Royal Commission
into Aged Care Quality and Safety

TECHNICAL MAPPING BETWEEN ACFI AND AN-ACC

RESEARCH PAPER 10

AUGUST 2020

The Royal Commission into Aged Care Quality and Safety was established by Letters Patent on 8 October 2018. Replacement Letters Patent were issued on 6 December 2018, and amended on 13 September 2019 and 25 June 2020.

The Honourable Tony Pagone QC and Ms Lynelle Briggs AO have been appointed as Royal Commissioners. They are required to provide a final report by 26 February 2021.

The Royal Commission releases consultation, research and background papers. This research paper has been prepared by the Australian Health Services Research Institute, University of Wollongong, for the information of Commissioners and the public. The views expressed in this paper are not necessarily the views of the Commissioners.

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Technical mapping between ACFI and AN-ACC

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Purpose of this document

The Royal Commission into Aged Care Quality and Safety (the Commission) contracted the Australian Health Services Research Institute, University of Wollongong, to develop a mapping of the Aged Care Funding Instrument (ACFI) to the Australian National Aged Care Classification (AN-ACC). The objective of this work was to enable the development of a casemix-adjusted indicator ('casemix index') for residential aged care facilities that appropriately reflects the relative care needs of their residents.

The mapping and the casemix-adjusted indicators are building blocks for other analyses the Commission has commissioned to assist its understanding of how much residential aged care services should cost at different quality levels.

This short report is not meant to stand alone. It is a technical report on how to map from one funding model to another but does not describe the funding models in any detail.

In addition, the mapping could be an important tool to the Australian Government Department of Health during the transition from ACFI to AN-ACC.

However, the mapping should not be used to estimate the impact of the transition from ACFI to AN-ACC at the level of an individual home or organisation.

In addition to this report, the SAS code for the mapping algorithm was provided to the Commission. It can also be found in Appendix 2.

1 Background and Introduction

The Royal Commission into Aged Care Quality and Safety (the Commission) is undertaking statistical analysis to assist its understanding of how much residential aged care services should cost at different levels of quality, the implications for funding and the scope for providers to improve their efficiency. This work will be improved by a measure of relative care needs so that variations in residential aged care facility outcomes can be better understood.

Care needs are currently assessed for all people in residential aged care using the Aged Care Funding Instrument (ACFI). ACFI is not an independent assessment since it is done by staff of aged care providers and consultants engaged by providers. There is an incentive to uplift scores so that the payment received is larger, which leads to skewing of the assessments. In recent years the Department of Health has reviewed 1,000-2,000 ACFI assessments each quarter and downgraded 30% or more.[1]

The Resource Utilisation and Classification Study (RUCS) separately and independently assessed the care needs of a large, nationally representative sample of aged care facility residents.[2,3,4] The residents were clinically assessed using a range of validated instruments. This information was used to develop the Australian National Aged Care Classification (AN-ACC) which groups residents with similar care needs. Data were also collected on how staff time and facility costs are attributable to people in the different AN-ACC classes or shared among all residents. This information was used to develop the AN-ACC funding model (described in the Appendix). [5,6]

Within the AN-ACC funding model there are weights reflecting the relative individual care costs for each resident based on their AN-ACC class and a base care tariff for the relative costs of different types of aged care facilities. The estimates enable the development of casemix-adjusted indicators ('casemix index') that appropriately reflect the relative care needs of residents as well as facility characteristics.

The Commission contracted the Australian Health Services Research Institute (AHSRI), University of Wollongong, to develop a mapping algorithm between ACFI and AN-ACC data for

[1] Department of Health (2018-2020). Aged Care Funding Instrument (ACFI) Review Quarterly Report. March Quarter 2018 – March Quarter 2020.
[2] Eagar K, McNamee J, Gordon R, Snoek M, Duncan C, Samsa P and Loggie C (2019). The Australian National Aged Care Classification (AN-ACC). The Resource Utilisation and Classification Study: Report 1. Australian Health Services Research Institute, University of Wollongong.
[3] Westera A, Snoek M, Duncan C, Quinsey K, Samsa P, McNamee J and Eagar K (2019). The AN-ACC assessment model. The Resource Utilisation and Classification Study: Report 2. Australian Health Services Research Institute, University of Wollongong.
[4] McNamee J, Kobel C and Rankin N (2019). Structural and individual costs of residential aged care services in Australia. The Resource Utilisation and Classification Study: Report 3. Australian Health Services Research Institute, University of Wollongong.
[5] McNamee J, Snoek M, Kobel C, Loggie C, Rankin N and Eagar K (2019). A funding model for the residential aged care sector. The Resource Utilisation and Classification Study: Report 5. Australian Health Services Research Institute, University of Wollongong.
[6] Eagar K, McNamee J, Gordon R, Snoek M, Kobel C, Westera A, Duncan C, Samsa P, Loggie C, Rankin N and Quinsey K (2019). AN-ACC: A national classification and funding model for residential aged care: Synthesis and consolidated recommendations. The Resource Utilisation and Classification Study: Report 6. Australian Health Services Research Institute, University of Wollongong.

the sample of residents and facilities collected through RUCS. AHSRI then supported the Commission to implement and validate the calculation of cost weights (i.e. Relative Value Units (RVUs) and National Weighted Activity Units (NWAUs)) and casemix indices for all aged care facilities and approved providers. These casemix-adjusted measures provide a better description of relative care needs than using ACFI or unadjusted bed days.

This short report provides a brief summary of the mapping methodology and the mapping results. It also contains instructions on how to calculate and calibrate casemix indices for residential aged care facilities and approved providers. It is assumed that the reader is sufficiently familiar with the ACFI, the AN-ACC funding model and casemix systems more generally. Relevant information is available elsewhere.[5,7,8,9]

2 Methods

This section contains a brief overview over the methods used to derive the ACFI to AN-ACC mapping algorithm.

2.1 Data sources

The Commission holds detailed ACFI assessment data from all residential aged care facilities. The Commission was able to match the ACFI data to the RUCS data and supply a de-identified file to enable the mapping to be developed. The ACFI data were for the assessment nearest to the date of the assessment for RUCS. The final dataset contained 3,540 records after cleaning from 96 facilities.[10] The columns contain the detailed responses to all ACFI questions, including the three domain results and the final ACFI score. The dataset also contained the RUCS assessment results and AN-ACC classes.

2.2 Mapping approach

The usual statistical approach for these types of analyses include multinomial regression modelling or Classification and Regression Tree (CART) analysis. However, initial attempts showed that these data-driven approaches were not sufficiently discriminative and results were inconsistent and inconclusive.

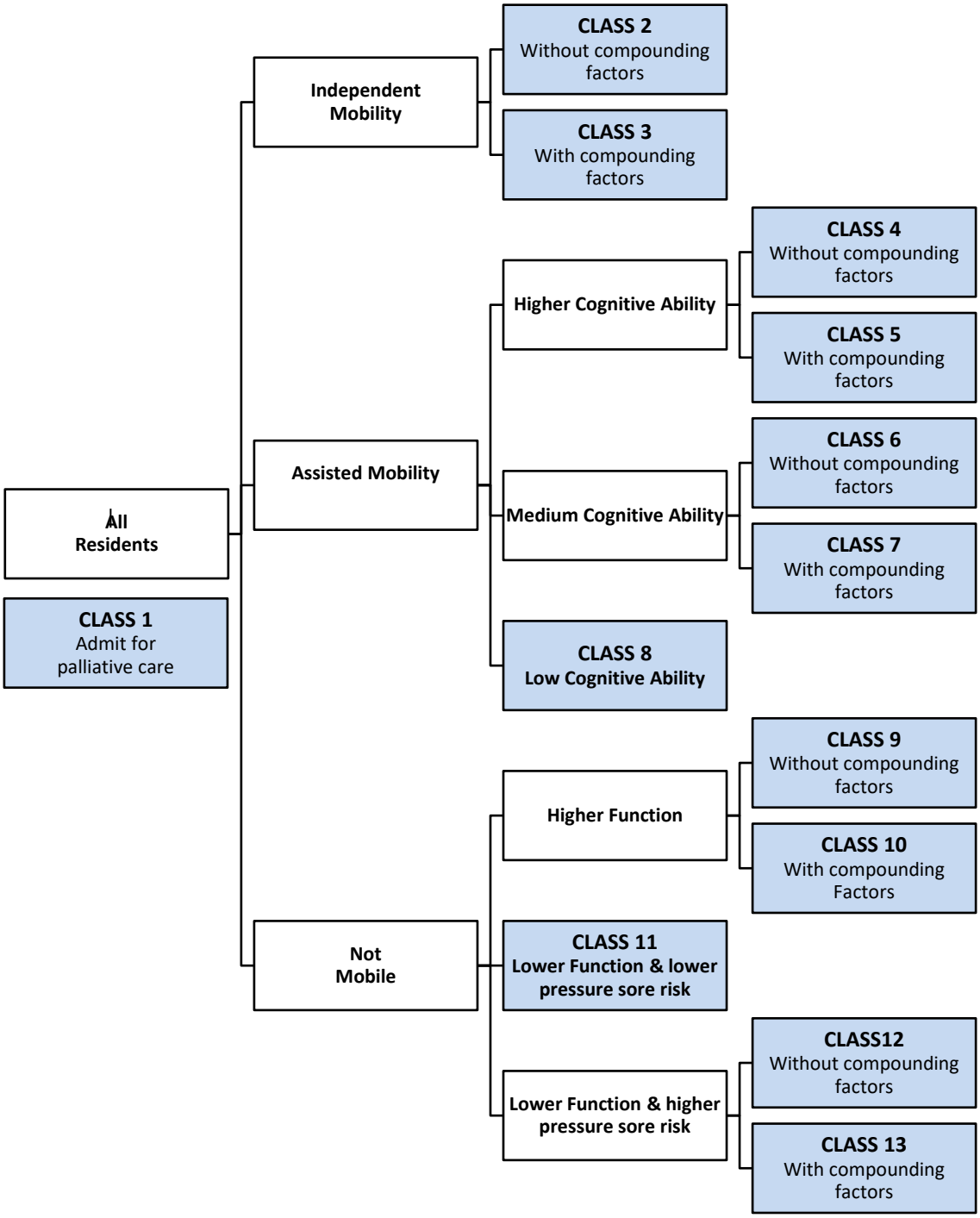
Therefore, a different approach was adopted; a process of elimination of options. The mapping approach was iterative and used statistical data analysis and clinical decisions based on expertise within AHSRI.

During exploratory analysis mappings to different levels of aggregation such as AN-ACC-class, second split level within AN-ACC (e.g. Assisted Mobility, Medium Cognitive Ability) or the AN-ACC Branches were tested. These analyses showed that the most promising level to map to was the second split level within AN-ACC (e.g. Assisted Mobility, Medium Cognitive Ability) as shown in Figure 1 below.

[7] Department of Health (2017). Aged Care Funding Instrument (ACFI) User Guide.
[8] Busse R, Geissler A, Quentin W and Wiley M ed. (2011). Diagnosis-Related Groups In Europe: Moving Towards Transparency, Efficiency And Quality In Hospitals. Open University Press.
[9] Kimberly J, De Pouvourville G and D'Aunno T ed. (2008). The globalization of managerial innovation in health care. Cambridge University Press.
[10] Three records classified as 'Admit for palliative care' were removed.

The process of elimination included a review of previously identified ACFI items cross-tabled against the AN-ACC second level groups. Whenever there was clear evidence in the data or mapping options were deemed implausible based on expertise within AHSRI, these have been eliminated, e.g. resident deemed immobile according to ACFI but independently mobile according to AN-ACC. This has led to the final mapping algorithm.

Figure 1 The Australian National Aged Care Classification (AN-ACC) Version 1.0



In practical terms, each resident starts with all mapping options available. By going through each of the identified ACFI questions and scores, mapping options were iteratively eliminated. This generates a set of viable ACFI scores corresponding to each AN-ACC second level as exemplified in Figure 2.

Figure 2 Concept of mapping between ACFI and AN-ACC

ACFI item	ACFI score	Independent Mobility		Assisted Mobility			Not Mobile		
		Without CF	With CF	Cognitive Ability			Higher Function	Lower Function & Lower Pressure Sore Risk	Lower Function & Higher Pressure Sore Risk
				Higher	Medium	Low			
ACFI Activities of Daily Living Domain	Nil, Low	☑							
	Medium	☑							
ACFI Cognitive and Behaviour Domain	Nil, Low	☑							
	Medium	☑							
ACFI1 Nutrition	A	☑							
	B	☑							
	D	☒							
ACFI2 Mobility	A, B	☑							
	D	☒							
ACFI3 Personal Hygiene	A, B, C	☑							
ACFI4 Toileting	A	☑							
	B	☑							
	C	☑							
ACFI5 Continence	A, B, C	☑							
ACFI6 R1 Cognitive Skills	1	☑							
	2	☑							
	3	☑							
	4	☑							
ACFI7 Wandering	B, C, D	☑							
ACFI12 R5 Complex skin integrity management	Yes	☒							
RUG-ADL (proxy)	≤ 15	☑							
	≥ 16	☑							
no ACFI score		☑							

Not options for the AN-ACC category

Options for the AN-ACC category

☒ – removed as mapping option
☑ – retained as mapping option

In most cases, the result of the mapping for individual residents is a single AN-ACC class, or a second level group which contains multiple classes, or a combination of AN-ACC second level groups with a larger number of potential classes.

The analyses were conducted using SAS 9.4 statistical software.

3 Mapping results

This section contains the results of the mapping approach along with selected results of the quality checks undertaken jointly with the Commission to ensure that the SAS code correctly reflected the mapping algorithm.

3.1 Algorithm

It should be noted that the order of the rules presented below is not a deciding factor. We have chosen to list ACFI12 R5 Complex skin integrity management first followed by all other items.

Table 1 shows the distribution across the AN-ACC Branches for the different outcomes of complex skin integrity management. The description for item ACFI12 R5 is 'Complex skin integrity management for residents with compromised skin integrity who are usually confined to bed and/ or chair and cannot self-ambulate. The management plan must include repositioning at least 4 times per day'. In line with this description, it was decided that all residents with complex skin integrity management should have the Independent and Assisted Branches removed as mapping options.

Table 1 ACFI Complex skin integrity management compared with AN-ACC Branch

AN-ACC Branch	ACFI12 R5 Complex skin integrity management			
	No	Yes	<missing>	Total
Independent	430	65	40	535
Assisted	1,181	539	103	1,823
Not Mobile	227	920	35	1,182
Total	**1,838**	**1,524**	**178**	**3,540**

The tables presented below do not include residents with complex skin integrity management (n = 1,524) in order to best show how other mapping options were narrowed.

Table 2 shows the ACFI Activities of Daily Living Domain against the AN-ACC second level groups. It is reasonable to assume that residents with no or few limitations in their Activities of Daily Living have a certain level of Mobility and Cognitive Ability. Based on the data presented, it was decided that the ACFI Activities of Daily Living scores 'Nil' or 'Low' should not be mapped into the Assisted Mobility, Low Cognitive Ability second level group or the Not Mobile Branch. If the resident's score was 'Medium' then the last two AN-ACC second level groups (Not Mobile, Lower Function & Lower Pressure Sore Risk or Not Mobile, Lower Function & Higher Pressure Sore Risk) should be removed as options.

Table 2 ACFI Activities of Daily Living Domain compared with AN-ACC second level

AN-ACC second level group	ACFI Activities of Daily Living Domain				
	Nil	Low	Medium	High	Total
Independent Mobility, Without Compounding Factors	12	109	165	40	326
Independent Mobility, With Compounding Factors	1	18	94	31	144
Assisted Mobility, Higher Cognitive Ability	9	125	348	275	757
Assisted Mobility, Medium Cognitive Ability	1	33	179	187	400
Assisted Mobility, Low Cognitive Ability	0	0	47	80	127
Not Mobile, Higher Function	0	4	25	103	132
Not Mobile, Lower Function & Lower Pressure Sore Risk	0	2	3	53	58
Not Mobile, Lower Function & Higher Pressure Sore Risk	0	0	5	67	72
Total	**23**	**291**	**866**	**836**	**2,016**

Table 3 shows the ACFI Cognitive and Behaviour Domain against the AN-ACC second level groups. Based on the data presented, it was decided that the Cognitive and Behaviour scores 'Nil' or 'Low' should not be mapped into the Assisted Mobility, Low Cognitive Ability second level group or the Not Mobile Branch. If the resident's score was 'Medium' then the last two AN-ACC second level groups (Not Mobile, Lower Function & Lower Pressure Sore Risk or Not Mobile, Lower Function & Higher Pressure Sore Risk) should be removed as options.

Table 3 ACFI Cognitive and Behaviour Domain compared with AN-ACC second level

AN-ACC second level group	ACFI Cognitive and Behaviour Domain				
	Nil	Low	Medium	High	Total
Independent Mobility, Without Compounding Factors	16	46	89	175	326
Independent Mobility, With Compounding Factors	1	3	18	122	144
Assisted Mobility, Higher Cognitive Ability	49	122	237	349	757
Assisted Mobility, Medium Cognitive Ability	9	30	61	300	400
Assisted Mobility, Low Cognitive Ability	0	0	12	115	127
Not Mobile, Higher Function	4	8	32	88	132
Not Mobile, Lower Function & Lower Pressure Sore Risk	1	3	6	48	58
Not Mobile, Lower Function & Higher Pressure Sore Risk	1	2	7	62	72
Total	**81**	**214**	**462**	**1,259**	**2,016**

Table 4 shows the ACFI Nutrition item against the AN-ACC second level groups. Based on the data presented, it was decided that the ACFI Nutrition score 'A' should not be mapped to Independent Mobility, With Compounding Factors; Assisted Mobility, Low Cognitive Ability or the Not Mobile Branch. The ACFI Nutrition score of 'B' should not be mapped to the Assisted Mobility, Low Cognitive Ability second level group or in the Not Mobile Branch. If the resident's ACFI nutrition score was 'D' then the 'Independent Mobility' Branch should be removed as options.

Table 4 ACFI Nutrition compared with AN-ACC second level

AN-ACC second level group	ACFI1 Nutrition				
	A	B	C	D	Total
Independent Mobility, Without Compounding Factors	28	114	180	4	326
Independent Mobility, With Compounding Factors	2	28	103	11	144
Assisted Mobility, Higher Cognitive Ability	58	158	526	15	757
Assisted Mobility, Medium Cognitive Ability	12	60	300	28	400
Assisted Mobility, Low Cognitive Ability	0	6	90	31	127
Not Mobile, Higher Function	3	4	111	14	132
Not Mobile, Lower Function & Lower Pressure Sore Risk	0	3	40	15	58
Not Mobile, Lower Function & Higher Pressure Sore Risk	0	1	39	32	72
Total	**103**	**374**	**1,389**	**150**	**2,016**

Table 5 shows the ACFI Mobility item against the AN-ACC second level groups. Based on the data presented and the assumption that ACFI Mobility and AN-ACC Mobility should generally correspond, it was decided that ACFI Mobility scores 'A' or 'B' should not be mapped to the Assisted Mobility, Low Cognitive Ability second level group or the Not Mobile Branch. If the ACFI Mobility score was 'D' then the 'Independent Mobility' Branch should be removed as option. These decisions were based on the view that residents on either end of the mobility spectrum should not be mapped to the opposite end of the mobility spectrum in AN-ACC.

Table 5 ACFI Mobility compared with AN-ACC second level

AN-ACC second level group	ACFI2 Mobility				
	A	B	C	D	Total
Independent Mobility, Without Compounding Factors	26	19	225	56	326
Independent Mobility, With Compounding Factors	8	6	105	25	144
Assisted Mobility, Higher Cognitive Ability	20	33	365	339	757
Assisted Mobility, Medium Cognitive Ability	11	8	186	195	400
Assisted Mobility, Low Cognitive Ability	0	1	66	60	127
Not Mobile, Higher Function	1	0	26	105	132
Not Mobile, Lower Function & Lower Pressure Sore Risk	0	0	12	46	58
Not Mobile, Lower Function & Higher Pressure Sore Risk	1	0	15	56	72
Total	**67**	**67**	**1,000**	**882**	**2,016**

Table 6 shows the ACFI Personal Hygiene item against the AN-ACC second level groups. Based on the data presented, it was decided that the ACFI Personal Hygiene scores 'A', 'B' or 'C' should not be mapped to the Assisted Mobility, Low Cognitive Ability second level group or the Not Mobile Branch. These decisions were partly based on the view that residents who do not rely solely on physical assistance for their personal hygiene require a certain level of Mobility and Cognitive Ability.

Table 6 ACFI Personal Hygiene compared with AN-ACC second level

AN-ACC second level group	ACFI3 Personal Hygiene				
	A	B	C	D	Total
Independent Mobility, Without Compounding Factors	11	61	84	170	326
Independent Mobility, With Compounding Factors	1	6	25	112	144
Assisted Mobility, Higher Cognitive Ability	8	65	99	585	757
Assisted Mobility, Medium Cognitive Ability	2	17	33	348	400
Assisted Mobility, Low Cognitive Ability	0	0	2	125	127
Not Mobile, Higher Function	1	1	7	123	132
Not Mobile, Lower Function & Lower Pressure Sore Risk	0	0	2	56	58
Not Mobile, Lower Function & Higher Pressure Sore Risk	0	0	1	71	72
Total	**23**	**150**	**253**	**1,590**	**2,016**

Table 7 shows the ACFI Toileting item against the AN-ACC second level groups. Based on the data presented and the view that no or low dependency in Toileting require a certain level of Mobility and Cognitive Ability, it was decided that the ACFI Toileting score 'A' should not be mapped into Independent Mobility, With Compounding Factors; Assisted Mobility, Low Cognitive Ability or the Not Mobile Branch. An ACFI Toileting score of 'B' should not be mapped to the Assisted Mobility, Low Cognitive Ability second level group or the Not Mobile Branch. For the ACFI Toileting score 'C' the Not Mobile Branch should be removed as option.

Table 7 ACFI Toileting compared with AN-ACC second level

AN-ACC second level group	ACFI4 Toileting				
	A	B	C	D	Total
Independent Mobility, Without Compounding Factors	38	96	88	104	326
Independent Mobility, With Compounding Factors	4	19	50	71	144
Assisted Mobility, Higher Cognitive Ability	36	123	171	427	757
Assisted Mobility, Medium Cognitive Ability	10	40	79	271	400
Assisted Mobility, Low Cognitive Ability	0	3	14	110	127
Not Mobile, Higher Function	0	6	7	119	132
Not Mobile, Lower Function & Lower Pressure Sore Risk	0	4	0	54	58
Not Mobile, Lower Function & Higher Pressure Sore Risk	0	0	3	69	72
Total	**88**	**291**	**412**	**1,225**	**2,016**

Table 8 shows the ACFI Continence item against the AN-ACC second level groups. Based on the data presented, it was decided that the ACFI Continence score 'A', 'B' or 'C' should not be mapped to the Assisted Mobility, Low Cognitive Ability second level group or the Not Mobile Branch.

Table 8 ACFI Continence compared with AN-ACC second level

AN-ACC second level group	ACFI5 Continence				
	A	B	C	D	Total
Independent Mobility, Without Compounding Factors	125	8	14	179	326
Independent Mobility, With Compounding Factors	20	7	9	108	144
Assisted Mobility, Higher Cognitive Ability	150	23	58	526	757
Assisted Mobility, Medium Cognitive Ability	35	21	18	326	400
Assisted Mobility, Low Cognitive Ability	4	0	3	120	127
Not Mobile, Higher Function	5	2	3	122	132
Not Mobile, Lower Function & Lower Pressure Sore Risk	0	0	0	58	58
Not Mobile, Lower Function & Higher Pressure Sore Risk	0	0	2	70	72
Total	**339**	**61**	**107**	**1,509**	**2,016**

Within the Assisted Mobility Branch the second level split is based on Cognitive Ability (Functional Independence Measure Cognition). The ACFI Cognitive Skills item was identified as the best proxy for this. Table 9 shows the ACFI Cognitive Skills item against the AN-ACC Cognitive Ability, only for those residents in the Assisted Mobility Branch. While there was a high correlation observed, the cut-offs between different levels were different. Therefore, the mapping was in part informed by the expected frequency profile. Hence, ACFI Cognitive Skills scores '1' or '2' should be considered to correspond to 'Higher Cognitive Ability' in AN-ACC. The ACFI Cognitive Skills score '3' should be considered 'Medium Cognitive Ability' and ACFI Cognitive Skills score '4' should be mapped to 'Low Cognitive Ability' in AN-ACC.

Table 9 ACFI Cognitive skills compared with AN-ACC Cognitive Ability

AN-ACC Cognitive Ability	ACFI6 R1 Cognitive Skills				
	1	2	3	4	Total
High	116	332	256	53	757
Medium	16	91	189	104	400
Low	0	6	32	89	127
Total	**132**	**429**	**477**	**246**	**1,284**

Table 10 shows the ACFI Cognitive Skills item against the AN-ACC second level groups. In addition to what is described above, it was decided that the ACFI Cognitive Skills score '1' should not be mapped to the Assisted Mobility, Medium or Low Cognitive Ability second level groups or the Not Mobile Branch. The ACFI Cognitive Skills score '2' should not be mapped to the Assisted Mobility, Medium or Low Cognitive Ability second level groups. A score of '3' should remove the mapping option of Assisted Mobility, Higher or Low Cognitive Ability second level groups and the ACFI Cognitive Skills score of '4' should not be mapped to the Assisted Mobility, Higher or Medium Cognitive Ability second level groups.

Table 10 ACFI Cognitive Skills compared with AN-ACC second level

AN-ACC second level group	ACFI6 R1 Cognitive Skills				
	1	2	3	4	Total
Independent Mobility, Without Compounding Factors	57	155	98	16	326
Independent Mobility, With Compounding Factors	5	15	72	52	144
Assisted Mobility, Higher Cognitive Ability	116	332	256	53	757
Assisted Mobility, Medium Cognitive Ability	16	91	189	104	400
Assisted Mobility, Low Cognitive Ability	0	6	32	89	127
Not Mobile, Higher Function	6	43	52	31	132
Not Mobile, Lower Function & Lower Pressure Sore Risk	3	10	18	27	58
Not Mobile, Lower Function & Higher Pressure Sore Risk	2	4	19	47	72
Total	**205**	**656**	**736**	**419**	**2,016**

Table 11 shows the ACFI Wandering item against the AN-ACC second level groups. Based on the data presented and the rationale that wandering residents cannot be 'not mobile', it was decided that the ACFI Wandering scores 'B', 'C' or 'D' should not be mapped to the Not Mobile Branch.

Table 11 ACFI Wandering compared with AN-ACC second level

AN-ACC second level group	ACFI7 Wandering				
	A	B	C	D	Total
Independent Mobility, Without Compounding Factors	235	31	22	38	326
Independent Mobility, With Compounding Factors	66	19	14	45	144
Assisted Mobility, Higher Cognitive Ability	637	47	32	41	757
Assisted Mobility, Medium Cognitive Ability	276	49	27	48	400
Assisted Mobility, Low Cognitive Ability	63	13	20	31	127
Not Mobile, Higher Function	108	8	5	11	132
Not Mobile, Lower Function & Lower Pressure Sore Risk	44	3	1	10	58
Not Mobile, Lower Function & Higher Pressure Sore Risk	54	6	0	12	72
Total	**1,483**	**176**	**121**	**236**	**2,016**

In the Not Mobile Branch the second level split is in part based on Function measured by Resource Utilisation Groups – Activities of Daily Living (RUG-ADL) which contains four items, Toileting, Eating, Bed Mobility and Transfers. ACFI Toileting, ACFI Nutrition and ACFI Transfers were identified as proxies for these items (the latter as proxy for Bed mobility and Transfers in RUG-ADL). Table 12 and Table 13 show the assigned numerical values. The proxy for RUG-ADL was calculated as the sum of the assigned values. It was determined that any values of 15 or lower should be mapped to Higher Function and any values of 16 or greater should be mapped to Lower Function.

Table 12 ACFI Toileting / Nutrition compared with AN-ACC RUG-ADL Toileting / Eating

ACFI Toileting / Nutrition	Toileting score	Eating score
A, B	1	1
C	3	2
D	5	3

Table 13 ACFI Transfers compared with AN-ACC RUG-ADL Bed Mobility / Transfers

ACFI2 R1 Transfers	Bed Mobility / Transfers score
0, 1	1
2	3
3	5

In the application of this mapping algorithm any resident without a valid ACFI score should be mapped to the lowest valued AN-ACC class, which is class 02. This is consistent with the AN-ACC funding model which funds at the level of AN-ACC class 02 while no AN-ACC assessment is available.

Occasionally, the process of elimination may lead to all mapping options being removed. In the data available for the mapping development this almost always occurred when the resident received complex skin integrity management, which led to a mapping to the Not Mobile Branch. However, other ACFI questions may lead to a removal of that Branch too. For those residents it was decided to effectively map them to the national average class (labelled as 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13).

Taken together, this process of elimination defined an algorithm to map a given ACFI score to AN-ACC. Table 14 provides an overview of the rules. The calculation of cost weights is provided in section 4.

Table 14 Mapping between ACFI and AN-ACC overview

ACFI item	ACFI score	Independent Mobility		Assisted Mobility			Not Mobile		
		Without CF	With CF	Cognitive Ability			Higher Function	Lower Function & Lower Pressure Sore Risk	Lower Function & Higher Pressure Sore Risk
				Higher	Medium	Low			
ACFI Activities of Daily Living Domain	Nil, Low	☑	☑	☑	☑	☒	☒	☒	☒
	Medium	☑	☑	☑	☑	☑	☑	☒	☒
ACFI Cognitive and Behaviour Domain	Nil, Low	☑	☑	☑	☑	☒	☒	☒	☒
	Medium	☑	☑	☑	☑	☑	☑	☒	☒
ACFI1 Nutrition	A	☑	☒	☑	☑	☒	☒	☒	☒
	B	☑	☑	☑	☑	☒	☒	☒	☒
	D	☒	☒	☑	☑	☑	☑	☑	☑
ACFI2 Mobility	A, B	☑	☑	☑	☑	☒	☒	☒	☒
	D	☒	☒	☑	☑	☑	☑	☑	☑
ACFI3 Personal Hygiene	A, B, C	☑	☑	☑	☑	☒	☒	☒	☒
ACFI4 Toileting	A	☑	☒	☑	☑	☒	☒	☒	☒
	B	☑	☑	☑	☑	☒	☒	☒	☒
	C	☑	☑	☑	☑	☑	☒	☒	☒
ACFI5 Continence	A, B, C	☑	☑	☑	☑	☒	☒	☒	☒
ACFI6 R1 Cognitive Skills	1	☑	☑	☑	☒	☒	☒	☒	☒
	2	☑	☑	☑	☒	☒	☑	☑	☑
	3	☑	☑	☒	☑	☒	☑	☑	☑
	4	☑	☑	☒	☒	☑	☑	☑	☑
ACFI7 Wandering	B, C, D	☑	☑	☑	☑	☑	☒	☒	☒
ACFI12 R5 Complex skin integrity management	Yes	☒	☒	☒	☒	☒	☑	☑	☑
RUG-ADL (proxy)	≤ 15	☑	☑	☑	☑	☑	☑	☒	☒
	≥ 16	☑	☑	☑	☑	☑	☒	☑	☑
no ACFI score		☑	☒	☒	☒	☒	☒	☒	☒

☒ – removed as mapping option
☑ – retained as mapping option

To illustrate the process of elimination an example is provided in Table 15. Step by step, the score for each relevant question is checked and options are removed. At the end of the process the only possibility for this resident is the AN-ACC class 08 which is the result of the mapping.

Table 15 Mapping of example resident

ACFI item	ACFI score	Mapped AN-ACC class											
		02	03	04	05	06	07	08	09	10	11	12	13
ACFI Activities of Daily Living Domain	High	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
ACFI Cognitive and Behaviour Domain	Medium	☑	☑	☑	☑	☑	☑	☑	☑	☑	☒	☒	☒
ACFI1 Nutrition	D	☒	☒	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
ACFI2 Mobility	C	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
ACFI3 Personal Hygiene	D	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
ACFI4 Toileting	C	☑	☑	☑	☑	☑	☑	☑	☒	☒	☒	☒	☒
ACFI5 Continence	D	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
ACFI6 R1 Cognitive Skills	4	☑	☑	☒	☒	☒	☒	☑	☑	☑	☑	☑	☑
ACFI7 Wandering	B	☑	☑	☑	☑	☑	☑	☑	☒	☒	☒	☒	☒
ACFI12 R5 Complex skin integrity management	N	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
RUG-ADL (proxy)	14	☑	☑	☑	☑	☑	☑	☑	☑	☑	☒	☒	☒

3.2 Comparison of results and data quality checks

Once all relevant ACFI items had been mapped, the resulting class distribution was reviewed and compared to the AN-ACC classes.

Table 16 shows this comparison. Overall, the mapping shows good levels of agreement between the mapped classes and the AN-ACC classes, especially against the backdrop of the structural differences between ACFI and AN-ACC. It should also be kept in mind that while all mapping rules are supported by data analysis, some decisions were made on the premise that residents on either end of the mobility spectrum should not be mapped to the opposite end of the mobility spectrum; e.g. a resident with complex skin integrity management who cannot self-ambulate should not be mapped to the Independent or Assisted Mobility Branch.

Table 16 Mapped classes compared to AN-ACC classes

Mapped class	AN-ACC class												
	02	03	04	05	06	07	08	09	10	11	12	13	Total
02	0	2	0	1	1	0	0	0	0	0	0	0	4
02 | 03	6	15	4	6	11	9	7	1	1	0	1	0	61
02 | 03 | 04 | 05	96	10	59	79	26	18	2	4	2	1	1	0	298
02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13	14	3	11	67	10	17	3	48	39	63	23	47	345
02 | 03 | 04 | 05 | 09 | 10	3	1	2	7	3	2	0	0	0	0	0	0	18
02 | 03 | 06 | 07	70	57	39	64	46	31	18	8	1	2	0	0	336
02 | 03 | 06 | 07 | 09 | 10	3	4	3	8	1	2	0	2	0	0	0	1	24
02 | 03 | 08	5	14	2	6	8	12	18	1	0	0	0	1	67
02 | 03 | 08 | 09 | 10	0	2	2	3	2	1	1	0	0	1	0	0	12
02 | 04 | 05	77	5	58	60	11	6	0	3	0	1	0	0	221
02 | 06 | 07	7	2	8	4	2	2	0	0	0	0	0	0	25
04 | 05	19	1	16	74	7	5	1	12	7	5	1	3	151

Mapped class	AN-ACC class												
	02	03	04	05	06	07	08	09	10	11	12	13	Total
04 | 05 | 09 | 10	17	3	16	75	14	15	3	14	6	6	0	1	170
04 | 05 | 11 | 12 | 13	0	0	0	2	0	0	0	0	1	0	0	0	3
06 | 07	7	0	8	24	19	11	2	7	1	3	2	4	88
06 | 07 | 09 | 10	11	9	19	79	31	44	12	21	8	10	5	6	255
06 | 07 | 11 | 12 | 13	0	0	0	0	0	0	0	2	2	3	1	0	8
08	1	6	0	3	2	8	27	3	2	9	1	10	72
08 | 09 | 10	4	12	3	19	25	19	36	14	7	17	10	20	186
08 | 11 | 12 | 13	0	0	0	1	0	1	0	0	2	0	0	3	7
09 | 10	24	23	30	157	78	86	55	82	48	79	45	89	796
11 | 12 | 13	1	1	0	13	4	9	7	34	48	79	50	147	393
Total	**365**	**170**	**280**	**752**	**301**	**298**	**192**	**256**	**175**	**279**	**140**	**332**	**3,540**

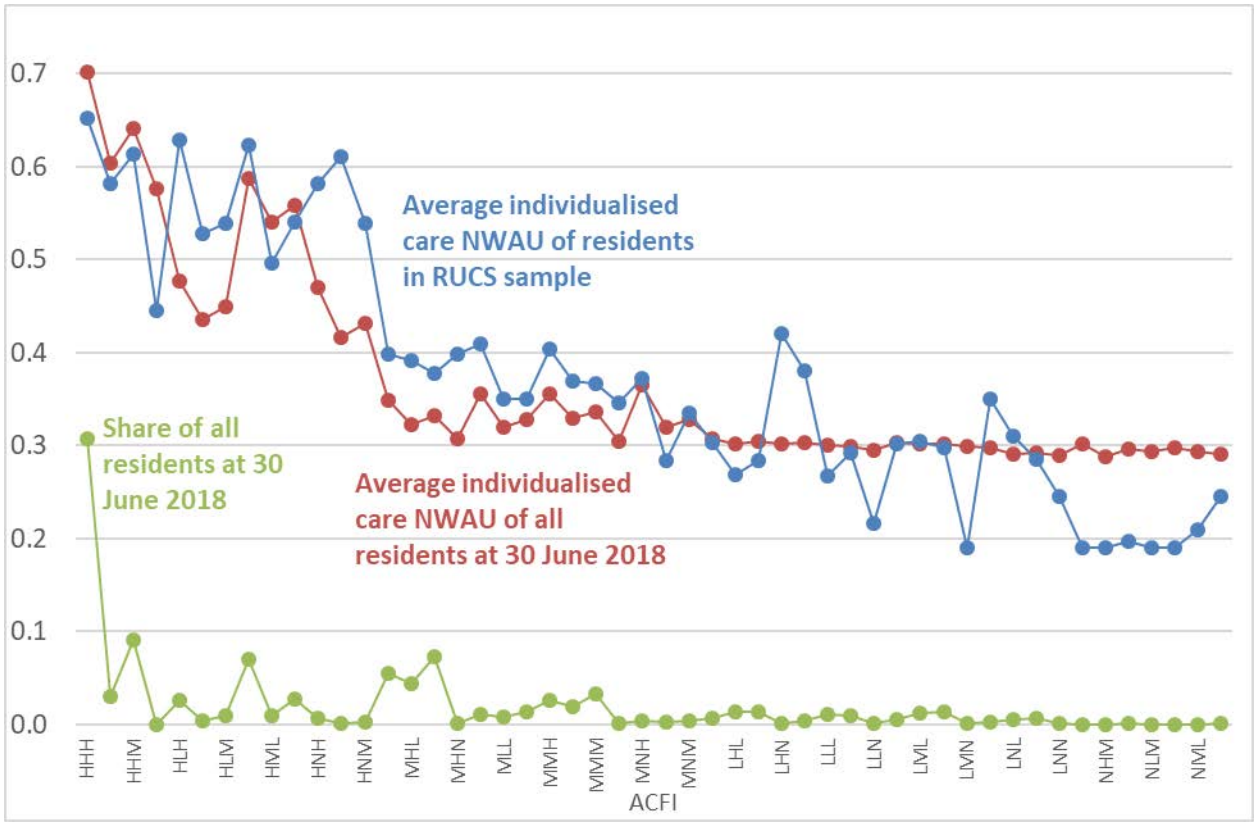
Table 17 shows the profiles of the analysis dataset (n = 3,540 residents) and the full dataset held by the Commission for all residents at 30 June 2018. Overall, the profiles are very similar and no substantial differences can be observed. This is one of the indications the mapping was able to be applied to the full dataset successfully.

Table 17 Comparison of mapped classes in analysis dataset and full dataset

Mapped class	Analysis dataset (%)	Total residents at 30 June 2018 (%)
02	0.1	0.4
02 | 03	1.7	2.4
02 | 03 | 04 | 05	8.4	10.4
02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13	9.7	9.9
02 | 03 | 04 | 05 | 09 | 10	0.5	0.6
02 | 03 | 06 | 07	9.5	11.3
02 | 03 | 06 | 07 | 09 | 10	0.7	1.0
02 | 03 | 08	1.9	2.2
02 | 03 | 08 | 09 | 10	0.3	0.5
02 | 04 | 05	6.2	6.5
02 | 06 | 07	0.7	0.9
04 | 05	4.3	3.8
04 | 05 | 09 | 10	4.8	3.8
04 | 05 | 11 | 12 | 13	0.1	0.1
06 | 07	2.5	2.1
06 | 07 | 09 | 10	7.2	6.9
06 | 07 | 11 | 12 | 13	0.2	0.1
08	2.0	2.1
08 | 09 | 10	5.3	4.9
08 | 11 | 12 | 13	0.2	0.2
09 | 10	22.5	21.0
11 | 12 | 13	11.1	9.0

Figure 3 compares the individualised care NWAUs for the analysis dataset and those estimated for the full dataset after the mapping. The NWAUs presented are averages for the residents in each ACFI category. Again, the results are very similar, particularly among the ACFI categories which have the largest shares of aged care residents. Around 89% of residents are in ACFI categories where the difference between the estimated NWAUs and RUCS sample NWAU is within +/-0.06.

Figure 3 Comparison of individualised care NWAUs



In addition, the following steps were undertaken to validate the mapping algorithm and the SAS code provided to the Commission:

- The SAS code used by the Commission was reviewed.
- Population profiles by facility type were reviewed.
- Summary statistics for RVU and NWAU were reviewed for data from 2014/15 to 2018/19.
- The Steering Committee for the Cost of Care project reviewed a draft version of the methodology.

Where these reviews identified issues all necessary corrections were made.

4 Cost weights, RVUs, NWAUs and Casemix indices

This section contains a description of how common casemix instruments can be calculated for a dataset with mapped AN-ACC classes and known facility characteristics. Within the blended AN-ACC funding model there are weights reflecting the relative individual care costs for each resident based on their AN-ACC class and a base care tariff for the relative costs of different types of aged care facilities as explained in the Appendix.

For a given financial year, the general goal is to calibrate weights so that the value of 1 represents a meaningful value. Within the framework of the AN-ACC funding model there are two alternative options of how this could be done.

The first option includes both, the individualised care component and the base care tariff component. We refer to this value as National Weighted Activity Units (NWAUs). Cost weights for the AN-ACC classes and the base care tariffs have to be calibrated against each other so that 1 NWAU represents the national average cost per resident day in a facility with base care tariff 6 (as determined by the AN-ACC funding model). The sum of the recalibrated individualised care component and the base care tariff component forms the total NWAU.

The second option includes only the individualised care component of the NWAU recalibrated so that 1 represents the national average care needs of the person. We refer to this as Relative Value Units (RVUs). RVUs should not be used together with base care tariffs since they have been calibrated differently.

4.1 Calculation of cost weights for mapped classes

The cost weight of a mapped class takes the value determined during the RUCS and listed in Table 2 in the Appendix. If the mapped class is a group of AN-ACC classes then the cost weight is determined as the weighted average cost weight across these AN-ACC classes, weighted by the relative frequencies observed during the RUCS (see Table 2 in the Appendix).

$$cost\ weight\ (cw) = \frac{\sum_{i=1}^{n} w_i * c_i}{\sum_{i=1}^{n} w_i}$$

Where c_i is the cost weight of AN-ACC class i and w_i is its relative frequency observed during RUCS. For example, the cost weight for the mapped class '02 | 03' (Class 02 or 03) is 0.23 = (9.87 x 0.19 + 4.54 x 0.31) / (9.87 + 4.54).

In theory, there are 255 combinations of AN-ACC classes, therefore this report does not list all cost weights.

4.2 Calibration of RVUs and NWAUs

For a given financial year, the national average cost per resident day (as determined by the individualised care component of the AN-ACC funding model), i.e. $1\ RVU$, is calculated as follows:

$$national\ average\ cost\ weight = 1\ RVU = \frac{\sum_{i=1}^{n} d_i * cw_i}{\sum_{i=1}^{n} d_i}$$

Where cw_i is the cost weight of resident i and d_i is their number of bed days during the financial year. To calibrate the cost weights of all classes to the national average, all that needs to be done is divide the cost weights by the average, $1\ RVU$, where cw_j is the cost weight of class j.

$$RVU_j = \frac{cw_j}{1\ RVU}$$

Alternatively, the individualised care component and the base care tariff component are considered jointly. Then, 1 NWAU represents the national average cost per resident day in a facility with base care tariff 6 (as determined by the AN-ACC funding model).

$$national\ average\ cost\ weight = 1\ NWAU = \frac{\sum_{i=1}^{n} d_i * (cw_i + 0.49)}{\sum_{i=1}^{n} d_i}$$

Where cw_i is the cost weight of resident i, d_i is their number of bed days during the financial year and 0.49 represents the value of base care tariff 6. To calibrate the cost weights of individualised care component and the base care tariff to the national average, the cost weights are divided by the average, $1\ NWAU$, where cw_j is the cost weight of class j and bct_k is the cost weight of base care tariff k.

$$\begin{aligned} NWAU_{jk} &= \frac{cw_j + bct_k}{1\ NWAU} \\ &= \frac{cw_j}{1\ NWAU} + \frac{bct_k}{1\ NWAU} \\ &= individualised\ care\ NWAU_j + base\ care\ tariff\ NWAU_k \end{aligned}$$

$NWAU_{jk}$ denotes the total NWAU for a resident with AN-ACC class j in a facility with base care tariff k, $NWAU_j$ is the individualised care NWAU for AN-ACC class j and $NWAU_k$ stands for base care tariff k.

4.3 Casemix indexes for residential aged care facilities or approved providers

In general terms, the casemix index (CMI) reflects the average complexity of a group of patients or residents. A CMI of 1.0 represents the national average resident complexity. CMI values less than 1 represent residents with lower than average complexity and CMIs greater than 1.0 indicate higher complexity.

For a residential aged care facility or approved provider the CMI can be calculated as the weighted average across all residents, weighted by their bed days. This can be done using either RVUs or total NWAUs. The main difference between CMIs based on RVUs and CMIs based on NWAUs is that the first only takes into account the resource use that is solely based on resident needs while the latter version also includes characteristics of the facility / provider that are independent of the resident needs. The formulas for the CMI are shown below.[11]

$$CMI_{RVU} = \frac{\sum_{i=1}^{n} d_i * RVU_i}{\sum_{i=1}^{n} d_i}$$

$$CMI_{NWAU} = \frac{\sum_{i=1}^{n} d_i * NWAU_{ik}}{\sum_{i=1}^{n} d_i}$$

[11] It should be noted that in the AN-ACC funding model the base care tariffs 1 to 4 are based on approved bed days rather than occupied bed days. For the purposes of calculating the NWAU-based CMI these values were converted to values representing occupied bed days.

Where RVU_i is the Relative Value Unit for resident i, $NWAU_{ik}$ is their total National Weighted Activity Unit and d_i is their number of bed days during the financial year. The so derived CMIs can be used for a range of applications, including funding, benchmarking and analyses.

Appendix 1

The description of the AN-ACC funding model provided below is an excerpt of RUCS Report 5.[5]

It should be noted that AN-ACC NWAU values presented here differ slightly (in the second digit) from the ones presented in the Reports 5 and 6.[5,6] This is mainly due to technical aspects of the conversions between Australian dollars, RVUs and NWAUs. The values presented here should be considered the final and correct ones.

Detailed description of the AN-ACC funding model

Under the AN-ACC funding model, the subsidies payable to homes for the care of residents incorporate three components:

- a base care tariff (for the fixed care component)
- a variable payment (for the individual care needs of the resident as determined by the resident's AN-ACC class)
- a one off adjustment payment for residents when a resident enters residential aged care.

For funding purposes a common unit, known as the NWAU, is used across all three components. The NWAUs that are applied in the funding model are relative values that determine the amount paid for each component — with an NWAU of 1.00 being a single measure of price that represents the national average. This allows payments to be weighted to reflect the variation in the costs of providing care due to the different individual care needs of residents and different structural characteristics of care homes. For example, an NWAU of 1.2 means that the price paid is 20% above the national average; while an NWAU of 0.5 means that the price is 50% below national average.

The daily subsidy is calculated by multiplying the total NWAU (the care home's base care tariff NWAU plus the resident's AN-ACC class NWAU) by the single NWAU price. The national NWAU price is set by the Commonwealth. The one off adjustment payment is a standard rate which is also calibrated to the NWAU.

Each of the components of the AN-ACC funding model is further detailed below.

The base care tariff (fixed care)

The base care tariff is included in the funding model for two key reasons. The first is to recognise the fact that a large proportion (approximately 50%) of care costs within a facility are driven not by the individual care needs of the residents but by care delivered equally to all residents. The second is to provide stability in the funding model, where 50% of the facility funding is fixed regardless of changes in the individual resident care needs profile and, for some facilities, regardless of changes in occupancy.

The base care tariff covers fixed care costs. These include activities such as clinical supervision and training, facility clinical management and shared care activities such as night supervision and resident observation during social activities and meal times. These costs are considered fixed (at least within a defined period) as they do not change significantly with changes in individual resident care need or with small changes in occupancy. For example, the costs of a night supervisor are fixed and are determined by the overall number of residents rather than

the needs of a specific resident. Fixed care costs have been found in the RUCS to be determined by structural characteristics of the facility including size, geographic location and service specialisation (see Report 3).

Aged care homes will receive a per diem base care tariff payment for all resident care days within the funding period and this payment will be standard across Australia for all facilities that meet the conditions for a particular base care tariff. These base care tariffs are mutually exclusive and each facility will only qualify for payment under a single tariff.[12] The base care tariff levels have been set based on the fixed costs of care analysis (see Report 3). This analysis found that, with some very notable exceptions, most facilities across the country report very similar fixed care costs per day.

The structural factors that are associated with significant increases in fixed care costs per day are remote and very remote facilities that provide indigenous care services, non-indigenous remote services that have less than 30 beds and specialised services to homeless people. Remoteness has been defined using the Modified Monash Model (MMM) a standardised measure of geographic isolation on a scale of 1 to 7. The MMM value of 1 represents the most urbanised parts of the country and, at the other end of the scale, the facilities with an MMM value of 7 are the most remote.

Each of the base care tariffs and their associated NWAUs are included in Table 1.

Table 1 Base care tariffs and NWAUs

Base care tariff	Facility description	Base care tariff NWAU
1	Indigenous, MMM=7	1.80
2	Indigenous, MMM=6	0.78
3	Non-indigenous, MMM=6-7, < 30 beds	0.68
4	Non-indigenous, MMM=6-7, 30+ beds	0.52
5	Specialised homeless	0.92
6	All other residential aged care facilities (RACFs)	0.49

The tariffs in Table 1 have been calculated based on a rate ***per occupied bed day*** for the non-remote facilities (Tariffs 5 and 6) and on ***approved bed days*** for those classified as remote (MMM 6 and 7).[13]

This feature of the base care tariff payment recognises that remote facilities tend to be the smallest and at risk of low and variable occupancy levels. With small local feeder populations, they are less likely to have a waiting list to draw from when a bed becomes available. Being small, these facilities suffer the largest percentage loss of income if funding is based on occupancy and beds are vacant for any substantial period.

[12] Where a facility potentially qualifies for two base care tariffs (e.g. a specialised homeless facility in MMM 6-7) it will be paid on the basis of whichever tariff is higher.

[13] The RVU (cost) statistics reported in Report 3 are based on occupied bed days for all facilities (include facilities located in MMM 6 and 7). In contrast, NWAU statistics used in the funding model are based on occupied bed days for MMM=1-5 and on capacity (approved beds) for MMM 6 and 7. If NWAU for remote facilities were to be based on occupancy rather than capacity, the NWAU would have to be recalibrated (increased) based on the RVU for occupied bed days rather than approved bed days.

The individualised care (variable) payment

The individualised care or variable payment is paid in addition to the base care tariff and relates to the tailored care received by residents. This payment recognises the costs associated with the care of residents with different needs for assistance with activities of daily living and clinical or social support. The variable payment is based on the AN-ACC class assigned for each resident (see Table 2).

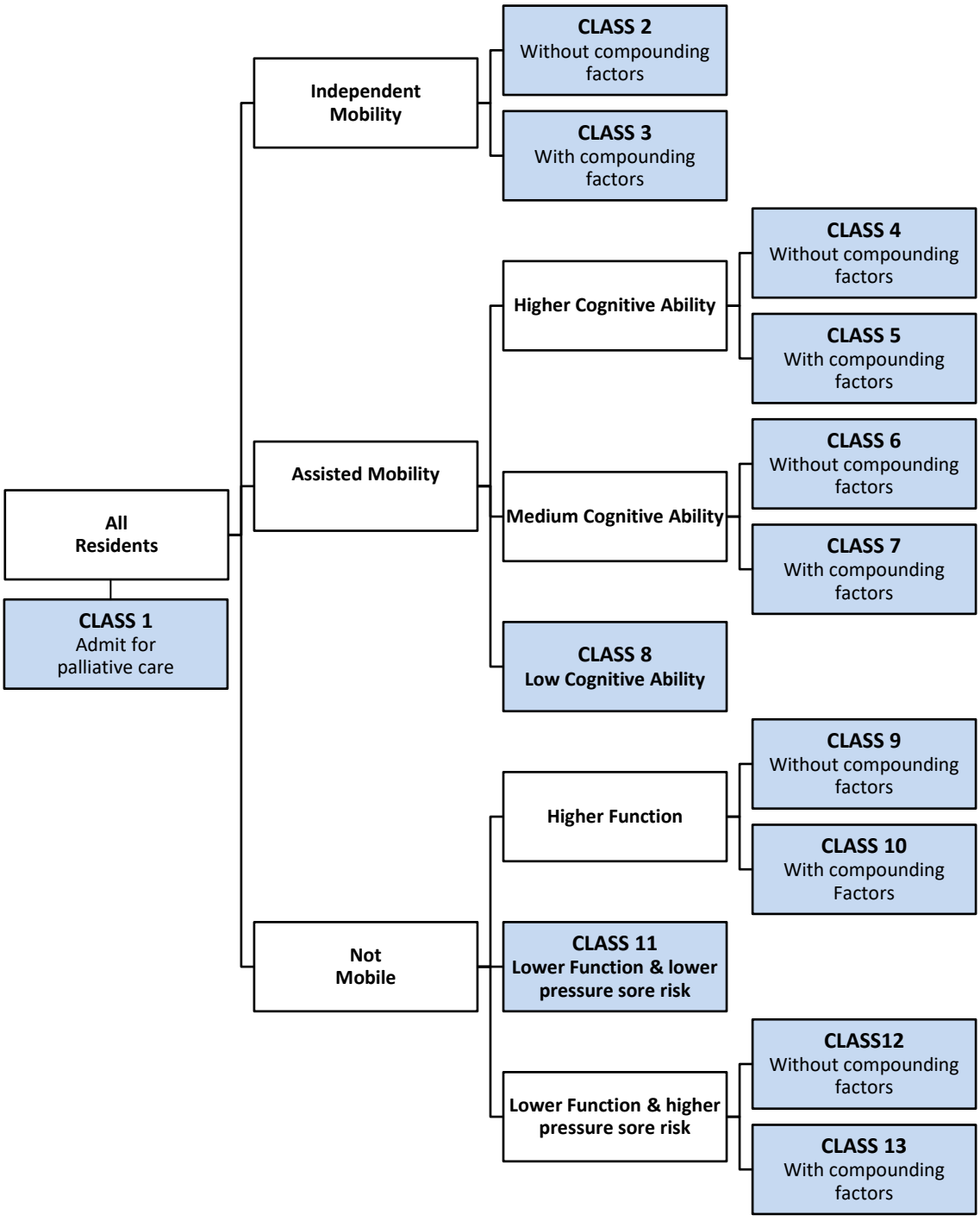
The AN-ACC classification system was developed with expert clinical input and was based on an intensive classification development study. Each resident was assessed using a standardised tool and care staff collected data on the time (in minutes) that they spent delivering care to each individual resident. The classification system is a branching model which enables the factors that drive care cost to be addressed interactively rather than operating in isolation. For example, two residents have cognitive impairment. One resident is mobile. The other is not. While they both have cognitive impairment, they have very different care needs. In the current ACFI system, cognition and mobility are each considered separately. In the AN-ACC, they are considered in combination. This issue is discussed in detail in an earlier report on options and recommendations for future funding models for residential aged care that was completed by AHSRI.[14]

In the AN-ACC funding model, the AN-ACC class is assigned based on an assessment conducted by an independent assessor who is not employed by the care home, using the AN-ACC Assessment Tool. The AN-ACC assessment process is described in detail in Report 2.

The branching model of the AN-ACC Version 1.0 is presented in Figure 1.

[14] McNamee J, Poulos C, Seraji H et al. (2017) *Alternative Aged Care Assessment, Classification System and Funding Models Final Report.* Centre for Health Service Development, Australian Health Services Research Institute, University of Wollongong.

Figure 1 The Australian National Aged Care Classification (AN-ACC) Version 1.0



Each of the AN-ACC classes is assigned an NWAU, with NWAUs calculated based on the relative cost of delivering care to residents within the class. Table 2 includes the NWAU for each class in Version 1.0 of the classification system.

The most costly residents (on a daily basis) with an NWAU of 1.00 are those who either enter the facility specifically for palliative care (Class 01) or are not mobile, have lower levels of function, higher risk of pressure sores and other compounding factors such as behavioural issues (Class 13). The least costly residents are those who are independently mobile without compounding factors (Class 02).

Table 2 AN-ACC Version 1.0 NWAUs

Code	Description	Individualised care NWAU	Residents (%)
Class 01	Admit for palliative care	1.00	---
Class 02	Independent without CF	0.19	9.87
Class 03	Independent with CF	0.31	4.54
Class 04	Assisted Mobility, high cognition, without CF	0.21	7.82
Class 05	Assisted Mobility, high cognition, with CF	0.37	20.29
Class 06	Assisted Mobility, medium cognition, without CF	0.35	7.42
Class 07	Assisted Mobility, medium cognition, with CF	0.49	9.76
Class 08	Assisted Mobility, low cognition	0.54	5.33
Class 09	Not Mobile, higher Function, without CF	0.54	6.68
Class 10	Not Mobile, higher Function, with CF	0.87	6.48
Class 11	Not Mobile, lower Function, lower pressure sore risk	0.83	8.22
Class 12	Not Mobile, lower Function, higher pressure sore risk, without CF	0.81	3.20
Class 13	Not Mobile, lower Function, higher pressure sore risk, with CF	1.00	10.39

CF = Compounding Factors

Appendix 2

The SAS code provided below contains the ACFI to AN-ACC mapping algorithm.

```
/*************************************************************************/
/*     Project:      Aged Care Royal Commission - ACFI to AN-ACC mapping  */
/*     Author:       Conrad Kobel (ckobel@uow.edu.au)                     */
/*     Descr.:       ACFI to AN-ACC mapping algorithm (extract for ACRC)  */
/*     Date:         2020-03-20                                           */
/*************************************************************************/

data temp_mapping;
      set ACFI_in_care;

/* remove palliative classes ******************************************/
      if ANACCclass not in ('Class 1', 'Class1');

/* create variable to act as proxy for FIM cognition (in 'assisted' branch) ****/
      length calc_FIM_cog $30.;
      select(Q06_R1);
           when(1, 2) calc_FIM_cog = '1=high cognition';
           when(3) calc_FIM_cog = '2=medium cognition';
           when(4) calc_FIM_cog = '3=low cognition';
           otherwise;
      end;

/* create variables to act as proxy for RUG-ADL (in 'Not mobile' branch) *******/
      select(Q01);
           when('A', 'B') calc_RUG_eat = 1;
           when('C') calc_RUG_eat = 2;
           when('D') calc_RUG_eat = 3;
           otherwise;
      end;

      select(Q04);
           when('A', 'B') calc_RUG_toi = 1;
           when('C') calc_RUG_toi = 3;
           when('D') calc_RUG_toi = 5;
           otherwise;
      end;
```

```
      select(Q02_R1);
           when(0, 1) calc_RUG_tra = 1;
           when(2) calc_RUG_tra = 3;
           when(3) calc_RUG_tra = 5;
           otherwise;
      end;

      select(Q02_R1);
           when(0, 1) calc_RUG_mob = 1;
           when(2) calc_RUG_mob = 3;
           when(3) calc_RUG_mob = 5;
           otherwise;
      end;

      calc_RUG = sum(calc_RUG_eat, calc_RUG_toi, calc_RUG_tra, calc_RUG_mob);

/* create variable to identify matching AN-ACC branch and/or following split ***/
/* Rules are based on data analysis and logical decision making ****************/

      length split_flag $30.;

      split_flag = '1-2-3-4-5-6-7-8';
      select(ADL_level);
           when('N', 'L') split_flag = compress(split_flag, '1-2-3-4', 'k');
           when('M') split_flag = compress(split_flag, '1-2-3-4-5-6', 'k');
           otherwise;
      end;

      select(BEH_level);
           when('N', 'L') split_flag = compress(split_flag, '1-2-3-4', 'k');
           when('M') split_flag = compress(split_flag, '1-2-3-4-5-6', 'k');
           otherwise;
      end;

      select(Q01);
           when('A') split_flag = compress(split_flag, '1-3-4', 'k');
           when('B') split_flag = compress(split_flag, '1-2-3-4', 'k');
           when('D') split_flag = compress(split_flag, '3-4-5-6-7-8', 'k');
           otherwise;
      end;

      select(Q02);
           when('A', 'B') split_flag = compress(split_flag, '1-2-3-4', 'k');
```

```
            when('D') split_flag = compress(split_flag, '3-4-5-6-7-8', 'k');
            otherwise;
      end;

      select(Q03);
            when('A', 'B', 'C') split_flag = compress(split_flag, '1-2-3-4', 'k');
            otherwise;
      end;

      select(Q04);
            when('A') split_flag = compress(split_flag, '1-3-4', 'k');
            when('B') split_flag = compress(split_flag, '1-2-3-4', 'k');
            when('C') split_flag = compress(split_flag, '1-2-3-4-5', 'k');
            otherwise;
      end;

      select(Q05);
            when('A', 'B', 'C') split_flag = compress(split_flag, '1-2-3-4', 'k');
            otherwise;
      end;

/* Proxy for FIM Cognition */
      select(Q06_R1);
            when(1) split_flag = compress(split_flag, '1-3', 'k');
            when(2) split_flag = compress(split_flag, '45');
            when(3) split_flag = compress(split_flag, '35');
            when(4) split_flag = compress(split_flag, '34');
            otherwise;
      end;

      select(Q07);
            when('B', 'C', 'D') split_flag = compress(split_flag, '1-2-3-4-5', 'k');
            otherwise;
      end;

      select(Q12_R5);
            when('Y') split_flag = compress(split_flag, '6-7-8', 'k');
            otherwise;
      end;

/* Proxy for RUG-ADL */
      select;
                  when(calc_RUG =< 15) split_flag = compress(split_flag, '78');
                  when(calc_RUG > 15) split_flag = compress(split_flag, '6');
```

```
            otherwise;
      end;

/* If there is no ACFI score, assign to the lowest AN-ACC class */
      if not prxmatch( '/^[NLMH]{3}$/', upcase(strip(ASSESSMENT_CATEGORY))) then split_flag = '1';

      split_flag = prxchange('s/[-]{2,}/-/', -1, split_flag);
      split_flag = prxchange('s/[-]{1,}\s*$//', -1, split_flag);
      split_flag = prxchange('s/\s*^[-]{1,}//', -1, split_flag);

/* If it turns out that all branches have been removed as options then assign to
the national average, i.e. all classes remain. */
       if missing(split_flag) then split_flag = '1-2-3-4-5-6-7-8';

      if ANACCclass = 'Class 1' then ANACCclass = 'Class1';
      ANACCclass_recode = input(substr(ANACCclass,6,2),best8.);

/* replace 'NULL' character with blanks ************************************/
      array var{*} _CHARACTER_;
      do i=1 to dim(var);
           if var{i}='NULL' then call missing(var{i});
      end;
      drop i;

run;

data mapping;
      set temp_mapping;

/* assign classes ************************************************************/
      length mapping_class $200.;

      if find(split_flag, '1') > 0 then mapping_class = catx(' OR ', mapping_class, 'Class 2');
      if find(split_flag, '2') > 0 then mapping_class = catx(' OR ', mapping_class, 'Class 3');
      if find(split_flag, '3') > 0 then mapping_class = catx(' OR ', mapping_class, 'Class 4 OR Class 5');
      if find(split_flag, '4') > 0 then mapping_class = catx(' OR ', mapping_class, 'Class 6 OR Class 7');
      if find(split_flag, '5') > 0 then mapping_class = catx(' OR ', mapping_class, 'Class 8');
      if find(split_flag, '6') > 0 then mapping_class = catx(' OR ', mapping_class, 'Class 9 OR Class 10');
      if find(split_flag, '7') > 0 then mapping_class = catx(' OR ', mapping_class, 'Class 11');
      if find(split_flag, '8') > 0 then mapping_class = catx(' OR ', mapping_class, 'Class 12 OR Class 13');

/* assign NWAU ***************************************************************/
       temp_weight = 0;
       temp_obs = 0;
```

```
if find(mapping_class, 'Class 2') > 0 then
do;
	temp_weight = temp_weight + 0.09867 * 0.19;
	temp_obs = temp_obs + 0.09867;
end;

if find(mapping_class, 'Class 3') > 0 then
do;
	temp_weight = temp_weight + 0.04543 * 0.31;
	temp_obs = temp_obs + 0.04543;
end;

if find(mapping_class, 'Class 4') > 0 then
do;
	temp_weight = temp_weight + 0.07821 * 0.21;
	temp_obs = temp_obs + 0.07821;
end;

if find(mapping_class, 'Class 5') > 0 then
do;
	temp_weight = temp_weight + 0.20289 * 0.37;
	temp_obs = temp_obs + 0.20289;
end;

if find(mapping_class, 'Class 6') > 0 then
do;
	temp_weight = temp_weight + 0.07419 * 0.35;
	temp_obs = temp_obs + 0.07419;
end;

if find(mapping_class, 'Class 7') > 0 then
do;
	temp_weight = temp_weight + 0.09756 * 0.49;
	temp_obs = temp_obs + 0.09756;
end;

if find(mapping_class, 'Class 8') > 0 then
do;
	temp_weight = temp_weight + 0.05329 * 0.54;
	temp_obs = temp_obs + 0.05329;
end;

if find(mapping_class, 'Class 9') > 0 then
```

```
	do;
		temp_weight = temp_weight + 0.06682 * 0.54;
		temp_obs = temp_obs + 0.06682;
	end;

	if find(mapping_class, 'Class 10') > 0 then
	do;
		temp_weight = temp_weight + 0.0648 * 0.87;
		temp_obs = temp_obs + 0.0648;
	end;

	if find(mapping_class, 'Class 11') > 0 then
	do;
		temp_weight = temp_weight + 0.0822 * 0.83;
		temp_obs = temp_obs + 0.0822;
	end;

	if find(mapping_class, 'Class 12') > 0 then
	do;
		temp_weight = temp_weight + 0.03205 * 0.81;
		temp_obs = temp_obs + 0.03205;
	end;

	if find(mapping_class, 'Class 13') > 0 then
	do;
		temp_weight = temp_weight + 0.10387 * 1.0;
		temp_obs = temp_obs + 0.10387;
	end;

	NWAU_indiv_raw = temp_weight / temp_obs;
	drop temp_:;
run;


Data mapping2;
Set mapping;
If refdate  = '30JUN2015'd then Financial_Year = '2014/2015';
If refdate  = '30JUN2016'd then Financial_Year = '2015/2016';
If refdate  = '30JUN2017'd then Financial_Year = '2016/2017';
If refdate  = '30JUN2018'd then Financial_Year = '2017/2018';
If refdate  = '30JUN2019'd then Financial_Year = '2018/2019';
run;

libname OBD "\\....\Occupied bed days\";
```

```
proc sql;
create table mapping3 as
select a.*, b.OBD_permanent
from mapping2 as a
inner join OBD.OBD_person as b
on a.RECIPIENT_ID = b.RECIPIENT_ID and a.Financial_Year = b.finyear;
run;


/*Add ATSI code from recipient table*/

Libname Output "\\....\Aged Care Data";


proc sort data= output.AIHW_RECIPIENT out=AIHW_RECIPIENT1 nodupkey;
by RECIPIENT_ID;
run;

proc sql;
create table AIHW_RECIPIENT2 as
select a.*, b.ATSI_CODE
from mapping3 as a
left join AIHW_RECIPIENT1 as b
on a.RECIPIENT_ID = b.RECIPIENT_ID;
run;

PROC SQL;
create table AIHW_RECIPIENT3 as

SELECT Financial_Year, SERVICE_ID,

SUM(CASE When ATSI_CODE in (1,2,3) THEN 1 ELSE . END) as Facility_ATSI_Count,
SUM(OBD_permanent) as Facility_bed_days

FROM AIHW_RECIPIENT2
Where Financial_Year is not missing

GROUP BY Financial_Year, SERVICE_ID
ORDER BY Financial_Year, SERVICE_ID;
QUIT;

/* Add Number of homeless and/or indigenous recipients in the service from the viability supplement as at 30 June*/
Data AIHW_VIABILITY_SUPPLMNT_STATS (Keep=Financial_Year SERVICE_ID NO_HOMELESS_INDIG_RECIPIENTS NO_PERMANENT_RECIPIENTS NO_RECIPIENTS);
```

```
Set output.AIHW_VIABILITY_SUPPLMNT_STATS;
If VIABILITY_STATISTICS_DATE = '30JUN2015'd then Financial_Year = '2014/2015';
If VIABILITY_STATISTICS_DATE = '30JUN2016'd then Financial_Year = '2015/2016';
If VIABILITY_STATISTICS_DATE = '30JUN2017'd then Financial_Year = '2016/2017';
If VIABILITY_STATISTICS_DATE = '30JUN2018'd then Financial_Year = '2017/2018';
If VIABILITY_STATISTICS_DATE = '30JUN2019'd then Financial_Year = '2018/2019';
Where VIABILITY_STATISTICS_DATE in ('30JUN2015'd,'30JUN2016'd,'30JUN2017'd,'30JUN2018'd,'30JUN2019'd);
Run;

proc sql;
create table AIHW_RECIPIENT4 as
select *
from AIHW_RECIPIENT3 as a
left join AIHW_VIABILITY_SUPPLMNT_STATS as b
on a.SERVICE_ID = b.SERVICE_ID and a.Financial_Year = b.Financial_Year;
run;

Data ACFI_ANACC_mapping1;
length Indigenous $ 3;
length Homelessness $ 3;
Set AIHW_RECIPIENT4;
Facility_Homeless_Count = sum(NO_HOMELESS_INDIG_RECIPIENTS,- Facility_ATSI_Count);
If Facility_Homeless_Count < 0 then Facility_Homeless_Count = 0;
Indigenous = 'No';
If Facility_Homeless_Count/NO_PERMANENT_RECIPIENTS >= 0.5 then Indigenous = 'Yes';
Homelessness = 'No';
If Facility_ATSI_Count/NO_PERMANENT_RECIPIENTS >= 0.5 then Homelessness = 'Yes';
run;

proc freq data=ACFI_ANACC_mapping1;
tables Financial_Year*Homelessness Financial_Year*Indigenous/norow nocum nopercent nocol;
run;
/**/
/*proc sql;*/
/*create table ACFI_ANACC_mapping1 as*/
/*select **/
/*from xxxx as a */
/*left join AIHW_RECIPIENT5 as b */
/*on a.SERVICE_ID = b.SERVICE_ID and a.Financial_Year = b.Financial_Year;*/
/*run;*/

Libname Clean "\\....\Clean data - Facility level data";

proc sql;
```

```
create table ACFI_ANACC_mapping2 as
select a.*, b.MMM_CODE
from ACFI_ANACC_mapping1 as a
left join Clean.Location as b
on a.SERVICE_ID = b.SERVICE_ID;
run;

proc sql;
create table ACFI_ANACC_mapping3 as
select *
from ACFI_ANACC_mapping2 as a
left join Clean.Characteristics as b
on a.SERVICE_ID = b.SERVICE_ID and a.Financial_Year = b.Financial_Year;
run;


proc sql;
create table ACFI_ANACC_mapping4 as
select *
from mapping3 as a
left join ACFI_ANACC_mapping3 as b
on a.SERVICE_ID = b.SERVICE_ID and a.Financial_Year = b.Financial_Year;
run;

/*Creating calibration/normalisation to average of 1*/

data ACFI_ANACC_mapping5;
      set ACFI_ANACC_mapping4;

      length base_care_tariff $ 50;


If Financial_Year in ('2014/2015') then do;

occ_rate = Facility_bed_days / (Total_NUMBER_OF_PLACES * 365);

      select;
           when (indigenous in ('Yes') and MMM_CODE in (7))
           do;
                 base_care_tariff = '1=Indigenous, MMM=7';
                 NWAU_base_raw = 1.8 / occ_rate;
           end;
           when (indigenous in ('Yes') and MMM_CODE in (6))
           do;
```

```
                base_care_tariff = '2=Indigenous, MMM=6';
                NWAU_base_raw = 0.78 / occ_rate;
          end;
          when (indigenous in ('No') and MMM_CODE in (6, 7) and Total_NUMBER_OF_PLACES < 30)
          do;
                base_care_tariff = '3=Non-indigenous, MMM=6-7, < 30 beds';
                NWAU_base_raw = 0.68 / occ_rate;
          end;
          when (indigenous in ('No') and MMM_CODE in (6, 7) and Total_NUMBER_OF_PLACES >= 30)
          do;
                base_care_tariff = '4=Non-indigenous, MMM=6-7, 30+ beds';
                NWAU_base_raw = 0.52 / occ_rate;
          end;
          when (MMM_CODE not in (6, 7) and homelessness in ('Yes'))
          do;
                base_care_tariff = '5=Specialised homeless';
                NWAU_base_raw = 0.92;
          end;
          when (MMM_CODE not in (6, 7) and homelessness in ('No'))
          do;
                base_care_tariff = '6=All other RACFs';
                NWAU_base_raw = 0.49;
          end;
          otherwise;
    end;

end;

If Financial_Year in ('2015/2016') then do;
occ_rate = Facility_bed_days / (Total_NUMBER_OF_PLACES * 366);

    select;
          when (indigenous in ('Yes') and MMM_CODE in (7))
          do;
                base_care_tariff = '1=Indigenous, MMM=7';
                NWAU_base_raw = 1.8 / occ_rate;
          end;
          when (indigenous in ('Yes') and MMM_CODE in (6))
          do;
                base_care_tariff = '2=Indigenous, MMM=6';
                NWAU_base_raw = 0.78 / occ_rate;
          end;
          when (indigenous in ('No') and MMM_CODE in (6, 7) and Total_NUMBER_OF_PLACES < 30)
          do;
```

```
                  base_care_tariff = '3=Non-indigenous, MMM=6-7, < 30 beds';
                  NWAU_base_raw = 0.68 / occ_rate;
            end;
            when (indigenous in ('No') and MMM_CODE in (6, 7) and Total_NUMBER_OF_PLACES >= 30)
            do;
                  base_care_tariff = '4=Non-indigenous, MMM=6-7, 30+ beds';
                  NWAU_base_raw = 0.52 / occ_rate;
            end;
            when (MMM_CODE not in (6, 7) and homelessness in ('Yes'))
            do;
                  base_care_tariff = '5=Specialised homeless';
                  NWAU_base_raw = 0.92;
            end;
            when (MMM_CODE not in (6, 7) and homelessness in ('No'))
            do;
                  base_care_tariff = '6=All other RACFs';
                  NWAU_base_raw = 0.49;
            end;
            otherwise;
      end;
end;

If Financial_Year in ('2016/2017') then do;
occ_rate = Facility_bed_days / (Total_NUMBER_OF_PLACES * 365);

      select;
            when (indigenous in ('Yes') and MMM_CODE in (7))
            do;
                  base_care_tariff = '1=Indigenous, MMM=7';
                  NWAU_base_raw = 1.8 / occ_rate;
            end;
            when (indigenous in ('Yes') and MMM_CODE in (6))
            do;
                  base_care_tariff = '2=Indigenous, MMM=6';
                  NWAU_base_raw = 0.78 / occ_rate;
            end;
            when (indigenous in ('No') and MMM_CODE in (6, 7) and Total_NUMBER_OF_PLACES < 30)
            do;
                  base_care_tariff = '3=Non-indigenous, MMM=6-7, < 30 beds';
                  NWAU_base_raw = 0.68 / occ_rate;
            end;
            when (indigenous in ('No') and MMM_CODE in (6, 7) and Total_NUMBER_OF_PLACES >= 30)
             do;
                  base_care_tariff = '4=Non-indigenous, MMM=6-7, 30+ beds';
```

```
                  NWAU_base_raw = 0.52 / occ_rate;
            end;
            when (MMM_CODE not in (6, 7) and homelessness in ('Yes'))
            do;
                  base_care_tariff = '5=Specialised homeless';
                  NWAU_base_raw = 0.92;
            end;
             when (MMM_CODE not in (6, 7) and homelessness in ('No'))
            do;
                  base_care_tariff = '6=All other RACFs';
                  NWAU_base_raw = 0.49;
            end;
            otherwise;
      end;
end;

If Financial_Year in ('2017/2018') then do;
occ_rate = Facility_bed_days / (Total_NUMBER_OF_PLACES * 365);

      select;
            when (indigenous in ('Yes') and MMM_CODE in (7))
            do;
                  base_care_tariff = '1=Indigenous, MMM=7';
                  NWAU_base_raw = 1.8 / occ_rate;
            end;
            when (indigenous in ('Yes') and MMM_CODE in (6))
            do;
                  base_care_tariff = '2=Indigenous, MMM=6';
                  NWAU_base_raw = 0.78 / occ_rate;
            end;
            when (indigenous in ('No') and MMM_CODE in (6, 7) and Total_NUMBER_OF_PLACES < 30)
            do;
                  base_care_tariff = '3=Non-indigenous, MMM=6-7, < 30 beds';
                  NWAU_base_raw = 0.68 / occ_rate;
            end;
            when (indigenous in ('No') and MMM_CODE in (6, 7) and Total_NUMBER_OF_PLACES >= 30)
            do;
                  base_care_tariff = '4=Non-indigenous, MMM=6-7, 30+ beds';
                  NWAU_base_raw = 0.52 / occ_rate;
            end;
            when (MMM_CODE not in (6, 7) and homelessness in ('Yes'))
            do;
                  base_care_tariff = '5=Specialised homeless';
                  NWAU_base_raw = 0.92;
```

```
            end;
            when (MMM_CODE not in (6, 7) and homelessness in ('No'))
            do;
                  base_care_tariff = '6=All other RACFs';
                  NWAU_base_raw = 0.49;
            end;
            otherwise;
      end;
end;

If Financial_Year in ('2018/2019') then do;
occ_rate = Facility_bed_days / (Total_NUMBER_OF_PLACES * 365);

      select;
            when (indigenous in ('Yes') and MMM_CODE in (7))
            do;
                  base_care_tariff = '1=Indigenous, MMM=7';
                  NWAU_base_raw = 1.8 / occ_rate;
            end;
            when (indigenous in ('Yes') and MMM_CODE in (6))
            do;
                  base_care_tariff = '2=Indigenous, MMM=6';
                  NWAU_base_raw = 0.78 / occ_rate;
            end;
            when (indigenous in ('No') and MMM_CODE in (6, 7) and Total_NUMBER_OF_PLACES < 30)
            do;
                  base_care_tariff = '3=Non-indigenous, MMM=6-7, < 30 beds';
                  NWAU_base_raw = 0.68 / occ_rate;
            end;
            when (indigenous in ('No') and MMM_CODE in (6, 7) and Total_NUMBER_OF_PLACES >= 30)
             do;
                  base_care_tariff = '4=Non-indigenous, MMM=6-7, 30+ beds';
                  NWAU_base_raw = 0.52 / occ_rate;
            end;
            when (MMM_CODE not in (6, 7) and homelessness in ('Yes'))
            do;
                  base_care_tariff = '5=Specialised homeless';
                  NWAU_base_raw = 0.92;
            end;
             when (MMM_CODE not in (6, 7) and homelessness in ('No'))
            do;
                  base_care_tariff = '6=All other RACFs';
                  NWAU_base_raw = 0.49;
            end;
```

```
           otherwise;
      end;
end;

run;

proc sql noprint;
       select mean(NWAU_indiv_raw), mean(NWAU_indiv_raw) + 0.49
       into
       :mean_NWAU_indiv1415, :mean_NWAU_total1415
       from mapping
       where Financial_Year = '2014/2015';

       select mean(NWAU_indiv_raw), mean(NWAU_indiv_raw) + 0.49
       into
       :mean_NWAU_indiv1516, :mean_NWAU_total1516
       from mapping
       where Financial_Year = '2015/2016';

       select mean(NWAU_indiv_raw), mean(NWAU_indiv_raw) + 0.49
       into
       :mean_NWAU_indiv1617, :mean_NWAU_total1617
       from mapping
       where Financial_Year = '2016/2017';

       select mean(NWAU_indiv_raw), mean(NWAU_indiv_raw) + 0.49
       into
       :mean_NWAU_indiv1718, :mean_NWAU_total1718
       from mapping
       where Financial_Year = '2017/2018';

       select mean(NWAU_indiv_raw), mean(NWAU_indiv_raw) + 0.49
       into
       :mean_NWAU_indiv1819, :mean_NWAU_total1819
       from mapping
       where Financial_Year = '2018/2019';

quit;

%put &mean_NWAU_indiv1415;
%put &mean_NWAU_total1415;
%put &mean_NWAU_indiv1516;
%put &mean_NWAU_total1516;
%put &mean_NWAU_indiv1617;
```

```
%put &mean_NWAU_total1617;
%put &mean_NWAU_indiv1718;
%put &mean_NWAU_total1718;
%put &mean_NWAU_indiv1819;
%put &mean_NWAU_total1819;

data ACFI_ANACC_mapping6;
      set ACFI_ANACC_mapping5;

       select(Financial_Year);
              when('2014/2015')
              do;
                     NWAU_indiv_adj = NWAU_indiv_raw / &mean_NWAU_total1415.;
                     NWAU_base_adj = NWAU_base_raw / &mean_NWAU_total1415.;

                     NWAU_total_adj = NWAU_indiv_adj + NWAU_base_adj;

                     RVU_indiv = NWAU_indiv_raw / &mean_NWAU_indiv1415.;
                     RVU_base = NWAU_base_raw / &mean_NWAU_indiv1415.;
              end;
              when('2015/2016')
              do;
                     NWAU_indiv_adj = NWAU_indiv_raw / &mean_NWAU_total1516.;
                     NWAU_base_adj = NWAU_base_raw / &mean_NWAU_total1516.;

                     NWAU_total_adj = NWAU_indiv_adj + NWAU_base_adj;

                     RVU_indiv = NWAU_indiv_raw / &mean_NWAU_indiv1516.;
                     RVU_base = NWAU_base_raw / &mean_NWAU_indiv1516.;
              end;
              when('2016/2017')
              do;
                     NWAU_indiv_adj = NWAU_indiv_raw / &mean_NWAU_total1617.;
                     NWAU_base_adj = NWAU_base_raw / &mean_NWAU_total1617.;

                     NWAU_total_adj = NWAU_indiv_adj + NWAU_base_adj;

                     RVU_indiv = NWAU_indiv_raw / &mean_NWAU_indiv1617.;
                     RVU_base = NWAU_base_raw / &mean_NWAU_indiv1617.;
              end;
              when('2017/2018')
              do;
                     NWAU_indiv_adj = NWAU_indiv_raw / &mean_NWAU_total1718.;
                     NWAU_base_adj = NWAU_base_raw / &mean_NWAU_total1718.;
```

```
                    NWAU_total_adj = NWAU_indiv_adj + NWAU_base_adj;

                    RVU_indiv = NWAU_indiv_raw / &mean_NWAU_indiv1718.;
                    RVU_base = NWAU_base_raw / &mean_NWAU_indiv1718.;
             end;
             when('2018/2019')
             do;
                    NWAU_indiv_adj = NWAU_indiv_raw / &mean_NWAU_total1819.;
                    NWAU_base_adj = NWAU_base_raw / &mean_NWAU_total1819.;

                    NWAU_total_adj = NWAU_indiv_adj + NWAU_base_adj;

                    RVU_indiv = NWAU_indiv_raw / &mean_NWAU_indiv1819.;
                    RVU_base = NWAU_base_raw / &mean_NWAU_indiv1819.;
             end;
             otherwise;
      end;

      drop NWAU_indiv_raw NWAU_base_raw;

run;

libname RUCS "\\....\RUCS\";

proc sort data=ACFI_ANACC_mapping6;
by Service_ID Financial_Year;
run;

proc summary data=ACFI_ANACC_mapping6;
by Service_ID Financial_Year;
var NWAU_indiv_adj NWAU_base_adj RVU_indiv RVU_base NWAU_total_adj;
weight OBD_permanent;
output out=RUCS.ACFI_ANACC_mappingv2(drop=_TYPE_) mean=NWAU_indiv_adj_WeightedAverage NWAU_base_adj_WeightedAverage
RVU_indiv_WeightedAverage RVU_base_WeightedAverage NWAU_total_adj_WeightedAverage;

run;
```