# Strategic Review of the National Hospital Cost Data Collection

*Independent Hospital Pricing Authority*

*Final Report*

*July 2013*

# Contents

# Executive summary

## The strategic review

The NHCDC Strategic Review has been commissioned by the Independent Hospital Pricing Authority (IHPA) to assess the Collection's suitability as the primary data collection to determine the NEP, seek the views of stakeholders regarding issues with the current Collection and its future directions, and recommend a roadmap for the future.

This Review involved national consultation with 148 stakeholders, to examine positive and negative aspects of the Collection through interview and submission. A framework was used to analyse the Collection's purpose, inputs, outputs and outcomes in order to determine its fitness for purpose for strategic intent, efficiency and effectiveness.

## An evolving data collection

The National Hospital Cost Data Collection ('NHCDC' or 'the Collection') is a valuable tool for use across the Australian health system. Having operated since the early 1990s, the Collection's role in collating the vast majority of health system costs at a 'product' level makes it a remarkable evidence base, unique in the world.

The NHCDC's primary early use was to collate information in order to determine cost weights and relativities among (mainly) acute hospital products. These elements were then used as inputs into a myriad of separate cost and funding models in both the public and private sectors and as a tool for hospital managers to compare cost efficiency.

With the implementation of national health reform, beginning with the National Partnership Agreement on Hospital and Health Workforce Reform in 2008, the Collection has operated in a markedly different context.

National health reforms sought to develop and apply consistent activity-based funding and costing approaches and led to the establishment of new agencies to take responsibility for data and performance reporting. In late 2011 IHPA was established and the NHCDC was reassigned under IHPA's mandate.

These reforms and the overall change of context provide an important opportunity to examine the Collection's current use and operation.

While this review will present a number of key findings and recommendations it is important to note the success of the NHCDC over its journey, specifically:

- It is a robust cost data collection that has been used successfully both domestically and internationally
- It is guided by a set of standards and review processes which enable the cost data to be used for benchmarking nationally and provide a degree of confidence to enable policy makers to source it for price setting
- It is an example of how hospitals both public and private, Commonwealth, States and Territory jurisdictions and now IHPA can work cohesively. Of particular note is the effort that has been

required to conduct three rounds of the Collection within 16 months to assist with the ABF reforms.

## Key findings and recommendations

While the Collection is clearly valued by stakeholders, and collects important and useful data, there are opportunities for improving the governance of the Collection and the various data processes at all organisational levels (hospital, jurisdiction and IHPA), and with transparency and methodology for data collection.

Communication regarding specific technical issues, processes and outputs is perceived lacking by stakeholders, who also have questions regarding the governance of the Collection. There does not appear to be a clearly articulated contemporary purpose or publically available information about the Collection's use, efficacy and processes.

The Strategic Review finds that through stronger governance and compliance frameworks, better communication and transparency, an agreed understanding of the key purpose of the Collection, greater industry involvement and specific improvements in methodology, the NHCDC will provide a robust evidence base regarding the cost of care delivery in Australia's health system.

There are twenty four findings and twenty recommendations contained within this review. The recommendations are summarised below.

### Governance, communication and transparency

Key improvements are needed at the broadest level to clarify and agree on the purpose of the Collection today (pricing and/or benchmarking), and a clear, effective and representative governance structure. This governance also applies to the Collection itself and how data is managed and owned.

Confidence in the data and its use are affected by perceived problems in communications and transparency. There is not a communication plan to engage and inform both stakeholders and the public, and stakeholders question the transparency of the costing methodology.

| | |
|---|---|
| 1 | The NHCDC's strategic purpose and role in pricing and benchmarking should be formally defined and communicated by IHPA. |
| 2 | The governance of the NHCDC should rest with IHPA under a reconstituted NHCDC Advisory Committee that reports through IHPA Executives to the Pricing Authority. Representation should include jurisdictions and specific industry and skills-based appointments |
| 3 | IHPA should develop a data governance framework, using best practice principles to more clearly define its custodianship of data. |
| 4 | IHPA should design and implement a communications plan to address stakeholders questions regarding methodology and outputs of the Collection linked to the annual cycle of the NHCDC process in collaboration with the NHCDC Advisory Committee and the JAC. |

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|---|---|
| **5** | The NHCDC Advisory Committee should review the costing quality framework for appropriateness, develop associated compliance mechanisms and distribute both components for industry consultation and adoption. |
| **6** | The NHCDC advisory committee and the JAC should provide advice to the Pricing Authority, through the IHPA CEO, on what public reporting will best meet the needs of all users of the NHCDC. |

### *Standards and compliance*

The current methodology for data collections needs improvement to reduce duplication of data, to reduce the burden of data submission, to ensure high participation through adding value (by costing intermediate products), and to ensure sufficient participation for accurate benchmarking.

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| **7** | IHPA should, through the NHCDC Advisory Committee, identify all necessary cost, demographic and activity data elements and compare these against other established data sets to develop a workplan toward single submission, multiple use. |
| **8** | IHPA should confirm to all jurisdictions that cost data supplied at the cost area and item level should be maintained and Date of Service is no longer necessary for IHPA purposes. |
| **9** | The NHCDC advisory committee should evaluate the appropriateness of using intermediate product costs in identifying clinical variation, and provide advice to the Pricing Authority through the IHPA CEO. |
| **10** | IHPA should use compliance mechanisms with system managers to ensure that adequate samples of high-quality data from each jurisdiction and population groups are included in the annual NHCDC cost collection. |

Questions related to standards and compliance affect confidence in the Collection. The standards used in the Collection, the Australian Hospital Patient Costing Standards (AHPCS), are seen as lacking wide industry input and a compliance mechanism. However, a better understanding of them supported by documentation and training would go some way to improving their acceptability and the capability of a limited hospital costing workforce in Australia.

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| **11** | IHPA and the NHCDC Advisory Committee should develop processes for industry involvement in standards development and quality and compliance frameworks as per Recommendation 5. |
| **12** | The NHCDC Advisory Committee should review the AHPCS Version 3 and recommend them to the Pricing Authority through the IHPA CEO. |
| **13** | The NHCDC Advisory Committee should develop guidance, consistent with other recommendations in this review, to enhance nationally consistent skills and knowledge on costing methodology. |
| **14** | IHPA should conduct cost studies to analyse the efficacy of the various methods of cost allocation which could then inform a cost allocation quality compliance framework. |

### *Refine timelines and private sector participation*

Other findings and recommendations relate to timelines (revised to enable the earlier release of costing data) and private sector participation in the Collection (which should be encouraged).

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| **15** | IHPA should revise the process timeline to enable a later submission date (28 February) and earlier release of costing data (separate from NEP release). |
| **16** | IHPA should continue to work collaboratively with the private sector to promote participation in the Private Sector NHCDC. |
| **17** | The NHCDC Advisory Committee should include private sector representation and consider whether a separate private sector working group should continue. |
| **18** | IHPA should address private sector concerns about the relevance of the AHPCS: that they were written for the public sector and lack clarity around key areas of concern to the private sector (for example, treatment of corporate costs and the different treatment of taxes between a not-for-profit and for-profit hospital) |
| **19** | IHPA should work with the overnight and stand-alone day facilities to ensure minimum participation levels are reached for future rounds. |
| **20** | IHPA should work together with the private sector to develop an acceptable format for the published data set for future years, and recommend this to the Pricing Authority through the IHPA CEO. |

## *An improvement workplan*

An improvement workplan has been developed from the groupings of the recommendations above.

The bulk of activities could be established and in large part completed within a twelve to eighteen month period see timeline on following page and on page 45.

The priority strategic recommendations are:

- establishment of the NHCDC Advisory Committee (2)
- review and consult on a costing quality framework (5) (11); and
- development of a single submission, multiple use data plan (7).

The workplan below is an indicative view of the prioritised implementation order in order to address the findings of this review.

| Recommendation | 2013 | 2014 | 2015 |
|---|---|---|---|
| ***Governance, communication and transparency*** | | | |
| **1** Clarify purpose | | | |
| **2, 3** Reestablish govenance | | | |
| **4, 6** Design communications plan including public reporting | | | |
| **5** Establish Costing Quality Framework | | | |
| ***Standards and Compliance*** | | | |
| **7, 8** Develop a single submission, multiple use data plan | | | |
| **9** Investigate intermediate product costing | | | |
| **10** Encourage high participation for benchmarking purposes and refine sampling for | | | |
| **11, 12** Review and reissue AHPCS standards | | | |
| **13** Produce additional guidance on costing methodology | | | |
| **14** Conduct cost studies | | | |
| **Timeline and Private Sector** | | | |
| **15** Revise timeline to submit and release of costing data. | | | |
| **16 -** Address private sector collection governance, participation and reporting. | | | |

# 1 Introduction

PwC was engaged by the Independent Hospital Pricing Authority (IHPA) to undertake a strategic review of the National Hospital Cost Data Collection ('NHCDC' or 'the Collection'). The review covers the full spectrum of the Collection from its objective, data inputs and processes to the outcomes of the Collection, including an assessment of its suitability as the primary data collection to determine the National Efficient Price (NEP).

## 1.1 Scope

The NHCDC Strategic Review aims to assess the Collection's suitability as the primary data collection to determine the NEP, seek the views of stakeholders regarding issues with the current Collection and its future directions, and recommend a roadmap for the future.

A number of specific questions to be addressed were identified within the review's Request for Tender (RFT) (See Appendix D). These questions covered eight specific areas:

- Purpose and Objectives
- Governance
- NHCDC Inputs
- Sample of Hospitals
- Reporting
- Technical requirements
- Quality of data
- Current Barriers.

The RFT stated that since the introduction of Activity Based Funding (ABF), there has been much debate from a range of stakeholders regarding the suitability and practicalities of the NHCDC including concerns about governance, the sample of hospitals, data collection processes and quality assurance. This Strategic Review was commissioned to adequately capture these views and concerns and to design a three-year road map to address them.

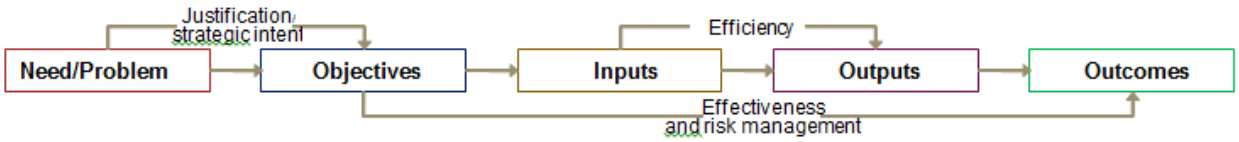
## 1.2 Approach

The review's findings and recommendations are based on a wide-scale national consultation that has informed the design of the roadmap for the future development of the NHCDC.

### Framework for the review

A program logic framework, as seen in Figure 1 below, was developed to give structure to the questions used in the consultations and to ensure its completeness. The questions outlined in the RFT were used as the starting point to address the objectives, governance, inputs and processes, outputs, and outcomes of the NHCDC.

Figure 1: Program logic framework for research questions




A stakeholder list was developed which included representatives from the IHPA; executives from each jurisdiction; Jurisdictional Advisory Committee (JAC) members; NHCDC Technical Working Group members; Local Hospital Networks (LHNs and other related health services); private sector providers; and other stakeholders such as the Australian Institute for Health and Welfare, classification developers and costing software vendors. The stakeholders identified were agreed upon both at the commencement and throughout the course of the engagement with the IHPA. The final stakeholder list is included in Appendix B.

## Consultation tools

Tools were developed to assist conducting the consultations including:

- A master list of stakeholders to track communications, scheduling, attendees and completion status
- Current state process maps of the NHCDC process, used in consultations to identify variations in processes (see Appendix C)
- An interview guide developed using the above framework (Figure 1) including 38 questions across the five themes of Purpose, Governance, Inputs and Process, Outputs and Outcomes. Each question was designated as either a strategic or technical question and the guide was used to direct the conversation in each consultation suitable to the stakeholder being consulted. An example of the consultation guide has been included in Appendix E
- A documentation tool developed to facilitate the real-time capture of consultation notes and consolidation of responses across stakeholders by question.

## Consultations

A total of 148 stakeholders participated in consultations nationally between 7 March and 30 April 2013. The majority of these were held in face-to-face meetings.

At least two PwC members were present at every consultation with notes captured concurrently with the conducted interview.

The current state process maps were used in the consultations to validate our understanding of the existing process. The notes from each consultation were reviewed by the PwC members who participated in that meeting, prior to being aggregated, to ensure an accurate reflection of the discussions.

Submissions and additional reference materials are listed in Appendix F.

# 2 Strategic purpose

The key strategic questions for the IHPA and the broader health sector are:

- Why does the Collection exist?
- Is this purpose appropriate given recent health reforms?

This section seeks to answer these questions.

## 2.1 Historical context

The historical context of the NHCDC is not straightforward. This review found that a majority of stakeholders were unaware of the history of the NHCDC, its reason for establishment and how it developed its processes and standards.

Some stakeholders attributed current issues with the NHCDC with the IHPA. Given IHPA now has the NHCDC within its remit, IHPA has acquired the Collection's historical issues and the changed role of the NHCDC within the Australian health funding system.

Several of the review's consultations highlighted the extensive efforts applied to hospital casemix development in the mid-1990s. Now that the Collection is in its seventeenth year and operating within a markedly changed health environment, some felt that this history provided an important context for the NHCDC.

The NHCDC was initiated in 1995 and, for the majority of its existence, was conducted by the Commonwealth Department of Health and Ageing (DoHA). Its primary purpose was to collate costs and activity volumes to determine cost relativities for various hospital products, mainly within the Diagnosis Related Groups (DRGs) produced by acute hospital services. It also contributed to the refinement of the DRG classifications.

The original Round 1 NHCDC Reference Manualo[1] provides the historical context for the first expected uses of the Collection, including:

- **Determining payment systems for hospitals** – to contribute to computing up-to-date averages of DRG costs for use by purchasing agencies (such as state health authorities and private insurers) in setting reasonable funding and payment rates
- **Allocating resources within the hospital** – to provide each hospital with information relevant to its own internal resource allocation processes (including the setting of departmental and clinical budgets)
- **Identifying problems in the use of resources** – to help each hospital find and resolve its own cost problems (for example, by comparison against peer group averages).

1 Round 1 Reference manual – September 1997

A summary of other related information from the original NHCDC Manual findings and how they relate to current key strategic issues are provided in Appendix G.

In December 2008, the Council of Australian Governments (COAG) signed the National Partnership Agreement (NPA) on Hospital and Health Workforce Reform. The agreement established efforts to implement nationally consistent approaches to Activity Based Funding (ABF) and provided $133.4m in transition funding to support all jurisdictions. The implementation of this agreement was to occur through four stages, broadly made up of:

- Classification and costing of acute inpatient services
- Costing for small and regional hospitals; and funding models for teaching, training and research
- Classification and costing for emergency, sub-acute, outpatient and hospital-auspiced community health services
- Funding methodology, price setting, and transition for all products.

In August 2011, following these and other significant health reforms, COAG agreed to the establishment of new bodies, in particular the IHPA and National Health Performance Authority (NHPA). In addition, the agreement established reform to health service funding through a National Efficient Price (NEP) and linkages to defined activity and governance arrangements.

Prior to the new bodies being established, DoHA facilitated the transition through the 'Transition Office' which delivered early components of the planned reforms. Within this period, the NHCDC was the beneficiary of an improved focus on casemix processes as well as, significantly, the national harmonisation of classification and costing methodology.

The findings below represent current views on the purpose of the Collection following this time of rapid change and cross-agency and cross-jurisdictional planning.

## 2.2 Finding S1 – The Collection is valued

**The NHCDC is a rich and valued source of information on the costs of hospital products.**

While noting the Collection's changed role and application, the review's consultations noted the strong appreciation for the Collection and its value to the health system. An overwhelming majority of stakeholders felt that the Collection, given its history and recent context, provided a robust evidence base of hospital product costs; and that there is a strong commitment to improving the NHCDC as the definitive source of costing data in the Australian health system.

A number of limitations in this area were also identified and are described in more detail in Sections 5 and 6.

## 2.3 Finding S2 – No contemporary purpose is documented

**There is no evidence of defined uses or an agreed purpose for the NHCDC that meets the change in requirements within reform arrangements.**

The introduction of health reforms has placed increased scrutiny on hospital costings and the NHCDC processes. Most consultations highlighted the positive improvements to the Collection in recent times. However, a majority also noted that the current role of the Collection as the primary input to calculate of the NEP means there are now 'consequences' to hospital's revenue from the Collection that were not previously within its remit.

No evidence was available as to the defined use or a consistent or agreed purpose for the NHCDC. Consultations described two distinct functions that were seen as comprising the Collection's purpose:

**Pricing** – the NHCDC should be structured and conducted principally to collect product costs as an input for nationally efficient pricing.

**Benchmarking** – the NHCDC should be a trusted source of benchmark information that is generated as a by-product of contemporary health service management.

In seeking a definitive source for documenting the purpose of the NHCDC, reference was made to the NHRA. While it does not make direct reference to the NHCDC, it provides the closest definition of IHPA's critical function through clause B3.c.:

*"…specifying costing data, methods and standards to be used in studies of the costs of delivering public hospital services, and to collect such data from Local Hospital Networks, through the States, to enable it to calculate the national efficient price and loadings;"* [2]

Further, the National Health Reform Act (2011) directs the functions of IHPA:

*"to determine data requirements and data standards to apply in relation to data to be provided by States and Territories, including:*

1 *data and coding standards to support uniform provision of data*

2 *requirements and standards relating to patient demographic characteristics and other information relevant to classifying, costing and paying for public hospital functions"* [3]

However, while these dual pricing and benchmarking purposes could be seen to be complementary and interrelated, they are not necessarily equivalent. The majority of stakeholders believe it is essential to have robust inputs in order to achieve a robust NEP because of its importance to revenue. Depending on what is seen as the primary purpose for the Collection (either pricing or benchmarking), a number of factors, such as the number of hospitals submitting data, the extent of data submitted and the outputs produced, can change (for example: a pricing purpose requires only one output, while benchmarking may require multiple).

ABF reforms have focused the use of NHCDC data on pricing in calculating the NEP. In recent years, the Collection has necessarily changed to ensure that the costs reported now go to supporting the inputs for the pricing model. The expansion of data fields and cost items, such as 'PharmPBS' and

2 National Health Reform Agreement, July 2011, p. 28

3 National Health Reform Act 2011 – S. 131

'PharmNon PBS', to identify those drugs that are PBS (Commonwealth) and non PBS (other source) funded, is one example of costing submissions now being used to determine funding sources (as Commonwealth funded items are removed from the NEP). In effect, the application of cost data for pricing is now seen as the primary purpose of the NHCDC with the use of cost data for benchmarking seen as secondary.

## 2.4 Finding S3 – The NHCDC is the best available national source of benchmark costs

**Among health services, a majority believe the NHCDC should be a key source of national cost benchmarks.**

Irrespective of the funding model, the NHCDC provides system and hospital managers the opportunity to benchmark costs for the purposes of comparing efficiency. A number of stakeholders in our consultations noted that hospitals should be investing and using their clinical costing data for hospital management purposes in the first instance, with the NHCDC seen as a by-product of the costing process.

As the only national collection that demonstrates a cost per patient product and the dataset with the most extensive range of hospital cost and activity, the NHCDC is the most comprehensive source of benchmark information.

While there was widespread agreement that there should be some form of national benchmark available from the NHCDC data, there was considerable uncertainty as to whether or not the IHPA should conduct the benchmarking service. There was a clear distinction in the views between most health services, who felt it was IHPA's role to provide national benchmarking on costs, and Departments of Health, who felt it was their role to do it. Some health departments believed IHPA should provide a central benchmarking reporting tool (eg available through a portal or internet access), while other health departments were adamant that they should receive the data to produce their own tools.

There was agreement across both public and private sectors that the production and publication of cost weights was important in terms of providing transparency and assisting benchmarking. Some of the items interviewees wanted to see included in national benchmarking datasets were cost by: cost bucket, length of stay, patient stay segmented by same day vs. overnight, separations by Major Diagnostic Category (MDC), Diagnosis related Group (DRG), Urgency Related Group (URG), cost vs. revenue and peer grouping reports across this range of segments.

**Recommendation 1: The NHCDC's strategic purpose and role in pricing and benchmarking should be formally defined and communicated by IHPA.**

The NHCDC's primary purpose is still as a comprehensive cost data collection, but this data should be available and used for multiple purposes by a range of entities. These uses should be defined through a requirements definition process and the associated data, costing and other standards be set by IHPA.

The primary purpose of the NHCDC should therefore be further refined using the following definition as a base:

The NHCDC exists as the national collection of the **total** costs of hospital production, including all operating expenditures of hospitals and those costs collected elsewhere that go to contributing to the services delivered to patients. Its primary use is to support IHPA's pricing role; and through its benchmarks to support jurisdictions and hospitals conduct their respective pricing and management roles.

The impact from this definition to the strategic questions itemised at the start of this section are discussed in later sections of the review.

# 3 Governance

As the purpose of the NHCDC has changed over time, so too have the governance arrangements. In particular the establishment of IHPA has led to significant changes and improvements to the Collections' governance structures and the processes for the Collection.

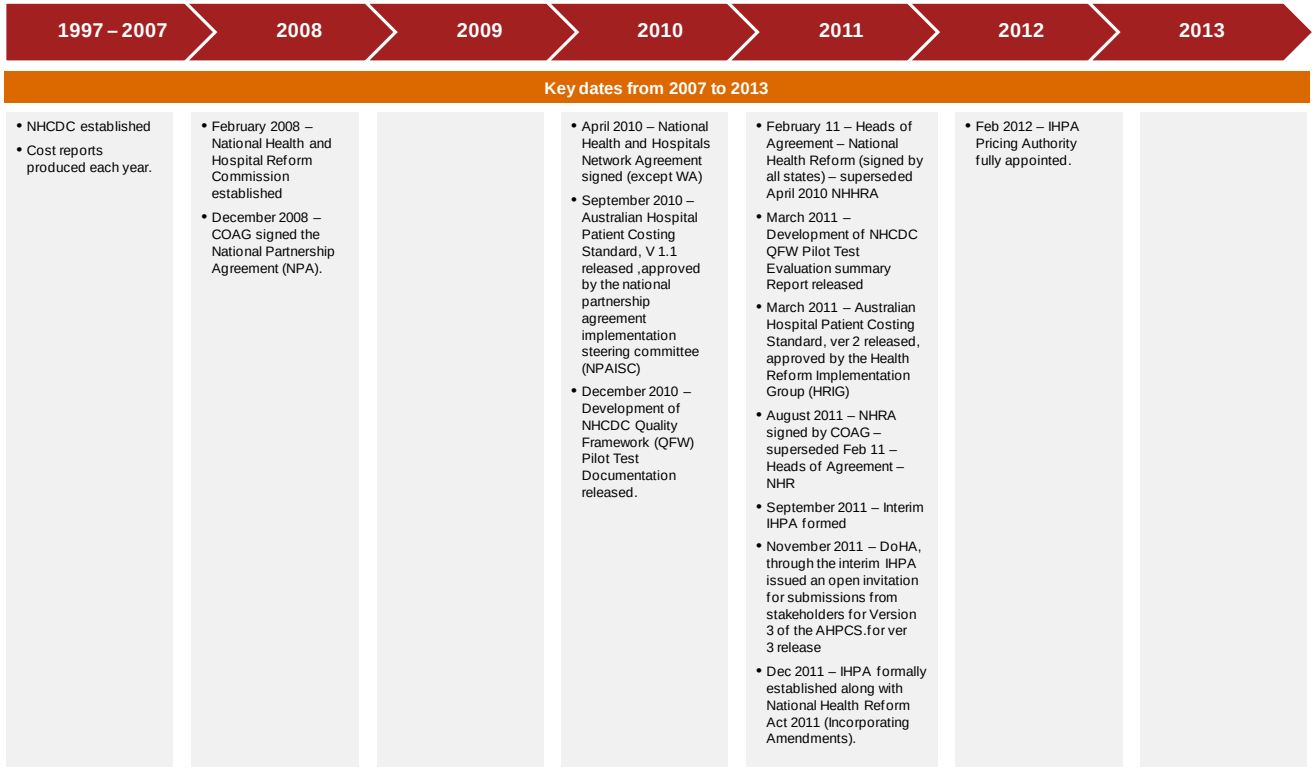
This section addresses a range of governance-related questions.

## 3.1 Context

### Committees and working group

The historical governance of the NHCDC has, until late 2009, been through DoHA and jurisdictional working and technical groups. As illustrated below, from 2008 a rapid succession of health reform initiatives began to influence the governance arrangements of hospital costing and ABF implementation.

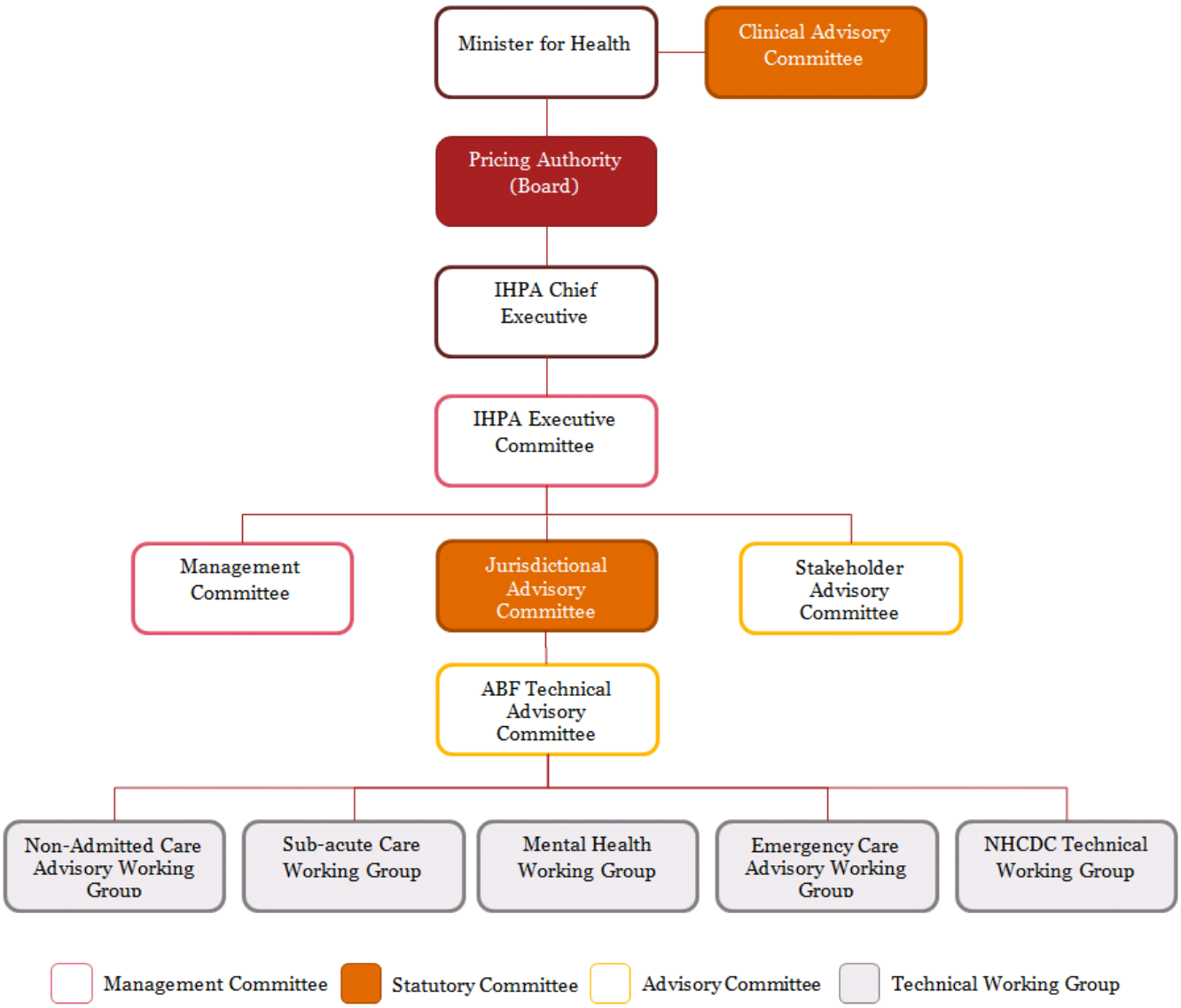
**Figure 2: NHCDC governance timeline - Key dates from 2007 to 2013**




The current governance of the NHCDC is based on these historical arrangements and the recent establishment of the IHPA. The formal committees are made up of the Jurisdictional Advisory Committee (JAC), Technical Advisory Committee (TAC) and NHCDC Technical Working Group (TWG).

These reporting arrangements are illustrated below: 3F[4]

**Figure 3: IHPA committee governance structure**




4 Source – IHPA working group structure as per Annual Report, provided on 22nd April 2013

## 3.2 Finding G1 – The governance of the NHCDC has been static since its transfer to IHPA

**There was no formal handover of governance of the NHCDC to the IHPA.**

While not of overall high consequence, the lack of formal transfer of responsibility for the NHCDC has created some confusion in the industry. Some of the uncertainty or confusions on roles and responsibilities and communication issues identified throughout the review's consultations relate to this lack of formal transfer.

**The structures and broader accountability arrangements around the Collection are not representative or aligned to its new context and purpose.**

A number of stakeholders commented that the NHCDC's governance is missing alignment with its new context and purpose and internally, between its technical and policy elements. There is a lack of coordination in the form of governance-related meetings as well as a lack of representation of broad industry skills and experience.

The existing committee's terms of reference (ToR) and a selection of minutes and agendas have been reviewed. The membership and objectives are summarised in the table below.

**Table 1: IHPA committee terms of reference**

| Governance group | Membership | Key objectives | Performance measures and review |
|---|---|---|---|
| **Jurisdictional Advisory Committee (JAC)** | The JAC consists of the following members:<br>1 a Chair<br>2 a member representing the Commonwealth<br>3 8 other members, one to represent each State, the Australian Capital Territory and the Northern Territory. | 1 The Jurisdictional Advisory Committee has the following functions:<br>a to advise the Pricing Authority in relation to the following:<br>i developing and specifying classification systems for health care and other services provided by public hospitals<br>ii determining adjustments to the national efficient price to reflect legitimate and unavoidable variations in the costs of delivering health care services<br>iii standards and requirements in relation to data relating to health care services provided by public hospitals to be provided by States and Territories<br>iv developing and maintaining a schedule of public hospitals and the kinds of health care services provided by each hospital<br>v funding models for hospitals<br>vi matters that are referred to the Jurisdictional Advisory Committee by the Pricing Authority<br>b to do anything incidental to or conducive to the performance of the above function.<br>2 The Pricing Authority must have regard to the advice provided by the Jurisdictional Advisory Committee. | None |
| **Technical Advisory Committee (TAC)** | None defined | The ABF Technical Advisory Committee (TAC) is a sub-committee of the Jurisdictional Advisory Committee (JAC), established to oversee the timely development and implementation of ABF to meet the requirements of the National Health Reform Agreement (NHRA). | No measures<br>"Regularly reviewed" |
| **NHCDC Technical Working Group (TWG)** | Representatives from all jurisdictions and the IHPA. | NHCDC TWG is a Working Group of the ABF Technical Advisory Committee to provide technical advice regarding costing to support the implementation of nationally consistent ABF. | No measures<br>"Regularly reviewed" |

Of particular note in the review of the ToR is the lack of definitions on membership (for the TAC and TWG) as well as on key performance criteria and time periods for 'regular review'. While reporting relationships were described, they may not be adequate or clear on delegating authority to ensure the transfer of key issues and information to appropriate decision-making bodies.

While the NHCDC TWG process served its purpose in meeting the obligations of the Commonwealth and States and Territories over 14 Collections prior to transfer to IHPA, there is near unanimous consensus that more robust input and methodologies are needed across all products (not just acute admitted care).

With increased industry-level engagement in the governance of the Collection, costing methodologies can be further developed and enhanced across and within products and methodologies can be shared nationally for implementation at the hospital level.

### The governance of the NHCDC is not aligned to other national data collections in health which reside with the Australian Institute of Health and Welfare (AIHW) and governed through Australian Health Ministers' Advisory Council (AHMAC) Principal Committees

In discussing the governance arrangements for the NHCDC, one suggestion was that the Collection should rest alongside other national collections within the Australian Institute of Health and Welfare (AIHW). The AIHW is the custodian of a number of national health collections; it has robust data quality processes and statistical capabilities, and established governance structures including industry advisory committees and reporting to AHMAC Principal Committees. AIHW was also thought to have robust arrangements for data through National Minimum Data Set (NMDS) arrangements, including regular inputs of activity data from jurisdictions.

Additionally, the National Health Performance Authority (NHPA) has been tasked with reporting on the efficiency of hospitals, creating further confusion around the role of the NHCDC. Some stakeholders suggested that the benchmarking function could be viewed as performance and reporting function, hence may sit within the remit of the NHPA.

However, the majority of stakeholders felt strongly that at this time, given the Collection has recently moved and is fundamental to the NEP, it should rest with IHPA and that IHPA should assume responsibility for improvements to the Collections and servicing the wider purposes of the NHCDC. Issues regarding data burden and alignment to the National Minimum Data Sets (NMDS) will need to be addressed and are discussed further in Section 6.

### Recommendation 2: The governance of the NHCDC should rest with IHPA under a reconstituted NHCDC Advisory Committee that reports through IHPA Executives to the Pricing Authority. Representation should include jurisdictions and specific industry and skills-based appointments.

Given the importance of the NHCDC to the IHPA's development of price and the importance for jurisdictions and other stakeholders for management, the oversight of the Collection's governance should be improved.

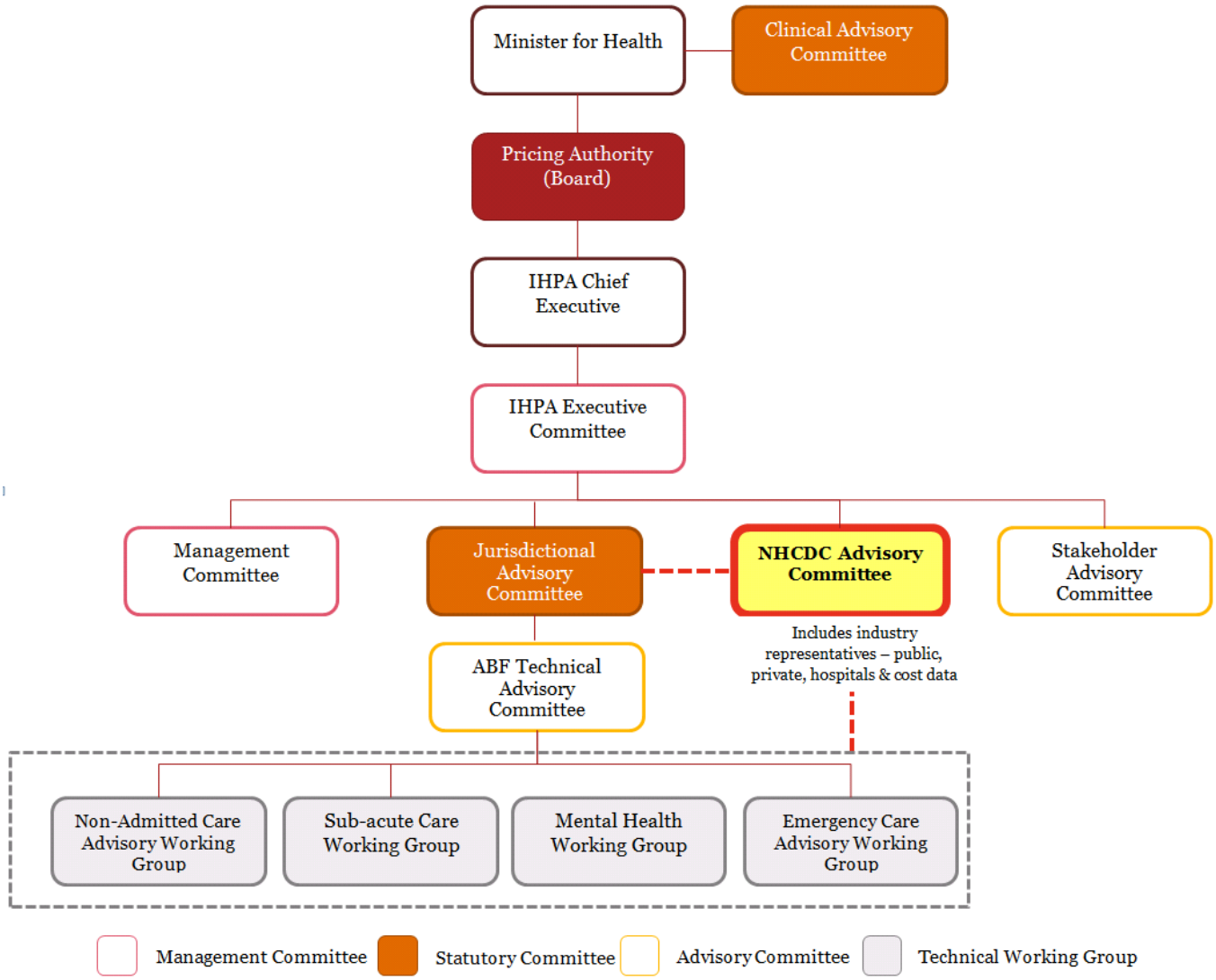
A new governance structure should be developed that enhances the NHCDC in line with its updated strategic purpose:

A new, industry represented skills-based NHCDC Working Group, reporting to the IHPA Board through the Executive and Chief Executive Officer (CEO) and with mandatory consultations with the JAC as illustrated below.

The primary purpose of the NHCDC Advisory Committee would be to deliver on the recommendations and the workplan provided in this review (see Section 9).

The NHCDC Working Group Terms of Reference should include responsibility for enhancing methodologies to increase both consistency and transparency.

**Figure 4: NHCDC revised data governance**




In addition to jurisdictional representatives, applications and appointments should be sought and managed by IHPA with industry-based key skills including:

- Hospital product costing
- Health service management
- Health system policy
- Private/not-for-profit hospitals
- Private health insurance
- Clinical/patient service delivery
- Others as deemed necessary by IHPA and the JAC (for example AIHW, NHPA)
- Health information management and related national data sets
- Regulated costing/pricing (potentially from outside the health sector).

## 3.3 Finding G2 – Data governance is inconsistent and fragmented at most levels of the Collection's processes

**The governance of data in the NHCDC is a topic of increasing importance for stakeholders as the NHCDC has risen in importance with health reform's NEP and standardised funding approaches.**

The NHRA states in relation to data governance that:

*"The Commonwealth and the States will take responsibility for the data integrity within their systems and agree to establish independent oversight mechanisms for data integrity, to provide certainty to the Australian public about the actual performance of hospitals and other parts of the health system"* (section B95).

As detailed in Section 5, a number of validation and data governance arrangements are carried out as the Collection, flow and analysis/validation of data occurs at multiple layers in the health system. The governance of the end-to-end process of collection, submission, and feedback is therefore spread across the hospital/health service (and potentially Local Hospital Network/Area management); jurisdiction and IHPA.

While not confirmed through specific practices, consultations noted that the inconsistency in data governance during the end-to-end sequence described above, has led to a lack of confidence in the quality of data. Examples of marked variation in cost bucket amounts such as operating theatre and prosthetics indicate methodology difference, rather than clinical practice or resource variation. This has influenced perceptions on the use of data for price setting and perceptions regarding the quality of costing data at the hospital level for use in benchmarking.

Anecdotally and through consultation responses, the sign-off processes across the multiple parties involved in the NHCDC are variable: some have no inclusion in formal delegation of authority policies, others an implied 'sign off', and others are involve formal review and distribution. Previous reviews have highlighted that while reconciliation processes have improved (mainly through the introduction of templates), there is "no agreed method for determining the extent of State and Territory compliance to AHPCS".[5]

Further, retrospective financial reviews have not tested the controls on the governance of submissions or sign-off prior to receipt by IHPA, which would provide a level of assurance in accuracy and completeness. IHPA has developed a framework for its activities through its Data Quality Framework as a supplement to its three-year data plan. The Framework details the processes and approach used by IHPA to monitor and ensure the best possible data quality as part of its broader quality systems that include risk management, human resources, finance, information technology, standards compliance, and roles and responsibilities.

In relation to the NHCDC, the Data Quality Framework does not adequately address or identify the features of good data practice such as data quality, integrity, timeliness and staff capabilities (further detailed in Appendix H).

5 KPMG, Review of Round 14 submissions to the NHCDCS Stage 2 Report

The definition and establishment of a data governance framework will enhance and support information reporting processes by:

- Standardising and consistently applying data definitions
- Identifying stakeholders, establishing decision-making responsibilities and clarifying accountabilities around data ownership
- Reducing operational ambiguities
- Protecting the needs of data stakeholders
- Training management and staff to adopt common approaches to data issues and taking action as necessary on the basis of evidence
- Building standard, consistent and repeatable processes
- Reducing costs and increasing effectiveness through coordination
- Ensuring processes are transparent.

Notwithstanding the role and responsibility of the jurisdictions for integrity of data, IHPA as the receiver, custodian and user of the Collection's data could provide the lead in the development of good practice. As described further in the report, future consideration should also be given to IHPA's role in determining the appropriate standards and compliance regimes through which good data governance practices might be delivered.

**Recommendation 3: IHPA should develop a data governance framework, using best practice principles to more clearly define its custodianship of data**

Because no entity has direct responsibility for the end-to-end data flow, it is important for governance of data to exist at every level in which it is created and used.

IHPA should refine and further develop its Data Quality Framework with best practice principles for data governance and encourage jurisdictions and hospitals to do the same.

# 4 Transparency

One of the key objectives in the National Health Reform Agreement is to improve transparency within the health care system. The NHCDC has a key role to play in delivering transparency around costs and therefore increasing confidence in those costs as the basis of the NEP.

This section discusses various issues raised by stakeholders relating to transparency around the Collection's process, costing methodology and outputs.

## 4.1 Finding T1 – Communication on NHCDC processes is insufficient

**Stakeholders' questions regarding the processes of the Collection have undermined confidence in the outputs.**

Given the recent and relatively rapid changes to responsibilities for the Collection and for the use of hospital costs in funding, there is a heightened requirement for communication and timely feedback between all levels of those participating in the NHCDC: between hospitals/LHNs and jurisdictions; between jurisdictions and the IHPA; and public reporting regarding the details of the process and interpretation of the outputs of the NHCDC. Many stakeholders describe these issues as a lack of 'transparency' around the NHCDC processes.

The use of the outputs of costing to inform hospital-level performance improvement initiatives creates a wholly new imperative for timely communication. Particularly at the hospital level, stakeholders have questions, not only regarding the purpose and governance of the Collection, but also regarding details of the costing methodology and the Collection's ultimate impact on hospital funding. Examples of the issues raised relating to methodology include requests for:

- A good practice General Ledger (GL) that supports patient-level costing
- The feeders used in the costing process
- Instructions for more granular and definitive costing allocation and the degree of jurisdictional involvement in the costing process
- Timely feedback on the hospital-level quality of costing and iterative processes to improve hospital-level costing
- Further clarity on how costing data is used in pricing calculations.

This level of uncertainty is indicative of the variability in processes and why there is a lack of confidence in the outputs of the Collection.

Many stakeholders believe that, in return for the substantial level of effort put into costing at the hospital level, there is not an equivalent 'return' from IHPA in responsiveness to queries or timely feedback. Some stakeholders also commented on poor communications between hospitals/LHNs and state jurisdictions. Most public health services consulted for this review were unaware of cost information being provided from the NHCDC to jurisdictions.

Consultations with IHPA indicate there has not been a stable routine regarding instructions and their timing over the past two rounds of the Collection, that is, while IHPA was assuming responsibility from DoHA and given the new timeframes associated with calculation of the National Efficient Price (NEP).

**Recommendation 4: IHPA should design and implement a communications plan to address stakeholders questions regarding methodology and outputs of the Collection linked to the annual cycle of the NHCDC process in collaboration with the NHCDC Advisory Committee and the JAC.**

IHPA through the NHCDC Advisory Committee and the Jurisdictional Advisory Committee (JAC) and working groups should determine the appropriate communication mechanisms and roles and responsibilities for communication, noting the requirements of hospitals and cost data users for clarity regarding processes and outputs.

The communication plan should include:

- The key stakeholders who receive communications, the modes of delivery and timing
- The improvement initiatives for the quality of the Collection as well as in the use of costing information in performance improvement and research
- References to other available documents including pricing framework and other key documentation
- Compliance criteria and the outputs and public reports produced by IHPA on jurisdiction performance.

## 4.2 Finding T2 – Transparency of costing method is lacking

**There is not transparency regarding the methodology used by hospitals or jurisdictions to cost their services and IHPA does not have an implemented national quality framework.**

There was a good deal of discussion over the accuracy of data and the methodology underpinning the costing approach.

Consultation with IHPA indicated that while work was undertaken on a costing quality tool in late 2010, the resulting tool is complex and burdensome for many jurisdictions and IHPA has subsequently not fully implemented it.

Consultations with hospitals and jurisdictions revealed substantial variability in the costing methods, staffing and structures, for example: where quality checks are undertaken and in the allocation of 'corporate costs'.

Both those constructing the cost data and those responsible for processing at the jurisdictional level felt that their current costing methodology was sound. There were, however, inconsistencies across the consultations in the level of understanding of the costing methodology and how the costing approach is applied. For example regarding:

- The methods used to construct the expenditure to populate cost areas from cost centres
- The type of feeders available for inputs to costing systems
- The relative value units (RVUs) used to drive utilisation
- The application of in-patient fraction variables (IFRAC)
- The use of service weights vs. patient-level information on nursing and medical costs
- The interpretation of the application of standards to external costs which are not present in the operating expenditure of the hospital (eg costs for corporate, shared or state services).

Consultations also identified national inconsistencies in classification of activity. Given that 'care type' selection is a clinical decision and there are variable care models and admission criteria around the country, the costing process follows the local policy and information on resource utilisation of the product to be costed, and therefore would always have a degree of variation. The example of chemotherapy was raised by a number of interviewees to highlight differing approaches to admission and inconsistency in cost.

In exploring this issue, while some differences would occur in revenue and funding sources, which is driven through an admissions policy, the issue for costing should be to ensure the costs of care in any setting are captured and that they reflect the resources used at the point of delivery and validated, ie resources and utilisation should drive costs rather than admission type.

Additionally, while substantial investment has been made in costing systems, the sources of data for costing (such as the general ledger and the feeders which reflect resource use and volume) have not been built with costing as the primary purpose.

**Recommendation 5: The NHCDC Advisory Committee should review the costing quality framework for appropriateness, develop associated compliance mechanisms and distribute both components for industry consultation and adoption.**

A quality framework regarding costing methodologies should include implementation tools such as reconciliation templates and sign-off templates (to be used by hospital, LHN and Jurisdictional CEOs). The Clinical Costing Standards Association of Australia (CCSAA) Standard 8 on intermediate products and feeder systems could be a useful starting point to determining the tools required to ascertain different cost methodologies.

Where possible such tools should be automated within costing software.

The cost quality framework should be a significant input to the retrospective Independent Financial Reviews that test and report on compliance with the framework and cost validation.

The framework should be reviewed annually for refinement and then distributed with specifications and other relevant communications. This approach would enable transparency on the variations in costing methods and could eventually enable a ranking of sites, based on the quality of their costing.

## 4.3 Finding T3 – Transparency of the Collection's outputs is weak

### There has been less NHCDC reporting since IHPA assumed responsibility for the Collection

IHPA has not produced recent cost reports, as it has been resource constrained and has questioned the value of what has been produced historically. Many stakeholders consulted however, were critical of this as they have used and sought the cost data reports for comparative purposes.

The NHRA states in relation to the provision of data that: [6]

*"The IHPA will improve transparency by publically reporting on ABF, including release of nationally consistent classifications, costing methods and data and efficient prices."*

While this does not explicitly mention the NHCDC, the principles of transparency and the reference to costing data extend to the Collection.

**Recommendation 6: The NHCDC Advisory Committee and the JAC should advise the Pricing Authority, through the IHPA CEO, on what public reporting will best meet the needs of users of the NHCDC.**

IHPA should work with jurisdictions, industry and other stakeholders to establish what data should be provided and in what format. Consideration should be given to:

- Web-enabled public reporting
- Timeliness (at the earliest possible timeframe; in advance of the release of NEP)
- Benchmarking functionality and other features
- The development of business intelligence systems to enable the communication of cost reports (including benchmarking and other data) directly to stakeholders via a secure internet portal.

At a minimum, the IHPA should refine its process for the provision of data in a format that others can use for comparison purposes, such as the de-identified national costing file.

6 Clause B6a of the National Health Reform Agreement.

# 5 Methodology

The NHCDC is built up from a multitude of inputs and processes across jurisdictions and IHPA. This section seeks to determine the efficiency and effectiveness of these inputs and the various methodologies underpinning the Collection.

## 5.1 Finding M1 – There is duplication of data across various national submissions

**Data submitted to the NHCDC is substantial and in some cases duplicative. There are limited controls on specification changes, which results in inefficiencies and potential differences in outputs.**

Throughout its history, the NHCDC has required numerous files to be submitted as part of the Collection process to support both its methodology and the construction of cost weights.

In seeking responses on how to make the NHCDC processes more efficient, a number of stakeholders supported the concept of one source of data collection and its subsequent processing, "single submission, multiple use".

A number of stakeholders interviewed cited the submission of the B1 (demographics) file as a process that requires further review. They pointed to NHRA (B86), which notes new bodies should:

*"meet its data requirements through existing national data collections, where practical".*

The B1 morbidity and demographics file has been the source of data to support the construction of cost weights through all previous Collections. When reviewed, it is clear the file elements have grown over time and that there is significant duplication of information provided in other collections such as the Admitted Patient Care (APC) NMDS.

The growth of this file appears to be a reflection of data being collected for NHCDC purposes, as is now required for all product costing, and not as a result of changes to other existing national collections (APC or others). It may also reflect the NHCDC's ability to include variables which may not have been possible in other external collections that have tighter reporting and data specification controls.

Resubmitting data through the B1 that has already been captured in other activity submissions creates a data burden for data providers (states and hospitals). This also creates the risk of variability in the construction of both cost weights and price weights because the source activity could be different. It was confirmed through the interview process that the creation of cost weights uses the B1 data submitted with the B2 cost file. However, during the price weight calculations, the B1 is not used, as other activity data is sourced from formal collections such as the NMDS (or APC). Given this and the timeframes for submission, there is the potential that the activity data within these files will be different.

An example of this situation is acute activity data where the DRG is present. These data are submitted to the NMDS and signed off by the jurisdiction at a point in time. The data is then duplicated for

submission through the B1 at a later date, which provides opportunity for changes to activity numbers or type, therefore creating variation between NMDS and B1.

This problem multiplies when there is a requirement for jurisdictions to reconcile activity data in the B1 (or multiple submissions of the B1) across other collections, such as the NMDS, that have different closing dates and submission timelines.

To address these issues, some jurisdictions have suggested that:

- the B1 and NMDS reconcile at source (hospital or state) where possible
- only the B2 file be submitted with a linking key to data sets such as the NMDS (to increase and support single submission, multiple use)
- only mandatory data is specified and collected (as historically there has been substantial increases in requests for 'optional' data elements, that have been inconsistently supplied)
- in the interim, provide a modified B1 that has only data not currently reported in existing collections, which are required for IHPA's purposes.

Conversely, some jurisdictions are comfortable with resubmitting data as they have assumed that improvements are underway which will align future data.

**Recommendation 7: IHPA should, through the NHCDC Advisory Committee, identify all necessary cost, demographic and activity data elements and compare these against other established data sets to develop a workplan toward single submission, multiple use.**

The NHCDC Advisory Committee should review the B1 Morbidity and Demographic Data file as a priority. Where the B1 incorporates data that is not found in other national data sets but required for IHPA's purposes, a revised B1 should be developed.

Both the cost weights and the price weights should be produced with activity submitted to the relevant national data set, which would remove the potential variation risk.

## 5.2 Finding M2 – There is too much detail in cost submissions

**The inclusion of Date of Service has been burdensome, not added value nor been used. IHPA have confirmed that this field is no longer required and will not be collected in future.**

There was consensus among interviewees from jurisdictions and industry that the level of detail in recent Collections has substantially increased the volume of data by including the Date of Service. They felt that an appropriate specification should be the unit record with cost area and line item costs as per the current specification.

Where data was being provided with date of service included, it took some of the larger health services up to 40 hours to process the data through costing software from start to finish. Given the complexities involved in the costing process and the extent of validation checks, every time a problem

was discovered, another 40 hours of processing was required. Overall, this has had an adverse impact on the productivity of costing and meant reduced time to undertake quality assurance checks.

### *Preferred level of data collection*

The requirement of unit record data with both cost area and cost item has been a feature of the NHCDC for a number of rounds. The underlying reason for the submission of these data was to give the Commonwealth the flexibility to map costs into buckets, which provides a level of transparency and the ability for consistent mappings of costs into the relevant buckets.

One jurisdiction noted that they had built their state pricing model using cost data collected at the unit patient level by bucket. Furthermore, a number of stakeholders interviewed stated that this level was the preferred view that would be requested in the first instance for benchmarking and analysis.

Some alternate options were provided by stakeholders at both hospital and state level. They include:

- One costed record per patient product at bucket level
- One costed record at bucket level with additional buckets identified for pricing/funding purposes (such as PBS & Non PBS, Blood, Prosthesis)
- One costed record per patient product at bucket level with a sample of intermediate products for randomly selected DRGs in subsequent Collections (see Finding 10).

However, if these options were pursued and the cost area and cost item removed, IHPA (and others) would lose visibility of what costs populate the buckets. This would create further ambiguity of what data is populated within the buckets as the allocation would be left with each jurisdiction, further complicating compliance issues.

**Recommendation 8: IHPA should confirm to all jurisdictions that cost data supplied at the cost area and item level should be maintained and Date of Service is no longer necessary for IHPA purposes.**

IHPA should also present and provide the cost bucket matrix to be applied in each NHCDC round within the rules governing the Collection.

## *5.3 Finding M3 – Costing data has the potential to be more clinically meaningful*

**Sampling the cost of intermediate products would be a valuable addition to the costing methodology and support greater clinical engagement.**

A number of interviewees highlighted the need for product costing to better engage clinical staff in order to refine data and increase its use in performance improvement. One approach to this could be through the development, standardisation and collection of 'intermediate products'. Intermediate products are typically categories of items produced or types of services provided by clinical or clinical support units that are usually aggregated for cost-reporting processes, for example the type of pathology and imaging tests (full blood count, x-ray or MRI scan), allied health interventions (such as initial consultation or standard daily visit) or the type of drug dispensed.

For some stakeholders the introduction of the intermediate product would assist in engaging more clinical level reporting as these products reflect the resource utilisation of the patient and the ordering of the clinician. The current data specification of cost area and cost item whilst serving a costing purpose does not detail costs at that clinical level.

For the industry, a greater understanding of and the ability to compare the cost of intermediate products is more relevant to operational management of health services than understanding costs at a bucket level because it demonstrates the discretionary costs elements of service or clinical practice

There were mixed views from stakeholders on the place of intermediate product costing in the NHCDC. While many felt that data at this level was too granular and would not be required for pricing purposes, others felt that this was the next step in understanding patient resource consumption and the transparency of costs nationally. This would also be meaningful for clinicians and hospital management in general when drilling into bucket composition, providing more insight into costs of production than is currently submitted.

Given the volume of data collected at intermediate product level and the requirement to map these products to a national consistent set of product lists (for example a drug or pathology test list) consideration will need to be given as to the approach taken if these products are captured in the future.

**Recommendation 9: The NHCDC Advisory Committee should evaluate the appropriateness of using intermediate product costs in identifying clinical variation, and provide advice to the Pricing Authority through the IHPA CEO.**

The NHCDC Advisory Committee should consider and determine the merits of the inclusion of intermediate products to the Collection process through analysing a sample of data for a selection of DRGs and their associated data across a number of sites.

This analysis should determine the extent to which intermediate products provide a clinically meaningful and robust input to comparing cost variation, how well they allow comparison of services, and the ease with which the data can be prepared and reported.

Building up patient-level costs from existing intermediate product data that is sitting in national clinical costing systems could improve the robustness of the Collection for NEP purposes, and demonstrate to stakeholders cost performance against specific NEP components. Further, it would enhance the ability of hospitals and system managers to benchmark performance against others who produce similar products, thus meeting a number of strategic objectives for the NHCDC.

## *5.4 Finding M4 – A participation rate of 85% would provide an estimated 99% confidence level to calculate national price weights*

**In designing the sample, it is important that reasonable coverage across the different kinds of hospitals that are required for price weight setting are included, to ensure that price weights for ICU, paediatric loadings, Indigenous and other loadings can be robustly estimated. A comprehensive sample is also required for benchmarking purposes**

The predominant view through the consultations was that while all hospitals should participate in the NHCDC, not all should be used within the NHCDC to set the NEP. The question of sample size was viewed through two lenses: the first with regard to the sample of hospitals used to set the NEP price weights; the second to the size of the NHCDC.

It should also be noted that the performance targets listed in A15 and A16 of the 2008 NPA states that 100% of admitted episodes, emergency department services, sub-acute, outpatient services and hospital-auspiced community health services be both classified and costed. However, it should be recognised that these clauses have been seen as unrealistic and most stakeholders in the ABF process have questioned their validity and practicality.

Many interviewees expressed a view that cost-modelled data should not be used to set the NEP, as its methodology was questionable given its reliance on externally produced service weights and that outputs were modelled at the DRG (or other aggregated product) level and not at the patient level. However, the NEP methodology adopted by IHPA does not use cost modelled sites to set price weights (costs are incorporated at the establishment level as an input to the base price).

There was some belief that the data informing the NEP should only include high quality data that meets the standards, and that the maturity of costing has implications for sampling, costing quality and therefore price.

Therefore any perception that cost-modelled sites are used to inform price weights needs to be corrected and communicated more clearly by IHPA and jurisdictions.

### *Sampling methodology*

The analysis of minimum sample size, expressed as a participation rate of population separations, is presented in Appendix I. The data used for this analysis was 2010/11 cost and activity data for acute admitted care. The required minimum participation rate will increase as the level of granularity of the required estimates increases.

For acute admitted care, NEP pricing requires accurate DRG pricing parameters at a national level, as well as robust estimates for other parameters such as Indigenous status, remoteness, and mental health patients.

Alternatively, for benchmarking, costs will be reported at levels that are more granular than the national level, so minimum participation levels for robust benchmarks will be higher than those required for National Price Weights.

Whether for NEP pricing or for benchmarking, the study highlights that the required participation rate is high for the highest cost DRGs, and decreases for the lower-cost DRGs.

### *Sampling for NEP*

It is assumed that a high precision, or low margin of error, is desirable at the DRG level. This is to ensure that hospitals are not overly advantaged or disadvantaged by the DRG-profile of their patients, and that the price weights reflect the best estimate of the national cost to deliver services

within the margin % of the true mean cost[7]. For NEP Acute Admitted National Price Weights, an 85% participation rate is estimated to achieve DRG-level cost estimates with 99% statistical confidence, such that:

- the true mean cost for the highest cost DRGs (deciles 1 and 2 as a percentage of cost-weighted separations) are within 1.5% to 2% of the sample mean cost;
- the true mean cost for DRGs in deciles 3 to 4 (percentage of cost weighted separations) are within 1% to 1.5% of the sample mean cost;
- the true mean cost is within less than 1% of the sample mean cost for lower-cost DRGs (deciles 5 to 10).

The analysis on which the above figures are based focussed on total costs at a DRG level. However, the NEP methodology requires parameter estimates for other factors such as Indigenous status, remoteness, ICU, paediatric loadings, and Mental Health loadings. Therefore, reasonable coverage across the different kinds of hospitals is necessary to ensure that price weights for ICU, paediatric loadings, Indigenous, Mental Health (psychiatric care days), and Remoteness loadings can be robustly estimated. It might be possible to further calculate minimum sample sizes for Indigenous, Remoteness, ICU and paediatric loadings to ensure that the hospital sample covers the range of hospitals required to set robust estimates for these pricing parameters.

As noted above, these estimates are based on 2010/11 activity and cost data and are likely to change over time as cost drivers change, classifications evolve, and the quality of costing improves. Therefore, if a sampling approach is adopted for price setting, the target sample size calculations based on the desired level of precision by DRG and other pricing parameters should be repeated each year.

### *Sampling for benchmarking*

For the benchmarking of costs by State and AIHW Hospital Peer Group, the current participation rate of patient-costed sites representing 83% of the total population provides cost estimates that are likely to be within a reasonable range of their mean costs although the level of precision decreases for State/Peer group combinations with small population sizes. Higher participation rates will increase the precision by which cost estimates at a DRG-level can be benchmarked at State and Peer Group level.

**Recommendation 10: IHPA should use compliance mechanisms with system managers to ensure that adequate samples of high-quality data from each jurisdiction and population groups are included in the annual NHCDC cost collection.**

Analysis of the 2010/11 patient-costed NHCDC and the 2010/11 Admitted Patient Care data collection supports the view that the NEP price weights can be based on a targeted sample of hospitals. A participation rate of 85% will achieve DRG-level cost estimates with 99% statistical confidence, however, the sample must be carefully designed to ensure that price weights for other adjustments can be robustly estimated (Indigenous, Remoteness, ICU, Mental Health, and Paediatric).

7 A 1% error for a given DRG decile (each decile representing 10% of cost weighted separations) is equivalent to a total cost of approximately $25 million – this calculation is provided in Appendix I.

The analysis also supports the views of stakeholders that high participation in the NHCDC should continue for benchmarking. The required minimum participation levels, for reasonably robust DRG-level benchmarks at State and Peer group level, exceeds 80%.

# 6 Standards and compliance

The quality of the data submitted to the NHCDC is affected by the application of Australian Hospital Patient Costing Standards (AHPCS), variability in costing practice, and variability in methodology.

This section addresses these elements and their roles in collection of data.

## Background to the AHPCS

The AHPCS were developed out of the fourteen rounds of the NHCDC. Rounds one to fourteen were supported through a NHCDC Reference Manual which had been developed initially by the Classifications and Payments Branch of the then Commonwealth Department of Health and Family Services and many other stakeholders including States and Territories, the Australian Private Hospital Association, and a Technical Advisory Group [8] . The Reference Manual was a key document for the Collection process; the last version of the Reference Manual was published for the Round 11 (2006/07) Collection.

For each Collection, every jurisdiction was provided with funding by the Commonwealth Department of Health and Ageing to employ a representative to coordinate their jurisdiction's submission and sit on relevant working groups (including the NHCDC Technical Working Group). These working groups had input into the Reference Manuals throughout the life of the Collection.

Following the establishment of health reform initiatives, the NHCDC TWG, then made up of jurisdictional representatives, was delegated the task by the NPA Implementation Steering Committee to develop nationally consistent costing standards, which became the AHPCS. [9]

The AHPCS were frequently criticised during consultation as not being industry standards because they were:

- not developed by the industry and lack compliance
- not in keeping with the industry standards nominally underpinned by the Clinical Costing Standards Association of Australia (CCSAA)
- not considered definitive enough to create consistency in costing outputs.

It is important to note that the criticism of the AHPCS through stakeholder discussions was largely based on the processes followed for their development, not on the content of the standards themselves.

8 National Hospital Cost Data Collection, Reference Manual September 1997

9 Taken from Australian Hospital Patient Costing Standards Version 2, March 2011

## 6.1 Finding C1 – The AHPCS are more appropriately defined as rules than standards

**The development and implementation of the AHPCS are not in line with best practice for standards development as they have not had wide industry input and lack a compliance mechanism.**

A number of stakeholders in consultations noted that while the NHCDC is an important collection of data for price setting, it, like other cost data collections (such as the Health Roundtable or specific jurisdictional costing studies), should be seen as a by-product of the costing and hospital management process. It was further felt that these alternative costing processes within the industry provide an additional avenue to inform the development of NHCDC's rules and standards.

A number of stakeholders expressed the view that the AHPCS are not true 'standards' as there has been little industry involvement in their creation and they do not have a compliance mechanism to test national consistency in costing.

The discussion as to what is a standard, rule or guideline was much debated with regards to the AHPCS.

The International Organisation for Standardisation (ISO) is the body recognised for standards development and provide a process map for standards development as follows:

**Figure 5: ISO standards development process**


A high-level comparison was conducted on ISO's development approaches compared to that of the AHPCS. The following observations can be made:

1 A number of the standards incorporated across all versions of the AHPCS stem from the NHCDC Reference Manuals from round 1 to 11 (The Round 11 manual for the 2006/07 data Collection being the last published document). These manuals were not established as standards and their development had varying levels of technical and industry representation.

2 While the TWG was tasked with developing costing standards for the NHCDC, it was left to a small number of jurisdictional representatives to complete the development work. Standards

were then ratified by jurisdictional representatives. It is unclear if this group are experts, [10] whether consensus was reached and whether drafts circulated for comment nationally.

3 In terms of governance, while Versions 1–3 of the standards provide documentation of the development lifecycle, consultations indicated there was very little clarity on the process and confusion over the decision-making through which the standards were ratified.

Consultations with hospitals across all jurisdictions indicated that greater industry involvement was required in the development of standards and in the Collection process. A number of hospital representatives pointed to examples where the industry has been engaged including:

- The Health Roundtable costing chapter and State-based Cost Weight Studies
- Industry-developed standards which underpin costing methodology, with standards and surveys that require reconciliations and assessment of the costing methodology undertaken – such as CCSAA Standard 8
- (State) Departmental collaboration with industry representatives to further develop methodology to support the development of funding models

### *Compliance mechanisms for AHPCS*

Version 2 of the AHPCS makes a number of references to the purpose and intended audience of the AHPCS, specifically:

> *"the AHPCS are designed to underpin the consistent costing of Australian hospital activity… it is important that the cost data conforms to the costing standards… to meet the COAG requirement for national consistency".*

At this stage, there is no compliance framework or assurance mechanism that provides evidence of the extent to which the AHPCS have achieved their purpose of national consistency.

As described in Recommendation 5 and its associated findings, a costing data quality framework and compliance regime is necessary.

However, it should be noted that a health service or jurisdiction may wish to deviate from these rules for its own management purposes and it is their responsibility to ensure that the costing methodologies employed for data submitted to the NHCDC meet the criteria set out in these rules. For example, the health services may need to establish a separate NHCDC costing configuration.

10 The definition of an expert is somewhat vague in the context of hospital costing and the NHCDC standard. It was noted by many consulted that the representatives completing the development of standards were not all performing costing at health service level

**Recommendation 11: IHPA and the NHCDC Advisory Committee should develop processes for industry involvement in standards development and quality and compliance frameworks as per Recommendation 5.**

Consideration should also be given to renaming the AHPCS to more appropriately reflect their use as rules to specify the NHCDC's requirements, until such time as the necessary standards development and compliance processes are in place.

## 6.2 Finding C2 – The current published standards are suitable for NHCDC purposes

**There is no evidence to indicate the need for major updates to the content within the AHPCS as 'rules'.**

In engaging with stakeholders, issues regarding areas of needed improvement to the AHPCS were discussed. Interviewees generally made comment on the lack of industry input and implied that there were differences between the AHPCS and industry practice or standards. However, when asked for examples or written submissions, no specific areas were identified that could demonstrate these differences.

In order to further clarify these issues, the analysis below examines the AHPCS v2, the AHPCS compared with the CCSAA, and the AHPCS draft v3.

### AHPCS Version 2

In reviewing version 2, the following observations were made:

- Cost Standard 5A.001: Order request point

  While point of order is not a field that is submitted to the NHCDC, it is an important standard as its intent is to demonstrate that the services provided to patients are linked to the appropriate costed product. The use of the term "order request point" can create ambiguity and may create erroneous cost allocation.

  Further, it may need to be departmental-specific, for example a patient under the care of the Emergency Department who has an imaging test must report that cost against the ED episode even if the patient is subsequently admitted to the ward. In this example, different costs could be spread across departments, as the test may have been ordered by a ward medical officer, not the ED and create potential unintended consequences.

  It is furthermore not clear whether the imaging test was undertaken while in the ED, or whether this is indeed relevant because the definition states that "for the purpose of matching, order request point includes that part of the hospital where the intermediate product is ordered or prescribed".

  This standard is also ambiguous regarding requests that are not auctioned. Review of the standard should also include a validation between 'point of order' and 'service performed date' to ensure only those services actually delivered are costed.

As this type of costing will be dependent upon the differing source systems available nationally, then it would be appropriate for this standard to include some form of documentation for hospitals to cite the approach they have undertaken.

- Cost  Standard 5B.001 Encounter Matching Method

  The Encounter Matching Method standard COST 5B.001 puts more rigour around matching intermediate products to the correct product episodes.

  Our review, noted that the standard could be made clearer with the use of diagrams to support the narrative.  Further the difficulty with feeders and matching is that hospital costing staff need to be able to ensure that the matching rules enable correct matching. As this step in the costing process is dependent upon the differing source systems available nationally, then it would be appropriate for this standard to include some form of documentation for hospitals to cite the approach they have undertaken. Ideally the feeder would be listed and the matching rules documented.

  It was noted that this standard makes comment on "indicative matching proportions" based on a sample of major metropolitan and regional hospitals, but no reference is given to this work. There would be merit in documenting this study and for the NHCDC Advisory Group to discuss prior to their release of the Version 3.0 standards; and there could also be value in examining the draft CCSAA standard CCS 15 Episode Matching Business Rules as reference to inform COST 5B.001.

  GL 5D.001: Matching activity and cost – negative costs

  The treatment of negative costs and its offsets is unclear because there is no guidance on the appropriate approaches for rectification. For example: a negative cost item for a Workers Compensation episode may have a range of options for redress such as assigning it to the cost centre (specific to compensable patients); to salaries and wages to the ward; or apportioned across all staff. Each of these options can have a marked impact on costing outputs.

## *AHPCS Version 2 compared to CCSAA standards*

A high-level review comparing both the AHPCS and CCSAA standards revealed some differences in the overall purpose, minor differences in the treatment of some costs, and differences in their scope, specifically:

- The AHPCS considers some costs to be overhead costs that the CCSAA considers direct costs:
  - Pastoral care is deemed to be an Allied Health service in the CCSAA but an overhead in the AHPCS. Pastoral care interventions could be considered a form of counselling and so in some circumstances considered a direct cost
  - Catering is a direct cost in the CCSAA but an overhead in the AHPCS
  - The materiality of both of these cost types is not significant and therefore any impact on the cost outcome of treating these as either direct or overhead is most likely marginal. The AHPCS do recognise that if direct consumption data is available, costs should be allocated

in this way; however, this does not imply that there should a change to the mapping of the cost centre to 'direct'.

- Some of the suggested overhead allocation methodologies differ, for example, in the treatment of energy-related costs where the CCSAA allocation hierarchy suggests direct use data should be used first and weighted floor area second. The AHPCS suggests floor space should be used first and all expenses used second
- The standards in CCSAA that are not in the AHPCS include:
  - Standard 3 – The allocation of costs where there is a ward/unit/service closure
  - Standards 4 and 12 – Assignment of costs to fixed and variable cost types
  - Standard 6 – How to treat errors that arise in the GL
  - Standard 9 – Matching of costs to public and private patients
  - Standard 11 – How to audit the data
  - Standard 14 – Benchmarking.
- On the other hand, the AHPCS includes a suite of standards on depreciation that are not included in the CCSAA standards (DEP 1.001 to DEP 1E.001).

## *AHPCS Version 3*

In reviewing draft version 3 documents, it is clear that an improved process has been followed. Upon reviewing the standards, they appear to reduce ambiguity, have addressed issues within earlier versions, and include two new standards for data reconciliation and medical cost allocations. The guidance on product costing processes, however, could be considered limited to a standards-based approach and may not indicate, or effectively direct, the process of costing or the extent of patient-level costing that the industry currently does or needs to undertake.

Of note, the standards have been in draft for at least 12 months with no clear process for their release or for communication on their progress. IHPA have confirmed the version 3 documents have been on hold pending the outcome of this review.

It is important to note that the costing process relies heavily upon data sourced from hospital departmental systems (built for clinical functionality) and general ledgers which are generally not built for costing. These systems differ across settings nationally which means that the data collected within them may not be consistent. An additional significant factor is workforce availability and capability to conduct specific hospital costing techniques.

Therefore, while the standards can prescribe rules for the data collection, they need to recognise that variability in costing will occur. The standards themselves need to ensure that the methodology underpinning the cost data derived from these systems are documented to enable transparency and cost validation.

## *Specific product issues*

The Mental Health Working Group has raised a specific concern regarding the capture of costs for Consultation Liaison services. Consultant Liaison services are provided across multiple care settings on a periodic basis/ad hoc via models of care such as 'in-reach' or 'out-reach' where the clinician is

not a regular part of the clinical staffing of the unit where the patient is receiving the bulk of their care. This issue is particularly relevant to the models of care in some of the newer ABF products, eg mental health and subacute care.

**Recommendation 12: The NHCDC Advisory Committee should review the AHPCS version 3 and recommend them to the Pricing Authority through the IHPA CEO.**

In line with other recommendations, the NHCDC Advisory Committee should further refine the standards development process and consider the merit of additional standards for improving the NHCDC and its outputs, in particular related to the reconciliation of data and the transparency of costing methodology.

Additionally, refinement of the AHPCS standards should include consideration of product specific issues such as Consultant Liaison.

## 6.3 Finding C3 – The AHPCS requires supplementary documentation and a skilled workforce

**The AHPCS assume a level of existing costing expertise and knowledge which may not exist. Additional documentation is needed.**

The AHPCS provide a list of supplementary materials available for costing guidance. When reviewing this list, it was found that the AHPC Methodology and AHPC Technical Manual have not been produced. The AHPCS Quality Framework has been included in this list. However, as noted in earlier findings this has not been applied or implemented in a nationally consistent manner.

Furthermore, a key issue for stakeholders is the availability of a workforce skilled in costing. While the challenge rests principally with hospitals and jurisdictions, many noted that IHPA could support the development of skills in this area.

It was noted that costing guidance material, training and education is limited and stakeholders believe that staff new to the process of costing in a hospital would not find the AHPCS definitive/useful in understanding how to cost.

While many stakeholders see the AHPCS as a useful start to national consistency, there was consensus that the standards would be improved with the provision of supplementary documentation such as a 'how to cost' manual and the establishment of a cost allocation quality compliance framework.

**Recommendation 13 – The NHCDC Advisory Committee should develop guidance, consistent with other recommendations in this review, to enhance nationally consistent skills and knowledge on costing methodology.**

Notwithstanding jurisdictions' responsibilities for quality and submission of data, given their dependence on these data, IHPA should support costing by providing other documentation to support the NHCDC Guidelines. [11]

- A 'how to cost' manual could address areas such as the following:
- A background on what hospital costing is and how to perform it
- Different sections for Cost Modelling and Patient costing
- How to manipulate the general ledger for appropriate cost allocation
- How to create patient-level services for cost allocation (eg minutes on ward, theatre, pathology tests)
- How to establish local cost-drivers and the issues surrounding the use of service weights
- How to report cost data to the NHCDC and for internal use in hospitals
- Understanding and measuring revenue at the patient level
- How to utilise the information to inform managerial and clinical decision-making within the organisation
- How to measure the quality of cost allocations within a costing quality framework (for external and internal use).

## 6.4 Finding C4 – The use of cost-modelled data is not understood

There was widespread questioning regarding the extent of cost-modelled data in the NHCDC. Other than cost modelling inferring a cost methodology at the product and not patient level, it is difficult to draw a distinction between what is cost modelling or patient-level costing. For example, it was noted that some modelling occurs in all hospitals (eg the apportionment of staffing costs) and that even large patient-costed hospitals may be using service weights of some description.

The value of cost modelling was questioned given the widespread use of service weights in the modelling process. Stakeholders raised the following concerns regarding that application of service weights:

- It creates circularity in the costing process
- They lose their currency over time

11 A starting point for reference would be a review of Hindle's 4a and 4b which were included in the Commonwealth Casemix education series in the early 1990s. While they are prescriptive to a cost modelling and IFRAC approach, they provide an excellent starting point to costing. Further analysis and refinement of patient-level costing could included in the development of a comprehensive document on how costing could be undertaken in hospitals.

- It is not relevant to the clinical practices of hospitals if they were developed elsewhere.

It is also noteworthy that, if hospital-specific Relative Value Units (RVUs) are not updated on a regular basis, they can lose their currency and no longer represent current clinical practice. It can be argued that the application of service weights alone should be the factor in deriving the value of cost modelling.

A theme emerged in consultation that modelling costs at a patient level was preferred over modelling at the product level – such as DRG.

It should also be noted that cost-modelling software was supplied as part of the NHCDC package in early NHCDC collections to enable stakeholder participation. For some health services, it provided the entry point to costing for facilities that were unable to justify a business case for patient-level costing systems.

The application as to what form of costing methodology a health service adopts is driven by a number of factors, including the size of the health service, its available feeders, the data within them, and the likely return on investment from the software's implementation. It would be fair to say that in some jurisdictions, health services have maintained their costing systems as a mandatory requirement of State Health Departments for costing their own cost studies, with the health service themselves not utilising the function appropriately.

The consultations demonstrated that transparency in the methodologies undertaken in each jurisdiction could remove scepticism around variable practices and enhance the level of hospital engagement in the Collection process.

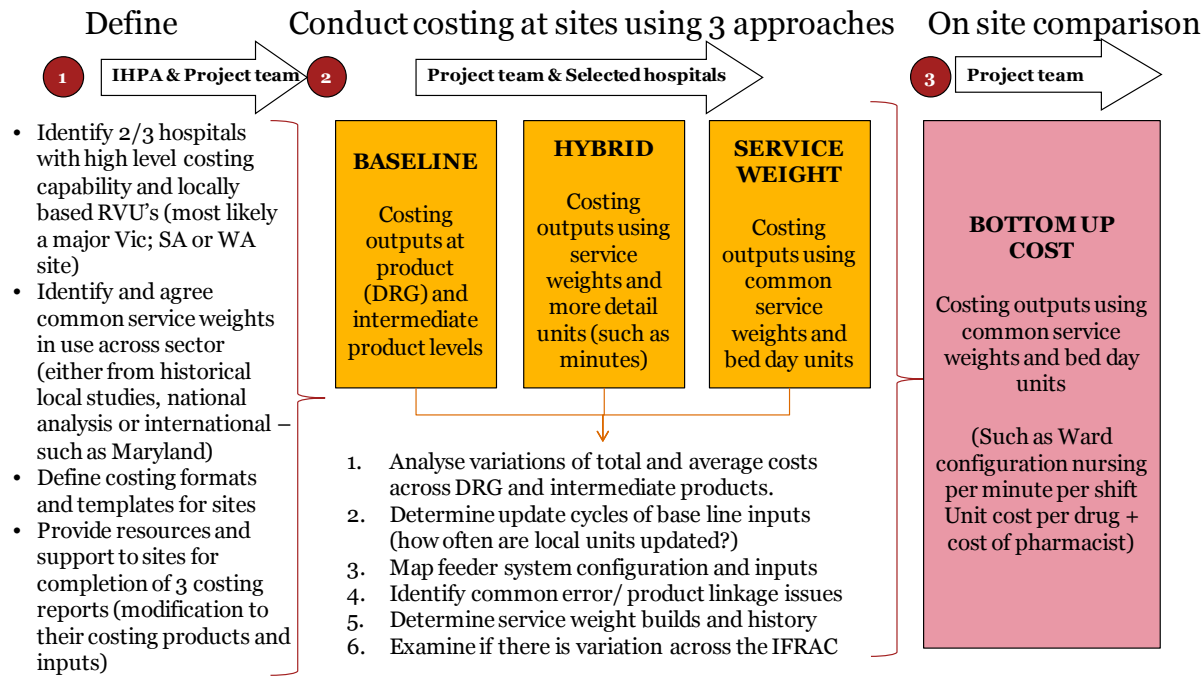
Of specific note is the fact that that no definitive evidence or studies have demonstrated the output differences between products that are modelled or input costed. In order to adequately address the issue of whether cost modelling should be continued or not, research should be commissioned by IHPA.

**Recommendation 14: IHPA should conduct cost studies to analyse the efficacy of the various methods of cost allocation which could then inform a cost allocation quality compliance framework.**

A study should be undertaken to measure the change in cost by applying different costing methodologies to three health services sampled nationally to demonstrate variations in cost data. As illustrated below, the three approaches will include a baseline of patient-level costing, a hybrid combining service weights and some utilisation drivers, and a service weight/modelled approach.

These outputs should then be compared to a directly observed sample of patients using real-time data and utilisation to determine the differences. A 'how to cost' manual could address areas such as the following:

**Figure 6: Analysing the quality of cost allocation methodologies**



# 7 Timeline

This section explores the current timeline, its challenges and how to address them.

IHPA are interested in exploring the feasibility of contracting the submission date to reduce the period of indexation of the NEP from three to two years; conversely, most jurisdictions would prefer the submission date to be extended to allow sufficient time to conduct a thorough quality review process.

## 7.1 Finding TL1 – Submission timelines need to allow time for data quality checks

**Views vary on a suitable timeframe for NHCDC submission.**

IHPA have coordinated three NHCDC rounds in the past two years, with the transition of the Collection from DoHA coinciding with the Round 14 (2009–10) process. The data submission dates for Round 15 (2010–11) and Round 16 (2011–12) have trended towards tighter timelines than previous years to support their provision of the NEP. Round 16's data submission date was 31 December 2012, which was later extended to 31 January 2013.

Stakeholders expressed conflicting views on the achievability of IHPA's accelerated submission timeline for the NHCDC.

- Most jurisdictions and industry representatives were critical of the timing of the submission, with the consistent view that the December deadline did not permit time for adequate quality assurance on the data prior to submission. Most stakeholders believe that in order to get better quality data, health services (or jurisdictions who undertake costing on behalf of health services) require more time to undertake property quality assurance checks prior to submitting the data – and that given holiday leave periods, a March submission deadline would provide adequate time to do this. It would also allow time to improve cost models where necessary.
- However, the December timeframe was seen as achievable by other jurisdictions which have decentralised the costing process (including for example: quality frameworks, allocation of central costs and training for workforce in LHNs) and who had increased the cycle time of costing to quarterly or monthly with the aim of making costing and use of costing outputs 'business as usual' in the management of health services.

### Comparability to other datasets

It was also noted that the National Public Hospital Establishments (NPHE) submission was requested in November 2012 for the 2011–12 year, whereas the submission date has historically been in December each year. Jurisdictions are also given the opportunity by AIHW to resubmit the data submission following their quality review process, which usually occurs in February or March.

The 'submit once, use many' philosophy should be considered for the NHCDC. It would enable jurisdictions to reconcile the data between various datasets – such as the NHCDC, NPHE and Government Health Expenditure – before submission.

## 7.2 Finding TL2 – Current processes cannot support a reduction in the NEP indexation to two years

**The current timeline requires a three-year indexation period.**

While not specifically an issue regarding the NHCDC timeline, there is a knock-on effect in determining the NEP, as IHPA is forced to apply a three-year indexation period when using the most current data submission.

To achieve a reduction in the need for indexation from three to two years, jurisdictions would need to complete their submissions early enough to allow IHPA to use the dataset and then release the draft NEP by 30 November and the final NEP by the end of the following February each year.

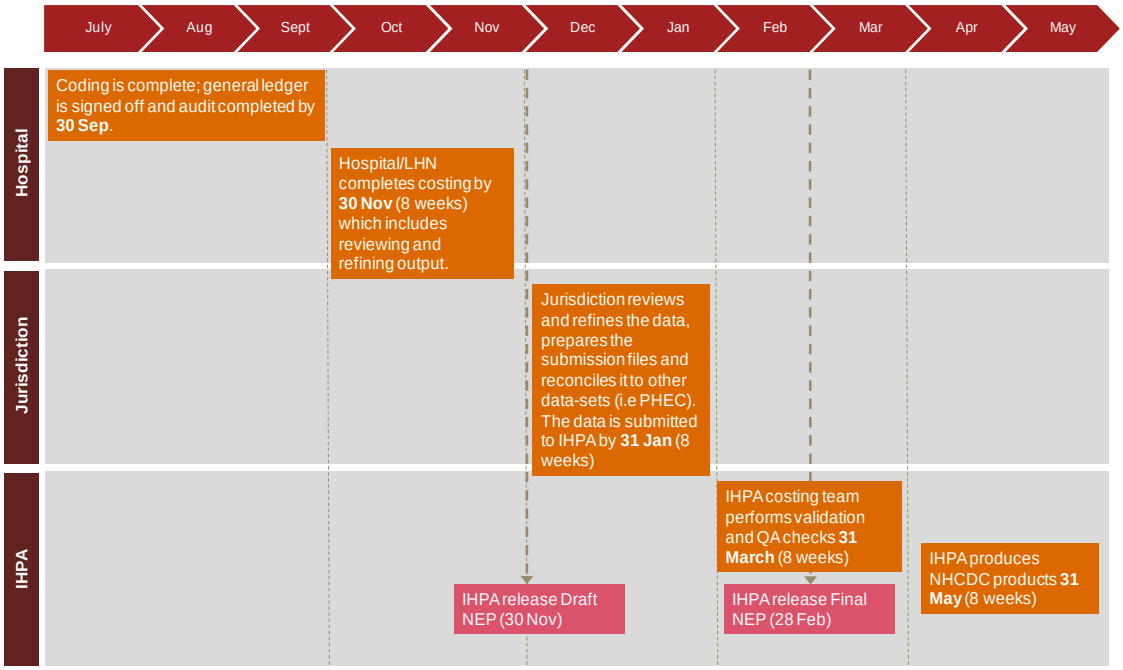
### The current process

While the costing process varies across jurisdictions, there are a number of dependent factors which impact on the timing of the process, such as:

- The hospitals generally commence the annual costing process for the NHCDC submission after the coding has been completed, the financial statements have been signed off and the audit process is finalised, which is typically 30 September
- The hospital takes approximately eight weeks to completed the costing process, which includes reviewing and refining the data
- The jurisdictions take approximately eight weeks to complete their review of the costing submissions from hospitals, which may include reconciliation of the information to other datasets before submission to IHPA
- IHPA's pricing team require eight weeks to produce the NEP once the costing data has been validated and checked.

Using the indicative time periods listed above, IHPA would not be able to produce a final NEP before 31 May of each year. To achieve this date, jurisdictions would need to be able to submit their data by 31 October each year to facilitate the reduction of the indexation from three to two years and the final NEP being released by 28 February. These indicative timelines have been depicted in the diagram below:

**Figure 7: NHCDC timeline**




## *7.3 Finding TL3 –Timely release of the data is needed to support the purpose of the NHCDC*

### The greatest concern about the timeline of the NHCDC relates to the time lag in IHPA's reporting back of costing outputs

Concern was expressed across many stakeholders regarding what is seen as an excessive time lag involved in the publication of data by IHPA. This was true for both the public sector and the private sector given the reliance on the data to develop funding agreements with jurisdictions and service providers. Other interviewees (such as academics, private sector hospitals and associations, and other bodies) raised the timing issue from another perspective – the publication of results. Many were critical of the two-year time lag as the publication of outputs takes too long to be meaningfully used for benchmarking. See earlier discussion regarding reporting in Section 4 Transparency.

The table below identifies the dates that the various files were released by IHPA or DoHA from prior data Collections and demonstrates the time lag between jurisdictions receiving the cost data compared to the submission date.

**Table 2. Release dates of files from historical NHCDC Studies** [12]

| NHCDC Round | Data submission date | Activity file | Episode data | Cost data |
|---|---|---|---|---|
| **Round 12 (2007–08)** | **Unknown** | **N/A** | **N/A** | **September 2009** |
| **Round 13 (2008–09)** | **Unknown** | **N/A** | **N/A** | **November 2010** |
| **Round 14 (2009–10)** | **Unknown** | **April 2012** | **April 2012** | **Not published** |
| **Round 15 (2010–11)** | **May 2012** | **November 2012** | **November 2012** | **April 2013** |

The delay in releasing the data is driven by IHPA's NEP determination process which involves the analysis and review of the NHCDC costing output. Releasing the cost outputs to the jurisdictions following the costing team refinement, but prior to the NEP pricing process would shorten the period between submission and release, and address the concerns around timeliness of submission.

### Recommendation 15: IHPA should revise the process timeline to enable a later submission date (28 February) and earlier release of costing data (separate from NEP release)

In the short term, until jurisdictions and hospitals have made and put in place improvements to the costing process, IHPA and the NHCDC Advisory Committee should weigh the benefits that a later, ie 28 February, submission date may allow for higher quality of data submission with the detrimental impacts this will have on the timeliness and usefulness of the released data.

In the long term, jurisdictions, LHNs and hospitals should seek to improve processes to enable greater efficiency in submitted data to IHPA, for example, by implementing the validation rules into costing systems to reduce delays around quality assurance iterations. The implementation of the recommendations included in the other sections of this report around the standards, quality framework and communication will all contribute towards streamlining and improving the process and ultimately, the timeline.

In addition, IHPA should release costing data as soon as practical once they have carried out the necessary validation and quality checks, irrespective of the timelines surrounding the NEP.

12 Dates provided by IHPA.

# 8 Private sector

This section of the report focuses on the Private Sector and contains the Strategic Review findings on the Private Sector within the themes of Purpose, Governance, Inputs and Processes, and Outputs.

## History of the Private Sector NHCDC

Round 1 of the NHCDC was conducted in 1996 with voluntary participation for the private sector. Despite the voluntary nature of participation, sufficient numbers of private hospitals participated to publish results from round 1 (1996–97) through to round 7 (2002–03) and from round 11 (2006–07) through to 13 (2008–09). The gaps between round 7 and round 16 were due to the Commonwealth deciding that the participation rates were too low to result in a valid and representative result, and prompted additional resources to be provided by the Department in the form of a Coordinator to address specific industry issues. The most recent Collection, round 16 (2011–12), achieved sufficient participation levels and is due to be released immanently.

**Table 3. Private sector participation in NHCDC**

| | Round 7 (2003–04) | Round 11 (2006–07) | Round 12 (2006–07) | Round 13 (2008–09) | Round 16 (2011–12) |
|---|---|---|---|---|---|
| **Number of hospitals** | **113** | **82** | **109** | **110** | **105** |
| **Number of separations** | **65%** | **59%** | **72%** | **71%** | **66%** |

A Private Sector NHCDC report[13] was produced in September 2012 which revealed that the sector felt there was value in having a private sector Collection, although the definition and perspective of that value was varied and dominated by concerns regarding the commercial sensitivity of the published data.

The key concern was the commercial sensitivity of the published data and the negative impact that detailed published data could have on negotiations with private health insurers. The visibility over the comprehensive cost breakdown within each component group was believed to create a competitive disadvantage to hospitals in price negotiations with the insurers, and created a tense purchaser–provider relationship. The report also revealed that the Commonwealth saw a strategic imperative in the continuation of the Collection and access to the dataset for future analysis, and that the publication of the cost weight relativities was needed to facilitate the operation of the market between the health funds and the private hospitals.

During consultations for this review, many private sector stakeholders report using previous NHCDC data for funding model purposes, fund negotiations, benchmarking, and analysing margins; however, there was concern at the considerable amount of time that has passed since the last private sector NHCDC submission and subsequent reports.

13 Private Sector Hospital Cost Data Collection Report on participation levels and publication options, 5 September 2012.

## 8.1 Finding P1 – Consistency and regularity of private Collections is needed

**Improving the consistency and regularity of the private sector Collection will enhance the usefulness of the data.**

Consultations with the Private Sector and relevant peak bodies reiterated the strategic importance of the Collection for a range of uses – predominantly for modelling of revenue by hospitals for health fund negotiations but also for benchmarking and understanding the costs of inputs and weights, case mix analysis, and providing data for establishing Public Private Partnership models.

Despite the varied uses, the value of the dataset is being hampered by the infrequent publication of previous rounds, concerns about the quality of the data, inconsistent application of data, and a high volume of participants providing cost-modelled data. A key issue is that for certain health funds, price weights are still being based off the Round 7 (2003–04) NHCDC using AR-DRG V4.2.

As a voluntary Collection, the perceived value of the Private Sector NHCDC by providers is important because it drives likely future participation.

Stand-alone day only facilities have not participated since Round 13 (2008–09) due to resource constraints and challenges providing the required submission data.

**Recommendation 16 – IHPA should continue to work collaboratively with the private sector to promote participation.**

IHPA should work with the sector, through the engagement of the peak bodies or the NHCDC Advisory Committees, to address their concerns and achieve consistent and sufficient participation levels for future rounds. The matters that need to be addressed include:

Early notice of timelines and timely publication of each round

Upfront agreement on what will be published and the amendments to the costing standards that will address the concerns of the Private Sector (see recommendations 11, 12 and 13).

## 8.2 Finding P2 – The private TWG was not effective

**The former private sector TWG was not viewed as effective due to weak dispute resolution processes and its function being unclear.**

The Private Sector Technical Working Group (TWG) was disbanded by the Commonwealth during the round 14 Collection and data analysis phase. Interviewees who were part of the former group felt that the failure of the TWG was as a result of not having an established mechanism to resolve issues.

Stakeholders felt that the functions of the former group were unclear and too focused on technical matters without being representative of the sector's diversity (such as stand-alone day hospital facilities, not-for-profit and for-profit entities of varying sizes).

There was consensus across all consultations that the re-establishment of a working group would be useful in improving the Collection process and output.

While there are core differences and challenges in comparability between the public and private sector, it was recognised in the Productivity Commission that:

> *"points of differences between the sectors should not necessarily preclude a comparative assessment, but serve to highlight the factors that must be taken into account in the assessment, and may potentially signal areas of relative efficiency."* [14]

**Recommendation 17 – The NHCDC Advisory Committee should include private sector representation and consider whether a separate private sector working group should be established.**

## 8.3 Finding P3 – Perception that AHPCS lack relevance for the private sector

**Issues specific to the private sector need to be addressed.**

The views expressed by most of the Private Sector stakeholders were that the Australian Hospital Patient Costing Standards (AHPCS) were written for the public sector and lack clarity around key areas of concern to the private sector (for example, treatment of corporate costs and the different treatment of taxes between a not-for-profit and for-profit hospital).

**Recommendation 18 – IHPA should address private sector concerns about the relevance of the AHPCS.**

Section 6 of this report sets out a number of improvements that should be made to the AHPCS. In addition, we recommend that private sector concerns around corporate costs and taxes are addressed as part of the revision to the standards.

## 8.4 Finding P4 – The private sector does not see value in participating in a voluntary NHCDC

**Current participants will want greater industry involvement in the Collection to maintain participation.**

An analysis of the minimum sample size for the Private Sector NHCDC was included within the Private Sector NHCDC report [15] released in September 2012. The number of separations, number of hospitals and number of hospital groups required to participate were calculated. It was concluded that for overnight hospitals, approximately 60% of all separations would be required in order to achieve a 95% confidence level and 4% acceptable margin of error.

Additionally, the Collection should include approximately 90 hospitals and 10 hospital 'groups' (of 2 or more hospitals) to be representative.

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14 Public and Private Hospitals Productivity Commission Research Report, December 2009, Section 4.1 – Similarities and differences between public and private hospitals in the health system.

15 Private Sector Hospital Cost Data Collection Report on participation levels and publication options, 5 September 2012.

For stand-alone day hospitals, the minimum participation level was determined to be 37% to achieve a 95% confidence level and 5% margin of error. Additionally, the Collection should include approximately 23% of all private stand-alone day hospitals, ie 55 hospitals based on the 2010–11 population of private stand-alone day hospitals, with coverage achieved across a mix of large and small day hospitals across major cities and non-major cities.

**Recommendation 19 – IHPA should work with the overnight and stand-alone day facilities to ensure minimum participation levels are reached for future rounds.**

While Round 16 (2011–12) exceeded the target of 60% of separations for overnight facilities, a number of the concerns of the sector that are included within this section will need to be addressed to guarantee their participation in future rounds. IHPA will also need to work with the Australia Day Hospital Association (ADHA) to rally the participation of the stand-alone day facilities for future rounds.

## 8.5 Finding P5 – Published cost outputs need to recognise the commercial sensitivity of information

**The format for Round 16 publication has gained industry support by limiting publication of commercially sensitive information.**

The September 2012 report identified that the key concern of the sector in regards to participation in the Collection was the commercial sensitivity of the published data and the negative impact this published data has on negotiations with private health insurers.

As a result, the Round 16 (2011–12) public report was limited to publishing only cost weights for four specified cost buckets (Total; Existing Operating Room and Specialist Suites; Critical Care; and Miscellaneous – consisting of Ward Medical, Pathology, Imaging, Emergency and Prostheses[16]). These cost buckets were developed and agreed to with industry participants who in turn guaranteed their participation in the Round 16 Collection.

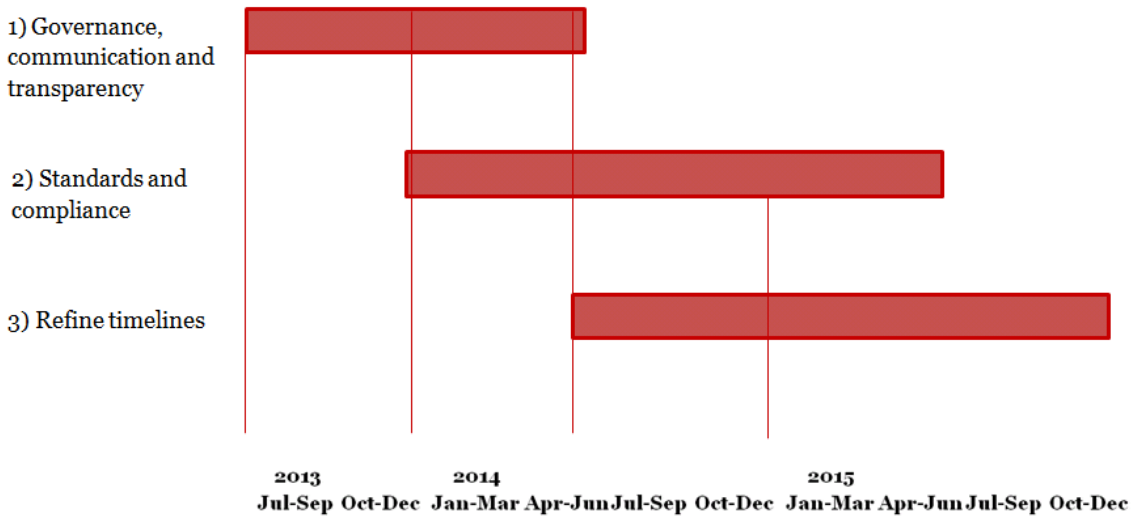
**Recommendation 20 – IHPA should work together with the private sector to develop an acceptable format for the published data set for future years and recommend this to the Pricing Authority through the IHPA CEO.**

IHPA will need to work with the participants to agree on the format and inclusion of the published dataset for future rounds. The output should represent a consensus view of useful information while still maintaining the commercial sensitivity of the data with respect to health fund negotiations.

16 A number of stakeholders expressed that the merger of Prostheses cost weight within the Miscellaneous cost bucket inhibited the usefulness of the published dataset.

# 9 Implementation map

The recommendations have been separated into three key groupings and time horizons to provide further structure and priorities to the implementation plan as illustrated below.




The workplan below has been provided as an indicative implementation schedule of all recommendations and their prioritised implementation order in order to address the findings of this review.

| Recommendation | 2013 | | 2014 | | | | 2015 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Jul - Sep | Oct - Dec | Jan - Mar | Apr - Jun | Jul - Sep | Oct - Dec | Jan - Mar | Apr - Jun | Jul - Sep | Oct - Dec |
| **Governance, communication and transparency** | | | | | | | | | | |
| **1** The NHCDC's strategic purpose and role in pricing and benchmarking should be formally defined and communicated by IHPA | | | | | | | | | | |
| **2** The governance of the NHCDC should rest with IHPA under a reconstituted NHCDC Advisory Committee that reports through IHPA Executives to the IHPA Board. Representation should include jurisdictions and specific industry and skills-based appointments. | | | | | | | | | | |
| **3** IHPA should develop a data governance framework, leveraging best practice principles to more clearly define its custodianship of data | | | | | | | | | | |
| **4** IHPA should design and implement a communications plan associated with the annual cycle of the NHCDC process in collaboration with the NHCDC Advisory Committee and the JAC. | | | | | | | | | | |
| **5** The NHCDC Advisory Committee should review the costing quality framework to determine its appropriateness for cost data validation and distribute it for industry consultation and adoption. | | | | | | | | | | |
| **6** As part of IHPA's communication planning, the NHCDC Advisory Committee and the JAC should advise the Pricing Authority what public reporting will best meet the needs of all users of the NHCDC. | | | | | | | | | | |
| **Standards and Compliance** | | | | | | | | | | |
| **7** IHPA should work with the NHCDC Advisory Committee to identify all necessary cost, demographic and activity data elements and compare these against other established data sets to develop a workplan toward single submission, multiple use. | | | | | | | | | | |
| **8** IHPA should confirm to all jurisdictions that cost data supplied at the cost area and item level should be maintained and Date of Service is no longer necessary for IHPA purposes. | | | | | | | | | | |
| **9** The NHCDC Advisory Committee should advise the Pricing Authority on use of intermediate product costing in identifying clinical variation and engaging clinicians. | | | | | | | | | | |
| **10** IHPA should encourage high participation for benchmarking purposes and annually refine sampling techniques for price weight setting. | | | | | | | | | | |
| **11** IHPA and the NHCDC Advisory Committee develop processes for industry involvement in standards development and quality and compliance frameworks as per Recommendation 5 | | | | | | | | | | |
| **12** The NHCDC Advisory Committee should review as a priority the version 3 AHPCS standards and make a recommendation to the Pricing Authority. | | | | | | | | | | |
| **13** The NHCDC Advisory Committee should consider developing guidance, consistent with other recommendations in this review, to enhance nationally consistent skills and knowledge on costing methodology | | | | | | | | | | |
| **14** IHPA should conduct cost studies to analyse the efficacy of the various methods of cost allocation which could then inform a cost allocation quality compliance framework | | | | | | | | | | |
| **Timeline and Private Sector** | | | | | | | | | | |
| **15** IHPA should revise the process timeline to enable a later submission date (28 February) and earlier release of costing data (separate from NEP release). | | | | | | | | | | |
| **16** IHPA to work together with the private sector to drive participation levels | | | | | | | | | | |
| **17** The NHCDC Advisory Committee should include private sector representation and consider whether a separate private sector working group should be established | | | | | | | | | | |
| **18** Private Sector concerns are addressed within the revision of the AHPCS | | | | | | | | | | |
| **19** IHPA will need to work with the overnight and stand-alone day facilities to ensure minimum participation levels are reached for future rounds | | | | | | | | | | |
| **20** IHPA to work together with the sector to determine the format of the published dataset for future years | | | | | | | | | | |

# *Appendices*

# Appendix A List of abbreviations

| Acronym | Definition |
|---|---|
| ABF | Activity Based Funding |
| AHPCS | Australian Hospital Patient Costing Standards |
| AHMAC | Australian Health Ministers' Advisory Council |
| AHSA | Australian Health Services Alliance |
| AIHW | Australian Institute of Health and Welfare |
| APHA | Australian Private Hospital Association |
| CCSAA | Clinical Costing Standards Association of Australia |
| CHA | Catholic Health Australia |
| COAG | Council of Australian Governments |
| DoHA | Department of Health and Ageing |
| DRG | Diagnosis-related group |
| DVA | Department of Veteran Affairs |
| JAC | Jurisdictional Advisory Committee |
| LHN | Local hospital network [also known as Local Hospital District (LHD); Hospital and Health Service (HHS), Tasmanian Health Organisations |
| NEP | National Efficient Price |
| NHPA | National Health Performance Authority |
| NPHE | National Public Hospital Establishments |
| NHRA | National Health Reform Agreement |
| NMDS | National Minimum Data Set |
| NWAU | An NWAU is a measure of health service activity expressed as a common unit, against which the national efficient price (NEP) is paid. It provides a way of comparing and valuing each public hospital service (whether it is an admission, emergency department presentations or outpatient episode), by weighting it for its clinical complexity [17] |
| RFT | Request for tender |
| RVU | Relative Value Unit |
| TAC | Technical Advisory Committee |
| TWG | Technical working group |

17 Source – http://www.publichospitalfunding.gov.au/national-health-reform/reporting-calculation-nwau

# Appendix B Stakeholder list

The following is a list of stakeholder details who participated in the NHCDC review consultations between 7 March and 30 April 2013.

### ACT Health

Stephen Goggs
Phil Ghirardello
Winston Piddington
Patrick Henry
Indra Silins Prithya
Patrick Henry
Kelly Hughes

### Australian Day Hospital Association (ADHA)

Jane Griffiths
Romy Baker

### Australian Healthcare & Hospitals Association (AHHA)

John Deeble

### Australian Health Ministers' Advisory Council (AHMAC)

David Filby

### Australian Health Services Alliance (AHSA)

Brian Hanning
Nicole Predl

### Australian Institute of Health & Welfare (AIHW)

Jenny Hargreaves
George Bodilsen
David Braddock
Adrian Webster

### Australian Private Hospital Association (APHA)

Lucy Cheetham

### Barwon Health, public hospital, VIC

Ross Arblaster

### Cabrini Health, private hospital

David Phillips

### Calvary Hospital

Thaya Ras

### Canberra Hospital

David Dowling

### Catholic Health Australia (CHA)

Patrick Tobin

### Catholic Negotiating Alliance (CNA)

Kylie Keates
Judith Wenborn

### Central Adelaide Local Health Network, SA

David Rawson

### Clinical Costing Standards Association of Australia (CCSAA)

Christopher Jackson
Peter Davey

### Colac Community Health Services, VIC

Jennifer Labourne

### Consultant/Health Roundtable

Chris O'Gorman

### Department of Health & Ageing (DoHA)

Kerry Flanagan
Janet Anderson
Richard Hurley

### Department of Health Services, Tasmania

Michael Pervan
Kevin Ratcliffe
John Smith
Julie Crowe
Ian Jordan
Val Whelan
Peter Russell

### Department of Health Victoria

Frances Diver
Amy McDowell
Bruce Prosser

Christopher Jackson
Daniel Borovnicar
Tyrone Patterson
Cathy Ma

### Department of Veteran Affairs (DVA)

Sarah Stephens
Leo Flynn
Patrick McLeish
Mark Mitchell
Tracy Whitmore
Mark Caczmarek

### Health Policy Analysis

Jim Pearse

### Healthscope Group, private hospital

Tyson Fowler

### Illawarra Shoalhaven LHD, NSW

Clark Chambers

### Independent Hospital Pricing Authority (IHPA) Staff

Tony Sherbon
James Downie
Karen Chudleigh
Joanne Siviloglou
Bruce Cutting
Trent Yeed
Phuong Nguyen

### Independent Hospital Pricing Authority (IHPA) Board

Shane Solomon
Jim Birch
Alan Bansemer
Jane Hall
Alan Morris
Bruce Chater
Glen Appleyard
Michael Walsh

### IHPA Mental Health Working Group

*36 members

## IHPA Subacute Working Group

*36 members

## KPMG, Cost Data User

John Pilla
Steve Gillett

## Key Informants

Stephen Duckett
Ric Marshall

## Medibank Private

David MacQueen

## Murrumbidgee LHD, NSW

Sharon McFarlane

## NSW Ministry of Health

Alfa D'Mato
Grantly Hunt
Katherine Katz
Brian Woods
Julia McGinty
Neville Onley
Harshall Naik
Sue-Ellen Fletcher
Mahendra Sharen
Stephen Guy
Roger Holt

## North West – THO, TAS

Gavin Austin

## NT Health

Amanda Lanagan
Jo Wright
Kristy Annesley
Geoff Thomson
Penny Fielding

## PowerHealth Solutions

Patrick Power

## Productivity Commission

John Garde

## Queensland Health

Paul Mcquire
Nick Steele
Gerry Wyvill
Colin McCrow
Bill Stomfay

## QLD hospitals & HHSs

Brett Oates-Northwest – Mt Isa
Erica Cole-Gold Coast
Steve Robinson-Gold Coast
Debbie Wenzel-West Moreton
Roslyn Coupland-West Moreton
Lynette Gill-West Moreton
Ian Wright-West Moreton
Sharyn Wilson-West Moreton
Geri Wardrope-Metro North
Delma Sellers-Mackay
Kaylene Gibb-Townsville
Liz Lea-Townsville
Katrina Smith-Metro South

## Ramsay Group

Mati Tabur

## Sir Charles Gairdner Hospital, WA

Alain St Flour

## St Vincents Hospital, NSW

Naomi Beveridge

## SA Health

Jenny Richter
Kym Piper
Krystyna Parrott
Phillip Battista
David Swan

## South Metropolitan Health Service, WA

Ian Male
Rinaldo Ienco

Kevin Trentino
Adam Lloyd
Diana Carlsson

### Southern Adelaide Local Health Network, SA

Vanessa Rowley

### Syris Consulting, costing Vendor

Simon Rush

### University of Wollongong, Centre for Health Service Development

Kathy Eager
Rob Gordon
Janette Green
Louise Lago

### Visasys, costing vendor

Alan Hodkinson

### WA Health

Dorothy Jones
Beress Brooks
Gerard Montague
Kevin Frost

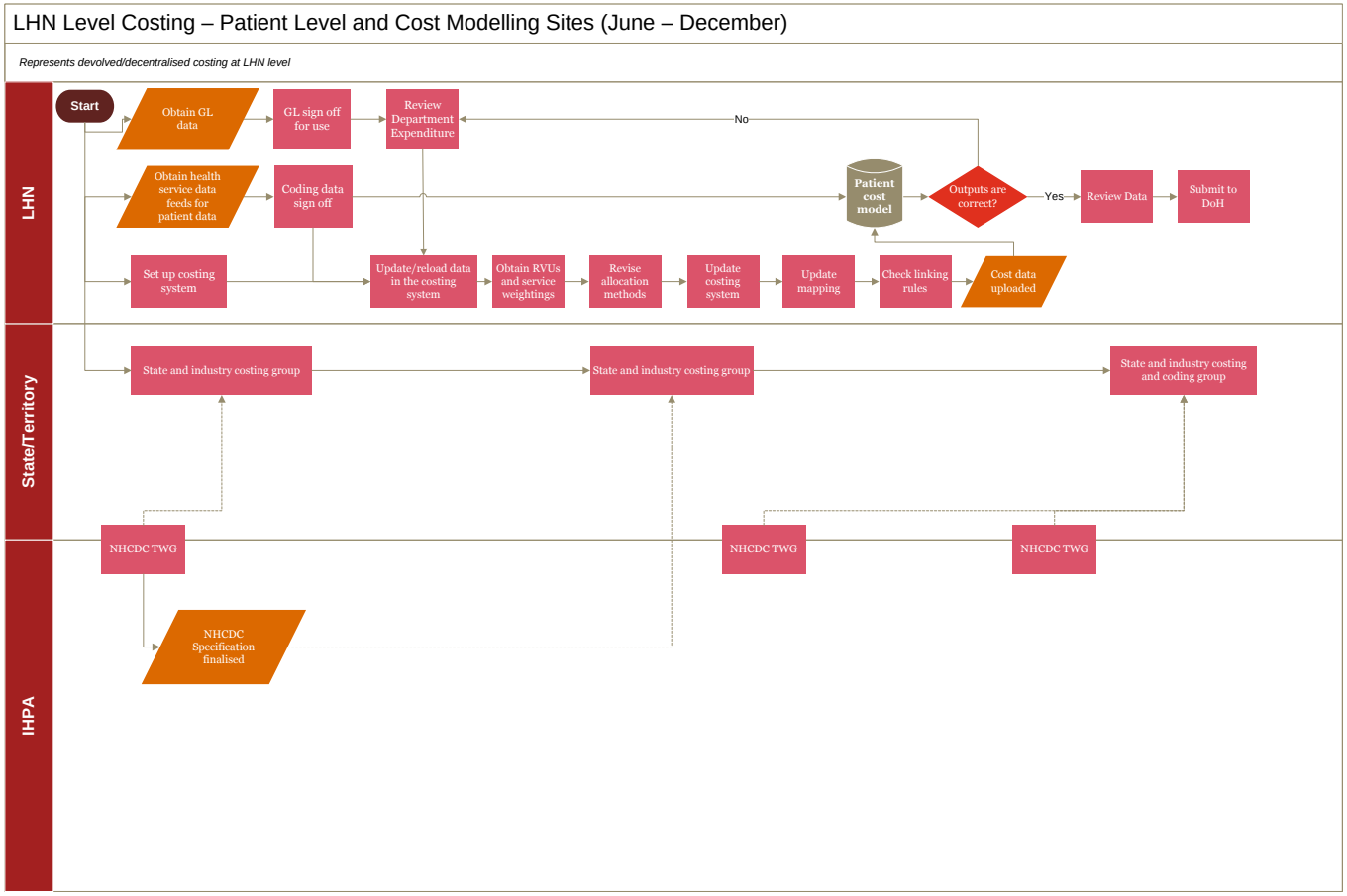
### Western NSW LHD

Steve Shea
Karen Storey
Anne Lee

### Women's and Children's Hospital, NSW

Christine Fan
Cheryl McCullagh

# *Appendix C Current state process maps of the NHCDC process*

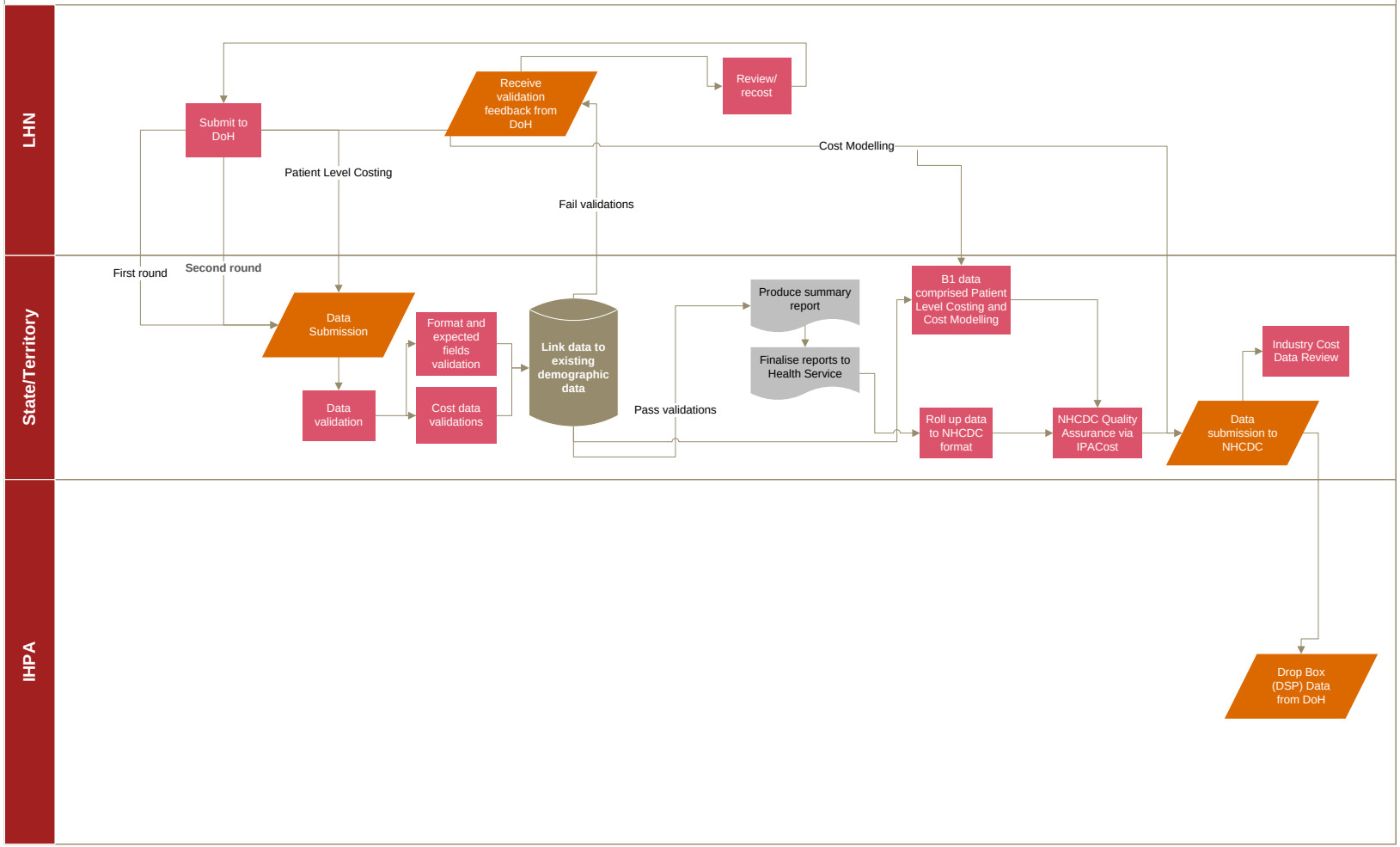



pwc.com.au

| Legend | |
|---|---|
| Legend Subtitle | |
| Symbol | Description |
| | Process |
| | Decision |
| | Terminator |
| | Data |
| | Data Store |

# State Health Department Validation and Sign Off (December – April)

*(Costing is performed at LHN Level), data is submitted do DoH, DoH performs the data validation & transformation for NHCDC submission*

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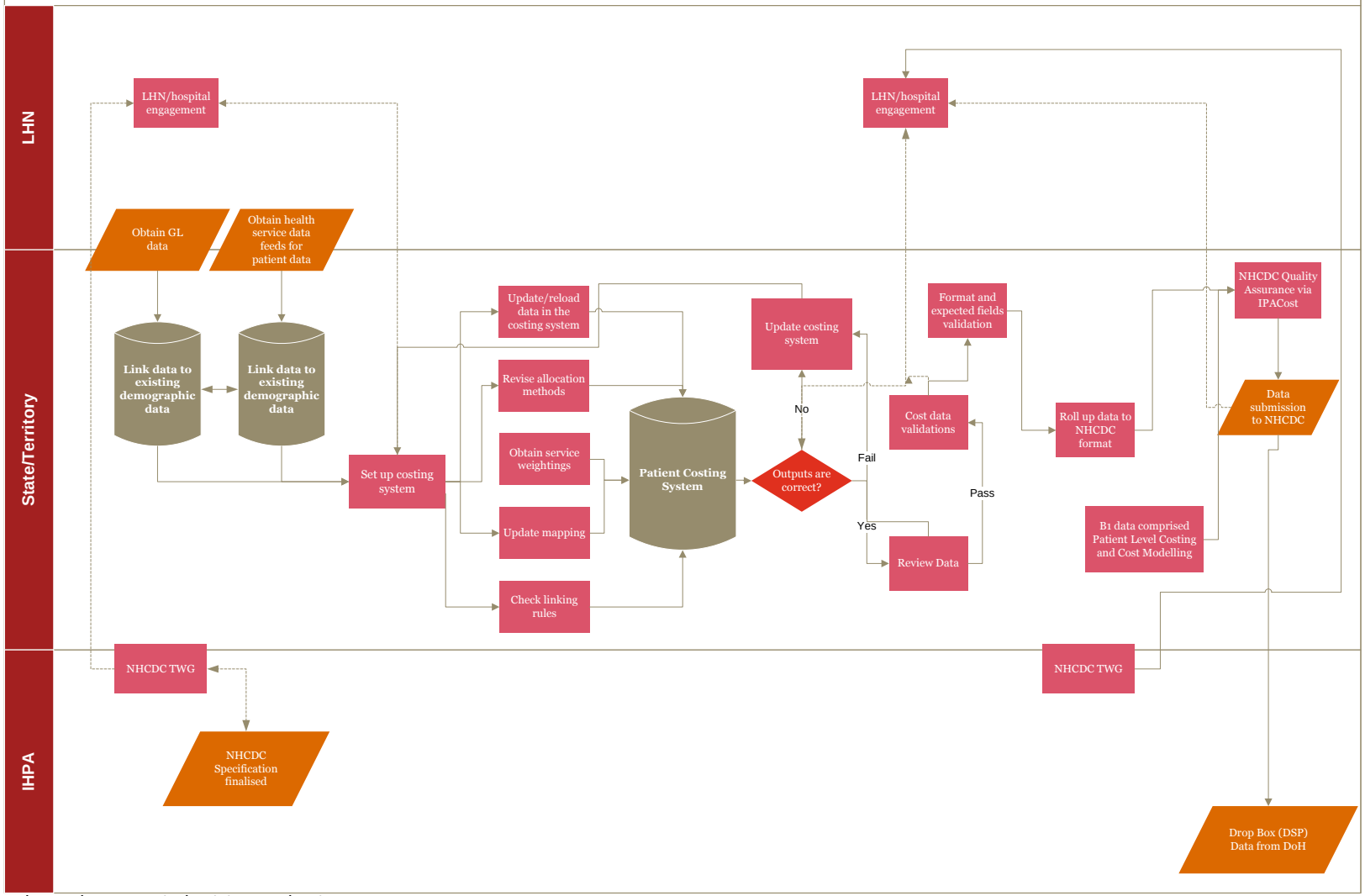
| Symbol | Description |
| | Process |
| | Decision |
| | Terminator |
| | Data |
| | Data Store |

# State Health Department Costing, Validation and Sign Off (June – April)

*(Costing is performed at State Level). Costing system is hosted centrally. Validation and transformation is undertaken by DoH*

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| Symbol | Description |
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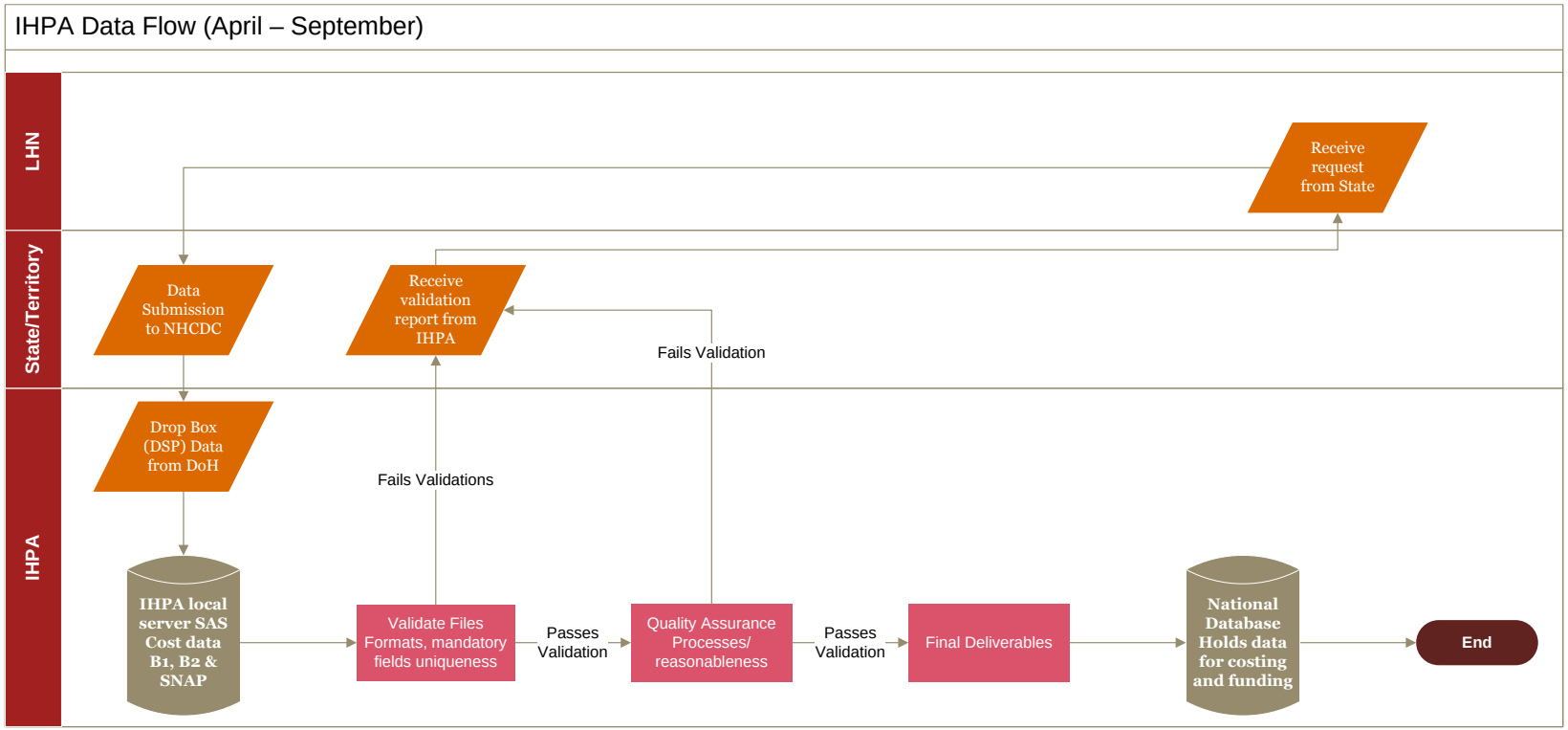
| | Decision |
| | Terminator |
| | Data |
| | Data Store |

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|---|---|
| Legend Subtitle | |
| Symbol | Description |
| | Process |
| | Decision |
| | Terminator |
| | Data |
| | Data Store |

# Appendix D Research questions

## Purpose and Objectives of the NHCDC

Are the current purpose and objectives of the NHCDC appropriate given the changes in health reform and subsequent reliance on the NHCDC? If no, please articulate revised statements for each objective:

- Produce robust estimates of hospital costs and casemix relativities
- Provide continual refinement in the costing of hospital products
- Provide a platform for inter and intra-state comparison of hospital costs
- Promote a framework for national hospital costing standards
- Encourage hospitals to examine their cost structures and produce costing information'
- Develop an effective hospital costing infrastructure at Commonwealth, State and local levels
- Provide data to inform the ongoing refinement of casemix classification.

## Governance

- Is the accountability around the NHCDC appropriate, if not what needs to be done to improve accountability?
- Is it appropriate to continue to have the NHCDC Technical Working Group, if not what (if any) structures should replace it?
- Should the current membership be expanded beyond states and territories, IHPA and the Commonwealth Department of Health and Ageing?

## NHCDC inputs

### Methodology

- Are there enhancements to the NHCDC that would improve its usage in developing the NEP? If so, what are they?
- Are there any additional processes that could be implemented to achieve a more consistent approach of costing hospital services resulting in a more robust Collection?

### Data items

- Is there a need for additional data items to support the development of the NEP? For example should information about Consultation Liaison Services or private patients in public hospitals be collected and reported routinely? If so what is the feasibility of collecting such data and how should it be collected – within the NHCDC or as a separate dataset?

- What level of detail should the NHCDC be collecting? Is the current level of detail too granular? Are there areas to reduce duplication, and how? Should the specifications be amended? Should there be a maximum file size?
- Are there improvements that can be made in the application of technology to collect the NHCDC data? If so, what types of changes are required?
- How can links be established between NHCDC and other NMDS datasets to ensure that data collections become more consistent and streamlined? Could linking keys be provided to activity data that has already been submitted, rather than re-submitting it with NHCDC?

### *Sample size*

- What is the optimum number of participating hospitals and subsequent activity levels to achieve a justifiable result? Should IHPA only seek cost data from a limited number of hospitals that meet the Australian Hospital Patient Costing Standards or should IHPA seek to continually expand the scope of hospitals included? Should it be agreed to expand the scope of the NHCDC and design a framework to determine the cost benefit analysis of such expansions?
- Non-participating hospitals – Should additional cost data be collected from non-participating hospitals? If so, at what frequency and format should this data be collected?

**Standards** – Are there areas for improvements to the Australian Hospital Patient Costing Standards that will increase the consistency of costing hospital services? If so, provide specific areas that require improvements or additions.

**Other documentation** – Are there improvements that can be made to the documentation of the NHCDC? If so, what are they?

**Patient costed or Cost modelled data** – Given that there is a shift towards patient costed data submission, what percentage of data is acceptable from cost modelled sites, in comparison to patient level data submissions?

### *Sample of hospitals*

- Sample size – What is the optimum number of participating hospitals and subsequent activity levels to achieve a justifiable result? Should IHPA only seek cost data from a limited number of hospitals that meet the Australian Hospital Patient Costing Standards or should IHPA seek to continually expand the scope of hospitals included? Should it be agreed to expand the scope of the NHCDC and design a framework to determine the cost benefit analysis of such expansions?
- Patient costed or Cost modelled data – Given that there is a shift towards patient costed data submission, what percentage of data is acceptable from cost modelled sites, in comparison to patient level data submissions?
- Non-participating hospitals – Should additional cost data be collected from non-participating hospitals? If so, at what frequency and format should this data be collected?

### *Reporting*

- Is there additional information required by stakeholders to understand the link between the NHCDC output and the NEP, if so, how should this be communicated?

- Should the NHCDC be available via a national benchmarking tool, if so, what elements should be benchmarked and should IHPA have a role in running this service?
- Are the stakeholders receiving the costing information they need from the NHCDC? If not, what needs to be done to improve communication?
- At what point does the underlying data become sufficiently robust to warrant a publication of reports and tools, should the review deem them to be beneficial?

### *Technical requirements*

- What level of detail should the NHCDC be collecting? Is the current level of detail too granular? Are there areas to reduce duplication, and how? Should the specifications be amended? Should there be a maximum file size?
- Are there improvements that can be made in the application of technology to collect the NHCDC data? If so, what types of changes are required?
- How can links be established between NHCDC and other NMDS datasets to ensure that data collections become more consistent and streamlined? Could linking keys be provided to activity data that has already been submitted, rather than re-submitting it with NHCDC?

### *Quality of data*

- Should there be a Quality Framework for the NHCDC, what should it contain?
- Should the annual NHCDC external review (currently a sample of NHCDC hospitals) be undertaken in isolation to coding and activity reviews?
- Which is more effective – external review, peer review or self – assessment? Should a combination or all three be conducted, and if so how often?
- Should a framework be established to determine whether a particular cohort of the Collection is over or under represented, or whether poor data quality for a particular LHN may warrant exclusion from the NEP calculation?
- Are there any additional processes that could be implemented to achieve a more consistent approach of costing hospital services resulting in a more robust Collection?

### *Current barriers*

- What are the current barriers to improving hospital costing throughout Australia? How should these be addressed?

# Appendix E Consultation guide

| Topic | Question No. | Question |
|---|---|---|
| **Objectives** | **1** | **Importance/value/purpose of the NHCDC in the context of ABF reforms?** |
| **Objectives** | **2** | **Achieving the purpose/objectives of the NHCDC?** |
| **Objectives** | **3** | **Evolution of the NHCDC?** |
| **Objectives** | **4** | **Does the Collection provide a robust estimate of hospital costs and national relativities? If not, what are the key challenges and how could they be improved?** |
| **Objectives** | **5** | **Scope of hospitals that should be included in the Collection?** |
| **Governance** | **6** | **Views on the governance arrangements regarding the NHCDC – are they appropriate?** |
| **Governance** | **7** | **Membership and functioning of the NHCDC Technical Working Group?** |
| **Governance** | **8** | **Formal review process for these cost data, for example: who is involved, who signs it off before it is sent to IHPA?** |
| **Governance** | **9** | **Roles and accountabilities for the inputs and processes related to the Collection clear?** |
| **Governance** | **10** | **Views on the current quality framework around the NHCDC ? How could it be improved/modified?** |
| **Governance** | **11** | **Views re: the annual NHCDC external review?** |
| **Inputs/processes** | **12** | **Is the methodology underpinning the NHCDC is fit for purpose?** |
| **Inputs/processes** | **13** | **Do the Australian Hospital Costing Standards provide the platform to robust costing?** |
| **Inputs/processes** | **14** | **Is the sample size of the Collection adequate? If not what is the optimum number of participating hospitals and subsequent activity levels to achieve a justifiable result?** |
| **Inputs/processes** | **15** | **What should be considered regarding the sampling frame to ensure a representative/robust Collection for the NEP?** |
| **Inputs/processes** | **16** | **Should additional cost data be collected from non-participating hospitals?** |
| **Inputs/processes** | **17** | **Are there specific issues in current data provision which should be addressed?** |
| **Inputs/processes** | **18** | **What level of data should the NHCDC be collecting?** |
| **Inputs/processes** | **19** | **Are there ways to make the Collection process more efficient?** |
| **Inputs/processes** | **20** | **Are there issues regarding the timing of the process ? If so, what could be done to improve the process?** |

| Topic | Question No. | Question |
|---|---|---|
| **Inputs/processes** | **21** | **Views on the current specification?** |
| **Inputs/processes** | **22** | **Are there improvements that can be made to the documentation of the NHCDC? If so, what are they?** |
| **Inputs/processes** | **23** | **Overview of process for cost data collection from the time the data is extracted from the GL to the point where it is submitted to IHPA** |
| **Inputs/processes** | **24** | **How sound is the costing infrastructure to meet the requirements of the NHCDC?** |
| **Inputs/processes** | **25** | **Views of patient costing v cost modelled sites in its use for an NEP?** |
| **Inputs/processes** | **26** | **Are there enhancements to the NHCDC that would improve its usage in developing the NEP?** |
| **Outputs** | **27** | **Current use of outputs of the NHCDC?** |
| **Outputs** | **28** | **View of the extent of reporting and its robustness?** |
| **Outputs** | **29** | **Are the outputs sound enough to inform inter and intra state comparisons?** |
| **Outputs** | **30** | **Validation the outputs of your cost data submission?** |
| **Outputs** | **31** | **Does the NHCDC reporting need to include a national benchmark tool?** |
| **Outputs** | **32** | **Are the current reports produced by the NHCDC are adequate for stakeholders?** |
| **Outputs** | **33** | **What is the value in publishing the National Cost Weights? Who uses them and what do they use them for?** |
| **Outcomes** | **34** | **To what extent has the Collection encouraged hospitals to examine their costs and costing information? What opportunities are there for the Collection to further support this?** |
| **Outcomes** | **35** | **Has the Collection or should the Collection support the refinement of "all products" costing ? If so, how?** |
| **Outcomes** | **36** | **Does the current submission support ongoing casemix classification refinement?** |
| **Outcomes** | **37** | **How well are the standards adhered to? Suggestions regarding getting consistency across jurisdictions?** |
| **Outcomes** | **38** | **What are the current barriers to improving hospital costing throughout Australia? How should these be addressed?** |

# Appendix F Submissions and additional reference materials

## Submissions

Submission from Austin Health, "CCSAA views on the matters relating to the NHCDC"

Submission from Acute Care Division, Department of Health and Ageing, "Issues to be raised in the NHCDC Strategic Review"

Submission from Syris Consulting, "Response to the National Hospital Cost Data Collection Review"

Submission from Health Policy Analysis, "NHCDC review – utilisation statistics, private patients, out of scope services and efficiency analysis"

Submission from Department of Health Victoria, "Proposals for Revisions to : VAED, VEMD, ESIS, VINAH and AIMS for 1 July 2013"

Submission from Department of Health Victoria, "Proposed NHCDC Annual Changes Process Flow", draft only, last updated 27 March 2013"

Submission from The Children's Hospital at Westmead, "Costing Review, New South Wales Health, by PowerHealth Solutions (released 12 Oct 2011)"

Submission from The Children's Hospital at Westmead, Outpatient Costing, a presentation deck by Activity based Funding Taskforce

Submission from The Children's Hospital at Westmead, 'Treating paediatric hydrocephalus in Australia : a 3 year hospital based cost analysis and comparison with other studies", a clinical article by Alan Chuong, Christine Fan and Brian Owler"

## Additional reference material

National Health Reform Agreement 2011, endorsed by Council of Australian Governments

National Health Reform Act 2011 (Act No. 9 of 2011 as amended)

Three Year Data Plan, released 28 June 2012, sourced from the IHPA website

Australian Hospital Patient Costing Standards version 2.0 – 1 March 2011

Draft Australian Hospital Patient Costing Standards version 3.0 (not publically released)

Development of the Australian Hospital Patient Costing Standards Version 3.0 – Review of Stakeholder Submissions prepared by HealthConsult Pty Ltd in March 2012

Clinical Costing Standards, sourced from Clinical Costing Standards Association of Australia (CCSAA)

Quality Assurance processing Manual and Quality Assurance Template for Round 15 and Round 16 provided by IHPA

Review of Round 14 Submissions to the NHCDC Stage 2 report prepared by KPMG in September 2012

Independent Financial Review of the Round 15 (2010/11) National Hospital Cost Data Collection, prepared by KPMG in October 2012

The National Casemix Education Series, Department of Health, Housing, Local Government and Community Services (1993)

Hospital Reference Manual Round 1, released in September 1997 by the Department of Health and Ageing

Hospital Reference Manual Round 10 (2005 – 06), released in September 2006 by the Department of Health and Ageing

Hospital Reference Manual Round 11 (2006 – 07), released in September 2007 by the Department of Health and Ageing

NHCDC R15 cost reports, provided by IHPA

Costing Standards Compliance Check List for 2011/2012, provided by The Health Roundtable

Terms of reference including committee membership and minutes from the most recent NHCDC Technical Working Group, Jurisdictional Advisory Committee and Technical Advisory Committee meetings.

# Appendix G Summary of Round 1 NHCDC manual to current strategic issues

The table below provides a summary of the key strategic issues and the related information from the original NHCDC Manual.

| Strategic issue | Related information from Round 1 NHCDC manual[18] |
|---|---|
| **Purpose of the Collection** | **Some expected uses of the Collection results:**<br>• Payment systems for hospitals – **to contribute to computing up-to-date averages of DRG costs for use by purchasing agencies (state health authorities, private insurers, etc) in setting reasonable funding and payment rates:**<br>– **Changing the cost weights used by State X in its budget-share funding model**<br>– **Updating private insurance benefits to take account of clinical practice changes**<br>– **Establishing the basis for payments between States for cross-boundary flows**<br>– **Estimating the costs of hospital care for the Coordinated Care Trials**<br>• Resource allocation within the hospital – **to provide each hospital with information relevant to its own internal resource allocation processes (including the setting of departmental and clinical budgets):**<br>– **Setting the rates to be paid by clinical departments for the hospital's pathology services**<br>– **Establishing a contract between renal service providers and a hospital group**<br>– **Defining a contract between the Physiotherapy Dept and the Orthopaedics Dept**<br>• Finding resource use problems – **to help each hospital to find and resolve its own cost problems (by comparison against peer group averages, and in other ways):**<br>– **Comparing costs of DRG 672 at this hospital and other well-managed hospitals**<br>• Payment systems – **to benchmark against peer hospitals in other states (eg paediatric hospitals):**<br>– **reconciliation of payments and costs at DRG level.** |

18 Note: the information provided below has been extracted from the reference manual

| Strategic issue | Related information from Round 1 NHCDC manual[18] |
|---|---|
| | **It will measure average costs per separation during 1996-97 in a national sample of public and private hospitals, and component costs will be reported.** |
| **Representation and input** | **This Manual was developed by the Classification and Payments Branch, Commonwealth Department of Health and Family Services. Much assistance was provided by the State and Territory health authorities, and the Australian Private Hospitals Association. Finally, technical supervision was provided by the National Hospital Cost Data Collection Technical Advisory Group. Special acknowledgement is made to Don Hindle for his assistance in developing and preparing this manual.** |
| **Outputs** | **There will be separate reports for subgroups of hospitals, such as for public hospitals in a State or Territory. Private hospital results will also be reported separately, excepting where there would be risks to confidentiality.** |
| **Timing** | **All hospitals will be expected to send their key data to the Commonwealth by 30 November 1997 at the latest. The Commonwealth will then check the data, and send queries to each hospital for resolution as appropriate. After aggregating the data across hospitals, the Commonwealth will publish the final results by April 1998.** |
| | **We need to establish a routine annual cycle of updated costs, which reflects the continual changes in hospital input prices and clinical practice. This can only be done well if a valid standard methodology is applied as soon as possible.** |
| **Advice and guidance** | **This Manual is part of a package of materials which will be made available to all participating hospitals. The main contents of the package are as follows:**<br>• **This Manual – NHCDC Reference Manual**<br>• **COMBO software on disk, for those hospitals wishing to use it**<br>• **The user's guide for the COMBO software**<br>• **Casemix Education Series Volume 4: product costing**<br>• **Casemix Education Series Volume 4a: the costing bridge**<br>• **The National Health Data Dictionary** |

| Strategic issue | Related information from Round 1 NHCDC manual[18] |
|---|---|
| **Scope of costs** | **The aim is to include the costs of all types of resources used in the creation of the products in scope. The emphasis is on validity of the results, and this has two important implications:**<br>• **if a cost is relevant, but missing from your accounting data, you are asked to make a best estimate. For example, if the cost of statewide pathology services for your patients does not appear in your accounts, it must be added in.**<br>• **if a cost is in your accounts, but not relevant to this costing study, you are asked to exclude it. For example, if the cost of providing services to admitted patients at other hospitals is shown in your accounts, it needs to be removed. It relates to products which are not in scope (and presumably not included in your morbidity data).** |
| **Methodology** | **The Collection will involve the categorisation of all the main types of products of your hospital, and the allocation of all your costs among those products. However, only acute admitted patient products will be further sub-categorised (by DRG and by CMBS).** |

# Appendix H Best practice in data governance

## Data governance

Data governance is the specification and delegation of decisions and accountability in the creation, storage, use, archiving and deletion of data and information. In part it should be considered as part of the overarching governance and accountability framework of organisations as well as informing the roles and responsibilities for the People component of IM (as identified in the table above).

It is important for data governance to exist at every level in which data is created and used. Defining and establishing a data governance framework aims to enhance and support information reporting processes by:

- Standardising and consistently applying data definitions
- Identifying stakeholders, establish decision rights and clarifies accountabilities around data ownership
- Reducing operational ambiguities
- Protecting needs of data stakeholders
- Training management and staff to adopt common approaches to data issues and taking action as necessary on the basis of evidence
- Building standard, consistent and repeatable processes
- Reducing costs and increasing effectiveness through co-ordination of efforts
- Ensuring processes are transparent.

**Table: Key attributes and implications for establishing good information management**

| | Attributes | Description | Implications for Information Management (IM) and Reporting |
|---|---|---|---|
| People | **Clear roles and responsibilities for data** | **Roles descriptions with RACI tables (responsible, accountable, consulted, and informed) are provided at various governance levels. Integration with position descriptions should occur.** | **When issues with data quality or availability occur, the relevant accountable or decision making person can identify the appropriate staff for clarification/corrections.** |
| | **Appropriate authorisations** | **Each individual's profile must contain authorisations for all roles he/she is performing; the authorisation matrix must be kept up-to-date and accessible.** | **Not having appropriate authorisations will prevent role-based reporting and audit trails, which in turn creates more ad hoc work for IT and IM analysts.** |
| | **Skilled and trained** | **Key skills for each of the roles outlined must be defined and** | **Errors and omissions coming from inadequate skills can undermine data** |

| | Attributes | Description | Implications for Information Management (IM) and Reporting |
|---|---|---|---|
| | | **persons assessed against them; if gaps are identified, adequate training (eg technology or process) will be given.** | **quality in systems, resulting in cleansing and remediation challenges.** |
| Data Quality | **Integrity** | **A measure by which data adheres to defined business rules, accepted values and accepted formats** | **Roll ups and calculations cannot work if either the expected format or correctly calculated value isn't adhered to.** |
| | **Timeliness** | **All data entered into systems must be done by the responsible person on 'x' day of the month, to enable reporting to be done by 'y' day of the month.** | **Improves timeliness of performance reporting, in addition to surveillance and prevention reporting. If not data uploads will not run and information management reports may not be refreshed, meaning reports and source systems are out of synch.** |
| | **Accuracy** | **The level of assurance that data contains correct values. Accurate data not only adheres to integrity constraints but is data that reflects actuality.** | **The reports will show inaccurate totals and rollups/aggregations will not work.** |
| | **Consistency** | **A measure by which data adheres to a common definition for its meaning and use, and has the same format and look throughout the data sets uploaded from source systems eg applying formulas consistently to calculate denominators** | **Reports will not be comparable and users will lose faith in the new IM solution.** |
| | **Equivalence** | **The semantic equality of data that is stored in multiple locations, ie data stored in one system has to be equivalent to that stored in other systems.** | **Multiple records in reports and dashboards for the same patient.** |
| | **Completeness** | **All data from source systems required to populate tables in central repository is present in the upload.** | **Missing data will stop reports running properly, ie either coming back with error message or showing lots of blank/zero fields.** |
| Process | **Auditable** | **Data input and processes for correction need to provide full audit trails to source when data problems occur.** | **Allows for identification of process or people issues and increases the confidence of the accuracy and ability to validate data** |
| | **Controlled** | **All data processes need to have well defined controls that satisfy internal and external audit.** | **Issues and defects showing in the IM solutions cannot be rectified if the root cause cannot be identified via auditable, well-documented process flows.** |
| | **Documented** | **Process documentation must be** | **Documentation should be readily** |

| | Attributes | Description | Implications for Information Management (IM) and Reporting |
|---|---|---|---|
| | | **up-to-date, complete and easily accessible to all roles from the Data Governance table.** | **accessible and able to be updated as change occurs** |
| | **Streamlined** | **Processes should be designed for efficiency and free from repetitions and inputs that do not contribute to the output.** | |
| Systems | **Traceability/audit trail** | **User activity and data elements from all systems must be defined and available upon request from the designated data governance manager.** | **Not having these logs means that errors cannot be rectified as their source(s) cannot be confirmed.** |
| | **Centralised data repository** | **All building blocks of the systems as well as the connections between them must be documented in functional and technical specifications and accessible to responsible Data Quality Manager and/or IT staff.** | **Adding and/or amending a building block or connection can adversely affect a number of systems/reports and the root causes may not be identified.** |
| | **Secure and robust** | **All systems must provide security and robustness (eg backups, disaster recover, resilience, load and attack) as described in system specification documents.** | **If security and availability become an issue, the quality of data in the reports and its synchronisation with source systems reports cannot be maintained.** |
| | **Available** | **All systems must adhere to the business – defined availability levels as described in SLAs** | |

# Appendix I Minimum sample size for Acute Admitted price weights

## 1 Introduction

PwC was requested to perform an analysis of the minimum sample size for the public sector NHCDC as part of this strategic review. The question of sample size was viewed through two lenses: the first was with regard to the sample of hospitals used to set the NEP price weights; the second with regard to the size of the NHCDC. The predominant view was while all hospitals should participate in the NHCDC, not all should be used to set the price.

The Round 15 (2010/11) Public Sector Collection for acute admitted care consisted of 4,178,599 separations from patient-costed sites. The estimated population figure for acute admitted care in 2010/11 was 5.02 million separations. The population figure is derived from the Admitted Patient Care national minimum dataset, based on hospitals with at least 200 acute admitted separations in 2010/11 (including care type 7.0 for newborn care). This represents a participation rate of 83% (4.18 million/5.02 million), and a total participation rate of 87% when cost modelled sites are included.

The submission of patient-costed data by hospitals that are funded through ABF is higher than non-ABF hospitals: we have estimated that 87% of separations are patient-costed by ABF hospitals, compared to 83% across all hospitals.

The setting of minimum sample size requires consideration of the variation in costs at a patient-level. Therefore, the remainder of the analysis presented in this section relates to the analysis of cost data from patient-costed sites.

## 2 Minimum sample size and the purpose of the NHCDC

A key determinant for the minimum sample size is what the NHCDC sample will be used for and the level of granularity for which cost estimates are required. The NHCDC is currently used for:

1) Setting the price weights for the National Efficient Price ("NEP") funding model. For acute admitted care, price weights are set by DRG but also consider length of stay and other attributes such as Indigenous status, region, ICU and paediatric status.
2) Setting the overall NEP, ie the base price to which the price weights apply. The NEP is $4,993 for 2013/14.
3) Benchmarking. For example:
    a. the Australian Institute of Health and Welfare publish cost information on hospitals, including a measure called the "Cost per casemix adjusted separation" which uses the NHCDC DRG-cost weights to adjust for casemix between hospitals
    b. the NHCDC have also published hospital peer group cost weights and hospital peer group benchmarking reports

c. other stakeholders such as the Productivity Commission have used NHCDC reports and NHCDC cost data for benchmarking public hospitals

d. feedback we have received during the consultations highlights that the NHCDC is used for benchmarking at more granular levels than those listed in a, b and c above

4) Inputs to contract negotiations between funders and providers.

As a general rule, the required sample size will increase as the level of granularity of the required estimates increases. For example, accurate cost estimates for each DRG within each hospital peer group will require a larger total sample size than that which is sufficient for accuracy at the national DRG level.

We first discuss the minimum sample size with respect to the setting of the NEP and NEP price weights. We then discuss the considerations for other uses such as benchmarking between hospitals.

# 3 Minimum sample size for the NEP

## Overview of the NEP methodology and implications for the NHCDC sample

As noted in (1) and (2) above in Section 2, the NEP funding model consists of (a) the base price, which is the average cost per Single Unit of Weight, and (b) the price weights that are applied to the base price. The base price and the price weights could be set using NHCDC samples that are different to current levels:

1) The base price can be set using aggregate cost data, ie costs reported at hospital level, and does not need patient-level cost data. Provided that detailed activity data is available (Admitted Patient Care data collection), the average cost per single unit of weight can be derived as hospital-level costs, divided by the total volume of weighted activity, which is derived from the price weight, or "NWAU" model (National Weighted Activity Unit)

2) The NEP price weights and cost parameters are estimates of the relative differences in costs between patient groups. Estimates of relative differences can be derived from:

   a. A sample of hospitals that have high quality patient-costed data so that estimates of relative differences between patients are reliable and robust. The advantage of using a targeted, high-quality cost sample is that the price weights are based on good quality cost data. The disadvantage of a smaller sample size is that a smaller sample will lead to lower coverage of the possible range of hospitals around the country (see following Section for a discussion on hospital coverage), and higher standard errors in the price weight estimates.

   b. A sample that is very broad in coverage, as per the current Collection. The cost data may be sourced from costing data of varying quality and robustness. The advantage of this approach is that the sample will cover a broader range of hospitals, and may lead to estimates with lower standard errors. The disadvantage of this approach is that if there is considerable inconsistency in application of the costing standards, or a wide variation in costing methodologies, then the price weights will contain an inherent degree of estimation error that is attributable to variation in costing practices and cost

data quality, rather than due to the actual variation in consumption of resources to treat patients.

An important consideration is that the national DRG-level price weights, national ICU price weights, national paediatric adjustments, and national Indigenous/remoteness loadings, can be influenced by the mix of hospitals that comprise the sample. Therefore, it is important that the profile of hospitals is representative of the national hospital profile.

## *Results of analysis*

### Method A – sample size based on the estimated standard error of DRG-level costs

For acute admitted separations, activity is classified using the DRG system. In order to obtain NEP cost estimates and price weights that are robust at the DRG-level, the percentage of DRG-level population separations that is required in a sample depends upon the tolerable "margin of error", statistical confidence[19] required, and the standard deviation of costs. To obtain an estimate of the average episode cost of a given DRG, say "k", within a margin of error m and with x% confidence, the required sample size for DRG(k) is:

sample size of DRG(k)

$$= \left(\frac{(Z\text{-}score\ of\ x)\times(standard\ deviation\ of\ episode\ cost\ for\ DRG(k))}{(margin\ of\ error\ m)}\right)^2$$

A lower margin of error, higher statistical confidence, and higher standard deviation, will require a larger sample size. The standard deviation of each DRG varies, and so the sample size required for each DRG (given the same parameters for error and confidence) will vary.

Two adjustments are applied to the above formula:

1) A finite population adjustment. In some cases, the formula above produces a minimum sample size that exceeds the number of separations in the population. A finite population adjustment has been applied to correct for this[20]

2) A minimum sample size, per DRG, equal to 180 (or equal to the population separations if fewer than 180 in the population). This is based on a minimum separation count of 30[21] per NEP pricing parameter (short stay base, short stay per diem, inlier, long stay per diem, paediatric, private patient discount).

The table below summarises the minimum sample size for ABF hospitals at various tolerance levels. The table assumes that:

1) A high statistical confidence (99%) is required for the parameter estimates. As noted in the footnote above, a confidence of 99% means "the probability that a given range will cover the

19 In this context: the probability that a given interval will cover the true mean.

20 Equals S x P/(S + P) where S = minimum sample size, P = population size

21 Based on the Central Limit Theorem.

true mean is estimated to be 99%". The parameter estimates are used to set Commonwealth funding for ABF services that are in the order of $10 billion, so small error rates, such as 1%, have an impact of $100 million. The estimates are also relied upon by State and Territory governments, which collectively fund more than $10 billion.

2) For the same reason as in (1) above, it is assumed that a high precision, or low margin of error, is desirable at the DRG level. This is to ensure that hospitals are not overly advantaged or disadvantaged by the DRG-profile of their patients, and that the price weights reflect the best estimate of the national cost to deliver services within the margin % of the true mean cost. An estimate of the cost impact of a given margin of error can be performed using the following table: each DRG decile represents 10% of total cost-weighted separations. Assuming a population of 5.1 million National Weighted Activity Units (NWAU) for Acute Admitted Care in 2013/14, each decile represents approximately 510,000 NWAU. A 1% margin of error applied to the 2013/14 NEP of $4,993 equals almost $50, so a 1% margin of error is equivalent to approximately 510,000 x $50 = $25.5 million in total cost.

**Table 5: Minimum sample size, expressed as participation rate per DRG, by margin of error and DRG cost weight rank, assuming 99% confidence (a)**

| DRGs ranked from highest cost weight to lowest cost weight, representing: | % Margin of Error from True Mean Cost per DRG | | | | |
|---|---|---|---|---|---|
| | 1% | 1.5% | 2% | 3% | 4% |
| Cost weighted separations decile 1 | 93% | 87% | 80% | 67% | 57% |
| Cost weighted separations decile 2 | 95% | 90% | 84% | 71% | 61% |
| Cost weighted separations decile 3 | 85% | 75% | 67% | 54% | 44% |
| Cost weighted separations decile 4 | 91% | 83% | 75% | 62% | 50% |
| Cost weighted separations decile 5 | 77% | 69% | 62% | 50% | 41% |
| Cost weighted separations decile 6 | 87% | 77% | 68% | 53% | 42% |
| Cost weighted separations decile 7 | 70% | 59% | 50% | 38% | 30% |
| Cost weighted separations decile 8 | 79% | 66% | 55% | 40% | 31% |
| Cost weighted separations decile 9 | 78% | 65% | 54% | 38% | 28% |
| Cost weighted separations decile 10 | 40% | 32% | 25% | 17% | 13% |

Notes:

a) a confidence of 99% means that "the probability that a given range will cover the true mean is estimated to be 99%

b) Decile 1 means the highest-ranked DRGs by cost weight, representing the top 10% of cost weighted separations. Decile10 means the lowest-ranked DRG by cost weight, representing the lowest 10% of cost weighted separations.

c) The current levels of participation are highlighted to illustrate the estimated margin of error in the current Collection (no shading is applied for those DRG deciles whose minimum levels of participation fall below the current participation levels).

In the above table, the total population of ABF acute admitted separations in 2010/11 is estimated to be 4.7 million. So if the sample size is

- 70% overall, this equates to a 3.3 million sample size;
- 90% overall, this equates to a 4.2 million sample size.

## *Discussion*

Table 5 is a summary of the theoretical sample size, expressed as a participation rate (% of population separations) that is required for DRGs ranked from highest to lowest cost weight. It shows that:

- The minimum participation rate decreases as the desired level of precision decreases (increasing margin of error)
- The minimum participation rate is generally higher for high-ranked DRGs (Deciles 1 to 4)
- A participation rate of 85% to 87% suggests, with 99% statistical confidence, that
  - the true mean cost for the highest cost DRGs (deciles 1 and 2 as a percentage of cost-weighted separations) falls within 1.5% to 2% of the sample mean cost;
  - the true mean cost for DRGs in deciles 3 to 4 (percentage of cost weighted separations) fails within 1% to 1.5% of the sample mean cost;
  - the true mean cost is within less than 1% of the sample mean cost for lower-cost DRGs (deciles 5 to 10).

`Method B – a top-down view that considers the profile of hospitals that should participate`
The formula that is used to produce price-weights is essentially:

$$Price - weight\ for\ DRG(k) = \left(\frac{Average\ cost\ of\ DRG(k) pricing\ parameter}{Base\ average\ cost\ across\ all\ DRGs}\right)$$

where the average costs are weighted by population levels of activity across all DRG classes and by other hospital characteristics (eg hospital size, state). The above formula shows that the price-weight is influenced by both the average cost of an individual DRG, as well as the overall average cost across all DRGs. The average costs within a given DRG, and across all DRGs, are in turn influenced by the underlying distribution of separations by hospital attribute by which average costs can vary. Therefore, to ensure that the national price-weights are representative of the Australian population of hospitals, it is important to have a sample that reflects the distribution of separations, and the average costs, across the hospital attributes by which costs can vary.

The IHPA NEP determination for 2013/14 and the accompanying technical specifications for acute admitted care state that the NHCDC sample is strata weighted to the population by hospital attributes, and by length of stay quartiles at the DRG level. The hospital attributes that are used to define strata are:

- State/Territory
- Location

- Specialty[22].

These strata can be used to determine a top-down estimate of the minimum number of hospitals that would be required to participate to obtain good coverage across a range of ABF hospitals in Australia:

**Minimum participation based on hospital coverage**

- **If there are at least 3 participating ABF hospitals per strata (some strata have fewer than 3 hospitals so in these cases the number of participating hospitals equals the number of hospitals in the strata), then we estimate:**
- **a minimum number of hospitals of 96, comprising 2.27 million separations,**
- **ie a participation rate of at least 50% of population separations.**

However, Table 5 shows that a minimum sample size of at least 87% of population separations for ABF is required to achieve a higher level of precision for the higher-cost DRGs.

# 4 Minimum sample size for benchmarking and other hospital analyses

A key finding from stakeholders is that the NHCDC is the best available national source for benchmarking costs for the purposes of comparing efficiency. Benchmarking studies are likely to be performed at levels that are more granular than DRG-alone. In the public domain, reports have been produced by the AIHW and previous NHCDC publications at hospital peer group level, by State, and teaching status. We have performed a similar analysis to estimate what proportion of the total population of acute admitted separations is required to obtain a reasonably accurate estimate of costs at a DRG level for each State and AIHW peer group classification. The table below summarises the results:

**Table 6: Sample sizes, expressed as participation rate, for cost estimates by State and Peer Group**

| DRGs ranked from highest cost weight to lowest cost weight, representing: | % Margin of Error from True Mean Cost per DRG | | | | |
|---|---|---|---|---|---|
| | 1% | 2% | 3% | 4% | 5% |
| **Up to 80% of cost weighted separations** | **94%** | **86%** | **78%** | **71%** | **65%** |
| **100% of separations** | **81%** | **69%** | **61%** | **54%** | **49%** |

Notes:

a) Current participation rate, of patient-costed sites to the total population is 83%. 86% and 81% above are highlighted to illustrate what margin of error from the true mean cost this represents.

b) The table above presents minimum sample sizes assuming a total population of 5.02 million acute admitted separations.

[22] Section 2.2.2 of the 2013/14 NEP technical specifications

c) The results are presented based on 99% statistical confidence that the range will cover the true mean cost for each DRG within a State and Peer group classification.

d) AIHW Peer groups are:

- A1 Principal referral
- A2 Specialist women's and children's
- B1 Large major city
- B2 Large regional
- C1 Medium
- C2 Medium other
- D1 Small regional
- D2 Small non-acute
- D3 Small remote
- E2 Unknown
- E3 Unknown
- E4 Rehabilitation
- E5 Mothercraft
- E9 Unknown
- F Psychiatric
- G Sub-acute and non-acute

However, for the purposes of this analysis, peer groups D1 to G have been grouped together due for sample size calculations to small hospital sizes.

## *Discussion*

In order to obtain reliable estimates of costs by DRG, State and Peer Group for benchmarking purposes, a high participation rate (expressed as a % of population separations) is required. As reporting becomes more granular, higher participation rates are required to obtain reasonably reliable estimates of costs for benchmarking purposes (using State and Peer group as an example).

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