters excluded

- Mental Heath – 22,548 encounters excluded

- Other – one encounter excluded.

South Western Sydney LHD

- Adjustments relating to WIP and negative cost adjustments amounted to $29.9 million.

- Cost exclusions for WIP patients not discharged at the end of the year amounted to $301.1 million.

- Cost exclusions of $103.6 million for costed products such as out of scope products not requiring submission to IHPA as detailed in the AHPCS or aggregate level costs such as Teaching, Training and Research in ABF facilities.

- Cost exclusions for non-ABF facilities amounted to $52.6 million.

The impact of these adjustments on activity submitted across the hospital products is listed below:

- Acute – 2,077 encounters excluded

- Outpatients – 3,607 encounters excluded

- Emergency – 18,095 encounters excluded

- Sub-acute – 579 encounters excluded.

4.5.3 Reconciliation with IHPA

Table 29 below compares the total costs and activity records submitted by the jurisdiction with the total costs and activity records that were received by IHPA. No variances were identified from this reconciliation.

Table 29: Reconciliation of total costs and activity submitted

Item	SLHD		MNCLHD		SWSLHD	
	Activity	Costs ('000s)	Activity	Costs ('000s)	Activity	Costs ('000s)
Submitted by Jurisdiction						
Acute	133,957	$747,988	52,163	$223,456	175,005	$780,688
Sub-acute	3,113	$40,919	2,265	$20,077	7,759	$72,695
Emergency Dept	143,390	$89,653	84,562	$48,569	219,797	$99,757
Outpatients	385,756	$137,362	15,837	$3,099	145,597	$30,712
Other	2	$16	3	$4	-	-
Total	666,218	$1,015,938	154,830	$295,205	548,158	$983,853
Data received by IHPA	666,218	$1,015,938	154,830	$295,205	548,158	$983,853
Variance	-	-	-	-	-	-

5 Northern Territory

5.1 Northern Territory overall

Hospitals in the NT belong to one of two LHNs: the Top End Hospital Network (TEHN) and the Central Australian Hospital Network (CAHN). However, the NT Department of Health (NT Health) ABF team performed the costing for all NT hospitals in Round 17, with support from Visasys. The team processed the costing data and performed QA procedures in consultation with hospital staff and clinicians to ensure the results were appropriately reviewed.

Round 17 was the third time the NT has participated in the NHCDC, and the centralised costing team this time focused its efforts on improving costings and increasing engagement with hospitals. Costing results are generally included in management reporting to hospitals and used to analyse hospital performance. The NT team nominated Katherine Hospital, part of the TEHN, as the participating hospital for this review.

5.1.1 Changes since Round 16

Among some other changes, since Round 16:

- NT Health pushed data ownership back out to the hospitals in Round 17, leading to greater involvement by hospital staff and clinicians in the overall costing process

- outreach and mental health programs have started to collect patient activity data, so the team was able to cost these programs and submit the resulting data in Round 17.

5.2 Katherine Hospital

5.2.1 Site overview

Katherine hospital is a 60 bed public hospital that serves an area of approximately 340,000 square kilometres between the WA and QLD borders. While the catchment population from this area is relatively small, the hospital services an annual tourist presence in excess of 500,000 visitor nights.

The hospital provides medical, diagnostic and treatment services with specialist services including general surgery, paediatrics, medicine, gynaecology, orthopaedics, cardiology and paediatric cardiology, ophthalmology, ear, nose and throat treatments. For more complex cases or specialist treatments, patients are transferred to the Royal Darwin Hospital or interstate.

Table 30 below is a summary of costs beginning with total expenses from the GL through to the total costs submitted to IHPA with the various adjustments made during the process. We note a $159,000 variance from the total hospital expenses loaded into the costing system and the allocation of cost to patients. This represents 0.36% of total costs.

Table 30: Financial overview of Katherine Hospital, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$35,743	Total costed products	$43,762
B. Adjustments to the GL		E. Final adjustments	
Inclusions	$8,019	WIP - Carried forward patients	$159
Exclusions	-	WIP - patients not discharged by year end	($692)
Total hospital expenses	**$43,762**	Other adjustments	($8,297)
		Total costs submitted to IHPA	**$34,931**
C. Allocation of costs		*Variance*	-
Patient care areas (direct)	$30,132		
Overhead areas (indirect)	$13,630		
Total hospital expenses	**$43,762**		
Variance	-		
D. Allocation of costs to patients			
Acute	$25,015		
Outpatients	$3,668		
Emergency	$5,571		
Sub-acute	$533		
Mental health	-		
Teaching and Research	-		
Other	$9,133		
Total costed products	**$43,921**		
Variance	($159)		

5.2.2 Financial data

General Ledger (Item A)

The NT releases financial statements on a health network level. The costing team was able to demonstrate how the costs were broken down to a hospital level using internal reconciliations. The total expenses for Katherine in FY 2012/13 were $35.7 million.

Table 31: Treatment of specific cost items

Cost item	Included in hospital's GL and costed	Allocated from dept or jurisdiction and costed	Not in GL or included in costing
Superannuation	✔		
Defined benefit scheme	✔		
Professional idemnity insurance	✔		
Workers' compensation	✔		
Annual leave costs	✔		
Long service leave costs		✔	
PBS rebates			✔
Trade discounts on pharmaceuticals			✔

Table 31 above identifies specific costs that were reviewed to understand their treatment in the GL and the costing process. Once these costs are allocated to final cost centres they are distributed to patients using the allocation methodology of that cost centre. Key cost treatments to note include:

- Staff members on defined benefit schemes are paid a contribution into a fund, which they receive on retirement. This is paid for by the NT government and does not get allocated down to patients. Employee superannuation contributions and NT Government contributions for non-defined benefit staff are included in the cost centres from where the staff member is paid.

- The NT government self-insures Workers' Compensation risk so expenses related to workers compensation claims and professional negligence claims are paid when incurred at the cost centre level.

- Annual leave expenses sit in the cost centre from where the staff member is paid and no additional allocation is required. Long service leave expenses are held at treasury and manually included for costing.

- PBS rebates and trade discounts sit within revenue accounts and are not brought in for costing purposes.

- Assets are revalued every five years and the depreciation in the GL is adjusted accordingly.

Inclusions and exclusions (Item B)

A total of $8.02 million was added to the extracted GL before uploading the total hospital costs into the costing system. This was made up of:

- $0.50 million for outpatient doctor costs in Royal Darwin Hospitals' GL

- $0.32 million for TEHN executive costs

- $5.33 million for TEHN financial and information services costs

- $1.87 million for TEHN shared corporate services

No costs were removed from the GL at this stage of the costing process. After the above items were included to the GL, the total expenses loaded into the costing system for Katherine Hospital were $43.76 million.

Allocation of overheads (Item C)

For FY 2012/13, overhead costs totalled $13.6 million, which represents 31.1% of total costs for Katherine. These costs were allocated to the patient care areas based on a variety of allocation statistics, but the major statistics utilised for Round 17 was nursing salaries and wages, ward days, and number of patients in clinics. The allocation statistics were determined based on the preferred hierarchy of allocation statistics in the AHPCS along with what reliable information was available.

Distribution of costs between hospital products (Item D)

Where some cost centres delivered services to multiple hospital products (such as medical cost centres servicing inpatients and outpatients along with some teaching), PFRACs were developed. These PFRACs are reviewed on an annual basis in consultation with hospital staff and clinicians, and were reviewed for the Round 17 submission. PFRACs are reviewed alongside activity information and where there is a material difference between the existing PFRAC and the activity, the PFRACS are amended accordingly.

5.2.3   Activity information and costing methodology

Overview

Once costs are split into the various cost areas and are ready to be allocated, a variety of feeder systems are used to allocate costs to patients across all hospital products depending on the type of patient. The table below outlines the costing methodology for some of the major hospital products.

Table 32: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Inpatients are costed at the episode level, utilising data from CareSysNT. Acute patients are classified using AR-DRGs and sub-acute patients are mapped to care types.
	Inpatients are allocated costs using various feeder systems, which indicate consumption of hospital resources or services. Nursing costs are allocated using a combination of LOS and service weights. Ward medical costs are allocated based on LOS. Diagnostics tests (such as imaging and pathology), pharmacy, theatre, and allied health costs use feeder data to allocate costs with RVUs derived from either MBS schedules or minutes.
	Prosthetics costs are cost modelled to patients using their ICD10 codes and the vendor price list.
Emergency Department	Patients are allocated costs using cost modelling. The model weights presentations based on where the patient waited over/under 120 mins, was admitted or not, and what the patient's triage. If the patient waited more than four hours additional costs were added.
	Diagnostic tests and dispensed pharmaceuticals are allocated to patients directly based on consumption.
Outpatients	All outpatient activity is classified under Tier 2. Most outpatient costs sit within one cost centre. Outpatient costs are allocated based on Tier 2 service weights, nursing service weights, doctor service weights, and clinic service weights.
	Diagnostic tests and dispensed pharmaceuticals are allocated to patients directly based on consumption.
Mental Health	Mental health patients are treated as inpatients and costed according to the same acute and sub-acute methodologies.
Teaching, training and research	Direct teaching costs are identified when costs sit in a designated teaching cost centre. Additional costs are added where PFRACs identify teaching effort in other cost centres.
Other	Boarders are costed in line with other inpatients.

5.2.4   Feeder data for sample areas

Overview

A variety of methods are used to allocate costs at Katherine including the following areas: imaging, pharmacy, pathology, prostheses, theatre, and allied health. Some allocation methodologies of note include:

- Patients are allocated ward medical costs based on a combination of fractional bed days and service weights.

- Prosthetics costs are cost modelled to patients using their ICD10 codes and RVUs were sourced from TAS, with some modifications.

Pharmacy

Katherine uses Ascribe, which records and manages consumption of pharmacy products by patients. Imprest drugs are allocated to wards, which are subsequently allocated to patients along with the ward costs, whereas dispensed drugs are linked to patients based on their medical record number and date of service.

Dispensed drugs that are administered directly to patients are recorded in Ascribe and the unit cost is used to allocate costs to patients using linking rules. It is first linked to inpatients, then emergency department patients, outpatients and then other patient types. The linking is done in waves around the date of service, starting with zero, then increasing to one day, three days, seven days and then 30 days on their side of the date. Records that are unable to be matched are linked to a virtual patient, which holds the costs for those drugs. Table 33 outlines the linking of records from the source system to patients within the hospital products.

Table 33: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**5,843**
b. Number of records validated against internal costing/business rules	5,843
c. Number of records loaded into costing system	5,843
Number of records linked to inpatients	4,981
Number of records linked to emergency	65
Number of records linked to outpatients	363
Number of records linked to other activity	-
Number of unmatched records	434
Number of feeder system occasions of service	-

A total of 5,843 records were extracted from the Ascribe system, of which 434 records could not be linked to a patient record. These records were allocated costs and excluded from the submission to IHPA.

Theatre

Katherine uses CareSysNT to record and manage theatre data. CaresysNT records various data points of the patient theatre, such as start and end time of theatre, start and end time of anaesthetics, recovery time etc. Data is extracted from the system and links directly to the patient encounter. As CareSysNT

manages inpatients as well as the theatre all records were linked directly to patients, which can be seen in Table 34 below.

Theatre costs are split into several buckets and allocated to patients using different theatre times. Theatre and surgeon costs are allocated using theatre time, calculated from the start of first cut to close. Anaesthetic time is used to allocated pre-operating costs

Table 34: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**903**
b. Number of records validated against internal costing/business rules	903
c. Number of records loaded into costing system	903
Number of records linked to inpatients	903
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

Ward Nursing

CareSysNT is the key patient administration system at Katherine and includes data on the patient's encounter in hospital, such as the admission and discharge date and time, transfers between wards and units. CareSysNT is also used for capturing theatre data, prosthetic data, ED data, Allied Health, Outpatients, and Ward Medical information. Transfer data is extracted from the system and links directly to the patient encounter. As all patients who are admitted to a ward and receive a transfer record, all ward nursing costs were allocated to inpatients. This is shown in Table 35.

Patient stay was identified down to the ward and unit level (such as a maternity ward or critical care unit) and the LOS was generated from the start and end date and time. A combination of fractional bed days and service weights were used to derive a cost driver for nursing.

Table 35: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**23,828**
b. Number of records validated against internal costing/business rules	23,828
c. Number of records loaded into costing system	23,828
Number of records linked to inpatients	23,828
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

5.2.5 The costed dataset

QA process

NT health performed a range of QA processes over costed data. This included reconciliations between total costs and activity loaded into the costing system and what was allocated to patients. Comparisons with prior year costs and activity were also performed, along with a review of high, low and negative cost patients. Other validation and reasonable tests were formed over fields such as ages and durations (such as LOS, ICU hours etc). Identified issues during the process are rectified and the new costing results again go through the QA processes.

Adjustments

NT Health only made two types of adjustment: WIP patients (which is discussed below) and out of scope adjustments. Out of scope adjustments included items such as Careflight (totalling $5 million), kiosk, Healthnet recoveries, teaching, and any unlinked patients etc. These out of scope adjustments amounted to $8.3 million in FY 2012/13.

Work in progress (Item E)

Adjustments are made for patients whose stay at the hospital crosses the financial year. The diagram below illustrates the four combinations of admission and discharge dates that can occur and the treatment of cost and submission through to IHPA.

Figure 4: Treatment of WIP patients

Scenario	<--- Previous years	2012/2013 (R17)	Future ---> years	Cost allocation approach		Submitted to IHPA	
				AHPCS Preferred	Followed	IHPA Preferred	Followed
Scenario 1				Allocate	Yes	Submit	Yes
Scenario 2				Allocate	Yes	Submit	Yes
Scenario 3				Allocate	Yes	Do not submit	Yes
Scenario 4				Allocate	Yes	Do not submit	Yes

Admission date
Discharge date

For Katherine in Round 17, patients in each of these scenarios were treated the following ways:

- Scenario 1 patients were allocated FY 2012/13 costs for their full length of their stay. These patients were submitted to IHPA.

- Scenario 2 patients were allocated costs FY 2012/13 cost for the portion of their stay that fell within the year. No costs were brought forward for these patients in Round 17.

- Scenario 3 patients were allocated costs FY 2012/13 cost for the portion of their stay that fell within the year. These patients were then set aside and will be submitted to IHPA in future rounds.

- There were no scenario 4 patients in Round 17 at Katherine.

5.2.6   Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. The table below lists the results, which identified no variances.

Figure 5: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$18,232.62	$18,232.62	-
2	Acute	$1,363.84	$1,363.84	-
3	Admitted Emergency	$349.56	$349.56	-
4	Outpatient	$965.24	$965.24	-
5	Acute	$7,491.71	$7,491.71	-

5.3 Jurisdictional overview

5.3.1 Overview of process

NT Health performs all costing for all hospitals in the territory, which is consistent with prior rounds. This model helps ensure consistency and comparability between the hospitals in the territory. GL and activity data was extracted from source systems, adjusted, and costed according to the steps outlined throughout Section 5.2. NT Health performed all the quality assurance procedures both before and after costing, including development and review of PFRACs through the review of QA reports.

There was, however, a greater push towards increased hospital ownership of data in Round 17 and thus staff and clinicians at Katherine were involved at various stages of the costing process, including at the account mapping and PFRAC review stage through to review and reporting of costed results.

5.3.2 Reconciliation with IHPA

The total costs and activity that the jurisdiction identified as being submitted to IHPA was reconciled with IHPA's records. No variances were identified from this reconciliation.

Table 36: Reconciliation of total costs and activity submitted

Item	Activity	Costs ('000s)
Submitted by Jurisdiction		
Acute	8,040	$24,584
Sub-acute	7	$275
Emergency Dept	16,571	$5,571
Outpatients	10,577	$3,668
Other*	869	$833
Total	36,064	$34,931
Data received by IHPA	36,064	$34,931
Variance	-	-

6 Queensland

6.1 Queensland overall

For Round 17 of the NHCDC, QLD was divided into 16 LHNs – known locally as Hospital and Health Services (HHS) – and the Mater Hospitals, which provide services to public patients under contract to QLD Health.

Each HHS local costing team (except in small rural and remote areas: Torres Strait, Northern Peninsula, Cape York, and Central and South West QLD) was responsible for managing patient-level costing for their HHS. Within each HHS, hospitals maintain their own costing databases in accordance with the QLD Costing Implementation Guidelines. All HHSs use Transition II costing software, with the exception of the Mater Hospitals, which use PPM2.

The hospitals conduct monthly costing for a rolling annual period, extracting data annually for submission to the NHCDC. Once the hospitals have submitted their costed outputs, QLD Health conducts a number of validity tests to ensure the final submitted data conforms with the national dataset requirements. It also makes adjustments in line with AHPCS requirements – adding corporate overheads applicable to final patient costing if those costs sat outside the HHS GL in the reference year – before submitting the data to the IHPA.

The review team met with costing representatives from the three sites nominated for participation in this financial review:

- Wide Bay HHS (Bundaberg)
- Townsville HHS
- Sunshine Coast HHS.

6.2 Wide Bay HHS (Bundaberg)
6.2.1 Site overview

The Wide Bay HHS services approximately 210,000 residents of regional southeast QLD, with an estimated population of 300,000 by 2025. Bundaberg is the largest facility of the region offering 266 beds, followed by Hervey Bay Hospital (166 beds) and Maryborough Hospital (102 beds). There are also 8 rural block funded facilities within the region.

The Wide Bay HHS is structured as two costing databases: Bundaberg and Hervey Bay, however only the Bundaberg database and the facilities assigned to it, have been considered for this review. Table 37 below outlines the flow of financial data for the Bundaberg costing database only.

Table 37: Financial overview of Bundaberg Hospital, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$238,126	Total costed products	$220,433
B. Adjustments to the GL		E. Final adjustments	
Inclusions	-	WIP - carried forward patients	$14,334
Exclusions	($17,514)		
Total hospital expenses	**$220,612**	WIP - patients not discharged by year end	($6,728)
C. Allocation of costs		Records removed during QA checks	($9,184)
Patient care areas (direct)	$192,307		
Overhead areas (indirect)	$28,127	Corporate overheads	$5,472
Total hospital expenses	**$220,433**	Out of scope activities	($9,419)
Variance	$179	Negative cost encounters	$18
		Mismatched cost records	($8,182)
D. Allocation of costs to patients		**Total costs submitted to IHPA**	**$206,745**
Acute	$99,773	**Variance**	-
Outpatients	$56,536		
Emergency	$30,041		
Sub-acute	$9,370		
Mental health	-		
Teaching and training	-		
Research	-		
Other	$24,714		
Total costed products	**$220,433**		
Variance	-		

6.2.2 Financial data

General Ledger (Item A)

Financial statements are published at the HHS level, which was $470.5 million for FY 2012/13. This was split between two costing databases, Bundaberg and Hervey Bay, which contained $238.1 million and $232.4 million respectively. The amount of $238.1 million was loaded into the Bundaberg costing database and is the focus for this review.

Table 38: Treatment of specific cost items

Cost item	Included in hospital's GL and costed	Allocated from dept or jurisdiction and costed	Not in GL or included in costing
Superannuation	✓		
Defined benefit scheme	✓		
Professional idemnity insurance	✓		
Workers' compensation	✓		
Annual leave costs	✓		
Long service leave costs		✓	
PBS rebates			✓
Trade discounts on pharmaceuticals			✓

Table 38 above identifies some of the specific costs examined to understand how the costs are treated in the GL until they get to direct cost centres. Once these costs are allocated to final cost centres they are distributed to patients using the allocation methodology of that cost centre. Key cost treatments to note include:

- Workers' compensation is managed through a state wide government insurer, WorkCover. An annual amount of workers' compensation is levied to Bundaberg for inclusion in costing and is allocated to patients.

- Medical indemnity insurance is managed by the HHS. An insurance levy is issued directly in the GL to each HHS by QLD Health based on annual advice on premiums from QLD Treasury. This is allocated to direct cost centres through the overhead allocation process.

- Annual leave and long service leave costs sit in the cost centres where the staff member is paid. Superannuation cost is a combination of defined benefit and defined contribution schemes and is managed by QSuper. It is distributed amongst cost centres in the same way described for leave.

- Rebates are treated as revenue items, and not included in costing. Any discounts arising from the purchase of consumables in bulk through state wide arrangements, for example, are not considered a rebate and included in the costing in the expense account.

- Assets are required to be revalued annually. Land is revalued annually using an indexation from the State Valuation Service. Buildings are independently valued with a desktop indexation applied to the balance. Major buildings undergo a comprehensive revaluation every five years, unless there has been evidence of a significant change in fair value, in which a valuation will be performed. For all other assets, a revaluation will only be required if there is evidence of a significant change in fair value. The adjusted depreciation is included in the costing results.

- For Round 17, payroll tax was paid for staff of non-PBI facilities of the HHS and not for any hospital or campus staff (i.e. community health facilities and oral surgeries). We note that from 1 July 2014 payroll tax will no longer be payable.

Inclusions and exclusions (Item B)

The total dead-ended overheads for this round were $17.5 million. Dead-ended costs may include various administrative functions and commercial services that are out of scope in the Australian Hospital Patient Costing Standards.

Allocation of overheads (Item C)

Overhead costs that were shared between the two costing databases (Hervey Bay and Bundaberg) were split between the two costing databases evenly. For example, the cost of executive staff would be allocated in full to both, and then half of the cost was removed. For overhead costs that are known to be specific to a particular site, then those costs are allocated in full to the respective costing database. Once the final overhead costs were determined, they were allocated using a range of allocation statistics that were selected based on the AHPCS preferred hierarchy and what data was available.

Distribution of costs between hospital products (Item D)

Cost centres that deliver services to multiple hospital products are split using activity rather than PFRACs. RVUs are used to allocate the labour and non-labour components of the cost centre to patients, which is not dependent on whether the patient was an inpatient, ED or outpatient. Labour costs are typically allocated using minutes, which is sourced from a feeder systems. Non-labour costs are allocated based on expended dollars. The RVUs used are provided by QLD Health and are reviewed each year by the hospital.

6.2.3 Activity information and costing methodology

Overview

Bundaberg utilised the state wide cost allocation methodology for Round 17. This is detailed in the Table 39 below.

Table 39: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Acute patients are costed at the episode level, utilising records from the HBCIS system. Sub-acute patients are costed in the same way. There was insufficient data available for costing to the phase level as phase of care dates and times were not available for this round. Due to this, costing was performed for the total episode.
	Inpatients are allocated costs using various feeder systems, which indicate consumption of hospital resources or services. Nursing is costed using a nursing acuity system where available or fractional bed days, with a time RVU for admission, discharge and death products to account for additional activity required during those events. Similarly with medical staff costs, fractional bed days are used to allocate costs along with a time RVU for admission, discharge and death.
	Operating theatre costs are broken down into several cost buckets and allocated using data from the state wide theatre management system. The system provides theatre minutes that are used along with state minute RVUs. Some count-based RVUs by procedure are used, along with high cost consumables such as prosthetics. Where direct prosthetic costs were unavailable, MBS cost bands were used.
Emergency Department	ED activity is costed for both URG and UDG classified activity. The EDIS REDIS and EMG2 feeder systems provide the time data and the state wide, triage-based RVUs were used to allocate costs to patients. The RVUs are updated annually by QLD Health and updated locally where required.
Outpatients	Only Tier 2 classified outpatient encounters were included in the costing system at patient level. These patients were given an RVU of time based on their clinic and whether the appointment is a new or review consultation. The aggregate time is then used to allocate cost for each clinic.
	Virtual patients were used to collect remaining costs where insufficient patient level information was available. These costs were mapped to a Tier 2 clinic and were then spread evenly to virtual patient episodes and submitted to IHPA.
Mental Health	Acute and sub-acute admitted mental health episodes were costed and reported in the same manner as non-mental health admitted patients. No integration to community mental health systems was established in Round 17 so these services were costed using virtual patients.
Teaching, training and research (TTR)	Where sites have cost centres that are specifically for direct teaching and training activities these are identified as part of TTR as outlined in the AHPCS. Any indirect TTR activity that clinicians perform

Hospital product	Allocation overview
	where costs sit in patient care cost centres are allocated to patients.
Other	Outreach and community care encounters are included in costing but virtual patients are used to capture those costs. Boarders and other admitted patient care encounters are costed to the patient level. Organ procurement is not costed separately due to lack of patient level data.

6.2.4   Feeder data for sample areas

Overview

As part of the costing process different methodologies will be utilised to allocate costs to a patient level. The recommended methodology in the AHPCS is to use a feeder system, which uses direct patient activity data to allocate costs; however if this is not available then service weights or RVUs could be used. Bundaberg used a range of feeder systems in Round 17 in order allocate costs to patients, include pharmacy, imaging, prosthetics, theatre, critical care, bloods, ED, ward nursing and ward medical. Three sample feeder systems are discussed in more detail below.

Pharmacy

Bundaberg uses iPharmacy, which records consumption of pharmacy products by patients, using different methodologies for dispensed and imprest drugs. Dispensed drugs costs are allocated to those patients who consumed those drugs using the patient's MRN, while imprest drugs are allocated to the ward where the drugs were delivered and allocated to patients along with the rest of the ward costs. Included in the cost that is allocated are the minutes of staff time required to manage these drug cupboards. Most S100 drugs are mapped to the 'PBS drugs' line item, however many PBS drugs and some S100 drugs are unable to be flagged by the system and are mapped to the 'Non-PBS drugs' line item.

Dispensed drugs were linked to patients using a set of state wide rules using the feeder date of service. Firstly, records were matched to inpatients where the data of service is maximum one day before the admission date or one day after the discharge. If that failed, the record was next matched to an ED presentation with the same one-day rule around admission and discharge. If that failed, the record was linked to outpatients where the data of service was a maximum of 30 days before or 30 days after the outpatient date and time. Any unlinked pharmacy records were linked to the Tier 2 40.04 Clinical Pharmacology clinic and submitted to IHPA.

For Round 17, 87,536 records were extracted from the system and linked to patients as displayed in Table 40 below. 65% of records were linked to inpatients and 23% to outpatients. 9,716 records were unable to be linked to patients and were mapped to the clinical pharmacology clinic for submission to IHPA.

Table 40: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**87,536**
b. Number of records validated against internal costing/business rules	87,536
c. Number of records loaded into costing system	87,536
Number of records linked to inpatients	57,329
Number of records linked to emergency	268
Number of records linked to outpatients	20,223
Number of records linked to other activity	-
Number of unmatched records	9,716
Number of feeder system occasions of service	

Theatre

Bundaberg uses ORMIS, which records various data points during the patient's operation. The ORMIS system captures several dates and times, along with prosthetics used. Theatre costs were split into several buckets and allocated using various time periods. For example, cut to close time is used to allocated theatre costs and recovery time to allocate the costs of the recovery room.

The linking performed used the state wide linking rules, utilising the feeder's date of service. Please see the Pharmacy section above for more details on the rules used. For Round 17, 80% of the records were matched to inpatients with the rest matched to ED and outpatients, as displayed in Table 41 below.

Table 41: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**34,384**
b. Number of records validated against internal costing/business rules	34,384
c. Number of records loaded into costing system	34,384
Number of records linked to inpatients	29,149
Number of records linked to emergency	28
Number of records linked to outpatients	5,207
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

Ward Nursing

Bundaberg uses the Tredcare HBCIS ADT system, which records encounter details such as the admission time, date time and ward transfers. The ward transfer times were used to create fractional bed days for each patient. Further, additional time RVUs were used to acknowledge the extra effort of

the staff during admission, discharge and death. These were state wide RVUs that are allowed to be reviewed and amended locally.

The linking performed used the state wide linking rules, utilising the feeder's date of service. Please see the Pharmacy section above for more details on the rules used. As Table 42: Outcome of ward nursing feeder linking demonstrates, all records were linked to inpatients for Round 17.

Table 42: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**301,267**
b. Number of records validated against internal costing/business rules	301,267
c. Number of records loaded into costing system	301,267
Number of records linked to inpatients	301,267
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

6.2.5   The costed dataset

QA process

There is a shared responsibility between the costing staff of the Bundaberg database to perform checks before submission to the jurisdiction. All data transformation processes have reconciliations back to source information. The key reconciliation is the activity summary check, which is a reconciliation of GL cost to patient level cost outcomes. Monthly reports are also run and provided to business managers who provide this information back to their clinical teams.

Other QA processes undertaken by the hospital include reviewing of batch processing audit reports, site status audit reports and pre-extract audit reports. More detailed QA checks are performed by the jurisdiction and reported back to the HHS. These are described in more detail in Section 6.5.1. The jurisdiction provides the CFO of the HHS summarised cost reports to approve by sign off. The CFO will review whether cost variance from prior year is greater than 10%.

Adjustments

No adjustments to activity or costs are made by the site costing team. All adjustments to the costed dataset are made by the jurisdiction once costed output has been submitted, and these are described in Section 6.5.2.

Work in progress (Item E)

Adjustments are made by the jurisdictional team after the data has been extracted to exclude those patients who have been admitted in the reference year but are yet to be discharged by the close of the reference year as is required under the AHPCS. For Round 17, patients whose length of stay exceeded 200 days in a prior year had these costs inflated by an indexation factor in line with the request from IHPA. The diagram below illustrates the four combinations of admission and discharge dates that can occur.

Figure 6: Treatment of WIP patients

Scenario	<--- Previous years	2012/2013 (R17)	Future ---> years	Cost allocation approach		Submitted to IHPA	
				AHPCS Preferred	Followed	IHPA Preferred	Followed
Scenario 1				Allocate	Yes	Submit	Yes
Scenario 2				Allocate	Yes	Submit	Yes
Scenario 3				Allocate	Yes	Do not submit	Yes
Scenario 4				Allocate	Yes	Do not submit	Yes

🟠 *Admission date*
🔴 *Discharge date*
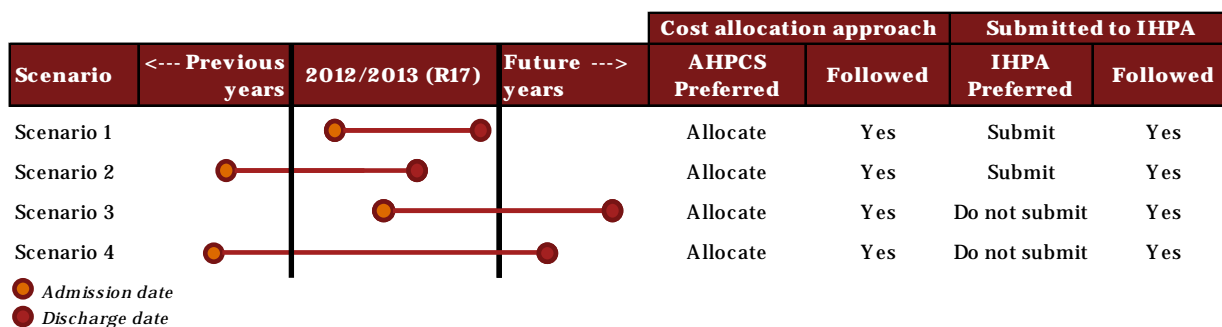
For all QLD sites in Round 17, patients in each of these scenarios were treated the following ways:

- Scenario 1 – Encounters are allocated costs for FY 2012/13 from their time of admission to discharge. These encounters are submitted to IPHA

- Scenario 2 – Costs from the FY 2012/13 and previous financial years are allocated to these patients. Costs from previous rounds are not indexed unless the length of stay was longer than 200 days at the time of discharge and the patient was admitted in the previous financial year. These encounters are submitted to IPHA.

- Scenario 3 & 4 – Encounters where patients have not been discharged by the end of the current year are allocated costs from the current financial year, but are not submitted to IPHA in the current round. These will be submitted in future rounds depending on when the patient is discharged.

6.2.6 Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. As Table 44 below demonstrates, no differences in costs were noted.

Table 43: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Rehab	$11,217.11	$11,217.11	-
2	AdmED	$749.16	$749.16	-
3	Outpat	$340.62	$340.62	-
4	NonAdmED	$656.53	$656.53	-
5	Acute	$862.86	$862.86	-

6.3 Townsville HHS
6.3.1 Site overview

The Townsville HHS is made up of 18 hospitals, community health campuses and two residential aged care facilities servicing a population of approximately 200,000 people in north QLD. There are seven spoke sites within the network, which are generally smaller, block-funded facilities offering 20 to 30 beds. The region services a relatively high proportion of ATSI patients compared to the other sites visited in this financial review.

Table 44 below outlines the flow of costs from the GL through to submission to IHPA. We noted a $270,000 variance when costs were allocated to patients, which is less that 0.04% of total costs.

Table 44: Financial overview of Townsville HHS, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$714,875	Total costed products	$685,845
B. Adjustments to the GL		E. Final adjustments	
Inclusions	-	WIP - carried forward patients	$52,271
Exclusions	($29,300)	WIP - patients not discharged by year end	($32,462)
Total hospital expenses	**$685,575**	Records removed during QA checks	($139,152)
C. Allocation of costs		Corporate overheads	$11,810
Patient care areas (direct)	$573,419	Out of scope activities	($4,522)
Overhead areas (indirect)	$112,156	Negative cost encounters	$101
Total hospital expenses	**$685,575**	Mismatched cost records	($20,896)
Variance	-	**Total costs submitted to IHPA**	**$552,996**
		Variance	-
D. Allocation of costs to patients			
Acute	$323,491		
Outpatients	$126,244		
Emergency	$46,430		
Sub-acute	$39,857		
Mental health	-		
Teaching and training	-		
Research	-		
Other	$149,822		
Total costed products	**$685,845**		
Variance	($270)		

6.3.2 Financial data

General Ledger (Item A)

Financial statements are released at the HHS level. The total expenses per the financial statements for FY 2012/13 were $715.1 million. A $227,000 variance was noted between what was recorded on the financial statements and what was included in the costing system (display under GL in Table 44 above). This was due losses on inventories and price differences which were recorded as expenditure in the financial statements but as negative revenue in the GL.

The GL structure and treatment of costs are consistent throughout QLD. As part of this review, specific cost items were examined to understand how they were treated in the GL and in costing. Please see Section 6.2.2 for more information on what costs were examined and their treatment.

Inclusions and exclusions (Item B)

No inclusions to the GL are made at the site level. The total dead-ended costs for this round were $27.8 million. Dead-ended costs may include various administrative functions and commercial services which are out of scope in the AHPCS. Another $1.4 million for capital costs was excluded from the GL.

Allocation of overheads (Item C)

Overheads that are included in the hospital GL are allocated to patients based on total expenses. However, not all overheads are included in the hospital GL, and additional costs are added by the jurisdiction upon submission. These overheads were added to comply with the AHPCS and allocated to costed patient records based on total expenses.

Distribution of costs between hospital products (Item D)

Distribution of costs was performed using activity data in line with the state wide methodology. See Section 6.2.2 for more information.

6.3.3 Activity information and costing methodology

Overview

The costing methodology and activity information used in Round 17 at Townsville did not deviate from the state wide methodology. Section 6.2.3 explains the allocation methodology by product that was used by Bundaberg and Townsville for Round 17.

6.3.4 Feeder data for sample areas

Overview

As part of the costing process different methodologies will be utilised to allocate costs to a patient level. The recommended methodology in the AHPCS is using a feeder system, which uses direct patient activity data to allocate costs. However, if this is not available then service weights or RVUs could be used. Townsville used a range of feeder systems in Round 17 in order allocate costs to patients, include pharmacy, imaging, prosthetics, theatre, critical care, bloods, ED, ward nursing and ward medical. Three sample feeder systems are discussed in more detail below.

Pharmacy

Townsville uses the iPharmacy system, which acts as the pharmacy activity feeder. All wards have a med-station that allows staff to dispense medication and allocate it directly to a patient record, which means there are no imprest drugs. However, the current feeder system does not, however, distinguish between PBS and non-PBS drugs.

Linking of records is performed in accordance with the state wide process, as described in Section 6.2.4. For Round 17, 86% of records were matched to inpatients and 7.2% of source records were unable to be matched to a patient encounter.

Table 45: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**809,823**
b. Number of records validated against internal costing/business rules	809,823
c. Number of records loaded into costing system	809,823
Number of records linked to inpatients	700,058
Number of records linked to emergency	17,356
Number of records linked to outpatients	33,772
Number of records linked to other activity	-
Number of unmatched records	58,637
Number of feeder system occasions of service	-

Theatre

Townsville HHS uses ORMIS, which records various data points during the patient operation. The use of the feeder data and linking rules used was consistent with the approach taken at Bundaberg, which can be found in Section 6.2.4. For Round 17, all but 11 records were matched to inpatients, as displayed in Table 46 below.

Table 46: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**37,726**
b. Number of records validated against internal costing/business rules	37,726
c. Number of records loaded into costing system	37,726
Number of records linked to inpatients	37,715
Number of records linked to emergency	-
Number of records linked to outpatients	11
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

Ward Nursing

Townsville uses FAMMIS, which includes data on the patient's encounter in hospital, such as the admission and discharge date and time, and transfers between wards. The use of the transfer records and RVUs to allocate costs, along with the linking methodology, is consistent with the approach taken at Bundaberg, which can be found in Section 6.2.4. In Round 17, all records were linked to inpatients as shown in Table 47.

Table 47: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**582,721**
b. Number of records validated against internal costing/business rules	582,721
c. Number of records loaded into costing system	582,721
Number of records linked to inpatients	582,721
Number of records linked to emergency	
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

6.3.5   The costed dataset

QA process

Costing is the responsibility of the costing officer from the Funding Analysis and Clinical Costing Team. A manager from the same team will review the costed outputs before submission to the jurisdiction. The hospitals do perform some reconciliations and checks of their own by reviewing the activity summary, which is a reconciliation of expenditures from the GL and final costs charged to encounters. Various other validations of the data are performed including checks to source feeder systems and checks of zero cost and high cost patients.

More detailed QA checks are performed by the jurisdiction and reported back to the HHS. These are described in more detail in Section 6.5.1. The jurisdiction provides the CFO of the HHS summarised cost reports to approve by sign off. After the jurisdiction has completed their validity testing and made the required adjustments, the CFO of the Townsville HHS signs off the finalised costed output.

Adjustments

The site costing team makes no adjustments to activity or costs. All adjustments to the costed dataset are made by the jurisdiction once costed output has been submitted. A description of the adjustments can be found in Section 6.5.2.

Work in progress (Item E)

Adjustments are made for patients whose stay at the hospital crosses the financial year in accordance with the state wide policy described. This is consistent with the approach taken by Bundaberg, which is described in Section 6.2.5 above.

6.3.6   Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. As Table 48 below demonstrates, no differences in costs were noted.

Table 48: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Rehabilitation	$13,784.16	$13,784.15	-
2	Acute	$891.00	$891.00	-
3	Admitted ED	$1,404.52	$1,404.53	-
4	Non-admitted ED	$538.36	$538.36	-
5	Outpatient	$167.43	$167.43	-

6.4 Sunshine Coast HHS
6.4.1 Site overview

Nambour Hospital is the primary facility within the Sunshine Coast HHS offering around 350 beds. Caloundra and Gympie are the other main facilities of the HHS offering between 50 and 60 beds at these sites. The Sunshine Coast HHS services mostly an ageing and weekend / holiday maker population, with close to 400,000 people in southeast QLD. The ATSI population is small, representing approximately 1.5% of this population. The Sunshine Coast HHS also has contract arrangements in place for full services with the Noosa Hospital and the Sunshine Coast University Hospital, both owned by a private provider.

The construction of new clinics has introduced challenges for the costing team. New products in the costing system relating to outpatient data have made defining costs difficult. Input into these decisions is made with the department head. Another challenge for the costing team is to correctly allocate costs between facilities when medical staff visit patients outside their native hospital. While the costing team are able to allocate costs to be spread across these facilities, they are only able to allocate costs accurately if they have sufficient information.

Table 44 below outlines the flow of costs from the GL through to submission to IHPA. We note that the $9.8 million variance is due to WIP patient costs being brought forward from prior years that were included in the breakdown of costs by product in item D.

Table 49: Financial overview of Sunshine Coast HHS, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$649,919	Total costed products	$656,627
B. Adjustments to the GL		E. Final adjustments	
Inclusions	-	WIP - patients not discharged by year end	($9,869)
Exclusions	($3,076)		
Total hospital expenses	**$646,843**	Records removed during QA checks	($95,357)
C. Allocation of costs		Corporate overheads	$9,372
Patient care areas (direct)	$556,873	Out of scope activities	($99,624)
Overhead areas (indirect)	$89,970	Mismatched cost records	($2,799)
Total hospital expenses	**$646,843**	**Total costs submitted to IHPA**	**$458,351**
Variance	-	**Variance**	-
D. Allocation of costs to patients			
Acute	$279,130		
Outpatients	$84,803		
Emergency	$48,831		
Sub-acute	$49,097		
Mental health	-		
Teaching and training	-		
Research	-		
Other	$194,767		
Total costed products	**$656,627**		
Variance	**($9,784)**		

6.4.2   Financial data

General Ledger (Item A)

Financial statements are published at the HHS level. The total expenses per the financial statements for FY 2012/13 were $650.7 million. $649.9 million of this was in the GL for costing. The difference of approximately $821,000 was made up of the following reconciling items:

- Losses on inventories and price differences (recorded as negative revenue when these should have been recorded as an expense) amount to a negative adjustment of approximately $472,000.

- Capital works cost centres included in the audited financial statements, but were not included in Transition II for costing. These amount to a positive adjustment of approximately $720.000.

- Removal of $579,214 to align the trial balance expenses with audited financial statements.

The GL structure and treatment of costs are consistent throughout QLD. As part of this review, specific cost items were examined to understand how they were treated in the GL and in costing. Please see Section 6.2.2 for more information on what costs were examined and their treatment.

Inclusions and exclusions (Item B)

No inclusions to the GL are made at the site level. The total dead-ended costs for this round were $3.1 million. Dead-ended costs may include various administrative functions and commercial services which are out of scope in the AHPCS.

Allocation of overheads (Item C)

Overheads that are included in the hospital GL are allocated to patients based on total expenses. However, not all overheads are included in the hospital GL, and additional costs are added by the jurisdiction upon submission. These overheads were added to comply with the AHPCS and are allocated to costed patient records based on total expenses.

Distribution of costs between hospital products (Item D)

Distribution of costs was performed using activity data in line with the state wide methodology. See Section 6.2.2 for more information.

6.4.3   Activity information and costing methodology

Overview

The costing methodology and activity information used in Round 17 at Sunshine Coast did not deviate from the state wide methodology. Section 6.2.3 explains the allocation methodology by product that was used by Bundaberg and Sunshine Coast for Round 17.

6.4.4   Feeder data for sample areas

Overview

As part of the costing process different methodologies will be utilised to allocate costs to a patient level. The recommended methodology in the AHPCS is using a feeder system, which uses patient activity data to allocate costs. However, if this is not available then service weights or RVUs could be used. Sunshine Coast used a range of feeder systems in Round 17 in order allocate costs to patients, include pharmacy, imaging, prosthetics, theatre, critical care, bloods, ED, ward nursing and ward medical. Three sample feeder systems are discussed in more detail below.

Pharmacy

Sunshine Coast HHS uses the feeder systems iPharmacy and Stocker, which records consumption of pharmacy products by patients. Imprest drugs are allocated to wards, and allocated to patients using the ward's allocation methodology. Dispensed drugs are linked to patients based on the date of service. The linking of these records was performed in accordance with the state wide process, as described in Section 6.2.4. For Round 17 the linking rules resulted in 66% of records being linked in inpatients and 12% being unmatched as shown in Table 50. Unmatched pharmacy records were linked to the Tier 2 40.04 Clinical Pharmacology clinic and submitted to IHPA as occasions of service.

Table 50: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**116,461**
b. Number of records validated against internal costing/business rules	116,461
c. Number of records loaded into costing system	116,461
Number of records linked to inpatients	77,407
Number of records linked to emergency	142
Number of records linked to outpatients	24,414
Number of records linked to other activity	-
Number of unmatched records	14,498
Number of feeder system occasions of service	-

Theatre

Sunshine Coast HHS uses ORMIS, which records various data points of the patient operation. The use of the feeder data and linking rules used was consistent with the approach taken at Bundaberg, which can be found in Section 6.2.4. For Round 17, all but 6 records were matched to inpatients, as displayed in Table 51 below.

Table 51: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**70,071**
b. Number of records validated against internal costing/business rules	70,071
c. Number of records loaded into costing system	70,071
Number of records linked to inpatients	70,065
Number of records linked to emergency	-
Number of records linked to outpatients	6
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

Ward Nursing

Sunshine Coast HHS uses FAMMIS, which includes data on the patient's encounter in hospital, such as the admission and discharge date and time, and transfers between wards. The use of the transfer records and RVUs to allocate costs, along with the linking methodology, is consistent with the approach taken at Bundaberg, which can be found in Section 6.2.4. In Round 17, all records were linked to inpatients as shown in Table 52.

Table 52: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**1,073,267**
b. Number of records validated against internal costing/business rules	1,073,267
c. Number of records loaded into costing system	1,073,267
Number of records linked to inpatients	1,073,267
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

6.4.5 The costed dataset

QA process

The Patient Costing & Reporting Officer of the Funding, Information and Costing Service team is primarily responsible for performing the costing, and this is reviewed by a Senior Business Support Officer. The costing team run weekly reports on volumes and patient activity looking for missing data and signs of integrity issues. Comparisons between data used in costing and data extracted from source systems are made. Current staffing constraints have limited the level of reporting able to be performed.

More detailed QA checks are performed by the jurisdiction and reported back to the HHS. These are described in more detail in Section 6.5.1. The jurisdiction provides the CFO summarised cost reports to approve by sign off. After the jurisdiction has completed their validity testing and made the required adjustments, the CFO of the Townsville HHS signs off the finalised costed output.

Adjustments

No adjustments to activity or costs are made by the site costing team. All adjustments to the costed dataset are made by the jurisdiction once costed output has been submitted, which can be found in Section 6.5.2.

Work in progress (Item E)

Adjustments are made for patients whose stay at the hospital crosses the financial year in accordance with the state wide policy described. This is consistent with the approach taken by Bundaberg, which is described in Section 6.2.5.

6.4.6 Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. As Table 53 below demonstrates, no differences in costs were noted.

Table 53: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$22,928.48	$22,928.48	-
2	Rehab	$644.84	$644.84	-
3	AdmED	$821.36	$821.36	-
4	NonAdmED	640.1939	$640.19	-
5	Outpat	$108.37	$108.37	-

6.5 Jurisdictional overview

6.5.1 Overview of process

QLD Health plays a central role in finalising the costed dataset submitted by the various Hospital and Health Services. They also provide guidance to each of the HHSs in the form of QLD Costing Implementation Guidelines. Once data is received by QLD Health, a data transformation and QA process is performed over the data. This occurs in October each year and is performed over each of the costing databases within the HHSs.

The data transformation and QA process performed by the jurisdiction is summarised in the following steps:

- Pre-extract audit – the underlying cost data is assessed using a number of crystal reports which identify data quality issues that may have an adverse effect on costing outcomes. If the costed data fails to pass an 80% confidence level, then the costing teams are informed that the data is of insufficient quality to be progressed to the next step of transformation. The costing teams will then re-cost and the audit will take place again.

- Source data extraction – once the data has been validated, three data extractions are done:
    - Patient level costing data is extracted from Transition II
    - Patient information is extracted from a system called pAWS, which contains information on admitted, ED and outpatients
    - GL data is extracted from the Decision Support System for reconciliation to costed outputs.

- Data mapping and review – A mapping is required between the state's required data elements and the NHCDC data requirements. A review at this point allows for the management of changes or new cost centres that require mapping.

- Facility specific data transformation – some facilities require additional transformation procedures to prepare patient level data.

- Build HHS level NHCDC database – new database is constructed for IHPA submission purposes using this source cost information. The original data is maintained for reconciliation purposes.

- Create cost reports – cost reports are created to ensure there are no significant costing issues that will require a re-extraction of data.

Once the final audit has completed, a spreadsheet is returned to the HHSs, where the outcomes of validation reports, costs by facilities, negative cost encounters and high and low cost encounters are reported. An end-to-end reconciliation is performed to identify variances in cost between the initial GL loaded for costing, and the finalised data in the Decision Support System (DSS).

6.5.2 Adjustments to costed dataset

General adjustments were made to the costed datasets of all HSS by the jurisdiction as part of their finalisation procedures. These included:

- Excluded services – These include trust management costs, community care and other dead-ended costs in order to comply with the AHPCS. They are allocated to a virtual patient and subsequently excluded.

- Data quality–related issues – Records that do not meet the validation requirements are excluded from the costed dataset. These may include records where the date of birth is earlier than 1 Jan 1900, an unqualified baby that does not have a corresponding episode for the mother, and patients who have been admitted based on ED records, but do not have an inpatient record. Unlinked records may exist where a record with full patient demographic data does not have a corresponding cost record.

Wide Bay HHS (Bundaberg)

Below is a list of specific adjustments made to the Bundaberg data by the jurisdiction:

- WIP adjustments – $14.3 million was added which related to carried forward costs from prior years. $6.7 million was removed which related to patients who were admitted during the financial year but were not yet discharged.

- Costs removed due to QA checks – $9.2 million was removed due to patient records not passing all the state and IHPA quality assurance checks.

- Corporate overheads – $5.4 million of corporate overheads added by the jurisdiction. Corporate overheads are allocated based on total cost of the encounter for inpatient, emergency and outpatients.

- Out of scope activities – $9.4 million related to non-ABF activities, including services provided to other entities and patient transport schemes.

- Negative cost encounters – $18,000 relating to encounters with a negative cost have been excluded in accordance with IHPA guidelines, increasing overall total costs.

- Mismatched cost records – $8.2 million was excluded, relating to patient and cost records unable to be linked or matched correctly. This is primarily due to data quality issues.

The impact of these adjustments on activity across the hospital products is listed below:

- Acute – 184 encounters excluded

- Outpatient – 12,293 encounters excluded

- Emergency – 11,222 encounters included (due to product type matching errors during processing)

- Sub-acute – 17 encounters excluded

- Other – 535 encounters excluded.

Townsville HHS

Below is a list of specific adjustments made to the Townsville data by the jurisdiction:

- WIP adjustments – $52.3 million was added which related to carried forward costs from prior years. $32.4 million was removed which related to patients who were admitted during the financial year but were not yet discharged.

- Costs removed due to QA checks – $139.2 million was removed due to patient records not passing all the state and IHPA quality assurance checks.

- Corporate overheads – $11.8 million in corporate overheads added by the jurisdiction. Corporate overheads are allocated based on total cost of the encounter for inpatient, emergency and outpatients.

- Out of scope activities – $4.5 million related to non-ABF activities, including nursing homes and services provided to other entities.

- Negative cost encounters – $101,000 relating to encounters with a negative cost have been excluded in accordance with IHPA guidelines, increasing overall total costs.

- Mismatched cost records – $20.9 million was excluded, relating to patient and cost records unable to be linked or matched correctly. This is primarily due to data quality issues.

The impact of these adjustments on activity across the hospital products is listed below:

- Acute – 423 encounters excluded

- Outpatient – excluded 22,540 encounters

- Emergency – included 15,213 encounters (due to product type matching error during processing)

- Sub-acute – excluded 57 encounters and

- Other – excluded 1,715 encounters

Sunshine Coast HHS

Below is a list of adjustments made to the Sunshine Coast data by the jurisdiction:

- WIP adjustments – $9.9 million was removed which related to patients who were admitted during the financial year but were not yet discharged.

- Costs removed due to QA checks – $95.4 million was removed due to patient records not passing all the state and IHPA quality assurance checks.

- Corporate overheads – $9.3 million of corporate overheads added by the jurisdiction. Corporate overheads are allocated based on total cost of the encounter for inpatient, emergency and outpatients.

- Out of scope activities – $99.6 million related to non-ABF activities, including services provided to other entities, nursing homes and the patient transport scheme.

- Negative cost encounters – $18,000 relating to encounters with a negative cost have been excluded in accordance with IHPA guidelines, increasing overall total costs.

- Mismatched cost records – $2.82 million was excluded, relating to patient and cost records unable to be linked or matched correctly. This is primarily due to data quality issues.

The impact of these adjustments on activity across the hospital products is listed below:

- Acute – 444 encounters excluded

- Outpatient – 11,877 encounters excluded

- Emergency – 3,299 encounters included (due to product type matching error during processing)

- Sub-acute – 57 encounters excluded

- Other – 352 encounters excluded.

6.5.3   Reconciliation with IHPA

Table 54 below compares the total costs and activity records submitted by the jurisdiction with the total costs and activity records that were received by IHPA. No variances were identified from the reconciliation.

Table 54: Reconciliation of total costs and activity submitted

	Wide Bay (Bundaberg)		Townsville		Sunshine Coast	
Item	Activity	Costs ('000s)	Activity	Costs ('000s)	Activity	Costs ('000s)
Submitted by Jurisdiction						
Acute	36,259	$100,836	68,302	$322,687	78,079	$274,998
Sub-acute	951	$9,405	1,695	$48,879	2,926	$45,281
Emergency Dept	59,369	$44,705	87,467	$51,767	99,824	$49,061
Outpatients	140,448	$46,211	394,636	$129,613	232,080	$88,880
Other	390	$5,588	1,328	$51	753	$131
Total	237,417	$206,745	553,428	$552,996	413,662	$458,351
Data received by IHPA	237,417	$206,745	553,428	$552,996	413,662	$458,351
Variance	-	-	-	-	-	-

7   *South Australia*

7.1   *South Australia overall*

In Round 17, the SA Department of Health (SA Health) Funding Models Unit conducted the costing for South Australian hospitals, in conjunction with LHN representatives. This differs to previous rounds, where SA hospitals were costed at the hospital level. SA Health worked closely with staff and clinicians at hospitals to ensure the results were appropriately reviewed.

SA Health nominated Flinders Medical Centre (FMC) and Noarlunga Hospital (NH) as the participating hospitals for the Round 17 review. Both are part of the Southern Adelaide Local Hospital Network (SALHN).

7.1.1   *Changes since Round 16*

As SA Health moves towards monthly costing and the responsibility for costing shifts to SA Health, there were several changes during the Round 17 review compared to previous rounds. SA Health used the PPM2 costing software, and established a centralised collection of financial and patient activity data. This centralised database also stores pharmacy and ED data. A greater resource allocation to the SA Health costing team also allowed for more rigorous QA data reviews in Round 17.

SA Health also implemented two costing improvements in Round 17. The first was to cost ED and outpatient episodes at a patient level, using data stored in the central database. Due to the infancy of outpatient data collection, SA Health did not submit this data to the IHPA in Round 17. The second improvement was to conduct costing for six country hospitals, whereas previous rounds of costing used cost modelling for all country sites.

7.2   *Flinders Medical Centre*

7.2.1   *Site overview*

FMC is a 593 bed public teaching hospital and medical school, co-located with Flinders University and Flinders Private Hospital. FMC serves the southern suburbs of Adelaide, but also cares for patients from regional areas of SA and NT. The hospital provides an extensive range of services and is one of two major trauma centres in SA.

The table below is a summary of costs beginning with total expenses from the GL through to the total costs submitted to IHPA with the various adjustments made during the process. No variances were noted between the GL and the financial data submitted to IHPA.

Table 55: Financial overview of Flinders Medical Centre, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$526,249	Total costed products	$567,038
B. Adjustments to the GL		E. Final adjustments	
Inclusions	$72,635	WIP adjustments*	($3,410)
Exclusions	($31,846)	Other adjustments	($1,497)
Total hospital expenses	**$567,038**	Outpatients not submitted	($81,411)
		Teaching and research	($17,917)
C. Allocation of costs		Dummy patient and non-casemix patients	($4,034)
Patient care areas (direct)	$418,331		
Overhead areas (indirect)	$148,708	**Total costs submitted to IHPA**	**$458,770**
Total hospital expenses	**$567,038**	**Variance**	-
Variance	-		
D. Allocation of costs to patients			
Acute	$422,922		
Outpatients	$81,411		
Emergency	$32,274		
Sub-acute	$8,481		
Mental health	-		
Teaching and research	$17,917		
Other	$4,034		
Total costed products	**$567,038**		
Variance	-		

*This amount includes carried-forward costs from 2011/12 and costs removed for patients who had not been discharged by year end. Carried forward costs were indexed at 3%.

7.2.2 Financial data

General Ledger (Item A)

Financial Statements are prepared at the SALHN level, and GLs are maintained at the hospital level. The total expenses per the financial statements for FY 2012/13 were $946.32 million. Of this amount, FMC contributed $526.25 million.

Table 56: Treatment of specific cost items

Cost item	Included in hospital's GL and costed	Allocated from dept or jurisdiction and costed	Not in GL or included in costing
Superannuation	✔		
Defined benefit scheme	✔		
Professional idemnity insurance	✔		
Workers' compensation	✔		
Annual leave costs	✔		
Long service leave costs		✔	
PBS rebates			✔
Trade discounts on pharmaceuticals			✔

Table 56 above identifies specific costs that were reviewed to understand their treatment in the GL and the costing process. Once these costs are allocated to final cost centres they are distributed to patients using the allocation methodology of that cost centre. Key cost treatments to note include:

- Superannuation and defined benefit scheme contributions sit in the cost centre where the staff member is paid from. No additional charge for defined benefit scheme liability adjustments are charged to the hospital GL.

- Professional indemnity and building insurances are allocated to LHN cost centres as part of accounting practices and are then allocated to hospitals during the costing process.

- A workers compensation levy is paid centrally with hospitals incurring all the associated workers compensation costs.

- All leave expenses sit in the cost centre where the staff member is paid and no additional allocation is required.

- PBS rebates sit within revenue accounts and are not brought in for costing purposes.

- Trade discounts are included in the expenses accounts and are therefore allocated to patients.

- Asset valuations are performed every three years and the depreciation in the GL is adjusted accordingly.

Inclusions and exclusions (Item B)

A total of $72.6 million was added to the extracted GL before uploading the total hospital costs into the costing system. This was made up of:

- $1.1 million of procurement services

- $5.6 million for the centrally run SA Pathology

- $0.2 million for the transfer of RGH patients due to the closure of Repatriation General Hospital (RGH) Emergency Department

- $34.3 million for the allocation of SALHN corporate costs

- $22.4 million for costs from other sites during the final patient costing process

- $9.2 million for reclass rules applied to FMC (costs related to FMC services).

A total of $31.8 million was excluded from the extracted GL. This was made up of:

- $12.9 million for recharges (revenue recouped for staff working in another hospital).

- $0.01 million for the collection of bad debts.

- $13.1 million for overheads in FMC relating to other sites

- $5.8 million reclass rules applied From FMC (costs unrelated to FMC services).

After these inclusions and exclusions, total expenses for FMC were $567.01 million.

Allocation of overheads (Item C)

For FY 2012/13, overhead costs totalled $148.7 million, which represents 26.2% of total costs for FMC. These costs were allocated to the patient care areas based on a variety of allocation statistics. The key allocation statistics utilised for Round 17 was headcount, total expenses, floor space, number of patients etc. The allocation statistics were determined based on the preferred hierarchy of allocation statistics in the AHPCS along with what reliable information was available.

Distribution of costs between hospital products (Item D)

Where some cost centres delivered services to multiple hospital products (such as medical cost centres servicing inpatients and outpatients along with some teaching), PFRACs were developed and utilised during the costing process. These PFRACs are reviewed on an annual basis in consultation with hospital staff and clinicians. PFRACs are also reviewed throughout the year if there is an indication of material change in hospital services provided by the cost area.

7.2.3   Activity information and costing methodology

Overview

Once costs are split into the various cost areas and are ready to be allocated, a variety of allocation methodologies are used to allocate costs to patients across all hospital products depending on the patient care type.

Table 57: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Inpatients are allocated costs using various feeder systems, which indicate consumption of hospital resources or services. Acute inpatients are classified using AR-DRGs and sub-acute patients are classified under AN-SNAP.
	Nursing costs are allocated using patient minutes from Excelcare, whereas ward medical costs are allocated based on fractional bed days. All inpatients are also allocated the costs of diagnostics tests (such as imaging and pathology), pharmacy and allied health use feeder data such as standard/actual costs or duration to allocate costs at the patient level.
	Prosthetic costs are allocated directly to patients using the Operating Theatre System (OTS) actual charge as the cost driver. If prostheses data is missing for patients expected to receive a prosthetic cost, then a national average prosthetic cost per DRG is used to allocate cost.
	Blood products are not currently in the GL of the hospital and thus are not included for costing. Blood products are funded by SA Health and the Commonwealth.
Emergency Department	Patients are allocated doctor and nursing costs based on ED presentation duration (time first seen by doctor to time of ED discharge) extracted from the EDDC system. Diagnostic tests and dispensed pharmaceuticals are allocated to patients directly based on consumption.
Outpatients	Outpatients are costed using a variety of feeder systems to reflect the patients' consumption of resources. Outpatient scheduling data is extracted from the CDW system and allocated to outpatient

Hospital product	Allocation overview
	clinics. Diagnostic tests and dispensed pharmaceuticals are also allocated to patients directly based on consumption. Outpatients were not submitted in Round 17.
Mental Health	Mental health patients are costed using patient level consumption data where possible. Costing methodology for admitted mental health patients are consistent with other admitted hospital services.
Teaching, training and research	Direct teaching, training and research costs where identified as part of the costing process but were not included in the Round 17 NHCDC submission.
Other	Boarder activity and costs are excluded and not submitted to IHPA.

7.2.4 Feeder data for sample areas

Overview

As part of the costing process different methodologies will be utilised to allocate costs to a patient level. The recommended methodology in the AHPCS is using a feeder system, which uses direct patient activity data to allocate costs; however if this is not available then service weights or RVUs could be used. Some allocation methodologies at FMC of note include:

- Patients are allocated theatre costs based not only on duration, but also on the number of surgeons/anaesthetists in attendance.

- Prosthetics costs are allocated directly to patients using the OTS actual charge data. If actual charge data is missing the national average cost per DRG is used as the cost driver.

Pharmacy

FMC uses iPharmacy, which records patient level consumption of pharmaceutical products. Imprest drug costs are allocated to wards, and are the distributed to patients based on fractional bed days, whereas dispensed drugs that are administered directly to patients are recorded in iPharmacy which is used to allocate costs. The results of the linking process are shown in table Table 58: Outcome of pharmacy feeder linking.

Dispensed drugs are linked to patients based on their medical record number and service date from iPharmacy, where the unit cost taken from the price list provided through vendors. The records were first linked to inpatients if the service date was either within two days before the admission or two days after the discharge date. If that linking failed, it was then linked to ED presentations with a service date within two days of the presentation date. If that linking failed, it was then linked to outpatients where the service date was within 30 days of the outpatient service event. Records that are unable to be matched are linked to a virtual patient, which holds the costs for those drugs.

Table 58: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**197,298**
b. Number of records validated against internal costing/business rules	193,113
c. Number of records loaded into costing system	197,288
Number of records linked to inpatients	117,735
Number of records linked to emergency	30,462
Number of records linked to outpatients	44,916
Number of records linked to other activity	-
Number of unmatched records	4,175
Number of feeder system occasions of service	-

While 197,298 records were extracted from the system, 4,175 records related to imprest drugs that were allocated to wards. The remaining 193,113 records related to dispensed drugs that were able to be linked to patient activity.

Theatre

OACIS at FMC records various data points of the patients in theatre, such as start and end time of anaesthetics, number of surgeons and anaesthetists etc. Data is extracted from the system and links directly to the patient encounter. Records are first linked to inpatients if the date of service is 24 hours before admission or 24 hours after discharge times, otherwise it is linked to outpatients if within 24 hours of service date and time. The results of this linking process is displayed in Table 59 below.

Multiple cost drivers are used to allocate theatre costs, which includes patient surgery duration (start to end time), anaesthetic duration (start to end), number of surgeons, and number of anaesthetists. The system does not record the number of nurses per operation and as such, total theatre time is used to allocate nursing costs to a patient. Central Sterilisation Department (CSSD) costs are allocated as an overhead.

Table 59: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**16,039**
b. Number of records validated against internal costing/business rules	16,023
c. Number of records loaded into costing system	16,039
Number of records linked to inpatients	15,529
Number of records linked to emergency	-
Number of records linked to outpatients	494
Number of records linked to other activity	-
Number of unmatched records	16
Number of feeder system occasions of service	-

There were 16,039 records extracted from OACIS, of which 16,023 could be linked to patients. This leaves 16 records that could not be matched/linked with admitted patient episodes.

Ward Nursing

Excelcare is the nursing dependency system at FMC, which provides nursing time by patient, which is the basis of allocating nursing cost to the patient. Data is extracted from the system and links directly to the patient encounter. Inpatients are linked if their activity falls within 2 days of the service.

The table below outlines the linking of records from the source system to patients within the hospital products.

Table 60: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	453,922
b. Number of records validated against internal costing/business rules	439,089
c. Number of records loaded into costing system	453,922
Number of records linked to inpatients	439,089
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	14,833
Number of feeder system occasions of service	-

There were 453,922 records extracted from Exclecare, of which 439,089 could be linked to patients. This leaves 14,833 records that could not be matched/linked. Costs attributed to this activity were excluded from the submission.

7.2.5   The costed dataset

QA process

Once costing has completed a range of quality assurance checks and reconciliations are performed by the SA Health staff. High-level reconciliations are performed on the total costs and activities to check that the source data that went into the costing system agrees to the costing output. Reports are then produced that show average DRGs costs, average cost by hospital product and reporting on any negative costs or separations. Exception reporting is also produced on high or low cost separations, and usual data items like extensive stays in ED. Identified issues during this process are rectified, costing is performed again, and the new costing results go through the QA processes until SA Health is satisfied with the results.

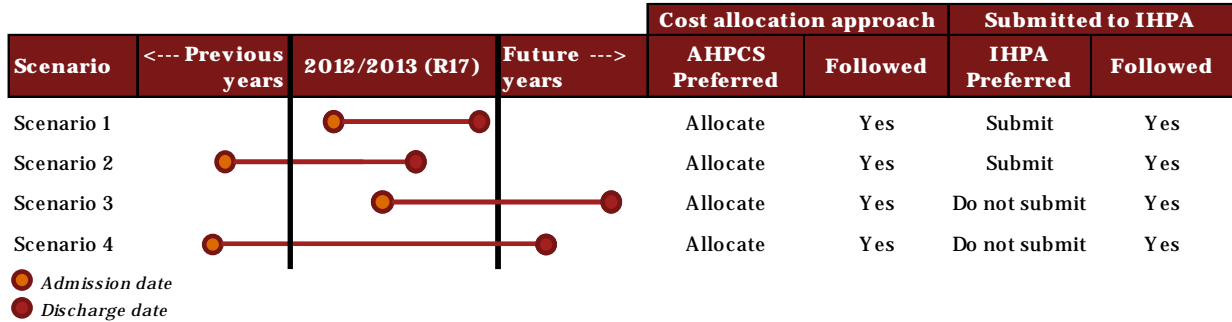**Adjustments**

SA Health made adjustments for WIP patients (discussed in the sections below). Further adjustments were made for patients that did not have a complete APC submission record. This amounted to $1.5 million in FY 2012/13, which was excluded from submission to IHPA. Another $81.4 million was excluded for outpatients that were costed but not submitted to IHPA.

Work in progress (Item E)

Adjustments are made for patients whose stay at the hospital crosses the financial year. The diagram below illustrates the four combinations of admission and discharge dates that can occur and the treatment of cost and submission through to IHPA.

Figure 7: Treatment of WIP patients

Scenario	<--- Previous years	2012/2013 (R17)	Future ---> years	Cost allocation approach		Submitted to IHPA	
				AHPCS Preferred	Followed	IHPA Preferred	Followed
Scenario 1				Allocate	Yes	Submit	Yes
Scenario 2				Allocate	Yes	Submit	Yes
Scenario 3				Allocate	Yes	Do not submit	Yes
Scenario 4				Allocate	Yes	Do not submit	Yes

🟠 *Admission date*
🔴 *Discharge date*

For FMC in Round 17, patients in each of these scenarios were treated the following ways:

- Scenario 1 patients were allocated FY 2012/13 costs for their full length of their stay. These patients were submitted to IHPA.

- Scenario 2 patients were allocated FY 2012/13 cost for the portion of their stay that fell within the year. FY 2011/12 costs were then brought forward and indexed at 3%. These were submitted to IHPA.

- Scenario 3 patients were allocated FY 2012/13 cost for the portion of their stay that fell within the year. These patients were then set aside and will be submitted to IHPA in future rounds.

- Scenario 4 patients were allocated FY 2012/13 cost for the portion of their stay that fell within the year. Prior year costs were then brought forward and indexed at 3%. SA Health do not submit any multi-year patients whose LOS extend beyond one year.

7.2.6   Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. The reconciliation found no variances, which is shown in in Table 61: Sample patient reconciliation with IHPA

Table 61: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$8,831.76	$8,831.76	-
2	Acute	$1,476.35	$1,476.35	-
3	Acute	$3,137.44	$3,137.44	-
4	Admitted ED	$1.39	$1.39	-
5	Maintenance	$102,727.27	$102,727.27	-

7.3 Noarlunga Hospital

7.3.1 Site overview

NH is an 82 bed public hospital that is co-located with Noarlunga Private Hospital. NH serves the southern suburbs of Adelaide offering a variety of services, including emergency care and community services. Complex cases or seriously ill patients are transferred to Flinders Medical Centre for treatment. NH has a Mental Health Unit and a large Emergency Department treating approximately 50,000 patients a year.

The table below is a summary of costs beginning with total expenses from the GL through to the total costs submitted to IHPA with the various adjustments made during the process. No variances were noted between the GL and the financial data submitted to IHPA.

Table 62: Financial overview of Noarlunga Hospital, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$69,824	Total costed products	$71,279
B. Adjustments to the GL		E. Final adjustments	
Inclusions	$8,891	WIP adjustments*	($819)
Exclusions	($7,435)	Other adjustments	($196)
Total hospital expenses	**$71,279**	Outpatients not submitted	($5,889)
		Teaching and research	($156)
C. Allocation of costs		Dummy/Non case mix patients	($15)
Patient care areas (direct)	$52,989		
Overhead areas (indirect)	$18,290	**Total costs submitted to IHPA**	**$64,204**
Total hospital expenses	**$71,279**	**Variance**	-
Variance	-		
D. Allocation of costs to patients			
Acute	$37,241		
Outpatients	$5,889		
Emergency	$23,002		
Sub-acute	$4,976		
Mental health	-		
Teaching and research	$156		
Other	$15		
Total costed products	**$71,279**		
Variance	-		

*This amount includes carried-forward costs from 2011/12 and costs removed for patients who had not been discharged by year end. Carried forward costs were indexed at 3%.

7.3.2   Financial data

General Ledger (Item A)

Financial statements are prepared at the SALHN level, and the GL is maintained at the hospital level. The total expenses per the financial statements for FY 2012/13 were $946.32 million. Of this amount, NH contributed $69.82 million.

Table 63: Treatment of specific cost items

Cost item	Included in hospital's GL and costed	Allocated from dept or jurisdiction and costed	Not in GL or included in costing
Superannuation	✓		
Defined benefit scheme		✓	
Professional idemnity insurance	✓		
Workers' compensation	✓		
Annual leave costs	✓		
Long service leave costs		✓	
PBS rebates			✓
Trade discounts on pharmaceuticals			✓

Table 63 above identifies specific costs that were reviewed to understand their treatment in the GL and the costing process. Once these costs are allocated to final cost centres they are distributed to patients using the allocation methodology of that cost centre. Key cost treatments to note include:

- Superannuation and defined benefit scheme contributions sit in the cost centre where the staff member is paid from. No additional charge for defined benefit scheme liability adjustments are charged to the hospital GL.

- Professional indemnity and building insurances are allocated to LHN cost centres as part of accounting practices and are then allocated to hospitals during the costing process.

- A workers compensation levy is paid centrally with hospitals incurring all the associated workers compensation costs.

- All leave expenses sit in the cost centre where the staff member is paid from and no additional allocation is required.

- PBS rebates sit within revenue accounts and are not brought in for costing purposes.

- Trade discounts are included in the expenses accounts and are therefore allocated to patients.

- Asset valuations are performed every 3 years and the depreciation in the GL is adjusted accordingly.

Inclusions and exclusions (Item B)

A total of $8.89 million was added to the extracted GL before uploading the total hospital costs into the costing system. This was made up of:

- $0.14 million for procurement services.

- $0.27 million for the centrally run SA Pathology.

- $0.04 million for the transfer of RGH patients due to the closure of Repatriation General Hospital (RGH) Emergency Department.

- $5.92 million for the allocation of SALHN corporate costs

- $2.52 million for reclass rules applied to NH (related to NH services).

A total of $7.44 million was excluded from the extracted GL. This was made up of:

- $0.81 million for recharges (revenue recouped for staff working in another hospital).

- $0.07 million for bad debts.

- $3.51 million for overheads in NH relating to other sites

- $1.86 million for costs from other sites during the final patient costing process

- $1.18 million reclass rules applied From NH (unrelated to NH services)

After these inclusions and exclusions, total expenses for FMC were $71.28 million.

Allocation of overheads (Item C)

For FY 2012/13, overhead costs totalled $18.3 million, which represents 25.7% of total costs for NH. These costs were allocated to the patient care areas based on a variety of allocation statistics, but the major statistics utilised for Round 17 was headcount, total expenses, floor space, number of patients etc. The allocation statistics were determined based on the preferred hierarchy of allocation statistics in the AHPCS along with what reliable information was available.

Distribution of costs between hospital products (Item D)

Where some cost centres delivered services to multiple hospital products (such as medical cost centres servicing inpatients and outpatients along with some teaching), PFRACs were developed. These PFRACs are reviewed on an annual basis in consultation with hospital staff and clinicians, and were reviewed for the Round 17 costing. PFRACs are also reviewed throughout the year if there is an indication of material change in hospital services provided by the cost area.

7.3.3 Activity information and costing methodology

Overview

Once costs are split into the various cost areas and are ready to be allocated, a variety of feeder systems are used to allocate costs to patients across all hospital products depending on the patient care type. The table below outlines the costing methodology for the various hospital products.

Table 64: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Inpatients were allocated costs using various feeder systems, which indicate consumption of hospital resources or services. Nursing and Ward Medical costs were allocated using LOS (fractional bed days), while diagnostics tests (such as imaging and pathology), pharmacy and allied health costs use feeder data to allocate costs with RVUs directive from either standard/actual costs, or minutes. Prosthetic costs were allocated directly to patients using the OTS actual charge as the cost driver. If prostheses data was missing for patients expected to receive a prosthetics cost, then a national average prosthetic cost per DRG was used as the cost driver. Blood products were not in the GL and thus are not included for costing.
Emergency Department	Patients were allocated doctor and nursing costs based on ED presentation duration (time first seen by doctor to time of ED discharge) extracted from the EDDC system. Diagnostic tests and dispensed pharmaceuticals were also allocated to patients directly based on consumption.
Outpatients	Outpatients were costed using a variety of feeder systems to reflect the patients' consumption of resources. For example, allied health scheduling data is extracted from the CME system and allocated to allied health clinics. Diagnostic tests and dispensed pharmaceuticals were allocated to patients directly based on consumption.
Mental Health	Mental health patients are costed using patient level consumption data where possible. Costing methodology for admitted mental health patients are consistent with other admitted hospital services.
Teaching, training and research	Direct teaching, training and research costs were identified as part of the costing process but were not included in the Round 17 NHCDC submission.
Other	Boarder activity and costs are excluded and not submitted to IHPA.

7.3.4   Feeder data for sample areas

Overview

As part of the costing process different methodologies will be utilised to allocate costs to a patient level. The recommended methodology in the AHPCS is using a feeder system, which uses direct patient activity data to allocate costs; however if this is not available then service weights or RVUs could be used. Some allocation methodologies at NH of note include:

- Patients are allocated theatre costs based not only on duration, but also on the number of surgeons/anaesthetists in attendance.

- Prosthetics costs are allocated directly to patients using ORMIS actual charge data. If actual charge data is missing the national average cost per DRG is used as the cost driver.

Pharmacy

NH uses iPharmacy, which records consumption of pharmacy products by patients. Imprest drug costs were allocated to wards, and were then distributed to patients based on fractional bed days. The costs of dispensed drugs that were administered directly to patients were allocated using iPharmacy data. The unit cost allocated to patients was taken from the price list provided through vendors. The results of the linking process are shown in Table 65 below.

Dispensed drugs are linked to patients based on their medical record number and service date from iPharmacy, where the unit cost taken from the price list provided through vendors. The records were first linked to inpatients if the service date was either within two days before the admission or two days after the discharge date. If that linking failed, it was then linked to ED presentations with a service date within two days of the presentation date. If that linking failed, it was then linked to outpatients where the service date was within 30 days of the outpatient service event. Records that are unable to be matched are linked to a virtual patient, which holds the costs for those drugs.

Table 65: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**20,266**
b. Number of records validated against internal costing/business rules	20,153
c. Number of records loaded into costing system	20,266
Number of records linked to inpatients	14,788
Number of records linked to emergency	5,012
Number of records linked to outpatients	353
Number of records linked to other activity	-
Number of unmatched records	113
Number of feeder system occasions of service	-

While 20,266 records were extracted from the system, 20,153 records related to dispensed drugs to patients with 113 records unmatched.

Theatre

OACIS at NH records various data points of the patient operations, such as start and end time of anaesthetics, date and time of first cut time spent in recovery etc. Data is extracted from the system and links directly to the patient encounter. The linking rules applied are as follows; first link inpatients if within 24 hours of service, then link outpatients if within 24 hours service. The system does not record the number of nurses per operation and total theatre time is used to allocate nursing costs to a patient. The table below outlines the linking of records from OACIS to patients within the hospital products.

Table 66: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**6,763**
b. Number of records validated against internal costing/business rules	6,751
c. Number of records loaded into costing system	6,763
Number of records linked to inpatients	5,575
Number of records linked to emergency	-
Number of records linked to outpatients	1,176
Number of records linked to other activity	-
Number of unmatched records	12
Number of feeder system occasions of service	-

There were 6,763 records extracted from OACIS, of which 6,751could be linked to patients. This leaves 12 records that could not be matched/linked with admitted patient episodes.

Ward Nursing

An in-house patient administration system is used at NH and captures data on the patient's encounter in hospital, such as the admission and discharge date and time, transfers between wards and units. Data is extracted from the system and links directly to the patient encounter. Inpatients are linked if their activity falls within 2 days of the service. As the table below demonstrates, all records were linked to inpatients.

Table 67: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**16,790**
b. Number of records validated against internal costing/business rules	16,790
c. Number of records loaded into costing system	16,790
Number of records linked to inpatients	16,790
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

7.3.5 The costed dataset

QA process

After costing was completed, SA Health performed various quality assurance checks and reconciliations over the costed dataset. The tests and reconciliations performed on the NH dataset were consistent with that performed over FMC. Details of these tests can be found in Section 7.3.5. Identified issues during the process are rectified and the new costing results again go through the QA processes until SA Health is satisfied with the results.

Adjustments

SA Health made adjustments for WIP patients (discussed in the sections below). Further adjustments were made for patients that did not have a complete APC submission record. This amounted to $1.5 million in FY 2012/13, which was excluded from submission to IHPA. Another $5.9 million was excluded for outpatients that were costed but not submitted to IHPA.

Work in progress (Item E)

The adjustments that were made for patients whose stay at the hospital crosses the financial year is consistent with approach taken at FMC. Please see Section 7.2.5 for more details.

7.3.6 Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. The reconciliation found no variances, as displayed in Table 68: Sample patient reconciliation with IHPA below.

Table 68: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$2,988.42	$2,988.42	-
2	Acute	$1,925.04	$1,925.04	-
3	Acute	$2,988.42	$2,988.42	-
4	Admitted ED	$230.94	$230.94	-
5	General Maintenance	$4,545.71	$4,545.71	-

7.4 Jurisdictional overview

7.4.1 Overview of process

SA Health performs the costing for all hospitals in the five LHNs. This along with the state wide implementation of PPM2 software helps ensure consistency and comparability across the state.

Input from hospitals is sought at various stages of the costing process, including at the PFRAC review stage through to review and reporting of costed results. Costed data is also presented to hospitals to assist with benchmarking and performance improvement processes.

7.4.2 Adjustments to costed dataset

The following adjustments for each of the sites were made to the dataset before submission was made to IHPA:

Flinders Medical Centre

- A cost inclusion of $0.17 million for the WIP patients who were discharged in Round 17.

- A cost exclusion of $3.58 million for WIP patients not yet discharged.

- A cost exclusion of $1.50 million for patients that did not have a complete APC submission record.

The impact of these adjustments on activity submitted across the hospital products is listed below:

- Acute – 1,480 encounters excluded

- Emergency – 255 encounters excluded

- Sub-acute – 113 encounters excluded.

Noarlunga Health Services

- A cost inclusion of $0.01 million for the WIP patients who were discharged in Round 17.

- A cost exclusion of $0.83 million for WIP patients not yet discharged.

- A cost exclusion of $0.20 million for patients that did not have a complete APC submission record.

The impact of these adjustments on activity submitted across the hospital products is listed below:

- Acute – 151 encounters excluded

- Emergency – 14 encounters excluded

- Sub-acute – 34 encounters excluded.

7.4.3   Reconciliation with IHPA

Table 69 below compares the total costs and activity records submitted by the jurisdiction with the total costs and activity records that were received by IHPA. No difference in activity was noted however a cost variance was identified, representing less than 0.02% of total cost for each site.

Table 69: Reconciliation of total costs and activity submitted

Item	FMC Activity	FMC Costs ('000s)	NHS Activity	NHS Costs ('000s)
Submitted by Jurisdiction				
Acute	59,840	$419,430	12,976	$36,490
Sub-acute	424	$6,934	355	$4,728
Emergency Dept	70,684	$32,406	44,811	$22,986
Outpatients	-	-	-	-
Other	-	-	-	-
Total	130,948	$458,770	58,142	$64,204
Data received by IHPA	130,948	$458,725	58,142	$64,194
Variance	-	*($45)*	-	*($10)*

8 Tasmania

8.1 Tasmania overall

The Department of Health and Human Services (DHHS) costed all hospitals in TAS for Round 17, which is consistent with previous rounds. DHHS completed this costing process and QA data review in consultation with hospital staff and clinicians to ensure the results were appropriately reviewed.

DHHS nominated Royal Hobart Hospital (RHH) as the participating hospital for the Round 17 review. RHH is part of the Tasmanian Health Organisation – South (THOS).

8.1.1 Changes since Round 16

DHHS implemented a new GL structure during Round 17, developed with some input from the costing team. One of the major improvements for the costing team was the increased breakdown in cost centres by clinical specialty, and increased consultation with clinicians including in pathology, imaging, pharmacy and oncology. This has been beneficial in helping the DHHS correctly source RVUs for these feeder systems.

8.2 Royal Hobart Hospital

8.2.1 Site overview

RHH is the major metro tertiary hospital in the region, performing most major surgeries and offering a wide range of specialities (including neonatal, burns and cardiothoracic). The hospital has approximately 430 beds and a broad mix of patients. It is also the major teaching hospital for THOS. RHH also has close ties with the Menzies Research Institute TAS, which conducts research and utilises some of the hospital's services.

As DHHS costed RHH, it was subject to many of the state wide improvements, including the new GL structure, increased feeder data quality and the new patient administration system. Table 70 below provides a summary of costs beginning with total expenses from the GL through to the total costs submitted to IHPA with the various adjustments made during the process. No variances were noted.

Table 70: Financial overview of Royal Hobart Hospital, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$438,178	Total costed products	$460,905
B. Adjustments to the GL		E. Final adjustments	
Inclusions	$22,727	WIP - Carried forward patients	-
Exclusions	-	WIP - Patients not discharged by year end	($1,716)
Total hospital expenses	**$460,905**	Oral health program	($40,041)
		Other out of scope activity	($25,460)
C. Allocation of costs		Teaching	($18,089)
Patient care areas (direct)	$359,393	Services provided for other facilities	($12,962)
Overhead areas (indirect)	$101,512		
Total hospital expenses	**$460,905**	**Total costs submitted to IHPA**	**$362,637**
Variance	-	Variance	-
D. Allocation of costs to patients			
Acute	$270,084		
Outpatients	$64,927		
Emergency	$28,369		
Sub-acute	$23,776		
Mental health	-		
Teaching and training	$18,089		
Research	-		
Other	$55,660		
Total costed products	**$460,905**		
Variance	-		

8.2.2 Financial data

General Ledger (Item A)

Financial statements are prepared at the THOS level, and GLs are maintained at hospital level. The total expenses per the financial statements for FY 2012/13 was $529.7 million. Of this, $438.2 million was in the RHH GL. Table 70 below outlines some specific cost items and how they are treated in the GL.

Table 71: Treatment of specific cost items

Cost item	Included in hospital's GL and costed	Allocated from dept or jurisdiction and costed	Not in GL or included in costing
Superannuation	✔		
Defined benefit scheme		✔	
Professional idemnity insurance	✔		
Workers' compensation	✔		
Annual leave costs	✔		
Long service leave costs		✔	
PBS rebates			✔
Trade discounts on pharmaceuticals			✔

Table 71above lists specific costs that were reviewed to understand their treatment in the GL and the costing process. Once these costs are allocated to final cost centres they are distributed to patients using that cost centre's allocation methodology. Key cost treatments to note include:

- A payment of 12.3% of salaries and wages expense is made to a retirement benefits fund; employees who are not on the defined benefit scheme receive 9.25% of this payment, the remainder is used to top up the defined benefit scheme liability. This contribution sits in the cost centre where the staff member is paid. The liability of the defined benefit scheme payouts sits with Treasury and no additional costs are brought down to the hospital for costing above the initial 12.3% contribution.

- Professional indemnity and building insurances is included in an overhead cost centre and is allocated to direct cost centres.

- A workers compensation premium is charged to all hospitals in THOS. As part of accounting practices these costs sit in the cost centres where staff are paid. Claims and reimbursements are also charged directly to cost centres where staff are paid as part of accounting practices. No adjustment is required for costing purposes.

- All leave expenses sit in the cost centre where the staff member is paid and no additional allocation is required.

- PBS rebates and trade discounts sit within revenue accounts and are not brought in for costing purposes.

- Assets are revalued every three to four years, and indexed annually when not revalued. The adjusted depreciation is included in the costing results and submitted to IHPA.

Inclusions and exclusions (Item B)

A total of $22.7 million was added to the extracted GL before uploading the total hospital costs to the costing system. This was made up of:

- $11.4 million in corporate overheads from THOS. This consists of costs from finance, payroll, IT and human resources

- $9.7 million for the Mental Health ward and psychiatric intensive care units, which sit outside the hospital's GL

- $1.6 million in corporate overheads from THOS relating to the Mental Health ward and psychiatric intensive care unit.

No costs were removed from the GL at this stage as all non-ABF products and programs were allocated costs and removed after costing. After these inclusions, total expenses for RHH was $460.9 million.

Allocation of overheads (Item C)

For FY 2012/13, overhead costs totalled $101.5 million, which represents 22.0% of total costs for RHH. These costs were allocated to the patient care areas based on a variety of allocation statistics, but the major statistics utilised for Round 17 were share of total expenses, number of occupied bed days, number of FTEs and patient usage of buildings. The allocation statistics were determined based on the preferred hierarchy of allocation statistics in the AHPCS along with any reliable information that was available.

Distribution of costs between hospital products (Item D)

Where some cost centres delivered services to multiple hospital products (such as medical cost centres servicing inpatients and outpatients along with some teaching), PFRACs were developed.

DHHS staff developed templates, which it sent to hospital cost centre managers to complete. The cost centre managers entered a proportion of time spent between hospital products, the intensive care units and the wards. This process is conducted each year.

8.2.3 Activity information and costing methodology

Overview

Once costs are split into the various cost areas and are ready for allocation, a variety of feeder systems are used to allocate costs to patients across all hospital products depending on the type of patient. With the new patient administration system (iPAS) and emergency department system (EDIS), more data was available for allocation, such as better collected theatre time (iniPAS) and time spent in EDIS.

Table 71 below outlines the costing methodology for the various hospital products.

Table 72: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Acute inpatients are costed at the episode level, utilising data from iPAS. Sub-acute patients are costed at the care-type level and are not classified under AN-SNAP.
	Costs are allocated to inpatients using various feeder systems, which indicate consumption of hospital resources or services. Nursing costs are allocated using LOS, weighted by the patient's PCCL. Ward medical costs are allocated based on LOS. Diagnostics tests (such as imaging and pathology), Pharmacy and allied health costs use feeder data to allocate costs with RVUs derived from either standard/actual costs (that is, the cost of the drug) or minutes.
	Prosthetic costs were allocated directly to private patients; however, the data was not suitable for public patients. A cost model was developed based on ICD10 and supplier price lists.
Emergency Department	Patients are allocated costs based on a model developed around the cubicles in the ED (such as the waiting room, mental health cubicle and resuscitation cube). Each cubicle has a weighting, which is used to allocate all costs in that cubicle. These weights are reviewed each year. Diagnostic tests and dispensed pharmaceuticals are allocated to patients directly based on consumption.
Outpatients	All outpatient activity is classified under Tier 2. Each specialty has its own cost centre from which costs are allocated to patients based on the length of the appointment. Multidisciplinary clinics are flagged and split out for costing purposes. No adjustment is made with group clinics and patients are mapped to a single clinic.
	Diagnostic tests and dispensed pharmaceuticals are allocated to patients directly based on consumption.
Mental Health	Mental health patients are treated as inpatients and costed according to the same acute and sub-acute methodologies. There are ICU mental health beds, which are separately identified and allocated to those patients that use them.
Teaching, training and research	Direct teaching costs are counted where identifiable; however, an additional 10% of medical costs and 5% of nursing and allied health costs are allocated to a 'direct teaching' cost centre and are not

Hospital product	Allocation overview
	allocated to patients.
	Research costs are generally held in special purpose funds and are not brought in for costing. Where diagnostics are used for research, those tests are allocated costs and attributed to research.
Other	Boarders are costed in line with other inpatients, but are only allocated 10% of the total costs.

8.2.4   Feeder data for sample areas

Overview

A variety of feeders are used to allocate costs at RHH including the following areas: imaging, pharmacy, pathology, theatre, critical care units and allied health. Some allocation methodologies of note include:

- Patients are allocated ward medical costs based on their LOS.

- Prosthetics costs are allocated directly to private patients, but cost modelled to public patients using their ICD10 codes and a vendor price list. The cost data used to create this model was sourced from Germany, QLD and TAS.

Pharmacy

RHH uses iPharmacy, which records consumption of pharmacy products by patients. Dispensed drugs that are administered directly to patients are recorded in iPharmacy, which is used to allocate costs directly to the patient during costing. The unit cost allocated to patients is taken from the vendors' price list.

Dispensed drugs are linked to patients based on their medical record number and date of service. It is first linked to inpatients, then emergency department patients, outpatients and then other patient types. The linking is done in waves around the date of service, starting with zero, then increasing to 1 day, 7 days, 15 days and then 35 days on their side of the date. Records that are unable to be matched are linked to a virtual patient, who holds the costs for those drugs.

Imprest drug costs are allocated to wards, and are then distributed to patients along with the ward nursing costs. Table 72 below outlines the linking of records from the source system to patients within the hospital products.

Table 73: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**270,364**
b. Number of records validated against internal costing/business rules	146,587
c. Number of records loaded into costing system	146,587
Number of records linked to inpatients	112,014
Number of records linked to emergency	1,201
Number of records linked to outpatients	22,986
Number of records linked to other activity	1,647
Number of unmatched records	8,739
Number of feeder system occasions of service	-

While 270,364 records were extracted from the system, 123,777 related to imprest drugs that were allocated to wards. The remaining 146,587 records related to dispensed drugs to patients.

Theatre

iPAS at RHH records various data points of the patient operations, such as start and end time of anaesthetics, and date and time of first-cut time spent in recovery. Data is extracted from the system and links directly to the patient encounter. Table 73 below outlines the linking of records from iPAS to patients within the hospital products. Since iPAS manages inpatients as well as the theatre, all records were linked directly to patients.

Theatre costs are divided into several cost centres and different feeder data is used to allocate different costs, including preparation start and end time used to allocate pre-operation costs, medical and nursing salaries allocated using surgery start and end time, and medical supplies allocated using surgery start and end time.

Table 74: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**125,601**
b. Number of records validated against internal costing/business rules	125,601
c. Number of records loaded into costing system	125,601
Number of records linked to inpatients	125,601
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

Ward nursing

iPAS is the key patient administration system at RHH and includes data on the patient's encounter in hospital, such as the admission and discharge date and time, transfers between wards and units, and theatre information. Data is extracted from the system and links directly to the patient encounter. Table 75 below outlines the linking of records from the source system to patients within the hospital products.

Patient stay was identified down to the ward and unit level (such as a maternity ward or critical care unit) and a LOS was generated from the start and end date and time. This was also weighted by the PCCL score so that patients with a higher acuity received more of the cost. This is to reflect the higher consumption of doctor and nurse time by those patients.

Table 75: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**19,511**
b. Number of records validated against internal costing/business rules	19,511
c. Number of records loaded into costing system	19,511
Number of records linked to inpatients	19,511
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

8.2.5 The costed dataset

QA process

Once costing was completed, the DHHS staff performed a range of quality assurance checks and reconciliations. These included:

- high-level reconciliations of total costs allocated to patients and products compared to the GL loaded into the costing system

- high-level reconciliations of number of costed separations compared to what was loaded into the costing system

- reports on average and weighted average DRG costs by total costs, as well as average cost by hospital product

- review of high-cost or low-cost patients

- review of negative cost items and patients.

Issues identified during the process are rectified and the new costing results again go through the QA processes.
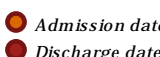
Adjustments

No adjustments are made at this point in the process other than WIP adjustments, which is discussed in the sections below.

Work in progress (Item E)

Adjustments are made for patients whose stay at the hospital crosses the financial year. Figure 8 below illustrates the four combinations of admission and discharge dates that can occur and the treatment of cost and submission through to IHPA.

Figure 8: Treatment of WIP patients

Scenario	<--- Previous years	2012/2013 (R17)	Future ---> years	Cost allocation approach		Submitted to IHPA	
				AHPCS Preferred	Followed	IHPA Preferred	Followed
Scenario 1				Allocate	Yes	Submit	Yes
Scenario 2				Allocate	Yes	Submit	Yes
Scenario 3				Allocate	Yes	Do not submit	Yes
Scenario 4				Allocate	Yes	Do not submit	Yes

🟠 *Admission date*
🔴 *Discharge date*

In Round 17, RHH patients in each of these scenarios were treated in the following ways:

- Scenario 1 patients were allocated FY 2012/13 costs for the full length of their stay. These patients were submitted to IHPA.

- Scenario 2 patients were allocated FY 2012/13 costs for the portion of their stay that fell within the year. No costs were brought forward from prior years.

- Scenario 3 patients were allocated FY 2012/13 costs for the portion of their stay that fell within the year. These patients were then set aside and will be submitted to IHPA in future rounds.

- There were no scenario 4 patients in Round 17 at RHH.

This is the first year that WIP adjustments were made to costing data at RHH, so costs will be brought forward for scenario 2 patients in future rounds.

8.2.6   Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. The results are listed in Table 75 below. No variances were noted in the reconciliation.

Table 76 : Sample patient reconciliation with IHPA

#	Type	Jurisdiction submission	Received by IHPA	Variance
1	Acute	$11,680.92	$11,680.92	-
2	Acute	$9,341.83	$9,341.83	-
3	Acute	$1,602.64	$1,602.64	-
4	Emergency	$251.99	$251.99	-
5	Outpatient	$169.05	$169.05	-

8.3 Jurisdictional overview

8.3.1 Overview of process

DHHS performs the costings for all hospitals in the three THOS. This helps ensure consistency and comparability across the state, and to overcome skill shortages in more remote areas of the state. Input from hospitals is sought at various stages of the costing process, including at the PFRAC review stage through to review and reporting of costed results. Costed data is also presented to hospitals to assist with benchmarking and performance improvement processes. No additional process is performed other than that discussed in Section 8.2.

8.3.2 Adjustments to costed dataset

The following adjustments were made to the dataset before submission to IHPA:

- $40 million relating to the oral health program whose costs sit in the RHH GL was removed.

- $25.4 million for out-of-scope activity relating to private patients was removed. This is a special arrangement with the DHHS and is not funded under ABF.

- $18 million relating to teaching was removed.

- $12.9 million relating to activity that was provided for and recorded at other facilities was removed.

- $1.7 million was allocated to 391 patients who were not discharged by the end of the financial year. These patients and their allocated costs were removed from the dataset and will be submitted to IHPA in future rounds of the NHCDC.

8.3.3 Reconciliation with IHPA

Table 77 below compares the total costs and activity records submitted by the jurisdiction with the total costs and activity records that were received by IHPA. A variance of $75,000 was noted, which represents 0.02% of the total costs dataset.

Table 77: Reconciliation of total costs and activity submitted

Item	Activity	Costs ('000s)
Submitted by jurisdiction		
Acute	43,496	$245,725
Sub-acute	1,325	$20,861
Emergency Dept	50,929	$28,381
Outpatients	266,122	$64,959
Other	1,076	$2,711
Total	362,948	$362,638
Data received by IHPA	362,948	$362,563
Variance	-	*($75)*

9 *Victoria*

9.1 *Victoria overall*

Each Health Service (HS) within VIC is responsible for preparing, processing and submitting its costed data to the Victorian Department of Health (DH). The data collected in this Victorian Cost Data Collection (VCDC) is the primary data behind the state's activity planning and budgeting process, but also forms the basis of VIC's NHCDC submission.

Once the DH receives the costing data, jurisdictional staff members within the Information and Funding Systems Branch perform a number of internal reviews and check the data. Any issues identified in this are investigated with the HS, which may or may not require a resubmission. If data is resubmitted, the DH runs the same reviews and checks again before submitting the data to the IHPA.

The DH uses VCDC data for the NHCDC submissions, but maps the data so the VCDC mapping aligns to the NHCDC mapping. It then submits this data to the IHPA for inclusion in the NHCDC. DH nominated Barwon Health (BH) and Western Health (WH) for inclusion in Round 17.

9.2 *Western Health*

9.2.1 *Site overview*

WH contains three acute hospitals, Western Hospital, Sunshine Hospital and the Williamstown hospital. These hospitals provide a range of acute and sub-acute health services. Sunshine Hospital currently caters for the highest number of births in the State. Western Health also operates a day procedure centre in Sunbury and in FY12-13 a small aged care facility in Melton, which has since been closed.

WH operates across the western metropolitan area of Melbourne. Its catchment area is diverse, covering significant residential areas that are experiencing rapid population growth while also including large pockets of dense industrial precincts that are in decline. The catchment area can be categorised as having significant levels of socioeconomic disadvantage. A large proportion of the population of the background nominate English as a second language, with areas in the inner west experiencing a strong population growth from resettled refugees.

Western Health uses the Power Performance Management (PPM2) costing system, which was introduced in January 2013. The costing process undertaken by WH's Performance Unit is conducted for all three WH hospitals and is submitted as part of the VCDC, and then ultimately to IHPA.

Table 78 below is a summary of costs, beginning with total expenses from the GL through to the total costs submitted to IHPA with the various adjustments made during the process. We note a $52,000 variance between the total hospital expenses in the GL, and allocated costs in patient care areas and overhead areas. This variance is due to timing differences between when the costing was performed and when the financial statements were released, and represents 0.1% of total costs.

Table 78: Financial overview of Western Health, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$592,161	Total costed products	$543,376
B. Adjustments to the GL		E. Final adjustments	
Inclusions	-		
Exclusions	($48,733)	Wip - Patients not discharged by year end	($12,086)
Total hospital expenses	**$543,428**	Excluded activity due to missing program & campus code	($12,426)
		Out of scope - non-admitted activity	($48,257)
C. Allocation of costs		Out of scope - community health activity	($7,194)
Patient care areas (direct)	$414,206	Unlinked/VCDC failed Admitted patients	($3,632)
Overhead areas (indirect)	$129,171	Unlinked/VCDC failed ED patients	($5)
Total hospital expenses	**$543,376**	**Total costs submitted to IHPA**	**$459,778**
Variance	**$52**	**Variance**	**-**
D. Allocation of costs to patients			
Acute	$343,441		
Outpatients	$73,621		
Emergency	$48,144		
Sub-acute	$42,072		
Mental health	$1,551		
Teaching and training	-		
Research	-		
Other	$34,547		
Total costed products	**$543,376**		
Variance	**-**		

9.2.2 Financial data

General Ledger (Item A)

The total expenses per the financial statements for FY 2012/13 were $543.4 million for the whole of Western Health. This did not include capital items, such as depreciation, which are included in the GL but presented separately in the financial statements. The GL extracted totalled $592.2 million in expenses, which was then adjusted to meet the requirements of the VCDC. The list of adjustments to the GL has been listed below.

Table 79: Treatment of specific cost items

Cost item	Included in hospital's GL and costed	Allocated from dept or jurisdiction and costed	Not in GL or included in costing
Superannuation	✔		
Defined benefit scheme	✔		
Professional idemnity insurance	✔		
Workers' compensation		✔	
Annual leave costs	✔		
Long service leave costs	✔		
PBS rebates			✔
Trade discounts on pharmaceuticals			✔

Table 79 above identifies some of the specific costs examined to understand how the costs are treated in the GL until they get to direct cost centres. Once these costs are allocated to final cost centres they are distributed to patients using the allocation methodology of that cost centre. Key cost treatments to note include:

Victoria

- Defined contribution funds and defined benefits funds are in scope for costing purposes and the relevant account codes are mapped as labour on costs (On-Costs line item) into direct or indirect cost areas.

- The Health Services' medical indemnity insurance is funded by the Victorian Department of Health. An actuarial allocation model is utilised to apportion the insurance premium paid by DH for each Heath Service and this cost is included in the Health Service's GL. Each Health Service's medical indemnity insurance is allocated on the basis of medical and clinical speciality cost areas. During the costing process, these costs are treated as an overhead and allocated to patients based on the cost drivers of the clinical speciality area.

- Western Health uses an external insurer for workers compensation, whose costs are included in the GL of the hospitals and included in the costing.

- Annual and long service leave liabilities are dispersed to multiple cost centres, typically from the cost centres where the salaries and wages for the relevant staff are paid from. These are included in the costing.

- PBS rebates or other revenue items (including private patient revenue) are not offset against hospital expenditure. These items are not included in the costing.

- Trade discounts on pharmaceutical products are treated as revenue and are excluded from costing calculations.

- Asset revaluations occur every 5 years in alignment with Department of Treasury and Finance requirements. The revised depreciation cost then flows through to the GL, however the depreciation is not included in the costing process. The VCDC does not include depreciation costs and therefore no depreciation costs flow through to the NHCDC submission.

Inclusions and exclusions (Item B)

A total of $48.7 million was removed from the GL in order to comply with the VCDC, which includes the following items:

- $48.5 million for capital cost centres (including depreciation) which are removed to comply with the VCDC

- $216,000 for Western Health foundation costs that are not included for costing.

No other exclusions are applied to the GL before or during the costing process and all patient products/programs (including non- admitted and other out of scope activities) are allocated costs. This resulted in a total cost of $543.4 million.

Allocation of overheads (Item C)

Western Health reported overhead costs of approximately $129.2 million in Round 17, which represents almost 24% per cent of total costs. Costing methodologies for allocating overheads were determined based on the preferred hierarchy (first, second or third preferred statistics as per the AHPCS) if appropriate direct feeder data was not available.

Distribution of costs between hospital products (Item D)

In Round 17, PFRACS were used to split total costs amongst the hospital products where direct cost centres provided services to multiple hospital products. The PFRACS were developed and/or reviewed as part of implementing the new costing system (PPM2) in January 2013.

9.2.3 Activity information and costing methodology

Overview

Once costs were split into the various cost areas and were ready to be allocated, a variety of feeder systems were used to allocate costs to patients across all hospital products depending on the patient care type. The table below outlines the costing methodology for the various hospital products.

Table 80: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Admitted patients (acute and sub-acute) were costed using various patient level activity data (feeder data) representing actual consumption of hospital resources and services where possible. MBS codes were utilised to determine weightings for different service level activities for allocating pathology and imaging costs.
	Surgical nursing and medical costs where allocated based on operating theatre feeder data (anaesthetic, surgery duration, no of surgeons) from the iPM theatre management system. Non-surgical medical costs, critical care and nursing costs were allocated to patients using fractional bed days (derived from ward transfer activities in iPM).
	Prosthetic costs were allocated using a model that was developed using the Prostheses Listing (Minimum benefit value), which is published by the Department of Health (Cth).
Emergency Department	Reportable admitted and non-admitted URG encounters (matched with Victorian Emergency Minimum datasets) were costed based on the ED service event (presentation to departure time) for Emergency Department patients. Data extracts from the EDIS were used to allocate clinician and nursing costs to ED service events.
	Other services such as diagnostics tests and pharmaceuticals are allocated to patients based on consumption. The linking was done on the basis of date/time of the service.
Outpatients	Outpatient appointments such as allied health appointments are costed using scheduling and attendance information from staff diaries. Costing methodology for ancillary services such as diagnostics tests and pharmaceuticals were consistent with other hospital services and were allocated to patients through various linking rules.
	Other non-admitted activity such as radiotherapy services to non-admitted patients were costed but not included in the NHCDC submission (non ABF activity).
Mental Health	Mental health services operating out of Western Health were funded and coordinated by North West Mental Health, a division of Melbourne Health. Overheads relating to these services were included in the cost allocation process.
Teaching, training and research	Teaching and training have a separate cost centre, which is linked to a dummy/derived encounter. Teaching, training and research costs were not submitted as part of NHCDC submission.

Hospital product	Allocation overview
Other	Hospital boarders were not admitted in hospital PAS and not treated as unique episodes. Boarders are identified with a specific program code (episode program 'B') in the costed dataset.

9.2.4 Feeder data for sample areas

Overview

As part of the costing process different methodologies will be utilised to allocate costs to a patient level. The recommended methodology in the AHPCS is using a feeder system, which uses direct patient activity data to allocate costs. However, if this is not available then service weights or RVUs could be used. For Round 17, WH used feeders for a range of hospital services such as pharmacy, ward nursing, critical care areas, ED, and theatre. Some of these are explained in more detail below.

Pharmacy

Western Health uses the Merlin pharmacy system for inventory management and dispensing drugs. Dispensed drugs include all discharged medications and specialised drugs that would not be routinely stocked in a ward's pharmacy as imprest drugs (which are allocated along with ward costs). All relevant costs are allocated to patients through the linking process of activities and services. As per the VCDC business rules, new episodes are created for services that cannot be linked to an existing valid episode. These records are submitted to DH and reported under VCDC program 'U – Unlinked Services'.

The table below outlines the linking of records from the source system to patients within the hospital products. During the linking process, a total of 5,584 records could not be matched to valid patient episodes, which represents 3% of total activity. These records were allocated costs and linked to a virtual patient record, which was excluded in the submission to IHPA.

Table 81: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**196,423**
b. Number of records validated against internal costing/business rules	196,423
c. Number of records loaded into costing system	196,423
Number of records linked to inpatients	159,084
Number of records linked to emergency	11,984
Number of records linked to outpatients	19,771
Number of records linked to other activity	
Number of unmatched records	5,584

Theatre

Western Health uses the iPM Operating Theatre module in conjunction with the iPM PAS to capture and extract various data points related to the patient's surgery. Theatres minutes such as anaesthesia duration, surgery duration and recovery time were used to allocate medical, nursing and medical supplies costs to directly to patients. This was weighted by the number of surgeons and/or anaesthetists. CSSD (Theatre Sterile Supply) costs were included as an overhead cost.

The theatre records were linked to patients based on their medical record number and date of service, the results of which were listed in the table below. A total of 108 theatre records were excluded from the

validation and linking process. During the linking process, three theatre records were excluded as they fell outside the Round 17 activity period.

Table 82: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**130,028**
b. Number of records validated against internal costing/business rules	129,920
c. Number of records loaded into costing system	129,920
Number of records linked to inpatients	129,917
Number of records linked to emergency	
Number of records linked to outpatients	
Number of records linked to other activity	3
Number of unmatched records	

Ward Nursing

Western Health uses patient information from iPM PAS which includes data on the patient's encounter in hospital, such as the admission and discharge date and time, transfers between wards and units. Transfer extracts are created and linked directly to the patient encounter in the costing system to derive patient fractional bed days. A total of 2,683 records were excluded from the extraction as they fell outside Round 17 with the remaining records being allocated to inpatients. This is displayed in Table 83 below.

Table 83: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**202,512**
b. Number of records validated against internal costing/business rules	
c. Number of records loaded into costing system	202,504
Number of records linked to inpatients	199,821
Number of records linked to emergency	
Number of records linked to outpatients	
Number of records linked to other activity	
Number of unmatched records	2,683

9.2.5 The costed dataset

QA process

In Round 17, the costing team performed a number of checks and reconciliations on the dataset to compare costs and activity loaded into the system to what was in the costed dataset. Data was then submitted to the DH and underwent a range of quality assurance checks as part of the VCDC submission process. Details of the checks can be found in Section 9.1. WH submitted data to the DH four times to the VCDC, each time adjusting the data to rectify identified issues from the DH validation process.
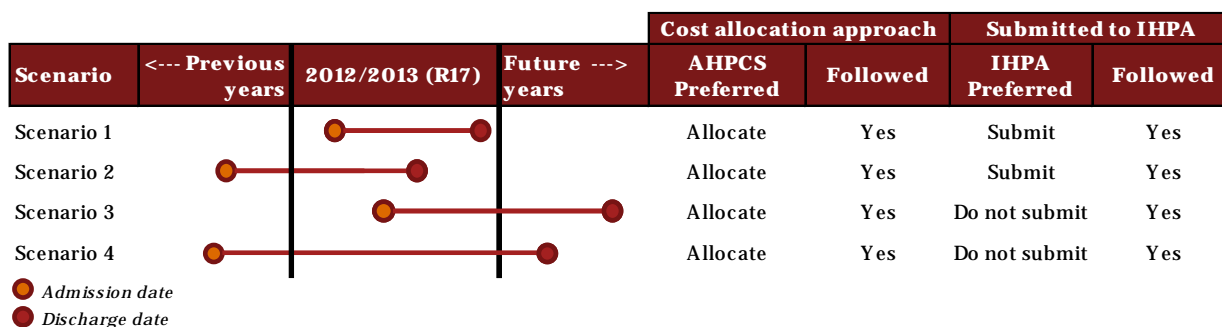
Adjustments

Adjustments were made for expenses incurred when WH provides services for another health service, lacks reliable patient activity data for a service and/or are funded outside the DH mechanisms. These include:

- Melton dialysis

- Children's allied health (funded by DEECD)

- Acute aged care assessment

- Drug and alcohol programs

- Encounters that lacked a VCDC program code and a campus code i.e. Health Independence group sessions.

Work in progress (Item E)

Adjustments were made for patients whose stay at the hospital crosses the financial year. The approach to making this adjustment is illustrated in Figure 9: Treatment of WIP patients and discussed below.

Figure 9: Treatment of WIP patients

Scenario	<--- Previous years	2012/2013 (R17)	Future ---> years	Cost allocation approach		Submitted to IHPA	
				AHPCS Preferred	Followed	IHPA Preferred	Followed
Scenario 1				Allocate	Yes	Submit	Yes
Scenario 2				Allocate	Yes	Submit	Yes
Scenario 3				Allocate	Yes	Do not submit	Yes
Scenario 4				Allocate	Yes	Do not submit	Yes

● *Admission date*
● *Discharge date*

In Round 17, patients in each of these scenarios were treated the following ways:

- Scenario 1 patients received an allocation of FY2012/13 costs and were submitted to IHPA

- Scenario 2 patients received an allocation of FY2012/13 and were submitted to IHPA, but only Round 17 costs were included. A new costing software (PPM2) was introduced in Round 17 and as a result previous years cost information was not available for submission.

- Scenario 3 patients received an allocation of FY2012/13 costs but were not submitted to IHPA. These patients will be included in future rounds of the NHCDC depending on when they are discharged.

- Scenario 4 patients received an allocation of FY2012/13 costs but were not submitted to IHPA. These patients will be included in future rounds of the NHCDC depending on when they are discharged.

9.2.6   Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. The reconciliation found only one rounding variance of $0.03 in one of the sample patients, as displayed in Table 84 below.

Table 84: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$2,144.60	$2,144.57	+ $0.03
2	Acute	$2,082.49	$2,082.49	-
3	Admitted ED	$182.96	$182.96	-
4	Outpatient	$220.99	$220.99	-
5	Maintenance	$8,718.08	$8,718.08	-

9.3 Barwon Health

9.3.1 Site overview

Barwon Health (BH) covers the southwest region of VIC, with most health services based out of Geelong. Its catchment area is significantly large, covering a large portion of the southwest region of VIC. BH's major facilities include Geelong Hospital, McKellar Centre and outpatient services at North Geelong and Belmont, which together provide a range of primary care, community, aged care, rehabilitation, mental health, emergency and acute care services. Geelong Hospital is also a major teaching hospital. It operates as a major education provider through its relationships with Deakin University, Melbourne University, Monash University, the Gordon and a number of other educational centres and universities.

The costing process for the health service is outsourced to an external contractor, Visasys. The costing function and data quality assurance checks are undertaken in consultation with the Decision Support and Data Integrity Operations team at Barwon Health. BH also submitted data to the DH, which undergo the state wide quality assurance checks as part of the VCDC.

A summary of costs beginning with total expenses from the GL through to the total costs submitted to IHPA is provided in Table 85 below. We note that the variance of $88.8 million identified in item D below is due to carried forward costs from WIP patients admitted in prior years, which are included in the breakdown by hospital product.

Table 85: Financial overview of Barwon Health, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$564,546	Total costed products	$653,146
B. Adjustments to the GL		E. Final adjustments	
Inclusions	-	Wip - Patients not discharged by year end	($91,885)
Exclusions	($181)	Other cost adjustments - out of scope	($71,762)
Total hospital expenses	**$564,365**	Out of scope - other admitted activity	($46,535)
		Out of scope - non-admitted activity	($63,011)
C. Allocation of costs		Out of scope - radiotherapy	($6,151)
Patient care areas (direct)	$455,554	Out of scope - mental health	($20,122)
Overhead areas (indirect)	$108,811	Out of scope - community health	($7,092)
Total hospital expenses	**$564,365**	Unlinked/VCDC failed Admitted patients	($673)
Variance	-	Unlinked/VCDC failed ED patients	($2)
		Total costs submitted to IHPA	**$345,914**
D. Allocation of costs to patients		**Variance**	-
Acute	$266,793		
Outpatients	$99,733		
Emergency	$23,822		
Sub-acute	$22,035		
Mental health	$29,761		
Teaching and training	-		
Research	-		
Other	$211,002		
Total costed products	**$653,146**		
Variance	**($88,781)**		

9.3.2 Financial data

General Ledger (Item A)

Financial statements are released at the LHN level for BH. The total expenses per the financial statements for FY 2012/13 were $564.54 million. This amount did not include capital items, such as depreciation, expenditure using capital purpose income, linen asset write offs and impairment of

financial assets as they are out of scope for the VCDC submission. These costs were also not submitted to IHPA.

Table 86: Treatment of specific cost items

Cost item	Included in hospital's GL and costed	Allocated from dept or jurisdiction and costed	Not in GL or included in costing
Superannuation	✔		
Defined benefit scheme	✔		
Professional idemnity insurance	✔		
Annual leave costs	✔		
Long service leave costs	✔		
PBS rebates			✔
Trade discounts on pharmaceuticals			✔

Table 86 above identifies some of the specific costs examined to understand how the costs are treated in the GL and until they get to direct cost centres. Once these costs are allocated to final cost centres they are distributed to patients using the allocation methodology of that cost centre. Key cost treatments to note include:

- Annual and long service leave liabilities are dispersed to many cost centres, typically from the cost centres where the salaries and wages for the relevant staff are paid from.

- Defined contribution funds and defined benefits fund contributions are in scope for costing purposes and the relevant account codes are mapped as labour on costs (On-Costs line item) into direct or indirect cost areas.

- PBS rebates or other revenue items are not included in costing. Barwon generally does not receive trade discounts as most items have a contract with an agreed price. One rebate is received which is included as an offset to the expense.

- The Health Services' medical indemnity insurance is funded by the Victorian Department of Health. An actuarial allocation model is utilised to apportion the insurance premium paid by DH for each Heath Service and this cost is included in the Health Service's GL. Each Health Service's medical indemnity insurance is allocated on the basis of medical and clinical speciality cost areas. During the costing process, these costs are treated as an overhead and allocated to patients based on the cost drivers of the clinical speciality area.

- Assets are typically revalued at least every five years, but may be revalued more frequently if fair value assessments indicate material changes in values. Non-current physical assets are measured at fair value and are revalued in accordance with the "Financial reporting directions and guidance" - 103d (applicable to all Victorian public sector agencies).

Inclusions and exclusions (Item B)

Only one adjustment of $0.18 million was made to the GL, which related to capital expenditure that is out of scope for the VCDC. No other adjustments are applied to the GL before or during the costing process and all patient products/programs (including non- admitted and other out of scope activities) are allocated costs.

Allocation of overheads (Item C)

Barwon Health reported overhead costs of $108.8 million in Round 17, which represent approximately 20% of total costs reported. For Round 17, the majority of overhead costs were allocated using ward days, subsets of FTEs (such as nursing FTEs for nursing education costs), and subsets of total expense (such as total expenses in a particular area). The selection of allocation statistics was determined using

the AHPCS preferred hierarchy. A feeder system that captured patient transport activities was also utilised to allocate patient transport costs directly to patients.

Distribution of costs between hospital products (Item D)

The costing team at Barwon Health is responsible for mapping the hospital cost centres and accounts to VCDC cost areas. No direct fractioning (PFRACs) is undertaken to determine the product fraction at a cost centre level. Feeder data was used to allocate costs within direct and indirect (where available) patient care areas.

9.3.3   Activity information and costing methodology

Overview

Patient level costing is performed for all hospitals in the health service by Visasys, who are an external provider which use the User Cost system. The costing process utilises a number of different data sources. The various allocation methodologies used for the Round 17 submission are described in Table 87 below.

Table 87: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Admitted patients (acute and sub-acute) were costed using various patient level activity data (feeder data) representing consumption of hospital resources and services where possible.
	Surgical nursing and medical costs were allocated based on operating theatre feeder data (anaesthetic, surgery duration, number of surgeons) from the hTrak theatre management system. Non-surgical medical costs and nursing costs were allocated using the patients' ward minutes/transfer activities in hospital wards. These ward minutes were weighted for several types of patients, such as restrained mental health or palliative care patients (based on phase of care).
	Prosthetics consumption data was recorded in this system and used for patient level cost allocation. RVUs (which were developed in TAS) were used where the patients had a prostheses procedure code but no activity recorded in the hTrak.
	Other services such as diagnostics tests, imaging, and pharmaceuticals were allocated to patients based on consumption. Apportionment of staff time in imaging, pathology or allied health areas also used the same method and cost drivers. In the absence of common identifiers between various feeder systems ('Merlin' pharmacy system, 'LabTrak' pathology system, 'AGFA' imaging system etc) and the iPM PAS system, the costing team utilised a number of business linking rules to match these services to the relevant episodes.
Emergency Department	Reportable admitted and non-admitted URG encounters (matched with the Victorian Emergency Minimum Dataset) were costed based on the ED service event (presentation to departure time) for ED patients. Data extracts from the 'Symphony Emergency Department system' were used to allocate clinician and nursing costs to ED service events.
	Other services such as diagnostics tests and pharmaceuticals were

Hospital product	Allocation overview
	allocated to patients based on consumption. The linking is done on the basis of date/time of the service.
Outpatients	Ambulatory care appointment extracts were available from the iPM feeder data to determine the outpatient appointment duration, which is used to allocate outpatients costs in each clinic.
Mental Health	Acute and admitted mental health patients were costed using patient level consumption data where possible. However, if an admitted mental health episode is not reported as part of the Admitted or Emergency minimum datasets (VAED, VEMD) and if patient level data is not available from any other data source, the costs were allocated to a 'derived' or 'virtual' patient.
Teaching, training and research	Dedicated teaching and training cost centres (if identifiable) were treated as an overhead and allocated to patients. Research, teaching and training costs were costed but not submitted to IHPA in Round 17. Any direct teaching, training and research costs that were funded by SPF (Special Purpose Fund) funds were excluded from costing.
Other	Hospital boarders (that received food and/or accommodation) were not admitted in the PAS and not treated as unique episodes. Boarders were identified with a specific program code (episode program 'B') in the costed dataset. Minimum costs were allocated to boarders. All non-admitted activity (including non-admitted radiotherapy, community health, unfunded/unregistered Tier 2 clinic), and out of scope activities such as Transition Care Program and Residential In-Reach patients were excluded from NHCDC submissions.

9.3.4 Feeder data for sample areas

Overview

As part of the costing process different methodologies will be utilised to allocate costs to a patient level. The recommended methodology in the AHPCS is using a feeder system, which uses direct patient activity data to allocate costs; however if this is not available then service weights or RVUs could be used. Described below is the allocation methodology for pharmacy, theatre and ward nursing costs.

Pharmacy

BH uses the Merlin pharmacy system for inventory management and dispensing drugs. All relevant pharmacy costs (including pharmacy staff costs) were allocated to patients through the linking process. As per the VCDC business rules, new episodes were created for services that cannot be linked to an existing valid episode. These records were submitted to DH and reported under VCDC program 'U – Unlinked Services', and were not submitted to IHPA.

As shown in Table 88 below, of the 172,139 records extracted from the pharmacy system, 10 were excluded as they fell outside the Round 17 period, 139,718 records were linked to inpatients and 26,652 were unmatched (15.5% of the total).

Table 88: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**172,139**
b. Number of records validated against internal costing/business rules	172,129
c. Number of records loaded into costing system	172,129
Number of records linked to inpatients	139,718
Number of records linked to emergency	434
Number of records linked to outpatients	5,185
Number of records linked to other activity	140
Number of unmatched records	26,652
Number of feeder system occasions of service	

Theatre

BH uses the iPM PAS and hTrak prosthesis management system to capture and extract various data points relating to the patient's surgery. Surgical nursing and medical costs were allocated to patients using a number of theatre minutes and usage data (anaesthetic time, surgery time, number of nurses, number of surgeons etc.). Time is weighted based on the number of nurses and surgeons in theatre at the time of the procedure. Theatre data is linked to the patients' admission records and as such, all theatre activity was linked to inpatients. This is shown in Table 89 below.

Table 89: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**20,057**
b. Number of records validated against internal costing/business rules	20,057
c. Number of records loaded into costing system	20,057
Number of records linked to inpatients	20,057
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	

Ward Nursing

BH used iPM PAS activity data, such as the admission and discharge date and time, and transfer activities between wards to allocate nursing cost for admitted patients. Transfer extracts were created as source systems for the costing software and linked directly to the patient encounter in the costing system to derive patient fractional bed days. As Table 90 shows, all ward nursing costs were linked to inpatients.

Table 90: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**113,726**
b. Number of records validated against internal costing/business rules	113,726
c. Number of records loaded into costing system	113,726
Number of records linked to inpatients	113,726
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

9.3.5   The costed dataset

QA process

In Round 17, BH performed various levels of reconciliation, quality assurance and reasonableness checks on the costed dataset before submitting to the DH. This included expenditure reconciliations between the UserCost cost file and the GL, along with the total cost by product. Patient episode records were also reconciled to the activity data submitted to the other Victorian data submissions (such as the Victorian Admitted Episodes Dataset, Victorian Emergency Minimum Dataset, Victorian public mental health client information management system). Costs were also compared to prior year's data to check for irregularities and variability.

Reviews were performed on the feeder data, particularly where actual charges were used as an RVU/cost driver, such as for prosthetics and pharmacy. The total RVU was compared and reconciled to the GL amount. Large variances were investigated by health service staff. Once all checks and reviews were completed at BH, the data was submitted and subjected to the DH's VCDC validation checks. More detail about these checks can be found in Section 9.4.1.

Adjustments

The majority of adjustments that were made to the dataset before submission to the NHCDC by the jurisdiction related to episodes and records failing the Departmental (VCDC) validation checks, non-admitted patients and out of scope/non ABF funded activity. These exclusions have been summarised in Section 9.4.

Work in progress (Item E)

The adjustments that were made for patients whose stay at the hospital crosses the financial year is consistent with approach taken at WH. Please see Section 9.2.5 for more details.

9.3.6 Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. The reconciliation found no discrepancies between the two data sources, as can be seen in Table 91.

Table 91: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$1,105.09	$1,105.09	-
2	Maintenance	$2,004.62	$2,004.62	-
3	Admitted ED	$686.53	$686.53	-
4	Outpatient	$162.51	$162.51	-
5	Acute	$4,470.40	$4,470.40	-

9.4   Jurisdictional overview
9.4.1   Overview of process

The health services within VIC undertake the costing onsite and submit the cost data annually to the DH for the VCDC. All Victorian metropolitan and major rural health services are required to submit patient level cost data to the VCDC. Once the costed dataset is received by the DH, a number of validation checks and mapping activities are performed in accordance with the AHPCS and 'VCDC Business Rules' for reporting cost data. Examples of tests performed by DH include:

- Initial validations on file format, data structure and value ranges. Submissions containing errors were required to be submitted.

- Validation of imported columns and derived fields using rules. Errors are listed at the end of each processing cycle.

- Review of high and low cost episodes.

- Review of low or zero cost areas or episodes.

- Activities linked to Episodes were required to have Episode records. All hospital episodes were to be reported to the VCDC episode types (based on the program/area of service for which the episodes were created). For example – Program A for admitted episodes, Program E for admitted emergency episodes etc. Episodes that could not be linked to a valid VCDC program type were excluded from Round 17 NHCDC submission.

When critical or validation errors are identified on the submitted file, QA outputs are sent back to the Health Services. Submissions containing errors are required to be re-submitted once the issues are rectified and resolved. Any re-submission is required to have complete records for the financial years and goes through the complete QA process. In some cases where data fails the validation tests due to poor quality or missing information, it is removed from the final submissions to IHPA.

9.4.2   Adjustments to costed dataset

The following adjustments to the dataset for each of the nominated Health Services were made by the jurisdiction before submission to IHPA.

Barwon Health

- WIP patients – $91.9 million was allocated to patients that were not discharged by the end of the financial year. These patients and their attributed costs will be submitted in future rounds.

- Out of scope costs – $71.8 million was removed which related to out of scope costs.

- Out of scope patients –Patient activity that was out of scope of ABF was not submitted to IHPA. This included:

  - $63.0 million for non-admitted activity, which includes unlinked encounters and un-registered Tier 2 or un-funded clinics. Also includes encounters without valid program type.

  - $46.5 million for admitted activity (such as Transition Care Residential patients).

  - $20.1 million for non-admitted mental health activity.

  - $6.2 million for radiotherapy.

  - $7.1 million for community health activity.

- Admitted patients – $0.68 million excluded as these records failed VCDC validation checks (due to data quality or invalid program type) and activity data could not be linked to valid admitted episodes.

- ED patients – $1,693 excluded as these records failed VCDC validation checks.

The impact of these adjustments on activity submitted across the hospital products is listed below.

- Admitted program – Excluded 26 admitted encounters.

- ED program – Excluded 259 ED episodes.

- Out of scope patients (other admitted) – Excluded 2,319 admitted episodes.

- Non-admitted patients (Non-admitted and other non-admitted) – 168,828 non-admitted encounters were excluded from final submission.

- Non-admitted mental health episodes – 102,298 non-admitted mental health episodes were excluded.

- Non-admitted radiotherapy patients – 29,011 non-admitted encounters under radiotherapy program were excluded.

- Out of scope patients (Community Health) – 36,426 community health patient episodes were excluded.

Western Health

- WIP patients – $12.1 million was allocated to patients that were not discharged by the end of the financial year. These patients and their attributed costs will be submitted in future rounds.

- Excluded activity – $12.4 million was removed relating to activity that did not have a valid program and/or campus code.

- Out of scope patients – Patient activity that was out of scope of ABF was not submitted to IHPA. This included:

    o $63.0 million for non-admitted activity, which includes unlinked encounters and un-registered Tier 2 or un-funded clinics.

    o $7.2 million excluded for other admitted patients (not part of Western Health, 4 wards operated by Melbourne Health).

- Admitted patients – $3.6 million excluded as these records failed VCDC validation checks (due to data quality or invalid program type) and activity data could not be linked to valid admitted episodes.

- ED patients – $4,824 excluded as these records failed VCDC validation checks or could not be linked to activity data.

The impact of these adjustments on activity submitted across the hospital products is listed below.

- Admitted program – Excluded 687 admitted encounters.

- ED program – Excluded eight ED encounters.

- Out of scope patients (other admitted) – Excluded 424 admitted episodes.

- Non-admitted patients (Non-admitted and other non-admitted) – 196,441 non-admitted encounters were excluded from final submission.

9.4.3   Reconciliation with IHPA

Table 92 below compares the total costs and activity records submitted by the jurisdiction with the total costs and activity records that were received by IHPA. The reconciliation identified no variances.

Table 92: Reconciliation of total costs and activity submitted

Item	Western Health		Barwon Health	
	Activity	Costs ('000s)	Activity	Costs ('000s)
Submitted by Jurisdiction				
Acute	43,496	$335,357	66,414	$270,749
Sub-acute	2,367	$39,595	1,606	$21,133
Emergency Dept	122,790	$48,104	62,478	$23,820
Outpatients	146,415	$36,467	162,851	$29,625
Other	23	$255	51	$587
Total	377,991	$459,778	293,400	$345,914
Data received by IHPA	377,991	$459,778	293,400	$345,914
Variance	-	-	-	-

10 Western Australia

10.1 Western Australia overall

Health Service (HS) costing teams conducted the costing review for Western Australian hospitals in Round 17. HSs worked closely with clinicians and cost centre managers to understand the drivers of cost and review the costing output. HSs are quite autonomous in their costing methodologies, although the Department of Health (WA Health) provides support in the form of guidance and QA procedures for reviewing the costed results.

WA Health is continuing to develop and implement ABF and ABM in hospitals around the state. It is also developing clinical costing standards to help the HS costing teams increase data quality. This will increase the consistency of costing methodologies used across the state and improve the ability to benchmark the collected data. Further, a more comprehensive set of QA procedures is being developed by WA Health to perform once it receives the costed results from the HSs.

Royal Perth Hospital (RPH) and Swan District Hospital (Swan) represented WA in the Round 17 review. These hospitals belong to South Metro HS and North Metro HS respectively.

10.1.1 Changes since Round 16

WIP patient adjustments in WA were introduced to the costing methodology for the first time in Round 17. Costs are now allocated to all patients admitted during the financial year, and patients who were not discharged by the end of the year are removed from the IHPA submission. Those patients will be submitted in future years, together with the allocated costs from the current year. In previous rounds, the costs for the financial year were only allocated to patients who were discharged in that financial year.

During Round 17, hospitals throughout WA – including the two sample sites – implemented the iPharmacy system to allocate pharmacy costs to patients.

10.2 Royal Perth Hospital
10.2.1 Site overview

RPH is a major metro tertiary hospital in Perth, performing most major surgeries and is the state's centre for trauma, burns and rehabilitation patients. RPH is the largest teaching hospital in WA and also contains heart and lung transplant units.

The South Metro HS team costed RPH, which benefited from several improvements in Round 16. PPM2 was implemented in Round 17, which enabled a large increase in the number of cost items used in the costing process. Education programs for staff also improved the quality of the data from the theatre management system which is now able to allocate prosthesis costs.

Table 93 below provides a summary of costs beginning with total expenses from the GL through to the total costs submitted to IHPA with the various adjustments made during the process. A variance of $33,000 was noted between the total costs in the GL and the total costs allocated to the patients. This is less than 0.01% of total costs allocated to patients. A further $289,000 (0.04% of total costs) was identified between what was adjusted by the jurisdiction and what was submitted to IHPA.

Table 93: Financial overview of Royal Perth Hospital, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$900,889	Total costed products	$870,843
B. Adjustments to the GL		E. Final adjustments	
Inclusions	-	Unlinked feeder records	($136)
Exclusions	($30,078)	WIP - patients not discharged by year end	($21,880)
Total hospital expenses	**$870,811**	Teaching and research	($44,403)
		Non-ABF activity	($12,100)
C. Allocation of costs		Other adjustments	($130)
Patient care areas (direct)	$618,693		
Overhead areas (indirect)	$252,117		
Total hospital expenses	**$870,810**	**Total costs submitted to IHPA**	**$792,483**
Variance	-	Variance	$289
D. Allocation of costs to patients			
Acute	$592,898		
Outpatients	$145,577		
Emergency	$19,940		
Sub-acute	$55,926		
Mental health	-		
Teaching and research	$44,403		
Other	$12,100		
Total costed products	**$870,843**		
Variance	($33)		

10.2.2 Financial data

General Ledger (Item A)

Financial statements are prepared in aggregate for the Metropolitan Health Service (Metro HS), which includes South Metro HS. The total expenses for the Metro HS were $4.49 billion, of which South Metro was $1.96 billion. This has been agreed to in WA Health's reconciliation. Costs from the South Metro HS were included in the hospital GLs.

Table 94: Treatment of specific cost items

Cost item	Included in hospital's GL and costed	Allocated from dept or jurisdiction and costed	Not in GL or included in costing
Superannuation	✔		
Defined benefit scheme	✔		
Professional idemnity insurance	✔		
Workers' compensation	✔		
Annual leave costs	✔		
Long service leave costs	✔		
PBS rebates			✔
Trade discounts on pharmaceuticals			✔

Table 94 above lists specific costs that were reviewed to understand their treatment in the GL and the costing process. Once these costs are allocated to final cost centres they are distributed to patients using that cost centre's allocation methodology. Key cost treatments to note include:

- Superannuation is charged to the cost centre where the staff member's salary is paid. The HS pays contributions for employees on a defined benefit scheme to WA Treasury, which is responsible for paying the final benefit and assumes all the risk related to the payment of benefits. The superannuation charged sits in the hospital cost centres where the FTE is paid from and is included in the costing.

- Professional indemnity sits in the South Metro HS GL and is allocated to hospitals based on FTEs. Building and equipment insurance is included in the hospital's GL. These costs are included in the costed results.

- Riskcover charges workers compensation to each HS, which is the WA state government fund. Premiums are charged to hospital cost centres where the staff member is paid.

- All leave expenses sit in the cost centre where the staff member is paid and no additional allocation is required.

- PBS rebates and trade discounts sit within revenue accounts and are not brought in for costing purposes.

- Payroll tax is not imputed for staff; however, contractors hired by hospitals do attract payroll tax. Assets are revaluated every two years and depreciation is included in the costing.

Inclusions and exclusions (Item B)

A total of $30.1 million was removed from the GL before uploading into the costing system. This was made up of:

- $19.2 million for Community Health programs

- $4.6 million for hospital activity with no or insufficient patient data, which includes $4.4m for radiotherapy costs

- $4.2 million for Community Mental Health programs

- $1.4 million for non-ABF related hospital activity

- $588,004 for non-recurrent programs.

After these exclusions, total expenses for RPH were $870.8 million.

Allocation of overheads (Item C)

For FY 2012/13, overhead costs totalled $252.1 million, which represents 29.0% of total costs for RPH. These costs were allocated to the patient care areas based on a variety of allocation statistics, but the major statistics utilised for Round 17 were share of total expenses, number of occupied bed hours and number of FTEs. The allocation statistics were determined based on the preferred hierarchy of allocation statistics in the AHPCS along with any reliable information that was available.

Distribution of costs between hospital products (Item D)

Where some cost centres delivered services to multiple hospital products (such as medical cost centres servicing inpatients and outpatients along with some teaching), IFRACs were developed. The costing team reviewed the IFRACs used in Round 16 with business managers to ensure the splits had not changed. This was done in conjunction with activity data.

10.2.3 Activity information and costing methodology

Overview

Once costs are split into the various cost areas and are ready to be allocated, a variety of feeder systems are used to allocate costs to patients across all hospital products. Extracts from the patient administration system (TOPAS/webPAS), EDIS, TMS (Theatre Management System) and various other feeders were used in the allocation process.

Table 95 below outlines the costing methodology for the hospital products.

Table 95: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Acute inpatients are costed at the episode level and are classified using AR-DRGs. Sub-acute patients are costed as the care-type level and are not classified under AN-SNAP. Inpatients are allocated costs using various feeder systems, which identify consumption of hospital resources or services. Nursing and medical costs are allocated based on AHPCS line items and LOS of patients. Diagnostics tests (such as imaging and pathology), pharmacy and allied health costs use feeder data to allocate costs with RVUs derived from either standard/actual costs (that is, the cost of the drug), or minutes. Prosthetic costs are allocated directly to patients who consumed the products identified by the TMS. An internally developed RVU is applied, which was developed using the actual costs of the prosthetic.
Emergency Department	Patients are allocated costs using the IHPA URG NWAU price weights. Patients who were admitted to the observation ward were then treated as an inpatient and were given a smaller proportion of costs for their stay. Diagnostic tests and dispensed pharmaceuticals are allocated to patients directly based on consumption.
Outpatients	All outpatient activity is classified under Tier 2. Each specialty has its own cost centre from which costs are allocated to patients based on the IHPA Tier 2 NWAU price weights. Multidisciplinary clinics are mapped to a single clinic. Diagnostic tests and dispensed pharmaceuticals are allocated to patients directly based on consumption.
Mental Health	Mental health patients are treated as inpatients and costed according to the same acute and sub-acute methodologies.
Teaching, training and research	Direct teaching costs are counted where recorded in separate cost centres. WA Health has performed modelling on the effort spent by medical, nursing and allied health staff at each hospital, which resulted in unique percentages of those expenses being fractioned out into direct teaching and research. For RPH, the percentages used for teaching were: • 9.2% for medical costs

Hospital product	Allocation overview
	• 10.4% of nursing costs • 3.4% of allied health costs. For research, the percentages used were: • 3.6% for medical costs • 1.1% of nursing costs • 0.9% of allied health costs. Research costs are held in special purpose funds and are not brought in for costing.
Other	Boarders are not allocated any ward costs; however, they do receive costs for services such as pathology, pharmacy and imaging. Organ procurement is costed at the care-type level.

10.2.4 Feeder data for sample areas

Overview

A variety of methods are used to allocate costs at RPH, such as feeder data, for the following areas: imaging, pharmacy, pathology, theatre, critical care units and allied health. Some allocation methodologies of note include:

- Patients are allocated ward medical costs based on AHPCS line items and their LOS.

- Prosthetics costs are allocated directly to patients using the theatre management system feeder data. RVUs used for the feeder are developed using the actual costs of the prosthetics.

Pharmacy

RPH uses iPharmacy, which records consumption of pharmacy products by patients. Dispensed drugs that are administered directly to patients are recorded in iPharmacy, which is used to allocate costs directly to the patient during costing. The unit cost allocated to patients is taken from the vendors' price list.

Dispensed drugs are linked to patients based on their medical record number and date of service. It is linked using the following hierarchy: first to emergency department patients, then inpatients, outpatients and then other patient types. The linking is done in waves through the hierarchy, increasing the number of days deviated from the date of service. This starts with zero days then increases to 30 days before and five days after the date of service. Records that are unable to be linked are linked to a virtual patient, which holds the costs for those drugs.

Imprest drug costs are allocated to wards, and are the distributed to patients along with the ward costs.

Table 96 below outlines the linking of records from the source system to patients within the hospital products.

Table 96: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**19,553,632**
b. Number of records validated against internal costing/business rules	19,553,632
c. Number of records loaded into costing system	19,553,632
Number of records linked to inpatients	11,903,872
Number of records linked to emergency	189,913
Number of records linked to outpatients	7,160,914
Number of records linked to other activity	-
Number of unmatched records	298,933
Number of feeder system occasions of service	-

Theatre

RPH uses TMS as their theatre management system, which records information on patient operations, such as start and end time of anaesthetics, and date and time of first-cut time spent in recovery. Data is extracted from the system and links directly to the patient encounter.

Theatre costs are added together into one bucket and allocated to patients using their 'total time', which is the sum of their preparation time, surgery time and recovery.

Table 97 below outlines the linking of records from TMS to patients within the hospital products.

Table 97: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**18,165**
b. Number of records validated against internal costing/business rules	18,165
c. Number of records loaded into costing system	18,165
Number of records linked to inpatients	18,150
Number of records linked to emergency	14
Number of records linked to outpatients	1
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

Ward nursing

TOPAS records all encounter information at RPH and includes data such as the admission and discharge date, and time and transfers between wards and units. Data is extracted from the system and links directly to the patient encounter. As Table 98 below identifies, all records were linked to inpatients.

Patient stay was identified down to the ward and unit level (such as a maternity ward or critical care unit) and a LOS was generated from the start and end date and time.

Table 98: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**102,124**
b. Number of records validated against internal costing/business rules	102,124
c. Number of records loaded into costing system	102,124
Number of records linked to inpatients	102,124
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

10.2.5 The costed dataset

QA process

Once costing was completed, the South Metro costing staff performed a range of quality assurance checks and reconciliations. These included high-level reconciliations using the costing software, such as GL to costing reconciliations, allocation of overheads to direct cost centres and allocations to non-hospital products. RPH also reviewed very high or low-cost patients, along with any negative cost patients. Issues identified during the process were rectified and the new costing results went through the QA processes.

Adjustments

No adjustments were made by RPH at this point in the costing process.

Work in progress (Item E)

Adjustments were made for patients whose stay at the hospital crosses the financial year. Figure 10 below illustrates the four combinations of admission and discharge dates that can occur and the treatment of cost and submission through to IHPA.

Figure 10: Treatment of WIP patients

Scenario	<--- Previous years	2012/2013 (R17)	Future ---> years	Cost allocation approach		Submitted to IHPA	
				AHPCS Preferred	Followed	IHPA Preferred	Followed
Scenario 1				Allocate	Yes	Submit	Yes
Scenario 2				Allocate	Yes	Submit	Yes
Scenario 3				Allocate	Yes	Do not submit	Yes
Scenario 4				Allocate	Yes	Do not submit	Yes

● *Admission date*
● *Discharge date*

In Round 17, RPH patients in each of these scenarios were treated in the following ways:

- Scenario 1 patients were allocated FY 2012/13 costs for the full length of their stay. These patients were submitted to IHPA.

- Scenario 2 patients were allocated FY 2012/13 costs for the portion of their stay that fell within the year. No costs were brought forward from prior years as this is the first year RPH is using this methodology.

- Scenario 3 patients were allocated FY 2012/13 costs for the portion of their stay that fell within the year. These patients were then set aside and will be submitted to IHPA in future rounds.

- Scenario 4 patients were allocated FY 2012/13 costs for the portion of their stay that fell within the year. These patients were then set aside and will be submitted to IHPA in future rounds. No costs were brought forward from prior years as this is the first year RPH is using this methodology.

This is the first year that WIP adjustments were made to costing data at RPH, so in future rounds there will be costs brought forward for scenario 2 and scenario 4 patients.

10.2.6 Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. No variances were identified from the reconciliation, as illustrated in Table 99 below.

Table 99: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$2,625.38	$2,625.38	-
2	Acute	$1,035.74	$1,035.74	-
3	Outpatient	$250.22	$250.22	-
4	Outpatient	$2,642.68	$2,642.68	-
5	Sub-acute	$2,041.92	$2,041.92	-

10.3 Swan District Hospital

10.3.1 Site overview

Swan District Hospital (Swan), which is part of North Metro HS, is a large metro hospital in the east of Perth whose local population has grown significantly in recent years. A new hospital is currently under development, which will replace existing infrastructure. Round 19 (FY 2014/15) will be the last year of activity for the current buildings.

Swan currently offers most major specialities and surgeries, including an emergency department and maternity ward. Swan's sister hospital, Kalamunda Hospital, provides rehabilitation services for patients in the local area.

Swan was costed by the North Metro HS team using PPM2. A new patient administration system (webPAS) was introduced in Round 17, on 4 July 2012. This new system enables the hospital to split patient records when they are admitted from the emergency department, removing the need for manual adjustments to activity data for costing purposes.

Table 100: Financial overview of Swan District Hospital, FY 2012/13

Item	Amount ('000s)	Item	Amount ('000s)
A. General Ledger (GL)	$164,838	Total costed products	$168,933
B. Adjustments to the GL		E. Final adjustments	
Inclusions	$6,741	WIP - Patients not yet discharged	($2,272)
Exclusions	($2,647)	Unlinked feeder records	($1,502)
Total hospital expenses	**$168,932**	Unlinked admitted ED patients	($2,836)
		Outpatients without a Tier 2 classification	($13,875)
C. Allocation of costs		Teaching and Research	($7,673)
Patient care areas (direct)	$126,443	**Total costs submitted to IHPA**	**$140,774**
Overhead areas (indirect)	$42,489		
Total hospital expenses	**$168,932**	**Variance**	-
Variance	-		
D. Allocation of costs to patients			
Acute	$80,448		
Outpatients	$23,882		
Emergency	$36,728		
Sub-acute	$15,841		
Mental health	-		
Teaching and Research	$7,673		
Other	$4,361		
Total costed products	**$168,933**		
Variance	($1)		

10.3.2 Financial data

General Ledger (Item A)

Financial statements are prepared in aggregate for the Metropolitan Health Service, including North Metro HS. The total expenses for the Metro HS were $4.49 billion, of which North Metro was $1.54 billion. This was agreed to in WA Health's reconciliation.

The GL structure and treatment of costs are consistent throughout WA. As part of this review, specific cost items were examined to understand how they were treated in the GL and in costing. Please see Section 10.2.5 for more information on what costs were examined and their treatment.

Inclusions and exclusions (Item B)

A total of $6.7 million was added to the Swan GL in the costing system before allocating costs to services. This was made up of:

- North Metro AH overheads of $3.9 million, which includes finance, IT and HR

- statewide overheads of $2.8 million, which includes software licences of EDIS, Microsoft Office and other feeder system licences.

A total of $690,663 was removed from the GL in the costing system before allocating costs to services. This was made up of:

- $629,677 for recoups from other hospitals for services provided at Swan but recorded in another hospital

- $60,986 for the hospital's patient-assisted travel scheme and interest expenses

After these inclusions and exclusions, the total expense for Swan was $170.9 million.

Allocation of overheads (Item C)

For FY 2012/13, overhead costs totalled $42.5 million, which represents 24.9% of total costs for Swan. These costs were allocated to the patient care areas based on a variety of allocation statistics, but the major statistic utilised for Round 17 was the number of FTEs. The allocation statistics were determined based on the preferred hierarchy of allocation statistics in the AHPCS and any reliable information was available.

Distribution of costs between hospital products (Item D)

Where some cost centres delivered services to multiple hospital products (such as medical cost centres servicing inpatients and outpatients along with some teaching), PFRACs were developed. The costing team reviewed the PFRACs used from Round 16 and consulted with clinicians and business managers to determine if the splits had changed. This review was done in conjunction with activity data.

10.3.3 Activity information and costing methodology

Overview

Once costs are split into the various cost areas and are ready to be allocated, a variety of feeder systems are used to allocate costs to patients across all hospital products depending on the type of patient. Extracts from the patient administration systems (TOPAS and webPAS), EDIS and various feeders were used in the allocation process. Table 106 below outlines the costing methodology for the various hospital products.

Table 101: Allocation methodologies for hospital products

Hospital product	Allocation overview
Inpatient (acute and sub-acute)	Acute inpatients are costed at the episode level, utilising data from iPAS and are classified using AR-DRGs. Sub-acute patients are costed as the care-type level and are not classified under AN-SNAP.
	Costs are allocated to inpatients using various feeder systems, which indicate consumption of hospital resources or services. Nursing and medical costs are allocated using ward bed hours. Diagnostics tests (such as imaging and pathology), pharmacy and allied health costs use feeder data to allocate costs with RVUs derived from either standard/actual costs (that is, the cost of the drug), or minutes.
	Prosthetic costs are allocated directly to patients who consumed the products identified by the theatre management system. An internally developed RVU is applied, which was developed using the actual costs of the prosthetic.
Emergency Department	Patients are allocated costs using the IHPA URG NWAU price weights for their ED presentation. Patients who were admitted to the observation ward are also given an ED presentation cost, plus a WBH cost based on their time spent in the observation ward.
	Diagnostic tests and dispensed pharmaceuticals are allocated to patients directly based on consumption.
Outpatients	Outpatient activity is classified under Tier 2, except for mental health outpatients (reported at the aggregate level). Each specialty has its own cost centre from which costs are allocated to patients based on the IHPA Tier 2 NWAU price weights. Multidisciplinary clinics are mapped to a single clinic.
	Diagnostic tests and dispensed pharmaceuticals are allocated to patients directly based on consumption.
	Clinics or other outpatient services that were not able to have activity recorded at the patient level were separated out during costing and those costs were not allocated to individual patients.
Mental Health	Admitted mental health patients are treated as inpatients and costed according to the same acute and sub-acute methodologies.
Teaching, training and research	Direct teaching costs are counted where identifiable in separate cost centres. Direct research costs are held in special purpose funds and are not brought in for costing.
	WA Health has performed modelling on the effort spent by medical, nursing and allied health staff at each hospital, which resulted in unique percentages of those expenses being fractioned out into direct teaching and research. For Swan, the percentages used for teaching were: 8.77% for medical costs 8.72% of nursing costs 2.06% of allied health costs. For research, the percentages used were: 4.02% for medical costs

Hospital product	Allocation overview
	• 0.14% of nursing costs • 0.51% of allied health costs. Research costs are held in special purpose funds and are not brought in for costing.
Other	Boarders were not costed in Round 17. Organ procurement is costed at the care-type level.

10.3.4 Feeder data for sample areas

Overview

A variety of methods are used to allocate costs at Swan, including the following areas: imaging, pharmacy, pathology, theatre and allied health. Some allocation methodologies of note include:

- Patients are allocated ward medical costs based on their ward bed hours (WBH).

- Prosthetics costs are allocated directly to patients using the TMS feeder data. RVUs used for the feeder are developed using the actual costs of the prosthetics.

Pharmacy

Swan uses iPharmacy, which records consumption of pharmacy products by patients. Dispensed drugs that are administered directly to patients are recorded in iPharmacy, which is used to allocate costs directly to the patient during costing. The unit cost allocated to patients is taken from vendors' price list.

Dispensed drugs that do not have a valid episode number are linked to patients based on their medical record number and date of service. It is first linked to ED patients, then inpatients, and then outpatients. The linking is done in waves around the date of service, starting with zero days, then increases to 30 days before and five days after the date of service for outpatients. Records that are unable to be linked are linked to a virtual patient, who holds the costs for those drugs.

Imprest drug costs are allocated to wards, and are the distributed to patients based on the pharmacy weights of NHCDC Rd14 per DRG.

Table 101 below outlines the linking of records from the source system to patients within the hospital products.

Table 102: Outcome of pharmacy feeder linking

Item	Number of records
a. Number of source records	**17,953**
b. Number of records validated against internal costing/business rules	17,953
c. Number of records loaded into costing system	17,951
Number of records linked to inpatients	12,970
Number of records linked to emergency	1,435
Number of records linked to outpatients	825
Number of records linked to other activity	-
Number of unmatched records	2,721
Number of feeder system occasions of service	-

Two records were removed from the feeder system and were not loaded into the costing system. This is 0.01% of the total records.

Theatre

Swan uses TMS as their theatre management system, which records information on patient operations, such as start and end time of anaesthetics, surgery and recovery, as well as information on consumables. Data is extracted from the system and links directly to the patient encounter.

Swans breaks down theatre costs into several intermediate products and uses a combination of anaesthetic time, surgery time (cut to close) and recovery time to allocate costs. It was noted that future rounds will include a weighting to account for the number of surgeons performing the surgery.

Table 102 below outlines the linking of records from the source system to patients within the hospital products.

Table 103: Outcome of theatre feeder linking

Item	Number of records
a. Number of source records	**15,295**
b. Number of records validated against internal costing/business rules	15,295
c. Number of records loaded into costing system	15,295
Number of records linked to inpatients	15,283
Number of records linked to emergency	13
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

Ward nursing

TOPAS and webPAS record all encounter information at Swan, and include data such as the admission and discharge date and time and transfers between wards and units. Data is extracted from the system and links directly to the patient encounter.

Patient stay was identified down to the ward and unit level (such as a maternity ward) and a fractionalised WBH was generated from the start and end date and time.

Table 103 below outlines the linking of records from the source system to patients within the hospital products.

Table 104: Outcome of ward nursing feeder linking

Item	Number of records
a. Number of source records	**58,753**
b. Number of records validated against internal costing/business rules	58,753
c. Number of records loaded into costing system	58,743
Number of records linked to inpatients	58,743
Number of records linked to emergency	-
Number of records linked to outpatients	-
Number of records linked to other activity	-
Number of unmatched records	-
Number of feeder system occasions of service	-

All transfer records were linked directly to patients.

10.3.5 The costed dataset

QA process

Once costing was completed, the North Metro costing staff performed a range of quality assurance checks and reconciliations. These included:

- high-level reconciliations, such as from the GL to North Metro HS, North Metro HS to hospital, and hospital to total hospital products. Reconciliations are performed throughout the cost process at various stages, such as after reclass rules, allocation of overheads and after final allocation to patients

- review of high-cost or low-cost patients, extreme costs in various areas (such as by Tier 2/DRG/URG, or extreme doctor or nurse costs)

- review of costs per output (that is by DRG/URG/Tier 2) compared to last year, the national average or other LHN sites

- review of negative cost items and patients.

Issues identified during the process are rectified and the new costing results again go through the QA processes.

Adjustments

A total of $2.3 million was removed from the dataset for work in progress patients that will be carried forward to future years. No other adjustments were noted by the hospital. Adjustments were made by the jurisdiction, which can be found in Section 10.4.2.

Work in progress (Item E)

Adjustments are made for patients whose stay at the hospital crosses the financial year. This approach was consistent with the approach taken at RPH, which is discussed in Section 10.2.5.

10.3.6 Sample patients

A sample of five patients was requested to verify that the total cost attributed to the jurisdiction's submitted patient records reconciles with what IHPA has recorded as being received. As Table 105 demonstrates, no variance was noted.

Table 105: Sample patient reconciliation with IHPA

#	Type	Jurisdiction records	Received by IHPA	Variance
1	Acute	$3,454.68	$3,454.68	-
2	Acute	$2,066.60	$2,066.60	-
3	Admitted ED	$1,269.06	$1,269.06	-
4	Outpatient	$386.73	$386.73	-
5	Sub-acute	$4,364.56	$4,364.56	-

10.4 Jurisdictional overview

10.4.1 Overview of process

WA Health continues to provide guidance and support to the health services around the state in an evolving costing environment. PPM2 were used across all WA NHCDC sites for the first time in Round 17.

With the move towards activity based funding in WA, the role of WA Health will become more important, with an aim of refining and improving the consistency of costing across the state. As such, WA Health is in the process of undertaking an Australian Hospital Patient Costing Standards compliance project and developing educational tools and documentation to enhance hospital costing. Further, the number of QA procedures that the department will perform will increase substantially with a greater focus on pre-emptive tests before costing has commenced.

10.4.2 Adjustments to costed dataset

Royal Perth Hospital

The following adjustments were made to the RPH dataset before submission was made to IHPA:

- $44.4 million relating to TTR costs was removed.

- $21.3 million relating to patients not yet discharged by the end of the financial year (scenario 2 and scenario 4 patients) was removed.

- $12.1 million relating to non-ABF activity was removed.

- $160,000 relating to other adjustments was removed.

- $134,000 relating to unlinked activity was removed.

Swan District Hospital

The following adjustments were made to the Swan dataset before submission to IHPA:

- $2.3 million for patients not discharged by year end and carried forward to future round. These were not submitted to IHPA in Round 17.

- $1.5 million relating to unlinked feeder records and $2.8 million for admitted ED presentations was removed.

- $13.9 million for outpatient activity that did not have a Tier 2 classification. These were removed from the submission to IHPA.

- $7.8 million relating to TTR was removed.

10.4.3 Reconciliation with IHPA

Table 106 below compares the total costs and activity records submitted by the jurisdiction with the total costs and activity records that were received by IHPA.

Table 106: Reconciliation of total costs and activity submitted

Item	RPH		SDH	
	Activity	Costs ('000s)	Activity	Costs ('000s)
Submitted by jurisdiction				
Acute	97,452	$567,577	23,814	$78,641
Sub-acute	3,676	$53,277	509	$14,567
Emergency Dept	40,311	$19,052	43,677	$33,892
Outpatients	337,032	$152,693	41,112	$9,362
Other	28	$245	1,387	$4,313
Total	478,499	$792,844	110,499	$140,774
Data received by IHPA	478,499	$792,844	110,499	$140,774
Variance	-	-	-	-

11 IHPA process review

11.1 Overview and scope

PwC reviewed the process the IHPA applied in compiling the NHCDC and followed the data submitted for the 15 participating sites, through to it being recorded in the national database.

The scope of the IHPA NHCDC data submission and review process was:

- understand the IHPA's processes for receiving the submitted data

- determine the IHPA's processes for validating and performing QA procedures, and verify that the IHPA followed these processes

- identify and understand any adjustments to the data

- reconcile the data against the national database.

The PwC review team met with the Director of Hospital Costing; the Manager of Costing, Analysis & Reporting; and other members of the IHPA Costing and Data Acquisition (DA) teams. They discussed the data management, validation and QA processes the IHPA applied in handling the Round 17 NHCDC submissions.

During the meeting, the review team collected supporting documentation, validation and QA outputs regarding the participating hospitals. Additional clarification and reconciliations between data the participants submitted and the national database were discussed during and after the meeting with the relevant IHPA team members.

11.2 IHPA NHCDC data submission process

Round 17 saw the introduction of a new data submission and quality review process for the IHPA. One of the big changes was the move to a CostA (activity data) and CostC (cost data) submission file. This was part of a move towards the 'one submission, multiple purposes' approach to collecting data. CostA files contained only the additional activity fields that were not submitted to the IHPA in jurisdictions' quarterly activity submissions.

The IHPA's process can be broken down into three phases, with several tasks performed during each phase. In each stage, the IHPA gives feedback to the jurisdictions (if required). Jurisdictions were informed at NHCDC Advisory Committee meetings of this new process for Round 17 and what would occur during each stage. Each phase of the process described below applies at the hospital level.

11.2.1 Phase 1: Data submission and validation

Jurisdictions submitted the CostA and CostC files to the IHPA Dropbox (the dropbox). An IHPA representative checked the dropbox daily at 1pm, and provided feedback on the outcome of the submission at 10am the following business day.

During this phase, IHPA's DA team produced a validation and linking report outlining the results of the following tests:

- Whether the CostC data matched completely against the ABF data submission

- Whether the CostA and CostC files met the data requirements, as set out in the NHCDC Data Request Specifications (DRS)

- Whether all patients recorded in the CostA file were present in the CostC file, and vice versa

- Other logical tests, such as whether all admitted ED patients had a corresponding acute separation recorded

The IHPA provided the jurisdictions with a report containing critical and warning flags. Jurisdictions made further submissions with adjusted data and the Phase 1 process ran again until, at a minimum, jurisdictions had resolved all the critical flags. The DA team provided its reports at a summary and detailed (episode) level.

11.2.2 Phase 2: Data transformation

Before the IHPA made any adjustments to the data, it aggregated costs in the CostC file so there was a single NHCDC line item and NHCDC cost centre for each episode. During Phase 2, the IHPA made two adjustments to the data: one for unqualified babies (UQB) and the other for admitted ED patients.

UQB adjustment

The UQB adjustment allocates the costs of UQB back to the mother DRGs rather than having two separations containing costs. The IHPA made this adjustment using the following methodology:

1. Calculate a summary of the number of mother DRGs and UQB DRGs at the hospital level.

2. Where a mother separation was directly linked with a baby separation, tie the costs of that UQB separation to the mother. If there are still mother separations with no linked UQB separation, those mother separations remain with no additional allocated cost.

3. Allocate the unallocated UQB separations to the remaining mother separations up to a maximum ratio of 1:1 (that is, only one UQB separation per mother separation).

4. If there are remaining UQB separations after following this process, allocate those costs to all mother separations.

Admitted ED costs

The IHPA linked any ED presentations that were subsequently admitted to the corresponding acute presentation. This enables reporting of acute presentations with the related ED costs, and of ED costs for all patients regardless of whether they were subsequently admitted as an acute patient or not. For hospitals this occurred in one of two ways:

- Most participants submitted admitted ED activity as individual separations with related costs, so during this phase the admitted ED presentation was linked to the related acute episode.

- Most WA sites included admitted ED costs in the acute separation, so during this phase the admitted ED cost component was identified and linked to the admitted ED presentation

After making the UQB and ED adjustments, the IHPA team emailed a report to the jurisdiction, summarising the outcomes of this process.

11.2.3 Phase 3: Quality assurance

During this phase, the IHPA conducted more than 40 tests to assess the reasonableness and validity of the data. These tests included:

- analysis of the cost results for patient episodes (such as high and low costs, and unexpected or missing costs in particular episodes)

- assessment of growth in average costs in each product

- assessment of the contribution of each component cost to the total, and whether there are disproportional contributions

- comparisons with prior year results

- specific hospital product tests (such as cost centre and line item relativities for acute patients, or non-admitted ED average cost relativity by triage category).

IHPA provided the jurisdictions with a detailed QA report for each hospital. Critical and warning flags identified areas for correction or further investigation. Jurisdictions were requested to review these reports and confirm the contents, then revisit their data and make further submissions, carrying out the Phase 1 process again.

11.3 Reconciliation between submitted data and the national database

Table 107 summarises the total cost and activity data provided by jurisdictions for the participating sites, and how this flows through the IHPA process to the national database.

Table 107: Reconciliation between data submitted and the national dataset

Participating site		Data received by IHPA		IHPA - Phase 2 adjustments		IHPA - national dataset	
		Costs	Activity	Costs	Activity	Costs	Activity
Canberra Hospital	ACT	$759.8m	1,043,017	-	-	$759.8m	1,043,017
Mid North Coast LHD	NSW	$295.2m	154,830	-	(5)	$295.2m	154,825
South West Sydney LHD	NSW	$983.9m	548,158	-	(3)	$983.9m	548,155
Sydney LHD	NSW	$1,015.9m	666,218	-	(12)	$1,015.9m	666,206
Katherine Hospital	NT	$34.9m	36,064	-	(295)	$34.9m	35,769
Sunshine Coast HHS	QLD	$458.4m	413,662	-	(2,138)	$458.4m	411,524
Townsville HHS	QLD	$553.0m	553,428	-	(2,047)	$553.0m	551,381
Wide Bay HHS (Bundaberg)	QLD	$206.7m	237,417	-	(915)	$206.7m	236,502
Flinders Medical Centre	SA	$458.7m	130,948	-	(11)	$458.7m	130,937
Noarlunga Hospital	SA	$64.2m	58,142	-	-	$64.2m	58,142
Royal Hobart Hospital	TAS	$362.6m	362,948	-	(697)	$362.6m	362,251
Barwon Health	VIC	$345.9m	293,400	-	(1,874)	$345.9m	291,526
Western Health	VIC	$459.8m	377,991	-	(4,360)	$459.8m	373,631
Royal Perth Hospital	WA	$792.5m	478,491	-	-	$792.5m	478,491
Swan District Hospital	WA	$140.8m	110,499	-	(1,030)	$140.8m	109,469

The activity adjustments noted in Phase 2 relate to the remapping of UQB costs back to mother encounters, so there is no net impact on total costs, and the UQB encounters are removed from the data. Some sites perform this remapping themselves, such as Canberra Hospital and the NSW sites, however some additional mapping was required where UQB encounters remained in the dataset. Noarlunga Hospital does not deliver babies; it only provides antenatal and early postnatal outpatient services for women delivering their babies at Flinders Medical Centre.

12 Peer review outcomes

12.1 The peer review process

The Round 17 financial review involved for a peer review process so that costing representatives from other jurisdictions could participate in site visits. The peer review allowed NHCDC peers to share information, processes, challenges and solutions. Based on the feedback from Round 16, all parties valued the chance to have costing staff and costing representatives visit other jurisdictions, so the project team continued this process for Round 17.

12.1.1 Participation in site visits

Jurisdictions were asked to nominate people to participate in the peer review, and to identify participants either at the hospital costing level or the jurisdiction level. Jurisdictions in QLD, NSW, VIC and NT nominated peers. The remaining jurisdictions were unable to send representatives due to capacity or funding constraints. NSW and VIC nominated LHN costing staff to attend, and VIC, QLD and NT sent jurisdiction representatives. Appendix A contains a list of the peer review participants.

The peer review nominees selected their preferred locations and the host site was informed of the peer review selection. The nominees attended the meetings together with the PwC review team, and were asked to actively participate in the meeting and ask any questions they had.

12.1.2 Site visit follow-up survey

Following the site visits, the IHPA sent out a survey to the peer review participants and the peer review host sites to gather their feedback on the peer review process. The survey had three sections:

1. What were your expectations of the peer review before you participated in the site visit?

2. Please provide details and/or examples of key learnings (a minimum of three) that you have taken away from your recent site visit.

3. Please provide any ideas or suggestions for improving the peer review process in future rounds of review.

12.2 The feedback

Overall, most of the peers who participated reported that they received substantial value from attending the site visits. One costing staff participant reported:

"The NHCDC inter-jurisdictional site visits are a unique vehicle to provide interstate costing staff a diverse perspective on the costing process, the many similar ongoing challenges in patient-level costing and the differing methodologies used to construct the same end product: the NHCDC."

Expectations of the peer review

Participants commonly noted their initial expectation was to understand the application of the AHPCS, particularly in some of the more complex areas such as allocation statistics, treatment of blood products and PFRACs. There was also an interest in the use of the various software packages available, and how they were implemented and used at the hospital and LHN level. Through discussion of these topics, participants expected to understand the common issues across the country and share approaches to tackling the problems.

Learnings from the peer review

Participants noted that they gained an understanding of how jurisdictions use other methodologies to split costs between hospital products through the use of feeder data (and without using PFRACs). Furthermore, they identified some of the variation between linking rules, and the contextual reasons why that was the case. Overall, while some sites use slightly different processes and methodologies, participants noted that the end result of patient-level costing data is very similar.

Another key learning from the peer review process came from discussions about the improvement plans in place at each site. Participants valued the opportunity to understand how costing processes were different (such as monthly costing instead of yearly costing), and also get an idea of other jurisdictions' the plans for the future. Improvement plans included areas such as better data collection, more use of feeder systems and enhanced data QA processes. These insights provided participants with alternatives to their existing methodologies.

Suggests for future rounds of the peer review process

Building on the learnings from this round, peers identified some changes the IHPA could make to maximise the value of the peer review process. One change would be to organise jurisdictional meetings before the site visits. This would give participants an understanding of the jurisdiction-wide processes in place before entering the site visits. Peers also noted that it was important to ensure hospital costing staff were present during the site visit to facilitate a detailed exchange of methodologies. Participants found this exchange could be limited when only jurisdictional staff attended the site visits.

Given the opportunity to be in the same room, some peers suggested allocating time for non-NHCDC–related discussions. One suggestion was to include time at the end of the site visit for costing staff to talk about their costing experience without IHPA or PwC representatives being present. Another suggestion was to ensure the team discussed how NHCDC data was being used for internal benchmarking and management purposes in an ABF environment.

Appendices

Appendix A
Site visit attendees

Jurisdiction	IHPA representative	Jurisdictional and hospital/LHN representatives	Peer representative	PwC representative
NSW	Angela Leary-Smith	Julia Heberle Tania O'Brien Nick de Groot Raymond Lal Stephen Johnson Katey Yang Yasuko Nakano Christine Gong Charlie Farrah Rachel Knoblanche	David Debono Graham Bushnell	Julia Strelitz Laila Qasem Joe Portelli Blake Bentley
SA	Julia Hume	Phillip Battista Silvana Di Ciocco Emma Martin	Colin McCrow	Laila Qasem Ruan Jordaan
TAS	Joanne Siviloglou	Kristian Murray Ian Jordan		Joe Portelli Yasmin Clarke
WA	Joanne Siviloglou	Kevin Frost Paul Smith Howard Andre Rinaldo Ienco Ian Massingham	Colin McCrow	Joe Portelli Ruan Jordaan
QLD	Angela Leary-Smith	Colin McCrow Leslie Egerton Brett Darracott Janet Moncrieff Dominic Flynn Rod Margetts Brett Darracott Geoff Evans Mitch Price Karen Stewart Allan Lawrie Lindy LePatourel Manjinder Daley Karen Gault-Wilde	Steve Shea	Julia Strelitz Joe Portelli Blake Bentley
VIC	Joanne Siviloglou	David Debono Kim Lim Ross Arblaster Graham Bushnell Tyrone Patterson	Kylie Hawkins	Stuart Shinfield Laila Qasem Abraam Gregiouro
NT	Stathi Tsangaris	Ian Pollock Kim Lim		Joe Portelli Ruan Jordaan
ACT	Joanne Siviloglou	Winston Piddington	Ian Pollock	Julia Strelitz Abraam Gregiouro

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