

AROC Impairment Specific Report

Amputation of Limb Report

INPATIENT – PATHWAY 3

1 January 2024 – 31 December 2024

Anywhere Hospital



Australasian
Faculty of
Rehabilitation
Medicine



australian health services
research institute



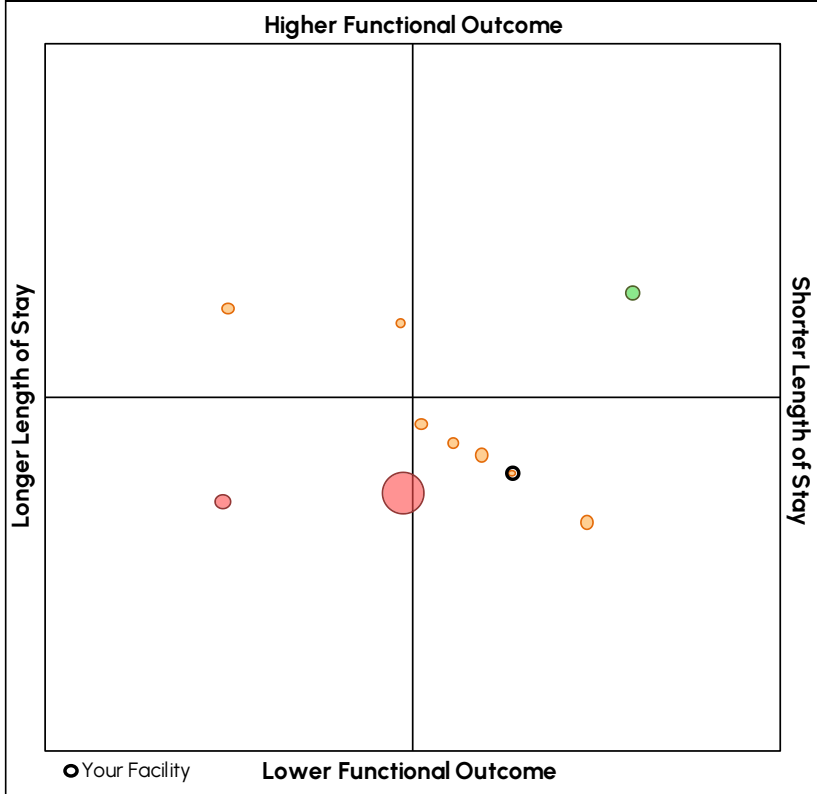
UNIVERSITY
OF WOLLONGONG
AUSTRALIA

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Amputation Dashboard



Rehabilitation Outcomes by Facility - AUSTRALIA



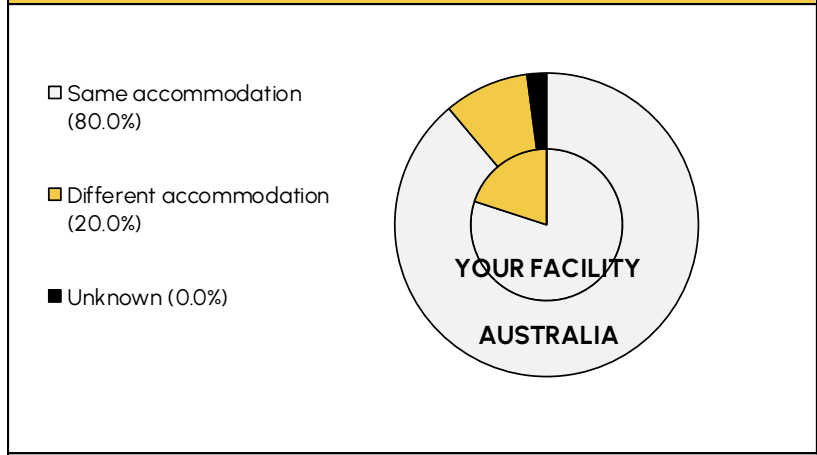
No outlier facilities are excluded from this graph

Amber	Trend data unavailable
Status	

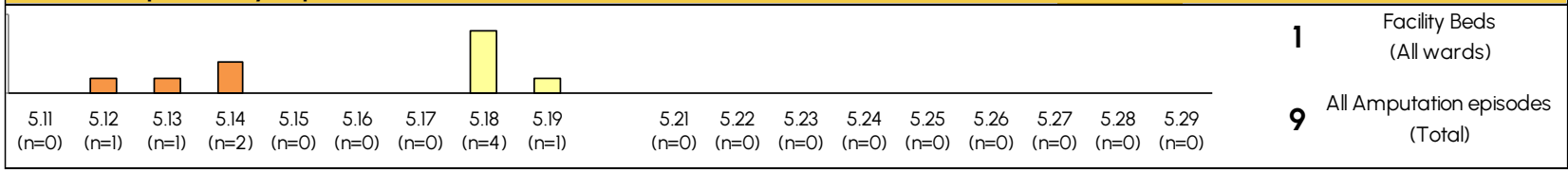
Performance Against Benchmark

Functional Gain				
Length of Stay				
Your Facility:	#N/A	#N/A	#N/A	#N/A
Trend data unavailable				

Change in Accommodation



Number of Episodes by Impairment



Amputation Dashboard



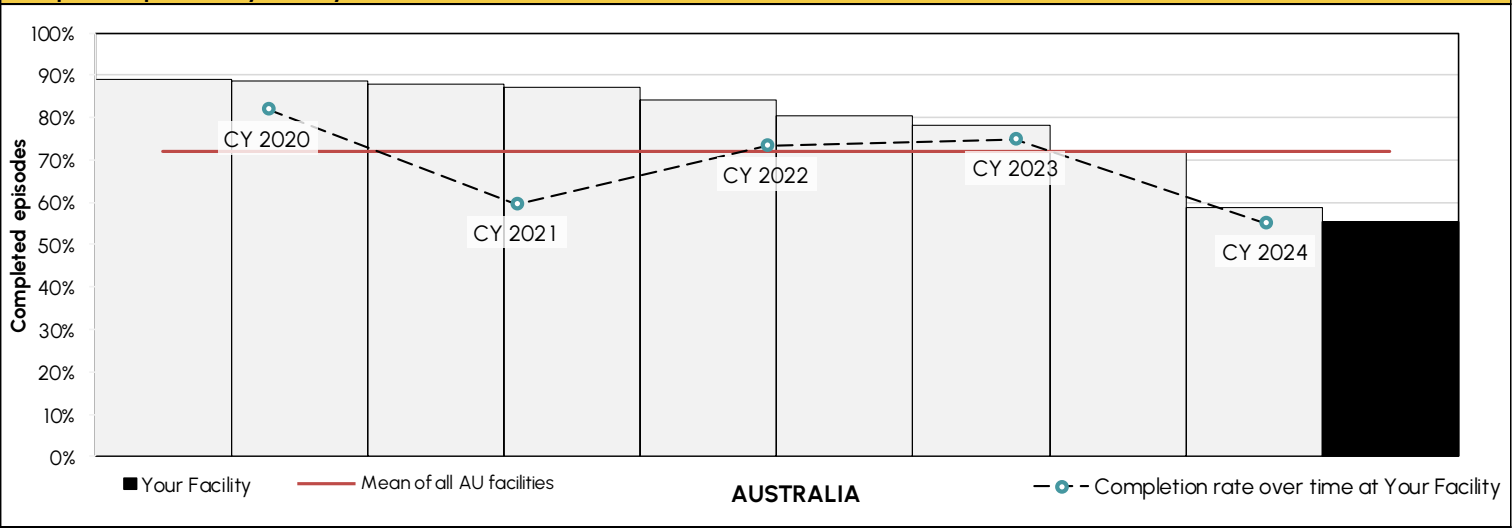
Key Indicators*	
YOUR FACILITY	AUSTRALIA
Mean Age: 65.2	Mean Age: 64.8
Mortality Rate: —	Mortality Rate: 0.2%
% with at least one comorbidity: —	% with at least one comorbidity: 62%
% with at least one complication: —	% with at least one complication: 43%
% episodes with start delays: 44%	% episodes with start delays: 28%
Days between onset and rehab episode: 21.8	Days between onset and rehab episode: 26.1
Days between clinically rehab ready & start date: 7.4	Days between clinically rehab ready & start date: 1.7

Facility FIM Training*	
FIM Credentialed Staff per 100 Episodes	FIM Credentialed Facility Trainers
<p>Your Facility</p>	<p>3</p> <p>Your Facility</p>
<p>AUSTRALIA (Mean)</p>	<p>2</p> <p>AROC Suggested Minimum</p>

* Mean value provided unless otherwise specified

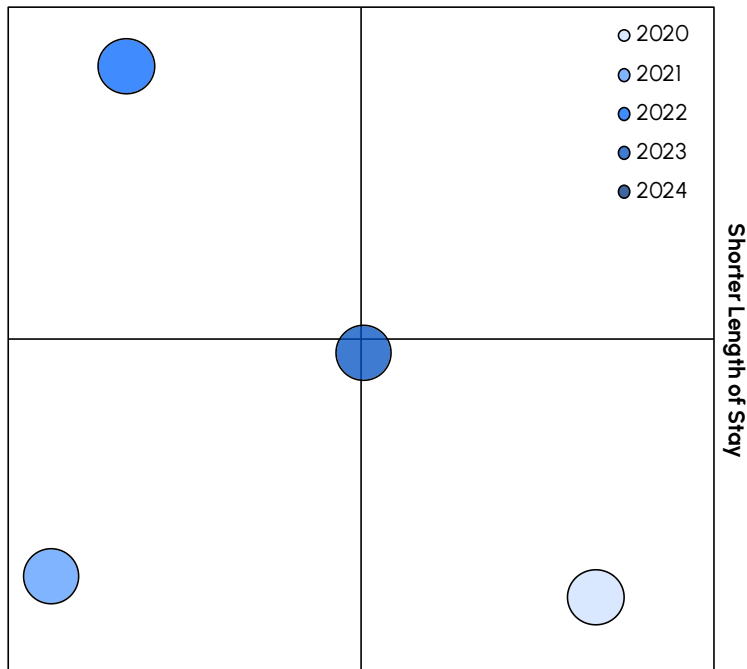
*This includes all impairments from all wards

Completed Episodes by Facility



Quadrant Positions – last 5 years

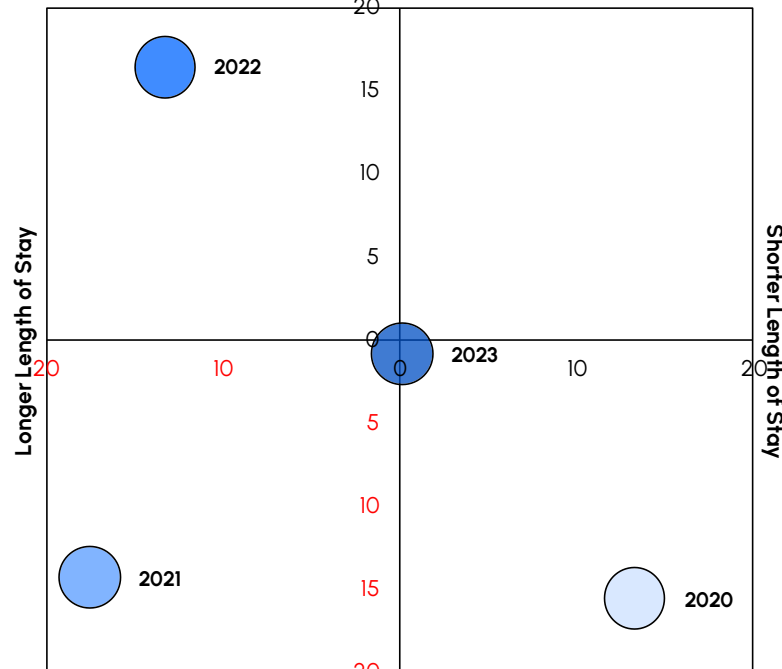
Higher Functional Outcome



Lower Functional Outcome



Higher Functional Outcome



Lower Functional Outcome

NB: Data from before FY22 is benchmarked using AN-SNAP V4 classes. FY22 onwards benchmarked using AN-SNAP V5 classes.

NOTE: Includes only completed episodes with valid FIM & LOS; where n<20 no dot will be shown

Data used in this report



- Amputation episodes discharged during the reporting period (1 January 2024 – 31 December 2024) and time series data covering five years.
- Benchmark group is AUSTRALIA.
- Casemix analysis uses version 5 AN-SNAP classes (Appendix 3). Casemix adjustment is calculated against AUSTRALIA data.
- Unit of counting is by concatenated* episode, not by patient.
- Where there are less than five episodes within a subgroup, summary data are not provided. Missing data and ungroupable AN-SNAP classes are excluded from figures, but are included in tables.
- Facilities will only receive this report when the facility reports a minimum of 20 completed amputation of limb episodes.

Note: Appendix 1 (Glossary) contains definitions of concepts referred to in this report. An understanding of these will help with interpretation of the data. This report should be considered in conjunction with the Outcome Benchmarks Report for your facility.

*Refer to Appendix 1 for more details about the process of data concatenation.

Amputation episodes were identified as those with the following AROC impairment codes:

- 5.11 — Non-Traumatic — Single upper above elbow
- 5.12 — Non-Traumatic — Single upper below elbow
- 5.13 — Non-Traumatic — Single lower above knee (includes through knee)
- 5.14 — Non-Traumatic — Single lower below knee
- 5.15 — Non-Traumatic — Double lower above knee (includes through knee)
- 5.16 — Non-Traumatic — Double lower above/below knee
- 5.17 — Non-Traumatic — Double lower below knee
- 5.18 — Non-Traumatic — Partial foot (single or double)
- 5.19 — Non-Traumatic — Other amputation not from trauma

- 5.21 — Traumatic — Single upper above elbow
- 5.22 — Traumatic — Single upper below elbow
- 5.23 — Traumatic — Single lower above knee (includes through knee)
- 5.24 — Traumatic — Single lower below knee
- 5.25 — Traumatic — Double lower above knee (includes through knee)
- 5.26 — Traumatic — Double lower above/below knee
- 5.27 — Traumatic — Double lower below knee
- 5.28 — Traumatic — Partial foot (single or double)
- 5.29 — Traumatic — Other amputation from trauma

Note: A list of all impairment codes can be found in Appendix 2

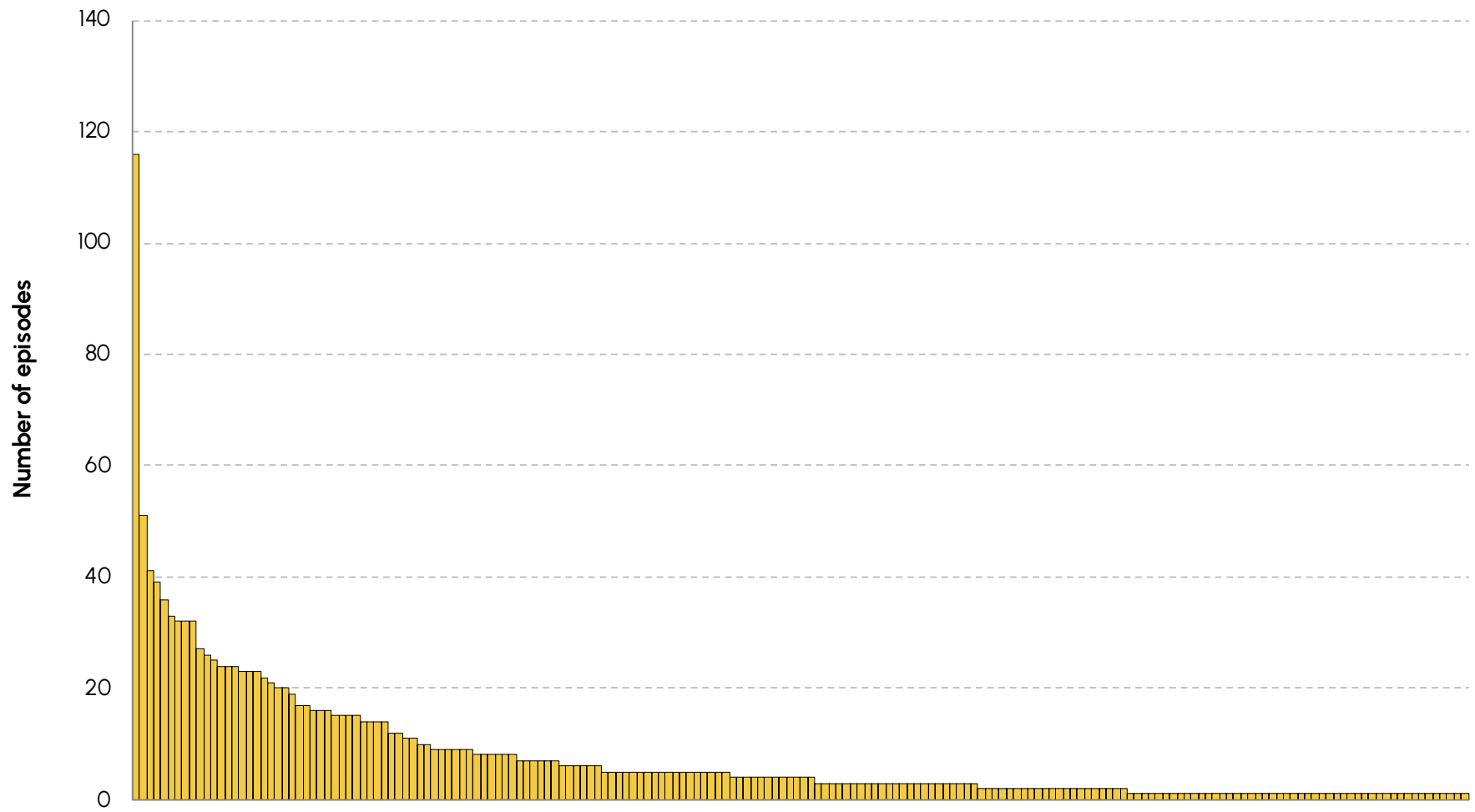
Levels of functioning for amputations are categorised by the following version 5 AN-SNAP classes:

- 5AE1 Amputation of limb, weighted FIM Motor 19 - 91
- 5AZ3 Weighted FIM Motor score 13-18, All other impairments, Age \geq 79
- 5AZ4 Weighted FIM Motor score 13-18, All other impairments, Age 18 - 78

NOTE: A list of all AN SNAP classes can be found in Appendix 3

The BIG Picture

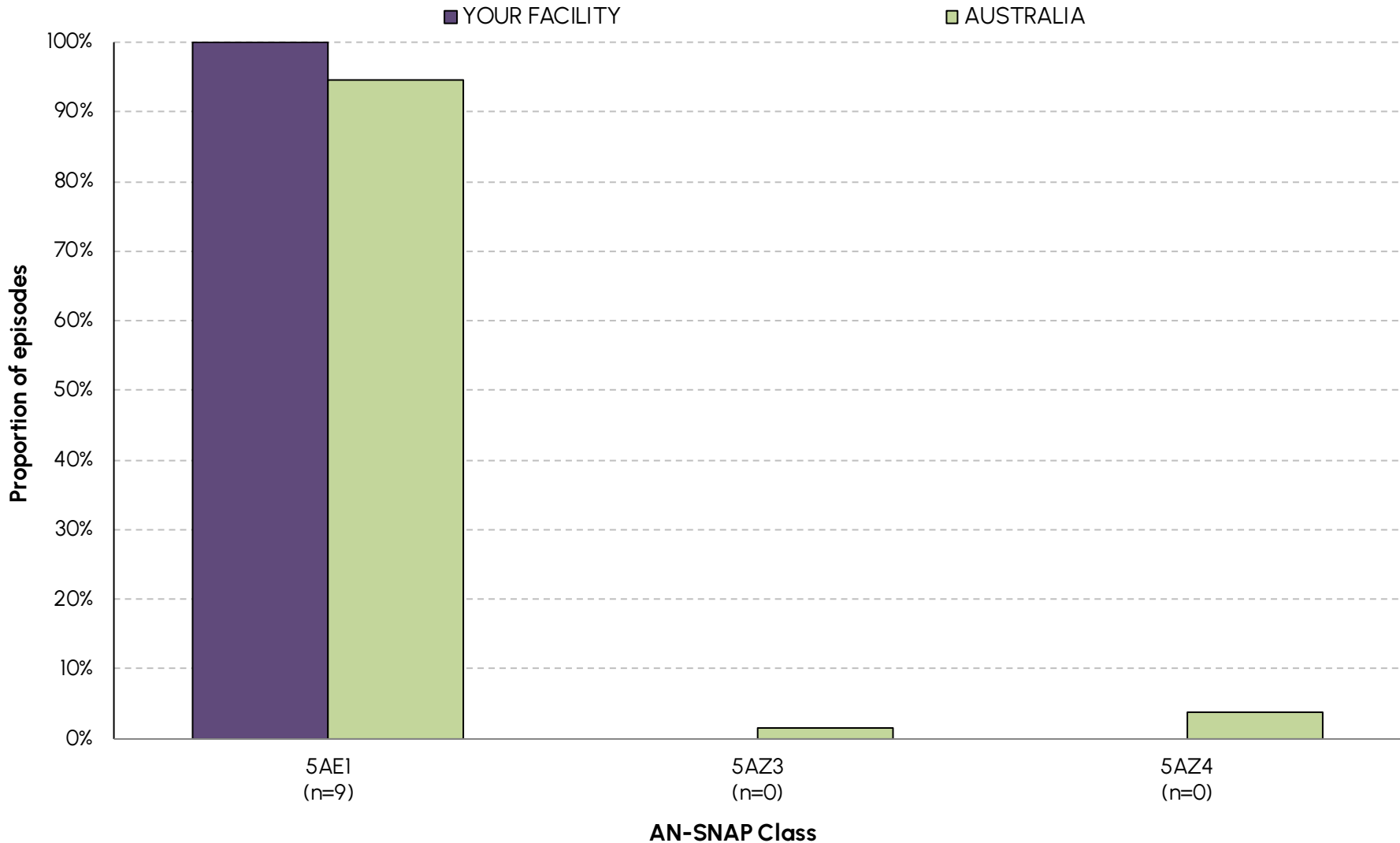
Volume of amputation episodes by facility



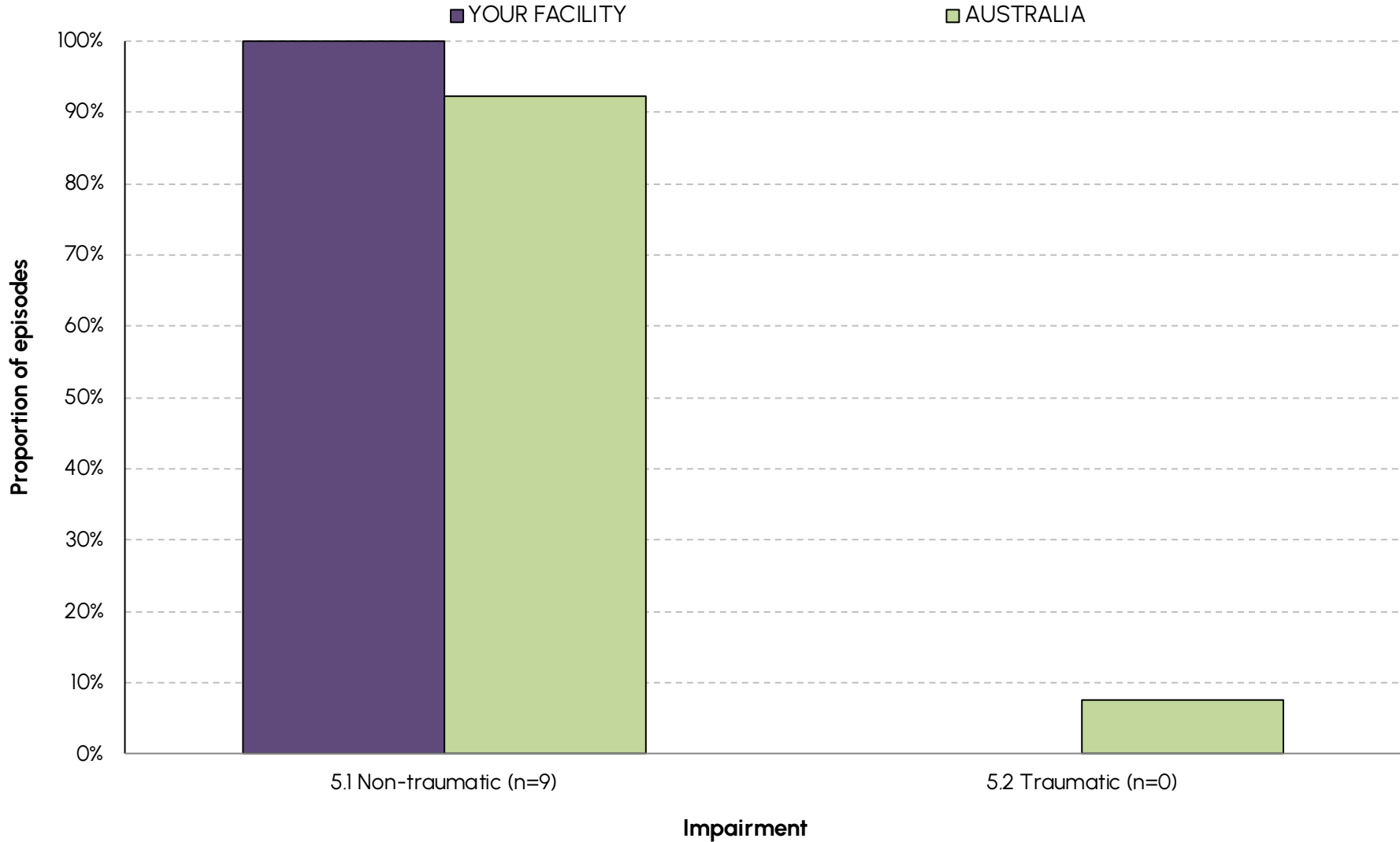
AUSTRALIA

NOTE: 188 facilities reported at least one amputation episode, with 22 facilities reporting between 20 and 116 episodes in this reporting period

Proportion of episodes by AN-SNAP class



Proportion of episodes by impairment

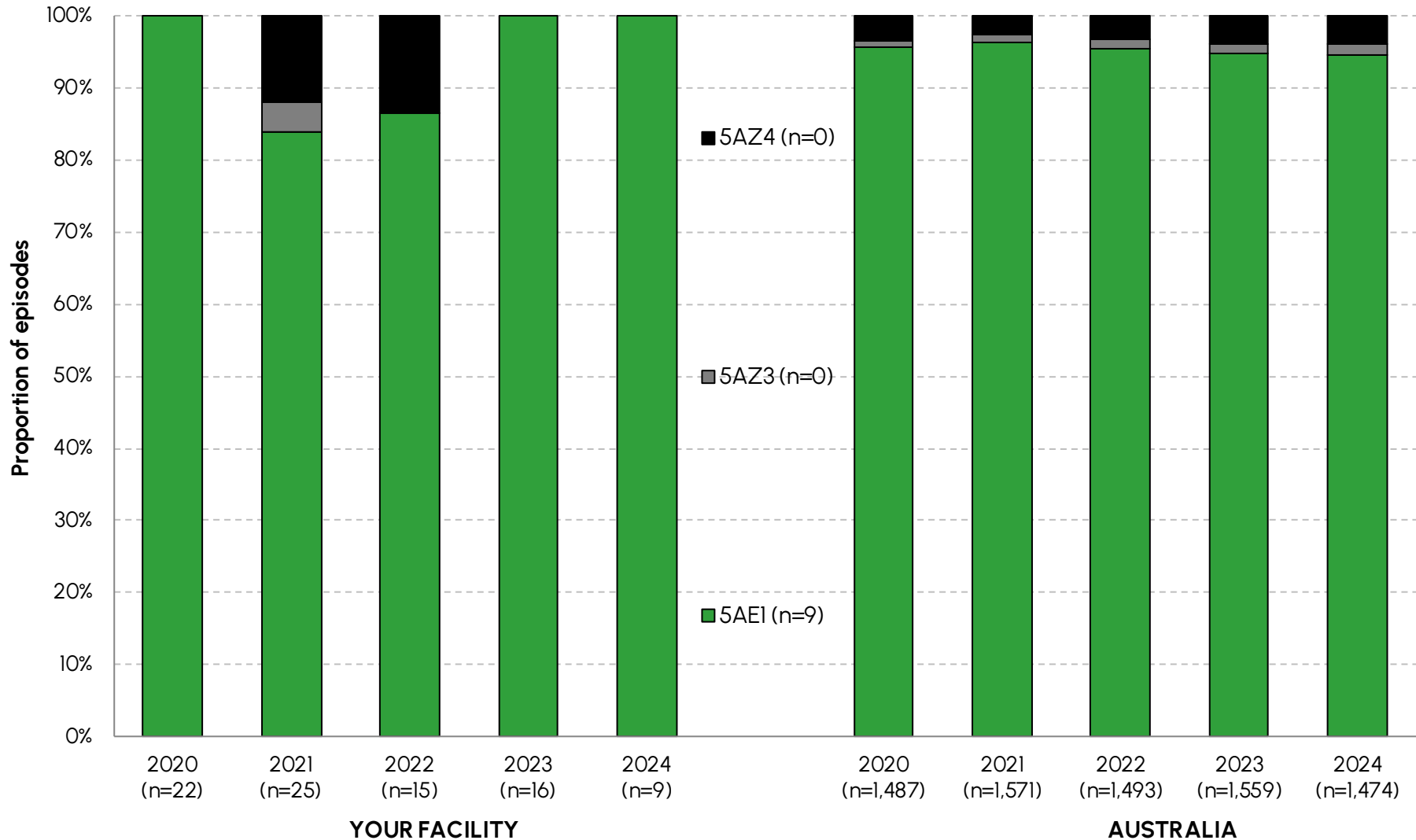


Episodes by AN-SNAP class and impairment code

YOUR FACILITY								
Impairment code	5AE1		5AZ3		5AZ4		All Amputation of limb	
	No.	%	No.	%	No.	%	No.	%
5.11	0	0.0	0	—	0	—	0	0.0
5.12	1	11.1	0	—	0	—	1	11.1
5.13	1	11.1	0	—	0	—	1	11.1
5.14	2	22.2	0	—	0	—	2	22.2
5.15	0	0.0	0	—	0	—	0	0.0
5.16	0	0.0	0	—	0	—	0	0.0
5.17	0	0.0	0	—	0	—	0	0.0
5.18	4	44.4	0	—	0	—	4	44.4
5.19	1	11.1	0	—	0	—	1	11.1
5.21	0	0.0	0	—	0	—	0	0.0
5.22	0	0.0	0	—	0	—	0	0.0
5.23	0	0.0	0	—	0	—	0	0.0
5.24	0	0.0	0	—	0	—	0	0.0
5.25	0	0.0	0	—	0	—	0	0.0
5.26	0	0.0	0	—	0	—	0	0.0
5.27	0	0.0	0	—	0	—	0	0.0
5.28	0	0.0	0	—	0	—	0	0.0
5.29	0	0.0	0	—	0	—	0	0.0

AUSTRALIA								
Impairment code	5AE1		5AZ3		5AZ4		All Amputation of limb	
	No.	%	No.	%	No.	%	No.	%
5.11	9	0.6	0	0.0	1	1.8	10	0.7
5.12	9	0.6	0	0.0	1	1.8	10	0.7
5.13	306	22.0	7	31.8	21	36.8	334	22.7
5.14	734	52.7	7	31.8	16	28.1	757	51.5
5.15	22	1.6	0	0.0	1	1.8	23	1.6
5.16	16	1.1	0	0.0	1	1.8	17	1.2
5.17	18	1.3	1	4.5	1	1.8	20	1.4
5.18	96	6.9	3	13.6	2	3.5	101	6.9
5.19	80	5.7	2	9.1	6	10.5	88	6.0
5.21	4	0.3	0	0.0	0	0.0	4	0.3
5.22	3	0.2	0	0.0	0	0.0	3	0.2
5.23	34	2.4	2	9.1	2	3.5	38	2.6
5.24	47	3.4	0	0.0	1	1.8	48	3.3
5.25	2	0.1	0	0.0	0	0.0	2	0.1
5.26	1	0.1	0	0.0	2	3.5	3	0.2
5.27	1	0.1	0	0.0	2	3.5	3	0.2
5.28	4	0.3	0	0.0	0	0.0	4	0.3
5.29	6	0.4	0	0.0	0	0.0	6	0.4

Proportion of episodes by AN-SNAP class over time



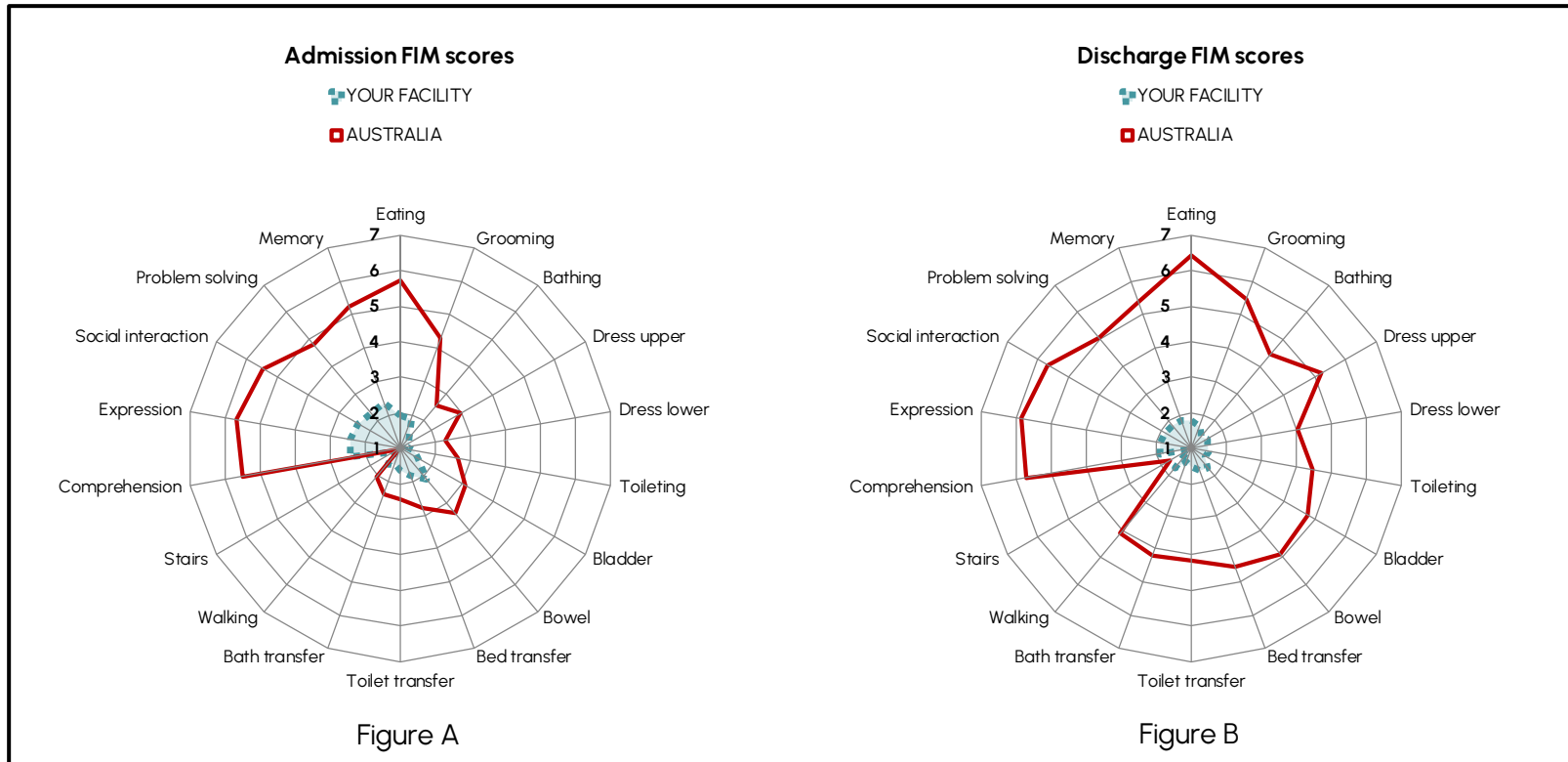
Episodes by AN-SNAP class over time

AN-SNAP class V5	YOUR FACILITY — No.					AUSTRALIA — No.				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
5AE1 (motor 63-91, cognition 30-35)	22	21	13	16	9	1,425	1,513	1,426	1,477	1,392
5AZ3 (motor 63-91, cognition 21-29)	0	1	0	0	0	13	17	18	20	22
5AZ4 (motor 63-91, cognition 5-20)	0	3	2	0	0	49	38	49	61	57
Ungroupable	0	0	0	0	0	0	3	0	1	3
All Amputation of limb AN-SNAP Classes	22	25	15	16	9	1,487	1,571	1,493	1,559	1,474

AN-SNAP class V5	YOUR FACILITY — %					AUSTRALIA — %				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
5AE1 (motor 63-91, cognition 30-35)	100.0	84.0	86.7	100.0	100.0	95.8	96.3	95.5	94.7	94.4
5AZ3 (motor 63-91, cognition 21-29)	0.0	4.0	0.0	0.0	0.0	0.9	1.1	1.2	1.3	1.5
5AZ4 (motor 63-91, cognition 5-20)	0.0	12.0	13.3	0.0	0.0	3.3	2.4	3.3	3.9	3.9
Ungroupable	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.2
All Amputation of limb AN-SNAP Classes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Review of FIM item scoring by AN-SNAP class

Interpreting the comparative FIM item scoring charts

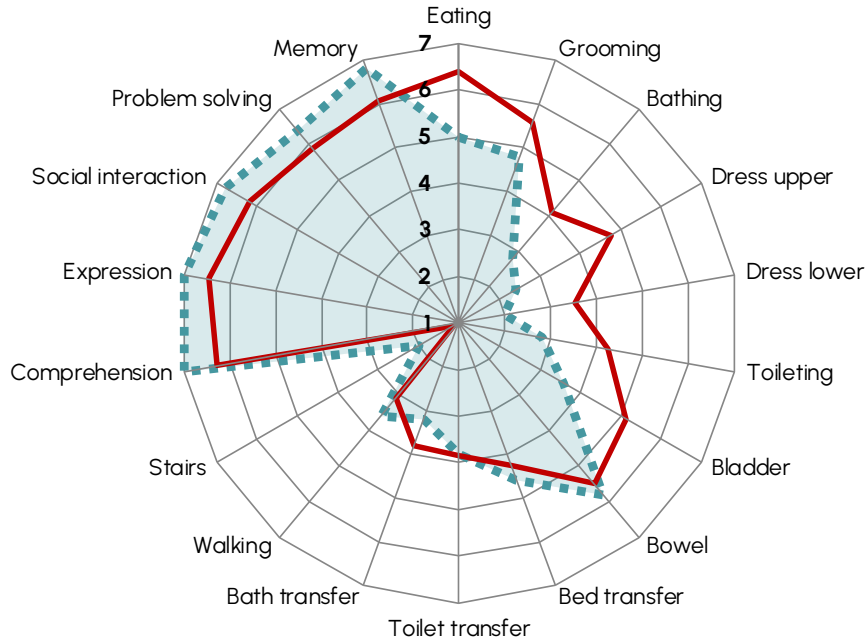


The FIM splat provides a graphic presentation of functional status in a radar chart. The 18 FIM items are arranged in order as 'spokes' of a wheel and the scoring levels from 1 (total dependence) to 7 (total independence) run from the centre outwards. The mean FIM item score for each item is indicated — a perfect score would be demonstrated as a large circle. The two FIM splats compare FIM scoring on admission (Figure A) and discharge (Figure B) between YOUR FACILITY and NATIONAL data — differences in the two shaded areas indicate differences in mean admission/discharge scoring. Graphs include completed episodes with valid FIM scoring.

Comparative FIM item scoring AN-SNAP class 5AE1

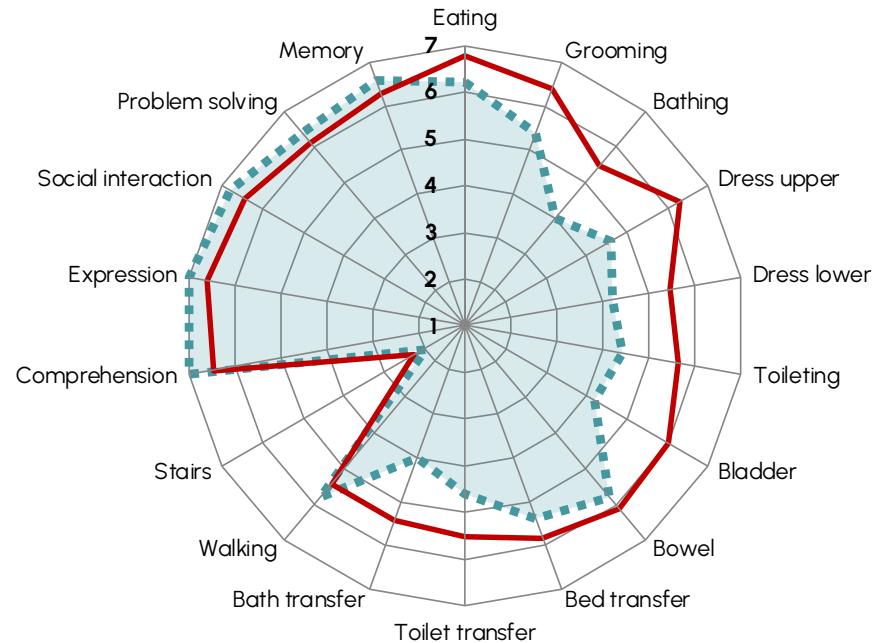
5AE1 Admission FIM scores

YOUR FACILITY (n=5)
 AUSTRALIA (n=1,014)



5AE1 Discharge FIM scores

YOUR FACILITY (n=5)
 AUSTRALIA (n=1,014)



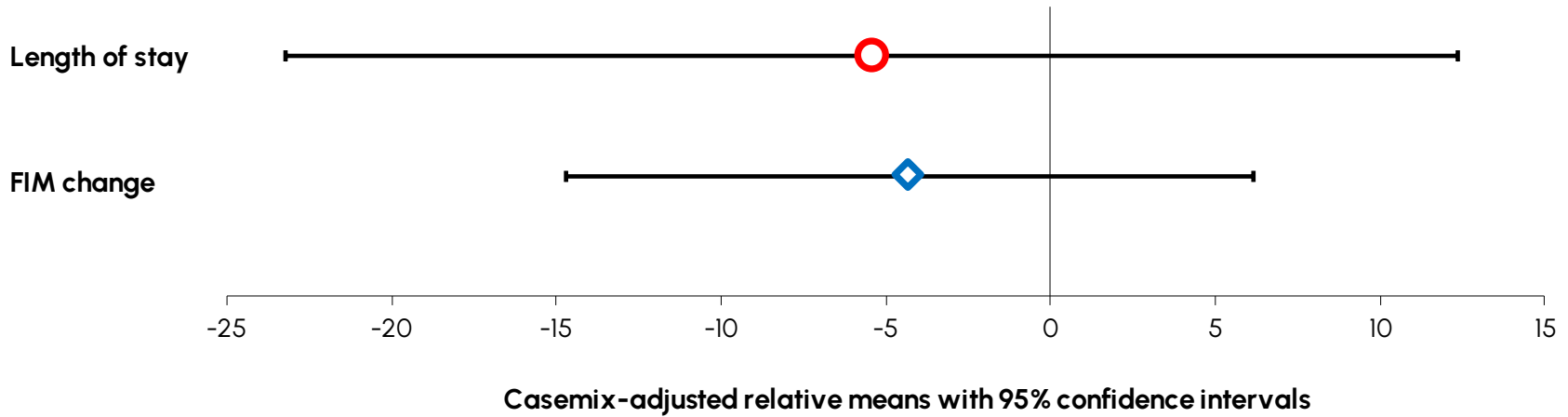
NOTE: Includes only completed episodes with valid FIM scores



Outcomes Analysis



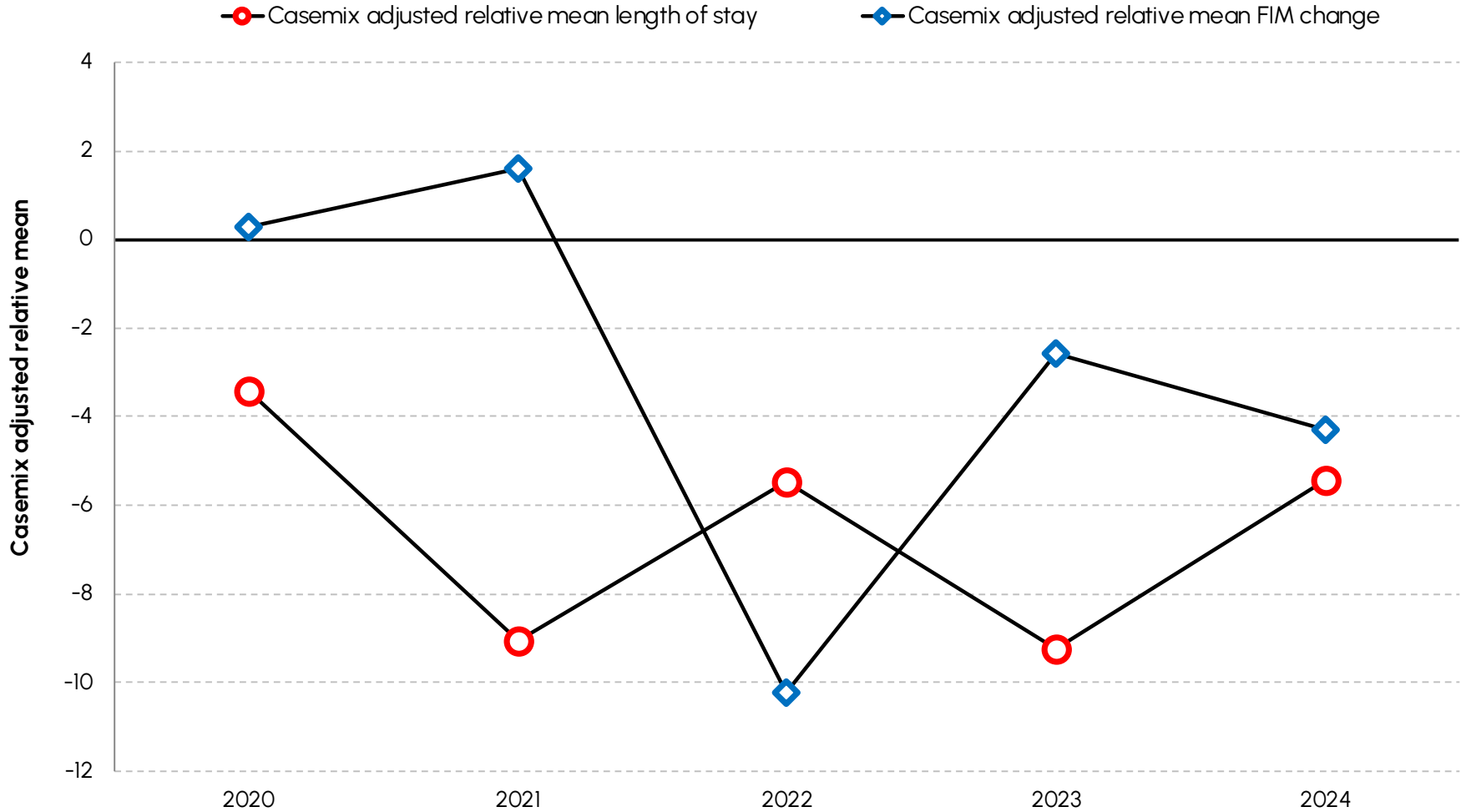
Casemix-adjusted* relative means



Outcome measure	YOUR FACILITY		AUSTRALIA
	Casemix-adjusted* relative mean	95% CI	National IQR
Length of stay	-5.4	-23.2 to 12.4	-17.4 to 8.6
FIM change	-4.3	-14.7 to 6.2	-9.3 to 8.7

*Includes only completed episodes with valid FIM scores and LOS

Casemix-adjusted* relative means over time



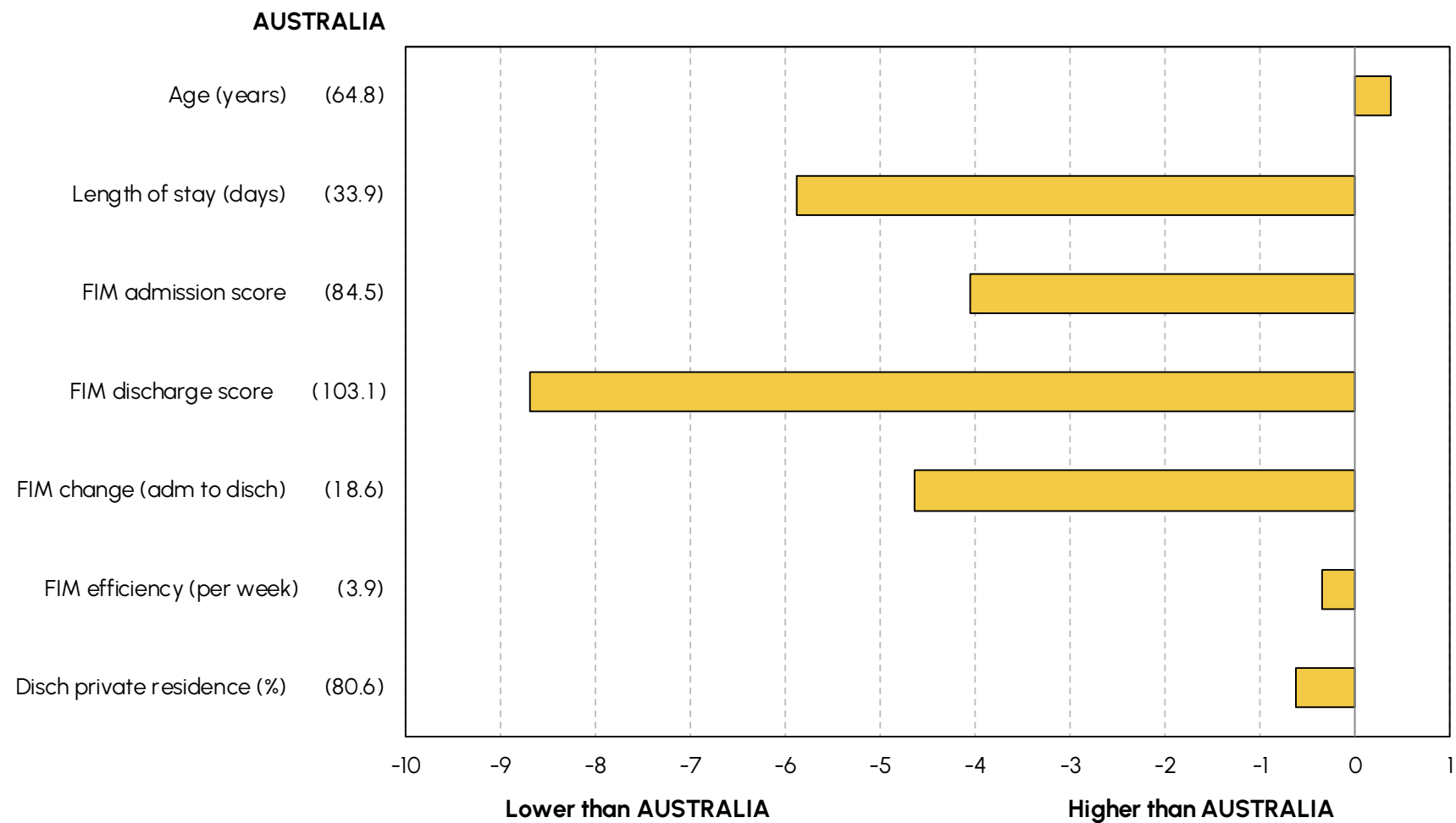
*Casemix adjusted values are based on CY 2024

NOTE: Includes only completed episodes with valid FIM scores and LOS; where n<5 the casemix-adjusted relative mean will not be shown

YOUR FACILITY

Outcome measures – difference from National

How YOUR FACILITY is different to AUSTRALIA

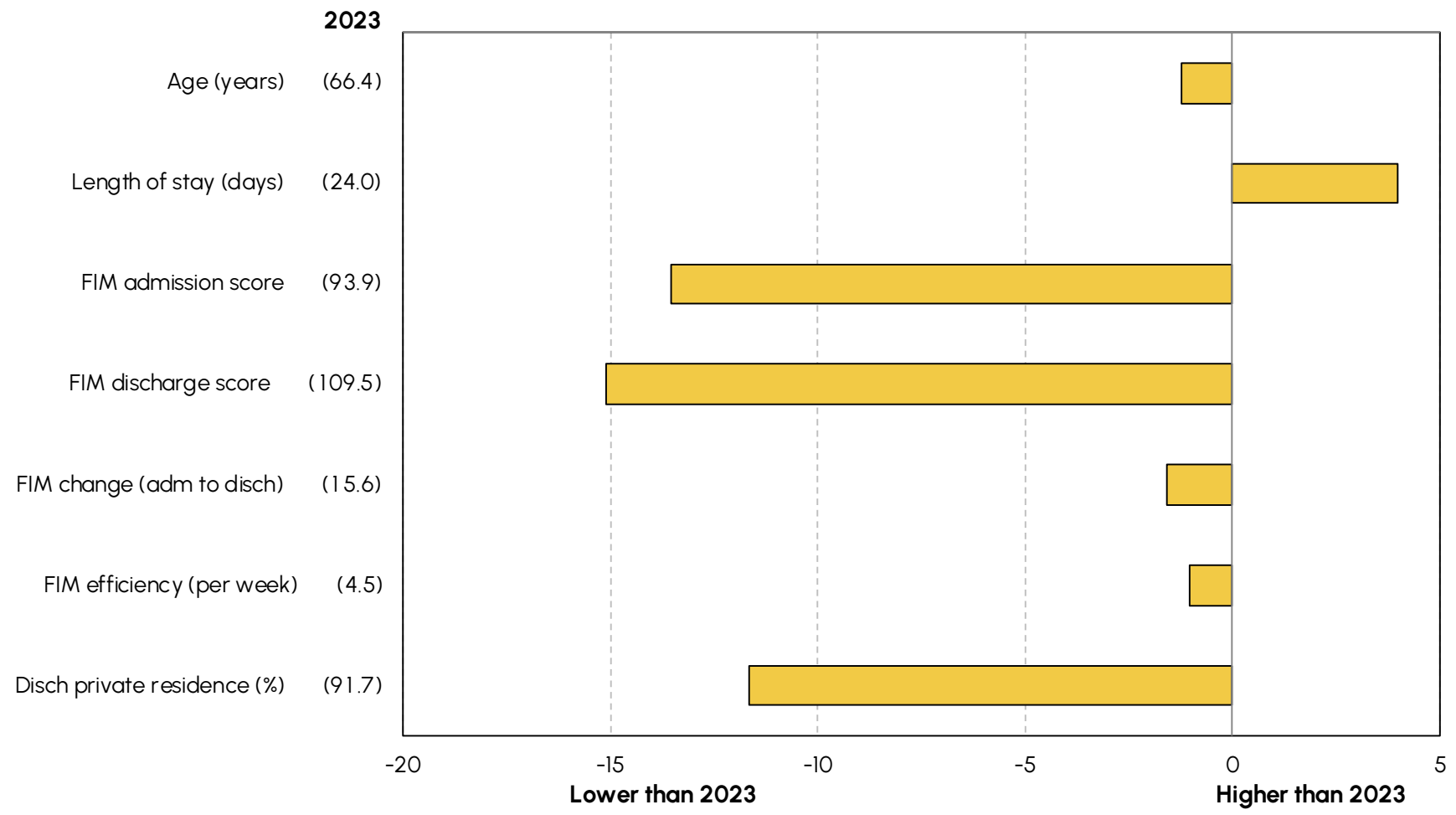


NOTE: Includes only completed episodes with valid FIM scores and LOS

Outcome measures – difference from last year

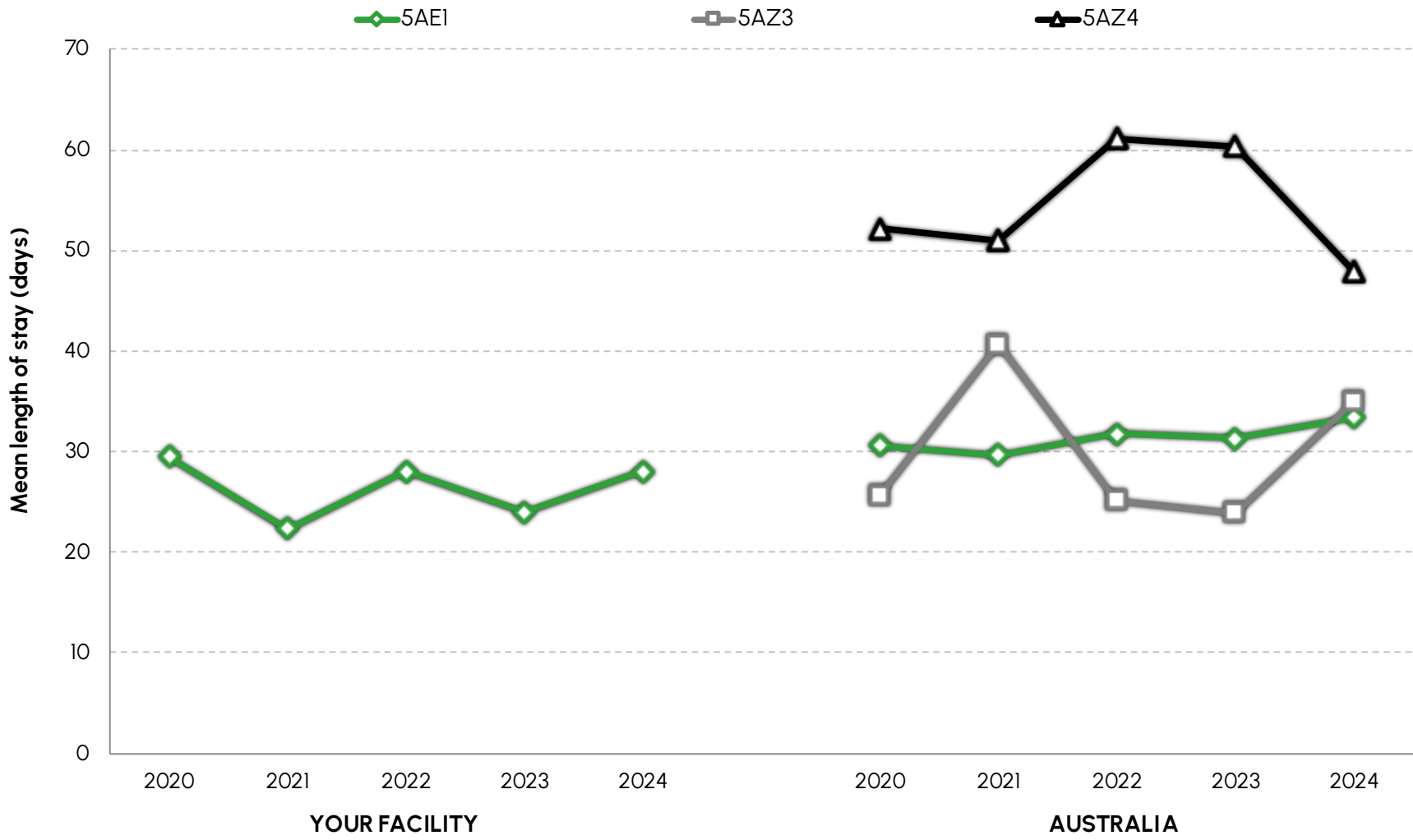


How YOUR FACILITY has changed since 2023



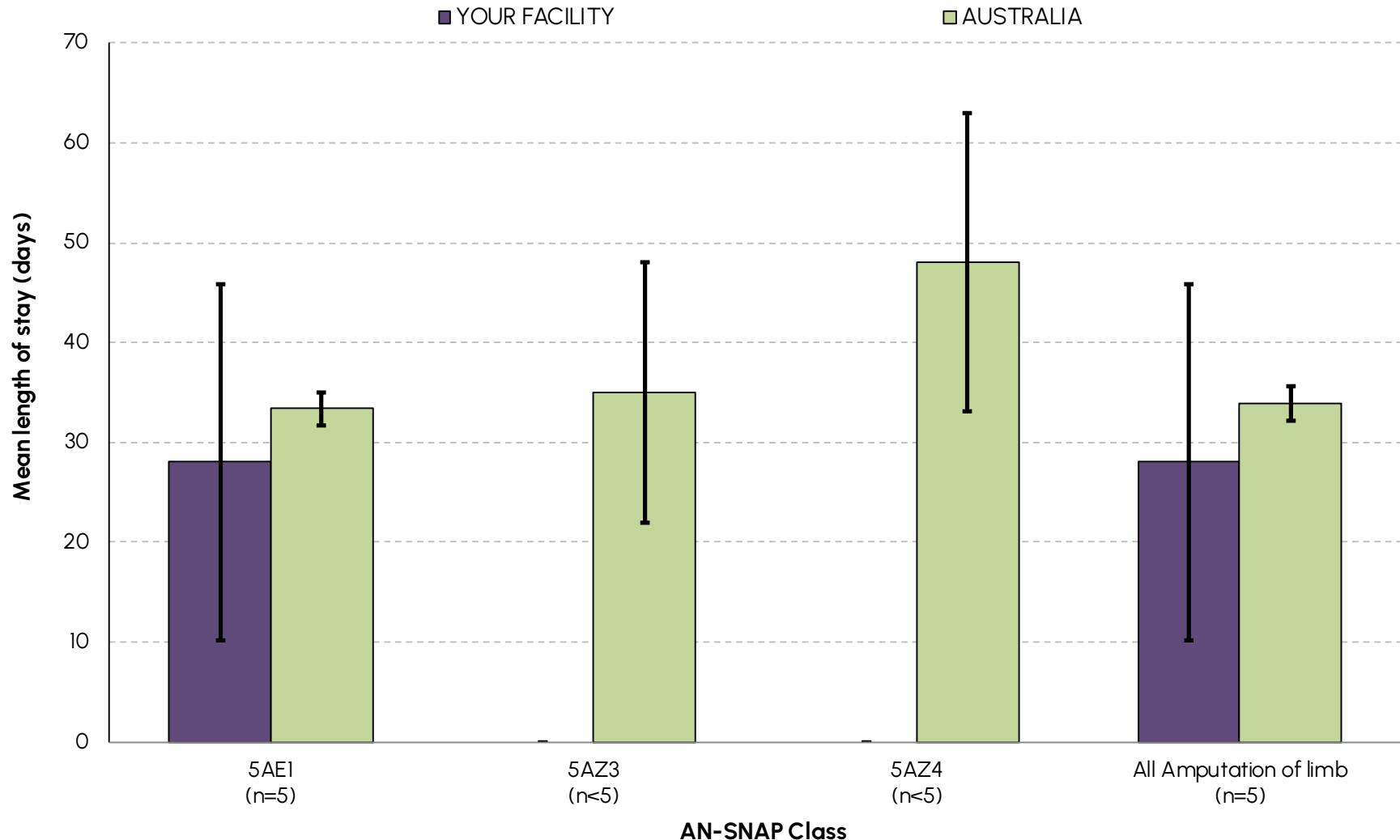
NOTE: Includes only completed episodes with valid FIM scores and LOS

Mean length of stay by AN-SNAP class over time



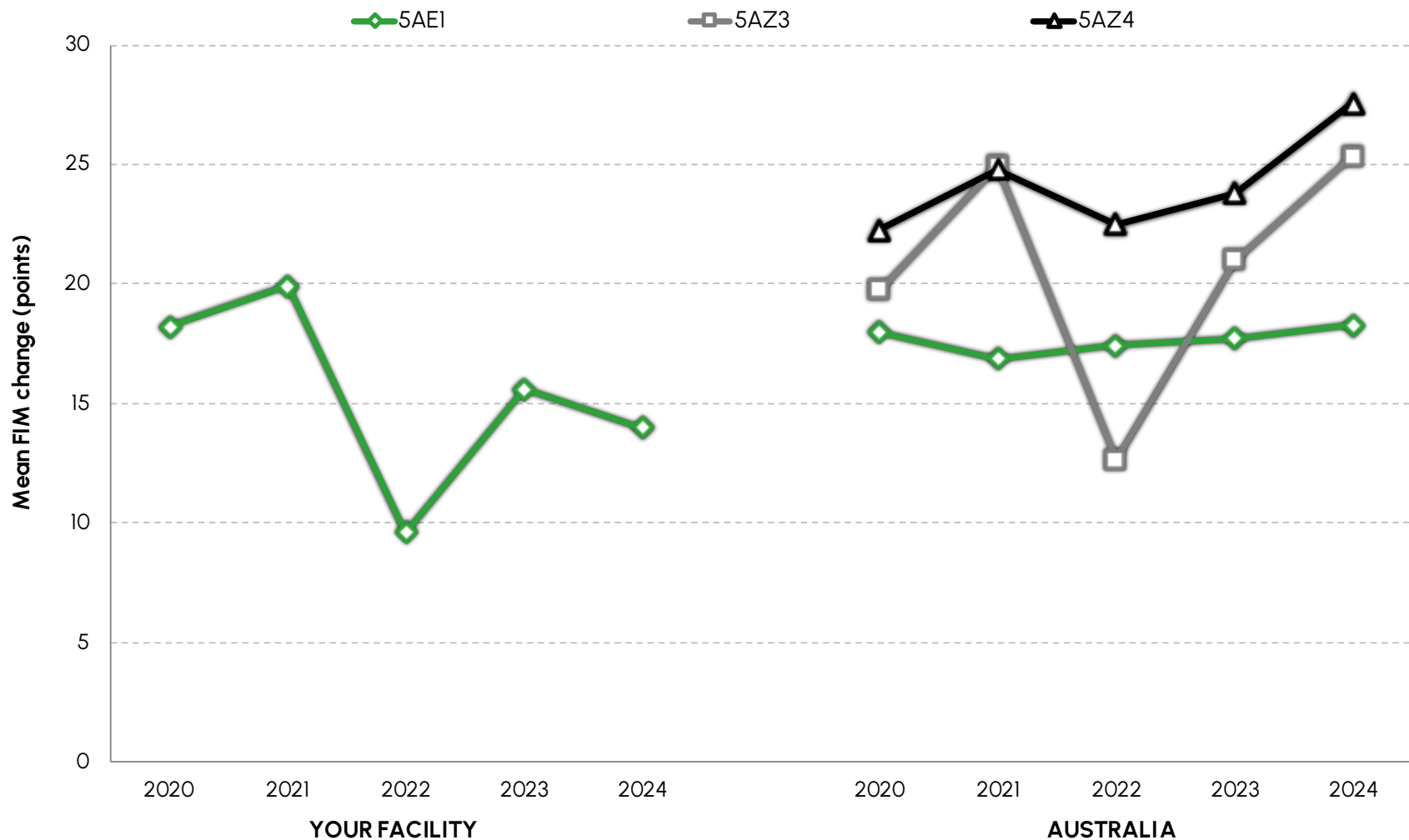
NOTE: Includes only completed episodes with valid LOS; where n<5 Mean LOS will not be shown

Mean length of stay by AN-SNAP class



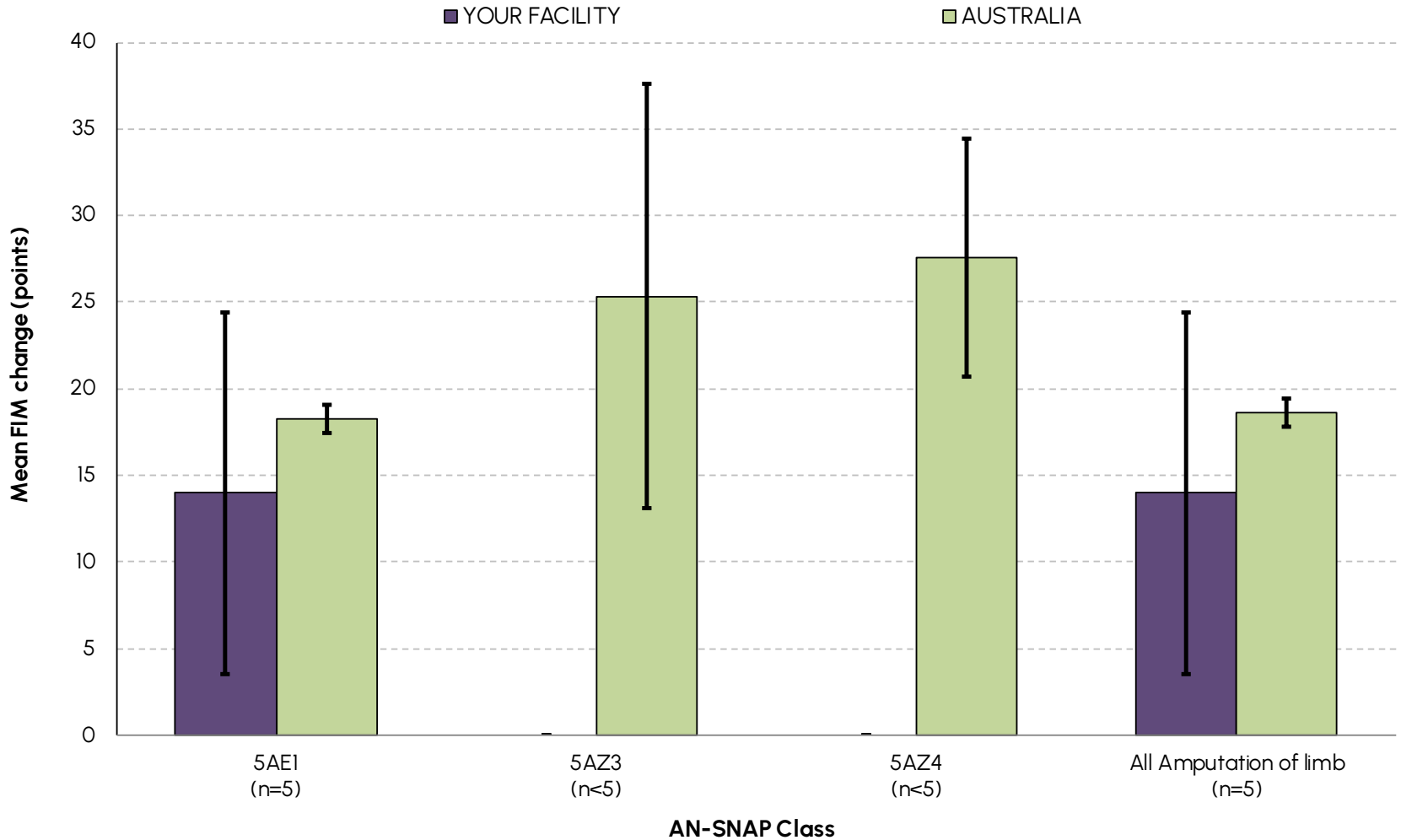
NOTE: Includes only completed episodes with valid LOS; where n<5 Mean LOS will not be shown

Mean FIM change by AN-SNAP class over time



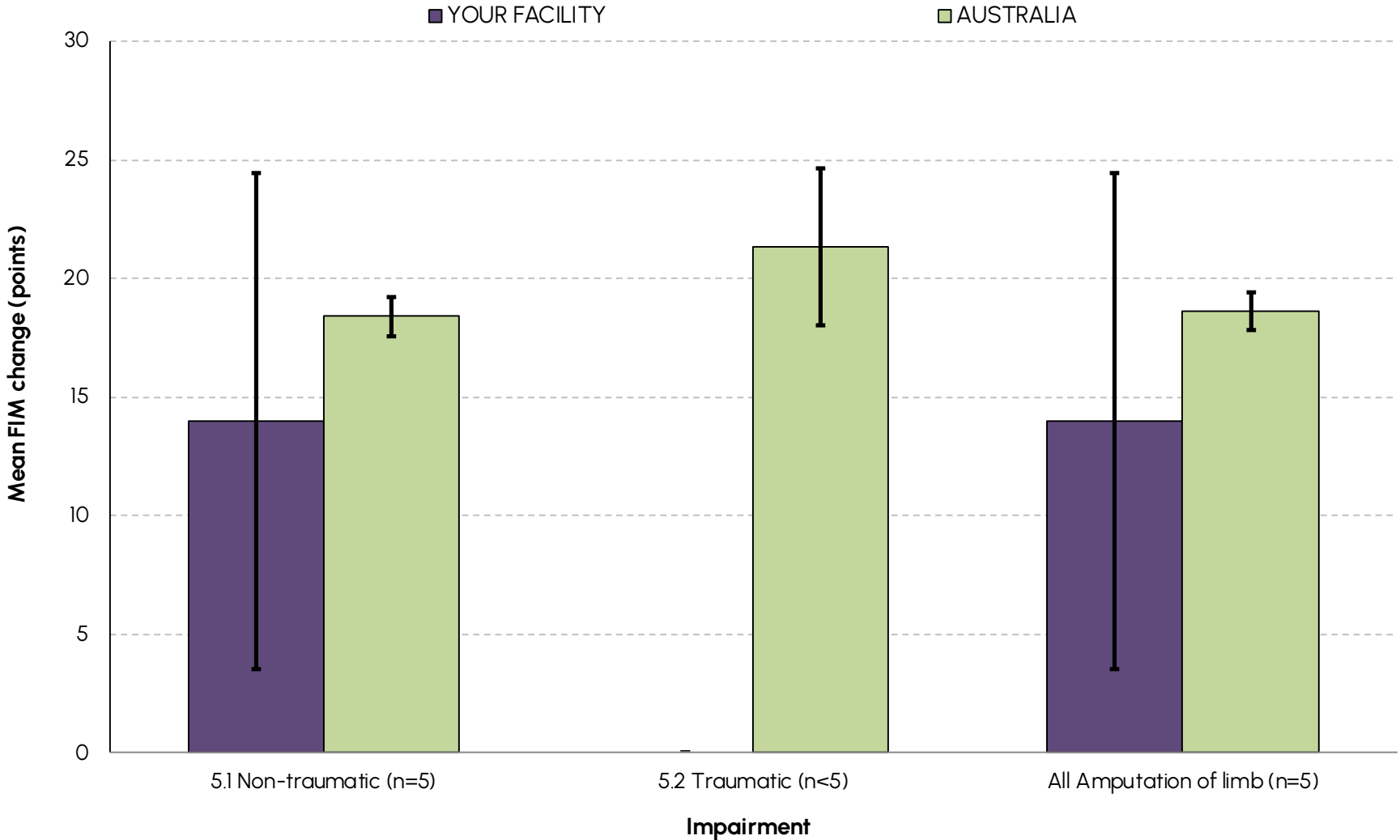
NOTE: Includes only completed episodes with valid FIM scores; where n<5 mean FIM change will not be shown

Mean FIM change by AN-SNAP class



NOTE: Includes only completed episodes with valid FIM scores; where n<5 mean FIM change will not be shown

Mean FIM change by impairment



NOTE: Includes only completed episodes with valid FIM scores; where n<5 mean FIM change will not be shown

Case-mix-adjusted relative mean and mean length of stay and FIM change by AN-SNAP class and impairment

AN-SNAP class V5	YOUR FACILITY						AUSTRALIA	
	CARMi (95%CI)			Mean (95%CI)			Mean (95%CI)	
	LOS	FIM change		LOS	FIM change		LOS	FIM change
5AE1 (motor 63-91, cognition 30-35)	-5.4 (-23.2 – 12.4)	-4.3 (-14.7 – 6.2)		28.0 (10.2 – 45.8)	14.0 (3.6 – 24.4)		33.4 (31.7 – 35.1)	18.3 (17.5 – 19.1)
5AZ3 (motor 63-91, cognition 21-29)	—	—		—	—		35.0 (21.9 – 48.1)	25.3 (13.1 – 37.6)
5AZ4 (motor 63-91, cognition 5-20)	—	—		—	—		48.0 (33.1 – 62.9)	27.6 (20.7 – 34.4)
All Amputation of limb AN-SNAP Classes	-5.4 (-23.2 – 12.4)	-4.3 (-14.7 – 6.2)		28.0 (10.2 – 45.8)	14.0 (3.6 – 24.4)		33.9 (32.2 – 35.5)	18.6 (17.8 – 19.4)

Impairment	YOUR FACILITY						AUSTRALIA	
	CARMi (95%CI)			Mean (95%CI)			Mean (95%CI)	
	LOS	FIM change		LOS	FIM change		LOS	FIM change
5.1 Non-traumatic	-5.4 (-23.2 – 12.4)	-4.3 (-14.7 – 6.2)		28.0 (10.2 – 45.8)	14.0 (3.6 – 24.4)		33.8 (32.1 – 35.6)	18.4 (17.6 – 19.2)
5.2 Traumatic	—	—		—	—		34.2 (28.0 – 40.4)	21.3 (18.0 – 24.6)
All Amputation of limb	-5.4 (-23.2 – 12.4)	-4.3 (-14.7 – 6.2)		28.0 (10.2 – 45.8)	14.0 (3.6 – 24.4)		33.9 (32.2 – 35.5)	18.6 (17.8 – 19.4)

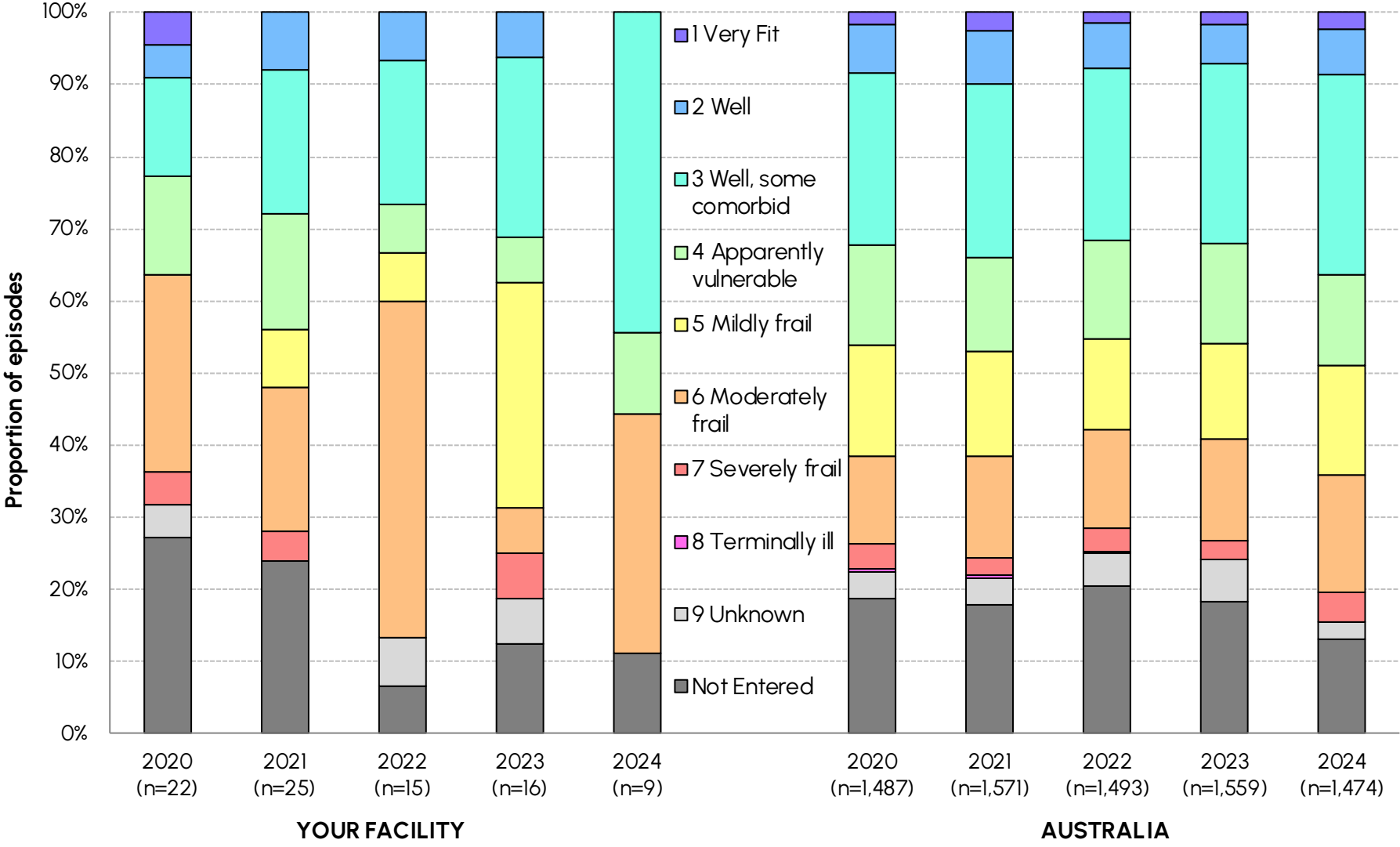
NOTE: Includes only completed episodes with valid FIM scores and LOS, where n<5 scores will not be shown.



Explanatory data



Frailty scores over time

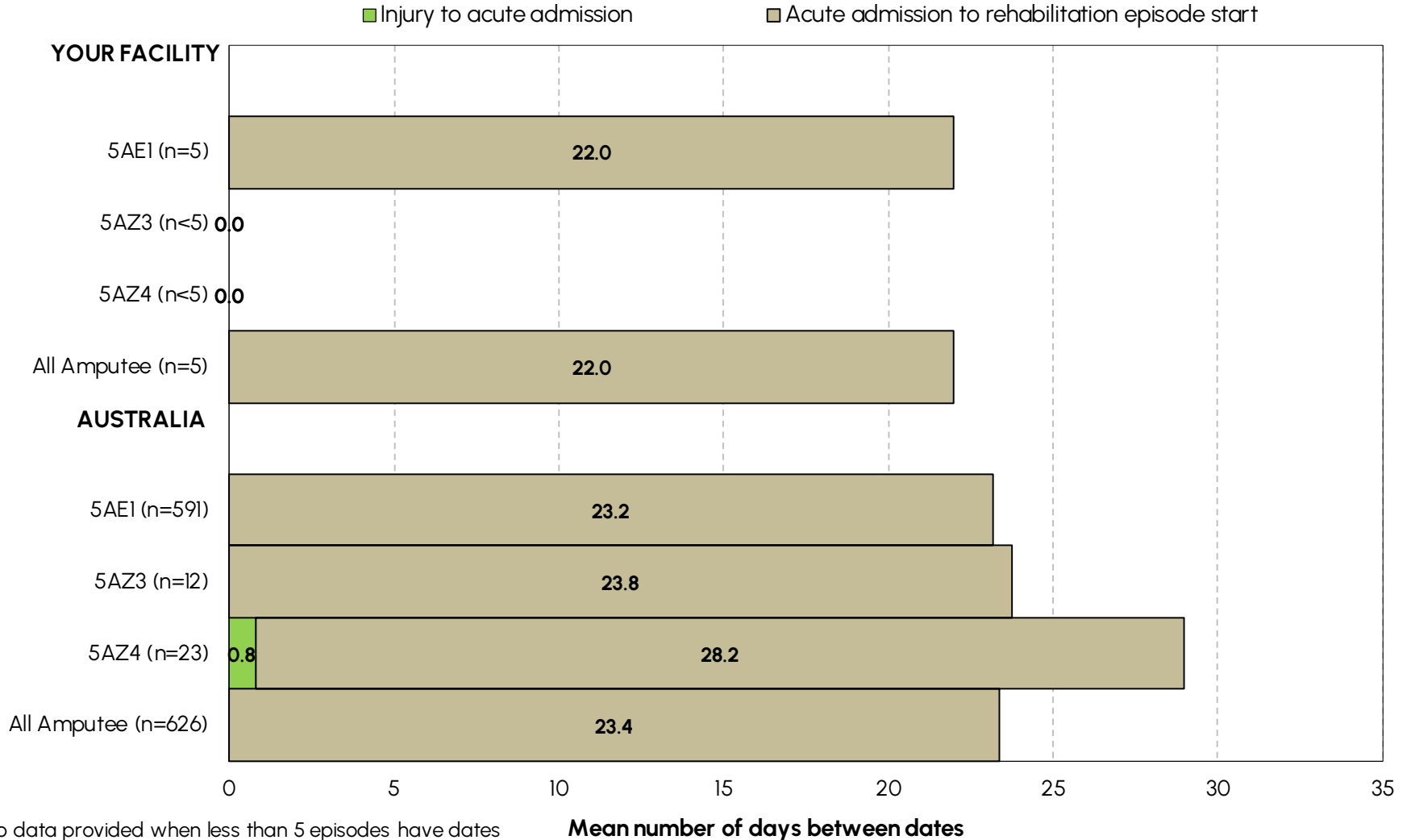


Proportion of episodes by frailty score over time

Frailty	YOUR FACILITY — N					AUSTRALIA — N				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
1 Very Fit	1	0	0	0	0	25	39	22	25	35
2 Well	1	2	1	1	0	101	115	95	87	91
3 Well, some comorbid	3	5	3	4	4	354	380	356	386	410
4 Apparently vulnerable	3	4	1	1	1	207	204	203	219	186
5 Mildly frail	0	2	1	5	0	229	227	187	205	222
6 Moderately frail	6	5	7	1	3	178	224	205	219	241
7 Severely frail	1	1	0	1	0	54	37	48	42	59
8 Terminally ill	0	0	0	0	0	6	6	3	0	0
9 Unknown	1	0	1	1	0	53	57	68	91	38
Not Entered	6	6	1	2	1	280	282	306	285	192
All Amputation of limb	22	25	15	16	9	1,487	1,571	1,493	1,559	1,474

Frailty	YOUR FACILITY — %					AUSTRALIA — %				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
1 Very Fit	4.5	0.0	0.0	0.0	0.0	1.7	2.5	1.5	1.6	2.4
2 Well	4.5	8.0	6.7	6.3	0.0	6.8	7.3	6.4	5.6	6.2
3 Well, some comorbid	13.6	20.0	20.0	25.0	44.4	23.8	24.2	23.8	24.8	27.8
4 Apparently vulnerable	13.6	16.0	6.7	6.3	11.1	13.9	13.0	13.6	14.0	12.6
5 Mildly frail	0.0	8.0	6.7	31.3	0.0	15.4	14.4	12.5	13.1	15.1
6 Moderately frail	27.3	20.0	46.7	6.3	33.3	12.0	14.3	13.7	14.0	16.4
7 Severely frail	4.5	4.0	0.0	6.3	0.0	3.6	2.4	3.2	2.7	4.0
8 Terminally ill	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.0	0.0
9 Unknown	4.5	0.0	6.7	6.3	0.0	3.6	3.6	4.6	5.8	2.6
Not Entered	27.3	24.0	6.7	12.5	11.1	18.8	18.0	20.5	18.3	13.0
All Amputation of limb	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

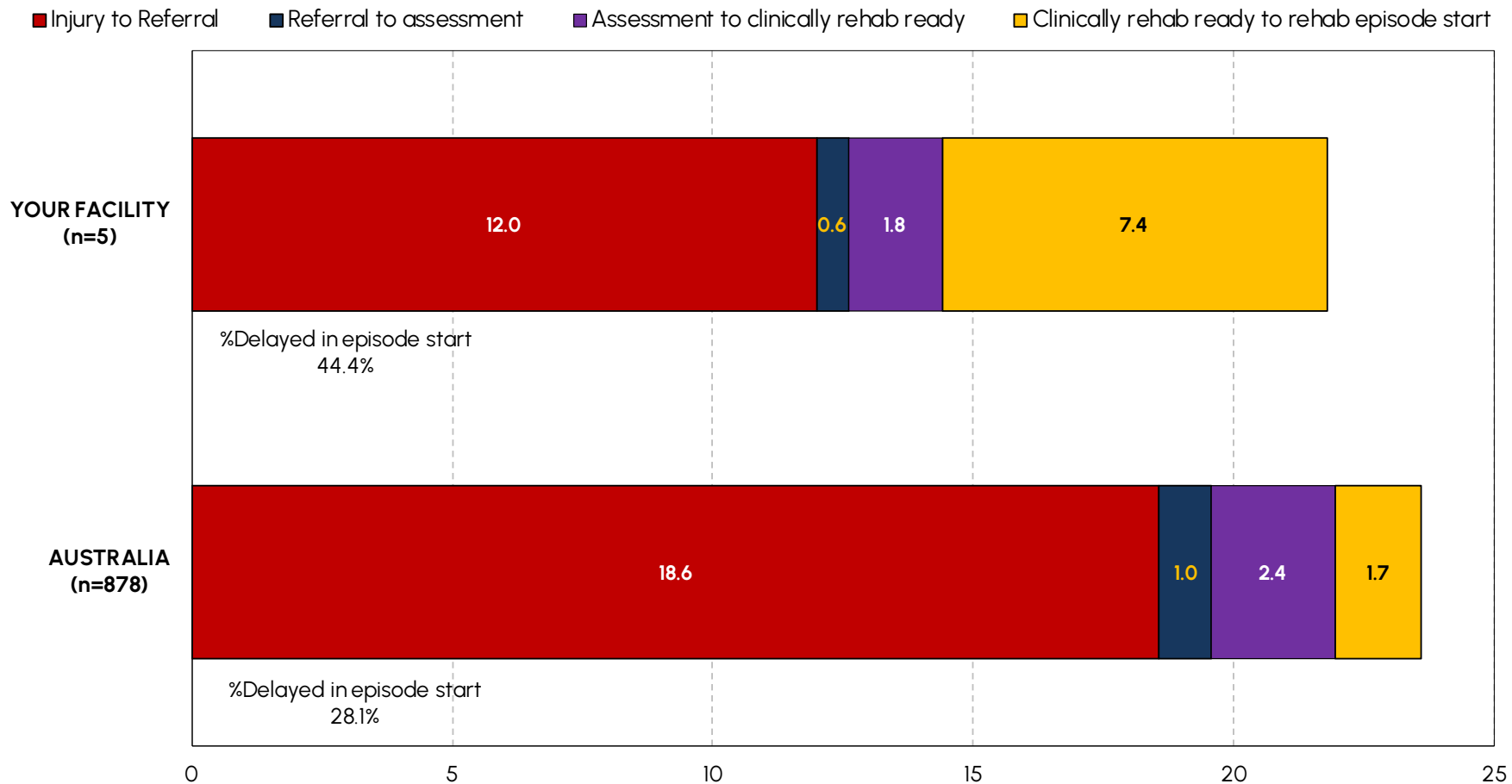
Days from injury to episode start with an acute admission by AN-SNAP class



*No data provided when less than 5 episodes have dates

NOTE: Includes first admissions where all dates have been entered

Days from referral to rehabilitation episode start

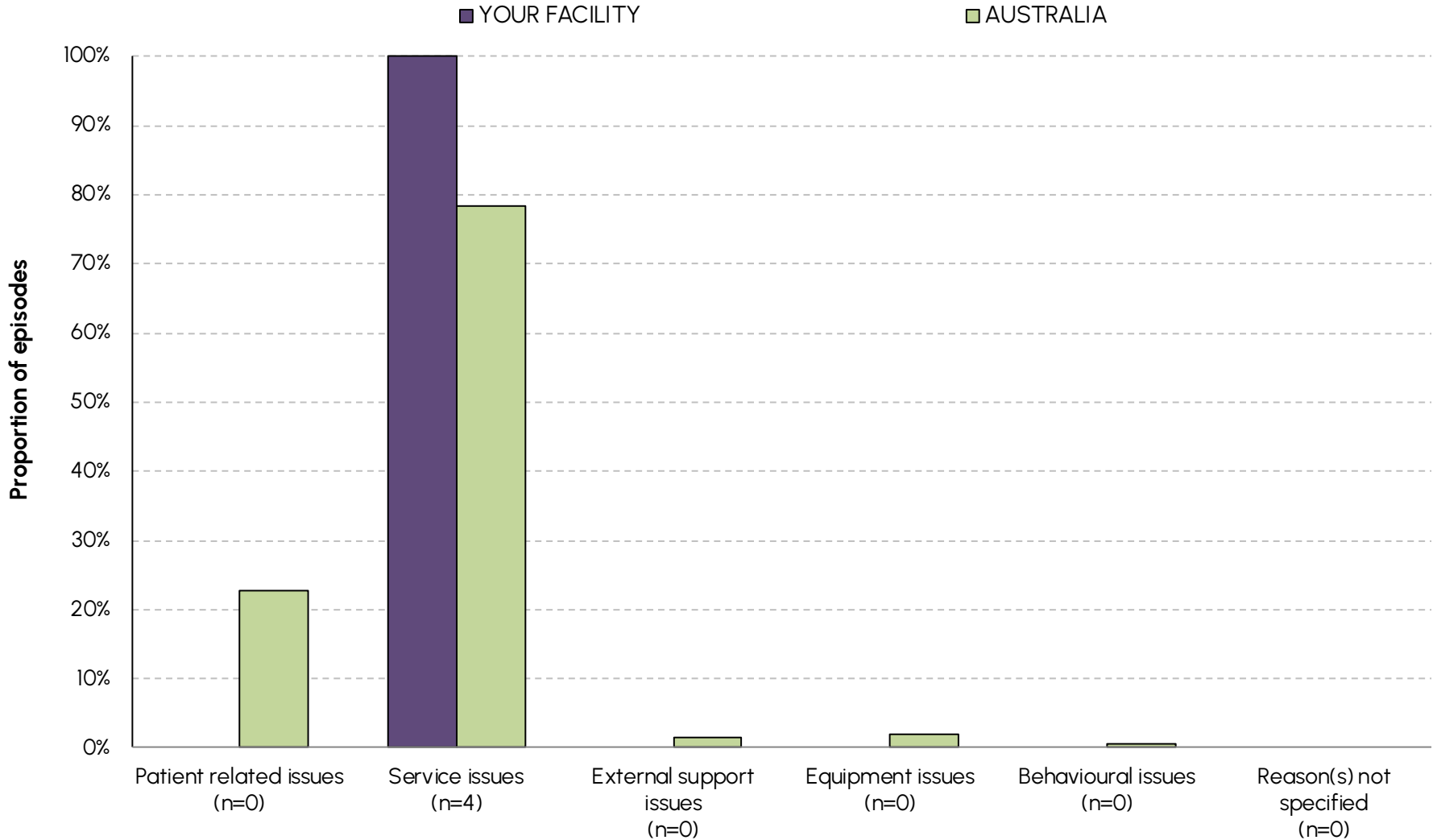


*No data provided when less than 5 episodes have dates

Mean number of days between dates

NOTE: Includes first admissions where all dates have been entered

Type of delay in episode start



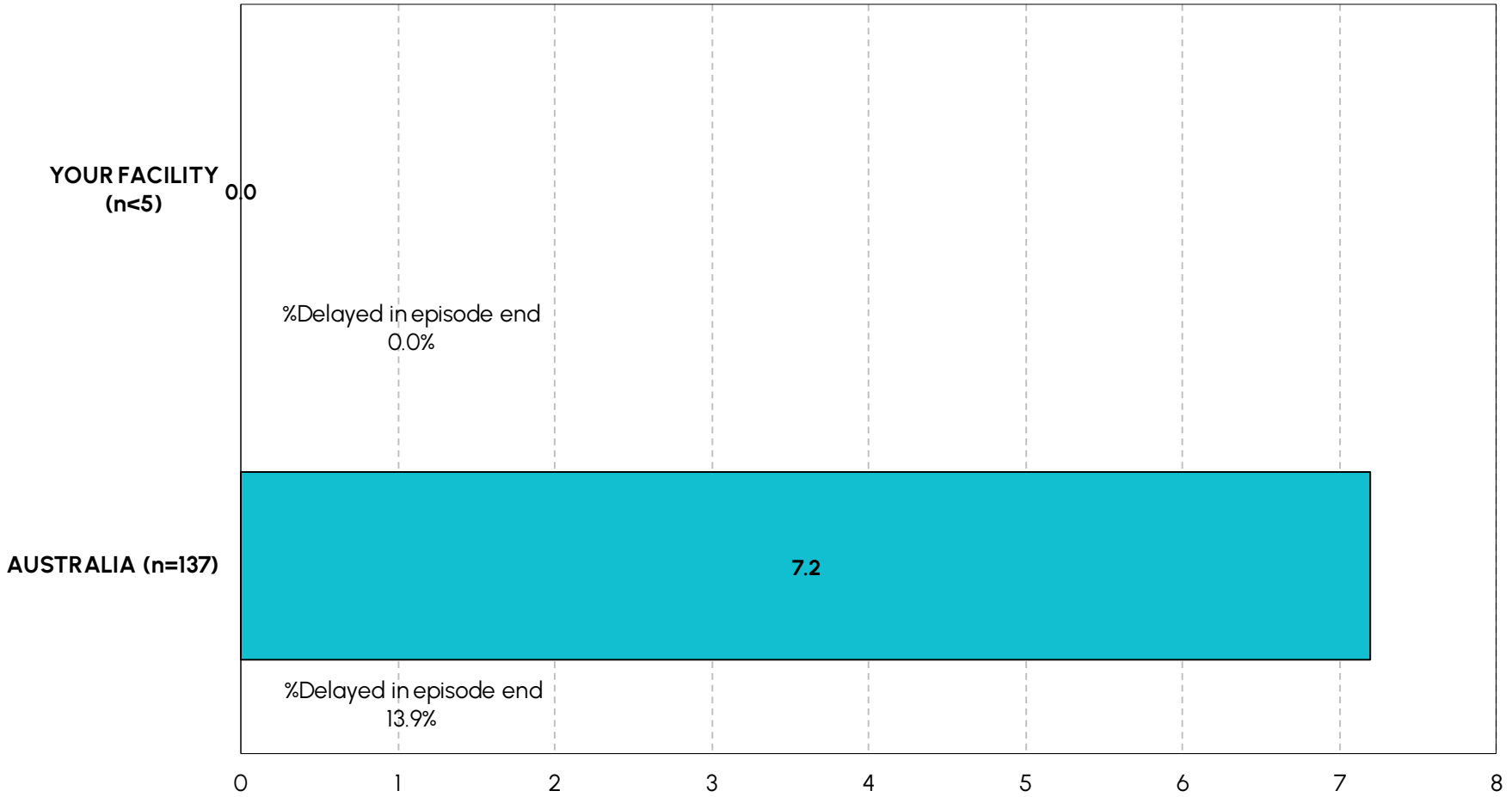
Delays in episode start

	YOUR FACILITY		AUSTRALIA	
	No.	%	No.	%
Delay in episode start				
No delay	5	55.6	1,022	71.9
Delay in episode start	4	44.4	399	28.1
Missing	0		53	
All episodes	9	100.0	1,474	100.0

	YOUR FACILITY		AUSTRALIA	
	No.	%	No.	%
Reasons for delay in episode start				
Patient related issues	0	0.0	91	22.8
Service issues	4	100.0	313	78.4
External support issues	0	0.0	6	1.5
Equipment issues	0	0.0	8	2.0
Behavioural issues	0	0.0	2	0.5
Reason(s) not specified	0	0.0	0	0.0

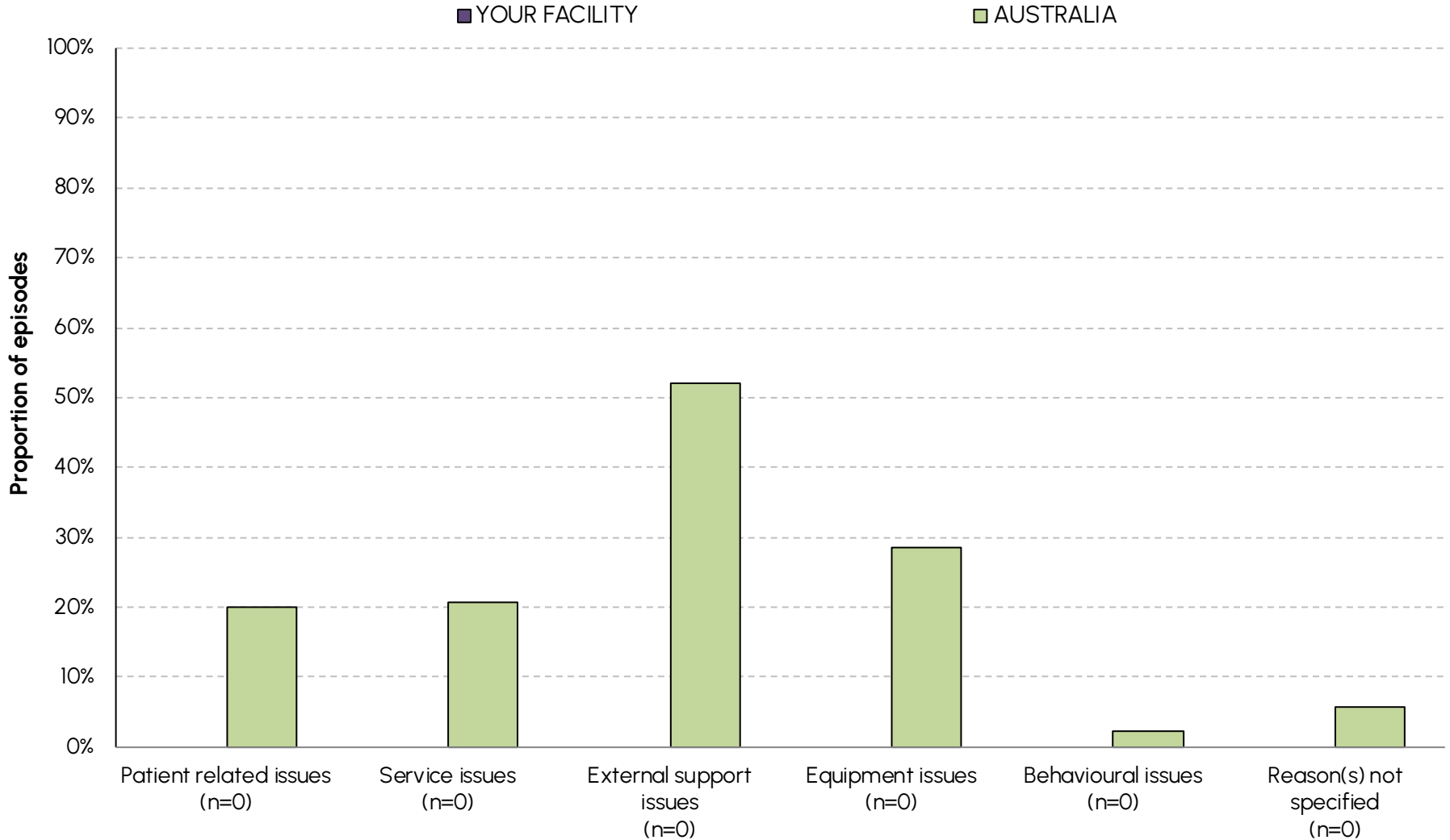
Days from clinically ready to discharge

■ Community to episode end (where a delay was reported)



*No data provided when less than 5 episodes have dates
 NOTE: Includes completed episodes with a delay in discharge

Type of delay in episode end



NOTE: Includes completed episodes only

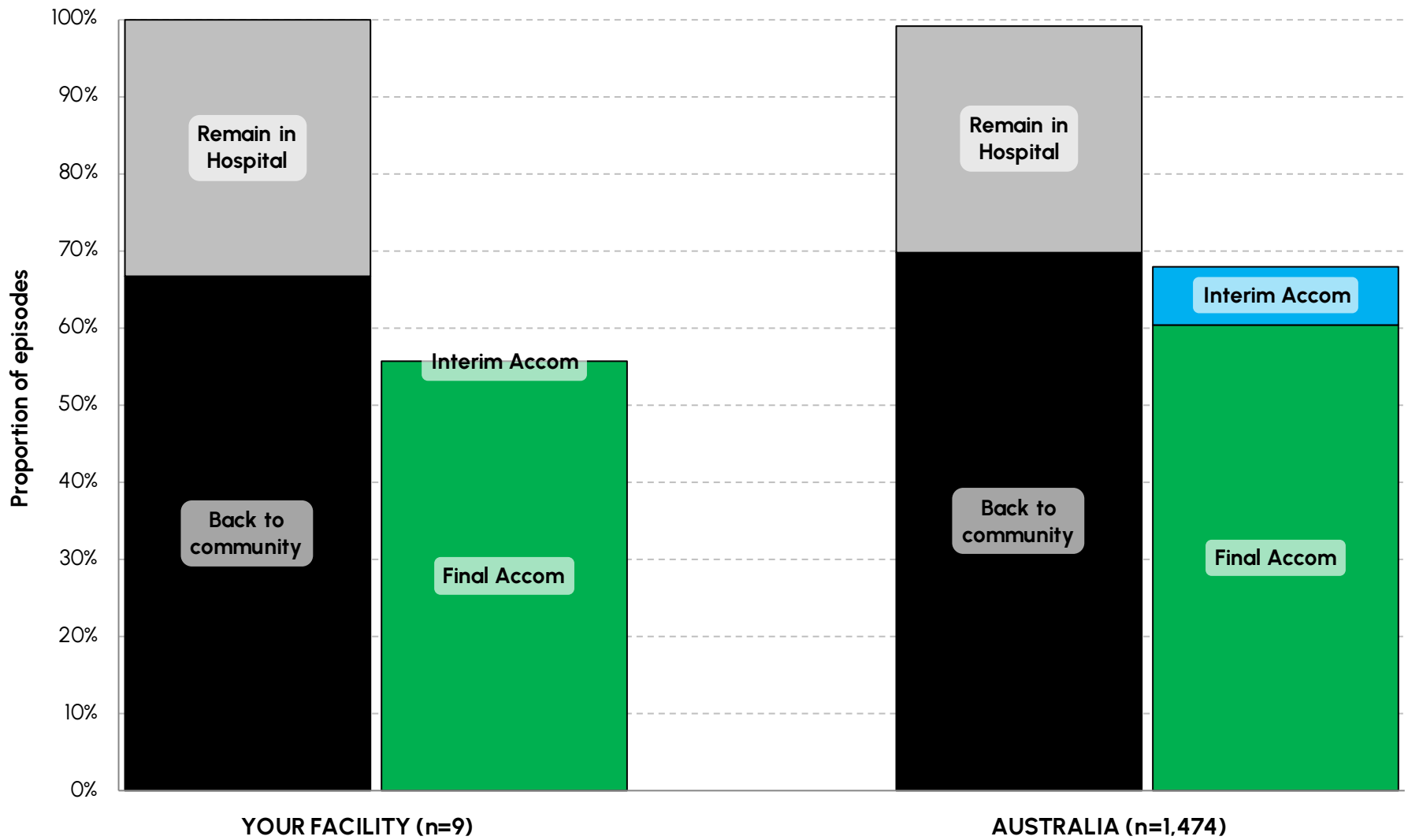
Delays in episode end

Delay in episode end	YOUR FACILITY		AUSTRALIA	
	No.	%	No.	%
No delay	5	100.0	869	86.1
Delay in episode end	0	0.0	140	13.9
Missing	0		17	
All episodes	5	100.0	1,026	100.0

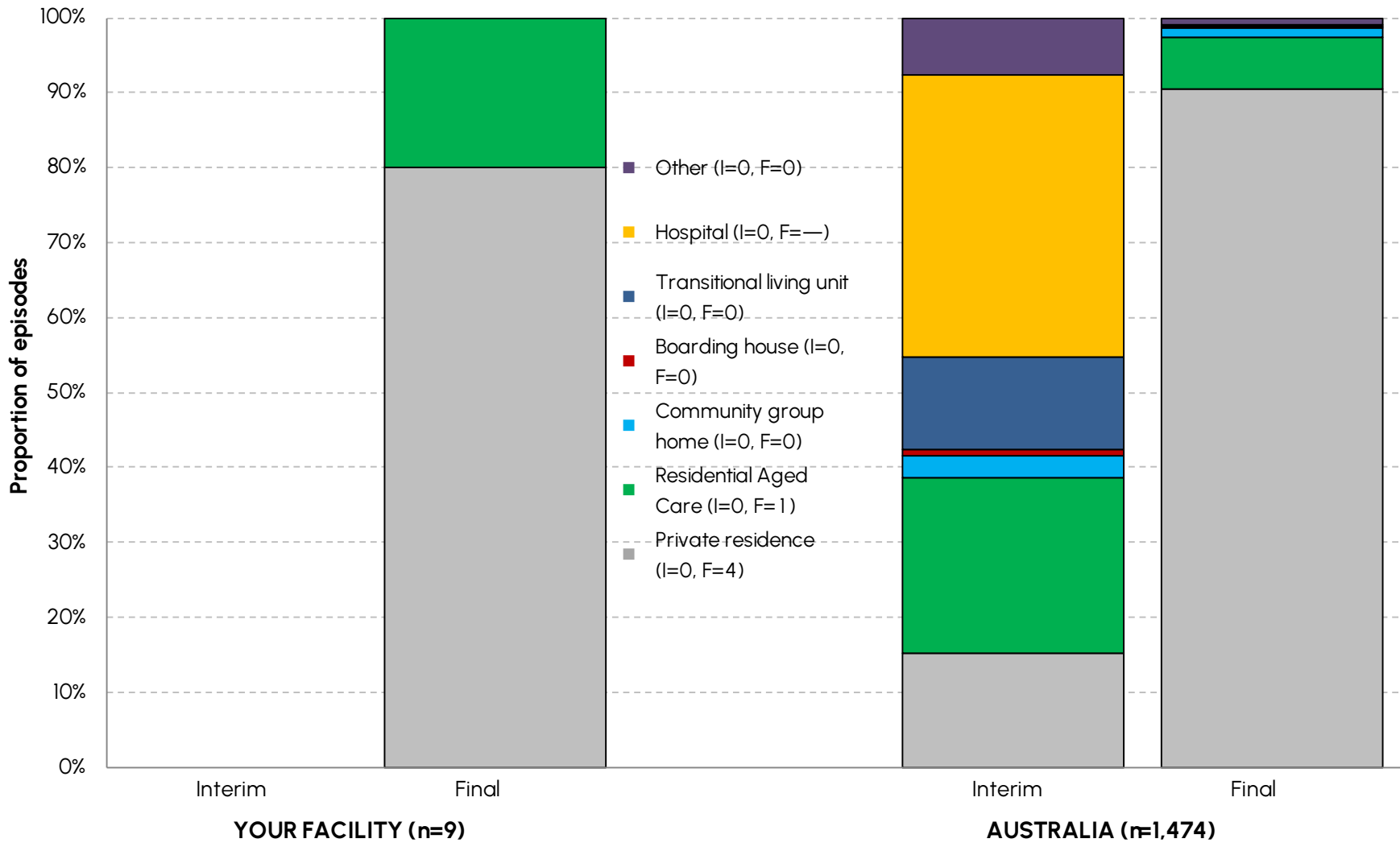
Reasons for delay in episode end	YOUR FACILITY		AUSTRALIA	
	No.	%	No.	%
Patient related issues	0	—	28	20.0
Service issues	0	—	29	20.7
External support issues	0	—	73	52.1
Equipment issues	0	—	40	28.6
Behavioural issues	0	—	3	2.1
Reason(s) not specified	0	—	8	5.7

NOTE: Includes completed episodes only.

Discharge destination



Interim and final accommodation post discharge



NOTE: Includes only those episodes with mode of episode end equal to either final or interim accommodation

Interim and final accommodation post discharge

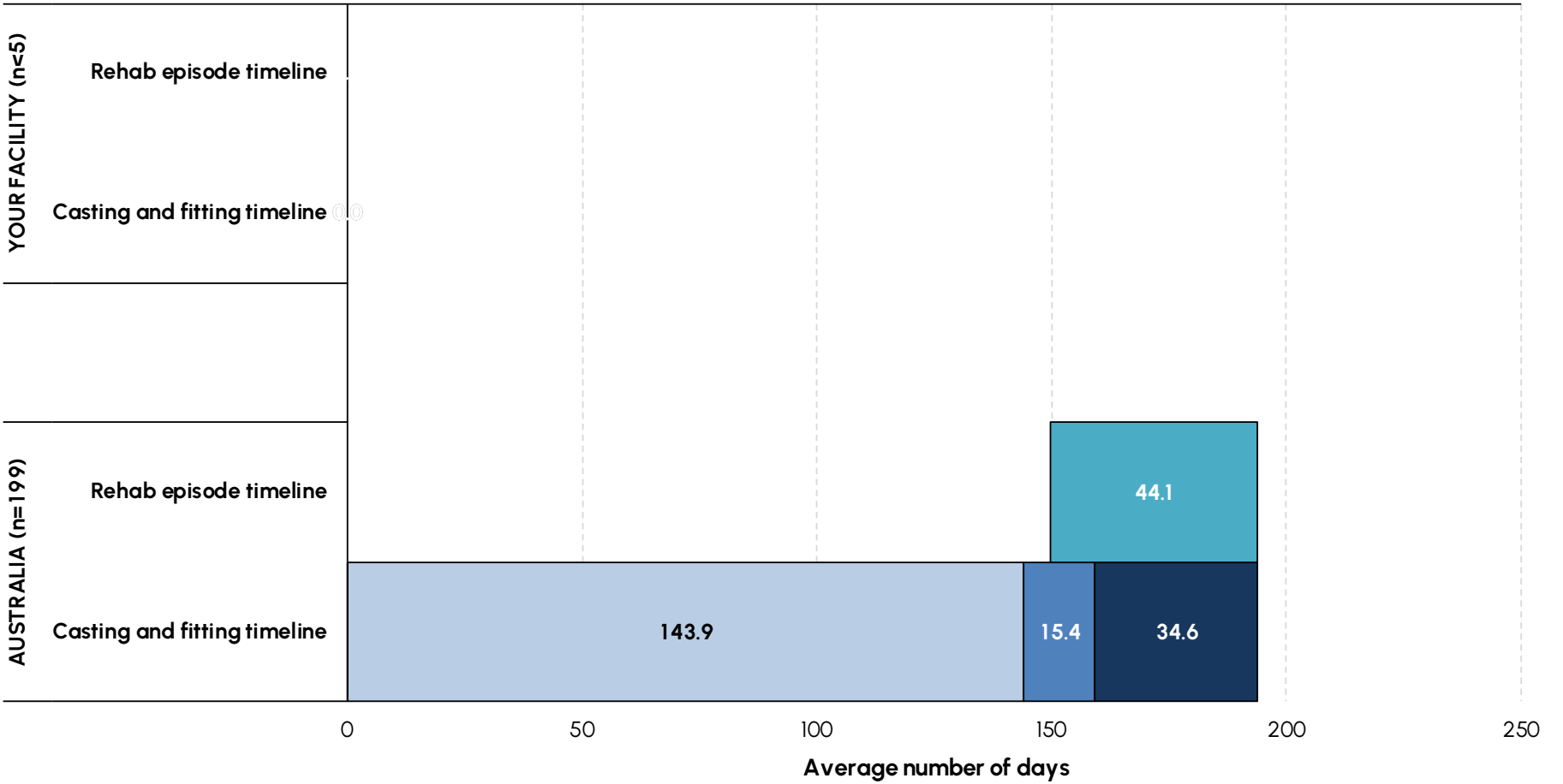
Accommodation	YOUR FACILITY				AUSTRALIA			
	Interim	(%)	Final	(%)	Interim	(%)	Final	(%)
Private residence	0	—	4	(80.0%)	16	(15.1%)	853	(90.5%)
Residential Aged Care	0	—	1	(20.0%)	25	(23.6%)	66	(7.0%)
Community group home	0	—	0	(0.0%)	3	(2.8%)	12	(1.3%)
Boarding house	0	—	0	(0.0%)	1	(0.9%)	2	(0.2%)
Transitional living unit	0	—	0	(0.0%)	13	(12.3%)	1	(0.1%)
Hospital	0	—	—		40	(37.7%)	—	
Other	0	—	0	(0.0%)	8	(7.5%)	9	(1.0%)
Missing/Unknown	0		0		5		58	
All episodes	0	(100.0)	5	(100.0)	111	(100.0)	1,001	(100.0)

NOTE: Includes only those episodes with mode of episode end equal to either final or interim accommodation

Casting and fitting timeline

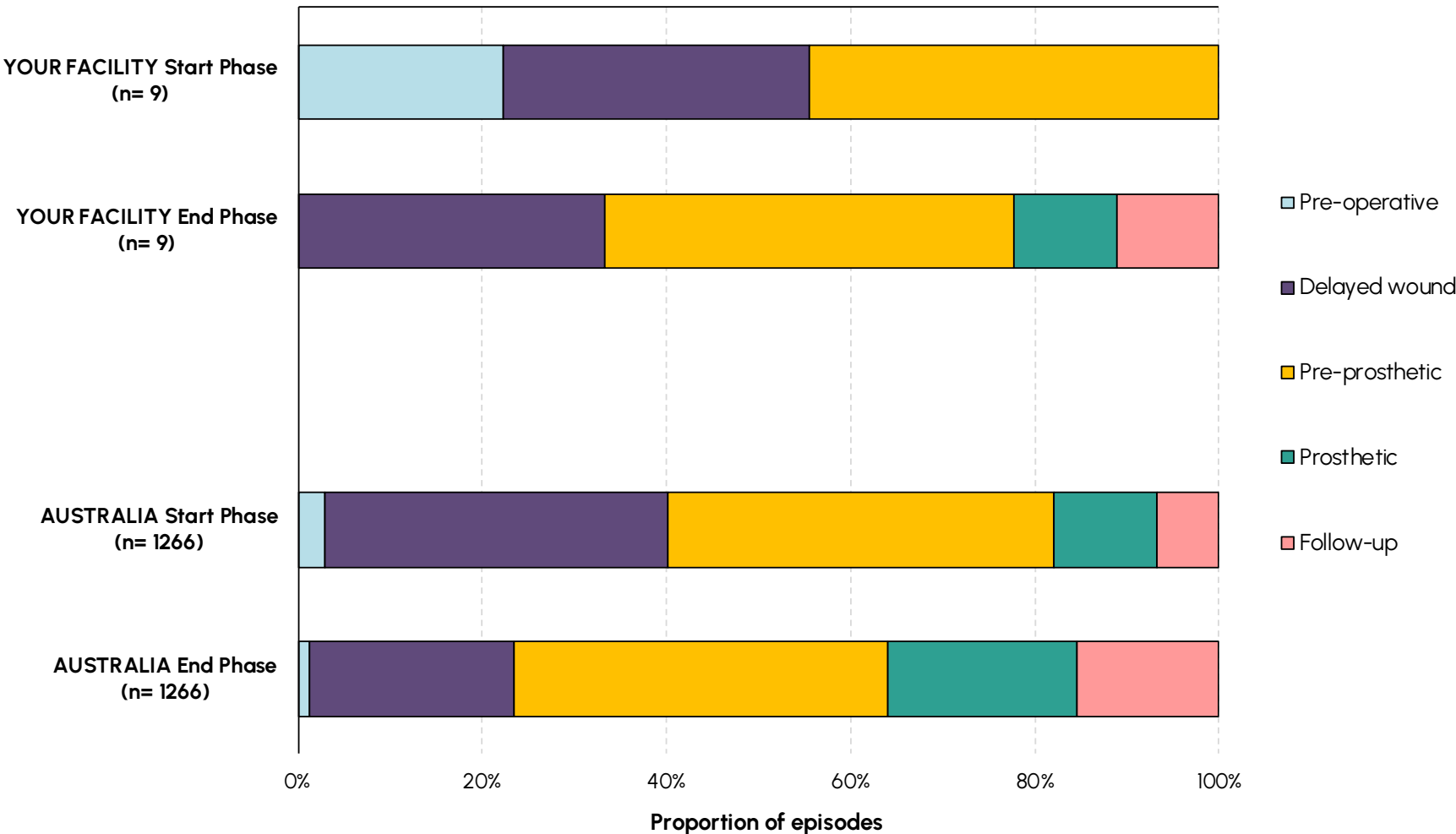


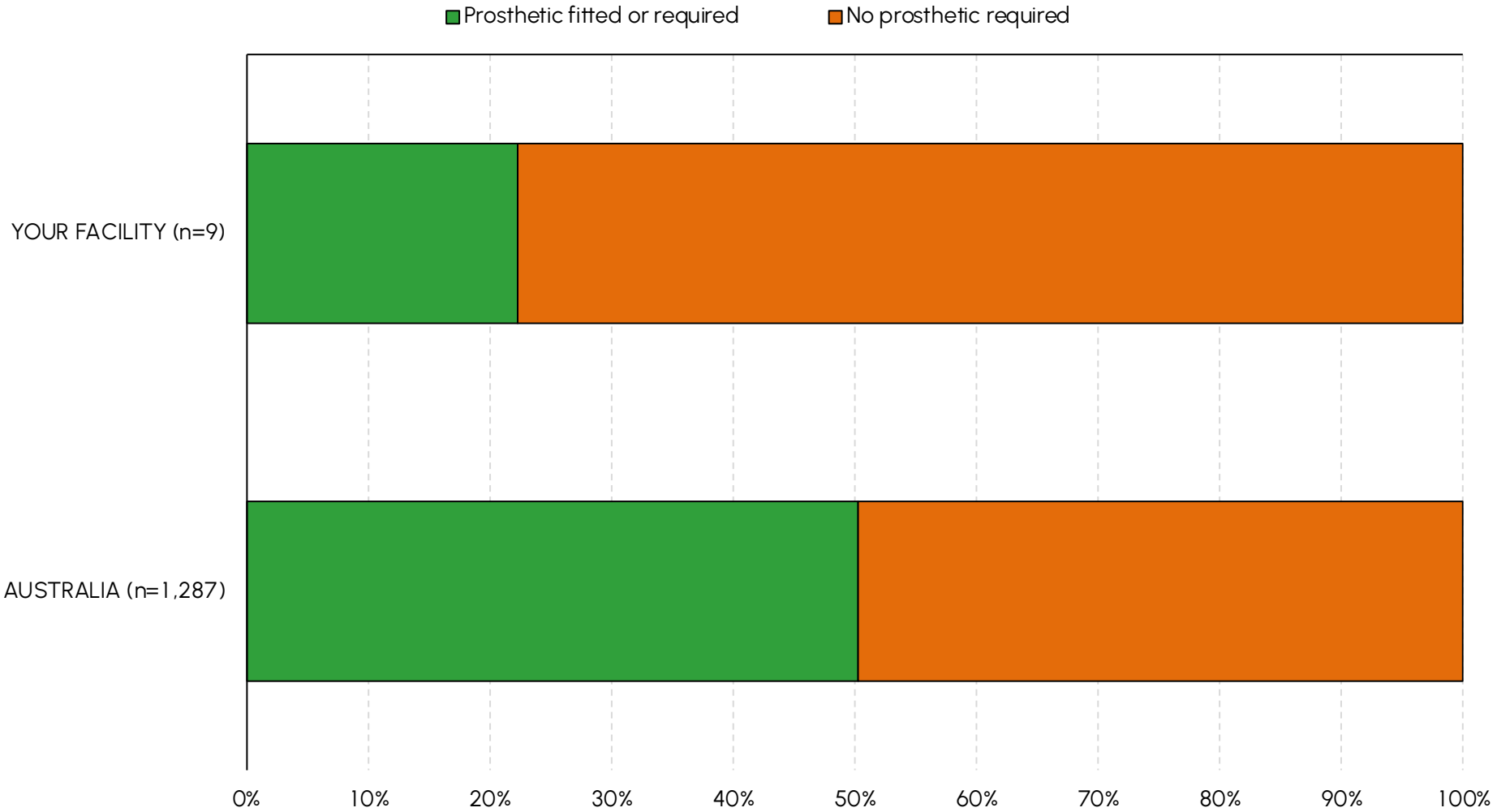
■ Injury to Casting
 ■ Casting to First Fitting
 ■ First Fitting to Episode End
 ■ Episode start to episode end



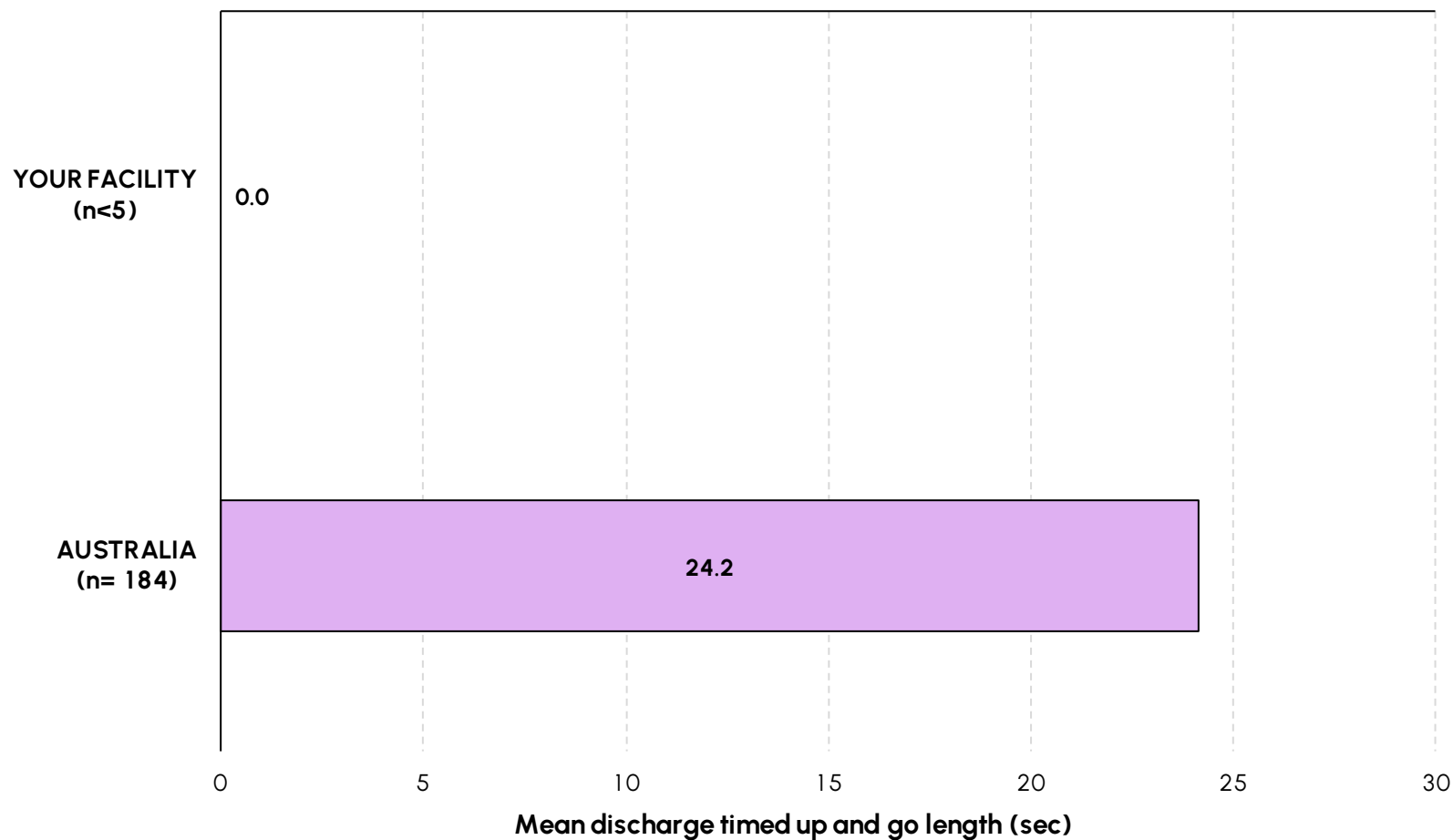
NOTE: Only includes episodes with valid injury date, casting date, first fitting date, episode start date and episode end date

Start and end phase proportions

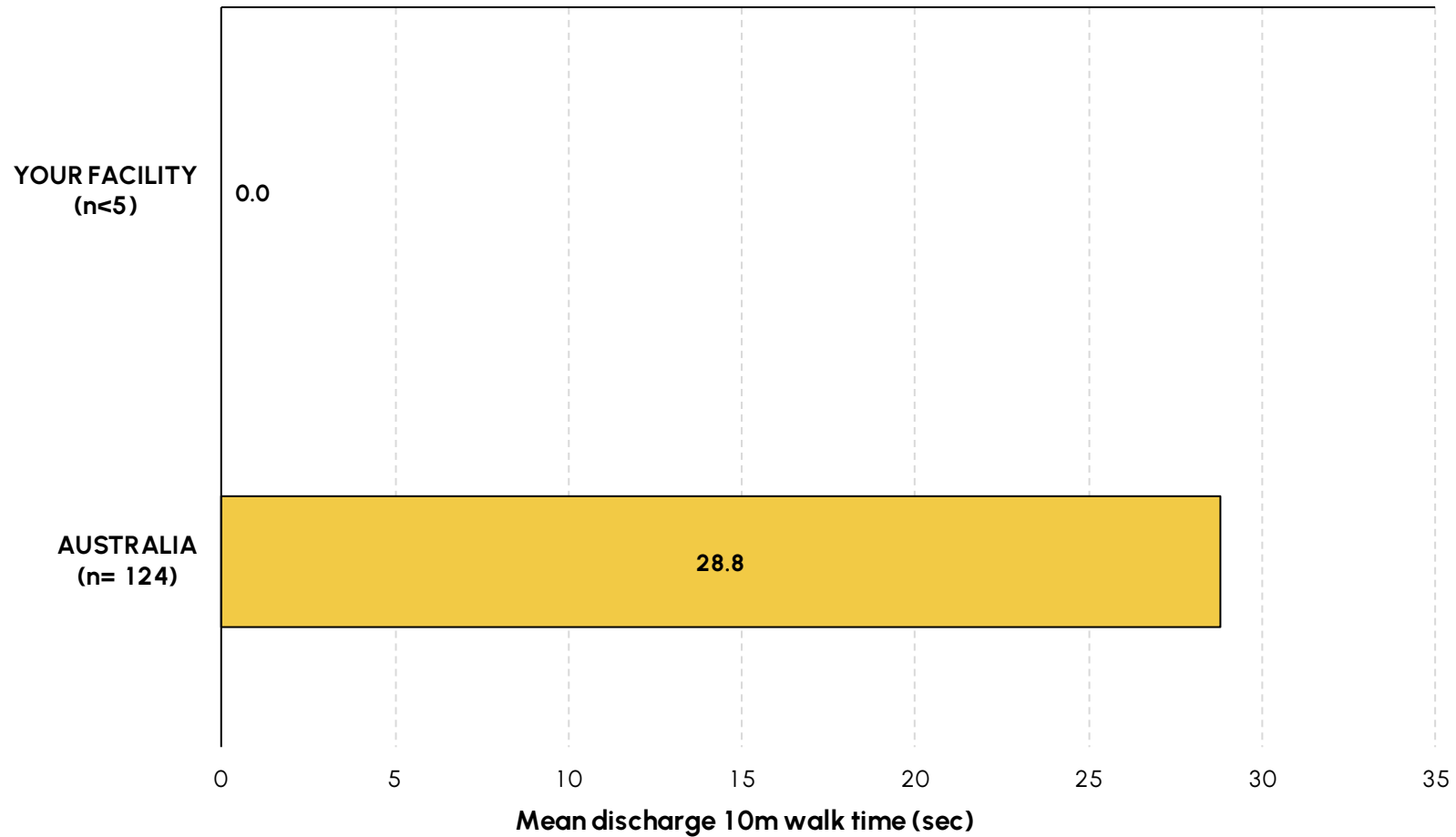




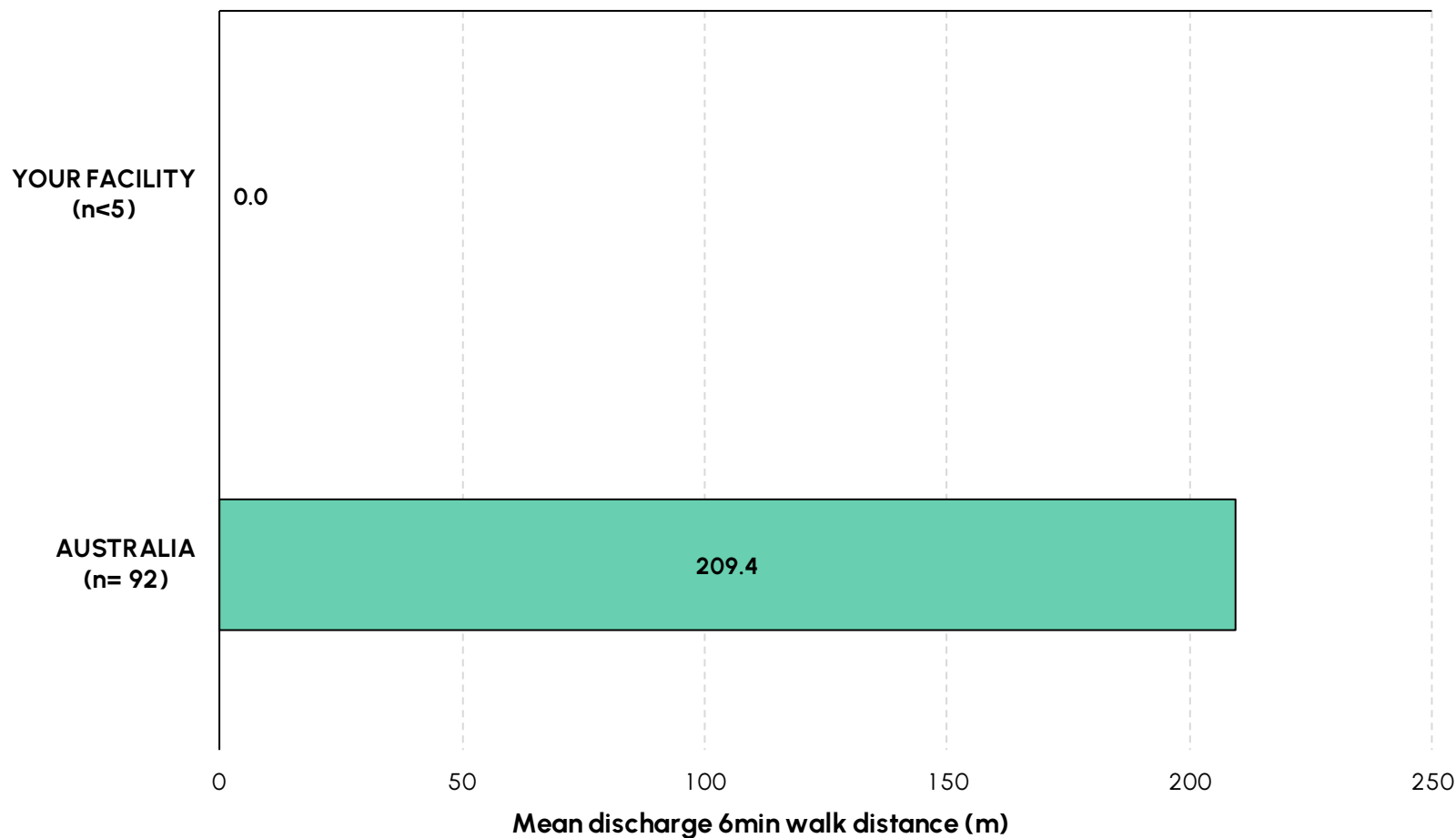
Timed up and go



10 metre walk test



6 minute walk test



AN-SNAP class

The Australian National Sub-Acute and Non-Acute Patient Classification (AN-SNAP) is a casemix classification for sub-acute and non-acute care provided in a variety of treatment settings. Version 5, introduced in July 2022 and used in these reports, uses the episode's impairment, age, weighted FIM motor admission score and FIM cognition score to determine which of 48 inpatient (admitted overnight adult) rehabilitation classes the episode should be assigned to.

Between AN-SNAP V4 and V5 there have been some minor refinements to the positioning of age and FIM score splits, and minor revisions to the impairment-specific weights used for the FIM item scores in the calculation of a motor score; orthopaedic replacement classes (lost in Version 4) have returned and brain injury classes are now split first on cognition FIM scores and second on motor FIM scores. Refer Appendix 3 for the full list of classes and the section Impairment specific weighted FIM scores below for more detail about how the items are weighted. For more information about AN-SNAP class V5 please refer to the AROC website.

AROC

The Australasian Rehabilitation Outcomes Centre (AROC) is the Australian and New Zealand rehabilitation medicine **integrated outcomes centre** that collects rehabilitation outcome measures at point-of-care from both private and public rehabilitation services across both countries. Established in 2002 it is a joint initiative of the Australasian rehabilitation sector (providers, payers, regulators and consumers) and current membership encompasses close to 100% of all Australian and New Zealand rehabilitation services, who routinely submit deidentified data to AROC for each rehabilitation episode, including information about demographics, process indicators and functional status.

Benchmark group

Benchmark groups are set nationally for all conditions except for those episodes recorded as brain injury or spinal cord injury (these include those with a major multi trauma involving brain and/or spinal cord injury). Benchmark groups for episodes of brain injury and spinal cord injury are set separately for traumatic and non-traumatic episodes by first admission episodes reported by specialist units binationally.

For Australian episodes and those episodes with a brain injury or spinal cord injury benchmarks are calculated each reporting period using all episodes submitted to AROC during the current reporting period. Commencing with the Calendar Year 2024 benchmark reports New Zealand episodes are benchmarked using the previously published CY2023 New Zealand benchmarks due to decreased episode volume.

Casemix-adjusted relative mean

A comparison of some statistics such as length of stay and FIM change is only possible if the groups being compared comprise similar episodes. The specific impairment, level of functional independence, age and other factors relating to the episode have an impact on these statistics. If, for example, your mean length of stay were different from the benchmark group, we could not tell if your episodes really were different or if the difference was merely due to the unique casemix.

To overcome this difficulty, it is possible to statistically control for casemix. This is achieved by adjusting measures such as length of stay and FIM change so that the comparison is only made between similar types of episodes.

In this report we have calculated casemix-adjusted relative mean length of stay and casemix-adjusted relative mean FIM change for completed episodes. To do this, we needed to know the LOS (or FIM change) and AN-SNAP class for each episode as well as the mean LOS (or FIM change) for the benchmark group for each AN-SNAP class. We then calculated the difference between each episode LOS (or FIM change) and the mean LOS (or FIM change) of the appropriate AN-SNAP class. We then took the mean of these differences to produce the casemix-adjusted relative mean. This may be easier to understand as a set of two equations illustrated below.

For each episode calculate:

LOSdiff = episode's LOS – mean LOS appropriate AN-SNAP class.

Casemix-adjusted relative mean = Sum of LOSdiff for all episodes divided by Number of episodes

A casemix-adjusted relative mean length of stay of, say, -2 days would indicate that, on average, your facility has a LOS of 2 days less than similar episodes in the benchmark group. A casemix-adjusted relative mean FIM change of, say, 4 would indicate that, on average, your facility improved 4 FIM points more than similar episodes in the benchmark group. It is important to consider both of these statistics together. For example, your episodes may have stayed longer than similar episodes in the benchmark group, but they may also have achieved a greater functional improvement.

Complete/incomplete episode

An episode is considered "complete" for the purpose of calculating outcome statistics in this report if (A) the mode of episode end was either 1 (discharged to usual accommodation) or 2 (discharged to interim accommodation) AND total FIM score at episode end was greater than 18, or (B) the mode of episode end was 7 (change of care type within sub-acute/non-acute care) AND length of stay greater than 6 days.

Confidence interval for a mean

To decide if a difference between your facility's mean score and the benchmark group's mean is statistically significant, look at the two confidence intervals. If they overlap, the difference is not likely to be statistically significant. For example your facility's mean onset to first admission may be 16 days while the benchmark group's mean is 12 days. These values are certainly different, but the difference may not be statistically significant. If the 95% confidence interval of your data were (13 – 19) (i.e. 13 days to 19 days) and that of the benchmark group data set were (10.5 – 13.5) (i.e. 10.5 days to 13.5 days), the difference is not likely to be statistically significant as the two confidence intervals overlap. Note that this is a conservative comparison and is not as accurate as a formal statistical test.

COVID-19

The immediate impact of COVID-19 on rehabilitation was a 12% decline in the number of rehabilitation episodes following temporary suspension of elective surgeries, ward re-assignments and closures, and fewer traumatic accidents. The ongoing impact of COVID-19 on rehabilitation from still reduced inpatient beds, increasing patient complexity and staffing issues has seen inpatient rehabilitation episodes decline 18% compared to the years prior to COVID.

The extent of the impact of COVID-19 on the demand for rehabilitation in both the inpatient or community rehabilitation is yet to be fully realised. To help measure the impact of COVID, and importantly long COVID, AROC added COVID specific impairment codes, comorbidity and complication codes to the AROC datasets effective July 2022. Appendix 2 lists the COVID impairment codes, which map to AN-SNAP V5 classes 5A91-5A93 & 5AZ3-5AZ4.

- **Guidelines for the collection and coding of COVID-19 AROC data** can be found at <https://documents.uow.edu.au/content/groups/public/@web/@chsd/@aroc/documents/doc/uow272916.pdf>
- **The AROC COVID Coding Decision Tree** can be found at <https://documents.uow.edu.au/content/groups/public/@web/@chsd/@aroc/documents/doc/uow272917.pdf>
- Updated **Data Collection Forms** can be found at [https://apps.ahsri.uow.edu.au/confluence/display/AD/Data Collection Forms](https://apps.ahsri.uow.edu.au/confluence/display/AD/Data+Collection+Forms)
- Services who do not have access to the new COVID codes are asked to identify patients who have had COVID-19 in the AROC data set services by entering the relevant **COVID-19 impairment code, comorbidity or complication** (as appropriate) in the patient comment field.

COVID-19 (cont.)

The potential sequelae of COVID-19 appear to be numerous, so the functional deficits of these patients that result in the need for rehabilitation can be quite varied. To enable comprehensive reporting of rehabilitation outcomes for these patients, the National COVID-19 rehabilitation adjunct data collection was created, in collaboration with the NSW Agency for Clinical Innovation's Rehabilitation Community of Practice.

The national COVID-19 rehabilitation adjunct data collection covers all care settings – in-reach, inpatient and ambulatory – and services do not need to be an AROC member to participate. The data collection is to be completed for **ALL** patients who have received a positive diagnosis of COVID-19 and are now participating in rehabilitation in any care setting (even if COVID codes have been used in the AROC data collection). Where possible and appropriate, the National COVID-19 rehabilitation adjunct data will be linked with the AROC inpatient and/or ambulatory data collections.

The National COVID-19 rehabilitation adjunct data collection is entered online at
<https://apps.ahsri.uow.edu.au/redcap/surveys/?s=DR4AE3FHAX>

All relevant data items must be known prior to commencing data entry as there is no save and resume function. For convenience a data collection form is provided as an optional mechanism to collect the data (available here
<https://apps.ahsri.uow.edu.au/downloads/CovidCollection.pdf>).

Data Concatenation

Increasingly some jurisdictions have introduced business rules around data collection that have resulted in episodes of rehabilitation being ended and then re-commenced a few days later. AROC definitions would record these as one episode with the period in between defined as a suspension of rehabilitation. Such business rules result in two (or more) episodes of rehabilitation being reported to AROC when only one full episode should be reported.

Whilst this happens much more frequently in some impairment groups (e.g. spinal cord injury & brain injury) it does impact all impairments to some degree. Reporting of multiple episodes impacts outcomes analysis, resulting in shorter than real length of stays and reduced FIM change being reported.

Concatenated episodes will have a revised Length of stay and FIM change (start details will be taken from the identified primary episode; end details from the identified final episode), and will also have a revised number of suspensions (being the sum across all concatenated 'submitted episodes' plus the number of breaks between 'submitted episodes') and a revised number of suspension days (being the sum across all concatenated 'submitted episodes' plus the sum of all days between 'submitted episodes').

Submitted episodes to AROC are identified for concatenation based on the following rules:

- Subsequent episodes MUST have same impairment code and be from same reporting facility with same MRN and DOB.
- Leading episode must be discharged into the hospital system with following episode being admitted from hospital system.
- Number of days between episodes being 0-14 days for spinal and 0-7 days for all other impairments.

To make it easier for AROC to identify episodes that should be concatenated in January 2014 the data item Mode of Episode Start had an additional code set value added: **9 = recommenced rehabilitation episode following suspension.**

Data completeness score

The data completeness score is the average percent reported for all AROC data items (including impairment specific items where relevant) with the exception of those items that are optional. Path, facility code, facility name, MRN and episode end date are not included as these fields are used to extract the data for reporting.

Functional Independence Measure (FIM)

The Functional Independence Measure (FIM) is used as a tool to assess the functional independence of patients at episode start and end.

- The **FIM motor score** is the sum of the scores obtained for the first thirteen (13) items in the FIM instrument. A higher FIM motor score indicates a greater level of functional independence in motor skills.
- The **FIM cognition score** is the sum of the scores obtained for the final five (5) items in the FIM instrument. A higher FIM cognition score indicates better cognitive function.

FIM change

The change in functional status from the beginning to the end of the episode is measured by the change in FIM score. This is calculated as the FIM score at the end of the episode minus the FIM score at the start of the episode. In some instances the change in total FIM score (the sum of items 1 to 18) is calculated. In other cases either the change in FIM motor score (the sum of items 1 to 13) or the change in FIM cognition score (the sum of items 14 to 18) is calculated.

A higher FIM score corresponds to higher level of function while a lower FIM score represents less functional independence. This means that a positive value for the change in FIM score indicates functional improvement during the episode. A negative value for the change in FIM score indicates a decline in functional independence during the episode.

FIM efficiency

The FIM efficiency indicates the average FIM improvement per day. This statistic is calculated as the mean FIM change divided by the mean length of stay (LOS).

Impairment-specific weighted FIM motor scores

AN-SNAP v5, like Version 4, uses impairment-specific weighted FIM motor scores in the inpatient (admitted overnight adult) rehabilitation classes. Weights reflect the relative impact of each item on the cost of caring for the rehabilitation patient. If an item has a weight of more than 1, it will have an impact on the cost of care that is more than average – a weight less than 1 implies the impact will be less than average. Within each impairment type, the weights are scaled to sum to 13 – thus both weighted and unweighted scores range from a minimum of 13 to a maximum of 91. Where impairments are grouped together in the classification, a single set of weights for that group has been derived. The exception is the FIM motor item stairs where all weights were set to 1.

Interquartile range (IQR)

The middle 50% — between the 25% percentile and the 75% percentile.

Length of stay (LOS)

The length of stay (LOS) of an episode is the number of days on which care has been provided. It is calculated as the end date minus the start date, minus the number of leave days during the episode.

Mean

The mean, or average, is a measure of the "centre" of your data. It is calculated by adding all data values and dividing by the number of values. The mean can be used to calculate a total. For example, if the mean length of stay were 21 days for a group of 30 episodes, the total number of bed days could be calculated as 21 multiplied by 30.

Mean or median - which to use?

The mean and the median are both measures of the "centre" of your data. For data that are symmetric about the mean (e.g. normally distributed data), the mean and the median will be close to each other. However they may have very different values for some data sets.

As an example, consider length of stay. Typically, most episodes within a class will have roughly the same length of stay. However, there will be a few episodes that are longer than the others and a smaller number that are very long. These longer lengths of stay have the effect of increasing the mean length of stay, but have little or no effect on the median.

If you want to know how long episodes in this class "typically" stay, you will probably be interested in the median as this gives you the middle value - half the episodes are longer and half the episodes are shorter. If, however, your interest is in allocation of resources and you want to know how long episodes stay on average, or if you want to get an idea of the total number of days of care provided to episodes in this class, you will need to look at the mean. (The total days can be calculated by multiplying the mean with the number in the class).

Median

The median provides the middle value of your data – half the values lie above it and half the values lie below. For example, if your median length of stay were 20 days, half of your episodes would have stayed for 20 days or less, while the other half would have stayed 20 days or longer. Note that the median, unlike the mean, cannot be used to calculate the total number of bed days.

Relative Functional Gain (RFG) and Relative Functional Efficiency (RFE)

FIM change measures the absolute difference between admission FIM and discharge FIM scores, i.e. client 1 had a 10 point improvement (admission 46 - discharge 56) and client 2 also had a ten point improvement (admission 116 - discharge 126). FIM change does not take into account the proportion of FIM change possible, i.e. client 1 improved 10 points out of possible 80 (126-46) and client 2 improved 10 points out of a possible 10 (126-116). So not all patients that improve 10 FIM points are the same. This proportion of FIM change possible is known as the Relative Functional Gain (RFG) and tries to take into account the amount of FIM gain possible. RFG is calculated as follows:

- If actual FIM change > 0 [improved]
 - **(Discharge FIM - Admission FIM)/(126 - Admission FIM)**
 - e.g. $(90 - 50)/(126-50) = 40/76 = 52.6\%$
- If actual FIM change < 0 [declined]
 - **(Discharge FIM - Admission FIM)/ (Admission FIM)**
 - e.g. $(90 - 100)/100 = -10/100 = -10\%$
- If actual FIM change = 0 [no change]
 - 0%

FIM efficiency measures the absolute difference between admission FIM and discharge FIM scores per day, without taking into account the proportion of FIM change possible. The Relative Functional Gain per day is known as the Relative Functional Efficiency (RFE), and is calculated as the RFG divided by the length of stay (LOS).

Submitted versus reporting episodes

Submitted episodes are those submitted to AROC either via direct data entry or upload through AROC Online Services. These episodes have not been concatenated.

The reporting data used by AROC in this report is made up of concatenated episodes. For most episodes there is no difference between the submitted episode and the one used for reporting.

Valid FIM

For an episode to have a Valid FIM flag it must be a complete episode and each of the 18 items on admission and discharge must have been answered with a valid response of 1-7. The Valid FIM flag is used in analysis which measures FIM scores as an outcome.

Valid LOS

For an episode to have a Valid LOS flag it must be a complete episode with a length of stay ranging between 1 and 500 days. The Valid LOS flag is used in analysis which measures LOS as an outcome.

Version 4 data set

The version 4 (V4) AROC dataset was introduced on 1 July 2012. V4 is designed as a bank of data items, combinations of which are used to describe 4 possible pathways of care (see the AROC website for more information about the different pathways). NOTE: This report utilises only Pathway 3 data (inpatient direct care).

Appendix 2: AROC Impairment Codes

STROKE

Haemorrhagic

- 1.11 Left body involvement
- 1.12 Right body involvement
- 1.13 Bilateral involvement
- 1.14 No paresis
- 1.19 Other haemorrhagic stroke

Ischaemic

- 1.21 Left body involvement (right brain)
- 1.22 Right body involvement (left brain)
- 1.23 Bilateral involvement
- 1.24 No paresis
- 1.29 Other ischaemic stroke

BRAIN DYSFUNCTION

Non-traumatic

- 2.11 Sub-arachnoid haemorrhage
- 2.12 Anoxic brain damage
- 2.13 Other non-traumatic brain dysfunction

Traumatic

- 2.21 Open injury
- 2.22 Closed injury

NEUROLOGICAL CONDITIONS

- 3.1 Multiple Sclerosis
- 3.2 Parkinsonism
- 3.3 Polyneuropathy
- 3.4 Guillian-Barre
- 3.5 Cerebral palsy
- 3.8 Neuromuscular disorders
- 3.9 Other neurological conditions

SPINAL CORD DYSFUNCTION

Non traumatic spinal cord dysfunction

- 4.111 Paraplegia, incomplete
- 4.112 Paraplegia, complete
- 4.1211 Quadriplegia, incomplete C1-4
- 4.1212 Quadriplegia, incomplete C5-8
- 4.1221 Quadriplegia, complete C1-4
- 4.1222 Quadriplegia, complete C5-8
- 4.13 Other non-traumatic spinal cord dysfunction

Traumatic spinal cord dysfunction

- 4.211 Paraplegia, incomplete
- 4.212 Paraplegia, complete
- 4.2211 Quadriplegia, incomplete C1-4
- 4.2212 Quadriplegia, incomplete C5-8
- 4.2221 Quadriplegia, complete C1-4
- 4.2222 Quadriplegia, complete C5-8
- 4.23 Other traumatic spinal cord dysfunction

AMPUTATION OF LIMB

Not resulting from trauma

- 5.11 Single upper above elbow
- 5.12 Single upper below elbow
- 5.13 Single lower above knee (includes through knee)
- 5.14 Single lower below knee
- 5.15 Double lower above knee (includes through knee)
- 5.16 Double lower above/below knee
- 5.17 Double lower below knee
- 5.18 Partial foot (single or double)
- 5.19 Other amputation not from trauma

AMPUTATION OF LIMB

Resulting from trauma

- 5.21 Single upper above elbow
- 5.22 Single upper below elbow
- 5.23 Single lower above knee (includes through knee)
- 5.24 Single lower below knee
- 5.25 Double lower above knee (includes through knee)
- 5.26 Double lower above/below knee
- 5.27 Double lower below knee
- 5.28 Partial foot (single or double)
- 5.29 Other amputation from trauma

ARTHRITIS

- 6.1 Rheumatoid arthritis
- 6.2 Osteoarthritis
- 6.9 Other arthritis

PAIN SYNDROMES

- 7.1 Neck pain
- 7.2 Back Pain
- 7.3 Extremity pain
- 7.4 Headache (includes migraine)
- 7.5 Multi-site pain
- 7.9 Other pain (includes abdo/chest wall)

Appendix 2: AROC Impairment Codes

ORTHOPAEDIC CONDITIONS

Fractures (includes dislocation)

- 8.111 Fracture of hip, unilateral (incl. #NOF)
- 8.112 Fracture of hip, bilateral (incl. #NOF)
- 8.12 Fracture of shaft of femur
- 8.13 Fracture of pelvis
- 8.141 Fracture of knee
- 8.142 Fracture of lower leg, ankle, foot
- 8.15 Fracture of upper limb
- 8.16 Fracture of spine
- 8.17 Fracture of multiple sites
- 8.19 Other orthopaedic fracture

Post Orthopaedic Surgery

- 8.211 Unilateral hip replacement
- 8.212 Bilateral hip replacement
- 8.221 Unilateral knee replacement
- 8.222 Bilateral knee replacement
- 8.231 Knee and hip replacement, same side
- 8.232 Knee and hip replacement, diff sides
- 8.24 Shoulder replacement
- 8.25 Post spinal surgery
- 8.26 Other orthopaedic surgery

Soft tissue injury

- 8.3 Soft tissue injury

CARDIAC

- 9.1 Following recent onset of new cardiac impairment
- 9.2 Chronic cardiac insufficiency
- 9.3 Heart and heart/lung transplant

PULMONARY

- 10.1 Chronic obstructive pulmonary disease
- 10.2 Lung transplant
- 10.9 Other pulmonary

BURNS

- 11 Burns

CONGENITAL DEFORMITIES

- 12.1 Spina bifida
- 12.9 Other congenital deformity

OTHER DISABLING IMPAIRMENTS

- 13.1 Lymphoedema
- 13.3 Conversion disorder
- 13.9 Other disabling impairments that cannot be classified into a specific group

MAJOR MULTIPLE TRAUMA

- 14.1 Brain + spinal cord injury
- 14.2 Brain + multiple fracture/amputation
- 14.3 Spinal cord + multi fracture/amputation
- 14.9 Other multiple trauma

DEVELOPMENTAL DISABILITIES

- 15.1 Developmental disabilities (excludes cerebral palsy)

RE-CONDITIONING/RESTORATIVE

- 16.1 Re-conditioning following surgery
- 16.2 Reconditioning following medical illness
- 16.3 Cancer rehabilitation

COVID-19 CONDITIONS

- 18.1 COVID-19 with pulmonary issues
- 18.2 COVID-19 with deconditioning
- 18.9 COVID-19 all other

Appendix 3: AN-SNAP V5 Overnight Rehabilitation Classes



Class	Description of AN-SNAP class
5AA1	Stroke, Weighted FIM Motor 63 - 91, FIM Cognition 30 - 35
5AA2	Stroke, Weighted FIM Motor 63 - 91, FIM Cognition 21 - 29
5AA3	Stroke, Weighted FIM Motor 63 - 91, FIM Cognition 5 - 20
5AA4	Stroke, Weighted FIM Motor 44 - 62, FIM Cognition 18 - 35
5AA5	Stroke, Weighted FIM Motor 44 - 62, FIM Cognition 5 - 17
5AA6	Stroke, Weighted FIM Motor 19 - 43, Age >= 80
5AA7	Stroke, Weighted FIM Motor 19 - 43, Age 67 - 79
5AA8	Stroke, Weighted FIM Motor 19 - 43 Age 18 - 66
5AB1	Brain dysfunction, FIM Cognition 27 - 35 Weighted FIM Motor 59 - 91
5AB2	Brain dysfunction, FIM Cognition 27 - 35 Weighted FIM Motor 19 - 58
5AB3	Brain dysfunction, FIM Cognition 19 - 26 Weighted FIM Motor 50 - 91
5AB4	Brain dysfunction, FIM Cognition 19 - 26 Weighted FIM Motor 19 - 49
5AB5	Brain dysfunction, FIM Cognition 5 - 18 Weighted FIM Motor 39 - 91
5AB6	Brain dysfunction, FIM Cognition 5 - 18 Weighted FIM Motor 19 - 38
5AC1	Neurological conditions, Weighted FIM Motor 70 - 91
5AC2	Neurological conditions, Weighted FIM Motor 50 - 69
5AC3	Neurological conditions, Weighted FIM Motor 19 - 49
5AD1	Spinal cord dysfunction, Weighted FIM Motor 55 - 91
5AD2	Spinal cord dysfunction, Weighted FIM Motor 37 - 54
5AD3	Spinal cord dysfunction, Weighted FIM Motor 19 - 36
5AE1	Amputation of limb, Weighted FIM Motor 19-91
5AH1	Orthopaedic conditions, fractures, Weighted FIM Motor 48 - 91, FIM Cognition 33 - 35
5AH2	Orthopaedic conditions, fractures, Weighted FIM Motor 48 - 91, FIM Cognition 21 - 32
5AH3	Orthopaedic conditions, fractures, Weighted FIM Motor 48 - 91, FIM Cognition 5 - 20

Class	Description of AN-SNAP class
5AH4	Orthopaedic conditions, fractures, Weighted FIM Motor 19 - 47
5A41	Orthopaedic conditions, replacement (knee, hip, shoulder), Weighted FIM Motor 61 - 91
5A42	Orthopaedic conditions, replacement (knee, hip, shoulder), Weighted FIM Motor 45 - 60
5A43	Orthopaedic conditions, replacement (knee, hip, shoulder), Weighted FIM Motor 19 - 44
5A21	Orthopaedic conditions, all other, Weighted FIM Motor 57 - 91
5A22	Orthopaedic conditions, all other, Weighted FIM Motor 41 - 56
5A23	Orthopaedic conditions, all other, Weighted FIM Motor 19 - 40
5A31	Cardiac, Pain syndromes, and Pulmonary, Weighted FIM Motor 66 - 91
5A32	Cardiac, Pain syndromes, and Pulmonary, Weighted FIM Motor 38 - 65
5A33	Cardiac, Pain syndromes, and Pulmonary, Weighted FIM Motor 19 - 37
5AP1	Major Multiple Trauma, Weighted FIM Motor 51 - 91
5AP2	Major Multiple Trauma, Weighted FIM Motor 19 - 50
5AR1	Reconditioning, Weighted FIM Motor 64 - 91, FIM Cognition 29 - 35
5AR2	Reconditioning, Weighted FIM Motor 64 - 91, FIM Cognition 5 - 28
5AR3	Reconditioning, Weighted FIM Motor 48 - 63, FIM Cognition 19 - 35
5AR4	Reconditioning, Weighted FIM Motor 48 - 63, FIM Cognition 5 - 18
5AR5	Reconditioning, Weighted FIM Motor 19 - 47
5A91	All other impairments, Weighted FIM Motor 61 - 91
5A92	All other impairments, Weighted FIM Motor 42 - 60
5A93	All other impairments, Weighted FIM Motor 19 - 41
5AZ1	Weighted FIM Motor score 13-18, Brain, Spine, MMT, Burns, Age >= 59
5AZ2	Weighted FIM Motor score 13-18, Brain, Spine, MMT, Burns, Age 18 - 58
5AZ3	Weighted FIM Motor score 13-18, All other impairments, Age >= 79
5AZ4	Weighted FIM Motor score 13-18, All other impairments, Age 18 - 78

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