



Independent Financial Review of the National Hospital Cost Data Collection

Financial Year 2020-21

Independent Health and Aged Care Pricing Authority

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Executive summary

The National Hospital Cost Data Collection (NHCDC) is the annual collection of public hospital costing data and is the primary data collection used to inform the national efficient price (NEP) each year. For the financial year 2020-21 (FY20/21), NHCDC cost data was submitted from 680 hospitals across all jurisdictions. The NHCDC provides an avenue for cost measurement across public hospitals. To ensure that the quality of NHCDC data is robust and fit-for-purpose, the Independent Health and Aged Care Pricing Authority (IHACPA) commissioned an annual validation process to verify that all participating hospitals have included appropriate costs and patient activity. IHACPA engaged KPMG to conduct the Independent Financial Review (IFR) of the Public Sector NHCDC for the 2020-21 year. A key objective of the IFR is to assess the consistency between jurisdictions sampled for the application of Version 4.1 of the Australian Hospital Patient Costing Standards (AHPCS) for selected standards.

The AHPCS provide direction for hospital patient costing through the development of standards for specific elements of the costing process and reporting requirements. The AHPCS Version 4.1 is comprised of¹:

- Part 1: Standards – provides costing principles.
- Part 2: Business Rules – provides practical guidance on how Standards are translated into action.
- Part 3: Costing Guidelines – provides step-by-step guidance on how to cost particular services.

In line with previous years, the IFR seeks to address:

1. **The accuracy and completeness of the FY20/21 NHCDC for participating health services, including an expenditure reconciliation between financial and costing systems**

Based upon the findings and observations contained in section 2, participating jurisdictions have provided reconciling data and source information to support the accuracy of submitted data.

2. **Assessment of the consistency between jurisdictions sampled for the application of Version 4.1 of the Australian Hospital Patient Costing Standards (AHPCS) for selected standards**

The application of the selected standards from AHPCS Version 4.1 across the jurisdictions was mostly consistent as outlined in the various data quality statements received by IHACPA. Jurisdictions noted partial compliance with various standards (e.g. Mental Health phase of care and blood products). While the process of applying standards is consistent, it was noted that the impacts of COVID-19 are still resulting in a variation of treatment of general ledger costs. Whilst detailed analysis was not conducted, discussions indicated the isolation of these costs appears to be comprehensive and robust.

¹ IHACPA (2022), Australian Hospital Patient Costing Standards Version 4.1, <https://www.ihacpa.gov.au/resources/australian-hospital-patient-costing-standards-version-41>

3. Assess the degree to which the NHCDC data is robust and fit for purpose

As outlined above while the data submissions are reconciled and complete, the impact of COVID-19 on expenditure and activity varied across the jurisdictions, i.e. COVID-19 impacts varied significantly in terms of timing and the relevant State Government responses to address COVID-19, e.g. Western Australia (WA) experienced almost no impact for FY20/21.

4. Review the data flow from the health service to the jurisdictional upload of hospital information, to the data submission portal, through to the storing of data in IHACPA’s national database, through a selected sample

A sample of five patient records from each hospital was taken to test the transfer of patient cost data from the hospital, via the jurisdiction, to IHACPA and to identify any cost variance. There were no material variances across any of the jurisdictional samples indicating appropriate data flow from the health service through to IHACPA. The individual sample results are provided within each jurisdictional chapter.

5. Identification of improvements implemented at the health service and/or jurisdictional level as compared to FY19/20 and address any developments made in response to the findings in the FY19/20 IFR Final Report

Several improvements to FY19/20 costing processes were identified through the discussions with each jurisdiction and are highlighted within the jurisdictional chapters, alongside additional areas for improvement that are being considered for FY21/22 and beyond.

6. Review the cost allocation methodology utilised by different hospitals for two selected diagnosis related groups (DRGs), i.e. haemodialysis and chemotherapy

A review of the costing allocation and service delivery methods for haemodialysis and chemotherapy across jurisdictions is provided in section 3, with comparative highlights also provided within this Executive Summary.

Specific observations from the FY20/21 IFR are detailed in section 2.1. While one jurisdiction did not participate this year, the IFR was well received by all participating jurisdictions with robust conversations throughout the consultation process.

As a result of previous recommendations, data collection templates were adjusted to gather relevant information and utilise information that had already been provided by health services through the data quality statements and jurisdictional submission process. The template also collected prior year data that was used to facilitate discussions on potential emerging trends or process changes from FY19/20.

Focus areas included for the FY20/21 year and agreed through the NHCDC Advisory Committee (NAC) were haemodialysis and chemotherapy, selected due to their high volume services nationally.

The following table provides a summary of the recommendations for the FY20/21 IFR, with further detail outlined in section 2.2.

Table 1: Recommendations from the FY20/21 IFR

No.	Recommendation
1	<p>Structure and approach for future IFRs</p> <p>Changes did occur for FY20/21 with the simplification of the data collection templates and further discussions on focus areas. However, the opportunity for further enhancements to the templates and the overall process were discussed during the site and jurisdictional consultations. Templates should be further enhanced for ease of completion for FY21/22.</p>

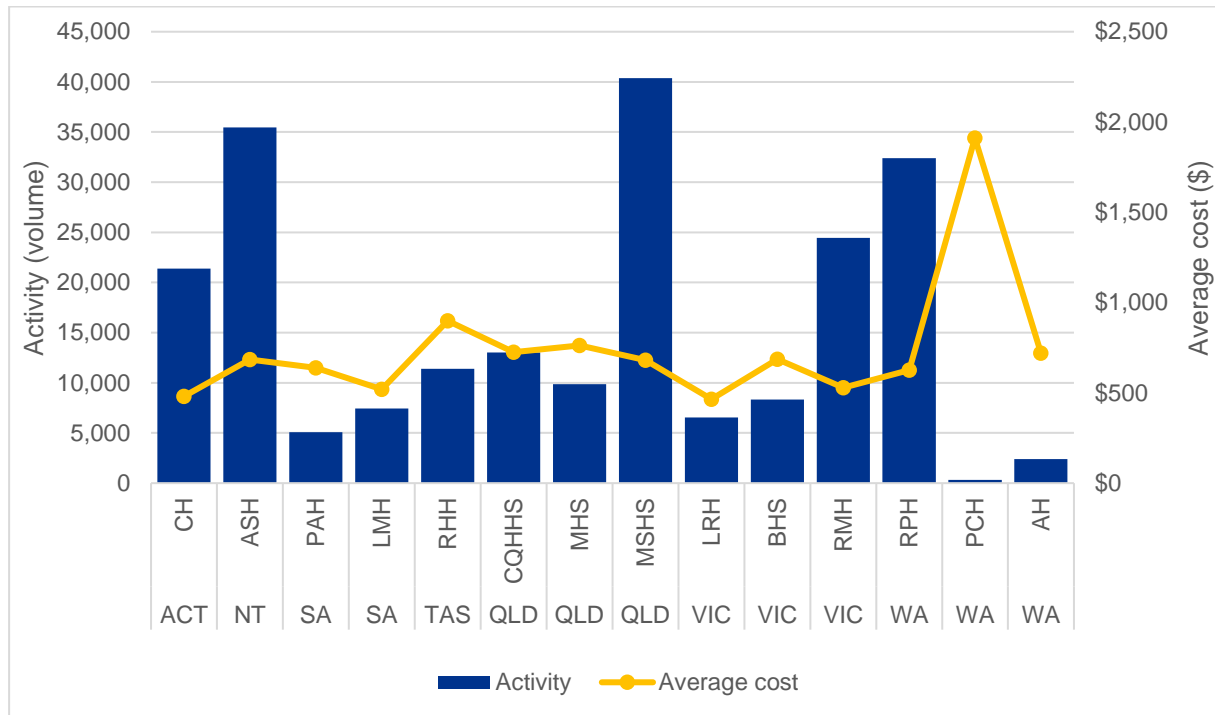
No.	Recommendation
2	<p>Developing and promoting cost practitioner knowledge</p> <p>During the consultation phase, it was evident that the impact of departing cost practitioners was significant for several jurisdictions. This recommendation was proposed last year and should again be a focus for the costing community. Recommendations range from formal knowledge sharing, costing internships through to formal discussions with a relevant professional body (HFMA).</p>
3	<p>Focus areas</p> <p>During the consultations, the discussion of the selected focus areas provided good context for how the services were run and highlighted any changes in practice that may have impacted costs. Focus area discussions should tie into a costing standard with a deep dive into the costing methods, feeder systems and data capture undertaken for the area. This would support focused improvement of standards.</p>
4	<p>Scope of the IFR – Sampling Local Health Networks (LHNs)</p> <p>The absence of any one particular jurisdiction may impact the robustness of the IFR. In addition to the sampling framework, the selection of sites should consider the size and breadth of the final sampling size. Notwithstanding the need to alternate sites in smaller jurisdictions, the final sample sites selected should be a robust representative of total NHCDC costs.</p>
5	<p>Sharing jurisdictional lessons and insights</p> <p>Building on the appetite of jurisdictions to discuss and debrief consolidated findings, consideration should be given to a formal follow-up process into DRGs or specialties where there are material variations in either the average cost or length of stay or the costing allocation methodologies.</p> <p>Identifying one or two exemplars during the Quality Assurance (QA) process as case studies for discussion and inclusion in the IFR report would increase the value of the IFR to jurisdictions. For in depth analysis, selecting areas of excellence as focus areas in future IFRs would help other jurisdictions learn what good looks like and how to practically implement similar practices and costing methodologies.</p>

Focus areas

For the FY20/21 IFR, the two focus areas selected were haemodialysis (AR-DRG L61Z) and chemotherapy (AR-DRG R63Z). The purpose of analysing the focus areas was to understand the approach and allocation methods employed by each health service for the identification of variation and learning. The outcome was a discussion on how to achieve greater consistency in applying the standards in respect of the two focus areas and to provide a basis for further discussion regarding service models.

The opportunity for peer participation also provided the jurisdictions with visibility of practices and data capture in these focus areas. Haemodialysis and chemotherapy were chosen as the focus areas this year given that they are both high volume services, with the scope for multiple service delivery models in order to deliver appropriate care.

Figure 1: Average cost and activity for haemodialysis services across jurisdictions and sample sites



Source: Jurisdictional consultations and templates

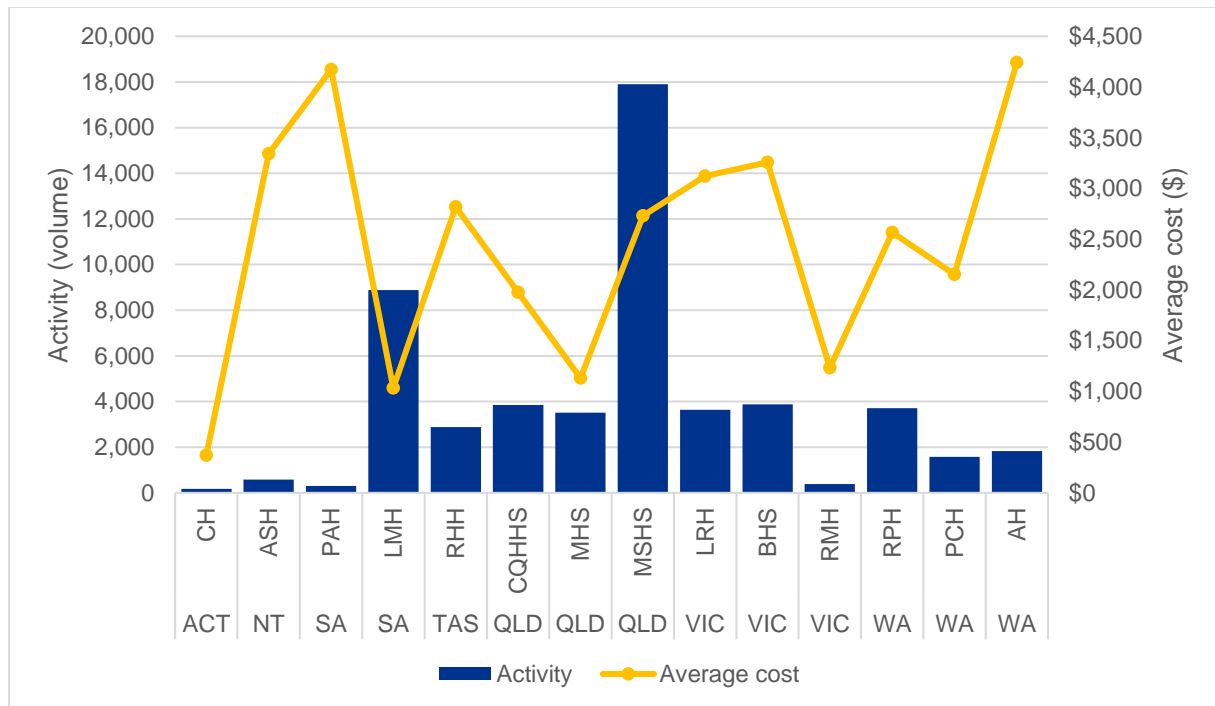
The majority of hospitals and health services sampled had in-house haemodialysis wards; most services would run 2-3 patient rotations throughout the ward each day. Services sampled highlighted that haemodialysis is relatively straightforward to cost, with all staffing and consumable costs able to be allocated down to the patient level. Figure 1 highlights relative consistency of average costs in haemodialysis, despite varying activity levels across different jurisdictions except for paediatric haemodialysis at Perth Children’s Hospital, for which average costs for paediatric services are typically higher.

From the sites sampled, WA, NT and VIC apply contracted models for parts of the haemodialysis service. However, all still retain in-house capabilities and services, tending to use contracted models for more remote locations where in-house services are not economical and/or patient travel to locations with in-house facilities is not appropriate. There were also some differences in service models between metropolitan and remote sites sampled with respect to outreach services, particularly for remote Aboriginal communities (as demonstrated in the summary for NT).

The outreach services highlighted the importance of understanding the context of care needs across different jurisdictions and their demographic cohorts and the possibility for further discussion across jurisdictions with similarly remote and/or rural communities with limited access to services. This is particularly relevant for haemodialysis where patients may need dialysis 3-4 times per week in perpetuity; such that, without outreach services, those patients may be required to move permanently to the location for ongoing treatment.

For chemotherapy, the majority of hospitals and health services sampled had in-house chemotherapy wards, with many also hosting in-house pharmacy capabilities for compounding of chemotherapy drugs. Canberra Hospital provides medical oncology as an outpatient service, which explained their lower average costs. All but one of these wards, the Royal Perth Hospital (RPH), provided services for other infusions (e.g. for the treatment of Crohn's Disease).

Figure 2: Average cost and activity for chemotherapy services across jurisdictions and sample sites



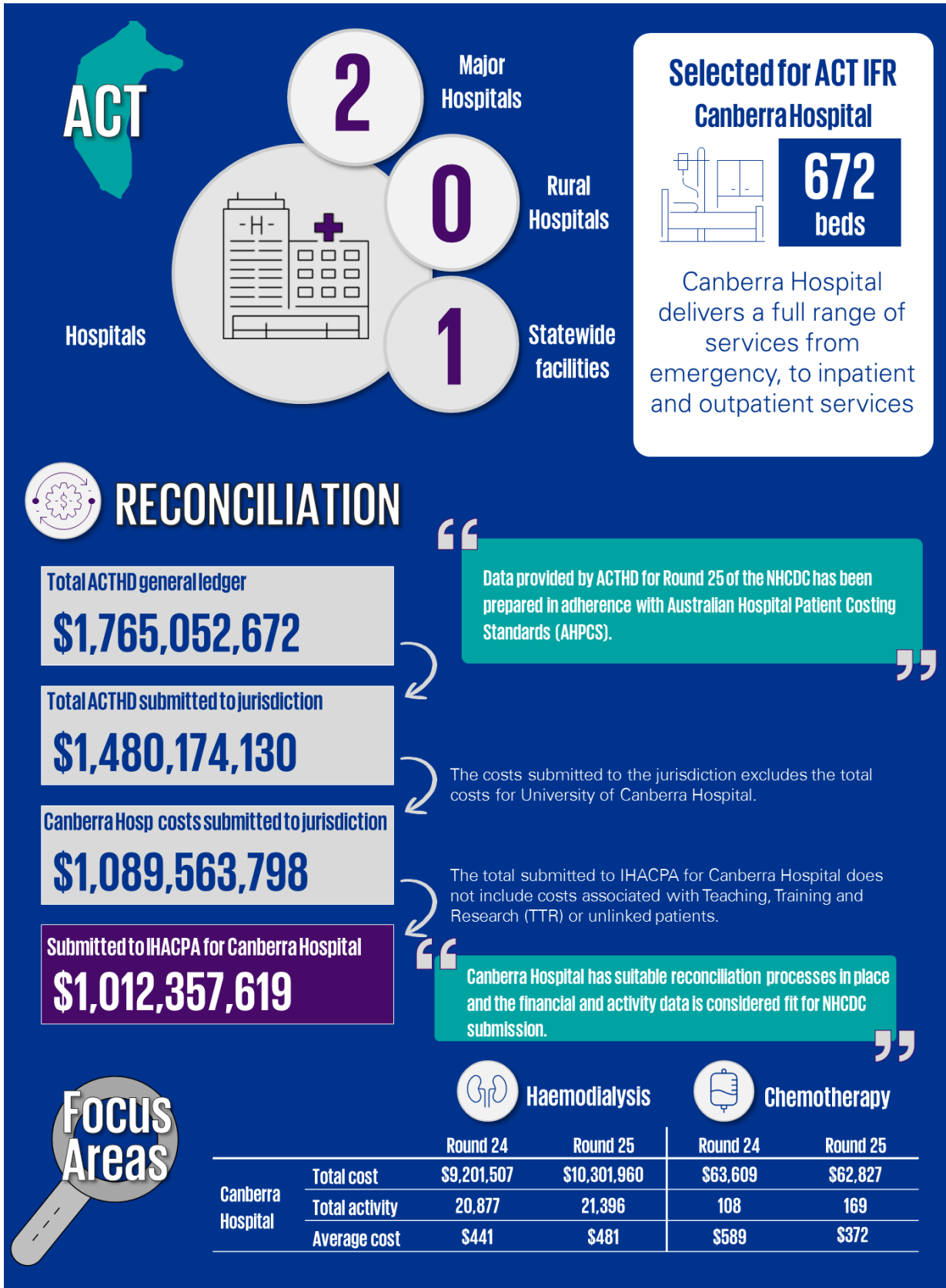
Source: Jurisdictional consultations and templates


All jurisdictions flagged drug costs as the major contributor to high-cost episodes and overall average cost increases in chemotherapy, particularly for patients who are administered non-Pharmaceutical Benefits Scheme (PBS) drugs or are participating in drug trials, that is common for this service. Figure 2 demonstrates that variability of average costs in chemotherapy across sample sites, predominantly driven by the usage and additional costs associated with non-PBS drugs in the delivery of this service.

Almost all hospitals and health services sampled experienced an increase in the cost of non-PBS drugs ranging between 10 and 65 per cent, with the highest examples being the Royal Hobart Hospital (368 per cent increase on FY19/20) and Latrobe Regional Hospital (424 per cent increase on FY19/20). Royal Melbourne Hospital also experienced a 1,751 per cent increase in the costs of non-PBS drugs from FY19/20, however they have much lower volumes of chemotherapy than other sites due to their partnership with the Peter MacCallum Cancer Centre within the same health precinct.

Summary of jurisdictional NHCDC submissions

The following one-page summaries for each jurisdiction summarise their final NHCDC submissions and demonstrate the flow of data from audited financial statements to the final submission to IHACPA.





TASMANIA

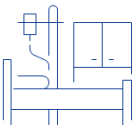
26
Hospitals

4
Major Hospitals

18
Rural Hospitals

2
Statewide facilities

Selected for Tas IFR
Royal Hobart Hospital



624
beds

RHH delivers a full range of services from emergency, to inpatient and outpatient services

RECONCILIATION

- Total Tasmania Health general ledger
\$2,099,418,025
- Total Royal Hobart submitted to jurisdiction
\$800,063,510
- Royal Hobart costs submitted to jurisdiction
\$902,190,184
- Submitted to IHACPA for Royal Hobart Hosp.
\$704,845,282

Tasmania Health Service (THS) continues to make best efforts to adhere to the Australian Hospital Patient Costing Standards (ACPCS) 4.1 and is compliant with exception to the areas listed below:

- Data Quality Framework (AHPCS 6.1.1.3.3, 6.1.3.5)
- Teaching, Training and Research (TTR) (CG 4.1, 4.2, 4.3)

Addition is due to post allocation amounts for central overheads and various other state-wide services.

The total submitted to IHACPA for RHH is less unlinked patients, TTR, community cost centre and other smaller variations in non-admitted and acute care (e.g. oral health).

Royal Hobart Hospital data submitted to IHACPA reconciles with IFR submission. Processes for financial and activity data are fit for NHCDC submission.

FOCUS AREAS

	Haemodialysis		Chemotherapy	
	Round 24	Round 25	Round 24	Round 25
Royal Hobart Hospital				
	Total cost	\$10,559,664 \$10,273,708	\$5,117,187 \$8,141,171	
	Total activity	11,902 11,414	3,127 2,888	
	Average cost	\$887 \$900	\$1,636 \$2,819	

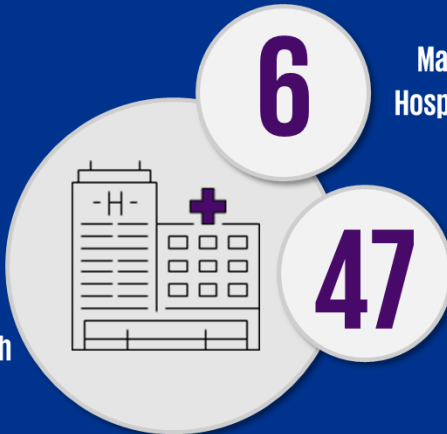
NT

5

Regional Health Services

6

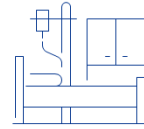
Major Hospitals



47

Remote Primary Health Centres

Selected for NT IFR
Alice Springs Hospital



205
 beds

Alice Springs Hospital delivers a full range of services from emergency to inpatient and outpatient services



RECONCILIATION

Total NT Health general ledger

\$1,755,222,683

Total NT Health submitted for costing

\$1,263,536,956

Alice Springs costs submitted to Jurisdiction

\$308,363,894

Submitted to IHACPA for Alice Springs Hospital

\$303,405,127

Data provided by NT Health for Round 25 of the NHCDC has been prepared in adherence with Australian Hospital Patient Costing Standards (AHPCS).

The total NT Health GL was \$1,755,222,683 as per the Audited Financial Statements, adjustments relating to third party long service leave and revenue were applied.

The various adjustments, primarily of excluded costs relating to non-NHCDC costs allocated to virtual patients, aged care, mental health and primary health care activity.

Alice Springs Hospital has suitable reconciliation processes in place and the financial and activity data is considered fit for NHCDC submission.

Focus Areas



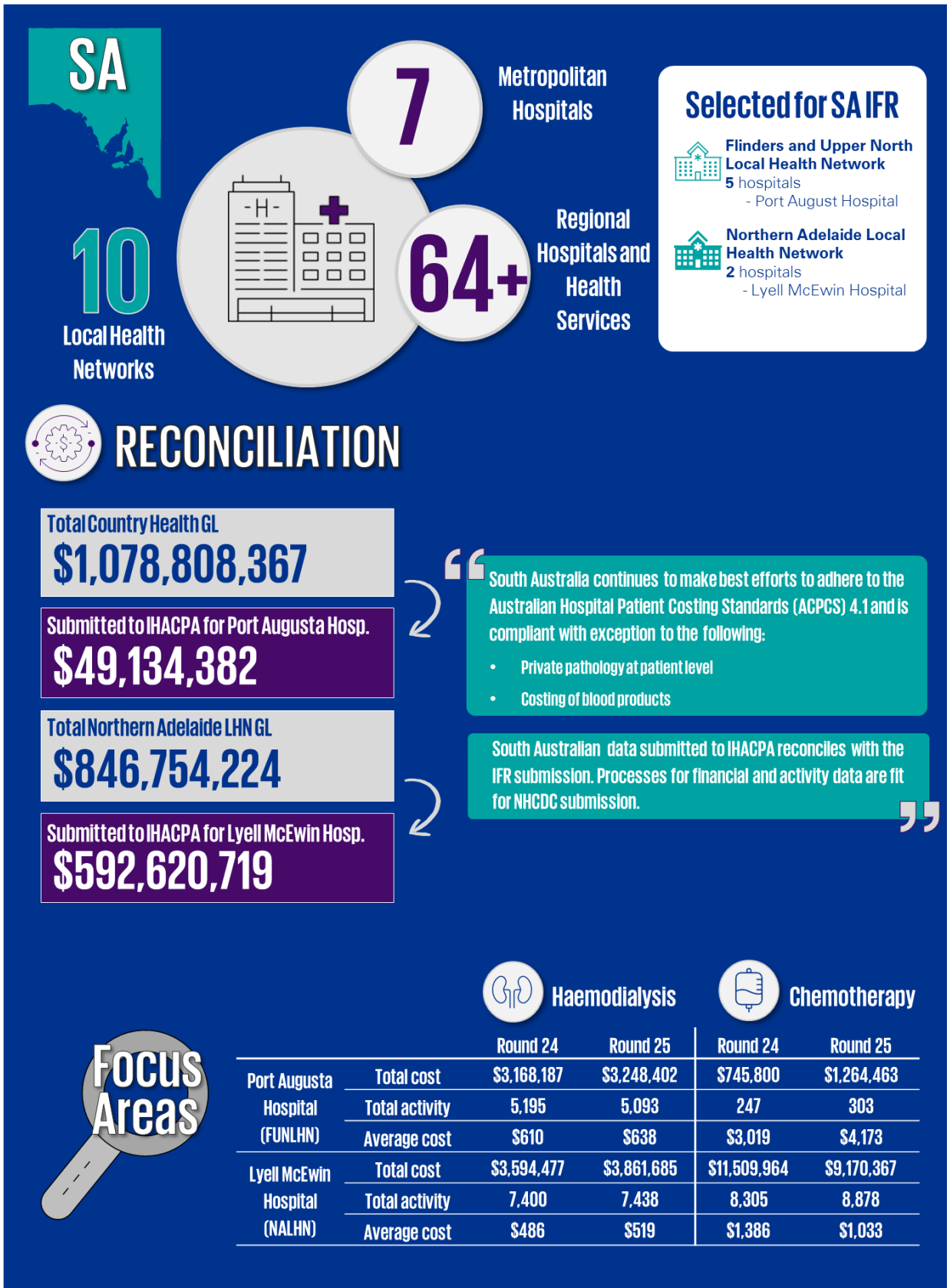
Haemodialysis

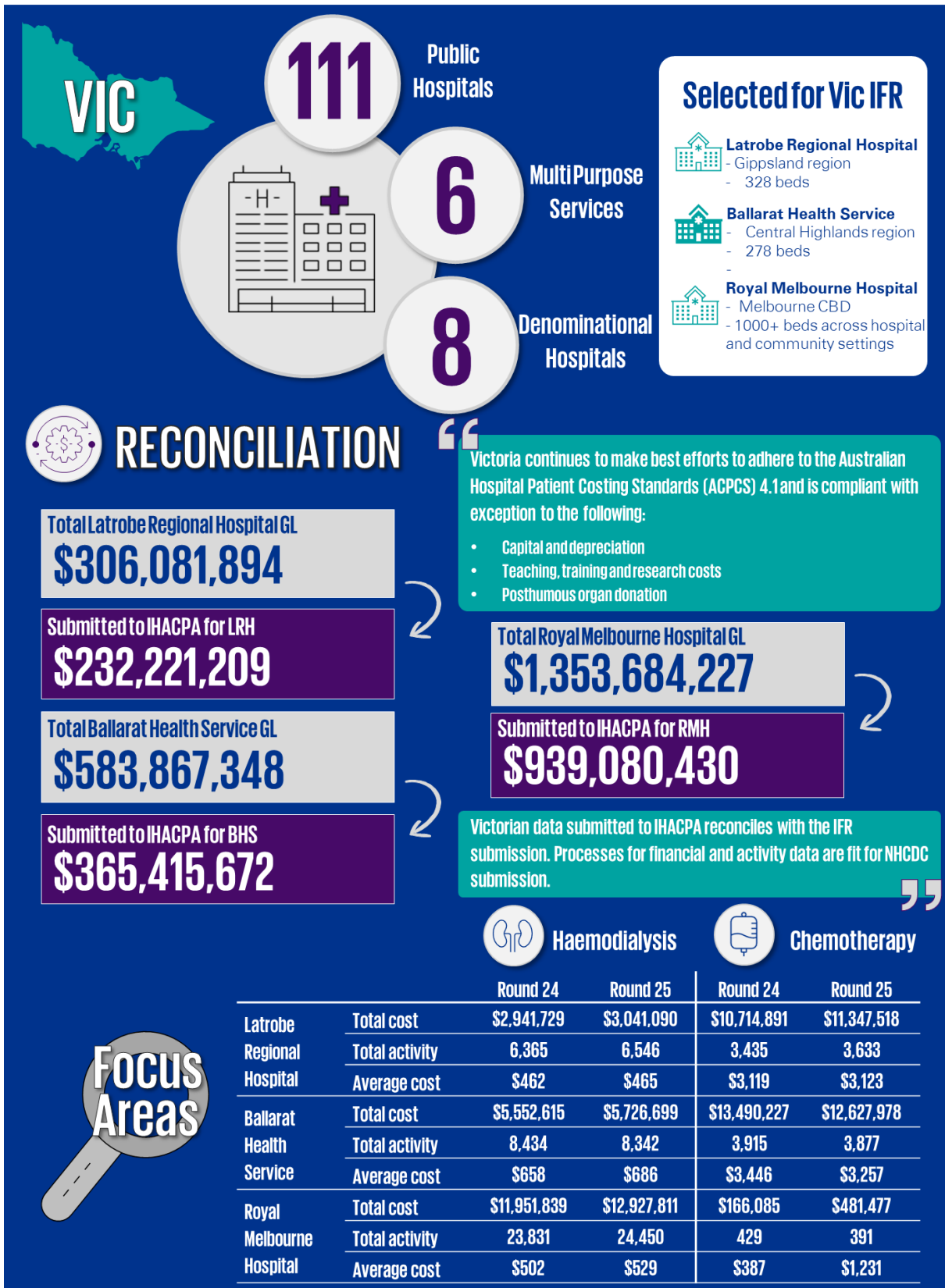


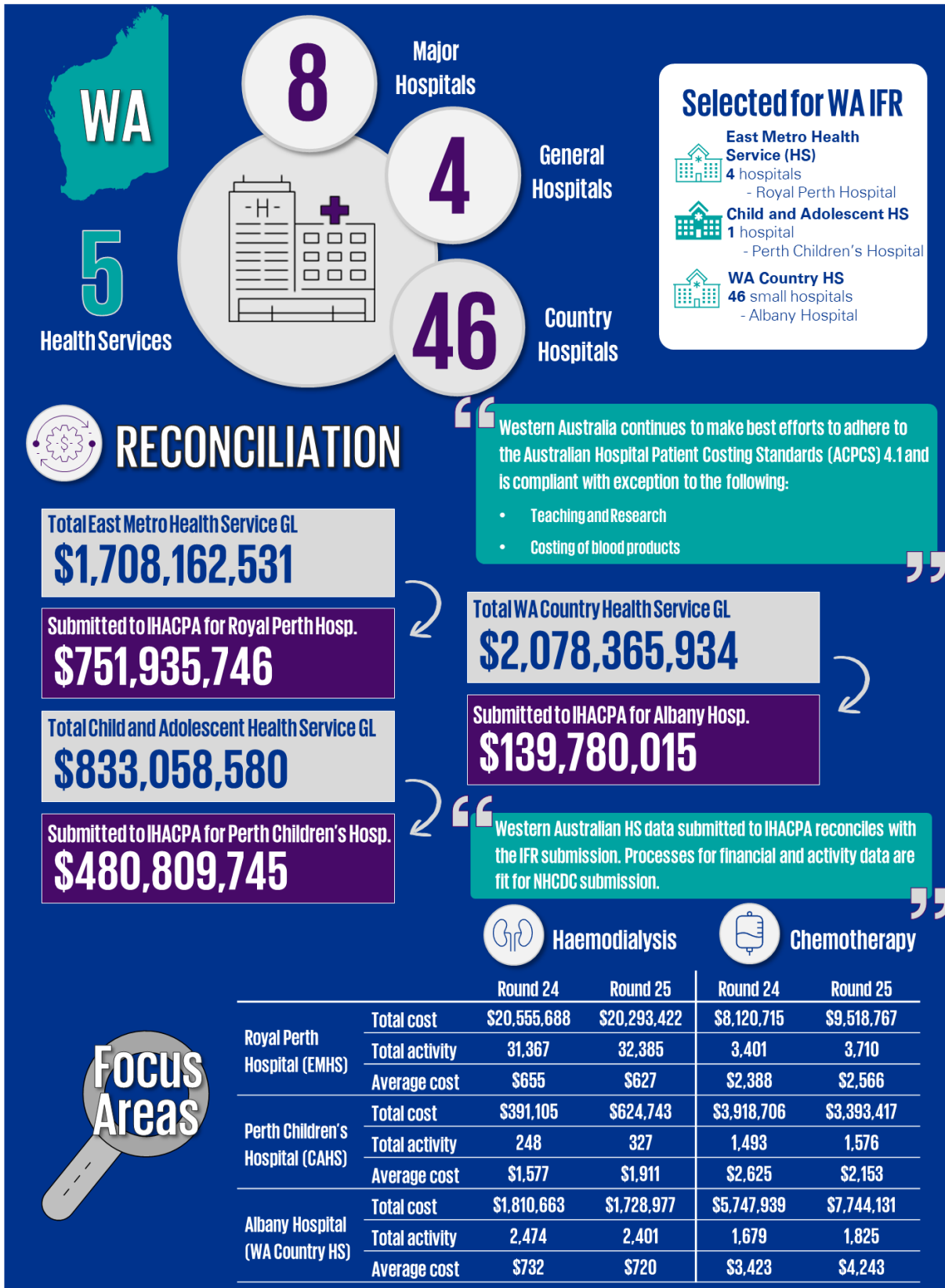
Chemotherapy

		Round 24	Round 25	Round 24	Round 25
Alice Springs Hospital	Total cost	\$15,579,624	\$18,879,007	\$441,858	\$1,711,201
	Total activity	35,348	35,464	504	588
	Average cost	\$578	\$684	\$1,067	\$3,344









1 Introduction

1.1 Scope of the Independent Financial Review

The Independent Health and Aged Care Pricing Authority (IHACPA) engaged KPMG to undertake a sample of the National Hospital Cost Data Collection (NHCDC) data submitted by states and territories for the Financial Year 2020-21 (FY20/21) of the NHCDC. The Independent Financial Review (IFR) of FY20/21 includes:

1. An assessment of the accuracy and completeness of the NHCDC participating health services provided for FY20/21, including a reconciliation between the financial and costing systems
2. An assessment of the consistency between jurisdictions sampled of the application of Version 4.1 of the Australian Hospital Patient Costing Standards (AHPCS)
3. An assessment of the degree to which the NHCDC data is robust and fit for purpose
4. A review of the data flow from the health service to the jurisdictional upload of hospital information, to the data submission portal, through to the storing of data in IHACPA's national database, through a selected sample
5. An identification of improvements implemented at the health service and/or jurisdictional level as compared to the previous round (FY19/20) and address any developments made in response to the findings in the FY19/20 IFR Final Report.

Following a workshop held at the commencement of the review, the FY20/21 IFR also included an additional focus area:

6. A review of the cost allocation methodology utilised by different hospitals for two selected diagnosis related groups (DRGs), i.e. haemodialysis and chemotherapy.

This review assessed the completeness and accuracy of jurisdictional data against the NHCDC standards, through a process agreed with IHACPA, but does not constitute a formal audit or assurance process. KPMG relied upon the assertions made by hospital/local health network (LHN) costing staff and jurisdictional representatives (and the information presented in the templates) in forming a view as to the reasonableness of the basis of the adjustments. Noting these adjustments and variances discussed during the consultations and in accordance with the review methodology detailed in section 1.2 of this report, jurisdictions have suitable reconciliation processes in place and the financial data is considered fit for purpose for the NHCDC submission for FY20/21.

Procedures performed were limited to the sample hospitals selected in agreement with IHACPA and utilising the KPMG sampling framework that considered, volume, complexity, and remoteness. A review was conducted of supporting data agreeing to source documentation (where possible), discussions with Costing teams and obtaining extracts from costing systems for the sample health services selected. The outcomes and results rely on the representations, assertions and data submissions made by the hospital or LHN² Costing teams and jurisdiction representatives and no work has been undertaken to verify the underlying data.

² LHN refers to a health network, district, or service. LHN has been selected for simplicity through sections of the report but the correct network name for the respective jurisdiction is specified appropriately.

1.2 Methodology

The Review team gathered information required for the IFR through the following methods:

1. A data (financial and activity) collection template (revised for FY20/21) distributed to hospitals and jurisdictions and tailored to provide the required information to assess the application of selected standards from AHPCS Version 4.1 collection of data
2. Collection of data, both quantitative and qualitative, relating to the two focus areas (i.e. haemodialysis and chemotherapy)
3. Virtual and face-to-face site visits (where possible) with the hospital/LHN Costing team and jurisdictional representatives and follow-up discussions to address feedback and outstanding issues
4. Sample testing of five patients from each hospital to test the transfer of patient cost data from the hospital, via the jurisdiction, to IHACPA
5. Review of IHACPA processes to understand the methods in place for the collection, amendments and collation of financial and activity data received from jurisdictions
6. A peer review process to enable peers from other jurisdictions to share information, processes, challenges and solutions through open invitations to attend any of the site visits.

1.3 Participating sites

Seven of the eight jurisdictions participated in the IFR for FY20/21; New South Wales (NSW) elected not to participate in the latest IFR. The sample selected for this review was consistent with the pragmatic approach of previous rounds that recognises the need for jurisdictional support for the IFR, resource constraints and a desire to obtain a geographical spread across the jurisdictions, and the KPMG sampling framework considering volume, complexity, and remoteness. The selection of the sample sites was undertaken by each jurisdiction with consideration of when the health service or hospital last participated in the IFR process. Table 2 identifies these participating hospitals and health services for FY20/21 IFR.

Table 2: FY20/21 participating hospitals and LHNs

Jurisdiction	LHN (if applicable)	Hospital(s)
ACT	ACT Health Service	Canberra Hospital
NSW	<i>Did not participate</i>	
QLD	Central Queensland Health Service Mackay Health Service Metro South Health Service	
SA	Flinders and Upper North LHN Northern Adelaide LHN	Port Augusta Hospital Lyell McEwin Hospital
TAS	Tasmanian Health Service	Royal Hobart Hospital
VIC		Latrobe Regional Hospital Ballarat Health Service ³ Royal Melbourne Hospital
WA	East Metro Health Service Child and Adolescent Health Service WA Country Health Service	Royal Perth Hospital Perth Children's Hospital Albany Hospital

Source: KPMG project planning

³ Refers to Ballarat Health Services only, prior to new amalgamated Grampians Health from 1 November 2021

1.4 Challenges

During the IFR for FY20/21 (2020-21), the following challenges were identified in the planning and delivery of the IFR:

1. COVID-19 restrictions limited the number of in-person site visits. While the majority of site visits were able to occur in person (compared with only one in-person site visit in FY19/20), two jurisdictional consultations were still conducted virtually due to COVID-19 policies within hospitals and health facilities.
2. Based on the feedback from FY19/20, new IFR jurisdictional data templates were developed to streamline data collection and improve usability. The pilot process for Tasmania was an important component to ensuring that the template and data flow was working correctly, however user testing was not conducted across all jurisdictions and there were some initial issues experienced with the new template. As a result, there was some delay in finalising the templates for submission with the remaining jurisdictions. During the discussions, improvement opportunities were identified to streamline the process for future IFRs.
3. There are nuanced governance arrangements across the jurisdictions; some have multiple LHNs / health services (HSs), comprising multiple hospital facilities and services (e.g. community health, mental health), while some smaller jurisdictions (e.g. Tasmania, ACT) have only one LHN that encompasses the entire jurisdictional health network. These differences caused some challenges with the IFR jurisdictional data template, that sought information at both the LHN and hospital level and therefore caused challenges with the corresponding interpretation and comparison of data at the aggregate level across jurisdictions.
4. Scheduling of jurisdictional consultations back-to-back during the IFR process caused some bottlenecks in the drafting and feedback process associated with the jurisdictional chapters. Timing in between consultations would allow for drafting to occur immediately but is reliant on an earlier start to the consultation period.
5. Staff turnover and significant capacity issues in some jurisdictions made it more difficult for them to complete the IFR jurisdictional templates where resourcing was constrained, or where corporate knowledge had been lost.

Please refer to the recommendations section (2.2) regarding potential changes and improvements to address some of these challenges for the FY21/22 IFR.

2 Findings and Recommendations

2.1 Observations from FY20/21

Specific observations from the FY20/21 IFR are detailed in section 2.1. While one jurisdiction did not participate this year, the IFR was well received by all participating jurisdictions with robust conversations throughout the consultation process.

As a result of previous recommendations, data collection templates were adjusted to gather relevant information and utilise information that had already been provided by health services through the data quality statements and jurisdictional submission process. The template also collected prior year data that was used to facilitate discussions on potential emerging trends or process changes from FY19/20.

Focus areas included for the 2020-21 financial year and agreed through the NHCDC Advisory Committee (NAC) were haemodialysis and chemotherapy, selected due to their high volume services nationally.

The general feedback on the templates and the reconciliation was that they were more user friendly than previous iterations. However, there was some confusion between the LHN (network level) and Hospital level tabs, particularly as most adjustments occur at the network level, with only the final output (submission to IHACPA) being at the hospital level. Given the current maturity of cost collection processes and data validation from IHACPA during the submission process, the Review team should look to pre-populate the templates with data previously provided.

In line with previous years, the IFR seeks to address:

- 1. The accuracy and completeness of the FY20/21 NHCDC for participating health services, including an expenditure reconciliation between the financial and costing systems**

Based upon the findings and observations contained in section 2, participating jurisdictions have provided reconciling data and source information to support the accuracy of submitted data.

- 2. Assessment of the consistency between jurisdictions sampled for the application of Version 4.1 of the Australian Hospital Patient Costing Standards (AHPCS) for selected standards**

The application of the selected standards from AHPCS Version 4.1 across the jurisdictions was mostly consistent, as outlined in the various data quality statements received by IHACPA. Jurisdictions noted partial compliance with various standards (e.g. Mental Health phase of care and blood products). While the process of applying standards is consistent, it was noted that the impacts of COVID-19 are still resulting in a variation of treatment of general ledger costs. Whilst detailed analysis was not conducted, discussions indicated the isolation of these costs appears to be comprehensive and robust.

- 3. Assess the degree to which the NHCDC data is robust and fit for purpose**

As outlined above while the data submissions are reconciled and complete, the impact of COVID-19 on expenditure and activity varied across the jurisdictions, i.e. COVID impacts, varied significantly in terms of timing and the relevant State Government responses to address COVID-19, e.g. Western Australia (WA) experienced almost no impact for FY20/21.

4. Review the data flow from the health service to the jurisdictional upload of hospital information, to the data submission portal, through to the storing of data in IHACPA's national database, through a selected sample

A sample of five patient records from each hospital was taken to test the transfer of patient cost data from the hospital, via the jurisdiction, to IHACPA and to identify any cost variance. There were no material variances across any of the jurisdictional samples indicating appropriate data flow from the health service through to IHACPA. The individual sample results are provided within each jurisdictional chapter.

5. Identification of improvements implemented at the health service and/or jurisdictional level as compared to FY19/20 and address any developments made in response to the findings in the FY19/20 IFR Final Report

Several improvements to FY19/20 costing processes were identified through the discussions with each jurisdiction and are highlighted within the jurisdictional chapters, alongside additional areas for improvement that are being considered for FY21/22 and beyond.

6. Review the cost allocation methodology utilised by different hospitals for two selected diagnosis related groups (DRGs), i.e. haemodialysis and chemotherapy

A review of the costing allocation and service delivery methods for haemodialysis and chemotherapy across jurisdictions is provided in section 3, with comparative highlights also provided within the Executive Summary.

2.1.1 Continuous improvement

Throughout the consultations, the level of continuous improvement by participants was evidenced. The prevailing theme for the jurisdictions and health services was the continuous pursuit of improving the matching of costs with activity by capturing information from hospital systems and increasing the percentage of direct costs. There was also a focus on the education of business users and continued use of costing data for purposes other than the NHDCDC submission. Set out below is a summary of the key improvements by participants during FY20/21.

Health Services

Health services continue to demonstrate a deep understanding of the data available to them by continuing to introduce additional and/or improved feeder files to the costing process to ensure strong matching of activity to costs.

Jurisdictions

Jurisdictions continue to invest time in initiatives that improve the quality of the data submitted by health services by introducing improved quality assurance (QA) processes, e.g. automated reports highlighting data errors prior to submission to the IHACPA portal, that saves time and effort during the submission period.

FY19/20 Recommendations

Improvements made by IHACPA predominately relate to FY19/20 recommendations, the commentary below relates to these improvements and the table provides a summary of the progress of the FY19/20 recommendations.

IHACPA

IHACPA publicly released the National Benchmarking Portal in 2022. The portal contains costing data for the three rounds up to FY19/20. IHACPA believes that open access to data will help enable policy decisions and improve patient outcomes.⁴

A workshop facilitated by the IFR reviewers for all jurisdictions and IHACPA to review the key observations and findings from the IFR has been implemented for FY20/21. This was a recommendation from the FY19/20 review.

Table 3: Recommendations from the FY19/20 IFR

No.	Recommendation from FY19/20 IFR	Progress to date
1	<p>Structure and approach for future IFRs</p> <p>Change the current focus from completing the current structured template to a review of key supporting documentation as evidence to support the reconciliation process.</p> <p>Documentation would be required at all key steps in the process to demonstrate adherence to costing standards. Key to this revised focus will be the QA processes that are in place in the health network, the jurisdictions and IHACPA.</p>	<p>Complete</p> <p>(Noting opportunity to refine further)</p>
2	<p>Implementation of IFR recommendations</p> <p>To ensure there is greater focus on the outcomes from future IFRs, it is recommended that a process be established for reporting progress of recommendations to the NAC with engagement from jurisdictions on progress of implementation, where applicable.</p>	<p>Complete</p> <p>(Presentation at NAC)</p>
3	<p>Developing and promoting cost practitioner knowledge</p> <p>To elevate and sustain the role of the costing practitioner, it is recommended that discussions be held with a relevant professional body, for example the Health Finance Management Association (HFMA), regarding hosting a costing focus group as part of its broader remit or tertiary institutions incorporating health costing into curricula.</p>	<p>Not commenced</p>
4	<p>Focus areas</p> <p>The change in the approach to the IFR will enable future reviews to have a greater focus on key costing processes such as continued deep dives on how costs are allocated by health networks, national consistency of cost allocations, consistency of approach and opportunities for future improvement and promoting innovation and good practice.</p>	<p>Complete</p> <p>(Noting opportunity to refine further)</p>
5	<p>Use of NHCDC data</p> <p>It was observed during the consultation phase that there are still opportunities to increase the utility of the costing data produced by health networks and the jurisdictions. While all jurisdictions refer to developing a portal of some kind, the National Benchmarking Portal already in place could be further developed for these purposes.</p>	<p>Complete</p>

⁴ <https://www.ihacpa.gov.au/health-care/data/national-benchmarking-portal>

No.	Recommendation from FY19/20 IFR	Progress to date
6	<p>Scope of the IFR – Health Service Selections</p> <p>IHACPA should consider re-implementing a risk-based approach to the identification of the number and mix of participants per jurisdiction in the FY20/21 IFR and beyond.</p> <p>It should be noted that the revised approach described above should be less onerous on smaller jurisdictions (whilst still being representative) and is expected to provide benefits from an increased focus on key focus areas.</p> <p>Data Quality Statements (DQS) and self-assessment submitted by jurisdictions could be utilised in the sampling approach to both inform sample selection and potentially focus areas. Submission for the costing entity would be required by February or March to inform the IFR approach.</p>	<p>Part Progress</p> <p>(Noting opportunity to refine further)</p>

Source: FY19/20 Independent Financial Review Report

2.1.2 COVID-19 impact

The impact of COVID-19 on the jurisdictions' and health services' respective finance and Costing teams continued in FY20/21. Discussions regarding COVID-19 were conducted in the context of the IFR and not for any broader purpose. The summaries in the jurisdictional chapters provide a summary of the discussions and any impacts on costing. The impact across jurisdictions varied significantly depending on how the relevant state government managed the response and COVID-19 case numbers. The key emerging issues identified during the consultations were:

- The need for clear guidelines and processes at the jurisdiction level, regarding how COVID-19 costs should be treated at the health service level, noting that IHACPA have drafted a standard for COVID-19 to assist with the costing of this information
- Moving forward, for consistency, a set of business rules that reflect current practice that should be considered, i.e. do COVID-19 costs constitute business as usual in the post-pandemic context or are they to be always isolated within different cost centres?

2.1.3 Reconciliation from LHN/hospital to jurisdictions to IHACPA

The templates completed for the IFR demonstrate the reconciliation of the respective network's source of financial data (as reflected in their Audited Financial Statements) through to the submissions to the jurisdiction and finally to IHACPA. During the site visits, discussions occurred regarding the various adjustments for out of scope or excluded costs, that demonstrated the efforts undertaken to reconcile data throughout the submission process.

Costing practitioners demonstrated in the templates and discussions adjustments made to the financial data, both pre and post allocation of costs to patients. KPMG relied upon the assertions made by hospital/LHN costing staff and jurisdictional representatives (and the information presented in the templates) in forming a view as to the reasonableness of the basis of the adjustments.

The review of the data flow from the jurisdiction to IHACPA identified no material variances between the jurisdictional data submitted to IHACPA and the data contained in the national reconciliation file provided by IHACPA.

Noting these adjustments and variances discussed during the consultations and in accordance with the review methodology detailed in section 1.2 of this report, jurisdictions have suitable reconciliation processes in place and the financial data is considered fit for purpose for the NHDC submission for FY20/21.

2.1.4 Testing data flow at patient level to IHACPA

IHACPA selected a sample of five patients from each sample site for the purposes of testing the patient level data flow from the jurisdiction to IHACPA. This was a simple test conducted at the total cost level, sampling each patient care stream to provide comfort that the records sent by the jurisdiction were received wholly by IHACPA. There were no variances between any of the sample patient records tested during this process.

2.1.5 Peer reviews

The opportunity to participate in the peer review continues to be offered to all jurisdictions. The level of participation has varied since the break in the IFR due to COVID-19 (i.e. Round 23 did not occur); feedback from those who participated in the consultations as peer reviewers was overwhelmingly positive and continues to be considered a beneficial component of the IFR.

Noting that FY19/20 was the first year the peer review was open to all participants (there were no limitations on space as site visits were conducted virtually), the take up this year was not as extensive. Suggestions for improving future peer participation have been considered in the recommendation section (2.2).

2.1.6 Increase in attendance by Costing teams

Although the peer review attendances were lower in FY20/21, there was an increase in attendance of the Costing teams in each jurisdiction, both from a department and hospital/LHN level. The increased attendance of Costing team members from previous rounds is evident and highlights the desire of both groups to continue to build both the numbers and education of their costing workforce, while increasing local transparency in the costing process and the submission to IHACPA.

2.1.7 Application of AHPCS (v4.1)

The application of the selected AHPCS Version 4.1 standards from across the jurisdictions was mostly consistent, as outlined in the respective jurisdictional chapters and reflected in the data quality statements received by IHACPA. Jurisdictions noted partial or full compliance with various standards and noted their exceptions. Specific exceptions to the standards were outlined in the relevant data quality statements. A sample of these is outlined below:

- Depreciation is excluded from some jurisdictional submissions.
- Research costs are excluded from some jurisdictional submissions.
- Posthumous organ donation – the application of this standard varies across the jurisdictions.
- Blood products are not costed at a patient level as data matching is not accurate enough to provide robust costings.
- Not all jurisdictions provided costings for Mental Health Care at the phase level.
- All jurisdictions provided commentary on the impact COVID-19 had on their financials during the period. It was noted that inclusion and exclusion of various costs was not consistent and may not reflect all applicable costs (regardless of funding source) for the purpose of the NHCDC. As a result, FY20/21 data may not be fit for purpose, such as setting a national efficient price without further quality assurance being conducted regarding the application of the COVID-19 standard.

2.1.8 Sampling approach

Considering the purpose of the IFR and the sampling methodology used to select the respective sites within each jurisdiction, the absence of any one jurisdiction may impact the robustness of the IFR. During FY19/20, Tasmania were unable to participate, while in FY20/21 NSW were unable to participate. Considering the percentage of the total NHCDC costs the respective jurisdictions represent, i.e. 2.5 per cent for Tasmania and 28.6 per cent for NSW, non-participation by a jurisdiction can have a material impact on the objectives of the IFR. The ability for all jurisdictions to be able participate should be considered when planning and scheduling future IFRs.

2.2 Recommendations for future IFRs

The recommendations from the FY20/21 IFR focus on opportunities to further refine future IFRs. Feedback during the consultations highlighted that, although the structure of the templates was modified from FY19/20, there is still further opportunity to improve on the approach. Opportunities need to be considered that reflect the maturity of costing across jurisdictions and improvements in IHACPA's data collection processes. Future IFRs should look to leverage off current and future QA and data submission processes, outputs and systems. The purpose and veracity of the IFR remains of primary importance to all stakeholders.

Key recommendations for future IFRs include additional improvements to the:

- Structure and approach taken to validate jurisdictional costing processes and data flow
- Development and promotion of cost practitioner knowledge
- Selection and discussion of outcomes from review of focus areas
- Scope of the IFR with respect to sampling LHNs
- Sharing of jurisdictional lessons and insights.

2.2.1 Structure and approach for future IFRs

The current approach to the IFR is focused on 'stepping through' the costing process to validate the data (financial and activity) used by the hospitals or health networks, from the source systems to the final submission to IHACPA. This process is achieved by the participants in the review completing a template that replicates the key steps in the costing process.

Consistent with a recommendation from the FY19/20 IFR, the review process should continue, however it is recommended that the approach and focus of future IFRs should change. Changes did occur for FY20/21 with the simplification of the data collection templates and further discussion on focus areas. However, the opportunity for further enhancements to the templates and the overall process were discussed during the site and jurisdictional consultations, specifically that future IFRs should consider:

- Using more of the information that is already available and provided by jurisdictions by either pre-populating the template or discussing the various reports submitted.
- Early engagement with the NHCDC Advisory Committee (NAC) including a pre-briefing on the process proposed for the next IFR, e.g. data requirements and proposed focus areas.
- Face to face and virtual options should be available for all future IFRs to increase peer group participation.

- Aligning the timing of the IFR more closely with the timing of the submission of data by health services to jurisdictions and jurisdictions to IHACPA to make data capture for the IFR timely and relevant.
- LHNs should be more involved in the jurisdiction end to end process for data submissions to IHACPA and receive the QA reports provided by IHACPA; this data should be utilised in the IFR.
- Templates should be further enhanced for ease of completion for FY20/21, and future templates should only be completed by an LHN, to align with the Audited Financial Statements, the starting point for the financial reconciliations.
- The potential to extend or redesign the site visits to enable the early drafting of the health service and jurisdictional chapter and validation of data closer to the consultations, removing timing issues between waiting for data and responses.

2.2.2 Developing and promoting cost practitioner knowledge

During the consultation phase, it was evident that the impact of departing cost practitioners was significant for several jurisdictions. This recommendation was proposed last year and should again be a focus for the costing community. The following should be considered:

- The IFR is a good introduction to the full costing process for those practitioners who do not have visibility beyond their hospital/LHN. Earlier engagement via the NAC with local Costing teams could encourage further participation in the IFR especially considering the virtual nature of recent IFRs.
- Beyond the IFR, more formal knowledge sharing or forums to showcase how different Costing teams use the data or any new developments in activity feeder files can be valuable for all levels of costing practitioners.
- At a jurisdictional level, there is a strong appetite for contacts to meet and go through the consolidated findings (IHACPA QA reports could be a starting point) and learn from one another; a structured forum for these discussions should be implemented.
- A number of smaller jurisdictions were impacted by the loss of key costing personnel for FY20/21. The Northern Territory (NT) aligned the costing and health information team to the finance function to improve longer term sustainability, together with developing a formal 'internship' for costing practitioners and those interested in costing that involves training, rotations, and forums. The ambition is that this will provide alternative career paths for costing and finance staff alike, broadening the pool of costing staff in the future, something other jurisdictions should consider implementing.
- A recommendation from FY19/20 was the idea to elevate the role of the costing practitioner through a professional body. Formal discussions should be held with a relevant professional body, for example the Health Finance Management Association (HFMA), regarding hosting a costing focus group as part of its broader remit.

2.2.3 Focus areas

During the consultations, the discussion of the selected focus areas provided context for how the services were run and highlighted any changes in practice that may have impacted costs. However, the following changes were suggested:

- There should be a clear reason in determining and selecting focus areas that should be communicated to jurisdictions and hospital/LHNs.

- Focus area discussions should tie into a costing standard with a deep dive into the costing methods, feeder systems and data capture undertaken for the area. This would support focused improvement of standards.
- In the focus areas selected for FY20/21, the scope was limited to DRG activity, and all non-admitted activity was excluded from the discussion. More time should be considered on the purpose of the discussion for full transparency. In some instances, focus areas of chemotherapy and haemodialysis were considered non-admitted depending upon the service models adopted.

2.2.4 Scope of the IFR – Sampling Local Health Networks (LHNs)

As outlined above, the absence of any one particular jurisdiction may impact the robustness of the IFR. Similarly, the selection of sites should consider the size and breadth of the final sampling size. The following recommendations should be considered:

- Notwithstanding the need to alternate sites in smaller jurisdictions, the final sample sites selected should be a robust representative of total NHCDC costs, for example 5-10 per cent of total jurisdictional costs. Again, this relies on timely submission and the Data Quality Statement (DQS) for the sampling to occur effectively.
- If the timing of the IFR is causing participation issues, perhaps allowing jurisdictions to test load submissions in December to allow them to address issues earlier would enable them to be ready for full submission in February. This could align with a pre-briefing of requirements to the NAC for the IFR and the completion of templates at the same time.
- During the consultations, it became clear that completing the templates at the hospital level was difficult as the submissions occur at the LHN level. It is recommended that future IFR templates are only completed at the LHN level (with hospital sites sampled informing LHNs in scope), allowing for better links with supporting information for reconciliation purposes (e.g. Audited Financial Statements) and IHACPA submissions.

2.2.5 Sharing jurisdictional lessons and insights

Building on the appetite of jurisdictions to discuss and debrief consolidated findings, consideration should be given to a formal follow-up process into DRGs or specialties where there has either been material variation in either the average cost or length of stay for those services or the costing methodologies for same. Identifying areas of excellence and selecting them as a focus area in a future IFR or a costing workshop would help other jurisdictions learn what good looks like and how to practically implement similar practices and costing methodologies.

3 Focus areas

For the FY20/21 IFR, the two focus areas selected were haemodialysis (AR-DRG L61Z) and chemotherapy (AR-DRG R63Z). The purpose of analysing the focus areas was to understand the approach and allocation methods employed by each health service for the identification of variation and learning. The outcome was a discussion on how to achieve greater consistency in applying the standards in respect of the two focus areas in particular, but also to provide a basis for further discussion regarding service models. The opportunity for peer participation also provided the jurisdictions with visibility of practices and data capture in these focus areas.

Haemodialysis and chemotherapy were chosen as the focus areas this year given that they are both high volume services, with the scope for multiple service delivery models in order to deliver appropriate care.

System and data limitations will always apply at varying levels across the health services within and across jurisdictions, but understanding those variations is the first step in creating consistency for application of costing standards where possible. For example, the scale and importance of outreach haemodialysis is even more pronounced for Alice Springs Hospital than it is for the Royal Darwin Hospital due to the high number of remote communities within its catchment.

Key metrics included total cost, highest and lowest episode cost, average cost, activity and length of stay. Length of stay metrics were largely uninformative for both haemodialysis and chemotherapy, as most jurisdictions were unable to refine this metric beyond 1.00 days – when it was noted there were typically 2-4 rounds of patients seen per day, that provides an opportunity for future refinement of data across jurisdictions. South Australia (SA) was able to refine this figure to 0.22 days for haemodialysis (approximately five hours) and 0.17 days for chemotherapy (approximately four hours). This outcome provides an opportunity for all jurisdictions to consider how they can refine length of stay (LOS) metrics for services that are less than one day's duration.

3.1 Haemodialysis

3.1.1 Haemodialysis service models and costing methods

The majority of hospitals and health services sampled had in-house dialysis wards – this is defined as a service that is owned and delivered by the health service; most services would run 2-3 patient rotations throughout the ward each day. Services sampled highlighted that haemodialysis is relatively straightforward to cost, with all staffing and consumable costs able to be allocated down to the patient level. In most cases, any inpatients were typically admitted to the haemodialysis ward, with dialysis services allocated to the patient and tracked using ward movement reports.

From the sites sampled, WA, NT and VIC are known to be applying contracted models for parts of the service. However, all still retain in-house capabilities and services too, and they are defined as those services owned and delivered by the health service, tending to use contracted models for more remote locations where in-house services are not economical and/or patient travel to locations with in-house facilities is not appropriate. There were also some differences in service models between metropolitan and regional/remote sites sampled with respect to outreach services, particularly for remote Aboriginal communities (as demonstrated in the summary for NT). This is particularly relevant for haemodialysis where patients may need dialysis 3-4 times per week in perpetuity; such that, without outreach services, those patients may be required to move permanently to the location for ongoing treatment. This highlighted the importance of understanding the context of care needs across different jurisdictions and their demographic cohorts and the possibility for further discussion across jurisdictions with similarly remote and/or rural communities with limited access to services.

There were some differences across jurisdictions with respect to the allocation of blood costs, being either at the point of service (the dialysis event) or the point of order (typically the outpatient consult). To improve consistency of costing allocation methods for blood, this could be a point of discussion across the jurisdictions in the future.

Most jurisdictions did not, or were not able to, refine the average length of stay to less than a day, when treatments typically take 2-4 hours. To improve the granularity of costing data and allow sites to compare models of service, further work could be undertaken to identify methods for refining this metric across this and similar services.

Table 4: Summary of IFR FY20/21 costing and activity data for haemodialysis, with FY19/20 variances for average cost and activity, by jurisdiction and sample site

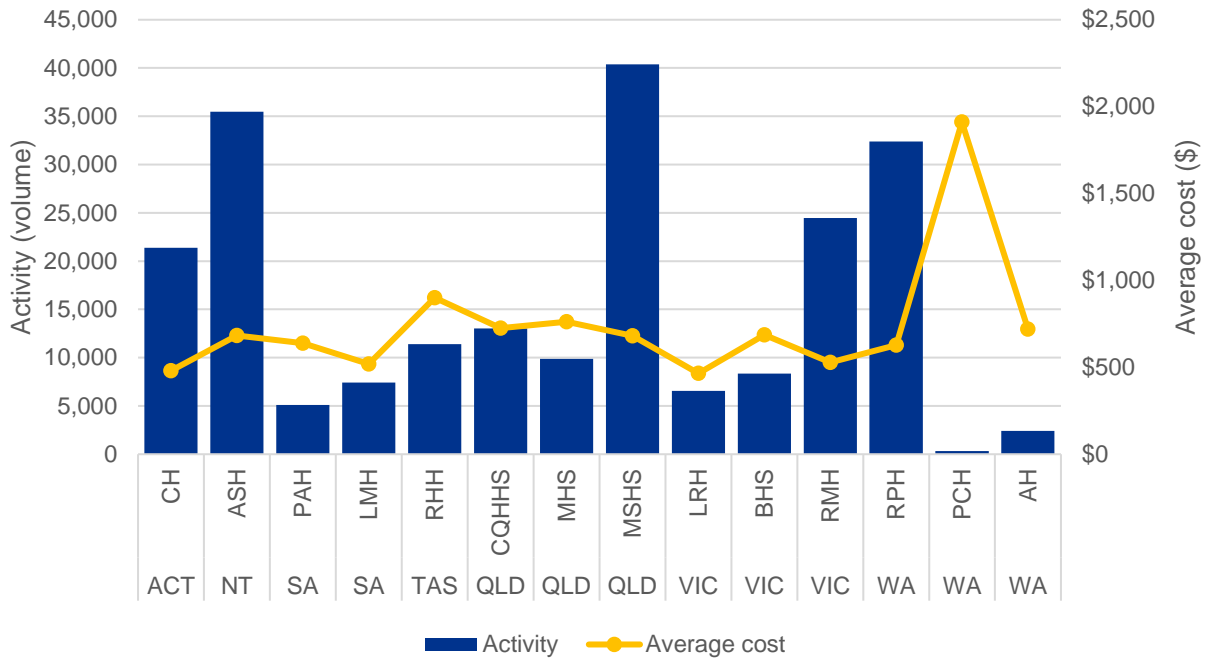
	Site	Total Cost	Highest Cost Episode	Lowest Cost Episode	R25 Average Cost	Average cost variance (R25 to R24)	R25 Activity	Activity variance (R25 to R24)
ACT	Canberra Hospital	\$10,301,960	\$50,438	\$94	\$481	9.1%	21,396	2.5%
NT	Alice Springs Hospital	\$24,253,790	\$17,435	\$106	\$684	18.3%	35,464	0.3%
SA	Port Augusta Hospital	\$3,248,402	\$5,676	\$121	\$638	4.6%	5,093	(2.0%)
	Lyell McEwin Hospital	\$3,861,685	\$11,894	\$78	\$519	6.8%	7,438	0.5%
TAS	Royal Hobart Hospital	\$10,273,708	\$68,381	\$266	\$900	1.5%	11,414	(4.1%)
QLD	Central Queensland Health Service	\$9,452,425	\$13,979	\$110	\$725	8.3%	13,033	3.9%
	Mackay Health Service	\$7,522,966	\$20,420	(\$210)	\$762	(9.2%)	9,875	14.6%
	Metro South Health Service	\$27,488,939	\$61,881	\$-	\$681	(7.6%)	40,373	7.7%
VIC	Latrobe Regional Hospital	\$3,041,090	\$5,646	\$58	\$465	0.6%	6,546	2.8%
	Ballarat Health Service	\$5,726,699	\$7,516	\$29	\$686	4.3%	8,342	(1.1%)
	Royal Melbourne Hospital	\$12,927,815	\$27,478	\$106	\$529	5.4%	24,450	2.6%
WA	Royal Perth Hospital	\$20,293,422	\$10,173	\$131	\$627	(4.3%)	32,385	3.2%
	Perth Children's Hospital	\$624,743	\$4,512	\$858	\$1,911	21.2%	327	31.9%
	Albany Hospital	\$1,728,977	\$1,983	\$228	\$720	(1.6%)	2,401	(3.0%)

Source: Jurisdictional consultations and templates

The average cost of haemodialysis services ranged from a low of \$465 (Latrobe Regional Hospital, Victoria) to \$1,911 (Perth Children's Hospital, WA), with an average of \$738 across sampled sites (see Figure 3). The higher cost of service delivery in PCH in this instance is consistent with paediatrics services in general. Despite this, PCH the second lowest differential between its highest and lowest cost episodes (variance of \$3,654) reflects a relatively consistent service level within this cohort, noting however that the lowest cost episode was the highest across all sample sites (\$858).

As the only children’s hospital selected as a sample site in FY20/21, this highlights the importance of understanding site demographics prior to comparison. The average variance between highest and lowest cost episodes across remaining hospitals was \$23,214, with Albany Hospital having the lowest variance of \$1,755.

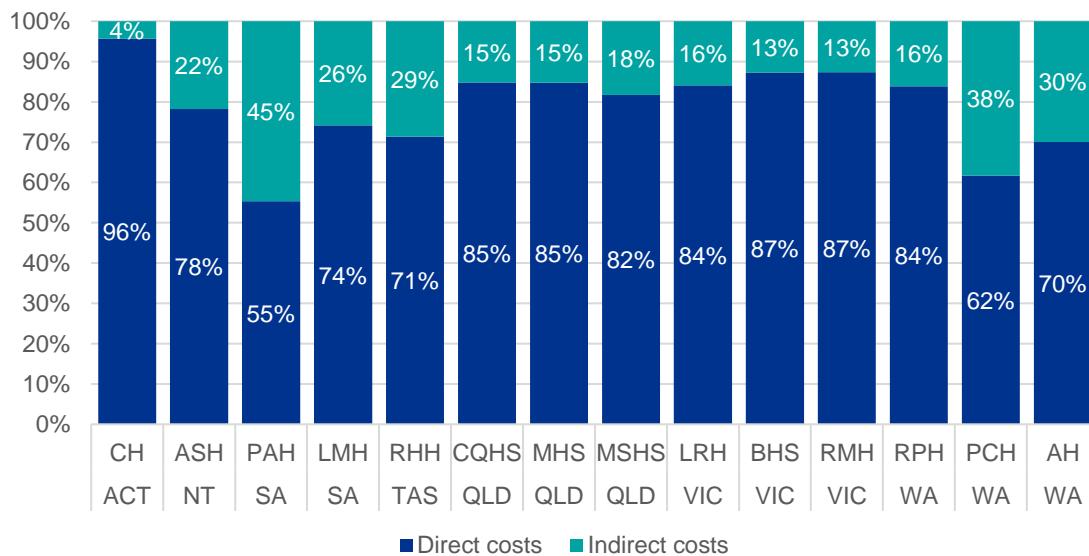
Figure 3: Average cost and activity for FY20/21 IFR haemodialysis, by jurisdiction and sample site



Source: Jurisdictional consultations and templates

Comparisons of proportional direct and indirect costs (see Figure 4) across sample sites highlighted a consistency of costing allocations across higher volume jurisdictions (i.e. Queensland and Victoria).

Figure 4: FY20/21 IFR direct and indirect proportional costs for haemodialysis, by jurisdiction and sample site.



Source: Jurisdictional consultations and templates

3.1.2 Haemodialysis jurisdictional summaries

The following provides an overview of the service models and costing methods highlighted, and comparison of key metrics to FY19/20, by each of the sampled sites.

Australian Capital Territory

Canberra Hospital

Canberra Hospital (CH) provides in-house dialysis services for all ACT patients, as well as those in neighbouring NSW communities – constituting 25 per cent of inpatients. In FY20/21, Canberra Hospital (CH) registered total activity of 21,396 with an average cost of \$481, representing a 9.2 per cent increase in average cost from FY19/20 with a 2.5 per cent increase in activity. Medical oncology services are provided as outpatients within CH that explains the lower average costs and overall activity when compared with other jurisdictions.

The year-on-year increase in average cost within CH was explained by increased medical salaries and wages costs (194.5 per cent increase on FY19/20 figures). Non-Pharmacy Benefit Schedule (PBS) drug costs decreased in FY20/21 by 30 per cent.

Northern Territory

Alice Springs Hospital

Haemodialysis is a critical service across the Alice Springs Hospital (ASH) catchment area where kidney disease is prevalent across remote geographical regions. The haemodialysis process is complicated as, over time, the system keeps adding services and expansions. ASH has 70 chairs in total, but these are spread over numerous facilities with different operating models, for example a Kidney Dialysis Unit (KDU) ward in the ASH. The KDU has eight chairs on the ward, that operates as a dialysis ward for overnight patients but increasingly is an overflow ward for patients who need to be reallocated due to demand.

In FY20/21, ASH registered total activity of 35,464 with an average cost of \$684, representing an 18.3 per cent increase on average costs from FY19/20, with an 0.3 per cent increase in activity. This level of activity is the third highest of all sampled sites, with the two highest representing major metropolitan centres and therefore higher population numbers. The increase in FY20/21 cost with only a minor increase in activity may be attributable to more patients dialysing on-country and/or issues with data matching that the Costing team are continuing to address. Non-PBS drugs also increased in FY20/21, by 22.6 per cent on FY19/20 figures.

Demand is extremely challenging for supply in the system, hence the need for add-on services and sites such as Flynn Drive which is an inpatient ward (satellite – off campus), managed by ASH clinical specialists with patients treated as admitted acute. Recently, the service times have been expanded with an evening shift six days a week, three rounds in each chair. Gap Road is another satellite ward of ASH, but it is run as an outsource model. ASH provide the infrastructure and pay a price per treatment.

Another operating model is an outreach service facilitated by the NGO Purple House, that is culturally focused (mobile dialysis unit, that provides the opportunity for remote Indigenous people to be home to country for treatment) and much loved by clients. The mobile unit is treated as a satellite ward for ASH, with patients captured as same-day admissions. With recent changes by the Commonwealth to provide Medicare clinics for remote nursing assisted dialysis, their footprint has increased. For sites within 100kms of Alice Springs, ASH will capture the data as Activity Based Funding (ABF) and pay a price per treatment and share activity data with the respective teams.

Where sites are 100kms further out from Alice Springs, Purple House will bill Medicare directly. ASH attempt to capture the data so that ASH has visibility of the work. It is clinically important that ASH has visibility of kidney disease prevalence in the region by capturing this data.

Regarding the costing process, all transactions link up through the various feeder systems in addition to specific costing rules in place, such as a virtual ward not receiving depreciation charges. These considered practices in the costing process are important given the different business models that are in place. Similarly, the Coding team at ASH have a considered process for haemodialysis such as adding specific codes to account for Allied Health or medical support to patients receiving service in-chair. Patient travel is a large component of the work undertaken in the NT and this has increased recently through a few high-cost retrievals, where they were dialysing on country however had to be evacuated and brought into ASH. Having the ability to identify and allocate these costs signifies an improvement in how the linking of those retrieval costs has improved.

Queensland

Central Queensland Hospital and Health Service

Central Queensland Hospital and Health Service (CQHHS) provides in-house haemodialysis services from Monday to Friday, with occasional weekend shifts – fully managed by the hospital and health services (HHS). In FY20/21, CQHHS registered total activity of 13,033 with an average cost of \$725, that was an increase of 8.3 per cent on FY19/20 average cost from an increase of 3.9 per cent in activity. Some of this increase was underpinned by increases in medical supplies (MS), that increased by 45 per cent from FY19/20. PBS and non-PBS drugs also increased by 7.3 per cent in FY20/21.

CQHHS flagged that very low-cost episodes reflect some data quality errors relating to pharmacy return misalignments that were not statistically significant. CQHHS highlighted that the significant variances between some year-on-year line items for haemodialysis was attributable to reclassification of account codes from salary and wages to improve the accuracy on costing designations.

Mackay Hospital and Health Service

Mackay Hospital and Health Service (MHHS) provides in-house haemodialysis services. In FY20/21, MHHS registered total activity of 9,875 with an average cost of \$762, that represented a 9.2 per cent decrease on FY19/20 average costs amidst a 14.6 per cent increase in activity. PBS and non-PBS drug costs increased in FY20/21 by 22 per cent, with imaging costs also increasing by 1,155 per cent on FY19/20 figures.

MHHS flagged that the negative-cost episode reflected a data quality error relating to pharmacy return misalignments that were not statistically significant.

Metro South Health Service

Metro South Hospital and Health Service (MSHHS) provides in-house dialysis services across its hospital sites, the majority of which run 24/7. In FY20/21, MSHHS registered total activity of 40,373 at an average cost of \$681, that represents a 7.6 per cent decrease in average cost from FY19/20 amidst a 7.7 per cent increase in activity.

The lowest cost episode for MSHHS was \$0, that might be explained by the linking of records for long-term patients (with low imaging and pathology services) coupled with a data quality error relating to pharmacy return misalignments that were not statistically significant. In contrast, higher costs are explained by expensive renal drugs, as experienced by other Queensland HHSs and other jurisdictions. PBS and non-PBS drug costs increased in FY20/21 by 11.8 per cent.

South Australia

Port Augusta Hospital

Port Augusta Hospital (PAH) has a dedicated haemodialysis ward on the electronic Patient Activity System (PAS) system. All services are delivered in-house. It is a high-volume ward with up to 3-4 sessions per day and is one of the easiest services to cost due to the discrete nature of services provided. If acute inpatients require dialysis, they will be admitted to the ward (in an inpatient bed, rather than a chair) and the costs will likely to be coded to a different DRG. PAH is currently not tracking inpatient activity in this ward; however the volume is likely to be immaterial. At PAH, blood costs are allocated based on order date (typically the date of the outpatient consult) and not the service date.

In FY20/21, PAH registered total activity of 5,093 with an average cost of \$638, that was only marginally higher (2.5 per cent) than FY19/20 average costs alongside a 2 per cent decrease in activity. Whilst PBS drug costs increased by 17.4 per cent, non-PBS drug costs decreased by 77.7 per cent.

As highlighted above, SA was the only jurisdiction that refined averaged LOS beyond 1.00 days; at 0.22 days, this equated to approximately 5.28 hours for haemodialysis services.

Lyell McEwin Hospital

Lyell McEwin Hospital (LMH) also has a dedicated haemodialysis ward, with some satellite dialysis arrangements with the Central Adelaide Local Health Network (CALHN). In FY20/21, LMH registered total activity of 7,438 at an average cost of \$519. This was a slight increase on the FY19/20 average cost (average cost of \$486), despite only a marginal increase in activity. Medical supplies and salaries and wages were the highest contributors to this increase, whilst non-PBS drugs decreased by 10.8 per cent, with PBS drugs increasing by 5.4 per cent.

There has been a recent increase in the number of chairs at the in-house facility that will flow through into The FY21/22 IFR.

As above, SA was able to refine average LOS to less than 1.00 days; at 0.24 days for LMH, this equates to approximately 5.7 hours and is a small increase on the FY19/20 figure of 0.23 days (5.5 hours).

Tasmania

Royal Hobart Hospital

Royal Hobart Hospital (RHH) provides in-house dialysis services. Haemodialysis costs are allocated based on the ward in which the service is delivered, where such wards may deliver a series of other treatments. Therefore, costs are allocated to each patient based on their time in the ward and the number of nurses rostered during that time. In FY20/21, RHH registered total activity of 11,414 at an average cost of \$900, representing a 1.5 per cent increase in average costs from FY19/20 despite a 4.1 per cent reduction in activity. This increase is largely explained through high-cost, non-PBS drugs (23 per cent increase on FY19/20) and higher pathology costs, and that is also reflected in the profile for the highest cost episode (totalling \$68,381).

The costing unit highlighted that non-clinical costs were higher in FY20/21, that can include overheads to system cost centres. The costing unit also flagged the need to look at the distribution of costs between inpatient and outpatient haemodialysis as a future improvement to costing this DRG.

Victoria

Latrobe Regional Hospital

Latrobe Regional Hospital (LRH) has an in-house haemodialysis ward, in affiliated with Monash Health. The ward has 12 treatment chairs, catering for 48 patients attending three times per week. The service is open Monday to Friday from 7.00am to 10.00pm. The service caters for two shifts of patients each day, i.e. morning and afternoon. There is also a nephrologist on site for consultations.

Nursing staff who work in the dialysis ward are employed by LRH, with consumables purchased directly from the supplier. If there is a Monash patient receiving dialysis at LRH, the relevant costs are identified and recharged to Monash.

There was a minor change to the cost allocations in FY20/21 due to a refinement in the methodology used to allocate engineering and contract costs. In FY20/21, LRH reported total activity of 6,546 with an average cost of \$465. This represents a 0.5 per cent increase in the average cost compared to FY19/20, with a 2.8 per cent increase in activity. This increase was driven largely by a 9932 per cent increase in salaries and wages for visiting medical officers and nursing; non-PBS drugs also increased by 66.1 per cent on FY19/20 figures.

Ballarat Health Service

Ballarat Health Service (BHS) has a dedicated haemodialysis ward, staffed by BHS employees. The ward has 12 treatment chairs for 60 routine patients and ad hoc holiday patients. It operates Monday to Saturday to cater for patients attending three time a week, i.e. Monday-Wednesday-Friday, or Tuesday-Thursday-Saturday. There are three shifts each day: morning, afternoon and twilight.

The ward operates as a hub and spoke with Royal Melbourne Hospital (RMH). For admitted same-day dialysis patients, they are under the care of RMH consultants and BHS pays a fee to RMH for consumables and medical care. For admissions longer than the same-day dialysis, patients are under the care of BHS consultants and BHS only pays a fee for consumables to RMH. RMH supplies major medical equipment and consumables, but BHS needs to meet extra costs for other equipment and medical supplies.

Any overnight or multiday inpatients requiring dialysis are transferred to and from the haemodialysis ward and this is visible in the bed transfer files, such that the costs associated with haemodialysis form part of the whole patient episode cost.

In FY20/21, BHS reported total activity of 8,342 with an average cost of \$686; this represents an increase of 4.3 per cent compared to FY19/20, with a 1.1 per cent decrease in activity. These increases were driven largely by a 6874 per cent increase in medical supply costs, with non-PBS drug costs also increasing by 88.8 per cent on FY19/20 figures.

Royal Melbourne Hospital

Royal Melbourne Hospital (RMH) has a dedicated dialysis ward in the hospital and several satellite sites that were included in the RMH data. If inpatients use the service, a share of the dialysis costs are apportioned to the inpatient episode. RMH cost allocations to L61Z only reflect the patients treated and discharged from the dialysis unit.

In FY20/21, RMH reported total activity of 24,450 with an average cost of \$529. This represents an increase of 5.4 per cent on the average cost compared to FY19/20, alongside a 2.6 per cent increase in activity. One of the main contributors to this was an increase in consumables (MS) that increased by 26 per cent on the previous year, that incorporates expenses from contracted haemodialysis services. RMH has agreements in place with two private haemodialysis providers to dialyse RMH public patients in their private units across Melbourne;

RMH pays each provider a set per-treatment cost, the expenses for that are then recorded under MS. Non-PBS drug costs also increased by 3.9 per cent in FY20/21, compared with a 16.9 per cent in PBS drugs.

Western Australia

Royal Perth Hospital

Royal Perth Hospital (RPH) has an in-house haemodialysis ward, however the staff on that ward also provide some non-admitted services. All clinical services are provided in-house, however there are some outpatient clinics for dialysis preparation and testing.

East Metropolitan Health Service has some contracted haemodialysis services (including for Rockingham, Cannington and Stirling), for that RPH holds the budget for. Whilst this has now changed, for FY20/21, these costs were identified as particular wards with specific notations (e.g. 'ZZ') to mark them as outsourced wards. Contracted dialysis services are removed from linking, with in-built rules in the system to ensure those services are not inadvertently linked. In this scenario, staffing, chairs and other consumables are all provided by the contractor, such that RPH is charged at a price per treatment.

In FY20/21, RPH registered total activity of 32,385 with an average cost of \$627, representing a 4.3 per cent decrease in average cost from FY19/20, despite a 3.2 per cent increase in activity. Much of the higher cost episodes in haemodialysis are explained by high-cost procedures (e.g. imaging screening testing costing ~\$2,300 per test) and diagnostic services. Both PBS-listed and non-PBS drug costs decreased in FY20/21, by 26 per cent and 26.2 per cent respectively.

Perth Children's Hospital

All haemodialysis is provided in-house at Perth Children's Hospital (PCH), however there are relatively small volumes. Due to the small volumes, there is no dedicated infusions ward; however, the service is allocated chairs as part of the larger Day Treatment Unit under Ambulatory Care

In FY20/21, PCH registered total activity of 327 with an average cost of \$1,911, representing a 21 per cent increase in average costs from FY19/20 alongside a 31.9 per cent increase in activity. With small volumes for this service, the highest (\$4,512) and lowest (\$858) cost episodes represented the smallest variance in haemodialysis across the sampled sites. Whilst PBS drug costs increased by 264.3 per cent in FY20/21, non-PBS drug costs decreased by 12.1 per cent.

Albany Hospital

Albany Hospital (AH) provides in-house dialysis services with self-contained, dedicated chairs that are consolidated in a single cost centre. These services are contracted, such that the contractor provides the staffing and chairs and AH provide the consumables. WA Country Health Service uses this model so they can use their purchasing power to reduce the costs of consumables. Given the central location of Albany within the Great Southern Health Service region, most patients travel to AH to access haemodialysis, as there are no outreach or mobile services available at present.

In FY20/21 AH registered total activity of 2,401 with an average cost of \$720, representing a 1.6 per cent decrease in average cost from FY19/20 alongside a 3.0 per cent decrease in activity. The Costing team flagged that the difference between years could reflect some challenges with costing allocations for inpatients accessing dialysis services in the ward. Non-PBS drug costs increased in FY20/21 by 8.9 per cent alongside an 8.6 per cent increase in PBS drug costs.

3.2 Chemotherapy

3.2.1 Chemotherapy service models and costing methods

The majority of hospitals and health services sampled had in-house chemotherapy wards - this is defined as a service that is owned and delivered by the health service. Many also host in-house pharmacy capabilities for compounding of chemotherapy drugs. All but one of these wards (RPH) also provided services for other infusions (e.g. for the treatment of Crohn's Disease).

All jurisdictions flagged drug costs as the major contributor to high-cost episodes and overall average cost increases in chemotherapy, particularly for patients who are administered non-PBS drugs or are participating in drug trials, that can be common in this service. As a result, there may be utility in seeking both an average cost and median cost for future IFRs to highlight any potential skew in the data from high-cost outliers.

WA's PCH raised the importance of understanding the nuance of paediatric service delivery that may not be suitable for like-for-like comparison with adult wards. Future IFRs could therefore consider cohort-based sampling to enable comparisons not just between regional and metropolitan services, but also adult and paediatric service delivery and costing insights.

Most services did not, or were not able to, refine the average LOS to less than one day, when most chemotherapy treatments take 2-4 hours. To improve the granularity of costing data and allow sites to compare models of service, further work could be undertaken to identify methods for refining this metric across this and similar services.

Victoria also raised the current discrepancy between the costing of sub-cutaneous delivery of chemotherapy drugs, compared with intravenous delivery, that should be further investigated.

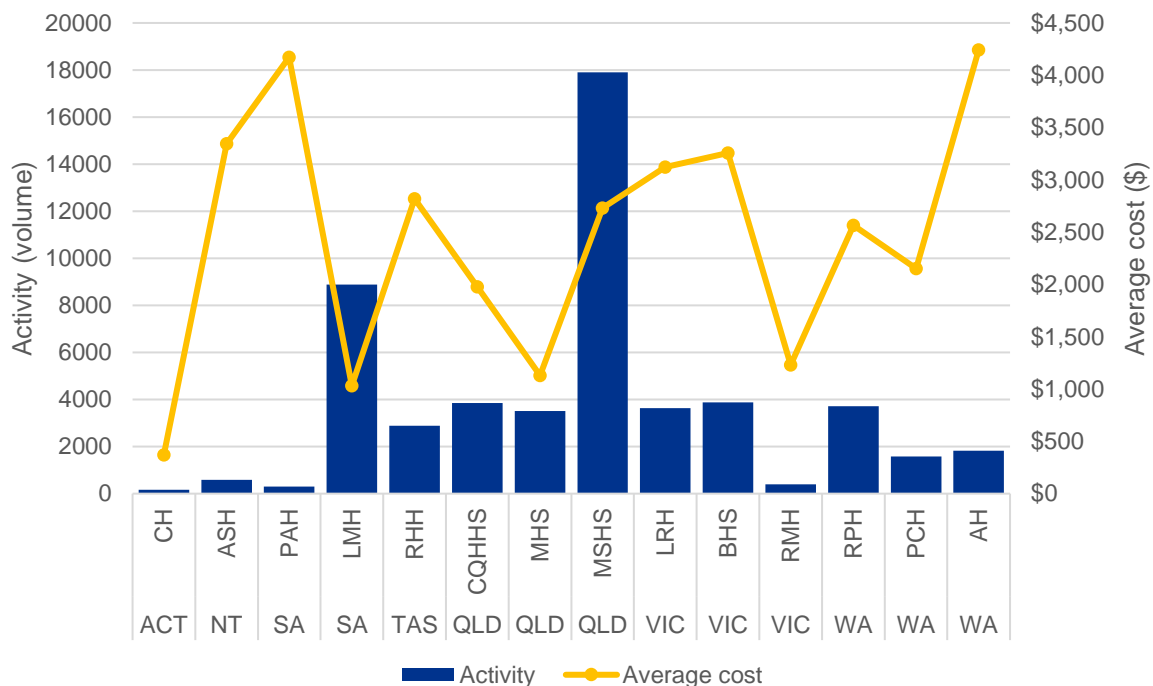
Table 5: Summary of IFR FY20/21 costing and activity data for chemotherapy, with FY19/20 variances for average cost and activity, by jurisdiction and sample site

	Site	Total Cost	Highest Cost Episode	Lowest Cost Episode	R25 Average Cost	Average cost variance (R25 to R24)	R25 Activity	Activity variance (R25 to R24)
ACT	Canberra Hospital	\$62,827	\$1,354	\$109	\$372	(36.8%)	169	56.5%
NT	Alice Springs Hospital	\$1,966,279	\$52,270	\$142	\$3,344	213.4%	588	16.7%
SA	Port Augusta Hospital	\$1,264,463	\$27,546	\$ 583	\$4,173	38.2%	303	22.7%
	Lyell McEwin Hospital	\$9,170,367	\$50,498	\$215	\$1,033	(25.5%)	8,878	6.9%
TAS	Royal Hobart Hospital	\$8,141,171	\$ 185,827	\$290	\$2,819	72.3%	2,888	(7.6%)
QLD	Central Queensland Health Service	\$7,602,185	\$49,600	\$397	\$1,976	25.5%	3,847	12.3%
	Mackay Health Service	\$3,977,268	\$22,980	\$180	\$1,131	7.0%	3,517	1.8%
	Metro South Health Service	\$48,881,977	\$23,695	\$ 23	\$2,731	8.9%	17,900	8.5%
VIC	Latrobe Regional Hospital	\$11,347,518	\$34,640	\$ 37	\$3,123	0.1%	3,633	5.8%
	Ballarat Health Service	\$12,627,978	\$54,202	\$ 61	\$3,257	(5.5%)	3,877	(1.0%)
	Royal Melbourne Hospital	\$ 481,477	\$18,315	\$391	\$1,231	218.1%	391	(8.9%)
WA	Royal Perth Hospital	\$9,518,767	\$39,045	\$119	\$2,566	7.5%	3,710	9.1%
	Perth Children's Hospital	\$3,393,417	\$8,224	\$191	\$2,153	(18.0%)	1,576	5.6%
	Albany Hospital	\$7,744,131	\$16,802	\$ 1,568	\$4,243	24.0%	1,825	8.7%

Source: Jurisdictional consultations and templates

The average cost of chemotherapy services ranged from a low of \$372 (Canberra Hospital, ACT) to \$4,243 (Albany Hospital, WA), with an average of \$2,439 across sampled sites (see Figure 5). The ACT's cost and activity figures are lower because medical oncology services at CH are provided as outpatients. All jurisdictions highlighted the impact of non-PBS drug costs on the highest cost episodes – where, in Tasmania alone, the three highest cost episodes constituted 10 per cent of the total cost of chemotherapy in FY20/21. The average costs for this service can vary considerably year-on-year due to higher usage of non-PBS drugs. As a result, Tasmania had the largest variance between its highest and lowest cost episodes (\$185,537), with ACT having the lowest (\$1,245). The average variance across all sampled sites was \$41,478.

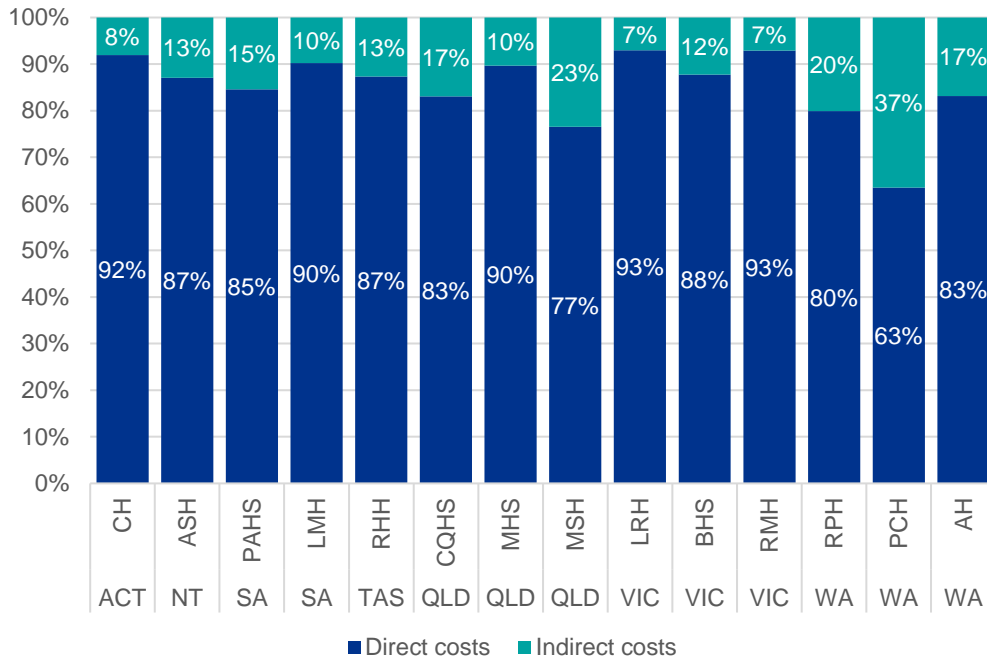
Figure 5: Average cost and activity for FY20/21 IFR chemotherapy services, by jurisdiction and sample site



Source: Jurisdictional consultations and templates

In comparing the proportional direct and indirect costs associated with chemotherapy (see Figure 6), Perth Children's Hospital in WA had the highest proportion of indirect costs that may be partly explained by the costing function and changeover in costing team resourcing during FY20/21. PCH is now supported by the East Metro HS who are applying their costing processes across PCH that is expected to improve the matching of direct costs into the FY21/22 IFR thereby reducing the proportion of indirect costs. In FY20/21, Victoria and the ACT had the lowest proportion of indirect costs in chemotherapy, ranging from 7 per cent to 12 per cent of total cost.

Figure 6: FY20/21 IFR proportional direct and indirect costs for chemotherapy, by jurisdiction and sample site.



Source: Jurisdictional consultations and templates

3.2.2 Chemotherapy jurisdictional summaries

The following provides an overview of the service models and costing methods highlighted, and comparison of key metrics to FY19/20, by each of the sampled sites.

Australian Capital Territory

Canberra Hospital (CH) provide an in-house chemotherapy service. In FY20/21, they registered total activity of 169 with an average cost of \$372, representing a 36 per cent decrease on FY19/20 average cost amidst a 56 per cent increase in activity. Whilst medical salaries and wages increased by 282 per cent on FY19/20 figures, salaries and wages for nursing and other decreased by 42 per cent and 31 per cent respectively. Whilst non-PBS drug costs increased by 51 per cent in FY20/21, this represented only a small variance in overall costs (an increase of \$934). Medical Oncology services are provided at CHS as outpatients hence the cost & activity numbers are lower

Northern Territory

The Alice Springs Hospital (ASH) is set up with six chemotherapy chairs, conducting 600 same day chemotherapy admissions and a small number of overnight admissions. ASH also receives oncology support from interstate (Royal Adelaide Hospital predominantly). All paediatric chemotherapy is referred interstate or to Darwin and the cost is captured together with any fly in fly out medical services. Feeder systems are important in chemotherapy and are utilised, particularly with the changes made in capturing compounded drug costs (previous system limitation in capturing drug costs). The ward transfer file is also referred to in determining how many times a patient goes in and out of the ward.

The chemotherapy ward also provides other infusion types, and the same process is undertaken for costing, regardless of the infusion type. ASH also utilises a non-admitted chemotherapy clinic in addition to a nursing led oncology clinic and specialist oncology review clinic.

In FY20/21, ASH registered total activity of 588 with an average cost of \$3,344, representing a 38.2 per cent increase on FY19/20 average costs with a 22.7 per cent increase in activity. Goods and services costs have increased year on year, given the remoteness of ASH, and supply chain issues have caused procurement pain with additional costs incurred regularly. Whilst non-PBS drugs decrease by 95 per cent, PBS drugs increased by 100 per cent in FY20/21 due to improvements in designating drug types from FY19/20, where PBS drugs were not allocated correctly.

Queensland

Central Queensland Hospital and Health Service

Chemotherapy services are delivered in-house at the Rockhampton Hospital, across four shifts Monday to Friday. Due to the distance between sites (e.g. Rockhampton and Gladstone are 100kms apart), there are costs associated with patient transport that are managed by the HHS. Whilst there is a patient transport reimbursement scheme, this does not cover all costs.

In FY20/21, CQHHS registered total activity of 3,847, a 12 per cent increase on FY19/20 figures (3,427) at an average cost of \$1,976 per patient, that represented a 25 per cent increase on FY19/20 costs (\$1,575). Salary and wages were the key driver for this increase, including a reclassification of administrative staff to clinical assistants within the period of FY20/21.

Total costs increased by over 40 per cent for chemotherapy due to the closure of the Gladstone Mater Private Hospital, resulting in increased patient flow, but also increased hiring and recruitment to service additional demand (that also increased salary and wages costs highlighted above).

CQHHS also noted an increase in medical supplies by 45 per cent due to account code classification changes between FY19/20 and FY20/21. PBS and non-PBS drug costs also increased in FY20/21, by 7.5 per cent.

Mackay Hospital and Health Service

MHHS provides an in-house chemotherapy service. In FY20/21 MHHS registered total activity of 3,517 with an average cost of \$1,131, that represented a 7 per cent increase in average costs from FY19/20, with a 1.8 per cent increase in activity. The higher cost profile was explained, in part, by increased PBS and non-PBS drugs, that increased by 65 per cent on FY19/20 figures. MHHS flagged that very low-cost episodes reflect some data quality errors relating to pharmacy return misalignments that were not statistically significant.

Metro South Hospital and Health Service

MSHHS delivers chemotherapy services across inpatient and outpatient settings, that remain relatively consistent with respect to service delivery and approach. In FY20/21, MSHHS registered total activity of 17,900 with an average cost of \$2,731, representing an 8.9 per cent increase in average cost from FY19/20 from an 8.5 per cent increase in activity.

MSHHS flagged that the very low-cost episodes reflect some data quality errors relating to pharmacy return misalignments that were not statistically significant, whilst increases in the overall cost profile were explained, in part, by increases in the use on non-PBS drugs (27 per cent increase on FY19/20 figures).

South Australia

Port Augusta Hospital

The Port Augusta Hospital (PAH) runs an in-house chemotherapy service in a dedicated ward. In FY20/21, PAH registered total activity of 303 at an average cost of \$4,173. This was a 22 per cent increase in average cost despite only a moderate increase in activity. Part of this was likely driven by improvements to the costing of chemotherapy floorspace, as this was previously not counted. In contrast to the experience of other sample sites, the usage of non-PBS drugs decreased at PAH in FY20/21, by 50 per cent, with PBS-listed drugs increasing by 33 per cent on FY19/20 figures. Oncology and chemotherapy services are expected to increase across SA regional sites over the coming IFR Rounds due to recent election commitments.

The ward also delivers other infusions that are unrelated to oncology (e.g. for the treatment of Crohn's Disease) but these services are costed to the relevant DRG. As highlighted for haemodialysis, SA was one of the jurisdictions able to refine LOS below 1.00 days; at 0.17 days, this equates to approximately 4.1 hours.

Lyell McEwin Hospital

The Lyell McEwin Hospital (LMH) also has a dedicated in-house chemotherapy ward. In FY20/21 LMH registered total activity of 8,878 at an average cost of \$1,033, that was a 20 per cent decrease in average cost compared with FY19/20. Part of this reduction is explained by a decrease in PBS drug costs within that period as well as an improvement of staffing overhead allocations (particularly for medical salaries and wages) that improved costing accuracy.

Tasmania

Royal Hobart Hospital

RHH provides in-house chemotherapy services. In FY20/21, RHH registered total activity of 2,888 with an average cost of \$2,819, that represented a 72.3 per cent increase on FY19/20 average costs amidst a 7.6 per cent decrease in activity. This difference is explained by higher cost non-PBS drugs applied to several patients within FY20/21 (an increase of 368 per cent on FY19/20 cost). For example, the highest cost episode was \$185,587, the majority of which (>\$184,000) was attributable to pharmacy costs that alone constituted 5 per cent of total chemotherapy pharmacy costs in FY20/21 for Tasmania. The three most costly patients in chemotherapy constituted 10 per cent of the pharmacy budget, that highlighted the implications of PBS and non-PBS drug usage on the average cost profile each year.

Victoria

Latrobe Regional Hospital

LRH runs an in-house chemotherapy service in a dedicated ward. The service consists of 16 chairs and four beds, operating Monday to Friday from 7.30am – 5.30pm. It is a high occupancy ward at 100% capacity, looking to expand ward / chair capacity in the near future. The hospital is currently looking at a business case to utilise spare chair capacity for other services in the future. The suite also provides a broader infusion service, not solely for the treatment of cancer. They process approximately 650-700 treatments per month of admitted cases, with the in-house compound pharmacy producing the required drugs.

In FY20/21, LRH reported total activity of 3,633 at an average cost of \$3,123. There was only a 0.1 per cent increase in the average cost despite a 5.8 per cent increase in activity from FY19/20. Both non-PBS and PBS-listed drugs increased in FY20/21, by 424 per cent and 5.2 per cent respectively.

The LRH Costing team also highlighted the current discrepancy between the application of costing for sub-cutaneous delivery of drugs compared with intravenous delivery in the same ward for consideration regarding future classifications.

Ballarat Health Service

BHS runs an in-house chemotherapy ward that is fully managed by BHS. There are 16 chairs and 3 beds in the ward, and it operates Monday to Friday between 8:30 am and 5:00 pm. Treatment includes both sub-cutaneous and intravenous delivery. BHS purchases IV chemotherapy treatments pre-compounded externally. There were no major changes in how costs were allocated between FY19/20 and FY20/21.

For FY20/21, BHS reported total activity of 3,877 separations at an average cost of \$3,257; this represents a 5.5 per cent decrease in the average cost compared to FY19/20. There was a 1 per cent decrease in activity between the two rounds. There was a significant variance in the highest cost episodes from FY19/20 (\$2,445,108) to FY20/21 (\$54,202) due to a major clinical trial being held in FY19/20 with large costs attributed to non-PBS drugs. Overall, non-PBS drugs increased in FY20/21 by 11.8 per cent.

Royal Melbourne Hospital

RMH does not have a chemotherapy ward, as these services form part of the Parkville Precinct model that covers RMH and the Peter MacCallum Cancer Centre (PMCC) whereby:

- PMCC make all cytotoxic agents
- RMH make all hazardous and non-hazardous agents; and
- both sites make their own monoclonal antibodies.

RMH does not deliver a significant amount of inpatient chemotherapy due to its proximity to (and arrangements with) the Peter MacCallum Cancer Centre (PMCC) that services most oncology patients in the catchment area.

In FY20/21, RMH reported total activity of 391, with an average cost of \$1,231; this represented a 218 per cent increase in the average cost, while there an 8.9 per cent decrease in the volume of activity was observed. The increase in average cost was largely due to increased PBS drug costs, that increased by 1,751 per cent compared to FY19/20.

Western Australia

Royal Perth Hospital

All chemotherapy services at RPH are provided in-house, with a dedicated infusions ward that is limited to chemotherapy treatments only. Some compounding of chemicals may also be delivered in-house. The main cost drivers for chemotherapy services are high-cost pharmaceuticals and the application of non-PBS drugs. For inpatients who require chemotherapy as part of their stay (whilst admitted for other primary services), they will be transferred to the chemotherapy ward, where costs can be applied to the individual patient, then the patient will be transferred back to their primary ward.

In FY20/21, RPH registered total activity of 3,710 with an average cost of \$2,566, representing an increase of 7.5 per cent on the FY19/20 average cost alongside a 9.1 per cent increase in activity. This is explained in part by 34 per cent increases in both non-PBS and PBS drugs on FY19/20 figures.

Perth Children's Hospital

PCH delivers in-house chemotherapy services. In FY20/21, PCH registered total activity of 1,576 with an average cost of \$2,153, representing an 18 per cent decrease in average costs from FY19/20 amidst a 5.6 per cent increase in activity. This is despite decreases in costs for both non-PBS and PBS drugs that are typically the main driver for cost increases in chemotherapy (increasing by 24 per cent and 32 per cent respectively).

The Costing team flagged that extended LOS for children is often a contributor to higher costs. It was highlighted that whilst hospital-in-the-home schemes may be more efficient for the delivery of chemotherapy services, patient outcomes for children can differ from adults, such that the clinicians tend to want children to remain in the ward for supervision and may request that others stay longer for observation following treatment. These protracted ward stays therefore have cost implications for the delivery of paediatric chemotherapy services.

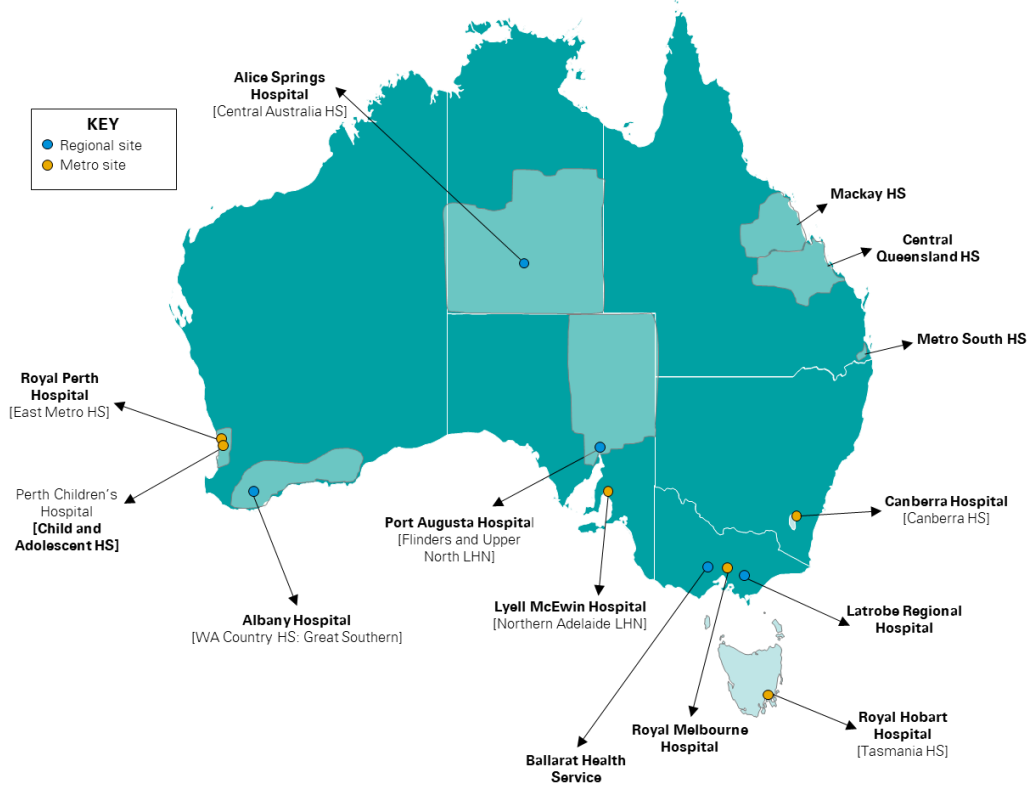
Albany Hospital

AH provides in-house chemotherapy services in a dedicated ward, with its own cost centre. Some of these drugs are compounded in-house whilst others are purchased. Given Albany's central location with the Great Southern region of WA, many patients travel to AH to access chemotherapy (as described earlier with haemodialysis). There is currently no outreach or mobile services available in that region for patients.

In FY20/21, AH registered total activity of 1,825 with an average cost of \$4,423, representing a 24 per cent increase in costs with an 8.7 per cent increase in activity. This is explained in part by a 39.2 per cent increase in both non-PBS and PBS-listed drugs in FY20/21.

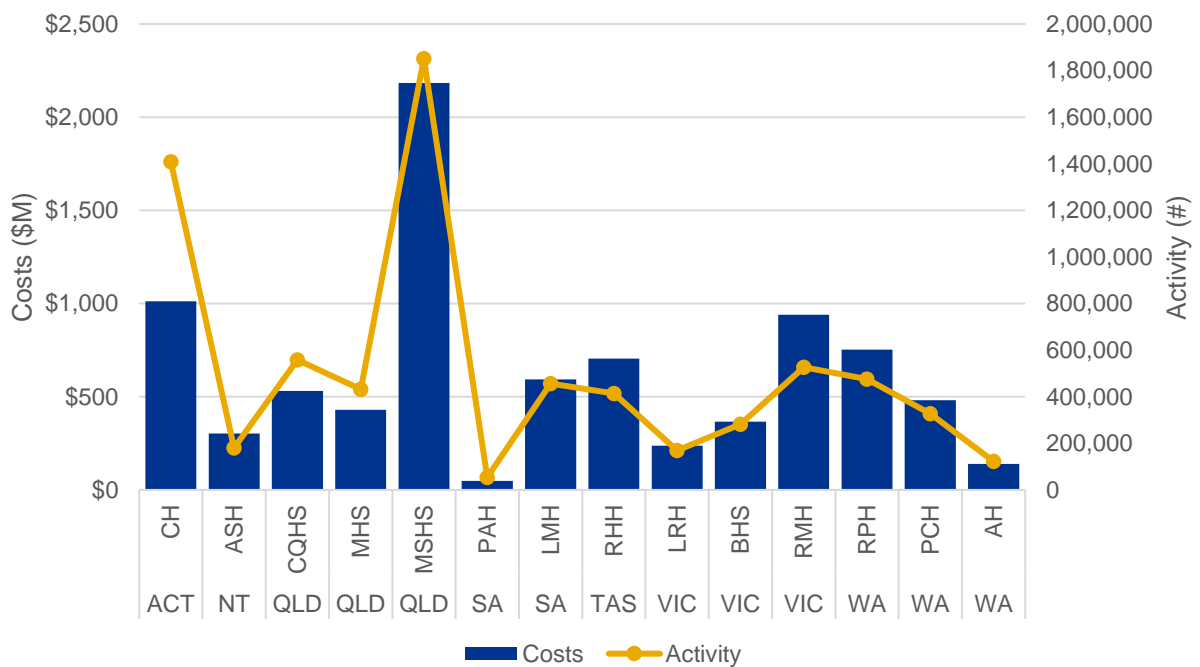
4 Jurisdictional chapters

Figure 7: Participating LHNs / health services and corresponding hospitals in the FY20/21 IFR, with LHN/HS boundaries for reference.



Note: LHN/HS boundaries are estimates only and are not to scale.

Figure 8: Final site / health service cost and activity data submitted to IHACPA for FY20/21 NHCDC



Source: Jurisdictional consultations and templates

Table 6: Summary of sample site costings submitted to the FY20/21 IFR process, including (1) initial site/health service (HS) costings submitted to jurisdictions, (2) adjustments by jurisdictions (where applicable) and (3) final site data submitted to the NHCDC for 2020-21.

	Site/HS	Type	1. Final site/HS submission to jurisdiction	2. Jurisdiction adjustments to site /HS submission	3. Final site/HS data submitted to IHACPA
ACT	Canberra Hospital	Activity: Costs:	1,409,125 \$1,012,357,619	- -	1,409,125 \$1,012,357,619
NT	Alice Springs Hospital	Activity: Costs:	204,285 \$308,363,894	(24,195) (\$4,958,767)	180,090 \$303,405,127
QLD	Central QLD HS	Activity: Costs:	994,620 \$684,989,127	(435,886) (\$153,180,923)	558,734 \$531,808,203
	Mackay HS	Activity: Costs:	914,819 \$522,177,303	(483,220) (\$91,764,874)	431,299 \$430,352,429
	Metro South HS	Activity: Costs:	3,930,618 \$2,761,396,563	(2,079,337) (\$577,168,188)	1,851,281 \$2,184,228,374
SA	Port Augusta Hospital	Activity: Costs:	54,172 \$49,134,382	- -	54,172 \$49,134,381
	Lyell McEwin Hospital	Activity: Costs:	455,879 \$592,620,719	- -	455,879 \$592,620,719
TAS	Royal Hobart Hospital	Activity: Costs:	413,800 \$704,845,282	- -	413,800 \$704,845,282
VIC	Latrobe Regional Hospital	Activity: Costs:	219,311 \$287,136,561	(50,025) (\$49,915,352)	169,286 \$237,221,209
	Ballarat HS	Activity: Costs:	378,282 \$534,517,579	(96,661) (\$169,101,907)	281,621 \$365,415,672
	Royal Melbourne Hospital	Activity: Costs:	1,082,840 \$1,333,132,466	(556,448) (\$394,052,036)	526,392 \$939,080,430
WA	Royal Perth Hospital	Activity: Costs:	654,496 \$831,653,470	(179,294) (\$79,717,723)	475,202 \$751,935,746
	Perth Children's Hospital	Activity: Costs:	390,683 \$524,594,999	(64,032) (\$43,785,254)	326,651 \$480,809,745
	Albany Hospital	Activity: Costs:	123,978 \$146,978,495	(1,780) (\$7,198,480)	122,316 \$139,780,015

Source: Jurisdictional consultations and templates

4.1 Australian Capital Territory

4.1.1 Jurisdictional summary

Health Service overview

In the Australian Capital Territory (ACT), there are two tertiary public hospitals. In FY20/21 of the IFR the Canberra Hospital (CH) was selected as the sample hospital for the ACT, based upon the sampling framework. CH is the largest public hospital in the ACT with 672 beds and is a major tertiary referral hospital for adjacent regions in NSW. CH delivers a wide range of ambulatory, acute, sub-acute and mental health services. CH operates under the broader direction of the Canberra Health Service (CHS) that supports the University of CH and various community-based health services.

Costing overview

The ACT Health Directorate (ACTHD) is responsible for the costing submission. This process is conducted yearly in consultation with public health service staff to validate and provide context to the data. The ACTHD is responsible for the collation, processing, reconciliation and submission of the NHCDC data to IHACPA for public hospitals in the ACT by using information supplied by health services.

Systems environment

ACTHD uses Power Health Solutions, Power Performance Manager 2 (PPM2) costing application for patient level costing. The ACTHD has direct access to feeder files and the general ledger (GL) from the Canberra Health Service. The Canberra Health Service GL contains data for both CH and the University of CH.

Improvements

ACTHD have implemented a series of improvements and changes since FY19/20. ACTHD had the aim of improving feeder and linking of data. After reviewing all cost centres, pathology and imaging have been a good example of growth since FY19/20. Data linking for emergency department (ED) presentations has also improved. Data is linked using MRN and date of service.

4.1.2 Data flow and reconciliation

The total submissions for ACTHD in the GL was \$1,765,052,672., this includes expenditure for all public hospitals. There were no adjustments made to the GL, so this formed the basis of the costing process. The total submission for Canberra Health Service in the GL was \$1,480,174,130. Similar to the jurisdiction, there were no adjustments made and this was transferred to the costing system. This value is inclusive of CH and University of CH. There were no Work in Progress (WIP) adjustments made to the GL. The total expenditure, as per the standards for the line items, remained consistent at \$1,480,174,130. The total costed amount for CHS was \$1,089,563,798. This was the total cost that was submitted to the jurisdiction.

The costs submitted to IHACPA on behalf of the CH was \$1,012,357,619. The variance between the costs submitted to the jurisdiction and the costs submitted to IHACPA was \$77,206,179. This variance is due to \$53,853,623 (70 per cent) in teaching and training costs and the remaining \$23,352,557 (30 per cent) is attributed to the 33,939 unlinked feeder data patient costs that were unable to be linked. This included patients with a referral for high-cost drugs, where the referral cannot be linked to an outpatient appointment, and data quality issues.

Table 7: Reconciliation from General Ledger to NHCDC Costed Products - Canberra Health Service and Canberra Hospital

Health Service level data	Value
Canberra Health Service General Ledger	
Transferred to costing system	\$1,765,052,672
Line items as per standards	\$1,765,052,672
Adjustments	(\$447,285,720)
Costs Submitted to jurisdiction	\$1,317,766,952
Hospital level data (CH)	Value
Transferred to costing system	\$1,480,174,130
Line items as per standards	\$1,480,174,130
Adjustments	(\$390,610,332)
Costs Submitted to jurisdiction	\$1,089,563,798
CH activity	Value
Data loaded to the costing system for costing purposes	
Activity data	1,409,636
Feeder data	1,799,955
NHCDC product output activity - post linking and loading	1,444,064
Final submission to jurisdiction - activity by product	1,444,577
Final submission to jurisdiction - activity and cost by product	1,444,064
CH submitted to jurisdiction	Value
Summary submission to jurisdiction	
Activity submitted to jurisdiction	1,444,064
Costs submitted to jurisdiction	\$1,089,563,798
CH costs submitted to IHACPA	Value
Final submission to jurisdiction for IHACPA - cost and activity by product	
Activity	1,444,064
Costs	\$1,089,563,798
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(34,939)
Cost totals	(\$77,206,179)
Final jurisdictional data for cost weight production	
Finalised activity	1,409,125
Finalised cost	\$1,012,357,619

Source: Jurisdictional consultations and templates

4.1.3 Sample patient data

IHACPA selected a sample of five patients from CH for the purposes of testing the data submitted from jurisdictions to IHACPA at the patient level.

The jurisdiction provided the patient level costs for all five patients and these reconciled with IHACPA records. Further information relating to the sample records is available in Table 8.

Table 8: ACT five patient sample reconciliation outcome

Jurisdiction	Site	Stream	Jurisdiction records	Received by IHACPA	Variance
Australian Capital Territory	Canberra Hospital	Acute	\$28,149.46	\$28,149.46	\$0.00
		Sub-Acute	\$6,599.31	\$6,599.31	\$0.00
		ED	\$1,403.55	\$1,403.55	\$0.00
		Non-Admitted	\$329.01	\$329.01	\$0.00
		Mental Health	\$2,740,127.10	\$2,740,127.10	\$0.00

Source: Jurisdictional consultations and templates

4.1.4 Governance arrangements

Data quality checks are coordinated by ACT Health, while implementing continuous refinements in consultations with the Health Services. Within the Department, the ACTHD perform data validation on feeder data received from each hospital. There is a formal and informal process to quality assurance. The formal quality assurance is largely automated using a Structured Query Language (SQL) code to capture in-scope costs and compare them to previous years. ACTHD conduct informal quality assurance checks by reviewing data compared to other relative figures, such as previous years or other wards. If there are issues identified, the data is returned to the hospital for resolution. Once all data is validated and linked, ACTHD provide cost summary reports for the providers to review.

All costing data is reviewed by health services before the data is submitted to IHACPA.

Table 9: Summary of quality assurance (QA) checks performed – Australian Capital Territory

QA Test	ACTHD	Canberra Hospital
Source data and systems		
Reconciliation back to GL and audited statements	Annual reconciliation and checks undertaken by ACTHD	
Reconciliation of activity data back to source systems	Annual reviews on feeder and source systems	
Costing Data – Validation		
Trend analysis to prior periods across cost products	Yes – annually	
Reasonableness test of excluded data and outliers	Yes – annually	
Analysis of outliers at the cost, LOS or cost bucket level	Yes – annually and reviewed with sites	
Reasonableness of direct vs overhead allocations	Yes – annually	
Specific business rule tests	Yes – through PPM2	
Costing Data – Governance		
Regular updates with costing staff	Ad hoc	
Local guidelines supporting the AHPCS standards framework	No	
Review of cost allocations	Yes – annually	
Review on reasonableness of costing data output	Data is reviewed for reasonableness and completeness	
Formal sign-off	Final sign off by ACTHD	Data is reviewed and signed off by the CFO at Canberra Hospital

Source: Jurisdictional consultations and data quality statement

4.1.5 Business requirements

The data collected by ACTHD and CH is used for different purposes across the ACT. Data is used to analyse the cost of healthcare in the ACT for various specialities and to perform comparative benchmarking using the IHACPA benchmarking portal. Patient costing data is also used by the health services and ACTHD to support business cases and decision making.

4.1.6 Implications of COVID-19

During FY21, there were no COVID-19 admissions to public hospitals in the ACT. However, there were a series of COVID-19 costs that were incurred as a result of changes that were made to prepare the health system for an increase in COVID-19 patients. Calvary Hospital opened a dedicated fever clinic and respiratory ward that triaged and supported suspected COVID-19 patients. All costs associated with this were direct costs. The delivery of COVID-19 vaccines was supported by the Canberra Health Service.

All costs associated with the delivery of the vaccine were allocated to a specific COVID-19 vaccine cost centre. There was a specific COVID-19 cost centre (separate to the vaccine cost centre) where associated costs such as additional PPE were allocated.

Like other jurisdictions, ACT also experienced workforce shortages and contracted the use of private sector facilities for surgery where required.

Patients who were being treated on wards who were later found to be suspected COVID-19 patients had all their associated costs allocated to the cost centre where they were receiving treatment. ACTHD faced numerous challenges with reconciling the various reimbursements from the Commonwealth.

4.1.7 Key learning and future improvements

ACTHD have implemented a range of quality assurance checks and data linking to ensure their data is accurate and reflective of what occurred during a given period. Continuous improvement on linking rules has allowed greater accuracy within the data. The quality assurance checks that follow in SQL provide an excellent screening tool to identify discrepancies within the data.

ACTHD has an opportunity to improve costing literacy across the public hospitals. Given that there are three ABF funded hospitals in the ACT, improving awareness of costing processes will lead to greater richness within the data. This will give hospitals the opportunity to better understand costs associated with delivering care and provide insights to clinicians when seeking additional funding through business cases.

4.1.8 Conclusion

Data provided by ACTHD for FY20/21 of the NHCDC has been prepared in accordance with AHPCS. ACTHD also included medical expenses in trust accounts that sit outside the GL. The exception to the AHPCS is that ACTHD excludes these costs from the ACT costing submission.

ACTHD reported their costing submission was prepared in accordance with the AHPCS version 4.1 for FY20/21. Based on the methodology outlined, CH has suitable reconciliation processes in place and the financial and activity data is considered fit for purpose for NHCDC submission.

4.2 Tasmania

4.2.1 Jurisdictional summary

Health Service overview

The Tasmanian Health Service (THS) comprises 26 hospitals, four major hospitals, 18 rural hospitals and two statewide facilities. These providers are primarily funded through existing block funding arrangements, however, there are a number of providers who are funded through ABF. In FY20/21 of the IFR, RHH has been selected as the only participating hospital in Tasmania, based upon the sampling framework. RHH is the largest hospital in Tasmania with 624 beds and delivering a range of acute, sub-acute, mental health and aged care inpatient and ambulatory services.

Costing overview

The Tasmanian Health Department (DOH) undertakes patient costing through the Clinical Costing Unit on behalf of the THS. The Clinical Costing Unit is responsible for the collation, processing, reconciliation, and submission of NHCDC data to IHACPA for the public hospitals in Tasmania using the information supplied by the health services. Activity is extracted from the Health Central database in THS. There is a strong focus on linking activity to costing data using established matching rules following extraction. This is specifically for pathology, imaging and pharmacy. The process allows the Clinical Costing Unit to determine if there are any feeder issues or data quality challenges that need to be addressed.

Systems environment

The costing software used by the Tasmanian DOH is UserCost, and the data is stored in the Clinical Costing SQL database, with QlikView as the reporting and analysis tool. The state has multiple feeder systems for services including pathology, imaging and pharmacy systems.

Improvements

Tasmania did not participate in FY19/20 of the IFR. There were no material improvements in the costing process or methodology between the previous year and the NHCDC FY20/21. The Tasmanian DOH have focussed on incremental refinement of patient costing processes following the disruption caused by COVID-19. A key focus following FY20/21 has been to improve quality assurance checks. The Tasmanian DOH conducts a series of manual and randomised quality assurance checks. This includes reviewing the GL and activity data as well as the pathology, pharmacy, and imaging services at a statewide and hospital level to ensure the number of items for each month are within expectations.

4.2.2 Data flow and reconciliation

The total submission for the Tasmanian Health Service (THS) in the GL was \$2,014,236,301. Following adjustments, such as corporate expenses, National Partnership on COVID-19 Response (NPCR) expenses, and others, \$2,099,418,025 was transferred to the costing system for FY20/21.

The Royal Hobart Hospital (RHH) total submission in the GL was \$877,754,953. Following an adjustment to salaries and wages workers compensation for southern THS, \$876,692,809 was transferred to the costing system. The total post allocation amount that was costed to RHH was \$902,190,182.

This increase in costs was due to inclusions such as a mental health ward, a series of corporate cost centres (including building expenditure), pharmacy and drugs. Lastly, there is additional variation introduced as costs are allocated to a patient based on their episode location, that may incur costs received from a different hospital or clinic, depending on where that hospital or clinic is located.

The total costs submitted to the jurisdiction for RHH was \$902,190,184. The total Work in Progress (WIP) adjustment was \$2,297,054. This includes \$11,754,848 of inclusions and \$9,457,794 of exclusions. WIP inclusions accounted for patients who were admitted in FY20 and discharged in FY21. WIP exclusions accounted for patients who were admitted in FY21 but excluded in FY22.

The total costs submitted to IHACPA from the jurisdiction for RHH was \$704,845,282, adjustments by the jurisdiction of \$197,344,902 are attributed to services and expenditure that do not form part of the NHCDC submission. This includes services such as community oral health, child and parenting services, external meals, cafeteria staff, and cancer screening. There was a substantial difference in costs submitted to the jurisdiction and costs submitted to IHACPA due to unmatched activity. For further details on the costs and activity submitted for the RHH and Tasmanian Health Service, see Table 10.

Table 10: Reconciliation from General Ledger to NHCDC Costed Products - Tasmanian Health Service and Royal Hobart Hospital

THS level data	Value
THS General Ledger	
Transferred to costing system	\$2,099,418,025
Adjustments	\$61,297,876
Line items as per standards	\$2,160,715,901
Costs submitted to jurisdiction	\$2,160,715,901
Hospital level data (RHH)	Value
Transferred to costing system	\$876,692,809
Adjustments	\$25,497,374
Line items as per standards	\$902,190,183
Costs submitted to jurisdiction	\$902,190,183
Activity	Value
Data loaded to the costing system for costing purposes	
Activity data	1,099,781
Feeder data	7,046,746
NHCDC product output activity - post linking and loading	1,145,275
Final submission to jurisdiction - activity by product	1,255,930
Final submission to jurisdiction - activity and cost by product	1,145,275
Cost submitted to jurisdiction	Value
Summary submission to jurisdiction	
Activity submitted to Jurisdiction	1,145,275
Costs submitted to Jurisdiction	\$902,190,184
Costs submitted to IHACPA	Value
Final submission from jurisdiction to IHACPA for NHCDC - cost and activity by product	
Activity	1,122,466
Costs	\$902,190,184
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(708,666)
Cost totals	(\$197,344,902)
Final jurisdictional data for cost weight production	
Finalised activity	413,800
Finalised cost	\$704,845,282

Source: Jurisdictional consultations and templates

4.2.3 Sample patient data

IHACPA selected a sample of five patients from RHH for the purposes of testing the data submitted from jurisdictions to IHACPA at the patient level. The jurisdiction provided the patient level costs for all five patients and these reconciled with IHACPA records. Further information relating to the sample records is available in Table 11.

Table 11: Tasmania five-patient sample reconciliation outcome

Jurisdiction	Site	Stream	Jurisdiction Records	Received by IHACPA	Variance
Tasmania	Royal Hobart Hospital	Acute	\$43,316.54	\$43,494.56	\$0.02
		Sub-Acute	\$333.91	\$333.92	\$0.01
		ED	\$3,612.45	\$3,612.45	\$0.00
		Non-Admitted	\$15.36	\$15.36	\$0.00
		Mental Health	\$578,698.81	\$578,698.79	\$0.02

Source: Jurisdictional consultations and templates

4.2.4 Governance arrangements

Quality assurance processes are conducted by THS on a monthly and annual basis. Quality assurance checks include monitoring for missing, incomplete or inaccurate data. Currently, there are no automated processes or algorithms that have been introduced to conduct validation and quality assurance checks on the data. The CFO signs off on the audited financial statements. The data quality statement (DQS) is internally reviewed by the Director of Monitor Reporting and Analysis and the DQS declaration is signed by the Deputy Secretary. Minutes summarising key points are supplied through the Director of Monitor Reporting and Analysis and the Deputy Secretary. Detailed costing analysis (approximately 30 pages) is also made available to key stakeholders involved in quality assurance process. Table 12 identifies a summary of the QA checks performed by Tasmania.

Table 12: Summary of quality assurance (QA) checks performed - Tasmania

QA Test	THS	Royal Hobart Hospital
Source data and systems		
Reconciliation back to GL and audited statements	Annual reconciliation and checks undertaken by THS	
Reconciliation of activity data back to source systems	Annual reviews on feeder and source systems	
Costing data – validation		
Trend analysis to prior periods across cost products	Yes – annually	
Reasonableness test of excluded data and outliers	Yes – annually	
Analysis of outliers at the cost, LOS or cost bucket level	Yes – annually	
Reasonableness of direct vs overhead allocations	Yes – annually	
Specific business rule tests	Yes	
Costing data – governance		
Regular updates with costing staff	Ad hoc	
Local guidelines supporting the AHPCS standards framework	No	
Review of cost allocations	Yes – annually	
Review on reasonableness of costing data output	Data is reviewed for reasonableness and completeness	
Formal sign-off	Final sign off by THS	Audited financial statements are reviewed and signed off by the CFO at RHH

Source: Jurisdictional consultations and data quality statement

4.2.5 Business requirements

The THS and RHH do not distribute the IHACPA reports and NHCDC data to the broader clinical workforce. Instead, this information sits within the Clinical Costing Unit and is reviewed informally and formally through their annual costing process. There is an opportunity to further engage clinicians and the health workforce to gain a greater understanding of costing processes.

4.2.6 Implications of COVID-19

THS and RHH did not specifically set up COVID cost centres. Instead, they repurposed wards to become COVID clinics. Additionally, hot and cold clinics were set up within the ED to help identify the treatment of suspected COVID positive patients. While review and analysis is still underway of pathology and imaging during the peak of the pandemic, there are signs of incremental increases in costs across the whole health system.

Increased costs were particularly relevant for staffing, as staff were constantly being relocated from different cost centres and being furloughed. This led to a sharp spike in average costs, as the number of patients being treated decreased significantly, while staffing levels remained consistent.

4.2.7 Key learning and future improvements

The THS utilised a clear and useful reporting software that enabled the quick review and analysis of activity and costing. This allowed the Clinical Costing Unit to review data at a high level, and a detailed level, to review patient level data to provide a greater richness to the analysis. Greater granularity of data allows the Clinical Costing Unit to easily review the data on a detailed level, and it also provides an opportunity to share information with parties when they are interested in furthering their knowledge of costing within THS. This was an important enabler for supporting the costing processes within THS, and similar features would be welcomed in other jurisdictions.

Mental Health costing at the phase of care level continues to be a difficult area to cost effectively and remains an area of ongoing improvement.

The THS has an opportunity to improve costing literacy across the jurisdiction at a hospital and health service level. Greater awareness of costing processes and implications of data collection would lead to a more robust dataset and intelligence to inform business and clinical decision making. Given that the majority of services are block funded, there is no clear incentive for public providers to engage with costing activities. Improving costing awareness and capability would be a clear enabler when implementing new and innovative funding models in Tasmania.

4.2.8 Conclusion

Tasmania continues to make best efforts to adhere to the AHPCS version 4.1 and is compliant, with exception to the areas listed below:

- Data Quality Framework (AHPCS 6.1.1.3.3, 6.1.3.5). The Tasmanian Data Quality Framework has minimal independent and external testing. Costed patient data is also not formally audited by an independent body.
- Teaching, Training and Research (TTR) (CG 4.1, 4.2, 4.3). Tasmania's approach to TTR is currently calculated using an established local methodology based on identifiable expenditure and a percentage-based approach, with a goal to improve this in future costing periods.

The jurisdiction reported their costing submission was prepared in accordance with the AHPCS version 4.1 for FY20/21. Based on the methodology outlined above, RHH has suitable reconciliation processes in place and the financial and activity data is considered fit for NHCDC submission.

4.3 Northern Territory

4.3.1 Jurisdictional summary

Health service overview

In late 2020, the NT Government created one integrated health system known as NT Health (five regions: Top End, Central, Big Rivers, East Arnhem and Barkley) rather than the previous three entities of the Department of Health (DoH), Top End Health Service (TEHS) and Central Australia Health Service (CAHS). NT Health is responsible for the NT's clinical costing process and leads all aspects of the process in consultation with the health services and is responsible for the preparation and submission of the NT's NHCDC submission to IHACPA.

In FY20/21 of the IFR, the Alice Springs Hospital (ASH) was selected as the sample site for the review, based upon the sampling framework. ASH is the major referral hospital for Central Australia with a catchment population of approximately 42,000 people and an area exceeding one million square kilometres, extending into the desert regions of SA and WA.

ASH provides health services across the whole continuum of care and is the major trauma response centre for the region. Medical services are diverse and complex with a prevalence of rheumatic heart disease, diabetes, sensory conditions, bronchitis, chronic liver and renal disease. Eighty-five per cent of patients presenting at ASH identify as Indigenous. ASH is the largest hospital in the region; it encompasses approximately 205 overnight beds, six operating theatres and 22 same day procedure chairs/beds. ASH provides regular visiting specialist medical services to Tennant Creek Hospital and a range of non-admitted specialist outreach services to remote and Indigenous communities, seeking to provide culturally appropriate services to these cohorts.

Costing overview

With the creation of the one integrated health system (NT Health), the clinical costing unit was relocated onsite at Royal Darwin Hospital and ASH to enhance clinical and operational engagement and improve participation in the costing process. NT Health lost a considerable amount of corporate knowledge between FY19/20 and FY20/21. They advised they are currently in a rebuilding stage and investing heavily to grow internal knowledge and capacity within the clinical costing function.

As per previous rounds, NT Health continue to maintain a relationship with costing software provider PowerHealth, particularly with system and technical guidance. As a result, the NT costing study is still a collaborative effort between NT costing, PowerHealth and the hospital stakeholders.

In the past, NT Health would upload all data to PowerHealth who would the conduct the matching of cost and activity. NT Health have brought this task in-house, with a virtual costing server and database now having been set up to improve matching and linking at an encounter level, while sharing the various outputs back to stakeholders for validation prior to any final use of the various datasets This has been an important change to the costing process and has allowed for data improvements, i.e. data that more closely reflects service provision and improved quality checks.

Systems environment

NT Health and the ABF hospitals use the Power Performance Manager (PPM) patient costing software for clinical costing. Across NT Health, there is an enterprise-wide data warehouse where hospitals submit ABF activity centrally that, in turn, is submitted through to IHACPA. That data is then available for the finance and the clinical costing team to access via the data

warehouse, eliminating the need to re-extract or ask hospitals again for that data at an episode or encounter level.

Various feeder systems are utilised throughout the process. In most instances, data is extracted directly from clinical systems in the hospital and validated with stakeholders from the specific areas. PowerHealth have a secure webfile platform that is used to transfer costing files. As described previously, NT Health have a virtual costing server and database in which the costing team match and link data prior to sending to PowerHealth. For FY20/21, the episode number that this service links to was also provided for stronger matching.

Improvements

NT Health has now implemented bi-annual costing across all NT hospitals to facilitate participation in the Health Round Table and more timely clinical costing. Similarly, with the development of in-house capabilities and control of source data, the ability to make continuous improvements in data matching with regular extraction and validation of feeder data is evident. NT realised the following costing improvements for FY20/21:

- Refined the activity and cost structure of non-admitted specialist outreach services provided to remote communities
- Costing for operating theatres was improved by using the actual clinicians present in theatre to allocate costs via a new feeder file as well as separating recovery time and cost from theatre to allow for more precise costing
- Allocation of high cost compounded antineoplastic drugs to episodes of chemotherapy and oncology treatment at three major hospitals in the NT; these costs were not identified previously due to system limitations
- Enhanced identification and categorisation of emergency aero-medical retrieval costs to ensure appropriate in-scope costs are now captured, particularly as these costs are significant for the NT.

4.3.2 Data flow and reconciliation

Alice Springs Hospital

The total NT Health GL was \$1,755,222,683 as per the Audited Financial Statements, adjustments relating to third party long service leave and revenue were applied to arrive at an amount of \$1,753,858,468 and transferred to the costing system for FY20/21. The IFR template was completed at the NT Health level and the hospital level, however source data loaded into PPM was provided at the jurisdiction level and information for ASH was derived as indicated below.

The ASH component of the GL costs loaded into the costing system was \$308,363,894. The various adjustments consisted primarily of excluded costs relating to non-NHDCDC costs allocated to virtual patients, aged care, mental health and primary health care activity relating to ASH totalled \$4,958,767.

The total costs submitted to the jurisdiction for ASH as per the line items (per IHACPA standards) was \$303,405,127. There were no further adjustments made at the jurisdictional level on this amount such that these were submitted as the total costs to IHACPA. For further details on the costs and activity submitted for ASH see Table 13.

Table 13: Reconciliation from General Ledger to NHCDC Costed Products – Northern Territory Health

NT Health level data	Value
NT Health General Ledger	
Transferred to costing system	\$1,753,858,468
Line items as per standards	\$1,753,858,468
Adjustments	(\$490,321,512)
Costs submitted to jurisdiction	\$1,263,536,956
Hospital level data (ASH)	Value
GL transferred to costing system	\$308,363,894
Adjustments	(\$4,958,767)
Post allocation amounts	\$303,405,127
Costs submitted to jurisdiction	\$303,405,127
ASH activity	Value
Data loaded to the costing System for costing purposes	
Activity data	204,285
Feeder data	749,657
NHCDC product output activity - post linking and loading	
Final submission to jurisdiction - activity by product	180,090
Final submission to jurisdiction - activity and cost by product	180,090
ASH submitted to jurisdiction	Value
Summary submission of data to jurisdiction	
Activity submitted to jurisdiction	180,090
Costs submitted to jurisdiction	\$303,405,127
ASH costs and activity submitted to IHACPA	Value
Final submission of data to jurisdiction for IHACPA - cost and activity by product	
Activity	204,285
Costs	\$308,363,894
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(24,195)
Cost totals	(\$4,958,767)
Final jurisdictional data for cost weight production	
Finalised activity	180,090
Finalised cost	\$303,405,127

Source: Jurisdictional consultations and templates

4.3.3 Sample patient data

IHACPA selected a sample of five patients from ASH for the purposes of testing the data flow from jurisdictions to IHACPA at a patient level. The jurisdiction provided the patient level costs for all five patients from each site and these reconciled with IHACPA records. Further information relating to the sample records is available in Table 14.

Table 14: Northern Territory five-patient sample reconciliation outcome

Jurisdiction	Site	Stream	Jurisdiction Records	Received by IHACPA	Variance
Northern Territory	Alice Springs Hospital	Acute	\$210.86	\$210.86	\$0.00
		Sub-Acute	\$116,721.03	\$116,721.03	\$0.00
		ED	\$794.52	\$794.52	\$0.00
		Non-Admitted	\$59,157.21	\$59,157.21	\$0.00
		Mental Health	\$3,006.96	\$3,006.96	\$0.00

Source: Jurisdictional consultations and templates

4.3.4 Governance arrangements

With the creation of the one integrated health system (NT Health), other governance changes occurred, including the transfer of the costing function from the ABF team to Finance to better connect the function to the business. In the same restructure, the finance teams were merged into one and are working more constructively with the ABF team. Coding and health information functions also report through to Finance. To upskill stakeholders, workshops have been held with the Finance teams, taking them through the costing process in order to understand the need for costing and the impact on the NT Health system if data is inaccurate.

During the costing year, once regional health service results are collated, the costing team run sessions with operational units for validation. The data and outputs are also provided to the hospital executive for visibility on the results for their hospital. The results are then rolled up to the regional level and are presented to the regional executive team. At the jurisdictional level, the costing team, together with the ABF and the Funding and Performance teams, will run various sessions to ensure there are no unexpected or unexplained variances. A brief and memorandum with the respective results is presented to the CFO for sign-off and submission to IHACPA. Once final results of the submission are received from IHACPA and the respective data outputs are collated, the team will review all output and provide a summary to the CEO prior to submitting the final sign-off and Data Quality Statement.

The changes to process and the various governance arrangements have resulted in rapid development for all involved in the costing process, with FY20/21 as step one, and the FY21/22 IFR will focus on further embedding the changes, with plans for Round 27 to further refine and manage the process as business as usual.

Table 15: Summary of quality assurance (QA) checks performed – Northern Territory

QA Test	NT Health	Alice Springs Hospital
Source data and systems		
Reconciliation back to GL and audited statements	GL is reconciled for each costing cycle	N/A
Reconciliation of activity data back to source systems	Numerous checks performed when activity data is extracted from source systems	Numerous checks performed when activity data is extracted from source systems
Costing data – validation		
Trend analysis to prior periods across cost products	Yes, with both internal stakeholders and external costings consultants	Yes
Reasonableness test of excluded data and outliers		Yes
Analysis of outliers at the cost, LOS or cost bucket level		Yes
Reasonableness of direct vs overhead allocations		Yes
Specific business rule tests	Yes, various business rules are tested when data is loaded.	Completed centrally
Costing data – governance		
Regular updates with costing staff	Regularly in contact with external costing consultants.	N/A
Local guidelines supporting the AHPCS standards framework	Yes, Local Costing Manual exists and is updated annually.	No
Review of cost allocations	Yes	Yes
Review on reasonableness of costing data output	Data is reviewed for reasonableness and completeness.	Review of data throughout the process
Formal sign-off	Formal sign-off by CEO	Formal sign-off by CFO

Source: Jurisdictional consultations and data quality statements

4.3.5 Business requirements

In the past, NT costing data was not timely, ownership of the data was with a third party, and the reliance and use of the data outside of the NHCDC process was negligible. Following inclusion in the Health Round Table, the team are working on completing the first six-monthly costing run. This is a significant process change for NT Health who are trying to improve engagement on this process with both corporate and clinical stakeholders.

This will give NT Health an opportunity to validate costing results more proactively with clinical stakeholders, allowing costing to be timely, relevant, and accurate to support the hospitals, the

staff and costing needs. Stakeholders are keen to have the data provided back to them in a user-friendly way, with the potential to add Power BI dashboards to the reporting suite.

4.3.6 Implications of COVID-19

To account for COVID-19 cost implications, NT Health isolated business as usual from the COVID-19 costs in the GL through the creation of standalone cost centres. Across the NT, a cost centre naming convention was implemented to allow for identification of COVID-19 costs even at the cost centre level if required. When NT Health created a new COVID-19 ward, a corresponding COVID ABF cost centre was created.

As there was low COVID-19 patient activity during FY20/21, allocating all costs to a handful of patients would not have been an accurate representation; as such, those costs were allocated to COVID-19 public health cost centres. In-hospital screening occurred regularly, and those costs already followed the patient. In hindsight, cost allocations may have been determined too far into the primary health space, due to an overabundance of caution and concerns about grossing up other hospital activity. COVID-19 costs were excluded from the NHCDC submission and then included for claims under the National Partnership Agreement (NPA).

The most significant COVID-19 impact for the FY20/21 IFR period in the NT has been a reduction in activity; however, the impacts of this are more likely to be apparent in the FY21/22 IFR. In FY20/21, COVID-19 had major implications on the availability of interstate surgeons and specialists due to border closures and restrictions. Furthermore, with a limited local workforce to draw from, the NT was forced to use expensive agency staff to fill workforce gaps.

In summary, due to NT Health applying a conservative approach to costing for COVID-19, its impact on costing is expected to be understated, as opposed to overstated in FY20/21.

4.3.7 Key learnings and future improvements

With the advent of bringing the costing function in-house, the journey of resourcing the costing team and educating all stakeholders has commenced. The various improvements previously undertaken and planned include six-monthly uploading of activity data with the endeavour to implement the practice monthly. This will ensure that staff are engaged, and it can be a business-as-usual monthly task. NT Health have also started a small Data Reference Group to discuss some of these improvement opportunities.

A system wide improvement scheduled for the near future that will positively impact patient costing is the implementation of 'one PAS' system that will be a replacement or an upgrade, depending on the current system in place at each respective site, incorporating one patient ID across all NT Hospitals, primary health care and mental health.

The continued improvement of capturing data for feeder files means that, for the FY21/22 IFR, there will be several new files such as improving patient transport costing allocations (including air services such as CareFlight). The team are keen to improve and drill down on linking data and breaking down the patient journey to cost them more definitively. This will make it easier for the team to check for errors, explain variances and ensure the reporting of user-friendly data when validating data with all NT Health stakeholders.

4.3.8 Conclusion

The NT continues to make best efforts to adhere to AHPCS version 4.1 and is compliant with exception of the costing of expenses in trust accounts, Mental Health Care at the phase level, TTR, organ donation and mental health services due to system and data limitations.

The NT reported their costing submission was prepared in accordance with the AHPCS version 4.1 for FY20/21. Based on the methodology outlined above, ASH have suitable reconciliation

processes in place and the financial and activity data is considered fit for NHDC submission. NT acknowledged their submission was late in FY20/21, due to the issues outlined previously, but have already worked (and will continue to work) on improving the timeliness of data flow process ahead of the FY21/22 IFR.

4.4 Queensland

4.4.1 Jurisdictional summary

Health Service overview

Queensland Health comprises 16 HHS in addition to the Mater Public Hospitals (Adult and Mothers'). Each HHS is responsible for the provision of health services to their community across a range of settings including admitted, emergency department and non-admitted services. In FY20/21 of the IFR, three HHSs were selected as sample sites for the review: Central Queensland HHS, Mackay HHS and Metro South HHS, based upon the sampling framework. Central Queensland HHS includes four ABF hospitals, eight block funded hospitals and two residential aged care facilities. Mackay HHS comprises two ABF hospitals and six block-funded hospitals. Metro South HHS consists of five ABF hospitals and no block-funded or aged care facilities. Each of the reviewed HHSs operate several other health care services, including oral health, community mental health, public health services, general community health services, cancer screening services, drug and alcohol services, Aboriginal and Torres Strait Islander health services, sexual health services and Hospital in the Home. Central Queensland HHS and Mackay HHS have co-located, multi-purpose health services within their rural acute hospitals.

Costing overview

Each HHS reviewed in this year's IFR utilises the statewide costing solution, CostPro. CostPro automatically runs an update costing process on a nightly basis and costs reflect a year-to-date cost for completed costing structures and products. At the close of each fiscal period, costing from the prior month is reviewed by the costing team. New products for costing from source feeder systems and any changes in financial data are updated in the costing application as part of a monthly costing management process. Costing is not considered final until after the formal close of the costing ledger within each HHS, which includes the end of year accrual GL transactions. At this time, a number of end-of-year audits are undertaken by the costing team prior to completing a costing survey (that includes the reconciliation of patient level costing data to the GL). This data is then provided to the Queensland Department of Health Activity Costing team who undertake the final data transformation processes, including matching to the submitted ABF activity data collections, numerous data quality checks and format of the final files required for submission to the IHACPA portal, as part of the annual NHDC.

Pharmaceutical Benefits Scheme (PBS) line item allocations were undertaken at a jurisdictional level for FY20/21, with all submitted HHS data attributed to non-PBS drugs. Queensland Health intend to implement this at an HHS level in future rounds.

Systems environment

The costing software used by Queensland Health for the three sites involved in this review is CostPro. CostPro includes several built-in reports, including full system end-to-end reconciliation (updated each day with the daily costing run). The CostPro application is a SQL front end with the SQL databases in a product called IntelPlus. IntelPlus is currently implanted

using a cloud-based infrastructure. It has several standardised views for reporting via SQL Server Management Studio. In addition, a schema has been created for each HHS to create additional views for reporting as required. The application and database have a schema based/table-based security model that ensures the integrity of the data. As an Open Database Connectivity (ODBC) compliant database, HHS teams also review and report over the costing data using other business intelligence (BI) tools such as Power BI and QlikView. In addition, the statewide financial and activity reporting BI tool, the Decision Support System (DSS) is used by all HHSs, as is the statewide System Performance Reporting tool (SPR).

Improvements

With the introduction of CostPro, there was a review of all cost centres and the cost allocation methodology that led to changes in costing line items and the allocation of direct and overhead cost centres.

Over the past two years, Queensland Health has been investing in initiatives to improve data quality, such as automated notifications in the event of non-matching of activity, high percentage allocation for overheads, negative costs and other data quality tests that accelerate the identification of issues. Several improvements have been made to the costing process including:

- The introduction of oral health activity data
- Improved identification of PBS drugs
- Improved identification of organ donation activity
- Capturing and costing COVID-19 vaccination data.

Several differences have been noted with respect to costing at Queensland Health between FY19/20 and FY20/21, including:

- Developing a method of acknowledging depreciation by shifting from amortisation to the expensing of all assets following a system-wide review
- Implementation of new feeder systems and refinement of information from existing feeder systems
- Review of overhead classifications and their relationship to direct costs at the higher level
- A decrease in the overall percentage of salaries and wages in FY20/21 because of reallocations of superannuation expenses to oncology and deferral enterprise bargaining wage increases as part of the COVID-19 response plan.

One key focus following FY19/20 was improving quality assurance checks. Each HHS has its own quality assurance processes in place to ensure accurate costing of services. Once the HHS has finalised the costing for the period and data quality issues have been addressed, they advise the jurisdiction that the data is ready to be extracted; the Department of Health Activity Costing team then assess the suitability of data for inclusion in the NHCDC.

4.4.2 Data flow and reconciliation

Central Queensland HHS

The Central Queensland HHS total submission in the GL was \$701,961,380, which was the same value that was transferred to the costing system for FY20/21. The direct post allocation amounts totalled \$604,289,226 (86 per cent).

The total costs submitted to the jurisdiction for Central Queensland HHS as per the line items (per IHACPA standards) was \$684,989,127. The net WIP adjustment was -\$16,972,253. This

includes \$8,240,636 of inclusions and \$25,212,889 of exclusions. WIP inclusions comprised patients admitted in prior years and discharged in the NHCDC reference year and includes costs for reference year plus one for ancillary system-matched data. Exclusions considered NHCDC reference year costs for patients not discharged within the reference year.

The total costs submitted to IHACPA from the jurisdiction for Central Queensland HHS was \$531,808,203, and adjustments by the jurisdiction of \$153,180,923 are attributed to services and expenditure that do not form part of the NHCDC submission.

This includes services such as virtual patients, unlinked feeder system activity and services that are out of scope for the NHCDC. For further details on the costs and activity submitted for the Central Queensland HHS see Table 16.

Mackay HHS

Mackay HHS total submission in the GL was \$526,636,741, which was the same value that was transferred to the costing system for FY20/21. The direct post allocation amounts totalled \$450,059,252 (85 per cent).

The total costs submitted to the jurisdiction for Mackay HHS as per the line items (per IHACPA standards) was \$522,117,303. The net WIP adjustment was -\$4,519,438. This includes \$9,739,898 of inclusions and \$14,259,336 of exclusions. WIP inclusions comprised patients admitted in prior years and discharged in the NHCDC reference year and includes costs for reference year plus one for ancillary system matched data. Exclusions considered NHCDC reference year costs for patients not discharged within the reference year.

The total cost submitted to IHACPA from the jurisdiction for Mackay HHS was \$430,352,429, and adjustments by the jurisdiction of \$91,764,874 are attributed to services and expenditure that do not form part of the NHCDC submission. This includes services such as virtual patients and services that are out of scope for the NHCDC. For further details on the costs and activity submitted for the Mackay HHS see Table 17.

Metro South HHS

Metro South HHS total submission in the GL was \$2,772,053,223, which was the same value that was transferred to the costing system for FY20/21. The direct post allocation amounts totalled to \$2,356,943,190 (85 per cent).

The total costs submitted to the jurisdiction for Metro South HHS as per the line items (per IHACPA standards) was \$2,761,396,563. The net WIP adjustment was -\$10,656,660. This includes \$48,647,777 of inclusions and \$59,304,437 of exclusions. WIP inclusions comprised patients admitted in prior years and discharged in the NHCDC reference year and includes costs for reference year plus one for ancillary system matched data. Exclusions considered NHCDC reference year costs for patients not discharged within the reference year.

The total cost submitted to IHACPA from the jurisdiction for Metro South HHS was \$2,184,228,374, and adjustments by the jurisdiction of \$577,168,188 was primarily attributed to services and expenditure that do not form part of the NHCDC submission. This includes services such as virtual patients and services that are out of scope for the NHCDC. For further details on the costs and activity submitted for the Metro South HHS see Table 18.

Table 16: Reconciliation from GL to NHCDC costed products - Queensland Health (Central Queensland HHS)

HHS level data	Value
HHS General Ledger	
Transferred to costing system	\$701,961,380
Post allocation amounts	\$701,961,380
Adjustments	(\$16,972,253)
Line items as per standards	\$684,989,127
Costs submitted to jurisdiction	\$684,989,127
Activity	Value
Data loaded to the costing system for costing purposes	
Activity data	995,084
Feeder data	178,586,428
NHCDC product output activity - post linking and loading	995,084
Final submission to jurisdiction - activity by product	994,620
Final submission to jurisdiction - activity and cost by product	994,620
Cost submitted to jurisdiction	Value
Summary submission to jurisdiction	
Activity submitted to jurisdiction	994,620
Costs submitted to jurisdiction	\$684,989,127
Costs and activity submitted to IHACPA	Value
Final submission from jurisdiction to IHACPA for NHCDC - cost and activity by product	
Activity	994,620
Costs	\$684,989,127
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(435,886)
Cost totals	(\$153,180,923)
Final jurisdictional data for cost weight production	
Finalised activity	558,734
Finalised cost	\$531,808,203

Source: Jurisdictional consultations and templates

Table 17: Reconciliation from GL to NHCDC costed products - Queensland Health (Mackay HHS)

HHS level data	Value
HHS General Ledger	
GL transferred to costing system	\$526,636,741
Post allocation amounts	\$526,636,741
Adjustments	(\$4,519,438)
Line items as per standards	\$522,117,303
Costs submitted to jurisdiction	\$522,117,303
Activity	Value
Data loaded to the costing system for costing purposes	
Activity data	914,886
Feeder data	141,393,458
NHCDC product output activity - post linking and loading	914,886
Final submission to jurisdiction - activity by product	914,519
Final submission to jurisdiction - activity and cost by product	914,519
Cost submitted to jurisdiction	Value
Summary submission to jurisdiction	
Activity submitted to jurisdiction	914,519
Costs submitted to jurisdiction	\$522,117,303
Costs submitted to IHACPA	Value
Final submission from jurisdiction to IHACPA for NHCDC - cost and activity by product	
Activity	914,519
Costs	\$522,117,303
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(483,220)
Cost totals	(\$91,764,874)
Final jurisdictional data for cost weight production	
Finalised activity	431,299
Finalised cost	\$430,352,429

Source: Jurisdictional consultations and templates

Table 18: Reconciliation from GL to NHCDC costed products - Queensland Health (Metro South HHS)

HHS level data	Value
HHS General Ledger	
Transferred to costing system	\$2,772,053,223
Post allocation amounts	\$2,772,053,223
Adjustments	(\$10,656,660)
Line items as per standards	\$2,761,396,563
Costs submitted to jurisdiction	\$2,761,396,563
Activity	Value
Data loaded to the costing system for costing purposes	
Activity data	3,930,942
Feeder data	455,008,746
NHCDC product output activity - post linking and loading	3,930,942
Final submission to jurisdiction - activity by product	3,930,618
Final submission to jurisdiction - activity and cost by product	3,930,618
Cost submitted to jurisdiction	Value
Summary submission to jurisdiction	
Activity submitted to jurisdiction	3,930,618
Costs submitted to jurisdiction	\$2,761,396,563
Costs submitted to IHACPA	Value
Final submission from jurisdiction to IHACPA for NHCDC - cost and activity by product	
Activity	3,930,618
Costs	\$2,761,396,563
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(2,079,337)
Cost totals	(\$577,168,188)
Final jurisdictional data for cost weight production	
Finalised activity	1,851,281
Finalised cost	\$2,184,228,374

Source: Jurisdictional consultations and templates

4.4.3 Sample patient data

IHACPA selected a sample of five patients from each HHS for the purposes of testing the data flow from jurisdictions to IHACPA at patient level. The jurisdiction provided the patient level costs for all five patients from each HHS and these reconciled with IHACPA records. Further information relating to the sample records is available in Table 19.

Table 19: Queensland five patient sample reconciliation outcomes

Jurisdiction	Site	Stream	Jurisdiction records	Received by IHACPA	Variance
Queensland	Central Queensland HHS	Acute	\$1,067.28	\$1,067.28	\$0.00
		Sub-Acute	\$122,033.81	\$122,033.81	\$0.00
		ED	\$4.49	\$4.49	\$0.00
		Non-Admitted	\$336.52	\$336.52	\$0.00
		Mental Health	\$20,943.89	\$20,943.89	\$0.00
Queensland	Mackay HHS	Acute	\$3,128.42	\$3,128.42	\$0.00
		Sub-Acute	\$307,459.18	\$307,459.18	\$0.00
		ED	\$456.44	\$456.44	\$0.00
		Non-Admitted	\$1,168.62	\$1,168.62	\$0.00
		Mental Health	\$374.05	\$374.05	\$0.00
Queensland	Metro South HHS	Acute	\$193,891.32	\$193,891.32	\$0.00
		Sub-Acute	\$9,544.24	\$9,544.24	\$0.00
		ED	\$246.43	\$246.43	\$0.00
		Non-Admitted	\$15,297.28	\$15,297.28	\$0.00
		Mental Health	\$7,212.87	\$7,212.87	\$0.00

Source: Jurisdictional consultations and templates

4.4.4 Governance arrangements

QA processes are conducted by each HHS as part of the costing process that includes system-based audit reports at each stage of the costing process. Prior to submission to Queensland Health, each HHS reviewed has a formal sign-off process that involves submission sign-off by the CFO. Furthermore, Queensland Health undertake annual validation of costing data as part of the NHCDC data transformation process prior to submission. Table 20 identifies a summary of the QA checks performed by Queensland.

Table 20: Summary of quality assurance (QA) checks performed - Queensland

QA Test	Queensland Health	Central Queensland	Mackay	Metro South
Source data and systems				
Reconciliation back to GL and audited statements	Annual reconciliation and checks undertaken by Queensland Health	Reconciliation undertaken annually	Reconciliation undertaken annually	Reconciliation undertaken annually
Reconciliation of activity data back to source systems	N/A	Conducted by HHS	Conducted by HHS	Conducted by HHS
Costing data – validation				
Trend analysis to prior periods across cost products	Yes – annually as part of the NHCDC data transformation process	Internal processes to review data in CostPro. This includes system-based audit reports at each stage of the costing process that are updated daily.		
Reasonableness test of excluded data and outliers				
Analysis of outliers at the cost, LOS or cost bucket level				
Reasonableness of direct vs overhead allocations				
Specific business rule tests	Yes – as part of the NHCDC data transformation process			
Costing data – governance				
Regular updates with costing staff	Monthly meetings of Clinical Costing Working Group (CCWG), HHS Funding and Costing Network (HHSFCN)	Monthly meetings of CCWG, HHSCFN and Statewide Virtual Costing Group (VCG)	Monthly meetings of CCWG, HHSCFN and Statewide VCG	Monthly meetings of CCWG, HHSCFN and Statewide VCG
Local guidelines supporting the AHPCS framework	Yes	Yes	Yes	Yes
Review of cost allocations	Yes, as part of the NHCDC data transformation process	Annual review	Annual review	Annual review
Review on reasonableness of costing data output	Data is reviewed for reasonableness and completeness	Multiple reviews undertaken prior to signoff	Multiple reviews undertaken prior to signoff	Multiple reviews undertaken prior to signoff
Formal sign-off	Deputy Director General	HHS CFO	HHS CFO	HHS CFO

Source: Jurisdictional consultations and data quality statement

4.4.5 Business requirements

Queensland Health and selected sample HHSs do not distribute the IHACPA reports and NHCDC data to the broader clinical workforce. Instead, this information sits within the Clinical Costing Unit and is reviewed informally and formally through their annual costing process. There is an opportunity to further engage clinicians and the health workforce to gain a greater understanding of costing processes and inform health planning decisions.

4.4.6 Implications of COVID-19

Queensland Health and selected sample HHSs utilised a specific cost centre/internal number to allocated COVID-19 related costs. There were also COVID-19 vaccine cost centres for each HSS when distributions of vaccines commenced. While review and analysis is still underway of pathology and imaging during the peak of the pandemic, there are signs of incremental increases in costs across the whole health system.

The FY20/21 IFR process only covered the approaches and methodologies HHSs utilised in costing COVID-19 activity; it did not cover any further detail about COVID-19 costing.

4.4.7 Key learning and future improvements

Queensland Health HHSs continually monitor the implementation of new clinical data collection systems to assess whether they can be utilised for clinical costing, and they work collaboratively with data managers to improve existing systems to attain minimum requirements for costing.

Now into the second year of the implementation of the statewide costing solution, this has provided further opportunities to review and modify episode matching rules to better align ancillary feeder system data where point of order data was not available in the legacy feeder system.

The opportunity to continue to improve business intelligence and clinical decision making is ongoing and has been assisted with the implementation of the statewide costing system. Improving costing awareness across all business units continues to be a path for future improvements.

Queensland Health discussed the absence of NSW from participating in the FY20/21 IFR process and noted that there were also no peer reviewers present during any of the meetings conducted for Queensland. There is concern about the ongoing usefulness and validity of the IFR process if jurisdictions can opt out and peer reviewing is minimally undertaken.

Finally, Queensland Health highlighted that all the information required for the National Health Reform Agreement (NHRA) activity components of the Public Hospital Establishment (PHE) collection are included in their NHCDC submission. While Queensland Health recognises the necessity of collecting this information via the PHE collection from jurisdictions that do not provide the level of granularity required in their annual NHCDC submission, there is an additional, redundant workload imposed upon some jurisdictions by requiring a separate PHE submission as well.

Queensland Health requested that the IHACPA consider introducing non-patient cost elements into the NHCDC to enable jurisdictions to fully report public health service expenditure through the NHCDC and therefore only complete the PHE by exception where this information is not available in the jurisdictional NHCDC submission.

4.4.8 Conclusion

Queensland Health reported their costing submission was prepared in accordance with AHPCS version 4.1 for FY20/21. Based on the methodology outlined above, Central

Queensland HHS, Mackay HHS and Metro South HHS have suitable reconciliation processes in place and the financial and activity data is considered fit for NHCDC submission.

4.5 South Australia

4.5.1 Jurisdictional summary

Health Service overview

The SA Department of Health and Wellbeing (DHW) comprises 10 LHNs, including four metropolitan and six regional health services (established from one country network to six LHNs during FY19/20). In FY20/21 of the IFR, two LHNs were selected as sample sites for the review: Flinders and Upper North LHN (FUNLHN) and Northern Adelaide LHN (NALHN), with the Port Augusta Hospital (PAH) and the Lyell McEwin Hospital (LMH) selected for assessment for FUNLHN and NALHN respectively based upon the sampling framework.

FUNLHN provides health services across the whole continuum of care for approximately 45,000 people living within the Spencer Gulf, eastern Eyre Peninsula and north to the NT border – encompassing an area of almost 541,000km². It comprises five hospitals, three of which are grant-funded, with the remaining two being ABF/case-mix funded, including PAH, the subject of the FY20/21 IFR. PAH is the second largest hospital in the region; it encompasses approximately 100 beds (including emergency services, general medical and surgical care services).

NALHN covers SA's fastest growing region in the north and north-east metropolitan area, with a catchment area covering approximately 400,000 people. It comprises two hospitals, including the LMH, Modbury Hospital (MH), Northern Mental Health Services, Watto Purrinna Aboriginal Primary Health Care Service, and a number of primary health, sub-acute and transitional care services. The LMH is the major hospital in the LHN with over 600 beds, selected as the sample site for the FY20/21 IFR. NALHN has additional beds planned with increasing investment in service delivery.

Costing overview

Patient costing activities are undertaken by costing resources embedded within the LHNs, with separate costing teams within the four metropolitan LHNs, and one costing team dedicated to supporting all six regional LHNs (through Rural Support Services). All LHNs use the same guidelines for costing patient level data and, whilst LHNs may select different cost drivers in certain instances, their methodology remains consistent. The data from all feeder systems is supplied by individual LHNs and collated into Microsoft Access databases, with activity data extracted from DHW corporate systems. LHNs run QA processes over the data and then supply this to DHW for collation and submission (e.g. costs per activity such as 'theatre cost per hour'). Additional technical support and subject matter expertise for QA is provided to some LHNs by an external contractor, PowerHealth Solutions.

DHW experienced staff turnover in FY20/21. The newly established team is looking to implement additional resources and improvements to the engagement and QA processes for inclusion in the FY21/22 IFR submission.

Systems environment

DHW and the LHNs use the PPM patient costing software for clinical costing. SA LHNs have several feeders available, including pathology, imaging and pharmacy systems. LMH currently list the most feeder systems across any SA LHN, including new sources in FY20/21 such as specialist nursing, rheumatology and patient incident data to cost Code Black incidents.

There are a number of sites using an electronic PAS, however the rollout of the "Sunrise" statewide PAS and Electronic Medical Record (EMR) technology is still underway. PAH is already using the Sunrise system, however the LMH still currently uses Homer.

Improvements

Overall, there were no material changes or improvements in SA's costing process or methodology between the previous FY19/20 and FY20/21; however, continuous improvements have been made in some areas to improve robustness and accuracy of costing data. For PAH, this includes a review of overheads (including applying minimum and maximum overheads for pharmacy by 'cost per issue'), review of floor space, and additional feeder files. For LMH, this includes new or improved feeder files for the Emergency Response team, consultation services (e.g. specialist nurses), contracted services, and improvements to the matching and cost allocation of community mental health services that are delivered at Glenside (Central Adelaide LHN) for LMH patients.

Furthermore, there has been recent recruitment into the DHW Patient Costing team to replenish lost capability. The new team is exploring opportunities for improvements to DHW processes and engagement with LHNs in time for the FY21/22 and FY22/23 IFR submissions.

4.5.2 Data flow and reconciliation

Flinders and Upper North Local Health Network (FUNLHN) – Port Augusta Hospital

The total Country Health GL was \$1,068,311,256 as per the Audited Financial Statements, multiple adjustments relating to items including non-operating costs, SA Pathology and other statewide service overhead charges, WorkCover levies and procurement services were applied to arrive at an amount of \$1,078,808,367 transferred to the costing system for FY20/21. The IFR template was completed at the Country Health level and the hospital level, however source data loaded into PPM was provided at the LHN level and information for FUNLHN was derived as indicated below.

The FUNLHN component of the GL costs loaded into the costing system was \$147,673,670 and the PAH component of that was \$48,152,023. The various adjustments outlined above were made at the Country Health level, the PAH adjustments totalled \$982,359.

The total costs submitted to the jurisdiction for PAH as per the line items (per IHACPA standards) was \$49,134,382. There were no further adjustments made at the jurisdictional level on this amount such that these were submitted as the total costs to IHACPA. For further details on the costs and activity submitted for PAH see Table 21

Northern Adelaide Local Health Network (NALHN) – Lyell McEwin Hospital

The Northern Adelaide Local Health Network (NALHN) starting GL was \$853,490,391 as per the Audited Financial Statements, multiple adjustments relating to items including non-operating expenses, SA Pathology overheads, WorkCover levies and procurement services were applied to arrive at an amount of \$846,754,224 transferred to the costing system for FY20/21.

The LMH's component of the GL costs loaded into the costing system was \$553,533,265. The various adjustments outlined above were made at the LHN level, however the net impact of the adjustments for LMH totalled \$39,087,454.

The total costs submitted to the jurisdiction for LMH as per the line items (per IHACPA standards) was \$592,620,719. There were no further adjustments made at the jurisdictional level on this amount such that these were submitted as the total costs to IHACPA. For further details on the costs and activity submitted for the LMH see Table 22.

Table 21: Reconciliation from General Ledger to NHCDC costed products – South Australian Health (Flinders and Upper North Local Health Network)

Country Health level data (6 regional LHNs)	Value
Country Health General Ledger	
Transferred to costing system	\$1,078,808,367
Post allocation amounts	\$1,078,808,367
Adjustments	(\$748,861)
Line items as per standards	\$1,078,059,505
Excluded costs	(\$601,478,638)
Costs submitted to jurisdiction	\$476,580,867
Hospital level data (PAH)	Value
GL transferred to costing system	\$48,152,023
Adjustments	\$982,359
Post allocation amounts	\$49,134,382
Line items as per standards	\$49,134,382
Costs submitted to jurisdiction	\$49,134,382
PAH Activity	Value
Data loaded to the costing system for costing purposes	
Activity data	54,172
Feeder data	187,936
NHCDC product output activity - post linking and loading	54,172
Final PAH submission to jurisdiction - activity by product	54,172
Final PAH submission to jurisdiction - activity and cost by product	54,172
PAH submitted to jurisdiction	Value
Summary submission of PAH data to jurisdiction	
Activity submitted to jurisdiction	54,172
Costs submitted to jurisdiction	\$49,134,382
PAH costs and activity submitted to IHACPA	Value
Final submission of PAH data to jurisdiction for IHACPA - cost and activity by product	
Activity	54,172
Costs	\$49,134,382
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	-
Cost totals	-
Final jurisdictional data for cost weight production	
Finalised activity	54,172
Finalised cost	\$49,134,381

Source: Jurisdictional consultations and templates

Table 22: Reconciliation from General Ledger to NHCDC costed products – South Australian Health (Northern Adelaide Local Health Network)

LHN level data (NALHN)	Value
LHN General Ledger (NALHN)	
GL transferred to costing system	\$846,754,224
Adjustments	\$846,754,224
Post allocation amounts	(\$1,393,753)
Line items as per standards	\$846,754,224
Costs submitted to jurisdiction	\$797,538,079
Hospital level data (LMH)	Value
GL transferred to costing system	\$553,533,265
Adjustments	\$39,087,454
Post allocation amounts	\$592,620,719
Line items as per standards	\$592,620,719
Costs submitted to jurisdiction	\$592,620,719
LMH Activity	Value
Data loaded to the costing system for costing purposes	
Activity data	455,879
Feeder data	1,653,486
NHCDC product output activity - post linking and loading	455,879
Final submission to jurisdiction - activity by product	455,879
Final submission to jurisdiction - activity and cost by product	455,879
LMH submitted to jurisdiction	Value
Summary submission to jurisdiction	
Activity submitted to jurisdiction	455,879
Costs submitted to jurisdiction	\$592,620,719
LMH costs and activity submitted to IHACPA	Value
Final submission to jurisdiction for IHACPA - cost and activity by product	
Activity	455,879
Costs	\$592,620,719
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	-
Cost totals	-
Final jurisdictional data for cost weight production	
Finalised activity	455,879
Finalised cost	\$592,620,719

Source: Jurisdictional consultations and templates

4.5.3 Sample patient data

IHACPA selected a sample of five patients from each site (PAH and LMH) for the purposes of testing the data flow from jurisdictions to IHACPA at the patient level. The jurisdiction provided the patient level costs for all five patients from each site and these reconciled with IHACPA records. Further information relating to the sample records is available in Table 23.

Table 23: South Australia five patient sample reconciliation outcome

Jurisdiction	Site	Stream	Jurisdiction records	Received by IHACPA	Variance
South Australia	Port Augusta Hospital	Acute	\$7,180.00	\$7,180.00	\$0.00
		Sub-Acute	\$79,213.20	\$79,213.20	\$0.00
		ED	\$1,326.59	\$1,326.59	\$0.00
		Non-Admitted	\$10.13	\$10.13	\$0.00
		Mental Health	\$9,012.67	\$9,012.67	\$0.00
South Australia	Lyell McEwin Hospital	Acute	\$3,000.39	\$3,000.39	\$0.00
		Sub-Acute	\$30,949.56	\$30,949.56	\$0.00
		ED	\$27.66	\$27.66	\$0.00
		Non-Admitted	\$63,577.21	\$63,577.21	\$0.00
		Mental Health	\$122.35	\$122.35	\$0.00

Source: Jurisdictional consultations and templates

4.5.4 Governance arrangements

LHN data for the NHCDC process are extensively reviewed by LHNs prior to official submissions, with multiple refinements to ensure the data is as accurate as possible. Prior to the NHCDC submission, the DHW Patient Costing team has meetings with LHN Costing teams for a thorough review of all costings at the DRG level, including all admitted, non-admitted and emergency classifications. This discussion allows for any discrepancies to be highlighted and addressed, ensuring all costs and activities are accounted for and processed in accordance with AHPCS version 4.1, with LHNs then making any final adjustments until they are satisfied that their data is fit for purpose.

Once LHN sign-off is achieved, the Patient Costing team finalises the necessary data for submission to the NHCDC, on behalf of all the LHNs. For the regional LHNs, final costing submissions to DHW are signed-off by Rural Support Services at the Director level, but are typically signed at an Executive level for metropolitan LHNs (e.g. the CFO at NALHN). For NALHN the signoff is traditionally based on recommendation from the ABF/Casemix Manager at NALHN. This signoff is undertaken via a formal brief. The final data submission to NHCDC is signed off by the CEO of DHW.

Table 24: Summary of quality assurance (QA) checks performed – South Australia

QA Test	DHW	Port August Hospital	Lyell McEwin Hospital
Source data and systems			
Reconciliation back to GL and audited statements	GL is reconciled for each costing cycle	GL is reconciled for each costing cycle	GL is reconciled for each costing cycle
Reconciliation of activity data back to source systems	Numerous checks performed when activity data is extracted from source systems	Numerous checks performed when activity data is extracted from source systems	Numerous checks performed when activity data is extracted from source systems
Costing data – validation			
Trend analysis to prior periods across cost products	Yes	Rural Support Services (RSS) work across regional LHNs to review data in PPM and match this to activity. Reasonableness and analysis of trends and outliers is conducted regularly.	A costing report is produced alongside each costing run to highlight broader LMH performance and divisional performance against benchmarks and prior years.
Reasonableness test of excluded data and outliers	Yes		
Analysis of outliers at the cost, LOS or cost bucket level	Yes		
Reasonableness of direct vs overhead allocations	Yes		
Specific business rule tests	Central team control feeder data and QA the data and run through the business rules for each LHN	Completed centrally	Completed centrally
Costing data – governance			
Regular updates with costing staff	Conducted monthly – process and agenda soon to be renewed to improve value-add	Conducted monthly – process and agenda soon to be renewed to improve value-add	Conducted monthly – process and agenda soon to be renewed to improve value-add
Local guidelines supporting the AHPCS standards framework	No	No	No
Review of cost allocations	Yes, annually	Yes, annually	Yes, quarterly
Review on reasonableness of costing data output	Data is reviewed for reasonableness and completeness. IHACPA QA reports provided to LHNs	Review of data throughout the process	Review of data throughout the process
Formal sign-off	Formal sign-off by CEO	Yes, by RSS ABF Manager to approve	Yes, by CFO for NALHN

4.5.5 Business Requirements

SA's public hospital data is used for benchmarking against the NEP, other hospitals in SA, forecasting for future work programs, and monitoring improvement initiatives.

It is largely used by the LHNs to provide detailed information on performance and as a guide to determining where there are potential cost efficiencies. LHNs also submit their data annually to the Health Round Table, utilising PPM. NALHN also participates in Children's Healthcare Australasia (CHA) and Women's Healthcare Australasia (WHA).

The usage of costing data and reporting varies across LHNs. In the regional setting, the major audience is still Business Managers and finance staff. However, this is starting to change, with increasing opportunities for engagement with clinicians particularly through the sharing of reports on a common SharePoint site, e.g. PAH worked with palliative care clinicians to explore how their service is performing against other LHNs on a costing basis. LMH are making strong inroads to improving engagement on costing information across Executives and clinicians, with one example involving engagement with cardiologists regarding the use of clinical costing data to support a review of hospital readmissions. At present, the LMH Costing team provide a report on the overall performance of LHN and that of individual divisions to the CFO and made available to clinicians after every costing run, occurring quarterly at a minimum.

4.5.6 Implications of COVID-19

Following protracted border restrictions, SA opened its borders during the FY20/21 period, in November 2021. To account for these impacts of COVID-19 in FY20/21, FY20/21 costing was separated into six months (July 2020 – December 2020, pre-COVID) and six months (January 2021 – June 2021, post-COVID). Splitting the year in this way allowed SA to compare the changes in cost per National Weighted Activity Unity (NWAU) under the different scenarios. In particular, the lifting of restrictions in SA triggered a pause in elective surgeries, changes to ward setups to account for COVID positive patients, and a transfer of more activity to the private sector.

Discrete cost centres were established in FY20/21 for testing and vaccination clinics. During FY20/21, the state was costing vaccinations at an individual level, however this will return to aggregate counts for the FY21/22 IFR. Some issues were experienced with the costing of pathology services as feeder files were not provided by SA Pathology; discussions are ongoing to improve this for the FY21/22 IFR.

As expected, higher costs were observed for PPE, security and cleaning services due to the nature of the pandemic response; however, costing was applied in the same manner as that for FY19/20 splits with additional costs charged separately to COVID cost centres. Understanding what is the "new normal" for post-pandemic costs in these areas is an important consideration for SA in the FY21/22 IFR.

4.5.7 Key learnings and future improvements

Future improvements that are being considered by DHW include the costing of blood products, a new feeder file on prostheses cost line items, and review of the allocation of TTR costs.

DHW is also looking to review how the costing standards are currently applied across LHNs to identify opportunities to improve consistency of approach. With the new staffing profile in the DHW Patient Costing team, the state is looking to renew and refresh its role in the costing process to add value to the work of the LHNs and improve its capacity and capability to support QA activities more proactively, improve collaboration and continuous improvement across the SA Health system, and support consistency of approach.

SA also acknowledges the opportunity to improve its business intelligence offering by turning data into insights that can engage clinicians and Executives on performance and opportunities for change. This will be a key focus of the DHW Patient Costing team in the next two years, in collaboration with the LHN costing teams.

4.5.8 Conclusion

SA continues to make best efforts to adhere to AHPCS version 4.1 and is compliant with exception to the costing of blood products and private pathology at patient level, as data matching is not sufficiently accurate to provide robust costings.

SA reported their costing submission was prepared in accordance with AHPCS version 4.1 for FY20/21. Based on the methodology outlined above, PAH and LMH have suitable reconciliation processes in place and the financial and activity data is considered fit for NHCDC submission.

4.6 Victoria

4.6.1 Jurisdictional summary

Health Service overview

The Victorian health system consists of over 120 public hospitals and health services, supported by the Victorian Department of Health (DH). In FY20/21 of the IFR three health services were selected as sample sites, based upon the sampling framework: Latrobe Regional Hospital (LRH), Ballarat Health Service (BHS) and Melbourne Health (since renamed the Royal Melbourne Hospital).

Latrobe Regional Hospital (LRH) is the largest hospital in the Gippsland region and employs approximately 2,500 staff. LRH has 268 beds, 10 ICU, 130 acute and 46 dedicated mental health beds. The hospital is currently expanding (Stage 3A of works is proceeding) that will include new operating theatres, an additional ward (to double surgical capacity to 64 beds), a new Women's and Children's unit and an expansion of the ICU to 15 beds. LRH is also the largest provider of community mental health services in the region, with a number of satellite sites (e.g. Wonthaggi).

Ballarat Health Service (BHS) provides acute, subacute, emergency, aged care and in-home and community care programs, and community mental health programs. BHS has more than 400 beds (excluding aged care), including 284 acute beds, 105 Hospital in the Home beds, 110 sub-acute beds, 57 psychiatry /mental health beds, and two contracted care beds. On 1 November 2021 (i.e. the FY21/22 IFR), BHS amalgamated with the Edenhope, Stawell and Wimmera Hospitals and health services to create a new service, Grampians Health, that services a catchment population of over 250,000 people. This report makes reference to Ballarat Health Services only, prior to the new amalgamated Grampians Health from 1 November 2021.

The Royal Melbourne Hospital (RMH) is a large trauma hospital located in the centre of Melbourne providing specialist medical, surgical, rehabilitation, aged care, outpatient and community programs. Northwest Mental Health service is also part of RMH, with more than 35 community mental health sites. In FY20/21, RMH had more than 100,000 inpatient admissions, more than 78,000 presentations in the ED and had more than 208,000 outpatient services.

Costing overview

In Victoria, patient costing activities are the responsibility to the respective health services and patient-level costing data is submitted to DH as part of the annual Victorian Cost Data Collection (VCDC) process. DH uses the data submitted for VCDC purposes to prepare the jurisdictions NHCDC submission to IHACPA.

DH provides guidelines to the health services to ensure that the costing process is consistent across all sites. The guidelines include information on data request specifications, business rules, specific costing guidance, and details of QA checks to be applied. This documentation is consistent with the requirements of the AHPCS, nuanced as required to local context.

In general, costing is undertaken annually (consistent with the VCDC submission), however a number of health services cost more frequently, such as quarterly or half-yearly for their own purposes (e.g. LRH cost annually and BHS cost twice yearly, once for VCDC and the other for internal reporting and review).

The VCDC submission progresses through a five-stage QA process to ensure that the data provided is as requested, can be matched, linked to the appropriate activities, is reasonable and valid. Health services review data that has been identified as not meeting certain criteria to confirm the validity of the costed results.

Systems environment

Victorian health services use two clinical costing systems for the VCDC costing process, PPM and CostPro.

There are a range of Patient Administration Systems (PAS) used across the state. The sample sites used a variety of PASs, for example, LRH uses iPM while BHS uses WebPAS for most major acute and sub-acute admissions (with some sub-acute community services using TCP). All sites use a common system, CMI, for mental health admissions. RMH implemented a new EMR system, Epic, during FY20/21 (that went live on 8 August 2020); as a result, the RMH submission for FY20/21 included six weeks of data from the previous system (iPM) – that had to be linked with EPIC data for the rest of the year. A significant volume of health service data was migrated from legacy systems into the EPIC EMR, including Allied Health contacts, outpatient contacts, sub-acute non-admitted contacts and theatre services.

DH applies automated processes where available to check and reconcile data, including Python scripts that reduces human error, improves efficiency and timeliness of processes.

RMH uses QlikView for internal reporting of their costing data, with dashboards available to all staff where requested (at present, business managers are the main users of these dashboards). Data is also provided for research projects and excel spreadsheets are provided for those who do not have access to QlikView. DH is also exploring opportunities for a dashboard portal through PowerBI or similar, where health services can use the costing data to inform performance reporting and decision making.

Improvements

Due to the impacts of the pandemic in the state, there were no material changes or improvements to Victoria's costing process or methodology between FY19/20 and FY20/21. However, there were improvements made by DH and the sampled sites to improve the robustness and accuracy of the costing data. These improvements included enhancements to feeder systems, specifically for non-admitted services, overhead allocations and mental health services.

For LRH, this has included work in CMI to fully cost community mental health, updating prosthesis pricing, theatre allocations, insights into urology costings and MBS allocations for

clinical consultants that bulkbill. For BHS, this has included the following: allocation of blood products to patient level; improvements to pathology and imaging feeder systems; improvement in bed transfer information between ICU/CCU/HDU; and enabling direct access to VINAH activity dataset for more accurate costing. RMH noted no major improvements to the costing process, however as noted above, they transitioned their EMR during FY20/21.

4.6.2 Data flow and reconciliation

The following summarises the financial reconciliation and adjustments processed by the sampled health services.

Latrobe Regional Hospital

The LRH starting GL balance was \$330,463,145 consistent with the Audited Financial Statements, following adjustments a total of \$306,081,894 was transferred to the costing system. Further adjustments totalling \$18,945,337 were processed relating to WIP, Special Purpose Fund (SPF) costs and excluded episodes to arrive at an amount of \$287,136,561 that was transferred to the costing system for FY20/21.

Adjustments were made at the jurisdictional level, totalling \$49,915,352. These adjustments included WIP and unlinkable records, e.g. admitted mental health and mental health care episodes. WIP is defined as either included costs from prior year or excluded costs as episodes yet to be discharged.

The total costs for LRH submitted to IHACPA totalled \$237,221,209. For further details on the costs and activity submitted for LRH, refer to Table 25.

Ballarat Health Service

The BHS starting GL was \$577,902,614, consistent with the Audited Financial Statements, following adjustments a total of \$583,867,348 was transferred to the costing system. Further adjustments totalling \$49,349,746 relating to privately funded activities through BHS Radiology and BHS Pharmacy, regional partnership expenditure (for services provided to the broader Grampians Health), capital and finance leases were applied to arrive at an amount of \$534,517,581 transferred to the costing system for FY20/21.

Adjustments made at the jurisdictional level, totalling \$169,101,907, included WIP, unlinked episodes in mental health and ED. As a result, the total costs for BHS submitted to IHACPA totalled \$365,415,672.

For further details on the costs and activity submitted for BHS see Table 26.

Royal Melbourne Hospital

The RMH starting GL was \$1,575,992,280, consistent with the Audited Financial Statements, following adjustments a total of \$1,353,684,227 was transferred to the costing system. There were a range of adjustments applied totalling \$20,551,762, relating to WIP for patients not discharged as at 30/06/2021, recoveries (e.g. salaries and wages, utilities, facility charges), shared services (e.g. finance, payroll, supply), Peter MacCallum Cancer Centre ICU patients and other recoveries, and the EMR project. The total value transferred to the costing system for FY20/21 was \$1,333,132,466.

Adjustments made at the jurisdictional level, totalling \$394,052,036, included WIP, unlinkable episodes in ED and mental health. As a result, the total costs for RMH submitted to IHACPA totalled \$939,080,430.

For further details on the costs and activity submitted for RMH see Table 27.

Table 25: Reconciliation from General Ledger to NHCDC costed products – Latrobe Regional Hospital

Health Service level data	Value
Health Service General Ledger	
Transferred to costing system	
Post allocation amounts	
Adjustments	N/A
Line items as per standards	
Costs submitted to jurisdiction	
Hospital level data (LRH)	Value
GL transferred to costing system	\$306,081,894
Post allocation amounts	\$306,081,894
Adjustments	(\$18,945,337)
Line items as per standards	\$287,136,561
Costs submitted to jurisdiction	\$287,136,561
LRH activity	Value
Data loaded to the costing system for costing purposes	
Activity data	204,261
Feeder data	1,015,749
NHCDC product output activity - post linking and loading	219,311
Final LRH submission to jurisdiction - activity by product	219,311
Final LRH submission to jurisdiction - activity and cost by product	219,311
LRH submitted to jurisdiction	Value
Summary submission of LRH data to jurisdiction	
Activity submitted to jurisdiction	219,311
Costs submitted to jurisdiction	\$287,136,561
LRH costs and activity submitted to IHACPA	Value
Final submission of LRH data to jurisdiction for IHACPA - cost and activity by product	
Activity	219,311
Costs	\$287,136,561
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(50,025)
Cost totals	(\$49,915,352)
Final jurisdictional data for cost weight production	
Finalised activity	169,286
Finalised cost	\$237,221,209

Source: Jurisdictional consultations and templates

Table 26: Reconciliation from General Ledger to NHCDC costed products – Ballarat Health Service

Health Service level data	Value
Health Service General Ledger	
GL transferred to costing system	
Post allocation amounts	
Adjustments	N/A
Line items as per standards	
Costs submitted to jurisdiction	
Health Service level data (BHS)	Value
GL transferred to costing system	\$583,867,348
Post allocation amounts	\$583,867,348
Adjustments	(\$49,349,726)
Line items as per standards	\$534,517,581
Costs submitted to jurisdiction	\$534,517,581
BHS activity	Value
Data loaded to the costing system for costing purposes	
Activity data	422,123
Feeder data	1,793,898
NHCDC product output activity - post linking and loading	422,123
Final submission to jurisdiction - activity by product	378,282
Final submission to jurisdiction - activity and cost by product	378,282
BHS submitted to jurisdiction	Value
Summary submission to jurisdiction	
Activity submitted to jurisdiction	378,282
Costs submitted to jurisdiction	\$534,517,579
BHS costs and activity submitted to IHACPA	Value
Final submission to jurisdiction for IHACPA - cost and activity by product	
Activity	378,282
Costs	\$534,517,579
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(96,661)
Cost totals	(\$169,101,907)
Final jurisdictional data for cost weight production	
Finalised activity	281,621
Finalised cost	\$365,415,672

Source: Jurisdictional consultations and templates

Table 27: Reconciliation from General Ledger to NHCDC costed products – Royal Melbourne Hospital (Melbourne Health Service)

Health Service level data	Value
Health Service General Ledger	
GL transferred to costing system	
Post allocation amounts	
Adjustments	N/A
Line items as per standards	
Costs submitted to jurisdiction	
Hospital level data (RMH)	Value
GL transferred to costing system	\$1,353,684,227
Post allocation amounts	\$1,353,684,227
Adjustments	(\$20,551,762)
Line items as per standards	\$1,333,132,466
Costs submitted to jurisdiction	\$1,333,132,466
RMH activity	Value
Data loaded to the costing system for costing purposes	
Activity data	1,885,832
Feeder data	4,142,591
NHCDC product output activity - post linking and loading	1,162,426
Final submission to jurisdiction - activity by product	1,160,509
Final submission to jurisdiction - activity and cost by product	1,160,509
RMH submitted to jurisdiction	Value
Summary submission to jurisdiction	
Activity submitted to jurisdiction	1,160,509
Costs submitted to jurisdiction	\$1,333,132,466
RMH costs and activity submitted to IHACPA	Value
Final submission to jurisdiction for IHACPA - cost and activity by product	
Activity	1,082,840
Costs	\$1,333,132,466
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(556,448)
Cost totals	(\$394,052,036)
Final jurisdictional data for cost weight production	
Finalised activity	526,392
Finalised cost	\$939,080,430

Source: Jurisdictional consultations and templates

4.6.3 Sample patient data

IHACPA selected a sample of five patients from each site (LRH, BHS and RMH) for the purposes of testing the patient level data flow from the jurisdiction to IHACPA.

The jurisdiction provided the patient level costs for the five patients from each site and these reconciled with IHACPA records. Further information relating to the sample records is available in Table 28.

Table 28: Victoria five patient sample reconciliation outcome

Jurisdiction	Site	Stream	Jurisdiction records	Received by IHACPA	Variance
Victoria	Latrobe Regional Hospital	Acute	\$149,090.66	\$149,090.66	\$0.00
		Sub-Acute	\$1,116.13	\$1,116.13	\$0.00
		ED	\$705.84	\$705.84	\$0.00
		Non-Admitted	\$2,347.15	\$2,347.15	\$0.00
		Mental Health	\$131.77	\$131.77	\$0.00
Victoria	Ballarat Health Service	Acute	\$15,992.11	\$15,992.11	\$0.00
		Sub-Acute	\$29,573.66	\$29,573.66	\$0.00
		ED	\$1,678.36	\$1,678.36	\$0.00
		Non-Admitted	\$30.59	\$30.59	\$0.00
		Mental Health	\$987.00	\$987.00	\$0.00
Victoria	Royal Melbourne Hospital (Melbourne Health)	Acute	\$845.27	\$845.27	\$0.00
		Sub-Acute	\$30,086.64	\$30,086.64	\$0.00
		ED	\$1,985.50	\$1,985.50	\$0.00
		Non-Admitted	\$23.62	\$23.62	\$0.00
		Mental Health	\$395,934.85	\$395,934.85	\$0.00

Source: Jurisdictional consultations and templates

4.6.4 Governance arrangements

The VCDC line items are aligned to Victoria's standard Chart of Accounts, which provides consistency in the mapping of costs from the GL. DH provides a specific data requirements statement to define the information they want reported and the reporting format, supported by appropriate business roles and guidance documentation; health services not only need to adhere to those requirements, but also those of the AHPCS.

Health service and hospital data for the VCDC is extensively reviewed by the in-house costing teams prior to submission to DH, with multiple refinements to ensure the data is as accurate as possible. Health services also provide DH with a reconciliation report (similar to the IFR templates) and submit their individual DQS as part of the VCDC. Both the reconciliation report and DQS require sign off by the Health Service CEO or CFO, including an attestation.

The Department's file validation process is like IHACPA's process with respect to data quality and error checking; if any critical errors or missing data is identified by DH, the submission is returned to the health service for their review, rectification, and resubmission (where appropriate).

Once the final VCDC has been consolidated, DH coordinates the submission of the NHCDC, ensuring that all reporting requirements are met with respect to final cost centres, line items and reported activity. A formal briefing is prepared the Deputy Secretary (Commissioning and Systems Improvement), who signs off on the data and submission to IHACPA.

Table 29: Summary of quality assurance (QA) checks performed – Victoria

QA Test	DH	Latrobe Regional Hospital	Ballarat Health Service	Royal Melbourne Hospital
Source data and systems				
Reconciliation back to GL and audited statements	The F1 report confirms that the submissions reconcile to the GL	All health services submit their F1 report to DH and all costing ledgers are reconciled to this.		
Reconciliation of activity data back to source systems	DH reconciles the activity records submitted through VCDC to the activity datasets reported by health services to the Department.	Various reconciliation processes to ensure what is loaded into staging database and PPM reconciles with what is lodged for VCDC.	Various reconciliation processes to ensure what is loaded into staging database and PPM reconciles with what is lodged for VCDC.	Various reconciliation processes to ensure what is loaded into staging database and PPM reconciles with what is lodged for VCDC.
Costing data – validation				
Trend analysis to prior periods across cost products	Various QA checks are conducted on the linking of datasets and the reasonableness of the costing data – including admitted, non-admitted (including subacute and mental health), emergency and community mental health. DH also summarises trends over 4–5-year period to highlight change.	Various QA and reasonableness checks are conducted during loading of data. Validation is throughout the whole process (GL reclass, overhead allocation, activity loading, linking, mapping and costing). Various vendor reports embedded in the cost system as well as user developed reports are specifically built for the validation purpose.	Various QA and reasonableness checks are conducted during loading of data. Validation is throughout the whole process (GL reclass, overhead allocation, activity loading, linking, mapping and costing). Various vendor reports embedded in the cost system as well as user developed reports are specifically built for the validation purpose.	Various QA and reasonableness checks are conducted during loading of data. Validation is throughout the whole process (GL reclass, overhead allocation, activity loading, linking, mapping and costing). Various vendor reports embedded in the cost system as well as user developed reports are specifically built for the validation purpose.
Reasonableness test of excluded data and outliers				
Analysis of outliers at the cost, LOS or cost bucket level				
Reasonableness of direct vs overhead allocations				
Specific business rule tests	A number of checks are conducted on submission outputs. Business rules for VCDC	Yes	Yes	Yes

QA Test	DH	Latrobe Regional Hospital	Ballarat Health Service	Royal Melbourne Hospital
	collection are published annually by DH and provide guidance on costing and reporting of patient-level data.			
Costing Data – Governance				
Regular updates with costing staff	Monthly meeting with cost practitioners.	Regular engagement with finance and other key stakeholders. Annual costing and reports provided to Executive.	Regular engagement with finance and other key stakeholders. Clinical costing dashboards provided on intranet.	Regular engagement with finance and other key stakeholders. Clinical costing dashboards (Qlikview) available on request
Local guidelines supporting the AHPCS standards framework	Yes, guidelines provided to all hospitals and health services	Yes	Yes	Yes
Review of cost allocations	DH conducts checks during site submissions to VCDC	Yes	Yes	Yes
Review on reasonableness of costing data output	Yes – any major variations highlighted, and reason is reporting in briefing to Deputy Secretary	Yes	Yes	Yes
Formal sign-off	Deputy Secretary signs submission to NHCDC. The reconciliation report is signed off by the CFO and the DQS is signed off by the executive director of which clinical costing report to.	CEO signs submission to VCDC	Finance Director signs off submission to VCDC	CFO signs submission to VCDC

Source: Jurisdictional consultations and data quality statements

4.6.5 Business requirements

The collated data from the VCDC submissions is extensively used by DH, including as an input into the jurisdiction's funding model; informing business cases, policies or models of care; investigating funding impacts; verifying NWAUs and is provided to DH's Data Linkage team such that it can be linked to cross-government datasets to inform decision-making (e.g. assessing potential flow-through impacts to health in the event of a change in housing policy).

The use of costing data and reporting varies across the health services sampled; however, all sites highlighted their intention to continue to improve their engagement with key stakeholders regarding the use of costing data to inform decision-making and improve performance. For most sites, business managers, health intelligence and finance teams were the key audience for costing reports, insights and trends.

Some sites, including RMH (through QlikView), develop and publish visual dashboards to improve accessibility of information across multiple stakeholders.

4.6.6 Implications of COVID-19

The pandemic had a significant impact on patient services, the workforce, patient volumes and data capture, with Victoria experiencing protracted lockdowns due to COVID-19 in FY20/21. This necessitated a number of changes across all health services including adjustments to wards (e.g. hot/cold zones), reductions or full postponement of elective surgery, bed closures due to furloughed staff, transfer of activity to private sector and changes to models of care (e.g. use of telehealth).

Vaccination programs were managed by the individual health services where the vaccinations were recorded at the aggregate level, not at the patient level. These costs were excluded in the submission to IHACPA for this round.

As expected, higher costs were observed for PPE, security and cleaning services due to the nature of the pandemic response; however, costing was applied in the same manner as that for FY19/20, with existing COVID cost centres being rolled over for the FY20/21 period. DH provided guidelines for COVID cost capture, including allocation of costs for treating COVID positive patients versus activities that had been impacted by COVID (e.g. cleaning, PPE).

These guidelines were extensive, detailing different types of activities and the appropriate cost allocation approach, with accompanying templates for consistent use. Victorian health services continued to use the PPE consumables distributed to them from the centrally procured stores specific to COVID-19 in terms of the state supply arrangement, and per the accounting rules from the DH Finance team. These were removed from the FY19/20 submissions (as these were sourced by the Public Health Payment). Some of these consumables are beginning to be treated as "normal" in the post-pandemic environment and allocated to patients accordingly.

DH noted some difficulties with linking data relating to COVID testing and screening activities, partly driven by the three different reporting requirements on COVID activities that was difficult to manage.

4.6.7 Key learnings and future improvements

DH and the health services across Victoria continue to explore opportunities to improve the accuracy and robustness of their patient costing. For example, LRH are reviewing bed-based mental health costings through CMI (their mental health PAS). As RMH are transitioning from iPM to their new PAS (Epic), they are looking to extend their business intelligence capacity and improve uptake and usage of data and analytics across the organisation. Continuing to

improve business intelligence and data analytics capacity and capability was echoed across all sites sampled and DH.

Furthermore, Victoria continues to report cost data at phase of care for mental health, for both a bed-based and community level for all health services in the state that have a mental health service, supported by enhanced guidelines for mental health costing.

4.6.8 Conclusion

Victoria continues to make best efforts to adhere to AHPCS version 4.1 and is compliant apart from costing the following:

- Capital and depreciation: non-cash expenditures (e.g. depreciation), as this does not impact on operational costs and comparisons.
- Teaching and training costs: where the sole purpose of activity is teaching and training, these are counted in overheads; where teaching and training cannot be separated from routine work, these costs are included as salary and wages expense.
- Research costs: excluded from Victoria's submission pending further developments in the ABF work stream.
- Posthumous organ donation: application of this standard is being considered; however, updates are required to the guidance in AHPCS version 4.1 to ensure full costing by Victoria.

Victoria reported their costing submission was prepared in accordance with AHPCS version 4.1 for FY20/21. Based on the methodology outlined above, LRH, BHS and the RMH (Melbourne Health) have suitable reconciliation processes in place and the financial and activity data is considered fit for the NHCDC submission.

4.7 Western Australia

4.7.1 Jurisdictional summary

Health Service overview

The Department of Health in Western Australian (DoHWA) is comprised of five LHNs, three located in metropolitan Perth, one responsible for WA Country Health and a specialist Child and Adolescent Health Service. These health services are supported by several other agencies, including PathWest and Health Support Services. In FY20/21 of the IFR, three LHNs were selected as sample sites for the review, based upon the sampling framework: East Metropolitan Health Services (EMHS), Child and Adolescent Health Service (CAHS) and WA Country Health Service (WACHS).

EMHS provides services across the whole continuum of care to almost 800,000 Western Australians in metropolitan Perth. The Royal Perth Hospital (RPH) is the largest facility in the EMHS, encompassing 425 multi-day beds (including 20 trauma, 18 ICU and six coronary care beds). On a yearly basis, there are approximately 65,000 inpatient separations, 73,000 emergency presentations and 324,000 non-admitted attendances.

CAHS is comprised of Neonatology (at King Edwards Memorial Hospital), Community Health, Child and Adolescent Mental Health Services and the Perth Children's Hospital (PCH). The PCH is responsible for approximately half of the total expenditure incurred by CAHS and provides specialist paediatric and trauma services to children and adolescents aged 15 years or younger. PCH has 298 beds and on a yearly basis, services approximately 31,000 admissions, 67,000 emergency presentations and 236,000 outpatient appointments.

WACHS is responsible for the provision of health care services across regional and rural WA, including across remote aboriginal communities. WACHS is comprised of seven health regions that consist of six large regional hospitals, 46 small hospitals, 43 health centres and nursing posts and 24 community-based mental health services⁵. Albany Hospital (AH) is part of the Great Southern Health region of WACHS and is one of the six large hospitals referred to above. AH is comprised of 134 beds, providing vertically integrated services across the whole continuum of care. As a larger regional health facility, staff from the AH also travel to service network gaps across the Great Southern region.

Costing overview

Patient costing is the responsibility of the respective LHNs and undertaken by dedicated costing teams. WA's FY20/21 NHDC submission was based on the individual submissions from the five LHNs. Costing is undertaken annually for the NHDC submission, however EMHS undertakes quarterly costing for internal purposes. Data submissions for the FY20/21 NHDC process were extensively reviewed by HSPs, prior to official sign-off at the CFO level, including a series of quality assurance tests covering inpatients, specific DRGs, emergency and outpatient activity and others.

Upon submission of the approved data files to DoHWA, HSP costs were further tested and reconciled, with adjustments made to incorporate WIP from previous rounds. DoHWA also undertakes data matching and validation prior to submission to ensure costed datasets align with activity data submitted to IHACPA.

WA has a single chart of accounts, such that the mapping for NHDC line items is set at the statewide level. This promotes greater consistency across the system and enables the WA

⁵ <https://www.wacountry.health.wa.gov.au/About-us/Overview>

health system to utilise costing resources more efficiently because the foundational systems, data and activities are the same.

There have also been some movements in resourcing of the costing teams due to capacity and capability constraints across the HSPs, such that the FY20/21 costings for CAHS was supported by EMHS. EMHS assumed responsibility for the process in late 2020/21, considering the timing the GL structure was taken as is, however EMHS were able to use the dataset in PPM to provide the extract to IHACPA; the costing process applied to CAHS data therefore mirrored that of EMHS.

Systems environment

DoHWA use the latest version of PPM 2 patient costing software for clinical costing. All WA HSPs use the same PAS and the same statewide feeder systems for services including pathology, imaging, and pharmacy systems. Health Support Services (HSS) – a shared service centre for WA’s health system – administer and provide technical support for the clinical costing system, provide extracts for the HSPs, and perform monthly validity checks on activity data against agreed data standards.

PowerBI is the most commonly used reporting and analysis tool across HSPs. WACHS had been using Presto for internal reporting in previous IFR rounds but will be transitioning to PowerBI from January 2023 due to Presto being wound down. HSPs have used PowerBI to create appropriate visualisations and dashboards to aid analysis and benchmarking of their results within their HSP and across like-HSPs.

Improvements

Overall, there were no material changes or improvements in WA’s costing process or methodology between the previous year and the NHCDC FY20/21. Since FY19/20 however, WA has formalised a suite of QA checks that HSPs are required to undertake (at a minimum) and sign-off with the HSP CFO prior to their data submission to DoHWA – that has streamlined the process and improved consistency of costing allocations.

4.7.2 Data flow and reconciliation

East Metropolitan Health Service – Royal Perth Hospital

The EMHS starting GL expenditure total was \$1,738,653,458 as per the Audited Financial Statements, adjustments relating to retail operations and recoupments were applied to arrive at an amount of \$1,708,162,351 transferred to the costing system for FY20/21. The initial expenditure attributed to RPH in the GL was \$818,256,560, after allowing for adjustments relating to recoupments, shared services and COVID-19 an amount of \$831,653,569 was transferred to the costing system for FY20/21.

The total costs submitted to the jurisdiction for RPH as per the line items (per IHACPA standards) was \$831,653,470. Adjustments made at the jurisdiction level for WIP, virtual patients, teaching and research, COVID-19 and unmatched costing records totalled \$79,717,722 and were excluded from the NHCDC submission.

The total costs submitted to IHACPA from the jurisdiction for RPH was \$751,935,746 including the adjustments listed above. For further details on the costs and activity submitted for RPH see Table 30.

Child and Adolescent Health Service – Perth Children’s Hospital

The total GL expenditure for the CAHS was \$833,058,580 as per the Audited Financial Statements. Adjustments relating to services to other health services and recoupments were applied to arrive at an amount of \$765,532,529 transferred to the costing system for FY20/21. The GL expenditure for PCH was \$590,816,725, after allowing for adjustments relating to shared services, community health and mental health, the amount transferred to the costing system for FY20/21 was \$524,595,023.

The total costs submitted to the jurisdiction for PCH as per the line items (per IHACPA standards) was \$524,594,999, with a minor variance of \$24 noted between the line items and product type tables. Adjustments made at the jurisdiction level for WIP, virtual patients, teaching and research and unmatched costing records totalled \$43,785,253 and were excluded from the jurisdictions NHCDC submission to IHACPA.

The total costs submitted to IHACPA from the jurisdiction for the PCH was \$480,809,745 including the adjustments listed above. For further details on the costs and activity submitted for the PCH see Table 31.

WA Country Health Service – Albany Hospital

Total expenditure, per the GL and consistent with the Audited Financial Statements, for WACHS was \$2,078,365,934. There were adjustments made relating to internal and external recoupments to arrive at an amount of \$2,064,442,822 that was transferred to the costing system for FY20/21. The GL expenditure for AH was \$146,978,495. The adjustments relating to recoupments, non-hospital products and exclusions were applied at the Health Service level, i.e. not be broken down to hospital level by WACHS.

The total costs submitted to the jurisdiction for AH, as part of the total WAHCS submission, per the line items (per IHACPA standards) was \$146,978,495. Adjustments made at the jurisdiction level for WIP, virtual patients, teaching and research and unmatched costing records totalled \$7,198,481 and these were excluded from the final NHCDC submission to IHACPA. The total costs submitted to IHACPA from the jurisdiction for AH was \$139,780,015, reflecting the adjustments listed above.

For further details on the costs and activity submitted for AH see Table 32.

Table 30: Reconciliation from General Ledger to NHCDC costed products – Western Australia (East Metropolitan Health Service)

HSP level data (EMHS)	Value
HSP General Ledger (EMHS)	
Transferred to costing system	\$1,708,162,351
Post allocation amounts	\$1,708,162,351
Adjustments	(\$452,610,063)
Line items as per standards	\$1,255,552,288
Costs submitted to jurisdiction	\$1,255,552,288
Hospital level data (RPH)	Value
GL transferred to costing system	\$818,256,560
Adjustments	\$13,397,009
Post allocation amounts	\$831,653,569
Line items as per standards	\$831,653,569
Costs submitted to jurisdiction	\$831,653,470
RPH activity	Value
Data loaded to the costing system for costing purposes	
Activity data	654,514
Feeder data	1,725,570
NHCDC product output activity - post linking and loading	654,496
Final submission to jurisdiction - activity by product	654,496
Final submission to jurisdiction - activity and cost by product	654,496
RPH submitted to jurisdiction	Value
Summary submission to jurisdiction	
Activity submitted to jurisdiction	390,683
Costs submitted to jurisdiction	\$524,594,999
RPH costs and activity submitted to IHACPA	Value
Final submission to jurisdiction for IHACPA - cost and activity by product	
Activity	654,496
Costs	\$831,653,470
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(179,294)
Cost totals	(\$79,717,723)
Final jurisdictional data for cost weight production	
Finalised activity	475,202
Finalised cost	\$751,935,746

Source: Jurisdictional consultations and templates

Table 31: Reconciliation from General Ledger to NHCDC costed products – Western Australia (Child and Adolescent Health Service)

HSP level data (CAHS)	Value
HSP General Ledger (CAHS)	
GL transferred to costing system	\$833,058,580
Adjustments	(\$67,526,951)
Post allocation amounts	\$765,532,529
Line items as per standards	\$765,532,529
Costs submitted to jurisdiction	\$765,532,529
Hospital level data (PCH)	Value
GL transferred to costing system	\$590,816,725
Adjustments	(\$66,221,792)
Post allocation amounts	\$524,595,023
Line items as per standards	\$524,595,023
Costs submitted to jurisdiction	\$524,594,999
PCH activity	Value
Data loaded to the costing system for costing purposes	
Activity data	413,813
Feeder data	656,215
NHCDC product output activity - post linking and loading	390,683
Final submission to jurisdiction - activity by product	390,683
Final submission to jurisdiction - activity and cost by product	390,683
PCH submitted to jurisdiction	Value
Summary submission to jurisdiction	
Activity submitted to jurisdiction	390,683
Costs submitted to jurisdiction	\$524,594,999
PCH costs and activity submitted to IHACPA	Value
Final submission to jurisdiction for IHACPA - cost and activity by product	
Activity	390,683
Costs	\$524,594,999
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(64,032)
Cost totals	(\$43,785,254)
Final jurisdictional data for cost weight production	
Finalised activity	326,651
Finalised cost	\$480,809,745

Source: Jurisdictional consultations and templates

Table 32: Reconciliation from General Ledger to NHCDC costed products – Western Australia (WA Country Health Service)

HSP level data (WACHS)	Value
HSP General Ledger (WACHS)	
GL transferred to costing system	\$2,078,365,934
Adjustments	(\$13,923,113)
Post allocation amounts	\$2,064,442,822
Line items as per standards	\$2,064,442,822
Costs submitted to jurisdiction	\$2,064,442,822
Hospital level data (AH)	Value
GL transferred to costing system	\$147,260,309
Adjustments	(\$281,814)
Post allocation amounts	\$146,978,495
Line items as per standards	\$146,978,495
Costs submitted to jurisdiction	\$146,978,495
AH activity	Value
Data loaded to the costing system for costing purposes	
Activity data	139,969
Feeder data	136,286
NHCDC product output activity - post linking and loading	123,916
Final submission to jurisdiction - activity by product	123,916
Final submission to jurisdiction - activity and cost by product	123,916
AH submitted to jurisdiction	Value
Summary submission to jurisdiction	
Activity submitted to jurisdiction	123,916
Costs submitted to jurisdiction	\$146,978,495
AH costs and activity submitted to IHACPA	Value
Final submission to jurisdiction for IHACPA - cost and activity by product	
Activity	123,916
Costs	\$146,978,495
Adjustments to jurisdictional submission prior to finalisation of jurisdictional data	
Activity totals	(1,780)
Cost totals	(\$7,198,480)
Final jurisdictional data for cost weight production	
Finalised activity	122,316
Finalised cost	\$139,780,015

Source: Jurisdictional consultations and templates

4.7.3 Sample patient data

IHACPA selected a sample of five patients from each site (RPH, PCH and AH) for the purposes of testing the data flow from jurisdictions to IHACPA at patient level.

The jurisdiction provided the patient level costs for all five patients from each site and these reconciled with IHACPA records. Further information relating to the sample records is available in Table 33.

Table 33: Western Australia five patient sample reconciliation outcome

Jurisdiction	Site	Stream	Jurisdiction records	Received by IHACPA	Variance
Western Australia	Royal Perth Hospital	Acute	\$518.43	\$518.43	\$0.00
		Sub-Acute	\$11,170.89	\$11,170.89	\$0.00
		ED	\$1,032.13	\$1,032.13	\$0.00
		Non-Admitted	\$19.81	\$19.81	\$0.00
		Mental Health	\$188,493.07	\$188,493.07	\$0.00
Western Australia	Perth Children's Hospital	Acute	\$1,005,942.55	\$1,005,942.55	\$0.00
		Sub-Acute	\$4,179.30	\$4,179.30	\$0.00
		ED	\$388.89	\$388.89	\$0.00
		Non-Admitted	\$1,408.70	\$1,408.70	\$0.00
		Mental Health	\$402.08	\$402.08	\$0.00
Western Australia	Albany Hospital	Acute	\$750.17	\$750.17	\$0.00
		Sub-Acute	\$263,020.45	\$263,020.45	\$0.00
		ED	\$1,744.50	\$1,744.50	\$0.00
		Non-Admitted	\$16.24	\$16.24	\$0.00
		Mental Health	\$9,384.83	\$9,384.83	\$0.00

Source: Jurisdictional consultations and templates

4.7.4 Governance arrangements

QA processes are conducted on a monthly and yearly basis, to monitor for missing, incomplete or inaccurate data and also highlight potential areas for further analysis (e.g. large variances to average length of stay or cost anomalies). At present, there are no automated processes or data algorithms available to validate and QA check the data.

The CFO of each of the HSPs signs off the data prior to submission to DoHWA, whereupon the Director General of DoHWA reviews and signs off on the final data submission to IHACPA. Table 34 summarises the QA checks performed by DoHWA and the HSPs.

Table 34: Summary of quality assurance (QA) checks performed – Western Australia

QA Test	DoHWA	Royal Perth Hospital	Perth Children's Hospital	Albany Hospital
Source data and systems				
Reconciliation back to GL and audited statements	Annual reconciliation and checks	Annual reconciliation	Annual reconciliation	Annual reconciliation
Reconciliation of activity data back to source systems	N/A	Conducted by Health Support Services (HSS)	Conducted by HSS	Conducted by HSS
Costing data – validation				
Trend analysis to prior periods across cost products	Yes, annually	RPH have internal processes in place to review data in PPM2, then matched to activity. Data validation occurs at the time feeder system data is loaded into PPM. A spreadsheet is maintained, and the values are verified as being loaded and linked. Feeder system files are also validated monthly to ensure consistency of data loaded into PPM	Data validation occurs at the time feeder system data is loaded into PPM. A spreadsheet is maintained, and the values are verified as being loaded and linked. Feeder system files are also validated monthly to ensure consistency of data loaded into PPM. However, given that EMHS was only engaged to complete CAHS costing for FY20/21 towards the end of the year, the data load, linking and activity reconciliation was completed by CAHS who were unable to provide any documentation.	AH has internal processes in place to review data in PPM2, then matched to activity. This is similar to metropolitan HSPs but nuanced for the country health service data.
Reasonableness test of excluded data and outliers	Yes, annually			
Analysis of outliers at the cost, LOS or cost bucket level	Yes, annually			
Reasonableness of direct vs overhead allocations	Yes, annually			
Specific business rule tests	Yes			
Costing data – governance				
Regular updates with costing staff	Business User Group (BUG) and WA Clinical Costing Standards Group meet monthly. BUG includes technical support (Health Services Support) to discuss PPM usage, new features, upgrades, technical issues, improvements to HSS staging and extraction processes; Clinical Costing Standards Group explores continuous improvement, information sharing and learnings, and QA processes.			

QA Test	DoHWA	Royal Perth Hospital	Perth Children's Hospital	Albany Hospital
Local guidelines supporting the AHPCS standards framework	Yes	Yes	Yes	Yes
Review of cost allocations	N/A	Annual	Annual	Annual
Review on reasonableness of costing data output	Multiple reviews undertaken, with any issues reported back to HSPs	Multiple reviews undertaken prior to sign-off	Multiple reviews undertaken prior to sign-off	Multiple reviews undertaken prior to sign-off
Formal sign-off	Director-General	Chief Financial Officer	Chief Financial Officer	Chief Financial Officer

Source: Jurisdictional consultations and data quality statements

4.7.5 Business requirements

WHS and hospitals do not distribute the final IHACPA reports and NHCDC data to the broader clinical workforce; however, many HSPs are using internal costing and PowerBI reports to engage with business managers within and across their hospital network. The NHCDC data is made available to health services and is used for a variety of ad hoc projects, costing requests and health economic modelling for funding calculations. However, WHS acknowledge the opportunity to educate and engage more clinicians and hospital executives where capacity exists, to increase its use as an input to decision making and benchmarking exercises within and across HSPs and hospitals.

4.7.6 Implications of COVID-19

The implications of COVID-19 on the data submitted for WA in the FY20/21 IFR are different to those experienced in the other states and territories. This is principally due to the approach to border closures in place during FY20/21 and the very limited number of cases identified in WA during that period. WA costed the whole reference year for FY20/21, following the 8/4 month split applied in FY19/20. It is expected that the impact on activity and costing due to COVID-19 will become more apparent in the FY21/22 IFR (from March 2022). While there were minimal impacts to clinical care costing in FY20/21, there were signs of incremental increases in costs for PPE and cleaning. The border closures (both in WA and other states) and vaccine mandates also caused workforce issues due to limitations on the accessibility of doctors or specialists from other states.

4.7.7 Key learnings and future improvements

Whilst many HSPs have developed PowerBI dashboards to improve visualisation of costing data and improved access to these reports through common webpages (e.g. PULSE portal data for EMHS), the audience is usually limited to business managers and business analysts. Like many other jurisdictions, WHS acknowledges the opportunity to improve costing literacy across WA, at both the hospital and LHN level. DoHWA is currently looking at how it can support HSPs with their data visualisation, analysis and education activities to maximise their impact and effectiveness. WHS is planning to increase the unity of activity, clinical and financial forecasting across the WA health system and increase the use of clinical costing data in decision-making processes.

For future submissions, DoHWA are looking to cost blood products and improve non-admitted activities for submission to the IHACPA process. At present, non-admitted activities are excluded from the IHACPA submission, however there are many instances of outpatient activity that is a non-attendance or non-client event. Costs are incurred at these events and their continued exclusion therefore understates overall cost estimates.

4.7.8 Conclusion

WA continues to make best efforts to adhere to AHPCS version 4.1 and is compliant with exception to blood products and TTR. WA's approach to TTR is currently calculated using an established local methodology. The costs are assigned at a patient level but withheld from the annual submission to IHACPA.

WA reported their costing submission was prepared in accordance with the AHPCS version 4.1 for FY20/21. Based on the methodology outlined above, RPH, PCH and AH have suitable reconciliation processes in place and the financial and activity data is considered fit for NHCDC submission.

5 IHACPA Review

5.1 IHACPA process for the NHCDC

IHACPA's Three Year Data Plan below outlines for each round of the NHCDC the respective timeframes associated with the submission of data through the portal, validation of data, QA of submitted data and the finalisation of the costing database for the publication of national cost weights by 31 May each year.

Table 35: NHCDC submission timeline

No	Data reporting period	Data request sent	Submission date	IHACPA review date	Resubmission date (if required)
23	2018-19	31 Jul 19	28 Feb 20	31 Mar 20	30 Apr 20
24	2019-20	31 Jul 20	1 Mar 21	31 Mar 21	30 Apr 21
25	2020-21	30 Jul 21	28 Feb 22	14 Mar 22	25 Mar 22

Source: IHACPA's Three Year Data Plan 2019-20 to 2021-22

IHACPA oversees the entire NHCDC process with continuous involvement of jurisdictional and hospital costing staff as represented through the NHCDC Advisory Committee (NAC). During the NHCDC study period, IHACPA staff hold internal meetings to discuss the progress of the NHCDC.

IHACPA's process can be separated into various phases, with several tasks performed during each phase. Throughout the NHCDC process, IHACPA communicates with jurisdictions to keep them informed of the progress of their submission.

Each phase of the process described below applies to all data submitted by jurisdictions at either the hospital, network or jurisdictional level.

Data collection process

For FY20/21, the data portal was available from the 4 January 2022, allowing for multiple submissions and resubmissions prior to the final submission date. Re-submissions occur after the various cross-validation and linking check outputs are validated by the jurisdictions and any errors are rectified in the source data. The validation checks are based on the Data Request Specifications (DRS) that are released in the prior year (25 July 2021 for FY20/21) for the upcoming data collection period. The DRS is presented to the jurisdictions via the NAC for commentary before publishing, allowing approximately six months to prepare the data from specification to submission.

Two files are submitted by the jurisdiction: the CostA (activity) and CostC (cost) files.

Transformation of costing data

Once jurisdictions confirm that their submitted data is absent of critical errors and they are satisfied with the validation reports, the Extract, Transform and Load (ETL) process is conducted by IHACPA's Data Acquisition (DA) team.

The ETL process for FY20/21 was similar to FY19/20. There were no changes to the steps required or methodology to process data. The first step in the process is to link and validate the CostA and CostC files directly at the cost bucket level. The second step is to link the CostA file according to the ABF data source and episode number aligned with establishment IDs and prepare the whole patient record, including cost profiles at cost bucket level. After this linking, the team investigate the unqualified baby cost (UQB) allocation and link all the UQB to their

mother, where the costs should belong. If there are no linked UQBs, these costs are removed. The UQB adjustment combines the costs of a UQB separation to a mother separation. This is not an additional cost, but a movement of costs between patients.

All errors are normally fed back to jurisdictions with a reconciliation table to track movements between CostA and CostC linking, in preparation of final data tables for QA. The DA team provides stream level jurisdictional data and various reports to the Costing and Analytics team to commence the QA process. At this stage, the mental health data is also analysed with consolidation of episode and phase-level data and finally, group patients according to care type.

Quality assurance reports

The first check performed by the analytics team is to define variables including current classification versions for each stream and checks to ensure there are no duplicates in the data before combining all streams into a jurisdictional dataset at a stream and product level. The same process is run for previous years' data using the current year classification version of the DRG to allow for like-to-like comparison.

For Mental Health data, there are three types of files: admitted, episode and phase level. Like the other streams, checks are performed to ensure no duplicates exist within the three data sets. If duplicates are found, jurisdictions are requested to fix the errors and re-submit their data if required. Any resubmitted data will progress again through validations, ETL process and QA reporting as described.

The next step is to ensure the stream level files were captured accurately from the source data while noting any exclusions, for example the removal of UQB records. Outlier WIP episodes are also marked and jurisdictions advised which transactions are going to be removed going forward. The final QA workbook contains numerous tabs with tables and graphs (including in- and out-of-scope records) analysing data for current year verses previous years, with year-on-year growth of more than 25 per cent highlighted for jurisdictional review. The tables are conditionally formatted to quickly highlight results that diverge from the accepted tolerances.

These reports are provided to jurisdictions within two weeks of their completed submission; however, in the event of data changes leading to a resubmission, the team rerun those QA reports.

Final submission and output

Final sign-off within IHACPA involves confirmation from jurisdictional representatives prior to the creation of the national database and cost weight tables. The IHACPA costing team prepare a minute to the Executive Director of Data and Infrastructure Branch with a detailed QA checklist that reconciles back to the ETL reports for approval, this is then signed off by the IHACPA Chief Executive Officer for release to jurisdictions.

5.2 Improvements

Improvements since FY19/20

Although there were no major changes to the data submission process, the following improvements for FY20/21 were identified:

- IHACPA released the National Benchmarking Portal, that contained costing data for the three rounds up to FY19/20.

- The creation of new cost buckets associated with COVID-19 costs; these costs were captured separately through the latest cost matrix and needed to be incorporated with the whole submission.
- Continued improvements in the QA reports, such as highlighting trends with prior year, to allow jurisdictions to make changes during the submission process if required.

Future improvements in development for FY21/22

The following improvements for the FY21/22 IFR and beyond were identified:

- The ETL process will only collect the CostC file, as CostA information is already collected from the activity data submission. This simplification will improve the runtime and performance of running the ETL process and will provide a simplified reconciliation report.
- IHACPA are still working towards automating QA reports that are available at the time of submission, enabling jurisdictions to receive the validated QA report immediately to conduct reviews. This improvement will speed up the whole submission process for both parties. While this was close to being implemented for Rounds 25 and 26, an efficient working data portal continues to be a goal for IHACPA team.

Appendix A. Acronym/Abbreviation

Acronym	Description
ABF	Activity Based Funding
ACT	Australian Capital Territory
ACTHD	ACT Health Directorate
AH	Albany Hospital
AHPCS	Australian Hospital Patient Costing Standards
ASH	Alice Springs Hospital
BHS	Ballarat Health Service
CAHS	Central Australia Health Service
CAHS	Child and Adolescent Health Service
CALHN	Central Adelaide Local Health Network
CFOs	Chief Financial Officers
CH	Canberra Hospital
CHS	Canberra Health Service
CQHHS	Central Queensland Hospital and Health Service
DH	Victorian Department of Health
DHW	SA Department of Health and Wellbeing
DOH	Tasmanian Health Department
DQS	Data Quality Statement
DRGs	Diagnosis Related Groups
DRS	Data Request Specifications
DSS	Decision Support System
ED	Emergency department
EMHS	East Metropolitan Health Services
EMR	Electronic Medical Record
ETL	Extract, Transform and Load
FUNLHN	Flinders and Upper North Local Health Network
HFMA	Health Finance Management Association
HHS	Hospital and Health Services
HSs	Health Services
IFR	Independent Financial Review
IHACPA	Independent Health and Aged Care Pricing Authority
KDU	Kidney Dialysis Unit
LHN	Local Health Network
LMH	Lyell McEwin Hospital
LOS	Length of Stay
LRH	Latrobe Regional Hospital
MH	Modbury Hospital
MHHS	Mackay Health Service
MS	Medical Supplies
MSHHS	Metro South Hospital and Health Service

NAC	NHCDC Advisory Committee
NALHN	Northern Adelaide Local Health Network
NEP	National Efficient Price
NHCDC	National Hospital Cost Data Collection
NHRA	National Health Reform Agreement
NPCR	National Partnership on COVID-19 Response
NSW	New South Wales
NT	Northern Territory
ODBC	Open Database Connectivity
PAH	Port Augusta Hospital
PAS	Patient Administration Systems
PBS	Pharmaceutical Benefits Schedule
PCH	Perth Children's Hospital
PHE	Public Hospital Establishment
PMCC	Peter McCallum Cancer Centre
PPM	Power Performance Manager
QA	Quality Assurance
RHH	Royal Hobart Hospital
RMH	Royal Melbourne Hospital
RPH	Royal Perth Hospital
RSS	Rural Support Services
SA	South Australia
SPF	Special Purpose Fund
SPR	System Performance Reporting tool
SQL	Structured Query Language
TEHS	Top End Health Service
THS	Tasmanian Health Service
TTR	Teaching, Training and Research
UQB	Unqualified Baby
VCDC	Victorian Cost Data Collection
WA	Western Australia
WA Health	Western Australian Health Service
WACHS	WA Country Health Service
WIP	Work in Progress

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