



**IHACPA**

# **National Benchmarking Portal**

**Technical Specifications**

Version 2.0  
April 2023

## National benchmarking portal – Technical specifications — Version 2.0 April 2023

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# 1. Introduction

This document specifies the data sources and preparation undertaken in the construction of the National Benchmarking Portal (NBP). The purpose of the NBP is to provide a tool for comparison between hospitals, local hospital networks, jurisdictions, and hospital peer groups throughout Australia. Consequently, the data chosen for inclusion in the NBP may be distinct from the data chosen for inclusion in other reference sources provided by IHACPA, such as the National Hospital Cost Data Collection, Public Report, or in constructing the National Efficient Price (NEP) determination each year. The emphasis in constructing the NBP is providing the user with tools to understand the relationship between costs incurred at a particular hospital, or group of hospitals, and the activities performed therein. Therefore, the NBP allows the user to investigate the contributors to cost and to National Weighted Activity Units (NWAU), which are used to measure activity. This document, and the NBP will continue to be updated as techniques for measuring cost and activity change.

If you require any further information about the NBP, contact IHACPA at the following address [enquiries.ihacpa@ihacpa.gov.au](mailto:enquiries.ihacpa@ihacpa.gov.au)

# 2. Data Sources and Classifications

This section outlines the sources used to produce the data included in the NBP and the classification methodologies that have been employed in describing and measuring those data.

## 2.1 Data Sources

### 2.1.1 Activity Data

Activity data describe the treatment provided within each admission, presentation, or service event at an Australian public hospital, as well as some demographic information used to measure hospital activity. The Data Request Specifications (DRS) which list the fields submitted to IHACPA within each year's activity data are provided on IHACPA's website (IHACPA 2023a).

The National Weighted Activity Unit (NWAU) is a standard unit for measuring hospital activity. IHACPA assigns an NWAU to each admission, presentation, or service event undertaken by a hospital, for the purposes of price setting in public hospitals under the National Health Reform Agreement (NHRA) (FFR 2023). The NWAU assigned to a given episode of care is updated annually to maintain clinical currency.

For each pair of consecutive financial years, IHACPA determines an NWAU version which is used to measure growth in hospital activity between those years. This NWAU version is referred to as being 'native' to the second of those financial years and is given a numbered suffix to indicate this. For example, the NWAU version designed to measure growth in hospital activity between the 2018–19 and 2019–20 financial years is referred to as NWAU19. NWAU19 is the native NWAU version for the 2019–20 financial year.

The formula used to assign NWAU to an episode of care, presentation, or service event under a given NWAU version is released annually by IHACPA within the National Efficient Price (NEP) Determination. Each year's Determination is available on IHACPA's website (IHACPA 2023d). Calculators used to determine the NWAU of a given episode of care are also available on IHACPA's website (IHACPA 2023f).

### 2.1.2 Cost Data

The cost incurred by each hospital for undertaking each admission, presentation, or service event is provided to IHACPA separately to activity through the National Hospital Cost Data Collection (NHCDC). Data request specifications (DRS) for each year's NHCDC report are available from IHACPA's website (IHACPA 2023e).

## 2.2 Classifications

### 2.2.1 Classifications Used for NWAU Calculations

For each stream of care undertaken by public hospitals, there is a classification system used to group similar records for the purpose of calculating NWAU. The classification systems used for the purpose of calculating NWAU in the years covered by the NBP are listed in Table 1.

In reading Table 1, note that the AR-DRG classification may be applied to all admitted episodes of care. Consequently, in instances where an admitted subacute or non-acute care record cannot be assigned an NWAU based on its AN-SNAP v4 class, a NWAU value is calculated using the AR-DRG classification. Further details regarding NWAU calculations are provided in Section 3.

Table 1: Classifications used for NWAU calculations by stream and year

Stream	Classification	Version
Admitted acute	Australian Refined Diagnosis Related Groups (AR-DRG) classification	2017–18: Version 8.0 2018–19: Version 9.0 2019–20: Version 9.0 2020–21: Version 10.0
Admitted mental health	Australian Refined Diagnosis Related Groups (AR-DRG) classification	2017–18: Version 8.0 2018–19: Version 9.0 2019–20: Version 9.0 2020–21: Version 10.0
Admitted subacute and non-acute care	Australian National Subacute and Non-Acute Patient (AN-SNAP) classification	Version 4.0
Non-admitted	Tier 2 Non-Admitted Services classification	2017–18: Version 4.1 2018–19: Version 5.0 2019–20: Version 6.0 2020–21: Version 7.0
Emergency department	Urgency Related Groups (URG) classification	Version 1.4

### 2.2.2 Classifications Based on the AR-DRG Classification

Several classification systems may be used for filtering the admitted care streams in the NBP, other than those used for the calculation of NWAU. These are described in Table 2.

Table 2: Classifications related to the AR-DRG classification

Streams	Classification	Description
Admitted acute, and admitted mental health	Major Diagnostic Category (MDC)	A companion to the AR-DRG classification which describes the primary body system which is being treated in each hospital admission. It is generally a coarser classification than AR-DRG.
Admitted acute, admitted mental health, and admitted subacute and non-acute care	Service Related Groups (SRG) Version 6.0	A classification of admitted episodes of care developed by the NSW Ministry of Health <sup>1</sup> . This classification is designed to group episodes of care for the purpose of administration and planning, according to the services used during each episode of care.

### 2.2.3 AIHW Peer Group

To enable users to identify and compare similar hospitals throughout Australia, IHACPA has classified each hospital according to the Australian Institute of Health and Welfare (AIHW) Peer Group (AIHW 2015, AIHW 2021). Further detail regarding the assignment of peer groups to hospitals which could not be successfully matched to entries in these sources is available in Section 3.

### 2.2.4 ICD-10-AM Codes

The International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (ICD-10-AM) is used to classify diseases and other health problems among patients in the admitted streams of care. Users may filter records according to primary diagnosis, as classified using the ICD-10-AM, on the NBP. The ICD-10-AM Version 10.0 is used for data from 2017–18 and 2018–19, and ICD-10-AM Version 11.0 is used for data from 2019–20 and 2020–21. More information is available via IHACPA’s website (IHACPA 2023c).

The Emergency Department ICD-10-AM Principal Diagnosis Short List (ED short list) is used to classify diseases and other health problems which give rise to emergency department presentations. The user may filter emergency department records based on the ED short list code corresponding to the primary cause for an emergency department presentation. The version used agrees with that used for admitted services. That is, 2017–18 and 2018–19 data use the ED Short List Version 10.0 whereas data from 2019–20 and 2020–21 use the ED Short List Version 11.0. More information on the ED short list is available via IHACPA’s website (IHACPA 2023b).

<sup>1</sup> The Service Related Groups Version 6.0 grouper was provided to IHACPA by the NSW Ministry of Health.



# 3. Data Preparation

The primary purpose of the NBP is to enable the benchmarking of hospitals and services between one establishment, LHN, or jurisdiction, to another. Consequently, data have been omitted if their inclusion would hamper accurate benchmarking, for example in instances where data are reported inconsistently across the nation. This section outlines the preparation undertaken to produce the data presented in the NBP.

NWAU is calculated according to the year in which the separation occurred (the 'native' NWAU version) and the NWAU version applying to the subsequent year. The latter is used to measure growth from one year to the next. Each NWAU version is calculated according to the NEP Determination in which it is defined.

## 3.1 Activity Data

### 3.1.1 Admitted Acute

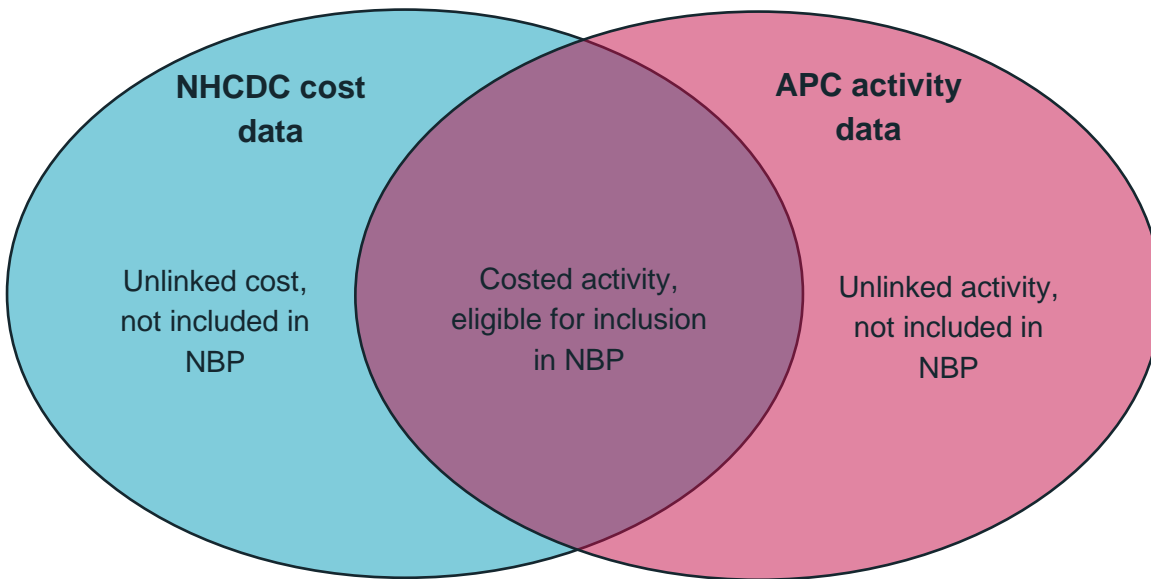
For the purposes of this document, admitted acute care refers to admitted patients with an admitted patient care type<sup>2</sup> of 'Acute care', or 'Newborn care' as assigned in the Admitted Patient Care (IHACPA 2023a) (APC) data set. Records with a care type of 'Mental health care' are discussed in the 'Mental Health Care Episodes' section below.

Cost data for this stream of care are contained in the National Hospital Cost Data Collection (IHACPA 2023e) (NHCDC). Cost data which cannot be linked to a record in the APC data set are not included in the admitted acute stream of the NBP, nor are APC records with no matching cost data. This is illustrated in Figure 1.

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<sup>2</sup> AIHW METeOR 711010.

Figure 1: Overview of NBP data



In keeping with the methodology used by IHACPA to set the National Efficient Price, and to produce the Public Sector Cost Report, patients who are separated from hospital after a very long stay are not included in the NBP. Here, the definition of ‘very long stay’ is a patient admitted before the financial year preceding the one in which they are separated from hospital. For example, if a patient is discharged from hospital in 2018–19 then their record is not included in the NBP if they were admitted before July 1, 2017.

To ensure that the NBP is a useful tool for comparing activity from one hospital to another, IHACPA has restricted data appearing on the NBP to those which may appropriately have their activity measured using the NWAU formulas in IHACPA’s NEP Determinations. This means that records are included only if they were reported by a hospital which was funded through ABF in the year of reporting. Similarly, records assigned to one of the error AR-DRG classes 960Z (Ungroupable), 961Z (Unacceptable principal diagnosis), or 963Z (Neonatal diagnosis not consistent w age/ weight) do not appear in the NBP. Records within these classes receive no NWAU because they contain insufficient or contradictory data.

Finally, records only appear in the NBP if their funding source allows for their being priced by IHACPA subject to IHACPA’s remit under the National Health Reform Agreement (NHRA). In the admitted acute stream this means that records included in the NBP are funded either through the jurisdiction’s health service budget (other than instances where no charge is raised due to hospital decision), through contracted care, through private health insurance or are self-funded. Further details on in-scope funding sources may be found in the National Efficient Price Determination on IHACPA’s website (IHACPA 2023d).

Table 3 summarises the records not included in the NBP in the admitted acute stream. The table uses the following key:

- NA: NHCDC records to which no matching activity data could be found.
- LS: Long-stay records.
- HO: Records reported by hospitals which were not funded through ABF in the given reporting year. This excludes records in the category NA or LS above.

- OS: Records without the requisite AR-DRG information to allow for pricing, or a funding source which is out of scope under the NHRA. This excludes records in the categories NA, LS, or HO above.

Table 3: Summary of admitted acute NHCDC records not included in the NBP

Reason for removal from admitted acute data	Jurisdiction									
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	National	
2017 – 18	NA	0	0	0	0	131	34	0	0	165
	LS	2	1	0	1	0	0	0	1	5
	HO	0	66	58,299	0	12,776	3,814	2,121	0	77,076
	OS	40,870	37,979	23,208	9,193	19,314	4,309	2,571	4,461	141,905
2018 – 19	NA	0	0	0	0	0	0	0	0	0
	LS	5	3	0	0	0	0	0	0	8
	HO	3,602	60	60,493	0	12,008	4,033	2,196	0	82,392
	OS	37,039	38,683	21,120	9,873	19,235	4,103	2,641	4,013	136,707
2019 – 20	NA	0	0	0	0	0	0	0	0	0
	LS	3	3	0	1	1	0	0	0	8
	HO	0	63	53,270	0	11,148	3,652	2,424	0	70,557
	OS	33,455	36,994	20,329	9,349	19,194	3,395	2,761	4,050	129,527
2020 – 21	NA	0	0	0	0	0	0	0	0	0
	LS	1	2	0	1	0	0	0	2	6
	HO	0	44	53,840	0	11,622	3,674	2,590	0	71,770
	OS	31,933	34,428	21,918	9,580	16,097	7,343	2,737	4,046	128,082

Table 4 summarises the number of records included in the NBP by jurisdiction.

Table 4: Summary of admitted acute NHCDC records included in the NBP

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18	1,594,703	1,637,352	1,319,029	370,579	499,319	113,356	161,010	104,674	5,800,022
2018 – 19	1,622,774	1,685,834	1,397,356	378,034	516,202	119,858	169,027	104,498	5,993,583
2019 – 20	1,564,738	1,634,623	1,435,617	378,157	534,558	116,497	173,690	103,884	5,941,764
2020 – 21	1,595,582	1,624,835	1,550,624	395,256	582,120	121,775	174,446	115,769	6,160,407

Using the remaining data, IHACPA calculates the native NWAU value for each admitted acute separation. To measure growth, IHACPA also calculates, for each record, the NWAU native to the subsequent and previous year of that record. The variables used to determine each record's NWAU are determined by data in the APC data set or are drawn from the relevant NEP determination.

Before including admitted acute data in the NBP, any principal diagnoses recorded in the APC data set which could not be identified in the ICD-10-AM codes are replaced with the value 'Missing', to allow for coarser aggregation of data. Table 5 summarises the small number of records impacted by year.

Table 5: Summary of separations with missing or invalid principal diagnoses in the admitted acute stream

Missing or invalid principal diagnosis	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18	0	0	0	0	0	0	0	0	0
2018 – 19	0	0	0	0	0	0	0	1	1
2019 – 20	0	0	0	0	0	0	0	0	0
2020 – 21	0	0	0	0	0	0	0	0	0

After renaming any ICD-10-AM codes to 'Missing' if necessary, admitted acute records with common data are aggregated into a single record, before being included in the NBP. Records are aggregated together in this process if they have the same values for all variables in the admitted acute NBP dimensions list, provided in Appendix A). Variables which are not in the NBP dimensions list, for example, cost and NWAU, are summed when performing the aggregation.

### 3.1.2 Admitted Subacute and Non-acute Care

Admitted subacute and non-acute care refers to admitted patient records with an admitted patient care type<sup>3</sup> of 'Rehabilitation care', 'Palliative care', 'Geriatric evaluation and management', 'Psychogeriatric care', or 'Maintenance care' as assigned in the APC data set. Cost data which cannot be linked to a record in the APC data are not included in the NBP, nor are APC records with no matching NHCDC data.

The selection of records for this stream is the same as that within the admitted acute stream, apart from palliative care data. Some palliative care cost and activity records are reported to IHACPA at the level of a 'phase', which is a clinically meaningful period within an episode of care<sup>4</sup> via the palliative care phase-level (PCC) activity data set (IHACPA 2023a). Each palliative care phase-level record in the PCC data set matches a unique episode in the APC. To view phase-level data, the user may choose to view palliative care phases on the NBP to compare statistics among records reported at the phase level. However, if the user chooses to view all records from within the admitted subacute and non-acute care stream, phase-level palliative care records are aggregated into their respective episodes so that these episodes may be compared fairly to other admitted subacute and non-acute care records. The dimensions by which admitted subacute and non-acute episodes and phases are aggregated are distinct from those in the admitted acute stream and may be found in Appendix A).

Records in the NHCDC data set which don't link to an APC record, or a palliative care phase-level activity record, are not included in the NBP. Furthermore, if a phase-level NHCDC record matches a phase-level PCC activity record which cannot be linked to an APC episode then that record is not included in the NBP. This is done to ensure that the records being compared within the NBP are defined using the most complete data possible.

The treatment of 'very long stay' episodes in the admitted subacute and non-acute care stream is the same as that in the admitted acute stream. That is, if a palliative care phase belongs to a 'very long stay' episode in the APC data set then data for that phase of care is removed from the NBP data set, regardless of the date on which the phase of care began. This is to improve consistency of benchmarking among all palliative care records, regardless of the manner in which they are reported.

Records from hospitals which are not funded through ABF and those with funding sources outside of IHACPA's remit under the NHRA are removed from the admitted subacute and non-acute stream. The funding sources included in the NBP for subacute and non-acute records are the same as those in the admitted acute stream. Records with an admitted patient care type 'Psychogeriatric care' or 'Geriatric evaluation and management' which pertain to a person under the age of eighteen are removed on the basis that the price assigned to such a patient is based on the care of geriatric patients and is therefore not useful for benchmarking the care of a non-adult.

Episode-level data with an error AN-SNAP Version 4 class are removed unless they pertain to overnight paediatric palliative care (AN-SNAP v4 class 499G) or they have a valid AR-DRG class with version appropriate to the year of reporting. The former are retained because they receive a

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<sup>3</sup> AIHW METeOR 711010.

<sup>4</sup> AIHW METeOR 681549.

valid per diem NWAU in each year under consideration and the latter because the admitted acute NWAU calculator is used as a fallback for calculating the NWAU of admitted subacute and non-acute records.

If one or more palliative care phases within an episode of care have an error AN-SNAP Version 4 class, other than 499G (Paediatric overnight palliative care – ungroupable) then the phase level data for this episode does not appear on the NBP. If this is the case, then the cost for these phases are summed and matched to an episode-level record if possible. This episode-level record must now meet the same criteria as any other episode-level record in order to appear on the NBP.

Table 6 and Table 7 summarise the admitted subacute and non-acute records removed from the NBP. The following abbreviations are used:

- NA: NHCDC records to which no matching activity data could be found.
- LS: Long-stay episodes, or phases belonging to long-stay episodes.
- HO: Records reported by hospitals which were not funded through ABF in the given reporting year. This excludes records in the category NA or LS above.
- OS: Records without the requisite AN-SNAP or AR-DRG information to allow for pricing, those with a funding source which is out of scope under the NHRA, or patients under the age of eighteen with an admitted patient care type of 'Psychogeriatric care' or 'Geriatric evaluation and management'. This excludes records in the categories NA, LS, or HO above.

Table 6: Summary of admitted subacute and non-acute episode-level NHCDC records not included in the NBP

Reason for removal from admitted subacute and non-acute episode-level data	Jurisdiction									
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	National	
2017 – 18	NA	0	0	0	0	7	331	1	0	339
	LS	3	2	17	0	3	0	2	0	27
	HO	0	1	2,025	0	722	508	45	0	3,301
	OS	2,444	1,469	970	367	577	139	41	153	6,160
2018 – 19	NA	0	1	0	0	765	360	0	28	1,154
	LS	3	2	9	1	3	0	5	0	23
	HO	26	4	2,065	0	276	338	53	0	2,762
	OS	2,229	1,258	933	339	462	159	55	301	5,736
2019 – 20	NA	0	1	0	0	10	354	0	15	380
	LS	7	3	9	0	1	1	1	2	24
	HO	0	4	1,855	0	330	473	45	0	2,707
	OS	1,904	1,149	958	312	447	83	35	258	5,146
2020 – 21	NA	9	0	0	13,934	55	308	821	248	15,375
	LS	6	2	15	1	0	0	0	0	24
	HO	0	2	2,179	0	312	376	51	0	2,920
	OS	1,597	840	1,088	384	438	102	22	241	4,712

Table 7 contains a summary of the episode-level admitted subacute and non-acute records included in the NBP.

Table 7: Summary of admitted subacute and non-acute episode-level NHCDC records included in the NBP

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
<b>2017 – 18</b>	48,746	37,000	32,941	8,852	10,619	2,533	965	3,728	<b>145,384</b>
<b>2018 – 19</b>	49,399	37,507	33,575	9,713	11,109	2,356	1,122	5,267	<b>150,048</b>
<b>2019 – 20</b>	45,042	35,507	34,430	10,411	11,374	2,115	783	4,885	<b>144,547</b>
<b>2020 – 21</b>	43,419	29,944	36,614	11,456	11,646	2,132	692	5,006	<b>140,909</b>



Table 8: Summary of admitted palliative care phase-level NHCDC records not included in the NBP

Reason for removal from admitted palliative care phase-level data*	Jurisdiction								National	
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT		
2017 – 18	NA	0	0	0	0	0	0	0	0	0
	LS	0	0	0	0	0	0	0	0	0
	HO	0	0	768	0	0	0	0	0	768
	OS	1,204	474	276	72	0	0	0	129	2,155
2018 – 19	NA	0	0	0	0	0	2	0	0	2
	LS	0	0	0	0	0	0	0	0	0
	HO	0	0	856	0	0	0	0	0	856
	OS	1,139	408	298	74	0	31	0	0	1,950
2019 – 20	NA	209	0	0	0	0	527	3	0	739
	LS	0	0	0	0	0	0	0	0	0
	HO	0	0	185	0	0	0	0	0	185
	OS	1,093	309	138	64	0	30	36	0	1,670
2020 – 21	NA	0	0	139	0	0	0	0	0	139
	LS	0	0	0	0	0	0	0	0	0
	HO	0	0	777	0	0	0	0	0	777
	OS	1,043	231	198	0	0	22	35	0	1,529

\* Record counts in this table are at the phase level, not the episode level.

Table 9 contains a summary of the admitted palliative care phases included in the NBP. Data are drawn from NHCDC records which could be matched to phase-level palliative care activity and for which that activity is priced at the phase-level on the NBP.

Table 9: Summary of admitted palliative care phase-level NHCDC records included in the NBP

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
<b>2017 – 18</b>	29,895	14,603	11,248	2,371	0	0	0	1,600	<b>59,717</b>
<b>2018 – 19</b>	31,460	15,531	11,838	2,918	0	636	0	0	<b>62,383</b>
<b>2019 – 20</b>	31,481	15,183	6,461	3,492	0	700	1,012	0	<b>58,329</b>
<b>2020 – 21</b>	29,648	14,738	8,897	0	0	551	1,222	0	<b>55,056</b>

IHACPA has attempted to provide information about palliative care episodes at the phase level where those data are available. However, to allow for accurate benchmarking between records with data reported at the phase level and those with data reported at the episode level, IHACPA also collates phases belonging to a common episode and presents this information at the episode level. When considering cost data, this involves summing the cost of constituent phases to obtain the cost of an episode. When obtaining activity data for such an episode, information is copied from the APC record to which the phase level data is matched. This process results in the loss of more granular information contained in phase-level reporting. For example, this aggregation generally results in the loss of the AN-SNAP v4 class, which is determined at the phase level for palliative care records.

IHACPA calculates the native NWAU for every record in the admitted subacute and non-acute care stream. Records with cost reported at the phase level have their NWAU calculated using the admitted subacute and non-acute care NWAU formula obtained from IHACPA's NEP determination (IHACPA 2023d). If an episode records an NWAU of zero using the admitted subacute and non-acute care calculator, then IHACPA obtains the NWAU for that record from the admitted acute NWAU formula.

Palliative care phases have NWAU calculated at the phase level using the admitted subacute and non-acute care NWAU formula for the relevant year. If one or more palliative care phase within an episode records zero NWAU due to the presence of an error AN-SNAP v4 class other than '499G' (Paediatric overnight palliative care – ungroupable) then IHACPA calculates the NWAU for that episode as though the costs were reported at the episode level. If there is no such error AN-SNAP v4 class then the NWAU of the episode to which the palliative phases belong is calculated by summing the NWAU of each phase within the episode.

Before uploading to the NBP, any principal diagnoses recorded in the APC data set which could not be identified with valid ICD-10-AM codes were replaced with the value 'Missing', to allow for coarser aggregation of data. Table 10 shows the number of records impacted by year.

Table 10: Summary of separations with missing or invalid principal diagnoses in the admitted subacute and non-acute care stream

Missing or invalid principal diagnosis	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18	11	0	0	0	0	0	0	0	11
2018 – 19	18	0	0	0	0	0	1	0	19
2019 – 20	2	0	0	0	0	0	0	0	2
2020 – 21	3	0	0	0	0	0	0	0	3

After renaming any ICD-10-AM codes to ‘Missing’ if necessary, admitted subacute and non-acute care records with common data are aggregated into a single record, before being included in the NBP. Records are aggregated together in this process if they have the same values for all variables in the admitted subacute and non-acute care NBP dimensions list in Appendix A). Variables which are not in the NBP dimensions list, for example, cost and NWAU, are summed when performing the aggregation.

### 3.1.3 Admitted Mental Health

The admitted mental health stream refers to admitted patient records with an admitted patient care type<sup>5</sup> of ‘Mental health care’ in the APC data set (IHACPA 2023a). Cost data which cannot be linked to a record in the APC data set are not included in the NBP, nor are APC records with no matching NHCDC data.

Cost and activity records in the admitted mental health care stream may be submitted at the episode or phase level, in the same manner as palliative care records. Each admitted mental health care episode is recorded in the APC data set and in the mental health care episode (MHCE) activity data set. Records which correspond to the same admission are identified via a linking key provided in the APC and MHCE data sets. Furthermore, each episode may be matched with one or many phases, which are reported in the mental health care phase (MHCP) activity data set (IHACPA 2023a). In this context, a ‘phase’ refers to a period within an admitted episode of care, defined in terms of the clinical goal of that period of care<sup>6</sup>. MHCP records are linked to the MHCE record to which they belong via a linking key present in both data sets. Cost data for these records may be reported so that it links to MHCP, MHCE, or APC activity records.

Unlike in the admitted subacute and non-acute care setting, the user is not able to view admitted mental health care data at the phase level on the NBP at present. This is because the NWAU versions provided on the NBP at the time of writing do not allow for the calculation of NWAU at the phase level for admitted mental health care. Instead, under NEP 2017–18, 2018–19, 2019–20, and

<sup>5</sup> AIHW METeOR 711010.

<sup>6</sup> AIHW METeOR 682464.

2020–21 and hence in NWAU17, NWAU18, NWAU19, and NWAU20, admitted mental health care is priced using AR-DRGs. Consequently, costs reported at the phase level are summed and allocated to the matching episode-level activity record before uploading. The dimensions on which admitted mental health care stream data are aggregated may be found in Appendix A).

Cost data must match an APC record to be included in the NBP, to ensure that there is sufficient data for each record to allow for effective benchmarking. If an admitted mental health care record in the NHCDC matches to a record in the MHCE activity data set, then that MHCE record must also link to an APC activity record to be included. Similarly, if an NHCDC record matches to the MHCP activity data set, then that MHCP record must be successfully matched to the APC data set to be included in the NBP.

Records that have a 'very long' length of stay are managed in the same manner as described for the admitted subacute and non-acute care stream. That is, if an episode has an admission date before the financial year prior to the year of its separation, then it is removed. If a phase is matched to such an episode in the APC data set, then it is removed, regardless of the date on which that phase began.

Using the same conventions as in the admitted acute stream, records do not appear in the admitted mental health stream within the NBP if they are not appropriate for benchmarking purposes. Specifically, this means that records are not included if they are submitted by hospitals which are not funded through ABF, if they are assigned one of the error AR-DRG classes 960Z (Ungroupable), 961Z (Unacceptable principal diagnosis), or 963Z (Neonatal diagnosis not consistent w age/ weight). Furthermore, records are included only if they have a funding source which is not within IHACPA's pricing remit under the NHRA. The funding sources for admitted mental health records which are included in the NBP are the same as those for the admitted acute stream.

Table 11 and Table 13 summarise the admitted mental health episodes and phases removed from the NBP, respectively. The following abbreviations are used:

- NA: NHCDC records to which no matching activity data could be found.
- LS: Long-stay episodes, or phases belonging to long-stay episodes.
- HO: Records reported by hospitals which were not funded through ABF in the given reporting year. This excludes records in the category NA or LS above.
- OS: Records without the requisite AR-DRG information to allow for pricing, those with a funding source which is out of scope under the NHRA. This excludes records in the categories NA, LS, or HO above.

Table 11: Summary of admitted mental health care episode-level NHCDC records not included in the NBP

Reason for removal from admitted mental health care episode-level data	Jurisdiction									
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	National	
2017 – 18	NA	0	0	0	0	0	0	0	0	0
	LS	0	15	26	0	0	5	0	0	46
	HO	0	0	481	0	0	609	0	0	1,090
	OS	0	11	88	0	21	16	30	2	168
2018 – 19	NA	12	0	0	0	0	0	0	0	12
	LS	0	0	21	2	16	1	0	2	42
	HO	0	0	363	0	0	117	0	0	480
	OS	0	18	102	1	47	114	47	45	374
2019 – 20	NA	0	0	0	0	0	5	0	0	5
	LS	0	3	26	10	25	0	0	1	65
	HO	0	0	384	0	0	162	0	0	546
	OS	0	76	71	29	266	86	40	41	609
2020 – 21	NA	0	0	0	0	0	0	0	0	0
	LS	0	0	19	0	15	0	0	0	34
	HO	0	0	320	0	0	0	0	0	320
	OS	1	0	130	22	208	0	0	47	408

Table 12 summarises the admitted mental health care records included in the NBP. Data are drawn from NHCDC data which could be matched to episode-level admitted mental health activity.

Table 12: Summary of admitted mental health care episode-level NHCDC records included in the NBP

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
<b>2017 – 18</b>	0	591	14,896	0	2,667	200	1,070	107	<b>19,531</b>
<b>2018 – 19</b>	651	994	11,606	5,925	2,661	3,132	1,188	2,269	<b>28,426</b>
<b>2019 – 20</b>	15	8,221	10,358	6,089	12,693	2,654	1,306	2,378	<b>43,714</b>
<b>2020 – 21</b>	523	418	17,217	6,188	12,631	3,246	1,354	2,562	<b>44,139</b>

Table 13: Summary of admitted mental health care phase-level NHCDC records not included in the NBP

Reason for removal from admitted mental health care episode-level data*	Jurisdiction									
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	National	
2017 – 18	NA	0	0	0	0	0	0	0	0	0
	LS	0	2	5	0	0	0	0	14	21
	HO	0	0	43	0	0	0	0	0	43
	OS	297	481	124	385	62	0	0	172	1,521
2018 – 19	NA	1,421	0	0	0	0	0	0	0	1,421
	LS	47	5	18	0	0	0	0	0	70
	HO	0	0	1,807	0	0	0	0	0	1,807
	OS	258	573	133	426	176	5	0	0	1,571
2019 – 20	NA	124	0	0	0	0	0	0	0	124
	LS	100	0	10	0	0	0	0	0	110
	HO	0	0	9	0	0	0	0	0	9
	OS	293	559	51	453	0	0	0	0	1,320
2020 – 21	NA	162	0	0	0	0	0	0	0	162
	LS	55	3	21	0	0	0	0	0	79
	HO	0	759	142	0	0	0	0	0	901
	OS	205	605	61	0	0	0	0	0	871

\* Record counts here are number of phases, whereas MHCP records are rolled up to the episode level before uploading to the NBP.

Table 14 summarises the admitted mental health care phases included in the NBP. These phases appear on the NBP after being aggregated to the episode level.

Table 14: Summary of admitted mental health care phase-level NHDC records included in the NBP

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18	35,794	22,399	17,601	7,284	7,525	0	0	5,781	96,384
2018 – 19	37,701	24,893	19,629	7,199	9,123	140	0	2	98,687
2019 – 20	37,027	17,312	9,055	6,820	0	0	0	0	70,214
2020 – 21	35,974	24,996	6,068	0	0	0	0	0	67,038

IHACPA calculates the native NWAU for every record in the admitted mental health stream. NWAU for records in the admitted mental health records is calculated using the same methodology as that used in the admitted acute stream. The data required for each NWAU calculation are contained either in the APC data set, or in the relevant NEP Determination (IHACPA 2023d).

Before uploading to the NBP, any principal diagnoses recorded in the APC data set which could not be identified with valid ICD-10-AM codes were replaced with the value 'Missing', to allow for coarser aggregation of data. Table 15 shows the number of records impacted by year.

Table 15: Summary of separations with missing or invalid principal diagnoses in the admitted mental health care stream

Missing or invalid principal diagnosis	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18	0	0	0	0	0	0	0	0	0
2018 – 19	651	451	156	5,875	0	5	0	163	7,301
2019 – 20	14	385	0	5,726	0	0	0	89	6,214
2020 – 21	518	418	1	5,101	0	3,246	1,354	755	11,393

After renaming any ICD-10-AM codes to 'Missing' if necessary, admitted mental health care records with common data are aggregated into a single record, before being included in the NBP. Records are aggregated together in this process if they record the same values on all variables in the admitted mental health care NBP dimensions list in Appendix A). Variables which are not in the NBP dimensions list, for example, cost and NWAU, are summed when performing the aggregation.



### 3.1.4 Emergency Department

The emergency department (ED) stream refers to activity data submitted to the emergency department activity data set (IHACPA 2023a) and the NHCDC cost records linked with this activity.

Only costs that can be linked to records in the emergency department activity data set are included in the emergency department stream within the NBP. Similarly, ED records with no matching cost data are not included in the NBP. Only patient-level data is reported in the NHCDC, hence all data included in the NBP is at the patient level, whereas some emergency services activity is reported to IHACPA at the aggregate level (IHACPA 2023a).

Just as in the admitted streams, records are not included in the NBP if they are not assigned an NWAU due to their being outside of IHACPA's remit under the NHRA. In the emergency department stream, this means that the record must not be funded through the Department of Veterans' Affairs and that the patient in question is not entitled to claim damages for the emergency presentation, for example under Motor Vehicle Third Party Insurance. Similarly, emergency department records are included in the NBP only if they are reported by a hospital which was funded through ABF in the year under consideration.

Records are not included in the NBP if they possess insufficient information to be assigned an NWAU. Urgency Related Groups (URG) are the primary classification used to assign an NWAU to emergency department events. However, in the years under consideration, a coarser classification, the Urgency Disposition Groups (UDG) may be used to do so if an error URG is assigned. The UDG class of an emergency presentation is determined by that presentation's Type of visit<sup>7</sup>, Episode end status<sup>8</sup>, and Triage category<sup>9</sup>. The criteria used to determine whether a record receives an error URG class differ in the years of data available in the NBP. However, if all three of these variables have valid values then a non-zero NWAU is assigned. The assignment of a non-error URG requires diagnostic information in addition to the variables required to determine a UDG.

Table 16 summarises the emergency department removed from the NBP. The following abbreviations are used:

- NA: NHCDC records to which no matching activity data could be found.
- HO: Records reported by hospitals which were not funded through ABF in the given reporting year. This excludes records in the category NA above.
- OS: Records without the requisite URG or UDG information to allow for pricing, those funded by the Department of Veterans' Affairs or those eligible for compensation via a damages claim. This excludes records in the categories NA, or HO above.

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<sup>7</sup> AIHW METeOR 746599

<sup>8</sup> AIHW METeOR 746709

<sup>9</sup> AIHW METeOR 746627

Table 16: Summary of emergency department NHCDC records not included in the NBP

Reason for removal from emergency department data	Jurisdiction									
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	National	
2017 – 18	NA	0	0	0	0	1,216	451	40	0	1,707
	HO	0	0	253,106	0	99,621	0	9,171	0	361,898
	OS	89,031	52,872	49,678	13,431	23,433	6,785	2,784	4,103	242,117
2018 – 19	NA	0	0	0	0	38,824	523	0	0	39,347
	HO	10,486	0	261,623	0	17,046	0	9,162	0	298,317
	OS	85,188	54,102	49,387	14,277	23,923	6,489	2,839	3,975	240,180
2019 – 20	NA	0	192,781	0	0	38,479	514	1	82	231,857
	HO	0	0	242,940	0	15,910	0	8,580	0	267,430
	OS	77,073	48,779	45,737	13,288	22,148	6,074	2,811	3,049	218,959
2020 – 21	NA	0	0	0	0	0	0	0	0	0
	HO	0	0	263,680	0	57,862	0	9,558	0	331,100
	OS	76,241	44,121	53,118	36,426	25,175	7,923	3,039	3,478	249,521

Table 17 summarises the emergency department records included in the NBP, by jurisdiction.

Table 17: Summary of emergency department NHCDC records included in the NBP

	Jurisdiction								
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	National
2017 – 18	2,491,806	1,684,113	1,556,293	486,807	605,841	155,656	146,731	144,084	7,271,331
2018 – 19	2,554,009	1,744,832	1,665,956	501,928	682,284	159,502	153,034	145,293	7,606,838
2019 – 20	2,494,672	1,675,430	1,658,890	516,907	671,150	147,661	153,392	136,628	7,454,730
2020 – 21	2,443,956	1,659,940	1,984,303	561,269	721,138	162,925	165,084	149,978	7,848,593

The principal diagnosis field appearing on the NBP takes values from the ED short list (IHACPA 2023b). If a diagnosis code appearing in the ED data set does not match a valid entry in the ED short list, then that code is replaced with the value 'Missing'. This allows for greater aggregation and

enables the user to compare all records with a missing or invalid principal diagnosis code. The records impacted are summarised in Table 18.

**Table 18: Summary of presentations with missing or invalid principal diagnoses in the emergency department stream**

Missing or invalid principal diagnosis	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18	2,175,472	328,983	506,340	133,477	177,164	7,273	47,068	11,656	<b>3,387,433</b>
2018 – 19	59,468	86,637	134,552	46,643	51,150	15	11,831	4,366	<b>394,662</b>
2019 – 20	49,363	79,243	112,607	22,900	47,864	9	7,315	3,742	<b>323,043</b>
2020 – 21	40,253	76,835	39,175	6,142	62,606	4,086	9,104	4,711	<b>242,912</b>

IHACPA calculates the native NWAU for every record in the ED stream using the formula published in the relevant NEP determination (IHACPA 2023d). The variables required to calculate the NWAU for each ED record are contained in the emergency department activity data set, or in the NEP determinations available on IHACPA’s website, other than remoteness of hospital location with respect to the Australian Statistical Geography Standard – Remoteness Area<sup>10</sup>. The latter is determined by IHACPA using the hospital’s address or by comparison to the remoteness value reported for the same hospital in APC data.

### 3.1.5 Non-admitted

The non-admitted (NA) stream refers to activity data submitted to IHACPA via the non-admitted patient (NAP) activity data set (IHACPA 2023a) and the NHCDC records identified with this activity.

Only cost data that links to the non-admitted patient activity data set are included in the non-admitted stream within the NBP. Similarly, NAP activity records with no matching cost data are not included in the NBP. Only patient-level data is reported to IHACPA in the NHCDC, hence only patient-level data are included in the NBP, whereas a large portion of data in the non-admitted stream for the years under consideration is reported to IHACPA through the non-admitted aggregate (NAA) data set (IHACPA 2023a).

Non-admitted services which belong to one of the Tier 2 classes in Table 44 are omitted from the NBP. This is done because records receive zero NWAU due to being out of scope for activity-based funding, or because their price is bundled with the NWAU of other services. However, many of these services are delivered at high volumes. Consequently, their inclusion would make cost per NWAU statistics at certain establishments unrealistically high, preventing effective benchmarking.

Non-admitted records are not included in the NBP if they receive funding from a source that is outside of IHACPA’s remit under the NHRA. In the non-admitted stream this means that records

<sup>10</sup> METeOR 697105.

included in the NBP are funded either through the jurisdiction's health service budget (other than instances where no charge is raised due to hospital decision) or through contracted care.

As discussed in the preceding streams, non-admitted records are included in the NBP only if they are reported by a hospital which was funded through ABF in the year under consideration.

Table 19 summarises the non-admitted records removed from the NBP. The following abbreviations are used:

- NA: NHCDC records to which no matching activity data could be found.
- HO: Records reported by hospitals which were not funded through ABF in the given reporting year. This excludes records in the category NA above.
- NP: Records with Tier 2 classes listed in Table 44. This excludes the categories NA and HO above.
- OS: Records excluded due to having a funding source which is not within IHACPA's remit. This excludes records in the categories NA, HO, or NP above.

Table 19: Summary of non-admitted NHDC records not included in the NBP

Reason for removal from non-admitted patient data	Jurisdiction									
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	National	
2017 – 18	NA	13,107	438,271	1,980	40,979	7,130	28,286	11,729	5	<b>541,487</b>
	HO	0	18,918	212,911	4,150	39,110	0	4,048	0	<b>279,137</b>
	NP	523,172	1,309	239,939	897	37,570	10,152	1,060	174,053	<b>988,602</b>
	OS	1,326,366	835,778	522,227	171,910	181,132	145,909	17,157	167,514	<b>3,367,993</b>
2018 – 19	NA	46,786	182	0	0	5,107	11,201	0	7,957	<b>71,233</b>
	HO	5,679	57	329,920	5,470	37,910	0	4,858	0	<b>383,894</b>
	NP	485,097	0	235,677	1,216	34,781	8,185	6,829	143,058	<b>914,843</b>
	OS	1,195,061	704,924	604,483	319,030	184,268	145,678	27,081	109,808	<b>3,290,333</b>
2019 – 20	NA	13,181	746,819	0	0	32,781	8,479	0	6,557	<b>807,817</b>
	HO	0	167	358,096	0	42,118	0	4,838	0	<b>405,219</b>
	NP	759,622	1,304	221,312	1,045	27,318	44,030	9,083	139,099	<b>1,202,813</b>
	OS	1,237,798	1,134,385	749,134	585,581	174,508	135,809	30,407	104,913	<b>4,152,535</b>
2020 – 21	NA	0	0	0	0	0	0	0	0	<b>0</b>
	HO	0	209	496,232	0	53,807	492	4,979	0	<b>555,719</b>
	NP	3,058,813	13,715	575,071	3,132	54,038	160,024	14,201	228,052	<b>4,107,046</b>
	OS	1,313,324	1,921,167	807,052	1,702,262	242,890	112,850	31,618	191,698	<b>6,322,861</b>

Table 20 summarises the non-admitted records included in the NBP.

Table 20: Summary of non-admitted NHCDC records included in the NBP

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
<b>2017 – 18</b>	5,513,702	2,706,082	4,014,006	1,232,272	1,803,786	381,313	246,846	454,726	<b>16,352,733</b>
<b>2018 – 19</b>	5,296,630	2,124,421	4,285,617	1,211,595	1,902,939	387,228	262,288	558,124	<b>16,028,842</b>
<b>2019 – 20</b>	5,655,899	2,989,811	4,741,909	1,109,831	1,972,989	376,484	267,164	571,766	<b>17,685,853</b>
<b>2020 – 21</b>	5,928,489	3,103,813	4,891,768	381,467	2,365,401	431,739	305,966	552,780	<b>17,961,423</b>

IHACPA calculates the native NWAU for every record in the non-admitted stream using the formula published in the relevant NEP Determination (IHACPA 2023d). All information required to calculate the NWAU of each record is available in the NAP activity data set and the relevant NEP Determination, other than remoteness of hospital location with respect to the Australian Statistical Geography Standard – Remoteness Area<sup>11</sup>. The latter is determined by IHACPA using the hospital's address or by comparison to the remoteness value reported for the same hospital in APC data.

## 3.2 AIHW Establishment Peer Group

The NBP lists the AIHW Peer Group of each hospital for which data are included in the NBP. This filter enables the user to compare cost and activity between similar hospitals. The references used to assign a peer group to each hospital are available via the AIHW website (AIHW 2021, AIHW 2015). Hospitals not listed in the more recent list (AIHW 2021) were grouped according to their peer group in the original AIHW peer group document (AIHW 2015), where possible. Hospitals not listed in either AIHW source were assigned the peer group Unknown. However, this category has been assigned to certain hospitals which appear in AIHW data.

It is noted in AIHW documentation (AIHW 2015) that the categories listed in Table 21 should not be considered *peer groups* due to the diverse characteristics of the establishments within those categories. However, IHACPA retains the term *peer group* for these categories in accordance with AIHW terminology and to ease navigability of the NBP. The same is true of the peer group 'Unknown' which is listed in (AIHW 2021) but not in (AIHW 2015).

<sup>11</sup> METeOR 697105.

Table 21: Categories not considered peer groups by the AIHW

AIHW Category
Very small hospitals
Other public acute specialized hospitals
Other day procedure hospitals
Mixed subacute and non-acute hospitals
Unpeered hospitals

In some instances, the establishment identifier of a facility listed in the AIHW table did not match that of the same facility listed in IHACPA's activity reporting. In most of these instances, matching was successfully performed on the basis of hospital name or a previous hospital identifier. The instances in which an establishment identifier was not used for matching are provided in Appendix C).

### 3.3 Service Related Groups Version 6.0

Each admitted acute record in the NBP is assigned a Service Related Group (SRG), Version 6.0 class. Service related groups (SRGs) are a classification of admitted patient care episodes, intending to capture the services used to treat that patient. They are intended for use in the planning of hospital services, for which the diagnosis and complexity information used for Diagnostic Related Groups (DRGs) would be too granular. In general, the SRG classification is a coarsening of the DRG classification, although there are some exceptions.

The Service Related Groups Version 6.0 classification was developed by the NSW Ministry of Health. Consequently, some of the methodology used is specific to NSW hospitals and this behaviour needs to be generalised to hospitals in the nation. Below, we discuss these adjustments to the Service Related Groups Version 6.0 classification for records obtained from outside NSW. The situations in which IHACPA has had to make these adjustments differ according to the 'Patient Type' assigned to the record within the SRG v6 grouper. Below we describe the assignment of Patient Types and the resulting decisions.

#### 3.3.1 Patient Type 9: Hospital Borders, Organ Procurement, and Other

Records assigned Patient type 9 cannot be reliably grouped with similar records for the purposes of benchmarking according to the services provided to the patient. These records are subsequently assigned the SRG v6 99, *Unallocated*. Some records are assigned Patient type 9 on the basis of data specific to that record and some are so assigned on the basis of the facility in which they were admitted. In this section we describe how IHACPA has managed this assignment.

Records with the admitted patient care type<sup>12</sup> listed in APC data as 'Other admitted patient care', 'Organ procurement – posthumous', or 'Hospital boarder' are not included in the NBP as they are not priced by IHACPA. These records are summarised in Table 27 – Table 29. However, some establishments have all their records grouped to Patient Type 9 in the NSW MoH SRG v6 grouper. For these establishments, the same treatment is applied to the data included in the NBP. In this section we describe how IHACPA has extended this treatment to hospitals outside NSW. The complete list of impacted hospitals is available in Appendix D).

All records from a NSW Justice Health facility are assigned to Patient type 9. The Forensic Hospital (NSW) is not included in this provision, or in Appendix D) because this facility has historically been distinguished from Justice Health facilities through use of a different establishment identifier. There were no establishments from other jurisdictions in IHACPA's data with a similar profile to Justice Health facilities from NSW, so the facilities in Appendix D) are the only ones impacted by this decision.

Within the NSW MoH grouper, all records from a facility within the NSW Health hospital peer group (NSW MoH 2016) 'Mothercraft', are assigned to Patient type 9. All facilities within this NSW MoH hospital peer group are within the AIHW peer group known as *Early Parenting Centres* (AIHW 2015). Therefore, any records from a facility belonging to the *Early Parenting Centres* is assigned to Patient type 9. The impacted facilities are listed in Appendix D).

Within the NSW MoH grouper, all records with the NSW Health hospital peer group 'Other Ungrouped' (NSW MoH 2016) are assigned to Patient type 9. This impacts all facilities with an AIHW peer group of *Drug and Alcohol Hospitals* or *Unknown*. Consequently, any records from establishments in Australia with an AIHW peer group *Drug and Alcohol Hospitals* or *Unknown* are assigned to Patient Type 9. This treatment does not extend to facilities with AIHW peer group *Unpeered*. The complete list of impacted facilities is provided in Appendix D).

There were an additional four NSW hospitals within the NSW MoH peer group 'Other Ungrouped' (NSW MoH 2016), which do not lie in any of the AIHW peer groups listed above. These are listed in Appendix D). These hospitals belong either to the AIHW peer groups *Outpatient* or *Mixed Subacute and Non-acute*. However, there are NSW facilities within these AIHW peer groups for which records are not assigned to Patient type 9. Therefore, the assignment of Patient type 9 to all records was not extended to all facilities in the AIHW Peer Groups *Outpatient* or *Mixed Subacute and Non-acute*.

All records assigned Patient type 9 are assigned to SRG v6 99, *Unallocated*.

### 3.3.2 Patient Type 2: Psychiatric Admission in Designated Facility

If a hospital is not listed as being restricted to delivering records within the SRG v6 99, *Unallocated* in the previous section, then records from that hospital may be assigned to Patient Type 2: psychiatric admission in designated facility. The NSW MoH SRG v6 grouper contains certain behaviour specific to NSW hospitals. IHACPA has generalised this behaviour to hospitals throughout the nation. We describe this generalisation below.

To undertake this generalisation, IHACPA needed to determine which private hospitals would be considered to be psychiatric hospitals and which would be considered to be private hospitals with a

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<sup>12</sup> AIHW METeOR 711010.



specialist psychiatric unit. A private hospital is considered to be a psychiatric hospital on the basis of that establishment's self-description. A private (non-psychiatric) hospital was deemed to have a psychiatric unit if there was at least one psychiatric care day from that facility in 2018–19 or 2019–20. The list of hospitals in each category is provided in Appendix E).

A record from a public hospital is assigned to Patient type 2 if it satisfies the following:

- 1) The record has not been assigned Patient type 9.
- 2) Either:
  - The record has admitted patient care type<sup>13</sup> of 'Mental health care' or
  - The record comes from a public hospital within the AIHW Peer Group *Psychiatric* or
  - The record comes from a public hospital and has at least one psychiatric care day or
  - The record comes from a hospital listed as a private psychiatric hospital in Appendix E) or
  - The record comes from a facility listed as a private hospital with a psychiatric unit in Appendix E), and has at least one psychiatric care day.

All records with Patient type of 2 are assigned SRG 83, *Specialist Mental Health*.

### 3.3.3 Patient Type 1: Acute and Patient Type 3: Unqualified Newborn

If a record has not been assigned to Patient type 9, then it is assigned to Patient type 1: acute, if it satisfies one of the following two criteria:

- 1) Admitted patient care type<sup>14</sup> is 'Acute care' and
  - Adjacent AR-DRG (ADRG) is not equal to Z60, *Rehabilitation*<sup>15</sup> and
  - Principal diagnosis does not have the prefix Z50, *Care involving use of rehabilitation procedures*, Z74, *Problems related to care-provider dependency*, or Z75, *Problems related to medical facilities and other health care*.
- 2) Admitted patient care type is equal to 'Newborn care' and record has at least one qualified day<sup>16</sup>.

If a record has admitted patient care type 'Newborn care' and does not have at least one qualified day, then that record is assigned Patient type 3: unqualified newborn. All such records are assigned to SRG v6 74, *Unqualified Neonate*.

Records having Patient type 1 may be assigned to SRG v6 73, *Qualified Neonate* or SRG v6 75, *Perinatology*, depending on the facility in which the admission takes place. SRG v6 75, *Perinatology*, contains only records with time within a neonatal intensive care unit (NICU). Below we list our methodology for determining which records have some number of NICU hours.

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<sup>13</sup> AIHW METeOR 711010.

<sup>14</sup> AIHW METeOR 711010.

<sup>15</sup> This ADRG was part of AR-DRG v8 but was assigned no NWAU as rehabilitation events should be grouped to the admitted care type 'Rehabilitation care'. This is not a valid ADRG within AR-DRG v9. Consequently, a small number of records among 2017–18 data are the only records classified within this ADRG in the NBP.

<sup>16</sup> AIHW METeOR 722649.

IHACPA does not maintain records of NICU facilities at Australian hospitals. Hospitals from NSW which are eligible to have records grouped into SRG v6 75 are exactly those chosen by NSW MoH in designing SRG v6. The NSW MoH also listed Canberra Hospital among eligible establishments and this decision has also been carried out in the NBP. For all other hospitals outside NSW, facilities deemed to have NICU facilities were those with at least 100 ICU hours delivered to patients in the neonatal care type in at least one of the years from 2018–19 to 2020–21. For the purposes of this assessment, all data were considered, not just those which were included in the NBP. The facilities deemed to have NICU facilities on this basis, are listed in Appendix F).

Records which have been assigned Patient type 3 are classed within SRG v6 74, *Unqualified Neonate*. Records assigned Patient type 1 with an admitted patient care type of 'Acute care' have their SRG class assigned on the basis of their DRG, primary diagnosis, and principal procedure. If the record has Patient type 1 and an admitted patient care type of 'Newborn care' then the SRG assignment uses the additional information of the number of ICU hours delivered and whether the record comes from a hospital with NICU facilities, as specified in Appendix F).

### 3.3.4 Patient Type 4: Subacute and Non-acute

Patients satisfying the one of the following two criteria were assigned Patient type 4: subacute and non-acute.

- 1) Admitted patient care type<sup>17</sup> is 'Acute care' and either:
  - Adjacent AR-DRG (ADRG) is equal to Z60, *Rehabilitation* or
  - Principal diagnosis has prefix Z50, *Care involving use of rehabilitation procedures*, Z74, *Problems related to care-provider dependency*, or Z75, *Problems related to medical facilities and other health care*.
- 2) Admitted patient care type is equal to 'Rehabilitation care' or 'Palliative care' or 'Geriatric evaluation and management' or 'Psychogeriatric care' or 'Maintenance care'.

If a record has been assigned Patient type 4 then its SRG is determined by the admitted patient care type of that record in the following manner:

- 1) If the record has admitted patient care type 'Acute care' or 'Rehabilitation care' then it is assigned SRG v6 84, *Rehabilitation*.
- 2) If the record has admitted patient care type 'Palliative care' then it is assigned SRG v6 86, *Palliative care*.
- 3) If the record has admitted patient care type 'Geriatric evaluation and management' then it is assigned SRG v6 92, *Geriatric evaluation and management*.
- 4) If the record has admitted patient care type 'Psychogeriatric care' then it is assigned SRG v6 85, *Psychogeriatric*.
- 5) If the record has admitted patient care type 'Maintenance care' then it is assigned SRG v6 87, *Maintenance*.

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<sup>17</sup> AIHW METeOR 711010.

## 3.4 Cost Data

All cost data presented in the NBP were submitted to IHACPA through the NHCDC (IHACPA 2023e). As a rule, all NHCDC costs are included in the NBP other than costs associated with the activity which has not been included in, as described in the previous section. However, there are some costs which have not been included in the NBP, or which are modified before uploading, to improve benchmarking or to align with IHACPA's practices in the pricing process. We discuss these costs and modifications in this section.

### 3.4.1 Costs of Unqualified Newborns

Unqualified newborns are those without care interventions following birth and who are less than ten days old when discharged. If a newborn undergoes a care intervention or is ten or more days old when discharged, then they begin to accrue 'qualified days' and are no longer considered 'unqualified newborns'.

If costs are submitted for unqualified newborns, then those costs are redistributed to the childbirth episodes of care in the following manner. This process refers to costs submitted in the NHCDC which could be matched to activity in the APC data set.

- 1) Patients eligible to have their costs redistributed are those with admitted patient care type<sup>18</sup> 'Newborn care'. Patients eligible to receive these costs are those with admitted patient care type 'Acute care' and any ICD-10-AM code (not necessarily principal diagnosis) belonging to the following list, each of which indicates that the patient gave live birth.
  - Z37.0, Single live birth.
  - Z37.2, Twins, both liveborn.
  - Z37.5, Other multiple births, all liveborn.
  - Z37.6, Other multiple births, some liveborn.
  - Z37.9, Outcome of delivery, unspecified.
- 2) The two lists created in the previous step are joined using a linking key present in the APC data set (IHACPA 2023a), where we ensure that the date of birth field of any patient in the newborn list between the admission and separation dates of any childbirth record to which it is matched.
- 3) For any successful matches created in the previous step, all costs from the newborn are added to the cost of the childbirth record to which it is matched.
- 4) For any newborn which could not be matched to a childbirth record in step 2, we group records taking place at the same hospital, and sum their costs.
- 5) For any childbirth records which could not be matched with a newborn record in step 2, we group records taking place at the same hospital, and sum their length of stay.
- 6) Dividing the output of stage 4 by the output of stage 5, we have a cost per day at each hospital at which there is a childbirth record without a matching unqualified newborn record. For each childbirth record which could not be matched to an unqualified newborn

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<sup>18</sup> AIHW METeOR 711010.

record, multiply this cost per day (specific to the hospital at which the childbirth record took place) by the length of stay of the childbirth record.

### 3.4.2 Costs Excluded from the NHCDC

We described above the records selected for inclusion in the NBP. Among these records all costs are included apart from those listed under the Capital works and Excluded costs line items within the NHCDC submission (IHACPA 2023e). These costs are removed because they are accrued through activity which is out of IHACPA's scope for IHACPA's hospital service pricing responsibilities under the NHRA (FFR 2023). Consequently, these costs are not reported consistently across jurisdictions and are not suitable for benchmarking. Table 22 summarises the costs excluded in this process, after restricting to the records which are included in the NBP. Negative costs are generally due to actuarial adjustments, for example in calculating long service leave liability.

Table 22: Excluded costs and capital works costs not included in the NBP

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18	\$133M	\$0	\$0	\$0	\$0	\$0	\$23M	\$0	\$156M
2018 – 19	\$347M	\$0	\$0	\$0	\$0	\$0	\$23M	\$0	\$369M
2019 – 20	\$203M	\$305	\$24M	\$0	\$0	\$0	\$9M	-\$215K	\$236M
2020 – 21	-\$99M	\$3K	\$42M	\$0	\$0	\$0	\$46M	\$0	-\$11M

### 3.4.3 Costs Excluded from the Pricing Process

There are also costs which are included in the NBP which are not used to develop the National Efficient Price or the Price Weights in IHACPA's Determinations. These costs include costs associated with depreciation and leasing, the Pharmaceutical Benefits Scheme (PBS), costs associated with the provision of blood services, costs reimbursed by private health insurers, and some teaching, training, and research costs. Consequently, it is expected that the cost of services appearing on the NBP may be greater than the product of NWAU for that service and the National Efficient Price (NEP) for the relevant year.

Table 23 – Table 26 summarise the costs of items that are excluded from the pricing process which are submitted to IHACPA, by jurisdiction. Not all costs in Table 23 – Table 26 are accrued in the performance of the activity represented in the NBP, for instance, some will be accrued among NHCDC records not matched to activity. Therefore, these tables should be read as an estimate only, provided for the purposes of conveying the scale and locus of potential inconsistencies.

Table 23 contains costs reported within the depreciation and leasing line items in the NHCDC. These costs are included in the NBP but are removed before pricing is undertaken.

Table 23: Depreciation and leasing costs included in the NBP, by jurisdiction

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18	\$554M	\$92M	\$295M	\$181M	\$235M	\$25M	\$33M	\$521K	\$1,416M
2018 – 19	\$596M	\$100M	\$272M	\$187M	\$236M	\$36M	\$42M	\$1M	\$1,472M
2019 – 20	\$680M	\$100M	\$301M	\$187M	\$226M	\$34M	\$43M	\$2M	\$1,574M
2020 – 21	\$662M	\$121M	\$235M	\$159M	\$224M	\$41M	\$43M	\$2M	\$1,486M

Table 24 contains costs accrued for blood services, which are removed before Pricing is undertaken but are retained for the NHCDC Public Sector Report.

Table 24: Blood costs submitted via the NHCDC, by jurisdiction

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18	\$101M	\$121M	\$44M	\$0	\$0	\$4M	\$2M	\$7M	\$279M
2018 – 19	\$111M	\$128M	\$45M	\$0	\$0	\$3M	\$2M	\$6M	\$295M
2019 – 20	\$110M	\$127M	\$48M	\$0	\$0	\$6M	\$2M	\$5M	\$299M
2020 – 21	\$112M	\$120M	\$50M	\$0	\$0	\$6M	\$2M	\$7M	\$296M

Table 25 contains costs reported in the NHCDC which are reimbursed through the Pharmaceutical Benefits Scheme. These costs are included in the NHCDC public sector report but not in the pricing process.

Table 25: Pharmaceutical Benefits Scheme (PBS) costs included in the NHCDC, by jurisdiction

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18	\$0	\$604M	\$329M	\$149M	\$181M	\$50M	\$30M	\$20M	\$1,363M
2018 – 19	\$0	\$650M	\$421K	\$179M	\$195M	\$46M	\$28M	\$20M	\$1,539M
2019 – 20	\$0	\$693M	\$495M	\$201M	\$213M	\$49M	\$30M	\$23M	\$1,704M
2020 – 21	\$386M	\$753M	\$549M	\$180M	\$233M	\$78M	\$32M	\$25M	\$2,236M

Table 26 contains the private health insurance benefits paid to private patients provided to IHACPA through the Hospital Casemix Protocol (HCP) data set (DoH 2021). These are generally deducted from the in-scope costs of patients before using their costs to set the prices found in the NEP Determination. Not all records in the NHCDC can be matched to HCP data, so private health insurance benefits paid to un-matched private patients are estimated in the pricing process. Conversely, some of these costs may be accrued by records excluded from the National Benchmarking Portal. Therefore, Table 26 should be understood as an indication of the order of magnitude of costs included in the National Benchmarking Portal which may result in over-estimating cost per NWAU.

**Table 26: Hospital Casemix Protocol (HCP) costs included in the NHCDC, by jurisdiction**

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
<b>2017 – 18</b>	\$456M	\$204M	\$110M	\$59M	\$22M	\$19M	\$4M	\$9M	<b>\$884M</b>
<b>2018 – 19</b>	\$446M	\$199M	\$117M	\$70M	\$67M	\$19M	\$4M	\$9M	<b>\$931M</b>
<b>2019 – 20</b>	\$393M	\$182M	\$105M	\$66M	\$68M	\$18M	\$4M	\$8M	<b>\$843M</b>
<b>2020 – 21</b>	\$290M	\$148M	\$106M	\$54M	\$68M	\$18M	\$3M	\$5M	<b>\$692M</b>

Not all admitted patients are included in the NBP due to their activity not being priced by IHACPA. Patients with an admitted patient care type of 'Other admitted patient care', 'Organ procurement – posthumous', or 'Hospital boarder' are not priced by IHACPA. IHACPA does not price these records, so they are not reported consistently by jurisdictions. Consequently, benchmarking measures cannot be applied appropriately to these records, so we do not include their activity or costs in the NBP. The costs and of these records as submitted via the NHCDC are contained in Table 27 – Table 29.

Table 27: Summary of records with admitted patient care type 'Other admitted patient care' submitted via the NHCDC

		Jurisdiction							National	
		NSW	Vic	Qld	SA	WA	Tas	NT		ACT
2017 – 18	Seps	87	0	0	0	0	423	0	0	510
	Cost	\$307K	\$0	\$0	\$0	\$0	\$416K	\$0	\$0	\$723K
2018 – 19	Seps	66	0	0	0	0	102	0	0	168
	Cost	\$531K	\$0	\$0	\$0	\$0	\$259K	\$0	\$0	\$790K
2019 – 20	Seps	0	0	0	0	0	34	0	0	34
	Cost	\$0	\$0	\$0	\$0	\$0	\$193K	\$0	\$0	\$193K
2020 – 21	Seps	0	0	0	0	0	3	0	0	3
	Cost	\$0	\$0	\$0	\$0	\$0	\$18K	\$0	\$0	\$18K

Table 28: Summary of records with admitted patient care type 'Organ procurement – posthumous' submitted via the NHCDC

		Jurisdiction							National	
		NSW	Vic	Qld	SA	WA	Tas	NT		ACT
2017 – 18	Seps	107	142	0	0	37	21	3	17	327
	Cost	\$4M	\$1M	\$0	\$0	\$944K	\$194K	\$82K	\$259K	\$7M
2018 – 19	Seps	129	172	0	40	54	14	5	0	414
	Cost	\$6M	\$2M	\$0	\$306K	\$1M	\$115K	\$101K	\$0	\$10M
2019 – 20	Seps	94	140	0	39	43	16	2	0	334
	Cost	\$1M	\$2M	\$0	\$339K	\$744K	\$181K	\$21K	\$0	\$5M
2020 – 21	Seps	94	120	65	47	41	8	3	11	389
	Cost	\$1M	\$2M	\$2M	\$396K	\$883K	\$153K	\$31K	\$355K	\$6M

Table 29: Summary of records with admitted patient care type 'Hospital boarder' submitted via the NHDC

		Jurisdiction							National	
		NSW	Vic	Qld	SA	WA	Tas	NT		ACT
2017 – 18	Seps	0	0	16,804	0	497	1,525	0	0	18,826
	Cost	\$0	\$0	\$7M	\$0	\$2M	\$179K	\$0	\$0	\$9M
2018 – 19	Seps	0	0	17,228	0	0	1,579	0	0	18,807
	Cost	\$0	\$0	\$14M	\$0	\$0	\$256K	\$0	\$0	\$14M
2019 – 20	Seps	0	0	17,118	0	0	1,486	0	0	18,604
	Cost	\$0	\$0	\$9M	\$0	\$0	\$355K	\$0	\$0	\$10M
2020 – 21	Seps	0	0	10,916	0	0	1,421	0	0	12,337
	Cost	\$0	\$0	\$7M	\$0	\$0	\$382K	\$0	\$0	\$8M

## 3.5 Hospital Acquired Complications Data

The Hospital Acquired Complications (HAC) dashboard on the NBP mainly utilises the admitted acute data prepared for the Cost per NWAU dashboard, detailed in Section 3.1.1. The following sections highlight the additional data preparation required and specifications in relation to the HAC data.

The definition of a HAC and the HAC categories appearing in the NBP are those established by the Australian Commission on Safety and Quality in Health Care (The Commission) in HAC Version 3.0 (ACSQHC 2023).

### 3.5.1 HAC groups not included in the NBP

. HAC Version 3.0 describes sixteen HAC categories. The NBP presents only fourteen of these categories due to data limitations.

HAC 5, *Unplanned intensive care unit admission* is not presented on the NBP as these ICU admissions cannot be identified in IHACPA's datasets. HAC 16, *Neonatal birth trauma* is not presented on the NBP due to low volume available in the data.

### 3.5.2 Episodes not eligible for HACs

Within the admitted acute stream, there are episodes that are not eligible to receive HACs or are not eligible for certain HAC groups. These episodes are not included in the calculation of HAC rates, where the denominator of the HAC rate represents the population that are eligible to receive a HAC.



If episodes have AR-DRG L61Z, *Haemodialysis* and R63Z, *Pharmacotherapy for Neoplastic Disorders*<sup>19</sup>, and the admission and separation dates fall on the same day, then these episodes are considered not eligible for HACs. Table 30 shows the number of admitted acute episodes that are not eligible for HACs and hence excluded from the HAC Rate calculations.

**Table 30: Summary of episodes not eligible for HACs**

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
<b>2017 – 18</b>	352,116	396,295	282,420	80,968	115,704	20,321	85,175	19,303	<b>1,392,302</b>
<b>2018 – 19</b>	356,395	404,906	303,884	84,335	161,233	23,907	89,137	17,751	<b>1,441,548</b>
<b>2019 – 20</b>	372,156	414,982	320,685	86,991	183,364	28,954	91,916	18,976	<b>1,518,024</b>
<b>2020 – 21</b>	372,367	426,779	352,975	94,604	201,951	29,226	92,254	19,798	<b>1,589,954</b>

Only certain episodes are eligible to be assigned HAC 15, *Third and fourth degree perineal laceration during delivery*, due to the nature of the HAC. Eligibility for this HAC is limited to episodes that relate to childbirth and delivery, those with an AR-DRG starts with 'O'. As such, when calculating the HAC rate for HAC 15, the denominator only includes eligible episodes. Table 31 shows the number of episodes that are eligible to be assigned HAC 15.

**Table 31: Summary of episodes eligible for HAC 15**

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
<b>2017 – 18</b>	115,080	88,918	105,915	24,989	27,753	6,697	7,863	7,288	<b>384,503</b>
<b>2018 – 19</b>	116,159	91,288	114,447	24,885	27,696	6,740	7,996	7,257	<b>396,468</b>
<b>2019 – 20</b>	112,501	90,917	117,560	23,654	27,509	6,442	8,231	7,225	<b>394,039</b>
<b>2020 – 21</b>	109,731	92,330	128,425	24,269	28,157	6,583	8,674	7,477	<b>405,646</b>

### 3.5.3 Episodes that do not receive NWAU adjustments for HACs

In some cases, episodes may be flagged with HACs, but no NWAU adjustments for HACs are applied to the total NWAU of these episodes.

Due to the low volume of data available for HAC 15, *Third and fourth degree perineal laceration during delivery*, episodes with HAC 15 did not receive any NWAU adjustment in relation to HAC 15 under the NWAU18 and NWAU19 calculations. However, in the calculation of NWAU20, episodes with HAC 15.2, *Fourth degree perineal laceration during delivery* receive NWAU adjustments as

<sup>19</sup> Description under AR-DRG v11.0. Note the description for R63Z is *Chemotherapy* under AR-DRG v10.0 and earlier.

there is a larger sample size to determine the pricing adjustments. As such, the NWAU adjustments for the HAC 15 group on the NBP represent episodes where an NWAU adjustment was applied in relation to HAC 15.2.

In the calculation of NWAU18, episodes with Major Diagnosis Category (MDC) 19, *Mental diseases and disorders*, and 20, *Alcohol/drug use or induced mental disorders* do not receive an NWAU adjustment for HAC, even if the episodes are flagged with HACs under HAC version 3.0. This is due to limitations in identifying MDC 19 and 20 under HAC version 1.0, which was the HAC version used for calculating the NWAU18 adjustment for HACs.

In the calculation of NWAU19 and NWAU20, IHACPA has decided to not apply NWAU adjustments for HACs on episodes relating to COVID patients, as COVID patient records were not included in the datasets used for calculating NWAU adjustments.

Table 32 shows the number of episodes where HACs are identified, but no NWAU adjustment for HACs are applied.

**Table 32: Summary of episodes with HACs that received no NWAU adjustment**

		Jurisdiction								National
		NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18	NWAU18	1,967	1,377	1,176	410	419	112	77	135	5,673
	NWAU19	1,767	1,222	1,072	365	364	94	71	125	5,080
	NWAU20	1,692	1,150	1,019	351	333	92	64	122	4,823
2018 – 19	NWAU18	1,837	1,402	1,122	369	414	110	75	136	5,465
	NWAU19	1,704	1,266	1,030	323	373	95	71	130	4,992
	NWAU20	1,630	1,207	961	303	351	91	66	127	4,736
2019 – 20	NWAU18	1,729	1,262	971	337	347	112	85	121	4,964
	NWAU19	1,634	1,172	917	305	326	101	79	116	4,650
	NWAU20	1,559	1,131	876	281	308	98	71	106	4,430
2020 – 21	NWAU18	1,521	1,244	1,034	289	392	91	107	101	4,779
	NWAU19	1,390	1,352	955	256	352	85	100	96	4,586
	NWAU20	1,327	1,313	907	244	335	83	95	93	4,397

### 3.5.4 NWAU adjustments for HACs

When calculating the NWAU adjustments for HACs, the native NWAU version is used for all years apart from 2017-18, where NWAU18 is used as a proxy to the native NWAU. This is due to the absence of NWAU adjustments for HACs in the calculation of NWAU17, which is the native NWAU for the 2017-18 year.

This guide does not describe the manner in which the HAC NWAU adjustment is calculated. For this information, see the National Pricing Model Technical Specifications for the relevant NWAU version on IHACPA's website (IHACPA 2023).

## 3.6 Avoidable Hospital Readmissions Data

An Avoidable Hospital Readmission (AHR) is an instance in which a patient:

- is admitted to hospital within a specified time interval of being discharged, and;
- in which the second admission (readmission episode) is clinically related to the first (index episode).

The AHR dashboards on the NBP utilise the admitted acute data prepared for the Cost per NWAU dashboard, detailed in Section 3.1.1. The following sections highlight the additional data preparation required and specifications in relation to the AHR data. The definition of an AHR, and the AHR categories appearing in the NBP are those established by The Commission in AHR Version 2.0 (ACSQHC 2023).

### 3.6.1 Episodes not eligible for AHRs

Using the definition provided by the Commission, some records are precluded from being the index episode of an AHR, regardless of the remainder of their activity. Those records are:

- Records taking place at multi-purpose services or mothercraft facilities.
- Records with a care type of: Hospital Boarder, Posthumous Organ Procurement, or Unqualified Newborns (none of these records are included in any NBP dashboard).
- Records pertaining to patients not discharged alive.
- Records pertaining to patients discharged against medical advice.
- Same-day or single night records from any of the following DRGs:
  - R63Z, *Pharmacotherapy for Neoplastic Disorders* (known as *Chemotherapy* before DRG V11)
  - L61Z, *Haemodialysis*,
  - L68Z, *Peritoneal dialysis*.
- Records pertaining to palliative care (all palliative care records are excluded from the HAC and AHR dashboards).
- Records pertaining to oncology or haematology (as defined by the presence of any ICD-10-AM codes indicating these categories of care).
- Records with a care type of Neonatal Care.

In addition to records which do not satisfy The Commission's index episode criteria, listed above, there are records which contain insufficient information to be index episodes. The National Minimum Datasets (NMDS) reported to IHACPA do not contain patient identification information, which would allow IHACPA to identify instances in which two admissions belong to the same person. Therefore, IHACPA relies on the provision of a Medicare PIN data set by Services Australia, which can be linked to the admitted patient care data set. If an episode of care cannot be linked to a Medicare PIN or if a single Medicare PIN is linked to episodes of care with different values of the sex or birth date variables then the episode in question is not eligible to be the index episode of an AHR due to the unavailability of a reliable patient identifier.

The AHR Rate values that appear on the NBP are defined to be the number of AHRs for every ten thousand records which are eligible to be the index episode of an avoidable hospital readmission.

Table 33 shows the number of admitted acute episodes that are not eligible to be the index episode of an AHR on the basis of The Commission’s index episode criteria, or due to the absence of reliable Medicare PIN data.

**Table 33: Summary of episodes not eligible to be the index episode of an AHR**

	Jurisdiction								National
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
<b>2017 – 18</b>	589,621	636,106	460,740	138,298	223,553	35,981	95,414	32,205	<b>2,211,918</b>
<b>2018 – 19</b>	600,889	659,926	493,489	142,853	232,022	40,492	99,292	41,031	<b>2,309,994</b>
<b>2019 – 20</b>	610,433	667,343	519,127	146,913	256,041	46,324	102,208	32,893	<b>2,381,282</b>
<b>2020 – 21</b>	618,645	672,315	564,781	155,183	282,737	46,459	102,592	36,918	<b>2,479,630</b>

### 3.6.2 NWAU adjustments for AHRs

IHACPA has sought to make the NBP relevant for those seeking to understand national funding arrangements and has therefore sought to measure activity in terms of a year’s native NWAU wherever possible. AHR deductions were not introduced in to NWAU calculations until NWAU21 and do not form part of the NWAU versions which are native to any of the years presented on the NBP at the time of publication. Therefore, all NWAU figures on the AHR dashboard are NWAU21 figures.

This guide does not describe the manner in which the AHR NWAU adjustment is calculated. For this information, see the National Pricing Model Technical Specifications for the relevant NWAU version on IHACPA’s website (IHACPA 2023).

# 4. Drivers of Acute NWAU Growth

The drivers of acute NWAU growth chart is displayed on the NWAU detail page within the NBP. IHACPA's intention in providing this chart is to quantify the factors contributing to annual admitted acute NWAU change among the categories of records selected by the user. The graphic refers to NWAU growth between the year prior to that selected by the user, and the year selected by the user. The NWAU version being measured is that which is native to the year selected by the user.

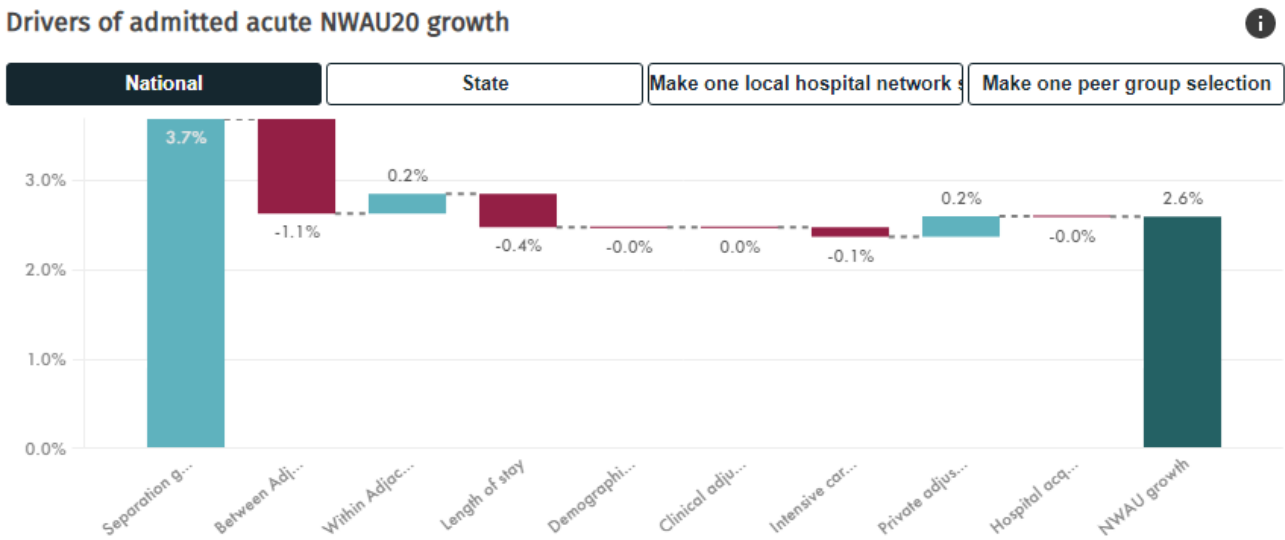
The chart only applies to the admitted acute stream, so any data displayed on this chart refers only to this stream of care. However, the user may select filters within the admitted acute stream, such as restricting to separations which have specific values of AR-DRG, SRG, and principal diagnosis. These choices will be reflected in the display of the drivers of acute NWAU growth chart.

## 4.1 Choosing a Cohort of Study

Before calculating separation growth, the user must select a baseline for NWAU growth based on separation growth figures for some group. This is used to attribute some amount of NWAU growth to the growth expected due to change in separations. This choice is implemented via the four tabs at the top of Figure 2. The tab chosen by the user is referred to as the *LEVEL* in this section.

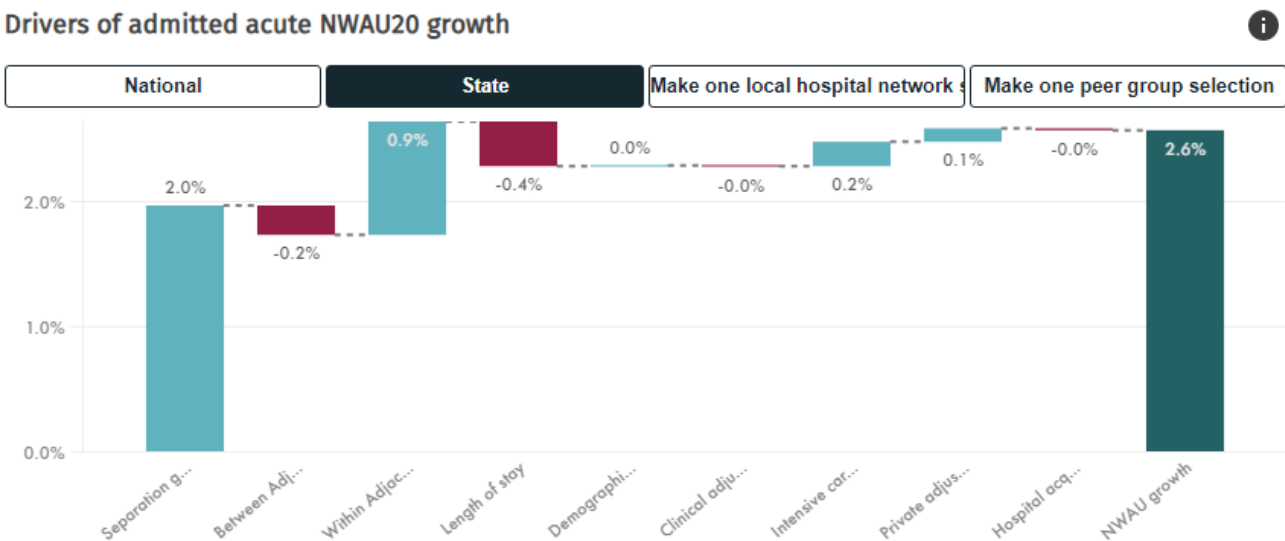
Figure 2 shows four level tabs available for selection: 'National', 'State', 'LHN' and 'Peer Group'. In this instance, the user has already filtered their data by state, so the 'State' tab is available for selection, indicating that the user may choose to view the drivers of acute NWAU growth chart using separation growth figures specific to the state or territory they have selected. The 'Local Hospital Network' and 'Peer Group' tabs are not available for selection (so they read 'Make Local Hospital Network selection' and 'Make peer group selection', respectively) because the user has not filtered their data by LHN or peer group.

Figure 2: Drivers of admitted acute NWAU growth



In Figure 2, the user has selected the 'National' tab, indicated by that tab being highlighted in green, so the growth figures are based on national separation growth benchmarks. This sets a baseline for NWAU growth based on national separation growth trends. Figure 3 shows the same data as Figure 2, after the user has selected the 'State' tab instead of the 'National' tab. The final growth figure is the same, but the contributors to that growth are the different because we start with different assumptions as to the growth which we attribute to separation change between one year and the next.

Figure 3: Drivers of admitted acute NWAU growth, observed using the state tab



In the remainder of this section, we define how each of the components of NWAU growth in Figure 2 and Figure 3 are calculated.

## 4.2 Accounting for Separation Growth

The first two categories attribute NWAU growth to separation growth by addressing the question ‘What if NWAU growth was the same as separation growth?’. The first component of NWAU growth in the chart is a growth factor equal to the total growth in separations between the two years under consideration. In this section, we refer to the year selected by the user as Y2 and the year prior to Y2 as Y1. The NWAU version under consideration is that which is native to Y2. This NWAU variable, with version native to Y2, is referred to as *NWAU* in this section.

Separation growth for the nation and for each jurisdiction, LHN and peer group is recorded in the NBP. The user chooses which separation growth factor to use by choosing one of the four tabs at the top of Figure 2. These growth factors are calculated only among separations which are assigned a valid NWAU. Let *LEVEL* represent the tab chosen by the user in the drivers of acute NWAU growth chart. Let  $LEVEL_i$  be the  $i^{th}$  possible value taken in the category *LEVEL*. For example, if *LEVEL* is ‘National’ then there is only value of  $LEVEL_i$ , which is Australia, but if *LEVEL* is ‘State’ then there are eight possible values of  $LEVEL_i$ ; NSW, Victoria, Queensland, South Australia, Western Australia, Tasmania, Northern Territory and the ACT. We define the  $i^{th}$  separation growth factor as follows.

$$g_i := \frac{\text{Separations with valid NWAU in } LEVEL_i \text{ in Y2}}{\text{Separations with valid NWAU in } LEVEL_i \text{ in Y1}}$$

Let  $x_k$  be the *NWAU* of the  $k^{th}$  separation in Y1. Let  $N_{Y1}$  be the total number of separations with valid *NWAU* satisfying the user’s filters, taking place in Y1, and let  $J = \{1, \dots, N_{Y1}\}$ . Fix an arbitrary order on those separations. We define

$$NWAU_0 := \sum_{j \in J} x_j = \text{Total NWAU in Y1}$$

Let  $LEVEL(k)$  be the value of the category *LEVEL* to which the  $k^{th}$  separation in Y1 belongs. For example, if *LEVEL* is ‘State’ then  $LEVEL(k)$  is the state in which the  $k^{th}$  separation in Y1 took place. We define

$$NWAU_1 := \sum_{j \in J} x_j g_{LEVEL(j)}$$

For the final chart display, we will need to recall the difference between  $NWAU_1$  and  $NWAU_0$  as a proportion of  $NWAU_0$ . Therefore, we define

$$\rho_{\text{Sep}} := \frac{NWAU_1 - NWAU_0}{NWAU_0}$$

This provides the reader with an indication of what *NWAU* growth would look like if *NWAU* grew at the same rate as separations in their chosen *LEVEL*.

Next, we consider separation growth by Adjacent AR-DRG (ADRG) within the user’s chosen *LEVEL*. We suppose that separation growth has been accounted for but rescale the *NWAU* of each ADRG according to separation growth, as follows. Let  $ADRG_{i,j}$  denote the  $i^{th}$  ADRG in  $LEVEL(j)$  and

$$\rho_{ADRG_{i,j}} := \frac{\text{Valid ADRG}_{i,j} \text{ Separations in Y2}}{\text{Valid ADRG}_{i,j} \text{ Separations in Y1}}$$

We refer to  $\rho_{ADRGi,j}$  as the growth ratio of the  $i^{th}$  ADRG in  $LEVEL(j)$  and let  $M$  be the total number of distinct values in the category  $LEVEL$ . Now we define the function

$$\phi_{ADRGi} : J \rightarrow \{\rho_{ADRGi,0}, \dots, \rho_{ADRGi,M}\}$$

$$k \mapsto \rho_{ADRGi(k),LEVEL(k)}$$

where the  $k^{th}$  separation belongs to  $ADRGi(k)$ . Let  $x_j$  be the  $NWAU$  of the  $j^{th}$  separation in Y1. We define  $NWAU_2$  as follows.

$$NWAU_2 := \sum_{j \in J} x_j \cdot \phi_{ADRGi}(j)$$

Defining  $NWAU_2$  is a means of showing reader what  $NWAU$  growth would look like if the  $NWAU$  in each ADRG grew in agreement with the valid separation growth in that ADRG. We refer to this as *casemix growth* as it incorporates the type of procedures a hospital is performing but does not consider the complexity of the individuals involved or per capita changes in ICU hours, adjustments or HACs.

When incorporating the change due to casemix growth into our activity reporting, we will consider the difference between  $NWAU_2$  and  $NWAU_1$  as a proportion of  $NWAU_0$ . Therefore, we record the following value for later use.

$$\rho_{ADRGi} := \frac{NWAU_2 - NWAU_1}{NWAU_0}$$

### 4.3 The Admitted Acute NWAU Formula

The remainder of growth is calculated by finding the difference between  $NWAU_2$  and the observed  $NWAU$  in Y2 in terms of the components of the  $NWAU$  formula. The formula used is that found in the NEP determinations pertaining to the years included in the NBP (IHACPA 2023d) relevant to the year selected by the user – with the exception that the  $NWAU$  formula below are forced to be non-negative, which is how  $NWAU$  is calculated in practice. The formulae used in the drivers of acute NWAU growth chart are as follows.

$$GWAU := PW \cdot A_{Paed} \cdot (1 + A_{SPA}) \cdot (1 + A_{Ind} + A_{Res} + A_{RT} + A_{Dia}) \cdot (1 + A_{Treat}) + A_{ICU} \cdot \text{ICU hours}$$

$$NWAU := \max(0, GWAU - (PW + A_{ICU} \cdot \text{ICU hours}) \cdot A_{PPS} - LOS \cdot A_{Acc} - PW \cdot A_{HAC})$$

where  $A_{Paed}$  = Paediatric adjustment,

$A_{SPA}$  = Specialist Psychiatric Age adjustment,

$A_{Ind}$  = Indigenous adjustment,

$A_{Res}$  = Patient residential remoteness adjustment,

$A_{RT}$  = Radiotherapy adjustment,

$A_{Dia}$  = Dialysis adjustment,

$A_{Treat}$  = Treatment remoteness adjustment,



$A_{ICU}$  = Intensive Care Unit hourly NWAU rate,

$A_{PPS}$  = Private Patient Service adjustment,

$A_{Acc}$  = Private Patient Accommodation adjustment,

$A_{HAC}$  = Hospital Acquired Complication adjustment,

ICU hours = Number of hours in a specified level 3 intensive care unit,

LOS = Length of stay, including any ICU hours

$PW$  = The price weight for this episode based on the DRG and length of stay (after removing any level 3 ICU hours). This is obtained from the NEP Determination relevant to the data year under consideration.

NWAU formulae generally differ from year to year. However, the formulae used in NWAU18, NWAU19 and NWAU20 were the same, and these are the only versions used in the drivers of acute NWAU growth chart, so we assume we are working with the formulae listed above for the remainder of this section.

For the purposes of accounting for growth, we break down the  $NWAU$  formula as follows. The term  $PW$  is broken down into two parts, which will be used to account for growth in acuity and length of stay. Next, the portion

$$P_{Demo} := PW \cdot A_{Paed} \cdot (1 + A_{Ind} + A_{Res}) \cdot (1 + A_{Treat}) - PW$$

is compared between Y1 and Y2 to measure the change in adjustments based solely on demographic factors: age, Indigenous status, remoteness of residence and remoteness of treatment. We next compare the difference in the component

$$P_{Clin} := PW \cdot A_{Paed} \cdot ((A_{RT} + A_{Dia} + A_{SPA} \cdot (A_{RT} + A_{Dia} + A_{Ind} + A_{Res})) \cdot (1 + A_{Treat}))$$

to measure the change in adjustments due to clinical factors: psychiatric treatment, radiotherapy, and dialysis. In this instance, some terms involving demographic factors remain to simplify the calculation. We measure the difference in the term

$$P_{ICU} := A_{ICU} \cdot \text{ICU hours}$$

to obtain an indication of how ICU hours have impacted  $NWAU$  growth, beyond what would be expected from the change in number of admissions within each ADRG. We then calculate the difference between the quantity

$$P_{Priv} := \max(-GWAU, -(PW + A_{ICU} \cdot \text{ICU hours}) \cdot A_{PPS} - LOS \cdot A_{Acc})$$

measured in Y1 and Y2 to study change in the amount of  $NWAU$  removed due to private patient adjustments. We do not allow  $NWAU$  to be negative so, for each episode we do now allow the amount of  $NWAU$  removed due to private patient deductions to exceed  $GWAU$ . The private patient deduction is calculated before the HAC deduction is taken into account. Therefore, if a private patient has a Hospital Acquired Complication (HAC), the private patient deduction is given priority when allocating the total deduction to one cause or the other. Finally, we compare the quantity

$$P_{HAC} := \max(-PW \cdot A_{HAC}, -GWAU - P_{Priv})$$

to determine the growth in  $NWAU$  removed due to HACs. As with private patient adjustments, for each episode we do now allow the amount of  $NWAU$  removed due to HACs to be greater than  $GWAU + P_{priv}$ .

## 4.4 Acuity and Base Growth

We begin by calculating growth in the  $PW$  term of the  $NWAU$  formula. The  $PW$  component is broken down into two parts. First it is estimated by the inlier weight, which is determined by a separation's DRG. The inlier weight of the  $j^{th}$  separation in the year  $X$  is denoted  $W_{In}(j, X)$ . This is done as a means of taking into account acuity before we consider length of stay.

If, after taking into account separation growth, we see a large increase in the sum of inlier weights from  $Y1$  to  $Y2$ , we interpret this information by saying that in  $Y2$ , the admissions being treated in  $Y2$  were of a more complicated nature.

Let  $J = \{1, \dots, N_{Y1}\}$ , where  $N_{Y1}$  is defined above. Similarly, we let  $N_{Y2}$  be the number of separations in  $Y2$  and  $K = \{1, \dots, N_{Y2}\}$ . Fix an order on the separations which took place in  $Y2$ . We define

$$\Delta_{Acuity} := \sum_{k \in K} W_{In}(k, Y2) - \sum_{j \in J} \phi_{ADRG}(j) \cdot W_{In}(j, Y1)$$

Recall that  $\phi_{ADRG}(j)$  is defined above to be the growth ratio of the ADRG to which the  $j^{th}$  separation in  $Y1$  belongs. Recall that this separation growth figure is calculated by considering only valid separations within the scope of the user-defined *Sample*.

For the purposes of presenting this information in the drivers of acute  $NWAU$  growth chart, we set about presenting all differences as a proportion of the total (unscaled)  $NWAU$  recorded in  $Y1$ . To this end, we define the following.

$$\rho_{Acuity} := \frac{\Delta_{Acuity}}{NWAU_0}$$

Not every patient receives the inlier weight for their DRG, therefore we need to consider the difference between the base price weight assigned to a separation (the value  $PW$  in the  $NWAU$  formula) and the inlier weight for that separation's DRG. We define the length of stay adjustment for the  $j^{th}$  separation in the year  $X$  by

$$W_{LOS}(j, X) := PW - W_{In}(j, X)$$

where  $PW$  is defined in the  $NWAU$  formula. This value is uniquely determined by a separation's length of stay and its DRG and may be found in the NEP Determination (IHACPA 2023d) relevant to the year  $Y2$ . If separation  $j$  in the year  $X$  is an inlier, then  $W_{LOS}(j, X) = 0$ . If separation  $j$  in the year  $X$  is a long-stay outlier, then  $W_{LOS}(j, X) > 0$ . If separation  $j$  in the year  $X$  is a short-stay outlier, then  $W_{LOS}(j, X) < 0$ . We now define

$$\Delta_{LOS} := \sum_{k \in K} W_{LOS}(k, Y2) - \sum_{j \in J} \phi_{ADRG}(j) \cdot W_{LOS}(j, Y1)$$

We define

$$\rho_{LOS} := \frac{\Delta_{LOS}}{NWAU_0}$$

## 4.5 Demographic and Clinical Adjustments

We now consider the demographic summands within the  $NWAU$  formula. Specifically, we are considering only the components which pertain solely to demographic factors. Let the value  $P_{Demo}(j, X)$  denote the value  $P_{Demo}$  for the  $NWAU$  calculation of the  $j^{th}$  separation in year  $X$ . Define

$$\Delta_{Demo} := \sum_{k \in K} P_{Demo}(k, Y2) - \sum_{j \in J} \phi_{ADRG}(j) \cdot P_{Demo}(j, Y1)$$

and

$$\rho_{Demo} := \frac{\Delta_{Demo}}{NWAU_0}$$

We now repeat the above for the clinical adjustments. Here we consider any terms in the  $NWAU$  that contain only clinical adjustments or are products of clinical and demographic adjustments. Let the value  $P_{Clin}(j, X)$  denote the value  $P_{Clin}$  for the  $NWAU$  calculation of the  $j^{th}$  separation in year  $X$ . Now define

$$\Delta_{Clin} := \sum_{k \in K} P_{Clin}(k, Y2) - \sum_{j \in J} \phi_{ADRG}(j) \cdot P_{Clin}(j, Y1)$$

and

$$\rho_{Clin} := \frac{\Delta_{Clin}}{NWAU_0}$$

We repeat the same procedure as above for the ICU adjustment. Let the value  $P_{ICU}(j, X)$  denote the value  $P_{ICU}$  for the  $NWAU$  calculation of the  $j^{th}$  separation in year  $X$ . We define

$$\Delta_{ICU} := \sum_{k \in K} P_{ICU}(k, Y2) - \sum_{j \in J} \phi_{ADRG}(j) \cdot P_{ICU}(j, Y2)$$

and

$$\rho_{ICU} := \frac{\Delta_{ICU}}{NWAU_0}$$

## 4.6 Private Patient and HAC Adjustments

In attributing  $NWAU$  growth to the private patient and HAC adjustments, we follow the same procedure as above except that we do not allow the amount being deducted to exceed an episode's  $NWAU$ . For this reason, the values  $P_{Priv}$  and  $P_{HAC}$  have been defined to ensure that

$$GWAU + P_{Priv} + P_{HAC} \geq 0$$

Let the  $P_{Priv}(j, X)$  denote the value  $P_{Priv}$  for the  $NWAU$  calculation of the  $j^{th}$  separation in year  $X$ . Define

$$\Delta_{Priv} := \sum_{k \in K} P_{Priv}(k, Y2) - \sum_{j \in J} \phi_{ADRG}(j) \cdot P_{Priv}(j, Y1)$$

and

$$\rho_{Priv} := \frac{\Delta_{Priv}}{NWAU_0}$$

Let  $P_{HAC}(j, X)$  denote the value  $P_{HAC}$  for the  $NWAU$  calculation of the  $j^{th}$  separation in year  $X$ . Define

$$\Delta_{HAC} := \sum_{k \in K} P_{HAC}(k, Y2) - \sum_{j \in J} \phi_{ADRG}(j) \cdot P_{HAC}(j, Y1)$$

and

$$\rho_{HAC} := \frac{\Delta_{HAC}}{NWAU_0}$$

For reference we define

$$\Delta_{Total} := \Delta_{Acuity} + \Delta_{LOS} + \Delta_{Demo} + \Delta_{Clin} + \Delta_{ICU} + \Delta_{Priv} + \Delta_{HAC}$$

## 4.7 Construction of the Drivers of Acute NWAU Growth Chart

The growth proportions which appear in the drivers of acute NWAU growth chart on the NWAU detail page of the NBP are described in Table 34, along with the labels of each item as it appears in Figure 2 and the NBP.

Table 34: Descriptions of each component of the drivers of acute NWAU growth chart

Value	Title in NBP	Interpretation
$\rho_{Sep}$	Separation growth	This is what NWAU growth between Y1 and Y2 would be if NWAU growth was the same as the overall growth in separations.
$\rho_{ADRG}$	Between ADRG changes	After taking into account total separation growth, this is the growth in NWAU we would expect after taking into account the different growth rates of the different ADRGs.
$\rho_{Acuity}$	Within ADRG changes	After taking into account separation growth by ADRG, this is the growth in NWAU attributed to changes in the distribution of inlier weights within each ADRG.
$\rho_{LOS}$	Length of stay	After taking into account separation growth by ADRG, this is the growth in NWAU attributed to changes in the length of stay profile within each ADRG.
$\rho_{Demo}$	Demographic adjustments	After taking into account separation growth by ADRG, this is the growth in NWAU attributed to change in demographic factors among the cohort of separated patients.
$\rho_{Clin}$	Clinical adjustments	After taking into account separation growth by ADRG, this is the growth in NWAU attributed to change in clinical factors.
$\rho_{ICU}$	Intensive care unit	After taking into account separation growth by ADRG, this is the growth in NWAU attributed to change in number of ICU hours provided.
$\rho_{Priv}$	Private adjustments	After taking into account separation growth by ADRG, this is the growth in NWAU attributed to changes in private patient deductions. Private patient deductions are removed before HAC deductions are taken into consideration.
$\rho_{HAC}$	Hospital acquired complications	After taking into account separation growth by ADRG, this is the growth in NWAU attributed to changes in HACs. HAC deductions are removed after any private patient deduction has already been removed.
$\frac{NWAU_2 + \Delta_{Total}}{NWAU_0}$	NWAU growth	Total NWAU growth if separation growth with separation growth rates determined by the tab selected by the user. This is equal to observed admitted acute NWAU growth.

# 5. Alignment with Other Data Sources

This section explains some of the ways in which figures presented in the NHCDC public report, and other sources based on NHCDC data, may differ from those in the NBP. As a general rule, the NBP has been prepared to enable effective benchmarking between services. Costs and services which are not amenable to this manner of benchmarking have been omitted from the NBP but may be present in other sources.

## 5.1 NHCDC Public Sector Reports

Each year, IHACPA publishes a report on the NHCDC data submitted by public sector hospitals (IHACPA 2023e). The purpose of the NHCDC public sector report is to describe all costs submitted to IHACPA via the NHCDC from public sector hospitals. This is distinct from the purpose of the NBP which is to enable accurate benchmarking between services. Therefore, the user may notice the following differences between figures within the NHCDC report and the NBP.

The NBP contains only NHCDC data which may be identified with records from IHACPA's activity data sets. This is also true of the NHCDC public sector report, however, among the admitted streams, the NBP also requires that NHCDC records be identified with records from the APC data set as this contains some information necessary for effective benchmarking. NHCDC records which match activity in the MHCE, MHCP or PCC data sets (IHACPA 2023a), but cannot be matched to the APC via the usual linking keys, are not included in the NBP.

Non-admitted service events in Tier 2 classes which receive no NWAU are included in the NHCDC public sector report, but not in the NBP. The number of service events impacted is summarised in Section 3.1.5.

A comparison between costs in the NHCDC public sector report and those in the NBP is provided in Table 35.

Table 35: Comparison between costs in NBP and NHCDC public sector report

		Jurisdiction								National
		NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
2017 – 18 (\$M)	NBP	\$12,854	\$9,861	\$9,407	\$3,462	\$4,538	\$918	\$864	\$873	<b>\$42,778</b>
	NHCDC	\$13,753	\$10,723	\$10,851	\$3,769	\$4,954	\$1,137	\$965	\$1,013	<b>\$47,165</b>
2018 – 19 (\$M)	NBP	\$13,545	\$10,667	\$10,165	\$3,787	\$4,862	\$1,010	\$942	\$976	<b>\$45,955</b>
	NHCDC	\$14,695	\$11,516	\$11,635	\$4,082	\$5,230	\$1,238	\$1,047	\$1,108	<b>\$50,550</b>
2019 – 20 (\$M)	NBP	\$14,232	\$11,484	\$10,807	\$3,798	\$5,028	\$1,114	\$1,000	\$1,065	<b>\$48,528</b>
	NHCDC	\$15,741	\$13,134	\$12,618	\$4,189	\$5,424	\$1,338	\$1,117	\$1,189	<b>\$54,749</b>
2020 – 21 (\$M)	NBP	\$14,615	\$12,165	\$11,236	\$3,210	\$5,361	\$1,237	\$1,088	\$1,104	<b>\$50,017</b>
	NHCDC	\$16,652	\$13,692	\$13,214	\$4,625	\$5,777	\$1,483	\$1,215	\$1,294	<b>\$57,952</b>

## 5.2 AIHW Admitted Patient Safety and Quality Data

The AIHW publishes admitted patient safety and quality data which includes episodes with HACs by complication group and subgroup (AIHW 2023). However, the HAC data presented on the NBP is not directly comparable to the publications from AIHW due to the following reasons:

- As noted in Section 3, for the purposes of benchmarking, records are only included on the NBP if:
  - o Records were reported by a hospital which was funded through activity based funding
  - o Records can be linked between activity and cost data
  - o Records are not assigned an error class and have sufficient information to be assigned an NWAU
  - o The funding source of the records allows for them being priced by IHACPA subject to IHACPA's remit under the National Health Reform Agreement.
- There are privacy considerations which impact the level of granularity in reporting HAC records on the NBP.

Due to the differences in how the HAC data is prepared and presented, IHACPA has not performed a reconciliation of the NBP HAC data against the AIHW admitted patient safety and quality data.

# 6. Data Masking

IHACPA has implemented data masking rules to limit the risk of personal re-identification or identification of personal information through information provided in the NBP. This limits the degree to which users may obtain information about low-volume end classes and small hospitals. The following rules have been implemented for each dashboard:

- Cost per NWAU dashboards:
  - o In any graphic pertaining to cost or NWAU per month, if there is a month in which fewer than 30 episodes of care took place then the graphic will not be displayed.
  - o In scatter charts representing categories other than end classes (AR-DRG, AN-SNAP v4, URG, or Tier 2 classifications) then the chart will be suppressed if any datum in the chart represents fewer than 30 separations.
  - o In scatter charts displaying data for an end class (AR-DRG, AN-SNAP v4, URG, or Tier 2 classifications) then end classes representing fewer than 30 separations are not displayed. All other end classes are displayed.
  - o In all other graphics and KPIs, no data are displayed if the user selects a combination of filters representing fewer than 30 separations.
- HAC and AHR dashboards:
  - o In any graphic showing trends over time, if there is a quarter in which fewer than 20 episodes of care took place then the graphic will not be displayed.
  - o In graphics displaying data by complication group or subgroup, complication groups or subgroups representing fewer than 20 separations are not displayed. All other complication groups or subgroups are displayed.
  - o In all other graphics and KPIs, no data are displayed if the user selects a combination of filters representing fewer than 20 separations.

A smaller threshold is implemented for the HAC and AHR dashboards in the interest of providing meaningful data for public access while balancing privacy considerations arising from the smaller sample sizes.



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# Appendix A) Variables Included in the NBP

This section lists the variables included in the NBP by stream. A variable has data type 'Dimension' if the user may filter data according to the values of that variable. Otherwise, the variable has data type 'Measure' and summaries of this variable are presented but the user may not filter according to common values. For example, cost within the pathology cost bucket is a 'Measure' because the user may view the total pathology cost for a group of records, but they cannot request to view all records with the same value of pathology direct costs.

## Cost per NWAU Variables by Stream

Table 36 lists the variables that are common to all streams of care on the Cost per NWAU dashboard.

Table 36: Variables included on all records in the Cost per NWAU dashboard

Variable	Data type	Notes
Jurisdiction	Dimension	AIHW METeOR 720081.
Hospital	Dimension	AIHW METeOR 269973.
Local Hospital Network	Dimension	AIHW METeOR 711144.
AIHW Peer Group	Dimension	AIHW METeOR 584663, also see (AIHW 2015, AIHW 2021).
Record Month	Dimension	For admitted episode-level records this is the month that a patient's episode of care ended. For admitted phase-level records this is the month that a patient's phase of care ended.
Total Records	Measure	
Ward medical costs	Measure	
Ward nursing costs	Measure	
Non-clinical costs	Measure	
Pathology costs	Measure	
Imaging costs	Measure	
Allied health costs	Measure	
Pharmacy costs	Measure	
Critical care costs	Measure	
Operating room costs	Measure	See Section 2 and (IHACPA 2023e) for more information about cost collection.
Emergency department costs	Measure	
Ward supplies costs	Measure	
Special procedure suit costs	Measure	
Prosthetics costs	Measure	
On-costs	Measure	
Hotel costs	Measure	
Depreciation costs	Measure	
Patient travel costs	Measure	
NWAU	Measure	Native NWAU is displayed for all records, see Section 2 for a further explanation of NWAU versions used in the NBP. Different NWAU versions are used internally to calculate growth statistics but are not directly displayed to the user.

Table 37 lists the variables listed in the NBP for records in the admitted acute stream, other than those in Table 36.

**Table 37: Variables contained in the admitted acute stream**

Variable	Data type	Notes
Service Related Group Version 6.0	Dimension	See Section 3.3.
Principal Diagnosis	Dimension	Categorised using ICD-10-AM. Versions differ by year as specified in Section 2. Different versions are held internally and used to calculate growth statistics but are not displayed to the user.
Major Diagnostic Category (MDC)	Dimension	Version differs by year, as specified in Section 2. Different versions held internally and used to calculate growth statistics but are not displayed to the user.
Australian Refined Diagnosis Related Group (AR-DRG) classification	Dimension	Version differs by year, as specified in Section 2. Different versions held internally and used to calculate growth statistics but are not displayed to the user.

Table 38 lists the variables listed in the NBP for records in the admitted mental health care stream, other than those in Table 36.

**Table 38: Variables contained in the admitted mental health care stream**

Variable	Data type	Notes
Principal Diagnosis	Dimension	Categorised using ICD-10-AM. Versions differ by year as specified in Section 2. Different versions are held internally and used to calculate growth statistics but are not displayed to the user.
Major Diagnostic Category (MDC)	Dimension	Version differs by year, as specified in Section 2. Different versions held internally and used to calculate growth statistics but are not displayed to the user.
Australian Refined Diagnosis Related Group (AR-DRG) classification	Dimension	Version differs by year, as specified in Section 2. Different versions held internally and used to calculate growth statistics but are not displayed to the user.

Table 39 lists the variables listed in the NBP for records in the admitted subacute and non-acute care stream (including palliative care phases), other than those in Table 36.

**Table 39: Variables contained in the admitted subacute and non-acute care stream**

Variable	Data type	Notes
Service Related Group Version 6.0	Dimension	See Section 3.3.
Principal Diagnosis	Dimension	Categorised using ICD-10-AM. Versions differ by year as specified in Section 2. Different versions are held internally and used to calculate growth statistics but are not displayed to the user.
Australian National Subacute and Non-Acute Patient (AN-SNAP) Version 4.0	Dimension	Version 4.0 used in each year, as specified in Section 2.

Table 40 lists the variables listed in the NBP for records in the emergency department stream, other than those in Table 36.

**Table 40: Variables contained in the emergency department stream**

Variable	Data type	Notes
Principal Diagnosis	Dimension	Categorised using the emergency department short list. Versions differ by year, as specified in Section 2. Different versions are held internally and used to calculate growth statistics but are not displayed to the user.
Urgency Related Group Version 1.4	Dimension	Version 1.4 used in each year, as specified in Section 2.

Table 41 lists the variables listed in the NBP for records in the non-admitted stream, other than those in Table 36.

**Table 41: Variables contained in the non-admitted stream**

Variable	Data type	Notes
Tier 2 Non-Admitted Services classification	Dimension	Version differs by year, as specified in Section 2. Different versions held internally and used to calculate growth statistics but are not displayed to the user.

## HAC Variables

Table 42 lists the variables listed in the HAC dashboard.

Table 42: Variables included in the HAC dashboard

Variable	Data type	Notes
Jurisdiction	Dimension	AIHW METeOR 720081.
Hospital	Dimension	AIHW METeOR 269973.
Local Hospital Network	Dimension	AIHW METeOR 711144.
AIHW Peer Group	Dimension	AIHW METeOR 584663, also see (AIHW 2015, AIHW 2021).
Record Quarter	Dimension	For admitted episode-level records this is the quarter that a patient's episode of care ended.
Complication Group	Dimension	Complication, as defined by Australian Commission on Safety and Quality in Health Care (ACSQHC 2023) Version 3.0.
Complication Subgroup	Dimension	Diagnosis, as defined by Australian Commission on Safety and Quality in Health Care (ACSQHC 2023) Version 3.0.
Age Group	Dimension	Age of patient, presented as three groups: 0-17, 18-59, 60+.
Charlson Score	Dimension	A score that predicts the one-year morbidity for a patient with a range of specific comorbidities, grouped into Mild, Moderate and Severe categories.
Risk Category	Dimension	Determined by the complexity score of each risk factor variable relevant to the HAC.
Number of HACs	Measure	Count of HACs on a complication group level.
Expected number of HACs	Measure	Count of HACs based on the probability of a HAC occurring determined using a logistic regression model as described in the National Pricing Model Technical Specifications (IHACPA 2023).
Number of episodes with HACs	Measure	The number of episodes satisfying The Commission's definition of a HAC Version 3.0 (ACSQHC 2023).
Average Length of Stay	Measure	Average length of stay in days derived from admission and separation dates.
Rate of Long Stay Outliers	Measure	The number of long stay outliers for every 10,000 episodes. The number of admitted days required for a patient to be a long stay outlier depends upon that patient's DRG and the NWAU version under consideration. Exact figures are available in each National Efficient Price Determination, available on IHACPA's website (IHACPA 2023d).
HAC NWAU Adjustments	Measure	Native NWAU adjustment is displayed for all records, see Section 3.5 for a further explanation of NWAU versions used in the HAC dashboard. Different NWAU versions are used internally to calculate growth statistics but are not directly displayed to the user.

## AHR Variables

Table 43 lists the variables listed in the AHR dashboard.

Table 43: Variables included in the AHR dashboard

Variable	Data type	Notes
Jurisdiction	Dimension	AIHW METeOR 720081.
Hospital	Dimension	AIHW METeOR 269973.
Local Hospital Network	Dimension	AIHW METeOR 711144.
AIHW Peer Group	Dimension	AIHW METeOR 584663, also see (AIHW 2015, AIHW 2021).
Record Quarter	Dimension	For admitted episode-level records this is the quarter that a patient's episode of care ended.
Readmission Group	Dimension	Complication Group as defined by the Australia Commission on Safety and Quality in Health Care, (ACSQHC 2023) Version 2.0
Readmission Subgroup	Dimension	Diagnosis Category as defined by the Australia Commission on Safety and Quality in Health Care, (ACSQHC 2023) Version 2.0
Age Group	Dimension	Age of patient, presented as three groups: 0-17, 18-59, 60+.
Charlson Score	Dimension	A score that predicts the one-year morbidity for a patient with a range of specific comorbidities, grouped into Mild, Moderate and Severe categories.
Risk Category	Dimension	The likelihood that a record will be the index episode for an AHR, grouped into three categories. The more likely a record is to be an index episode, the lower the AHR deduction if an AHR does occur. The method of calculation is described in the National Pricing Model Technical Specifications (IHACPA 2023).
Number episodes with AHRs	Measure	The number of episodes satisfying the Commission's definition of an AHR Version 2.0 (ACSQHC 2023).
Expected number episodes with AHRs	Measure	Count of AHRs based on the probability of a AHR occurring determined using a gradient boosted decision tree model as described in the National Pricing Model Technical Specifications (IHACPA 2023).
Total eligible episodes	Measure	Admitted acute records eligible to be the index episode of an AHR, as defined in Section 3.6.1
Average Length of Stay	Measure	Average admitted length of stay among admitted acute records.
Rate of Patients Aged at Least 60 Years	Measure	The number of patients aged at least 60 years for every 10,000 episodes.
AHR NWAU Adjustments	Measure	NWAU removed via AHR NWAU deductions. This value is calculated at the episode level and summed over the user's selected data. The manner in which the deduction is calculated is described in the National Pricing Model Technical Specifications (IHACPA 2023). NWAU21 is the only version used in the NBP at the time of publication.



# **Appendix B) Non-admitted Tier 2 Classes Omitted from the NBP**

Table 44 lists the Tier 2 classes which have been omitted from the NBP on the basis that they are not assigned NWAU and would therefore distort cost per NWAU statistics. The reason that NWAU is not assigned is provided alongside the code for each Tier 2 class.

Table 44: Tier 2 classes not included in the NBP

Tier 2 class	Reason no NWAU is assigned
10.19: Ventilation – home delivered	This activity is block funded.
10.21: COVID-19 Vaccination	This activity is not priced by IHACPA but funded under a separate agreement between the Commonwealth and the states and territories.
20.06: General practice and primary care	This activity is out of IHACPA's scope under the NHRA.
30.01: General imaging	NWAU is bundled to the originating service.
30.02: Magnetic resonance imaging (MRI)	NWAU is bundled to the originating service.
30.03: Computerised tomography (CT)	NWAU is bundled to the originating service.
30.04: Nuclear medicine	NWAU is bundled to the originating service.
30.05: Pathology (microbiology, haematology, biochemistry)	NWAU is bundled to the originating service.
30.06: Positron emission tomography	NWAU is bundled to the originating service.
30.07: Mammography screening	NWAU is bundled to the originating service.
30.08: Clinical Measurement	NWAU is bundled to the originating service.
30.09: COVID-19 response diagnostics	NWAU is bundled to the originating service.
40.02: Aged care assessment	This activity is out of IHACPA's scope under the NHRA.
40.08: Primary health care	This activity is out of IHACPA's scope under the NHRA.
40.27: Family planning	This activity is out of IHACPA's scope under the NHRA.
40.33: General counselling	This activity is out of IHACPA's scope under the NHRA.
40.34: Specialist mental health	This activity is block funded.
40.62: Multidisciplinary case conference – patient not present	This class was not yet priced in the years under consideration.

# Appendix C) AIHW Peer Groups Reassigned in the NBP

Table 45 lists hospitals having identifiers within IHACPA's data which did not agree with those in the AIHW list. In these instances, the AIHW peer group of a hospital in IHACPA's data set was identified according to hospital name or previous hospital identifier. For transparency, we provide these hospitals in the table below.

Table 45: Hospitals with discrepancy between IHACPA and AIHW identifier, and their peer group assignment

Establishment	AIHW peer group listed in NBP	Reason for discrepancy
Armadale-Kelmscott Memorial Hospital	Public acute group A	Hospital identifier mismatch due to changed identifier.
Royal Perth Hospital, Wellington St. Campus	Principal referral	Hospital identifier mismatch due to changed identifier.
University of Canberra Hospital	Principal referral	Hospital identifier mismatch due to disaggregation from Canberra Hospital.
Byron Central Hospital	Public acute group C	Hospital identifier mismatch.

# Appendix D) Assignment of SRG v6 99, *Unallocated* Due to Establishment

Following the practice of the NSW Ministry of Health SRG v6 grouper, records from certain establishments are assigned SRG v6 99, *Unallocated*, regardless of the content of that record. IHACPA has sought to generalise this decision to hospitals throughout Australia. The resulting list of establishments from which all records are assigned SRG v6 99, *Unallocated* is provided in Table 46. Further information is provided in Section 3.3.

Table 46: Establishments with records assigned to SRG v6 99, *Unallocated*

Jurisdiction	Establishment	Reason for assigning 99, <i>Unallocated</i>	Notes
NSW	Bathurst Inpatient Service	NSW Ministry of Health Justice Health Facility	Data formerly reported under establishment identifier for 'Justice Health (NSW)'.
	Grafton Inpatient Service		
	Justice Health		
	Long Bay Hospital		
	Metropolitan Remand and Reception Centre Inpatient Service		
	Silverwater Womens Inpatient Service		
Queensland	Ellen Barron Family Centre (Riverton)	AIHW Peer Group <i>Early Parenting Centre</i>	
NSW	Riverlands Drug and Alcohol Centre	AIHW Peer Group <i>Drug and Alcohol Hospital</i>	
WA	Next Step Drug and Alcohol Services	AIHW Peer Group <i>Drug and Alcohol Hospital</i>	
Queensland	Cairns Adult Community MHS	AIHW Peer Group <i>Unknown</i>	Data for 2018-19 only. Public mental health services. Establishments not listed on AIHW Peer Group list.
	Longreach Community MHS		
	Cooktown Community MHS		
	Innisfail Community MHS		
	Cape York Community MHS		

Doomadgee Community MHS		
Bayside Child & Youth Community MHS		
Warwick Community MHS		
Biloela Community MHS		
Palm Beach Adult Community MHS		
Beenleigh Community MHS		
Bundaberg Adult Community MHS		
Bundaberg Child & Youth Community MHS		
Goondiwindi Community MHS		
Stanthorpe Community MHS		
Ipswich Adult Community MHS		
Redcliffe-Caboolture Crisis Assessment & Treatment Community MHS		
Mackay Adult Community MHS		
Mackay Child & Youth Community MHS		
Maroochydore Adult Community MHS		
Community Forensic MHS		
Inner North Brisbane Community MHS		
Rockhampton Adult Community MHS		
Logan Central Adult Community MHS		
Toowoomba Adult Community MHS		
Toowoomba Child & Youth Community MHS		
Dalby Community MHS		
Mount Isa Community MHS		
Whitsunday Community MHS		
Moranbah Community MHS		
Fraser Coast Adult Community MHS		
Fraser Coast Child & Youth Community MHS		
Redcliffe-Caboolture Child & Youth Community MHS		

	Townsville Adult Community MHS		
	Townsville Adult Community Forensic MHS		
	Bayside Adult Community MHS		
	Nundah Community Mental Health Service		
	Browns Plains Community MHS		
	Ingham Community MHS		
	Robina Community MHS		
	Woolloongabba Community MHS		
	Southport Adult Community MHS		
NSW	Goodooga Health Service	NSW Ministry of Health Peer Group <i>Other</i> <i>Ungrouped</i>	
	Ivanhoe Health Service		
	Kiama District Hospital		
	Tibooburra Health Service		

# Appendix E) Private Psychiatric Facilities

Table 47 lists the private establishments which are considered eligible to have their admitted episodes grouped into SRG v6 83, *Specialist Mental Health*. Hospitals are included on this list if they are either private psychiatric hospitals or not specialised private psychiatric hospitals but private hospitals with a psychiatric unit. The category into which a hospital falls is provided in the 'Type of Facility' column.

Table 47: Private psychiatric hospitals and private hospitals with psychiatric units, used in the SRG v6 grouper

Jurisdiction	Hospital	Type of Facility
NSW	Northern Beaches Hospital	Private hospital with psychiatric unit
Victoria	Albert Road Clinic	Private psychiatric hospital
Victoria	South Eastern Private Hospital	Private hospital with psychiatric unit
Victoria	Melbourne Clinic	Private psychiatric hospital
Victoria	Wyndham Clinic	Private hospital with psychiatric unit
Victoria	Northpark Private Hospital	Private hospital with psychiatric unit
Queensland	Belmont Private Hospital	Private psychiatric hospital
Queensland	Toowong Private Hospital	Private psychiatric hospital
Queensland	Townsville Private Clinic	Private psychiatric hospital
Queensland	Robina Private Hospital	Private hospital with psychiatric unit
Queensland	The Cairns Clinic	Private psychiatric hospital
WA	Abbotsford Private Hospital	Private psychiatric hospital
WA	St John of God Health Care Mount Lawley	Private hospital with psychiatric unit
WA	Joondalup Health Campus	Private hospital with psychiatric unit
WA	Marian Centre	Private psychiatric hospital
WA	St John of God Midland Hospital	Private hospital with psychiatric unit
ACT	Calvary Private Hospital	Private hospital with psychiatric unit
ACT	Canberra Private Hospital	Private hospital with psychiatric unit

# Appendix F) Establishments with NICU Facilities

Table 48 lists the establishments with NICU facilities. These are the only establishments which are eligible to have their admitted episodes grouped into the SRG v6 75, *Perinatology*. The establishments in Table 48 which lie within NSW, and Canberra Hospital, are those designated by the NSW MoH SRG v6 grouper. All other establishments in the table below have been selected on the basis that they delivered at least 100 ICU hours to patients with admitted patient care type 'Newborn care' in at least one of the years from 2017–18 to 2020–21.

Table 48: Hospitals with a neonatal intensive care unit, used in the SRG v6 grouper

Jurisdiction	Hospital
NSW	Children's Hospital, Westmead
NSW	Royal Prince Alfred Hospital
NSW	Royal North Shore Hospital
NSW	Royal Hospital for Women
NSW	Sydney Children's Hospital
NSW	Liverpool Hospital
NSW	Nepean Hospital
NSW	Westmead Hospital
NSW	John Hunter Hospital
Victoria	South West Healthcare (Warrnambool)
Victoria	Mildura Base Hospital
Victoria	Monash Medical Centre (Clayton)
Victoria	Mercy Hospital for Women
Victoria	Royal Childrens Hospital (Parkville)
Victoria	Royal Womens Hospital (Clayton)
Victoria	Sunshine Hospital
Queensland	Mater Mothers Hospital
Queensland	Sunshine Coast University Hospital



Queensland	Townsville University Hospital
Queensland	Royal Brisbane and Women's Hospital
Queensland	Queensland Children's Hospital
Queensland	Gold Coast University Hospital
SA	Women's and Children's Hospital
SA	Flinders Medical Centre
WA	King Edward Memorial Hospital for Women
WA	Perth Childrens Hospital
Tasmania	Royal Hobart Hospital
ACT	Canberra Hospital
ACT	Calvary John James Hospital



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