

# National Pricing Model Technical Specifications 2013-2014

Version 1.0

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## Table of acronyms and abbreviations

Acronym/ abbreviation	Description
ABF	Activity based funding
ALOS	Average length of stay
AN-SNAP	Australian National Subacute and Non Acute Patient Classification
APC	Admitted Patient Care
AR-DRG	Australian Refined Diagnosis Related Groups
ASGC	Australian Standard Geographic Classification
ASNC	Admitted Subacute and Non-acute Care
CSO	Community Service Obligation
DoHA	Department of Health and Ageing
DSS	Data Set Specification
DVA	Department of Veterans' Affairs
ED	Emergency Department
ICU	Intensive Care Unit
IHPA	Independent Hospital Pricing Authority
LOS	Length of Stay
MDB	Major Diagnostic Block, used in Urgency Related Groups
MDC	Major Diagnostic Category, used in AR-DRGs
NAPED	Non Admitted Patients Emergency Department
NEC	National Efficient Cost
NEP	National Efficient Price
NHCDC	National Hospital Cost Data Collection
NHRA	National Health Reform Agreement
NPHED	National Public Hospital Establishment Data collection
NWAU	National Weighted Activity Unit
PHI	Private health insurance
SLA	Statistical Local Area
TTR	Teaching, Training and Research
UDG	Urgency Disposition Groups
URG	Urgency Related Groups

## 1 Overview of process

The National Health Reform Agreement (NHRA) sets out the intention of the Australian Government and state and territory governments to work in partnership to improve health outcomes for all Australians. One of the ways in which the NHRA aims to achieve this is through the implementation of national Activity Based Funding (ABF). The NHRA specifies that the central component of ABF is to be an independently-determined National Efficient Price (NEP), which is to be used as the reference for the Commonwealth to determine its funding contribution, as well as a price signal for the delivery of hospital services. The NHRA provides for the establishment of an independent pricing authority to determine the NEP. The Commonwealth's *National Health Reform Act 2011* gives effect to this requirement to establish the Independent Hospital Pricing Authority (IHPA), from 13 December 2011.

IHPA issued the first National Efficient Price Determination for 2012-2013 (NEP12), on 8 June 2012.

IHPA has now published its second NEP Determination, for 2013-14, which sets out the determinations for 2013-14 in relation to each of its legislative functions, namely:

- a. The 2013-14 National Efficient Price (NEP13) for health care services provided by public hospitals where the services are funded on an activity basis
- b. The 2013-14 National Efficient Cost (NEC13) for health care services provided by public hospitals where the services are funded on a block-funded basis
- c. Development and specification of classification systems for health care and other services provided by public hospitals
- d. Adjustments to the NEP to reflect legitimate and unavoidable variations in the costs of delivering health care services
- e. Except where otherwise agreed between the Commonwealth and a state or a territory the public hospital functions that are to be funded in that state or territory by the Commonwealth
- f. Publication of a report setting out the NEP and NEC for the coming year and any other information that would support the efficient funding of public hospitals.

This document has been produced as an accompaniment to the NEP13 and NEC13 *Determinations*. It provides the technical specifications for how IHPA developed the ABF models for the service streams to be funded on this basis from 1 July 2013 (acute admitted, emergency department, non-admitted, subacute and mental health care). It also shows how the NWAU were developed, and provides guidance to hospitals, Local Health Networks and state and territory health authorities on how to apply these to hospital activity.

Systems for classifying outputs have been applied separately to different ABF service streams. In addition, under the current national application of ABF, a common unit has been developed across all ABF service streams, known as a national weighted activity unit or NWAU. This is the unit to which NEP13 is applied as a reference for the Commonwealth, to determine its share of funding for activity undertaken by hospitals (aggregated at a Local Hospital Network level).

To develop NWAU and to determine the NEP13, IHPA collated activity and cost data for each of the ABF service streams to be funded on an activity basis in 2013-14, as follows:

- acute admitted;
- emergency department;
- non-admitted;
- subacute and non-acute admitted; and
- mental health.

In consultation with jurisdictions, IHPA has identified 267 hospitals for the ABF price model and 430 hospitals have been designated for the block-funded cost model. Details are available from IHPA on request.

Separately, block-funded hospitals have been grouped by size and locality for the specification of availability and service capacity elements to determine NEC13.

The data was sourced from various national data collections supplemented by other data provided by states/territories. Table 1 below references the relevant sections in the *Determination*, the classification systems and sources of cost and activity data pertaining to each service stream are shown in Table 2.

#### Table 1: Sections of the NEP13 and NEC13 Determinations

Component	Section of
	Determination
National efficient price	Chapter 2
Acute admitted services	NEP13
AR-DRG inlier bounds, flags for designated same-day payment AR-DRG and unbundled ICU AR-	
DRG, National Weighted Activity Unit (NWAU) weights for same-day payment AR-DRGs, short-	Annendix B
stay outliers (base and per diem), inliers, long-stay outliers (per diem), Intensive Care Unit (ICU)	
rates per hour, paediatric adjustment, private patient service adjustment	
indigenous adjustment, outer regional, remote and very remote adjustments	Chapter 5
private patient accommodation adjustment	Appendix B
Specialised children's hospitals	Glossary
Definition of a Level 3 ICU or paediatric ICU (PICU)	Glossary
Emergency department services	NEP13
Urgency Related Groups v 1.3 classification and NWAU weights	Appendix B
Urgency Disposition Groups v 1.3 classification and NWAU weights	Appendix B
Emergency departments in-scope for ABF	Glossary
Definitions of emergency department role levels	Glossary
Non-admitted services	NEP13
Tier 2 non-admitted services classification v2.0 weights	Appendix B
Definition of Tier 2 list of non-admitted services classifications v2.0	Glossary
Subacute and non-acute services	NEP13
AN-SNAP v3 weights	Appendix B
Care Type per diem rates for those subacute facilities yet to implement AN-SNAP	Appendix B
Definitions of AN-SNAP v3	Glossary
Mental health services	NEP13
AR-DRG-based inlier bounds, NWAU and adjustment weights	Appendix B
Definition of mental health patients	Chapter 5
Block-funded hospital services	NEC13
NEC weights	Chapter 3
Efficient costs for each block-funded hospital	Chapter 5

#### Table 2: Summary of classification systems and sources of cost

Service stream	Classification. <sup>1</sup>	Cost data	Activity data
Acute admitted care	Australian Refined Diagnosis Related	National Hospital Cost Data Collection	Admitted Patient Care ABF
	Groups (AR-DRG) version 6.x	(NHCDC) Round 15 (2010-11).	DSS
Emergency	Urgency Related Group (URG)	NHCDC Round 15 (2010-11)	Level 3B to 6 emergency
department care	version 1.3		departments: Emergency
	Urgency Disposition Groups (UDG)		Department Care ABF DSS
	version 1.3		Lovel 1 to 24 emergenery
			departmente: Emergency
			Sonvisoo ARE DSS
No doubte doo as	The O.O. to still at Oligie Definitions		Services ABF D33
Non-admitted care	Tier 2 Outpatient Clinic Definitions	NHCDC Round 15 (2010-11)	Non-admitted Patient ABF DSS
(outpatients only)	V2.0		
Subacute care	AN-SNAP v3	NHCDC Round 15 (2010-11)	Admitted Patient Care ABF
(and non-acute)	Care type		DSS and Admitted Subacute
			and Non acute Care ABF DSS
Mental health care	(AR-DRG) version 6.x with modified	NHCDC Round 15 (2010-11)	Admitted Patient Care ABF
	inlier bounds		DSS
Block-funded services	IHPA-defined size and Australian	Expenditure data from the National	Admitted Patient Care (APC)
	Standard Geographic Classification	Public Hospital Establishments Data	NDMS, NAPED and NPHED
	(ASGC) location categorisation on	collection (NPHED) (2010-11)	
	total NWAU for hospital	NHCDC Round 15 (2010-11)	

A summary of the NHCDC Round 15 cost data received for the 2010-11 is at Attachment A.

An important part of the modelling process is the preliminary preparation of both the costing and activity data. The essential steps in the data preparation process are:

- a. A substantial validation process, which is undertaken as the data are received from jurisdictions;
- b. The matching of mothers with unqualified neonates to ensure costs are properly attributed to the mothers;
  c. The matching of the NHCDC cost file with the APC activity file at the patient level, which recorded a success rate of over 99%; and
- d. Identify any differences in patient characteristics or operational data recorded across the two datasets and reconcile to APC data where appropriate.

Classification systems within each service stream were applied uniformly across all available data. Although these systems have been developed in part to explain variation in cost between different outputs within the stream, there is known additional systematic variation. To account for this, various adjustments were modelled and, where justified, they were implemented.

Once agreement was reached on the cost profiles and relative weights of various classes within each service stream, and on adjustments, the data were projected to reflect 2013-14 prices and relativities. Finally, these data are fed into the development of the NEP13.

The overall process to determine NEP13 is shown in Figure 1 below.

<sup>&</sup>lt;sup>1</sup> Details of each of the classifications are available from:

www.ihpa.gov.au/internet/ihpa/publishing.nsf/Content/ABF-Price-Model-Reference-Classifications-for-2013-14





## 2 Acute admitted care cost model

## 2.1 General Issues

#### 2.1.1 Cost unit

An 'episode of admitted patient care'<sup>2</sup> is the cost unit for acute admitted patients. It is "[t]*he period of admitted patient care … characterised by only one care type*"<sup>3</sup>, and covers the period of care from admission to discharge.

#### 2.1.2 In-scope activity

Acute admitted care is that provided to patients who undergo a facility's formal admission processes, where the clinical intent or treatment goal is the provision of acute care, or the patient is a baby born in hospital, or is nine days old or less at the time of admission<sup>4</sup> and has been qualified for one or more days<sup>5</sup>.

#### 2.1.3 In-scope patients

National arrangements for ABF will apply to a subset of acute admitted episodes, defined by the funding source for the patient and the type of hospital in which the episodes occur.

In *public hospitals*, ABF has been taken to apply to patients with a funding source<sup>6</sup> of 'Australian Health Care Agreements', 'private health insurance', 'self-funded' and 'reciprocal health care agreements' or 'other hospital or public authority contracted care'.

All episodes from all funding sources were included in the calculation of the cost weights. This approach was taken to ensure that the sample used for the development of NWAU was maximised and reflected the overall costs for the hospital. Only in-scope patients were included in the calculation of the mean cost used in the development of the NEP.

All other episodes (e.g. those funded through the Department of Veterans' Affairs and compensable patients) are excluded from scope of funding.

<sup>&</sup>lt;sup>2</sup> See object class *Episode of admitted patient care* [METeOR identifier: 268956].

<sup>&</sup>lt;sup>3</sup> Ibid.

<sup>&</sup>lt;sup>4</sup> See data element *Care type* [METeOR Identifier: 270174], values: 1 Acute care; 7 Newborn care.

<sup>&</sup>lt;sup>5</sup> See data element Number of qualified days for newborns [METeOR identifier: 270033]

<sup>&</sup>lt;sup>6</sup> See data element *Principal source of funding (Funding source for hospital patient)* [METeOR identifier: 339080]

#### Table 3: Acute admitted episodes in scope for ABF

Variable	Episodes that meet the inclusion criteria			
Care type	1 Acute care			
	7 Newborn care and qualified days > 0			
Funding source/	Funding source	Public hospitals	Private hospitals	
Election status	01 Australian Health Care Agreements	Included	Included	
	02 Private health insurance	Included	Excluded	
	03 Self-funded	Included	Excluded	
	10 Other hospital or public authority	Included	Included where	
	(contracted care)		election status is	
			public	
	11 Reciprocal health care agreements	Included	Included	
Hospital size & location	As per the Determination.			
Error AR-DRGs Episodes with an 'error' AR-DRG are not assigned an NWAU. These include v6.x 960Z, 961Z, and 963Z.			ese include AR-DRGs	

#### In-scope hospitals

The *NEP13 Determination* sets down a definition of hospital services in-scope for the application of ABF for 2013-14.

The lists of ABF hospitals and those to be block funded were based on nominations from the jurisdictions on the basis of draft eligibility criteria being considered by COAG. Based on the 2010-11 datasets and advice from jurisdictions, there are:

- a. 257 ABF hospitals; and
- b. 436 hospitals to be block funded.

#### In-scope costs

Factors impacting on scope of costs include:

- Where a patient is admitted through an emergency department within the scope of ABF for emergency care, this component of cost has been removed from the episode and funded through the emergency care funding model.
- Depreciation and other capital related costs (where reported) have been removed.
- Indirect costs for teaching, training and research (TTR) costs have been included but direct TTR costs have been excluded and will be block funded.

#### 2.1.4 Classification

Australian Refined Diagnosis Related Groups (AR-DRGs) are used to classify acute admitted care. The version applying for funding in 2013-14 is 6.x. This is a modified version from Version 6.0, with some Adjacent DRGs rolled back to Version 5.2.

## 2.2 Analysis of costs to derive NWAU for acute admitted care

This section provides an overview of the steps involved in developing the NWAU for acute admitted care. Detailed information in relation to each of the components of the model is included further below. Broadly, the steps involved in developing the NWAU for acute admitted care were:

- a. Prepare data.
- b. Stratification and weighting of cost data to activity data.
- c. Calculation of inlier bounds from activity data.

- d. Classify episodes into relevant categories including inliers, short- and long-stay outliers, designated same-day AR-DRGs, paediatric status, indigenous status and remoteness area status.
- e. Determine cost level for ICU adjustment and deduct associated costs.
- f. Derive initial parameters for AR-DRG inlier/outlier model and ensure predicted costs align with actual costs by AR-DRG.
- g. Derive paediatric adjustment, specialist psychiatric age adjustment (see Section 6), indigenous adjustment and remoteness adjustment.
- h. Derive private patient service adjustment and private patient accommodation adjustment.
- i. Incorporate aggregate-level cost data and data trimmed in data preparation process.

These steps are described in further detail below.

#### 2.2.1 Data preparation

The activity-level cost sample of 4,178,599 acute admitted separations was partitioned into two groups for modelling purposes: one group evaluated as fit for use to develop AR-DRG cost profiles for the 2010-11 cost model, and a second group identified as not fit for this purpose.

The second group was incorporated into the cost model, along with establishment-level aggregate cost data, to calibrate the overall level of costs within the model (see Section 2.2.9).

The main sample was first reduced to 4,170,115 separations by restricting to those with a total in-scope cost (excluding depreciation and ED costs) of greater than \$20.

The remaining sample was then analysed by AR-DRG, and observations with extreme outlier costs were identified and removed. This identification was undertaken by ranking observations by cost and identifying those extreme values that recorded a jump in cost of over 500% (or a decrease in cost to less than 20%) from the previous observation. Figure 2 illustrates this approach to identification of outlier observations.

A second stage of extreme outlier identification was undertaken in a similar way to the previous process, further controlling for length of stay within AR-DRG. The resulting sample of 4,169,990 separations were identified for use in creating AR-DRG cost profiles, and the other 8,609 separations were identified for incorporation into the cost model along with the sample of aggregate cost data.

#### Figure 2: Illustration of outlier identification



#### 2.2.2 Stratification and weighting

Weighting of the entire sample of costed activity from ABF establishments up to the population of all in-scope acute admitted activity from ABF establishments occurred in two stages. The two-stage approach was required to adjust for the cost data sample not including any activity with an admission date prior to 1 July 2010.

The first stage of the weighting process stratified and weighted the ABF sample up to the population of all 2010-11 ABF acute admitted activity with an admission date on or after 1 July 2010. The stratification was based on establishment state/territory, size, location and specialty. Establishments were classified by size using 2012-13 acute admitted NWAU calculated on 2010-11 activity data.

Both patient-level and aggregate samples of cost data were used within the weighting process.

The second stage of the weighting process weighted the 2010-11 activity with admission date on or after 1 July 2010 up to all activity with separation date within 2010-11. This weighting was done by Length of Stay quartile within AR-DRG. Same-day activity receives a weight of 1 in this process, as there are no 2010-11 same-day separations with admission date prior to 1 July 2010.

To illustrate this process, consider the AR-DRG E01A - Major Chest Procedures W Catastrophic CC. There were 1,775 ABF overnight/multi-day separations in 2010-11, of which 1,703 had an admission date within 2010-11. So, overall a weight factor of 1.042 would be required to inflate the 1,703 separations up to population of 1,775 separations. However, the missing (pre-2010/11 admission) separations are skewed to longer length of stay (i.e. the longer the length of stay of the separation, the higher the probability that it has an admission date prior to 1 July 2010). As such, the separations of E01A were broken into quartiles by length of stay to calculate different weight factors required to inflate each LOS quartile up to the total population.

Note that the resulting sample-to-population weights are applied throughout all stages of the cost model development.

#### 2.2.3 Inlier bounds

The L3H3 method was applied to the population of in-scope activity from ABF establishments, to identify inlier bounds, outside of which are short-stay and long-stay outliers. The method excluded same-day episodes occurring in AR-DRGs designated for a separate same-day payment, and used length of stay adjusted to remove ICU days for in ICU-unbundled AR-DRGs. The steps were:

- a. Calculate the national mean length of stay for each AR-DRG.
- b. Calculate the inlier lower bound for each AR-DRG. This was based on the calculation: national mean length of stay divided by 3. The result was truncated. This means that it was rounded down to the next lowest integer (e.g. if the result was 3.6, the inlier lower bound was set to 3).
- c. Calculating the inlier upper bound for each AR-DRG. This was based on the calculation: national mean length of stay multiplied by 3. The result was rounded to the nearest integer (e.g. 10.2 would result in the upper bound being set to 10, whereas 10.7 would result in the upper bound being set to 11).
- d. Episodes with an ICU-adjusted length of stay equal to or between the two inlier bounds of the AR-DRG to which they belong were considered inlier episodes.

Further to the above process, changes with respect to inlier bounds from the 2009-10 cost model were monitored to ensure they were the result of real change and were not due to statistical noise. Wherever an AR-DRG had not changed status on the Designated Same-Day Payment list or on the Bundled ICU list, 95% confidence intervals around bounds were used to evaluate changes as significant or not. Changes were also evaluated in terms of their materiality (required to affect at least 1% of an AR-DRG's separations and at least 10 separations).

Separate to the above process, MDCs 19 and 20 (Mental Health) had L1.5 H1.5 boundaries applied to minimise the inlier (bundled cost) interval (See Section 6).

#### 2.2.4 Classification of patient-level cost data in relevant categories

Prior to analysing costs, episodes were assigned to categories reflecting the relevant adjustments to be made through the 2010-11 cost model. The steps involved included:

- a. Assigning one of the following categories to each episode:
  - Same-day separation from an AR-DRG on the Designated Same-Day Payment list;
  - Short stay outlier;
  - Inlier;
  - Long stay outlier.
- b. Flagging episodes that are eligible for the paediatric adjustment. These are episodes that:
  - Occur in establishments identified as delivering specialised paediatric services (listed in the Determination), AND
  - Have an AR-DRG which is not within Major Diagnostic Category 15 (Newborns and other neonates), AND
  - Have patient age at admission of 16 years or less.
- c. Flag episodes that are eligible for the specialist psychiatric age adjustment. These are episodes that have patient psychiatric care days and fall within the age categories specific to the adjustment (see Section 6). These episodes together with all the episodes in MDCs 19 and 20 (Mental diseases and disorders and Alcohol/drug use and alcohol/drug induced organic mental disorders respectively) are considered part of the mental health model and are explained in Section 6.

- d. *Flag episodes that are eligible for the indigenous adjustment.* These are episodes with indigenous status.<sup>7</sup> of Aboriginal and/or Torres Strait Islander origin.
- e. Flag episodes that are eligible for the remoteness adjustment. These are episodes where the patient's place of usual residence has been assigned to a remoteness area.<sup>8</sup> of:
  - RA2 Outer Regional Australia
  - RA3 Remote Australia
  - RA4 Very Remote Australia.

Three flags are used: one for outer regional Australia, one for remote Australia and one for very remote Australia. The remoteness area of the usual residence of a patient was determined using the following process:

- The patient's postcode of usual residence was mapped to remoteness areas (see Supplementary Table 1).
- If the postcode was missing or invalid, then the supplied SLA code is used (see Supplementary Table 2).
- If the SLA code was also missing or invalid, then the remoteness area of the hospital is used. The remoteness code of the hospital was based on the remoteness area of the ABS collection district within which the hospital was located.
- f. *Flag episodes eligible for ICU adjustment.* These are episodes that occur in hospitals with a Level 3 ICU or PICU and have an AR-DRG not on the Bundled ICU list.
- *g.* Flag private episodes. These are episodes with a funding source.<sup>9</sup> of '02 Private health insurance' or '03 Self-funded'.

#### 2.2.5 Determine ICU adjustment level and deduct associated costs

Patient-level cost data for episodes in hospitals with a Level 3 ICU or PICU with ICU hours reported were analysed to estimate an average cost per ICU hour. A total sample of 59,948 separations with ICU hours from establishments with Level 3 ICUs/PICUs was used. Of these, 50,331 had associated ICU costs.

Linear regression by state was used to derive state hourly ICU costs. DFFITS statistics were used to exclude overly influential observations. The weighted mean of the hourly ICU costs taken across states was used to derive a national ICU rate.

For ICU-eligible episodes, an ICU adjustment was calculated using the estimated ICU cost per hour and the reported number of whole ICU hours. This amount was deducted from the in-scope costs used for modelling the same-day payment AR-DRG, short stay outlier, inlier and long stay outlier costs and associated adjustments, but added back in for the ICU adjustment. Whole ICU days were also removed from each eligible episode's length of stay.

#### 2.2.6 DRG Inlier/Outlier Model

Initial parameters were derived for designated same-day payment AR-DRG episodes, short-stay outlier episodes, inlier episodes, and long-stay outlier episodes. The steps involved were as follows:

- a. Designated same-day AR-DRG episodes: calculate the mean cost per episode.
- b. Inlier episodes: calculate the mean cost per episode.
- c. Short-stay outlier episodes: these were split into:

<sup>&</sup>lt;sup>7</sup> See data element *Indigenous status* [METeOR identifier: 291036].

<sup>&</sup>lt;sup>8</sup> Remoteness areas are defined in the *Australian Standard Geographic Classification (ASGC)*, which is maintained by the Australian Bureau of Statistics (see: www.abs.gov.au). The 2006 ASGC Remoteness Area classification was used to classify patients' place of residence and locality of hospitals.

<sup>&</sup>lt;sup>9</sup> See data element *Principal source of funding (Funding source for hospital patient)* [METeOR identifier: 339080], values: 01 Australian Health Care Agreements; 02 Private health insurance; 03 Self-funded; 10 Other hospital or public authority (contracted care); 11 Reciprocal health care agreements (with other countries); 12 other.

- Surgical AR-DRGs, other procedural AR-DRGs and AR-DRGs with significant prostheses costs, where a 'fixed' cost component was calculated using the operating theatre, special procedure suites and prostheses cost buckets) and a mean cost per day for 'variable' costs (all other cost buckets).
- Remaining Medical AR-DRGs, where a mean cost per day was calculated.
- *d.* Long-stay outlier episodes. The mean inlier cost was assigned to each episode as a base amount. A per diem for each outlier day was calculated using one of two methods:
  - In AR-DRGs where the length of stay profile was adequately wide and regular to allow robust regression analysis to be undertaken, the per diem cost was taken as the length of stay regression coefficient; this process excluded designated same-day episodes and overly influential observations (as determined by the DFFITS statistical measure).
  - In the remaining AR-DRGs, cost buckets were partitioned into 'fixed' and 'variable' (similar to the short-stay outlier process for surgical AR-DRGs), and the per diem cost was taken as the mean variable cost per patient day.

A calibration process was then undertaken on each AR-DRG to ensure cost neutrality (i.e. each AR-DRG's model costs equalised against their actual costs).

Subsequent to derivation of the paediatric adjustment (see Section 2.2.7), the AR-DRG cost parameters were compared against those of the 2009-10 cost model. An AR-DRG's cost parameters were regarded as comparable between the two cost models in circumstances where the AR-DRG:

- a. Did not change status on the Designated Same-Day Payment list;
- b. Did not change status on the Bundled ICU list;
- c. Was not from MDCs 19 or 20; and
- d. Did not change its inlier bounds.

AR-DRGs regarded as comparable across the two cost models had their parameters stabilised against the 2009-10 cost model in circumstances where their inlier sample from the 2010-11 cost data contained less than 1,000 episodes. In these instances, percentage change in parameters was restricted so that inlier parameters changed no more than  $\pm 20\%$ .

Further to this small-sample stabilisation process, the AR-DRG labelled Z60C (Rehab, same-day) had its cost parameter set to level consistent with the same-day rehabilitation cost parameters from the admitted subacute cost model.

All AR-DRG parameters were then uniformly calibrated to ensure the modelled costs were equalised against actual costs.

Figure 3 illustrates the general form of the cost model within each AR-DRG. However, an AR-DRG's form may differ depending whether it has a designated same-day separation category, a short-stay outlier category, or a long-stay outlier category.





Figure 4 provides an example of the model with a particular AR-DRG, showing the reported mean cost per episode by length of stay and also plots the cost model levels arising from applying the initial parameters.



Figure 4: Example of an AR-DRG - Initial parameters for model and average cost by length of stay

#### 2.2.7 Calculation of additional adjustments

After the AR-DRG inlier/outlier model was derived, the following four adjustments were calculated based on factors considered to have a material impact on the cost of acute services.

#### Paediatric adjustment

A paediatric adjustment was derived by AR-DRG using a process similar to the 2009-10 acute admitted cost model. Specialised paediatric patients were identified as being less than or equal to 16 years of age, from an establishment identified as delivering specialised paediatric services (see Determination), and excluding AR-DRGs from Major Diagnostic Category (MDC) 15 (newborns and other neonates).

The paediatric adjustment for each AR-DRG was:

- a. Rounded to the nearest whole per cent;
- b. Capped and floored at 2.0 and 0.8; and
- c. Set to 1 (i.e. no adjustment) if the adjustment was less than 0.05 either side of 1.

Further to this, the paediatric adjustment was compared against that of the 2009-10 cost model, and changes were stabilised for AR-DRGs where either of the cost data samples (paediatric or non-paediatric) contained less than 500 observations. This stabilisation involved taking the average adjustment across the two years.

The cost parameters of each AR-DRG were then calibrated to ensure that the modelled costs, with paediatric adjustment applied, were equal to the actual costs of the AR-DRG.

Specialist psychiatric age adjustment

See Section 6.

#### Indigenous adjustment and remoteness adjustment

These adjustments were derived in the same way as in the 2009-10 cost model:

- a. A multivariate least squares weighted regression model was used to estimate the extent to which indigenous status and remoteness of patient's usual residence explained variation in the mean cost per weighted episode. Episodes were weighted to control for the level to which the model already explained costs (i.e. through the AR-DRG inlier/outlier model together with the paediatric and specialist psychiatric age adjustments). The coefficients estimated from this model indicated the extent to which indigenous status and remoteness of patient usual residence explained residual variation in costs.
- b. The analysis yielded an adjustment for indigenous patients and three adjustments for patients resident in outer regional, remote and very remote areas.
- c. The adjustments are additive where more than one adjustment applies, so for example, where an indigenous patient resides in a remote area, an adjustment equal to the addition of the indigenous and remote adjustments is applicable.

AR-DRG cost parameters were then uniformly calibrated to ensure cost neutrality of the model (including indigenous and remoteness adjustments) against actual costs.

#### 2.2.8 Private patient adjustments

Private patient episodes in scope for ABF include those episodes occurring in a public hospital with a funding source of either '02 Private health insurance' or '03 Self-funded'.

The NHRA requires that in setting the NEP, IHPA take into account costs of private patients that are met through alternative funding sources. These alternative sources include medical benefits payments by the Australian Government, private health insurance benefits payments and payments made by patients.

To this end, a methodology similar to that applied in the 2009-10 cost model was used, including a private patient service adjustment and a private patient accommodation adjustment.

The private patient service adjustment differs slightly in its application compared the 2009-10 cost model. Specifically, the 2010-11 adjustment excludes any effect on the paediatric, specialist psychiatric, indigenous and remoteness adjustments.

The private patient adjustments were derived in the following way:

- a. The following components were identified from the reported costs of private patient episodes to estimate the other revenue received (such as medical benefits, private health insurance or payments by patients):
  - 100% of the pathology cost bucket (direct and indirect)
  - 100% of the imaging cost bucket (direct and indirect)
  - 100% of the prostheses cost bucket (direct and indirect)
  - 75% of the ward medical cost bucket (direct and indirect)
  - 37.5% of the operating room cost bucket (direct and indirect)
  - 37.5% of the special procedure suite cost bucket (direct and indirect)
  - 15% of the critical care cost bucket (direct and indirect).
- b. A private patient service adjustment was then calculated at the AR-DRG level, although for some AR-DRG with small samples, the adjustment was derived at a more aggregate level. The adjustment was calculated as the following ratio taken at the AR-DRG level:

#### (Total AR-DRG model costs less removed costs) / Total AR-DRG model costs

Note here that the AR-DRG model costs referred to here exclude the application of any other adjustments.

- c. The AR-DRG cost parameters were then uniformly calibrated to ensure cost neutrality of the cost model (including private patient service adjustment and previously derived adjustments) against actual costs.
- d. In addition to medical and prostheses cost, insurers are also charged for accommodation. A private patient accommodation adjustment is applied to account for revenue received in relation to these charges. For the purpose of deriving the adjustment associated with the 2013-14 NEP, 2012-13 average default benefits for private health insurers by state/territory were indexed forward one year to 2013-14.

#### 2.2.9 Incorporation of aggregate-level and outlier samples of cost data

The development of the cost model to this point has been based on the sample of patient-level cost data evaluated as fit for use to develop AR-DRG cost profiles. In particular, the sample of patient-level cost data identified as not fit for use at the AR-DRG level, together with the sample of aggregate-level cost data, have not been used within the cost model.

The following process was used to calibrate the cost model against the entire sample of cost data:

- a. The cost model developed to this point, including all adjustments except the private patient accommodation adjustment was applied to the entire cost data sample. Note that for the sample of aggregate-level cost data, the cost model had to be applied to the corresponding activity from the APC activity dataset. This process resulted in model costs across the entire sample of cost data.
- b. The AR-DRG cost parameters were then uniformly adjusted to ensure that the resulting total modelled cost across the entire sample was equalised against the total actual costs of the entire sample.

It should be noted again that sample-to-population weights were applied throughout all stages in the development of the cost model.

#### 2.2.10 Price weights and NWAU

The final step in the process involved conversion of the 2010-11 cost model parameters to cost weight values by dividing the cost parameters by a reference cost.

The reference cost used was the 2009-10 reference cost indexed one year by the growth rate in the consecutive years' cost models, where this growth rate is standardised against the 2010-11 activity data. Specifically, the growth rate was derived by applying the 2009-10 and 2010-11 cost models (excluding private patient adjustments) to the 2010-11 activity data, and calculating the change in total modelled costs between the two models.

These resulting cost weights were then converted to the price weights that are used to assign NWAU.

## 2.3 Applying the NEP

As set out in 2013-14 National Efficient Price Determination, the price of an ABF Activity is calculated using the following formula, with adjustments applied as applicable:

#### Price of an admitted acute ABF Activity =

$$\left[\left(\mathsf{PW}\times\left(\mathsf{A}_{\mathsf{Paed}}\times(1+\mathsf{A}_{\mathsf{SPA}})\times(1+\mathsf{A}_{\mathsf{Ind}}+\mathsf{A}_{\mathsf{A}})+\mathsf{A}_{\mathsf{PPS}}-1\right)+\left(\mathsf{A}_{\mathsf{PPS}}\times\mathsf{A}_{\mathsf{ICU}}\times\mathsf{ICU}_{\mathsf{Hrs}}\right)\right)-\left(\mathsf{A}_{\mathsf{Acc}}\times\mathsf{LOS}\right)\right]\times\mathsf{NEP}$$

Where:

- PW means the Price Weight for an ABF activity as set out at Appendix B of the NEP Determination
- A<sub>Paed</sub> means the paediatric adjustment
- A<sub>SPA</sub> means the specialist psychiatric age adjustment
- A<sub>Ind</sub> means the indigenous adjustment
- A<sub>A</sub> means the remoteness area adjustment
- AICU means the ICU adjustment
- ICU<sub>Hrs</sub> means the number of hours spent by a person within a Level 3 ICU/PICU
- A<sub>PPS</sub> means the private patient service adjustment
- A<sub>Acc</sub> means the private patient accommodation adjustment applicable to the State of hospitalisation and length of stay
- LOS means length of stay in hospital (in days)
- **NEP** is the National Efficient Price 2013

In the event that the application of the private patient accommodation adjustment returns a negative NWAU(13) value for a particular patient, the NWAU(13) value is held to be zero; that is, negative NWAU(13) values are not permitted for any patients under the National Pricing Model.

## 2.4 Assigning NWAU to acute admitted patient data

This section describes how the NWAU resulting from the analysis of costs described in the previous sections can be applied to acute admitted patient activity data to assign NWAU to acute admitted episodes. To enable users to implement the NWAU to activity data, the end of this section gives detailed definitions of the variables required throughout the process of assigning NWAU.

The key steps in determining NWAU for acute admitted activity are:

Stage 1. Preparation of acute admitted patient data and creation of variables required for NWAU calculation.

Stage 2. Calculation of NWAU using acute admitted patient data prepared in Stage 1.

#### 2.4.1 Data Preparation

The data preparation stage is illustrated in Figure 5. The process is broken into twelve steps, each requiring variables created in previous steps. The resulting dataset is called the 'prepared acute dataset'.





The process requires the seven input datasets or tables referred to in Table 4.

The input APC dataset has sixteen variables. Table 5 lists these variables, which form part of the APC ABF DSS, located on the IHPA website.

The variable definitions required to apply the Stage 1 process are given in Table 6.

Table 4: Dataset and tables required for assignment of NWAU to acute admitted patient data

Input dataset or table	Description
APC ABF DSS Dataset	Dataset based on the 2013-14 Admitted Patient Care ABF Data Set Specifications located on the IHPA website.
Postcode table	Table of postcodes mapped to the 2006 ASGC Remoteness Area classification. Each postcode is mapped to the Remoteness Area category within which the majority of the postcode's population resides. PO Box postcodes are mapped to the Remoteness Area category within which the Post Office is located.
SLA table	Table of Statistical Local Areas (SLAs) mapped to the 2006 ASGC Remoteness Area classification. The mapping can be used for SLAs from the 2009 or 2010 ASGC. Each SLA is mapped to the Remoteness Area category within which the majority of the SLA's population resides.
Paediatric Adjustment eligibility table	Table listing establishments eligible for the acute admitted Paediatric Adjustment, found in the Determination Glossary
ICU Rate eligibility table	Table listing establishments with a Level 3 ICU or PICU
2013-14 NWAU Price Weight table	2013-14 Acute Admitted NWAU Price Weight table, found in the 2013-14 Determination.
2013-14 NWAU Adjustments	2013-14 Acute Admitted NWAU Adjustments, found in the 2013-14 Determination.

#### Table 5: APC ABF DSS variables used to calculate 2013-14 acute admitted NWAU

State Identifier			
Establishment Identifier			
Hospital geographical Indicator			
Date of Birth			
Date of Admission			
Date of Separation			
Саге Туре			
Number of Qualified Days for Newborns			
Total Psychiatric Care Days			
Indigenous Status			
Funding Source. <sup>10</sup>			
Diagnosis Related Group v6.x			
Total Leave Days			
Total Hours spent in Intensive Care Unit			
Postcode of Patient's Usual Residence			
Statistical Local Area of Patient's Usual Residence			

<sup>&</sup>lt;sup>10</sup> Data element *Principal source of funding (Funding source for hospital patient)* [METeOR identifier: 339080]

Table 6: Assigning NWAU to acute admitted patie	ent data – Stage 1 – Data	Preparation – variable definitions
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Step	Variable	Name	Description	Definition
Step 1	A01	est_eligible_icu_flag	ICU rate adjustment eligible establishment, derived from ICU rate eligibility table	1 if establishment is designated as eligible for ICU rate adjustment; else 0.
	A02	est_eligible_paed_flag	Paediatric adjustment eligible establishment, derived from paediatric adjustment eligibility table	1 if establishment is designated as eligible for paediatric adjustment; else 0.
	A03	est_remoteness	Establishment Remoteness Area	2006 ASGC Remoteness Area category of the establishment location taken from the hospital geographical indicator variable, where: 0 = Major City; 1 = Inner Regional; 2 = Outer Regional; 3 = Remote; and 4 = Very Remote.
	A04	pat_los	Length of stay	max( 1, ( Date of Separation ) - ( Date of Admission ) - ( Total Leave Days ) ) if Care Type = 1; else Total Qualified Days if Care Type = 7.
	A05	pat_sameday_flag	Same-day flag	1 if Date of Admission = Date of Separation; else 0.
	A06	pat_acute_flag	Acute patient flag	1 if ( Care Type = 1 ) or ( Care Type = 7 and Number of Qualified Days for Newborns > 0 ); else 0.
	A07	pat_age_years	Age at admission (in years)	total whole years from Date of Birth to Date of Admission.
	A08	pat_icu_hours	Whole hours spent in ICU	total whole Hours Spent in Intensive Care Unit if hours are greater than or equal to 1; else 0.
	A09	pat_ind_flag	Indigenous patient flag	1 if Patient Indigenous Status = 1, 2 or 3; else 0.
	A10	pat_pcd_flag	Psychiatric care days flag	1 if Total Psychiatric Care Days > 0; else 0.
	A11	pat_private_flag	Private patient flag	1 if Funding Source = 2 or 3; else 0.
	A12	pat_public_flag	Public patient flag	1 if Funding Source = 1, 10 or 11; else 0.
Step 3	A13	pat_inscope_flag	In-scope patient flag	pat_public_flag + pat_private_flag
	A14	pat_0to16years_flag	Patient age group flag: 0 to 16 years	1 if pat_age_years ≤ 16; else 0.
	A15	pat_0to17years_flag	Patient age group flag: 0 to 17 years	1 if pat_age_years ≤ 17; else 0.
	A16	pat_65to84years_flag	Patient age group flag: 65 to 84 years	1 if pat_age_years ≥ 65 and age_years ≤ 84; else 0.
	A17	pat_85plusyears_flag	Patient age group flag: 85 plus years	1 if pat_age_years ≥ 85; else 0.

Step	Variable	Name	Description	Definition
Step 5	A18	pat_eligible_paed_flag	Paediatric Adjustment eligible patient	est_eligible_paed_flag * pat_0to16years_flag.
	A19	pat_spa_0to17nonspecpaed_flag	Specialist psychiatric adjustment eligible patient age group flag: 0 to 17 years from establishment not eligible for Paediatric Adjustment	pat_pcd_flag * pat_0to17years_flag * ( 1 - est_eligible_paed_flag ).
	A20	pat_spa_0to17specpaed_flag	Specialist psychiatric adjustment eligible patient age group flag: 0 to 17 years from establishment eligible for Paediatric Adjustment	pat_pcd_flag * pat_0to17years_flag * est_eligible_paed_flag.
	A21	pat_spa_65to84_flag	Specialist psychiatric adjustment eligible patient age group flag: 65 to 84 years	pat_pcd_flag * pat_65to84years_flag.
	A22	pat_spa_85plus_flag	Specialist psychiatric adjustment eligible patient age group flag: 85 plus years	pat_pcd_flag * pat_85plusyears_flag.
Step 6	A23	pat_remoteness	Patient Remoteness Area	ra06 value from joined postcode table if non-missing; else ra06 value from joined SLA table if non-missing; else est_remoteness.
Step 7	A24	pat_ra_oreg_flag	Outer regional patient flag	1 if pat_remoteness = 2; else 0.
	A25	pat_ra_rem_flag	Remote patient flag	1 if pat_remoteness = 3; else 0.
	A26	pat_ra_vrem_flag	Very remote patient flag	1 if pat_remoteness = 4; else 0.
Step 8	A27	drg_inlier_lb	Inlier lower bound	inlier lower bound from NWAU AR-DRG Price Weight table.
	A28	drg_inlier_ub	Inlier upper bound	inlier upper bound from NWAU AR-DRG Price Weight table.
	A29	drg_samedaylist_flag	same-day price list flag	1 if Same-Day Price List variable from joined NWAU AR-DRG Price Weight table equals 'Yes'; else 0.
	A30	drg_bundled_icu_flag	bundled ICU flag	1 if Bundled ICU variable from joined NWAU AR-DRG Price Weight table equals 'Yes'; else 0.
	A31	drg_adj_paed	Paediatric adjustment	paediatric adjustment from joined NWAU AR-DRG Price Weight table.
	A32	drg_adj_privpat_serv	Private patient service adjustment	private patient service adjustment from joined NWAU AR-DRG Price Weight table.
	A33	drg_pw_sd	Same-Day Price Weight	same-day price weight from joined NWAU AR-DRG Price Weight table if not missing; else 0.

Step	Variable	Name	Description	Definition
	A34	drg_pw_sso_base	Short-Stay Outlier Base Price Weight	short-stay outlier base price weight from joined NWAU AR-DRG Price Weight table if not missing; else
				0.
	A35	drg_pw_sso_perdiem	Short-Stay Outlier Per Diem Price Weight	short-stay outlier per diem price weight from joined NWAU AR-DRG Price Weight table if not missing; else
				0.
	A36	drg_pw_inlier	Inlier Price Weight	inlier price weight from joined NWAU AR-DRG Price Weight table.
	A37	drg_pw_lso_perdiem	Long-Stay Outlier Per Diem Price Weight	long-stay outlier per diem price weight from joined NWAU AR-DRG Price Weight table if not missing; else 0.
Step 9	A38	pat_eligible_icu_hours	Unbundled ICU hours	est_eligible_icu_flag * ( 1 - drg_bundled_icu_flag ) * pat_icu_hours.
Step 10	A39	pat_los_icu_removed	Length of Stay with unbundled ICU hours removed	max(1, pat_los - int( pat_eligible_icu_hours ÷ 24 ) ).
Step 11	A40	pat_sepcat_sd_flag	Same-day separation category flag	1 if drg_samedaylist_flag = 1 and pat_sameday_flag = 1; else 0.
	A41	pat_sepcat_sso_flag	Short-stay outlier separation category flag	0 if drg_samedaylist_flag = 1 and pat_sameday_flag = 1; else 1 if pat_los_icu_removed < drg_inlier_lb; else 0.
	A42	pat_sepcat_inlier_flag	Inlier separation category flag	0 if drg_samedaylist_flag = 1 and pat_sameday_flag = 1; else 1 if pat_los_icu_removed ≥ drg_inlier_lb and pat_los_icu_removed ≤ drg_inlier_ub; else 0.
	A43	pat_sepcat_lso_flag	Long-stay outlier separation category flag	1 if pat_los_icu_removed > drg_inlier_ub; else 0.
Step 12	A44	adj_spa_0to17nonspecpaed	See definition	specialist psychiatric age adjustment: patient aged 0 to 17 years and from an establishment not eligible for paediatric adjustment.
	A45	adj_spa_0to17specpaed	See definition	specialist psychiatric age adjustment: patient aged 0 to 17 years and from an establishment eligible for paediatric adjustment.
	A46	adj_spa_65to84	See definition	specialist psychiatric age adjustment: patient aged 65 to 84 years.
	A47	adj_spa_85plus	See definition	specialist psychiatric age adjustment: patient aged 85 years or older.
	A48	adj_indigenous	See definition	indigenous adjustment.
	A49	adj_remoteness_oreg	See definition	remoteness adjustment: outer regional patient.
	A50	adj_remoteness_rem	See definition	remoteness adjustment: remote patient.
	A51	adj_remoteness_vrem	See definition	remoteness adjustment: very remote patient.
	A52	state_adj_privpat_accomm_sd	See definition	private patient accommodation adjustment: same-day rate (state-specific adjustment).
	A53	state_adj_privpat_accomm_on	See definition	private patient accommodation adjustment: overnight per diem rate (state-specific adjustment).
	A54	adj_icu_rate	See definition	unbundled ICU rate.

#### 2.4.2 Calculation of NWAU

The NWAU calculation stage is illustrated in Figure 6. The process is broken into seven steps, which correspond to steps 13 through 19 in the overall NWAU assignment process. The first of the seven steps requires the 'prepared acute dataset' output from Stage 1, and each of the steps that follow requires the variable created in the previous step.

Table 7 details the variables created in each of the steps, with the last step (Step 19) resulting in a variable containing the 2013-14 NWAU.





Step	Variable	Name	Description	Definition
Step 13	A55	w01	DRG by inlier/outlier weight	pat_sepcat_sd_flag * drg_pw_sd + pat_sepcat_sso_flag * ( drg_pw_sso_base + drg_pw_sso_perdiem * pat_los_icu_removed ) + pat_sepcat_inlier_flag * drg_pw_inlier + pat_sepcat_lso_flag * ( drg_pw_inlier + ( pat_los_icu_removed - drg_inlier_ub ) * drg_pw_lso_perdiem ).
Step 14	A56	w02	Application of the paediatric adjustment	w01 * ( 1 + pat_eligible_paed_flag * ( drg_adj_paed - 1 ) ).
Step15	A57	w03	Application of the specialist psychiatric age adjustment	w02 * (1 + pat_spa_0to17nonspecpaed_flag * adj_spa_0to17nonspecpaed + pat_spa_0to17specpaed_flag * adj_spa_0to17specpaed + pat_spa_65to84_flag * adj_spa_65to84 + pat_spa_85plus_flag * adj_spa_85plus ).
Step 16	A58	w04	Application of the indigenous and remoteness adjustments	w03 * (1 + pat_ind_flag * adj_indigenous + pat_ra_oreg_flag * adj_remoteness_oreg + pat_ra_rem_flag * adj_remoteness_rem + pat_ra_vrem_flag * adj_remoteness_vrem ).
Step 17	A59	w05	Application of the ICU rate adjustment	w04 + pat_eligible_icu_hours * adj_icu_rate.
Step 18	A60	w06	Application of the private patient service adjustment	w05 - pat_private_flag * ( 1 - drg_adj_privpat_serv ) * ( w01 + pat_eligible_icu_hours * adj_icu_rate ).
Step 19	A61	NWAU13	Application of the private patient accommodation adjustment	max( 0, w06 - pat_private_flag * ( pat_sameday_flag * state_adj_privpat_accomm_sd + ( 1 - pat_sameday_flag ) * pat_los * state_adj_privpat_accomm_on ) ).

## 3 Emergency care cost model

## 3.1 General issues

#### 3.1.1 Cost unit

The cost unit for ABF for emergency care is an 'emergency department stay'.<sup>11</sup> or presentation. It includes stays for patients who are treated and go home, and ones that are subsequently admitted to hospital or transferred to another facility for further care.

#### 3.1.2 Scope

Emergency care is that provided to patients registered for care in an emergency department in selected public hospitals. Patients who were dead on arrival are in scope if an emergency department clinician certified the death of the patient. Patients who leave the emergency department after being triaged and then advised of alternative treatment options are also in scope.

All patients in the Emergency Department Care and Emergency Services ABF DSS datasets are in scope.

Patients being treated in emergency departments may subsequently become 'admitted'. All patients remain in scope for ABF for emergency care until they are recorded as having physically departed the emergency department, regardless of whether they have been admitted.

#### 3.1.3 Classification

Two systems are used to classify emergency care for the purposes of ABF of these services from 1 July 2013: Urgency Related Groups (URGs) Version 1.3 and Urgency Disposition Groups (UDGs) Version 1.3. The former applies to level 3B to 6 emergency departments, and the latter to all others (i.e. levels 1 to 3A). The levels are defined in the Determination (Glossary).

## 3.2 Analysis of costs to derive NWAU for emergency care

#### 3.2.1 Data preparation

NHCDC Round 15 reported 4,992,407 presentations in 173 establishments with patient-level cost data and 409,184 presentations from 40 establishments with aggregate-level cost data, together representing 84% of the total ED population as reported in the ABF DSS datasets, Non-Admitted Patients Emergency Department (NAPED) and NPHED (Attachment B).

The initial data preparation processes were similar to that used last year. The data was trimmed for extreme outliers using a more conservative methodology to that used last year. A number of Queensland establishments were excluded on the basis of being identified by Queensland as having unreliable cost data.

The initial trimming of the data resulted in removing about 73,000 presentations which mainly related to the establishments identified by Queensland to be excluded.

The cleansed data was a mixture of episode level data grouped by URG or UDG and aggregate data reported at the establishment level. The following data were not used in deriving relativities across URGs and UDGs, but were

<sup>&</sup>lt;sup>11</sup> See data set specification *Non-admitted patient emergency department care DSS 1 January 2012-30 June 2012* [METeOR identifier: 471595].

used to calibrate the overall cost level of the model, in a similar way to the integration of aggregate-level cost data in the acute admitted model:

- a. Aggregate data provided at the establishment level in NHCDC Round 15 such as for cost modelled sites;
- b. Presentations that grouped to error URGs and UDGs due to missing or invalid data fields;
- c. Presentations that were less than \$5; and
- d. Extreme cost outliers within each UDG class.

#### 3.2.2 Sample weights

The NHCDC provides a sample of emergency care activity in public hospitals. To ensure the resulting calculations for the NWAU were appropriate for the full population of emergency care activity, observations from the NHCDC were weighted up to reflect the entire population of emergency care activity by state/territory.

#### 3.2.3 Cost parameters and adjustments

Data entered the cost model at one of three levels: by URG, by UDG or aggregated to an establishment level. URG data was used to derive an initial set of URG cost parameters. The URG and UDG data was combined to obtain cost parameters across UDGs, and the URG parameters were then calibrated against the UDG parameters. Finally, the URG and UDG datasets were combined with the aggregate data (controlled for UDG casemix) to obtain an overall cost level across the entire sample. The URG and UDG cost parameters were calibrated against this cost level.

This process ensured that the URG and UDG cost parameters were aligned, and that overall model costs were equal to actual costs.

#### 3.2.4 Price weights and NWAU

The final step of the process involves the conversion of cost parameters to cost weights. This was done by dividing the URG and UDG cost parameters by the mean modelled cost for all in-scope acute admitted episodes. These cost weights were then converted to the price weights used to calculate NWAU.

## 3.3 Assigning NWAU for emergency care

NWAU are assigned to emergency care activity on the basis of a URG or a UDG. The former is applied to level 3B to 6 emergency departments, and the latter to Level 1 to 3A emergency services.

The steps involved in assigning NWAU to emergency department presentations are illustrated in Figure 7 below. The two stages of data preparation and NWAU calculation are combined in the following section.

#### 3.3.1 Data Preparation and calculation of NWAU

This section details how to assign NWAU to emergency department patient data. The data preparation and NWAU calculation stages are illustrated in Figure 7. The process is broken into seven steps, each requiring variables created in previous steps, with the final step (Step 7) resulting in a variable containing the 2013-14 NWAU.

The process requires the four input datasets or tables referred to in Table 8.

Six variables are required to form the input ED dataset. These variables form part of the Emergency Department Care ABF DSS on the IHPA website and are listed in Table 9.

Table 10 details the variables created in the process of assigning NWAU to emergency department patient data.

Figure 7: Assigning NWAU to emergency department patient data



#### Table 8: Dataset and tables required for assignment of NWAU to emergency department patient data

Input dataset or table	Description
Emergency Department Care ABF DSS Dataset	Dataset based on the 2013-14 Emergency Department Care ABF Data Set Specifications located on the IHPA website.
2013-14 NWAU Price Weight tables	2013-14 Emergency Department NWAU URG and UDG Price Weight tables, found in the 2013-14 Determination.
2013-14 NWAU Adjustments	2013-14 Emergency Department NWAU Adjustments, found in the 2013-14 Determination.

#### Table 9: ED Care ABF DSS variables used to calculate 2013-14 ED NWAU

Establishment Identifier		
Indigenous status		
Episode end status		
Type of visit to Emergency Department		
Triage category		
Urgency related group (Version 1.3)		

#### Table 10: Assigning NWAU to emergency department patient data - variable definitions

Step	Variable	Name	Description	Definition
Step 1	E01	pat_ind_flag	Indigenous patient flag	1 if Patient Indigenous Status = 1, 2 or 3; else 0.
	E02	urg_flag	URG v1.3 flag	1 if urgency related group is not missing; else 0.
	E03	udg	UDG v1.3	Derived from DSS variables: type of visit to Emergency Department, triage category, and episode end status. See IHPA website for details.
Step 3	E04	w01_a	See definition	URG price weight, taken from NWAU Price Weight table.
Step 4	E05	w01_b	See definition	UDG price weight, taken from NWAU Price Weight table.
Step 6	E06	adj_indigenous	See definition	Indigenous adjustment from NWAU Adjustment table.
Step 7	E07	NWAU13	Application of indigenous adjustment	w01_a * ( 1 + pat_ind_flag * adj_indigenous ) if urg_flag = 1; else w01_b * ( 1 + pat_ind_flag * adj_indigenous ).

## 4 Non-admitted care cost model

#### 4.1 General issues

#### 4.1.1 Cost unit

The cost unit for non-admitted care is a Non-Admitted Patient Service Event. This is "An interaction between one or more healthcare provider(s) with one non-admitted patient, which must contain therapeutic/clinical content and result in a dated entry in the patient's medical record".<sup>12</sup>

#### 4.1.2 .Scope

The scope of non-admitted care includes service events occurring in outpatient clinics in ABF hospitals and in the community as explained in the Pricing Framework.

#### 4.1.3 Classification

The NHCDC Tier 2 clinics V2.0 are used to classify non-admitted care for the purposes of ABF as explained in the Pricing Framework and set out in the NEP13 Determination.

## 4.2 Analysis of costs to derive NWAU for non-admitted outpatient care

#### 4.2.1 Data preparation

Non-admitted patient data was received for 5 jurisdictions, the same as for 2009-10. NHCDC Round 15 included non-admitted data for 99 establishments and 103 Tier 2 Clinics. This compares to 76 establishments and 91 Tier 2 Clinics in 2009-10.

Essentially the same initial processes for data cleansing that were used last year were used again this year. The initial data preparation involved:

- a. Excluding approximately 297,100 records on the advice of jurisdictions.
- b. Excluding approximately 71,370 episodes that were less than \$5 or more than \$10,000.
- c. Excluding a further 47,760 episodes where they had a z-score of greater than 4.

Last year the data trimming was focussed at the patient level in each clinic and judgments were made about which patient costs were outliers. This year, recognition was given to the many comments that the outpatient price weights in NEP12 could be substantively improved to better reflect real cost levels. A group of Technical Advisory Committee (TAC) representatives experienced in costing for non-admitted services was convened to review the NHCDC Round 15 cost data.

This resulted in a detailed set of instructions on how to trim the data by hospital or by hospital-clinic combination where the cost data were clearly outliers. The following establishments were removed entirely from modelling clinic costs:

- Box Hill (Vic)
- Hervey Bay(Qld)
- Mareeba (Qld)

<sup>&</sup>lt;sup>12</sup> See object class Non-admitted patient service event [METeOR identifier: 400604].

- Royal Hobart (Tas)
- Calvary (ACT)

In reviewing each outpatient clinic, the TAC team identified particular establishment-clinic combinations that were clear outliers to remove them from the modelling of clinic costs. Several 10.xx clinics were linked to the same-day acute admitted costs of treatment; acute admitted activity was identified for this purpose on the basis of procedure codes relevant to the clinic procedures.

A summary of all data preparation steps along with the number or records removed is at Attachment C.

#### 4.2.2 Sample weights

As there was no comprehensive cost dataset on non-admitted activity in 2010-11, it was not possible to do a weighting of the cost sample in the same way that was done for acute separations and ED presentations.

#### 4.2.3 Cost parameters and adjustments

The non-admitted care model calculates the mean cost for the trimmed data in each Tier 2 clinic.

The fit of the 2010-11 non-admitted cost model was comparable to that for 2009-10 but still low. That is, the r-squared statistic is low but comparable to last year, and reflects the considerable variation in the NHCDC non-admitted cost data. The final Mean Absolute Percentage Error (MAPE) value of 26% was significantly influenced by one outlier establishment (Barwon Health – Geelong Hospital Campus). If this establishment was excluded, the MAPE reduced to 21%, which is lower than in 2009-10.

Last year the NEP12 indigenous and remoteness adjustments were applied to non-admitted episodes in the same way as for ED presentations. This was essentially a policy decision coming out of the development of the Pricing Framework.

After the publication of NEP12 there were a number of suggestions from jurisdictions that the non-admitted costs in the more remote hospitals were not more costly as presumed by the application of these adjustments, but may actually be less costly.

Analyses on the costs of hospitals in different remoteness areas did not support the continuation of the remoteness adjustments for non-admitted services. The indigenous adjustment was retained but the situation will be reviewed in 2013 when more data becomes available.

#### 4.2.4 Price weights and NWAU

The cost parameters were converted to cost weights by dividing each by the mean modelled cost for all in-scope acute admitted episodes. These cost weights were then converted to the price weights used to assign NWAU.

#### 4.3 Assigning NWAU for non-admitted care

NWAU are assigned to non-admitted care on the basis of the Tier 2 clinic providing the care.

The steps involved in assigning NWAU to non-admitted activity are illustrated in Figure 8 below. The data preparation and NWAU calculation stages are combined together in the following section.

#### 4.3.1 Data preparation and calculation of NWAU

This section details how to assign NWAU to in-scope non-admitted patient data. The data preparation and NWAU calculation process is illustrated in Figure 8.

The process is broken into four steps, each requiring variables created in previous steps, with the final step resulting in a variable containing the 2013-14 NWAU.

The process requires the three input datasets or tables referred to in Table 11.

Three variables are required to form the input non-admitted dataset. These variables form part of the Non-Admitted Patient ABF Data Set Specifications on the IHPA website and are listed in Table 12.

Table 13 details the variables created in the process of assigning NWAU to non-admitted patient data.



Figure 8: Assigning NWAU to non-admitted patient data

#### Table 11: Dataset and tables required for assignment of NWAU to non-admitted patient data

Input dataset or table	Description
Non-admitted patient ABF DSS Dataset	Dataset based on the 2013-14 Non-admitted patient ABF Data Set Specifications located on the IHPA website.
2013-14 NWAU Price Weight table	2013-14 Non-Admitted NWAU Price Weight table, found in the 2013-14 Determination.
2013-14 NWAU Adjustment	2013-14 Non-Admitted NWAU Adjustment, found in the 2013-14 Determination.

#### Table 12: Non-admitted patient ABF DSS variables used to calculate 2013-14 NWAU

Establishment Identifier		
Indigenous status		
Outpatient clinic type Tier 2 (Version 2.0)		

Step	Variable	Name	Description	Definition
Step 1	N01	pat_ind_flag	Indigenous patient flag	1 if Patient Indigenous Status = 1, 2 or 3; else 0.
Step 2	N02	w01	See definition	Tier 2 Clinic price weight, taken from NWAU Price Weight table.
Step 3	N03	adj_indigenous	See definition	Indigenous adjustment from NWAU Adjustment table.
Step 4	N04	NWAU13	Application of indigenous adjustment	w01 * ( 1 + pat_ind_flag * adj_indigenous ).

#### Table 13: Assigning NWAU to non-admitted patient data – variable definitions

## 5 Subacute and non-acute admitted care cost model

## 5.1 General issues

#### 5.1.1 Cost Unit

An 'episode of admitted patient care'.<sup>13</sup> is the cost unit for subacute and non-acute admitted patients. It is "[t]*he period of admitted patient care … characterised by only one care type*".<sup>14</sup>, and covers the period of care from admission to discharge.

#### 5.1.2 Scope

Subacute and non-acute admitted care is that provided to patients who undergo a facility's formal admission.<sup>15</sup> processes, where the clinical intent or treatment goal is the provision of subacute care.

In-scope hospitals and patients are as defined for acute admitted patients except that the patients are admitted into a care type for subacute or non-acute care.

#### 5.1.3 Classification

Version 3 of Australian National Sub and Non-Acute Patient Classification (AN-SNAP V3) is used to classify subacute and non-acute admitted care. Where data on AN-SNAP classification is not available, the episode is classified by care type.

## 5.2 Analysis of costs to derive NWAU for subacute admitted care

The following steps were taken in developing the cost parameters and weights for subacute and non-acute admitted care:

- Prepare data
- Develop sample-to-population weights
- Classify AN-SNAP episodes into relevant categories: inliers, short- and long-stay outliers
- Apply University of Wollongong (UoW) AN-SNAP V2 cost weights and calibrate them within each care type imposing a maximum relative change of 10% to AN-SNAP weights.
- Calculate care type per diem rates implied by the calibrated AN-SNAP model.
- Derive paediatric, indigenous and remoteness adjustments.
- Derive private patient service adjustments for each care type.
- Assign the calibrated AN-SNAP V2 cost parameters to the matching AN-SNAP V3 classes.

These steps are described in more detail below.

14 Ibid.

<sup>&</sup>lt;sup>13</sup> See object class *Episode of admitted patient care* [METeOR identifier: 268956].

<sup>&</sup>lt;sup>15</sup> See glossary item Admission [METeOR identifier: 327206].

#### 5.2.1 Data preparation

Preparing the data involved the following steps:

- a. Join the NHCDC patient costing data with Admitted Patient Care (APC) dataset. Around 17% of episodes could not be matched. Of those 8% belonged to NSW Palliative care (which is phase level in NHCDC and separation level in APC) and 7% belonged to hospital boarder, an out-of-scope care type.
- b. 1,288 episodes were removed from the NHCDC sample.
  - 574 NSW palliative care episodes were removed because the overarching episode (from admission to separation) had multiple care types.
  - 465 WA episodes in psychogeriatric care type were removed because there was no match in the APC dataset.
  - 249 episodes from SA were removed because the episodes reported in the NHCDC were unmatchable with the APC dataset.
- c. Additional data containing NSW Palliative Care and phase start and end dates and Victoria's re-supplied SNAP classification were joined to the original dataset.
- d. Queensland's AN-SNAP V1 data were converted to AN-SNAP V2 where possible.
- e. 99 records where AN-SNAP classification did not match their care type were trimmed.
- f. Sample was restricted to in-scope care types: Palliative Care, Rehabilitation, Psychogeriatric, GEM, Maintenance and Other Admitted. Care types 9 and 10 (organ procurement and hospital boarder) were excluded.
- g. 110 episodes with costs lower than \$20 were removed.
- h. The rest of the data was grouped by care type and ranked by in-scope cost. Those extreme values which recorded an increase in cost of over 120% (or a decrease in cost to less than 80%) from the previous observation were removed. This resulted in removal of 79 episodes.
- i. Similar ranking and trimming process was performed on residuals of cost by LOS linear regression model. This stage resulted in removal of a further 82 episodes.
- j. The sample was restricted to hospitals in scope for ABF.
- k. "Other Admitted" care type contained only 280 patient days and the data were considered insufficient to include in the model. These episodes were trimmed.
- I. If the number of patient days in a state and care type fell below 30, the data was also trimmed. This resulted in no non-trimmed Psychogeriatric episodes for VIC, TAS and NT.

The final sample consisted of the following groups:

- a. Removed data described in (b) above not used at any point in the modelling.
- b. Trimmed data and aggregate-level cost data used to calibrate model against overall actual costs.
  - 479 episodes were trimmed involving 9,973 patient days and a cost of \$14.141 million.
  - Aggregate-level data comprised 19 establishments, with 1,690 episodes and \$26.745 million in costs.
- c. Non-trimmed data used to obtain per-diem costs for each care type.
  - 157 patient costed establishments comprising 102,161 episodes involving 1.429 million patient days and a cost of \$1.215 billion.
- d. AN-SNAP classified data a subset of (c) used to calibrate UoW AN-SNAP Version 2 weights.
  - 98 establishments reported AN-SNAP Version 2 classified data comprising 32,605 episodes involving 534,254 patient days.

#### 5.2.2 Stratification and weighting

The first stage of calculating sample-to-population weights involved taking the ratio of the number of patient days in the population to the number of patient days in the sample for each state and care type. The weight was capped at a value of 3 to ensure strata with small sample size were not overly influential. The second stage consisted of inflating the weights for each state, ensuring that each state's total weighted patient days equal its total population patient days.

The sample of AN-SNAP classified data was also weighted to account for the fact that the sample excluded all activity with admission date prior to 1 July 2010 (see Section 2.2.2).

#### 5.2.3 Determining AN-SNAP Version 3 cost parameters

The AN-SNAP cost model parameters comprise:

- a. An episode cost parameter for inliers and long-stay outliers, which varies according to the relevant AN-SNAP class; **plus**
- b. A per diem cost parameter which varies according to whether the LOS is:
  - a short-stay outlier with a per diem payment which varies across AN-SNAP classes;
  - an inlier, with a per diem payment which is the same across all AN-SNAP classes; or
  - a long-stay outlier, with an inlier payment for each day up to and including the upper inlier bound plus the outlier per diem payment which varies across AN-SNAP classes for every day above the inlier upper bound.

The AN-SNAP V2 cost weights developed by UoW and implemented by NSW Health, were calibrated with each care type in the cost data.

- a. The (trimmed) AN-SNAP Version 2 classified data were partitioned into inliers, short-stay outliers and longstay outliers and the UoW cost weights were applied and calibrated. The calibration was constrained to have at most 10% impact on the UoW cost weights.
- b. The obtained cost parameters were then adapted to the AN-SNAP V3 classification.

#### 5.2.4 Calculation of care type per diem costs

Some state and care type combinations were under-represented while others were over-represented in both the sample and the population. Also, the sample of cost data was not considered reliable enough to be used in isolation to develop care type per diems. The following steps were taken in determining the national care type per diem costs:

- a. The calibrated UoW AN-SNAP cost parameters were applied to the AN-SNAP classified data and the implied care type per diem costs were derived.
- b. Patient days for the sample of aggregate-level cost data were estimated from corresponding activity data.
- c. The care type per diems were applied to the entire sample of cost data and the parameters were adjusted to ensure actual and model costs aligned.

#### 5.2.5 Calculation of additional adjustments

The following adjustments were derived within the subacute cost model:

- a. Paediatric adjustment: All subacute patients whose age was less than or equal to 16 years at the time of admission were considered eligible for paediatric adjustment. Paediatric adjustments were calculated to apply to paediatric patients in all hospitals.
- b. Indigenous adjustment and remoteness adjustment: These adjustments were calculated in the same way as for the acute model. The three components of the remoteness adjustment were harmonised and set to be equal to their counterparts in the acute admitted model because they each differed from their acute counterpart only by a very small margin. The indigenous adjustment was derived from the subacute data.
- c. *Private patient service adjustment:* This adjustment was calculated by care type in the same way as it was calculated by AR-DRG within the acute admitted cost model.
- d. *Private patient accommodation adjustment:* This adjustment is identical to that of the acute admitted cost model (see Section 2.2.8).

In summary the proportion of NHCDC activity for which the adjustments apply are as follows:

- a. The paediatric adjustment applied to 0.5% of subacute activity.
- b. The indigenous adjustment applied to 1.8% of subacute activity.
- c. The remoteness adjustment applied to 6.5% of subacute activity.

d. The private patient adjustments applied to 11.8% of subacute activity.

The cost model (including all adjustments except the private patient accommodation adjustment) was then calibrated to ensure model costs were equalised against actual costs.

#### 5.2.6 Price weights and NWAU

The final step in the process was the conversion of cost parameters to cost weights by dividing them by a reference cost. The same reference cost is used across all streams of activity and is discussed in Section 2.2.10. These cost weights were then converted to the price weights used to assign NWAU.

## 5.3 Applying the NEP

As set out in 2013-14 National Efficient Price Determination, the price of an ABF Activity is calculated using the following formula, with adjustments applied as applicable.

#### Price of an admitted subacute ABF Activity =

 $\left[\left(PW \times \left(A_{Paed} \times (1 + A_{Ind} + A_{A}) + A_{PPS} - 1\right)\right) - \left(A_{Acc} \times LOS\right)\right] \times NEP$ 

Where:

- **PW** means the Price Weight for an ABF Activity as set out at Appendix B of the NEP13 Determination.
- A<sub>Paed</sub> means the paediatric adjustment
- A<sub>Ind</sub> means the Indigenous adjustment
- A<sub>A</sub> means each or any remoteness area adjustment
- **A<sub>PPS</sub>** means the private patient service adjustment
- A<sub>Acc</sub> means the private patient accommodation adjustment applicable to the State of hospitalisation and length of stay
- LOS means length of stay in hospital (in days)
- NEP is the 2013-14 National Efficient Price

In the event that the application of the private patient accommodation adjustment and the private patient service adjustment returns a negative NWAU value for a particular patient, the NWAU value is held to be zero - that is, negative NWAU values are not permitted for any patients under the National Pricing Model.

## 5.4 Assigning NWAU to subacute and non-acute admitted patient data

This section describes how the cost parameters calculated in the previous section can be applied to subacute and non-acute patient activity data to calculate NWAU for each episode. The process is broken into two stages:

<u>Stage 1</u>. Preparation of subacute and non-acute admitted patient data and creation of variables required for NWAU calculation.

Stage 2. Calculation of NWAU using subacute and non-acute admitted patient data prepared in Stage 1.

#### 5.4.1 Data Preparation

The data preparation stage is illustrated in Figure 9. The process is broken into eleven steps, each requiring variables created in previous steps. There are two resulting datasets, one containing data grouped to AN-SNAP Version 3 and the other containing only Care Type information.

#### Figure 9: Assigning NWAU to subacute and non-acute admitted patient data - Stage 1 - Data Preparation



The process requires the five input datasets or tables referred to in Table 14.

Fifteen variables are required to form the input APC dataset. These variables form part of the APC and ASNC ABF Data Set Specifications on the IHPA website and are listed in Table 15.

The variable definitions required to apply the Stage 1 process are given in Table 16.

#### Table 14: Datasets and tables used for assignment of NWAU to subacute admitted patient data

Input dataset or table	Description		
APC & ASNC ABF DSS Dataset	Dataset based on the 2013-14 Admitted Patient Care ABF Data Set Specifications, with extra SNAP information from the Admitted Subacute and Non acute Care ABF DSS, where available. Dataset specifications are located on the IHPA website.		
Postcode table	Table of postcodes mapped to the 2006 ASGC Remoteness Area classification. Each postcode is mapped to the Remoteness Area category within which the majority of the postcode's population reside. PO Box postcodes are mapped to the Remoteness Area category within which the Post Office is located.		
SLA table	Table of Statistical Local Areas (SLAs) mapped to the 2006 ASGC Remoteness Area classification. The mapping can be used for SLAs from the 2009 or 2010 ASGC. Each SLA is mapped to the Remoteness Area category within which the majority of the SLA's population reside.		
2013-14 NWAU Price Weight tables	2013-14 NWAU Subacute and Non-Acute Admitted AN-SNAP and Care Type Per Diem Price Weight tables, found in the 2013-14 Determination		
2013-14 NWAU Adjustments	2013-14 NWAU Subacute and Non-Acute Admitted Adjustments, found in the 2013-14 Determination		

#### Table 15: APC & ASNC ABF DSS variables used to calculate 2013-14 subacute admitted NWAU

APC ABF	State Identifier	
DSS	Establishment Identifier	
	Hospital geographical Indicator	
	Date of Birth	
	Date of Admission	
	Date of Separation	
	Саге Туре	
	Indigenous Status	
	Funding Source	
	Total Leave Days	
	Postcode of Patient's Usual Residence	
	Statistical Local Area of Patient's Usual Residence	
ASNC ABF	AN-SNAP Class (Version 3)	
DSS	Palliative phase of care start date	
	Palliative phase of care end date	

Step	Variable	Name	Description	Definition
Step 1	S01	est_remoteness	Establishment Remoteness Area	2006 ASGC Remoteness Area category of the establishment location taken from the hospital geographical indicator variable, where: 0 = Major City; 1 = Inner Regional; 2 = Outer Regional; 3 = Remote; and 4 = Very Remote.
	S02	pat_age_years	Age at admission (in years)	total whole years from Date of Birth to Date of Admission.
	S03	pat_ind_flag	Indigenous patient flag	1 if Patient Indigenous Status = 1, 2 or 3; else 0.
	S04	pat_private_flag	Private patient flag	1 if Funding Source = 2 or 3; else 0.
	S05	pat_public_flag	Public patient flag	1 if Funding Source = 1, 10 or 11; else 0.
	S06	pat_subacute_flag	Subacute and non-acute patient flag	1 if Care Type = 2, 3, 4, 5, 6 or 8; else 0.
	S07	pat_phase_flag	Palliative care phase flag	1 if Care Type = 3 and ( PalCare Phase Start and End Dates are not missing ); else 0.
Step 3	S08	pat_inscope_flag	In-scope patient flag	pat_public_flag + pat_private_flag
	S09	ansnap_flag	AN-SNAP grouped flag	1 if AN-SNAP Class is not missing and non-error; else 0.
	S10	pat_epi_length	Episode length	max(1, ( PalCare Phase End Date ) - ( PalCare Phase Start Date ) ) if pat_phase_flag = 1; else max( 1, ( Date of Separation ) - ( Date of Admission ) - ( Total Leave Days ) ).
	S11	pat_sameday_flag	Patient same-day flag	1 if pat_phase_flag = 1 and ( PalCare Phase Start Date ) = ( PalCare Phase End Date ); else
				1 if pat_phase_flag = 0 and ( Date of Admission ) = ( Date of Separation ); else
				0.
	S12	pat_0to16years_flag	Patient age group flag: 0 to 16 years	1 if pat_age_years ≤ 16; else 0.
Step 5	S13	pat_remoteness	Patient Remoteness Area	ra06 value from joined postcode table if non-missing; else ra06 value from joined SLA table if non-missing; else est_remoteness.
Step 6	S14	pat_ra_oreg_flag	Outer Regional patient flag	1 if pat_remoteness = 2; else 0.

#### Table 16: Assigning NWAU to subacute and non-acute admitted patient data - Stage 1 - Data Preparation - variable definitions

Step	Variable	Name	Description	Definition
	S15	pat_ra_rem_flag	Remote patient flag	1 if pat_remoteness = 3; else 0.
	S16	pat_ra_vrem_flag	Very Remote patient flag	1 if pat_remoteness = 4; else 0.
Step 8	S17	ansnap_inlier_lb	Inlier lower bound	( inlier lower bound from NWAU AN-SNAP Price Weight table ) if not missing; else 0.
	S18	ansnap_inlier_ub	Inlier upper bound	( inlier upper bound from NWAU AN-SNAP Price Weight table ) if not missing; 0
	S19	ansnap_pw_inlier	Inlier Price Weight	( inlier price weight from joined NWAU AN-SNAP Price Weight table ) if not missing; else 0.
	S20	ansnap_pw_inlier_perdiem	Inlier Per Diem Price Weight	( inlier per diem price weight from joined NWAU AN-SNAP Price Weight table ) if not missing; else 0.
	S21	ansnap_pw_outlier_perdiem	Outlier Per Diem Price Weight	(outlier per diem price weight from joined NWAU AN-SNAP Price Weight table) if not missing; else 0.
Step 9	S22	pat_epicat_sd_flag	Same-day episode category flag	1 if ( ansnap_inlier_lb = 0 ) and ( ansnap_pw_outlier_perdiem = 0 ); else 0.
	S23	pat_epicat_perdiem_flag	Per diem episode category flag	1 if ( ansnap_inlier_lb = 0 ) and ( ansnap_pw_inlier = 0 ); else 0.
	S24	pat_epicat_sso_flag	Short-stay outlier episode category flag	1 if ( ansnap_inlier_lb ≥ 1 ) and ( pat_epi_length < ansnap_inlier_lb ); else 0.
	S25	pat_epicat_inlier_flag	Inlier episode category flag	1 if ( ansnap_inlier_lb ≥ 1 ) and ( pat_epi_length ≥ ansnap_inlier_lb ) and ( pat_epi_length ≤ ansnap_inlier_ub ); else 0.
	S26	pat_epicat_lso_flag	Long-stay outlier episode category flag	1 if ( ansnap_inlier_lb ≥ 1 ) and ( pat_epi_length > ansnap_inlier_ub ); else 0.
Step 10	S27	caretype_perdiem	Care Type Per Diem Weight	per diem price weight from joined NWAU Care Type Price Weight table.
Step 11	S28	adj_paed	See definition	paediatric adjustment.
	S29	adj_indigenous	See definition	indigenous adjustment.
	S30	adj_remoteness_oreg	See definition	remoteness adjustment: outer regional patient.
	S31	adj_remoteness_rem	See definition	remoteness adjustment: remote patient.
	S32	adj_remoteness_vrem	See definition	remoteness adjustment: very remote patient.
	S33	caretype_adj_privpat_serv	See definition	private patient service adjustment (care type specific adjustment).
	S34	state_adj_privpat_accomm_sd	See definition	private patient accommodation adjustment: same-day rate (state-specific adjustment).
	S35	state_adj_privpat_accomm_on	See definition	private patient accommodation adjustment: overnight per diem rate (state-specific adjustment).

#### 5.4.2 Calculation of NWAU

The NWAU calculation stage is illustrated in Figure 10. The process is broken into eight steps, which correspond to steps 12 through 19 in the overall NWAU assignment process. The first two steps require the two prepared subacute and non-acute datasets output from Stage 1, and each of the steps that follow requires the variables created in previous steps.

Table 17 details the variables created in each of the steps, with the last step (Step 19) resulting in a variable containing the 2013-14 NWAU.



Figure 10: Assigning NWAU to subacute and non-acute admitted patient data - Stage 2 - NWAU calculation

Step	Variable	Name	Description	Definition
Step 12	S36	w01_a	AN-SNAP inlier/outlier weight	<pre>pat_epicat_sd_flag * ansnap_pw_inlier + pat_epicat_perdiem_flag * pat_epi_length * ansnap_pw_outlier_perdiem + pat_epicat_sso_flag * pat_epi_length * ansnap_pw_outlier_perdiem + pat_epicat_inlier_flag * ( ansnap_pw_inlier + pat_epi_length * ansnap_pw_inlier_perdiem ) + pat_epicat_lso_flag * ( ansnap_pw_inlier + ansnap_inlier_ub * ansnap_pw_inlier_perdiem +   ( pat_epi_length - ansnap_inlier_ub ) * ansnap_pw_outlier_perdiem )</pre>
Step 13	S37	w01_b	Care Type weight	caretype_perdiem * pat_epi_length
Step 15	S38	w02	AN-SNAP or Care Type weight	w01_a if ansnap_flag = 1; else w01_b.
Step 16	S39	w03	Application of paediatric adjustment	w02 * ( 1 + pat_0to16years_flag * ( adj_paed - 1) ).
Step 17	S40	w04	Application of indigenous and remoteness adjustments	w03 * (1 + pat_ind_flag * adj_indigenous + pat_ra_oreg_flag * adj_remoteness_oreg + pat_ra_rem_flag * adj_remoteness_rem + pat_ra_vrem_flag * adj_remoteness_vrem ).
Step 18	S41	w05	Application of the private patient service adjustment	w04 - pat_private_flag * ( 1 - caretype_adj_privpat_serv ) * w02.
Step 19	S42	NWAU13	Application of the Private Patient Accommodation Adjustment	max( 0, w05 - pat_private_flag * ( pat_sameday_flag * state_adj_privpat_accomm_sd + ( 1 - pat_sameday_flag ) * pat_epi_length * state_adj_privpat_accomm_on ) ).

#### Table 17: Assigning NWAU to subacute and non-acute admitted patient data – Stage 2 – NWAU calculation – variable definitions

## 6 Mental health care cost model

## 6.1 General issues

#### 6.1.1 Cost unit

An 'episode of admitted patient care'.<sup>16</sup> is the cost unit for mental health patients. For the 2013-14 NEP, mental health patients are specifically defined as only those acute admitted patients that are in MDCs 19 and 20 (Mental diseases and disorders and Alcohol/drug use and alcohol/drug induced organic mental disorders respectively) and those patients in other MDCs that have recorded psychiatric care days.

As such mental health patients are a sub-set of acute admitted patients and therefore they were analysed together in the Acute Cost Model.

Mental health patients receiving ED and non-admitted care services are not differentiated in the 2013-14 NEP and so receive payments as defined for the relevant ABF product category.

#### 6.1.2 Scope

Mental health admitted care is that provided to patients who undergo a facility's formal admission.<sup>17</sup> processes, where the clinical intent or treatment goal is the provision of acute care.

In-scope hospitals and patients are as defined for acute admitted.

#### 6.1.3 Classification

Australian Refined Diagnosis Related Groups (AR-DRGs) are used to classify acute admitted care including the mental health acute patients. The version applying for funding in 2013-14 is 6.x. This is a modified version from 6.0, mainly splitting some classes to better delineate resources associated with subclasses of patients.

## 6.2 Analysis of costs to derive NWAU for mental health care

6.2.1 Data preparation

See Section 2.2.1.

#### 6.2.2 Stratification and weighting

See Section 2.2.2.

<sup>&</sup>lt;sup>16</sup> See object class *Episode of admitted patient care* [METeOR identifier: 268956].

<sup>&</sup>lt;sup>17</sup> See glossary item Admission [METeOR identifier: 327206].

#### 6.2.3 Inlier bounds

The inlier bounds for AR-DRGs within MDCs 19 and 20 were set using the L1.5 H1.5 method while all other MDCs in the Acute Cost Model remained at L3H3 (see Section 2.2.3).

These narrower inlier bounds resulted in a lower proportion of inliers and a corresponding higher proportion of short-stay and long-stay outliers and particularly long-stay outliers as shown in Table 18.

	Short-Stay Outlier	Inlier	Long-Stay Outlier
Separations	37%	50%	12%
Patient Days	15%	37%	48%
Actual Costs	16%	38%	46%

Table 40. MDC	- 40 0 00	(Mantal haalth)		
	S 19 & 20	(mental nealth)	) – activity a	and cost distribution

Note: Same-day payment separation category has been combined with the short-stay outlier category.

Table 19 shows the corresponding distribution of activity and costs across the medical AR-DRGs (which are classified under the L3H3 inlier bounds policy).

#### Table 19: Medical AR-DRGs excluding MDC 19 & 20 – activity and cost distribution

	Short-Stay Outlier	Inlier	Long-Stay Outlier
Separations	14%	85%	2%
Patient Days	6%	82%	13%
Actual Costs	5%	83%	12%

Note: Same-day payment separation category has been combined with the short-stay outlier category.

Applying the narrower inlier bounds to MDCs 19 and 20 (mental health) significantly improves the explanatory power of the AR-DRG inlier/outlier model for mental health patients to a level comparable to the model applied across all other activity.

#### 6.2.4 Cost parameters and adjustments

The cost parameters of the AR-DRG inlier/outlier model that apply to mental health patients are calculated in the same way as those for acute patients (see Sections 2.2.3 to 2.2.6). The resulting cost parameters for mental health patients do differ to the extent that MDCs 19 and 20 (Mental health) use L1.5H1.5 to define the inlier bounds.

The calculation and application of the adjustments are broadly similar but there are a number of important differences. The empirical evidence was analysed for a number of different adjustments specifically for mental health patients on the advice of the Mental Health Working Group.

The different adjustments for mental health patients are as follows:

- a. Patients with psychiatric care days were identified and broken into five age groups, with the following three groups exhibiting significantly higher costs:
  - Less than or equal to 17 years
  - 65 to 84 years
  - Greater than or equal to 85 years
- b. Patients under the age of 17 years with psychiatric care days were further divided into those that received care in the 9 specialist paediatric hospitals and the remainder.

- c. Specialist psychiatric age adjustments were derived for the age categories as set out in Table 1 of the NEP13 Determination.
- d. Mental health patients also accrue other relevant adjustments that apply to acute admitted patients.
- 6.2.5 Price weights and NWAU

See Section 2.2.10.

## 6.3 Assigning NWAU to mental health patient data

See Section 2.4.

## 7 Cost model for block-funded hospitals

## 7.1 General issues

#### 7.1.1 Cost unit

The cost unit is a hospital.

#### 7.1.2 .Scope

Hospitals are in-scope if they have been nominated by a jurisdiction, meet the criteria for block-funded hospitals and provide in-scope hospital services.

• The draft criteria for block-funded hospitals (**Attachment D**) are currently with COAG for approval.

#### 7.1.3 Classification

Hospitals are categorised into seven size groupings (A to G) and five locality groupings (Major Cities to Very Remote) making 35 size-locality cells each with their own level of funding.

Funding is comprised of two parts, namely:

- a. An availability payment, which is 100% of the average expenditure for size groups A to E and 90% for groups F and G; and
- b. A service volume payment for groups F and G with a payment per NWAU funded by the remaining 10% of the combined total expenditure across these groups.

The category matrix and those groups eligible for the service volume payment are visualised in Figure 11.

ASGC	Service Volume Grouping (Total NWAU)								
Remoteness Classification	Group A 0-199.9	Group B 200-374.9	Group C 375-674.9	Group D 675-1049.9	Group E 1050-1499.9	Group F 1500-2649.9	Group G 2650+		
Major Cities									
Inner Regional									
Outer Regional									
Remote									
Very Remote									

#### Figure 11: Block Funding Model Structure



Eligible for Service Volume Payment

## 7.2 Analysis of costs

#### 7.2.1 Data preparation

Hospital expenditure and activity data was collected from the following data sources:

- a. The National Public Hospital Establishment Data (NPHED) collection;
- b. The National Hospital Cost Data Collection (NHCDC);
- c. The Admitted patient Care (APC) NMDS;
- d. Summaries of the Non-admitted Emergency Care Patients NMDS (NAPED); and
- e. Department of Health and Ageing MPS places and funding.

A total of 439 establishments were nominated by their respective jurisdictions, of which 430 were eligible for block funding. An overview of these hospitals by jurisdiction and remoteness classification is provided in Table 1 of **Attachment E**. Of these, four hospitals lacked sufficient expenditure data and/or activity data to enable classification.

Seventeen establishments identified as providing specialist services, including mothercraft and designated psychiatric facilities were also excluded from modelling. These are listed in Table 2 of **Attachment E**.

Expenditure was taken primarily from the NPHED, net of depreciation and identified MPS funding for aged care. The net expenditure was then divided into 19 expenditure streams with reference to reported activity data, NHCDC data and NPHED data, where possible. These are described in Table 20.

Expenditure Stream Name	Comment
1.1.1 Admitted acute public	In scope public admitted acute patients
1.1.2 Admitted acute PHI	Acute admitted private patients funded through private health insurance. Private patient price has
	been adjusted for inclusion in the model.
1.1.3 Admitted acute Self	Acute admitted private patients funded through patient contributions
1.1.4 Admitted acute other	Acute admitted patients funding through other out of scope funding streams such as DVA,
	compensibles etc. This has been excluded from the in scope cost.
1.2.1 Admitted subacute public	In scope public admitted subacute patients
1.2.2 Admitted subacute PHI	Subacute admitted private patients funded through private health insurance
1.2.3 Admitted subacute self	Subacute admitted private patients funded through patient contributions
1.2.4 Admitted subacute other	Subacute admitted private patients funded through other out of scope funding streams such as DVA,
	compensibles etc. This has been excluded from the in scope cost
1.3.1 Admitted maintenance public	In scope public admitted non-acute patients
1.3.2 Admitted maintenance PHI	Non-acute private patients funded through private health insurance.
1.3.3 Admitted maintenance self	Non-acute admitted private patients funded through patient contributions
1.3.4 Admitted maintenance other	Non-acute admitted private patients funded through other out of scope funding streams such as
	DVA, compensibles etc. This has been excluded from the in scope cost
1.4.1 Admitted Other	Out of scope services included those funded by DVA and other compensibles
2.1.1 Emergency Admitted	In scope emergency services with an admitted end status.
2.2.1 Emergency Non-admitted	In scope emergency services with a non-admitted end status.
3.1.1 Non-admitted - Outpatients	In scope outpatient services.
3.2.1 Non-admitted - Outreach	In scope outreach services.
4.1.1 Teaching Training & Research	This refers to Direct TTR and is considered out of scope. This has been excluded from the model.
5.1.1 Other	Other out of scope activity. This includes age care, primary care etc. This has been excluded from the in scope cost.

#### Table 20: PHE Expenditure Streams used to calculate Total In scope cost

The total in-scope expenditure for each hospital was calculated by removing estimated costs for out of scope services (mainly aged care, DVA patients and those funded by insurance and compensation claims). The total in-scope expenditure is given by the following formula, where the numbers correspond to with the titles in Table 20 above.

Total In-scope cost= Public Patient Streams<sub>(1.1.1 + 1.2.1 + 1.3.1 + 2.1.1 + 2.2.1` + 3.1.1 + 3.2.1)</sub> + (Private Patient Streams<sub>(1.1.2 + 1.1.3 + 1.2.2 + 1.2.3 + 1.3.2 + 1.3.3)</sub> - Establishment Private Accommodation Cost)

An outlier methodology was applied to smooth the wide variance in costs and activity observed across nominated hospitals. Specifically, hospitals with an initial cost ratio (in-scope costs/efficient cost) of more than 1.8, or less than 0.3 have been identified as model outliers. Using this process, sixteen establishments were identified as outliers and removed from the model for separate negotiation with jurisdictions. These are also listed at in Table 2 of **Attachment E**.

#### 7.2.2 Calculation of cost parameters

The eligibility for block-funding was determined by the average number of acute NWAUs over the three years to 2010-11.

Establishment-level activity, measured in Full NWAU, was estimated for 407 hospitals, where Full NWAU is given by the formula:

**NWAU**<sub>(Full)=</sub> NWAU<sub>(Acute)</sub> + NWAU<sub>(SubAcute)</sub> + NWAU<sub>(Maintenance)</sub> + NWAU<sub>(ED)</sub> + NWAU<sub>(Opts)</sub>

The calculations used for each component element are described in Table 21.

STREAM	APPROACH TO CALCULATE NWAU
Acute NWAU	Using the IHPA Acute Admitted NWAU calculator.
Subacute NWAU	Subacute NWAU = $LOS_{(Subacute)} x$ Acute NWAU per day x 0.80 where NWAU per day = $LOS_{(Acute)} \div$ NWAU (Acute) or where Acute NWAU < 10 Subacute NWAU = $LOS_{(Subacute)} x$ 0.168 x 0.8
Maintenance NWAU	Maintenance NWAU= LOS <sub>(Maintenance)</sub> x 0.0488 x 0.8
Outpatient NWAU	Outpatient NWAU = Outpatient Episodes x 0.014
Emergency Department NWAU	Using the IHPA Emergency Department calculator where possible Otherwise ED NWAU= ED Occasions of Service <sub>(PHE)</sub> x 0.063

Table 21: Calculation of Full NWAU components

A 3-year average of Full NWAU (2008-09 to 2010-11 data) was calculated and used to assign each establishment to a size grouping.

- Establishments with unusual activity patterns or missing data were reviewed on a case by case basis to derive the Full Average NWAU.
- Averages were reviewed for 24 establishments with an unusual activity jump of over 100% between any of the years; and 12 establishments with missing data.

An overview of model data is provided in Table 3 of Attachment E.

The average expenditure per size-locality cell was determined by the average 2010-11 expenditure of hospitals grouped within the particular cell.

Where less than 3 hospitals fell within the parameters of a particular cell grouping, a wider sample of comparable hospitals was drawn upon to determine an appropriate average estimated expenditure for hospitals within the cell. Comparable samples were obtained by comparing the average Full NWAU of the small cell to hospitals in the nearest remoteness areas within the same group.

Figure 12 illustrates that if there were only one or two hospitals in Group F- Remote cell then the raw average expenditure for that cell cannot be used.

Expenditure data from comparable hospitals would be sourced from the Group F -Outer Regional and Group F- Very Remote cells to calculate an average expenditure for the Group F – Remote cell.

Hospitals in the source data cells with a Full NWAU within 30 per cent of the target cell average are considered comparable. The average expenditure for the target cell is based on the average of the expenditure for the comparable hospitals, including those located within the target cell.

Figure 12: Alternative Method for Assigning Average Expenditure to Small Cells

ASGC	Service Volume Grouping (Total NWAU)									
Remoteness Classification	Group A 0-199.9	Group B 200-374.9	Group C 375-674.9	Group D 675-1049.9	Group E 1050-1499.9	Group F 1500-2649.9	Group G 2650+			
Major Cities										
Inner Regional										
Outer Regional						<u>−</u>				
Remote						•				
Very Remote						+ -				
Identifed Small Cell (Requires Alternate Method)										

The following formula was used to calculate the cost per NWAU required to derive the Service Volume element for hospitals in groups F and G.

\$NWAU<sub>SC:2010-11</sub> = (TExp<sub>F&G:2010-11</sub> x 10%) ÷ TNWAU<sub>F&G:2010-11</sub>

Where:

- TExp<sub>F&G:2010-11</sub> = Total in-scope expenditure for all establishments in Groups F and G
- TNWAU<sub>F&G:2010-11</sub> = Total in-scope NWAU for all establishments in Groups F and G

The overall model average expenditure for 2010-11 was calculated by dividing the total expenditure of all the block-funded hospitals in the model by the total number of hospitals.

The 2010-11 cost weights per size-locality cell were calculated by dividing the average expenditure for the particular cell and NWAU by the overall model average spend for 2010-11.

## 7.3 Calculation of National Efficient Cost

The overall 2010-11 model average spend was projected to 2013-14 using the annual indexation factor as specified in the NEC13 Determination.

• The NEC has been reduced by 3.1% in recognition of the Commonwealth hospital expenditure through other programs (same as the reduction effected in other ABF product streams).

#### 7.3.1 Calculation of the efficient cost for a particular hospital

The efficient cost of a particular hospital in groupings A to E is calculated by multiplying the price weight of the particular size-locality cell into which the hospital is placed by the NEC.

The efficient cost of a particular hospital in size categories F and G is calculated by:

- a. The price weight of the size-locality cell in which the hospital fits multiplied by the NEC; PLUS
- b. The 2010-11 total NWAU for the particular hospital multiplied by the \$NWAU<sub>SC:2010-11</sub>.

## Attachment A – Summary of NHCDC Round 15 cost data received

	Number of establishments reporting episode-level data							
		Acute Subacute			E	Outpatient		
State	Total	DRG	SNAP	Care Type	URG	UDG	T2 Clinic	
NSW	97	82	49	49	48	48	0	
VIC	55	53	30	43	30	30	25	
QLD	108	89	17	96	29	66	63	
SA	8	8	0	7	6	6	0	
WA	14	14	0	14	0	0	0	
TAS	4	4	0	4	4	4	4	
NT	5	5	0	5	5	5	5	
ACT	2	2	2	2	2	2	2	
TOTAL	293	257	98	220	124	161	99	

	Number of episodes						
	Acute	Suba	cute	E	Outpatient		
State	DRG	SNAP	SNAP Care Type		URG UDG		
NSW	1,310,821	21,462	21,462	1,204,492	1,493,355	0	
VIC	1,080,310	9,202	25,482	1,110,407	1,128,129	524,363	
QLD	886,343	13,401	42,636	1,088,387	1,242,240	2,947,445	
SA	262,323	0	9,354	294,227	297,752	0	
WA	366,861	0	10,285	0	0	0	
TAS	94,034	0	1,869	141,990	142,978	445,340	
NT	105,156	0	9,537	140,797	140,797	207,727	
ACT	87,513	316	5,382	111,202	111,818	950,291	
TOTAL	4,193,361	44,381	126,007	4,091,502	4,557,069	5,075,166	

## Attachment B – Emergency Department Activity and Cost Data

Population 2010-11 Source: ABF DSS, NAPED, PHE			Sam Source	nple 2010-11 : NHCDC pat	cost data iient costed <sup>A</sup>	Sample 2010-11 cost data Source: NHCDC aggregate-level data		
State	Activity Estabs		Activity	Estabs	Costs	Activity	Estabs	Costs
NSW	1,997,445	64	1,493,355	48	\$710,404,664	-	-	-
VIC	1,552,773	49	1,128,129	30	\$530,631,045	-	-	-
QLD	1,302,551	32	1,273,656	70	\$644,884,747	-	-	-
SA	479,909	17	297,752	6	\$183,256,564	126,700	19	\$11,158,496
WA	688,169	18	403,922	8	\$203,074,378	282,484	21	\$115,904,972
TAS	143,896	4	142,978	4	\$61,867,728	-	-	-
NT	118,334	3	140,797	5	\$64,794,221	-	-	-
ACT	112,463	2	111,818	2	\$78,987,482	-	-	-
Total	6,395,540	189	4,992,407	173	\$2,477,900,829	409,184	40	\$127,063,468

#### 2010-11 activity and cost data

#### 2009-10 activity and cost data

	Population 2009-10 Source: ABF DSS, NAPED, PHE		Sample 2009–10 cost data Source: NHCDC Patient costed			Sample 2009–10 cost data Source: NHCDC aggregate-level data		
State	Activity	Estabs	Activity	Estabs	Costs	Activity	Estabs	Costs
NSW	1,967,895	61	984,596	26	\$491,163,621	722,817	23	\$341,820,597
VIC	1,462,033	42	974,842	35	\$415,507,649	-	-	-
QLD	1,143,715	27	987,144	36	\$488,787,120	-	-	-
SA	450,037	14	271,292	6	\$159,100,429	97,007	5	\$31,182,372
WA	632,166	17	-	-	-	640,059	29	\$288,977,417
TAS	141,968	4	141,367	4	\$76,456,547	-	-	-
NT	112,177	3	131,842	5	\$51,562,396	-	-	-
ACT	106,814	2	106,528	2	\$69,105,519	-	-	-
Total	6,016,805	170	3,597,611	114	\$1,751,683,281	1,459,883	57	\$661,980,386

A - In the 2010-11 NHCDC submission, WA reports all 8 hospitals at an establishment level (Data Level 8). QLD reports 4 of its 70 hospitals at an establishment level.

B - Some differences in counts for the population between jurisdictions over the past year can be accounted due to the change of classification of a hospital as ABF.

## Attachment C – Summary of 2010-11 Non-admitted NHCDC Cost Data

#### Table 1: Summary of records removed in each of the data preparation steps

	Reco	ords
Data Preparation Step	Remaining	Removed
Source	5,269,897	
Removal of establishments on advice from jurisdictions	4,972,794	297,103
Removal of In-Scope Cost > \$10,000 or < \$5	4,901,421	71,373
Removal of z-score < -4 or > 4	4,853,663	47,758
Removal of non-ABF establishments	4,709,973	143,690
Removal of T2Clinic exclusions (e.g. out of scope or linked to admitted costs)	3,320,226	1,389,747
Removal of establishment-clinic combinations with less than 5 service events	3,319,986	240
Removal of 5 outlier establishments	3,000,595	319,391
Removal or records based on Clinic-specific rules or Clinic-specific establishment exclusions	2,817,898	182,697

#### Table 2: Summary of NHCDC non-admitted records by state/territory

	Records			
State	Source	Prepared		
VIC	524,363	233,769		
QLD	3,141,794	1,950,135		
SA	382	-		
WA	445,340	205,879		
NT	207,727	144,455		
ACT	950,291	283,660		
Total	5,269,897	2,817,898		

## Attachment D – Draft eligibility criteria of block-funded hospitals

The following draft eligibility criteria for block-funded hospitals have been submitted to COAG for consideration.

Public hospitals, or public hospital services, will be eligible for block grant funding if:

- a) The technical requirements for applying activity based funding (ABF) are not able to be satisfied; and/or
- b) There is an absence of economies of scale that mean some services would not be financially viable under ABF.

Examples of circumstances which may meet the criteria proposed above include, for each of the criteria:

#### Inability to satisfy technical requirements

ABF may be impractical in situations where there is:

- No or poor product specification/classification, meaning that there is no bas is for differentiating/describing the 'product' that is to be priced; and/or
- No or poor costs associated with any product classification, or where there is no cost homogeneity of the product classification; and/or
- No suitable 'unit of output' for counting and funding the product, such as a well defined occasion of service, episode of care, or bed-day, amongst others.

#### Absence of economies of scale/lack of financial viability

ABF may be impractical in situations where there is:

- A low volume of services, with an outcome being that the costs of keeping the health service open and 'available' exceed the funding that would be able to be achieved under ABF payments;
- Instability or unpredictability in service volumes, accompanied by an inability to manage input costs in accordance with changing service patterns; and
- A skewed profile of services and/or costs.

#### Other considerations

IHPA is also releasing some indicative guidelines on 'low volume' thresholds that might form part of draft Block Funding Criteria for use from 2013-2014. Under these thresholds, hospitals may be eligible for block funding if:

- They are in a metropolitan area (defined as 'major city' in the Australian Standard Geographical Classification) and they provide ≤ 1,800 inpatient National Weighted Activity Units (NWAU) per annum; or
- They are in a rural area (defined as all remaining areas, including 'inner regional', 'outer regional', 'remote' and 'very remote' in the Australian Standard Geographical Classification and they provide ≤ 3,500 inpatient NWAU per annum.

## Attachment E – Summary Data for Block Funded Hospitals

	ASGC Establishment Region							
State	Major Cities	Inner Regional	Outer Regional Remote		Very Remote			
NSW	12	52	62	12	5	143		
VIC	0	28	27	2	0	57		
QLD	3	16	37	16	17	89		
SA	0	12	24	12	6	54		
WA	1	5	25	20	14	65		
TAS	0	3	12	2	2	19		
NT	0	0	0	0	2	2		
ACT	1	0	0	0	0	1		
ASGC Region Total	17	116	187	64	46	430		

#### Table 1: Nominated Block Funded Hospitals By Jurisdiction and Remoteness Classification

Table 2: Specialist & Outlier Hospitals Considered Outside the Model

Category	State	Establishment Name	Hospital Remoteness Classification
	NSW	GRENFELL HEALTH SERVICE	Outer regional
	NSW	Bulli	Major cities
	Vic	MALLEE TRACK HEALTH AND COMMUNITY SERVICE	Outer regional
	Vic	NUMURKAH DISTRICT HEALTH SERVICE	Inner regional
	Vic	ROBINVALE DISTRICT HEALTH SERVICES	Outer regional
ers	Qld	THURSDAY ISLAND HOSPITAL	Very remote
utlis	SA	SNOWTOWN HOSPITAL	Outer regional
g O lital	WA	NANNUP HOSPITAL	Outer regional
ck Fundinç 16 Hosp	WA	MORAWA HOSPITAL	Remote
	WA	CENTRAL DRUG UNIT (NEXT STEP)	Major cities
	WA	DONGARA MULTI-PURPOSE HEALTH CENTRE	Outer regional
Blo	WA	MOORA HOSPITAL	Outer regional
_	WA	DENMARK HOSPITAL	Outer regional
	WA	CARNARVON HOSPITAL	Remote
	WA	NICKOL BAY HOSPITAL	Remote
	Tas	TOOSEY AGED AND COMMUNITY CARE	Inner regional
	Tas	FLINDERS ISLAND MULTIPURPOSE CENTRE	Very remote

Category	State	Establishment Name	Hospital Remoteness Classification
	NSW	Sydney Dental	Major cities
	NSW	CORAL TREE FAMILY CENTRE	Major cities
	NSW	Forensic Hospital	Major cities
	NSW	Illawarra Mental Health Services	Major cities
tal	NSW	NOLAN HOUSE AT ALBURY BASE HOSPITAL	Major cities
Den	NSW	THOMAS WALKER	Major cities
es- or [	NSW	Wentworth Psychiatric Services	Major cities
aft	NSW	JAMES FLETCHER - MORISSET	Inner regional
Sel	NSW	KENMORE HOSPITAL	Inner regional
sed	NSW	RNS - Sydney Dialysis Centre	Major cities
Mc	NSW	Westmead Dental Service	Major cities
beci tric,	NSW	White Cliffs Health Service	Major cities
Sp	Qld	THE PARK - CENTRE FOR MENTAL HEALTH	Major cities
syc	Qld	KIRWAN REHABILITATION UNIT	Outer regional
<u>م</u>	WA	CENTRAL DRUG UNIT (NEXT STEP)	Major cities
	Tas	STATEWIDE MENTAL HEALTH SERVICES	Inner regional
	NSW	KARITANE	Major cities
	Qld	ELLEN BARRON FAMILY CENTRE	Major cities
	ACT	QEII Family Centre	Major cities
	NSW	Gudal	Outer regional
sing ata	NSW	NSCCAHS Acute and Post-acute Centre	Major Cities
Mis: Da	WA	Dumblevung Memorial Hospital	-
~	Vic	MANANGATANG AND DISTRICT HOSPITAL	Outer regional
als ers	Qld	CHARTERS TOWERS REHABILITATION UNIT	Outer regional
spit utlie	Qld	HERBERTON HOSPITAL	Outer regional
유 V 모 ·	Qld	TEXAS HOSPITAL MULTIPURPOSE HEALTH SERVICE	Remote
lled	WA	MERREDIN HOSPITAL	Outer regional
ode evic	Qld	BAILLIE HENDERSON HOSPITAL	Inner regional
Ъй	Qld	Wynnum Hospital	Major cities

Table 3: Overvie	w of Modelled Block	Funded Hospitals	by Availability	Grouping
			,	

Group	Service Volume Grouping (Total NWAU)							
Measure	Group A 0-199.9	Group B 200-374.9	Group C 375-674.9	Group D 675-1049.9	Group E 1050-1499.9	Group F 1500-2649.9	Group G 2650+	
Count of Nominated Hospitals	74	87	85	61	37	41	24	
Total Acute NWAU	4,572	13,113	25,541	30,389	28,312	52,140	48,272	
Total Full NWAU	8,676	23,936	42,438	51,590	46,292	84,899	84,819	
Total Expenditure (\$)	95,765,961	176,647,105	260,205,024	244,089,356	233,850,371	391,010,713	392,063,145	
Minimum NWAU	116	314	579	750	620	1,257	3,095	
Maximum NWAU	186	284	803	1,057	1,546	2,731	3,803	
Minimum Expenditure (\$)	95,953	250,043	661,183	996,177	3,473,638	5,010,699	8,989,467	
Maximum Expenditure (\$)	3,350,826	3,815,528	4,510,488	6,128,070	6,755,656	12,791,316	31,309,390	
Count of Modelled Hospitals	69	85	80	60	37	39	21	
Average Full NWAU	119	277	498	847	1,251	2,072	3,388	
Average Expenditure (\$)	1,290,404	2,031,932	2,870,812	4,051,553	6,320,280	8,746,888	15,618,396	