

The AROC Annual Report: the state of rehabilitation in Australia 2005

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Abstract

This is the inaugural comprehensive annual report that describes patients discharged from subacute inpatient rehabilitation programs provided by facilities that are members of the Australasian Rehabilitation Outcomes Centre (AROC). Collection of a standardised dataset has enabled the provision of a national benchmarking system, which in turn has led to an improved understanding of factors that influence rehabilitation outcomes and costs, and therefore performance of the sector.

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THIS REPORT DESCRIBES patients discharged from subacute inpatient rehabilitation programs provided by facilities that are members of the Australasian Rehabilitation Outcomes Centre (AROC).¹ Rehabilitation medicine is that part of the science of medicine involved with:

- the prevention and reduction of functional loss;
- the limitation of restrictions of activity and participation arising from impairments;
- the management of disability in physical, psychosocial and vocational dimensions, and improvement of function.

A rehabilitation medicine service aims to provide people with loss of function or ability due to injury or disease with the highest possible level of independence (physically, psychologically, socially and economically). This is achieved through a combined and coordinated use of medical, nursing and allied health professional

skills. It involves individual assessment, treatment, regular review, discharge planning, community integration and follow up. Some common rehabilitation terms are defined in Box 1.

Rehabilitation will continue to play an increasingly important role in the provision of a continuum of care to an increasingly ageing, but well educated, community. By definition, rehabilitation is about functional independence, about people being able to return to their home and look after themselves, rather than becoming a burden on an increasingly stretched social services and health care system.

Australasian Rehabilitation Outcomes Centre (AROC)

AROC is a joint initiative of the Australian rehabilitation sector (providers, payers, regulators and consumers). The Australasian Faculty of Rehabilitation Medicine (AFRM) is the auspice body and data custodian. The Centre for Health Service Development (CHSD) is the data manager and responsible for the day-to-day operations of AROC.

AROC was established in July 2002, with the prime objective to collect standardised data for each and every rehabilitation episode of care. Collection of these data has enabled the provision of a national benchmarking system, which in turn has led to an improved understanding of factors that influence rehabilitation outcomes and costs, and therefore performance of the sector. AROC provides biannual reports to member facilities, analysing their data and comparing them to the appropriate benchmark group data and the national data. Current benchmark groups are public sector and private sector, although this is expected to expand to also include impairments, eg, brain injury,

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I Definitions

The rehabilitation sector uses some terms that may require some explanation.

Debility is an impairment group that includes patients with generalised deconditioning not attributable to any other AROC impairment code.

Onset date – rehabilitation is indicated at various times after the onset of trauma or disease. This item collects the date at which the impairment started affecting the patient's function. For example, arthritis has an insidious onset and the time between onset and the requirement for rehabilitation may be prolonged. An example of a short period between onset and rehabilitation is stroke, where rehabilitation is often indicated to occur once the patient is stable and ready to be discharged from the acute care setting. In this case the onset date is the date of the stroke.

Interruption days refers to any days on which a patient's rehabilitation program has been temporarily suspended, due to a medical condition that requires the patient to receive acute care.

Leave days refer to those days a patient leaves the facility, usually over a weekend, and usually to return home, to determine if they are ready and able to be discharged to this setting.

Length of stay (LOS) – in rehabilitation the 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.

FIM improvement (positive or negative) refers to the difference between the FIM admission score and the FIM discharge score, and reflects the degree of functional improvement achieved by the patient during their rehabilitation program.

FIM efficiency is the FIM improvement score divided by the total length of stay of the patient; it is a measure of functional improvement by unit of time.

Discharge destination is an important outcome measure in rehabilitation, with the distinction being made between those patients discharged to a form of accommodation that allows them to be independent (either with or without support) and those patients discharged from a rehabilitation episode but who remain in the health care system.

spinal cord injury, as well as other relevant groupings.

At the end of 2005, AROC membership covered 85% of all rehabilitation beds (public and private) in Australia, with 110 of the then 130 rehabilitation units in Australia submitting data covering more than 45 000 episodes for the year. In 2005, AROC had incomplete coverage of public rehabilitation units in Queensland, Victoria and Tasmania. Since then AROC coverage has grown so that currently 130 of the 145 rehabilitation units in Australia are members of AROC, and recruitment of New Zealand facilities has begun. In total, the AROC database comprises data describing some 300 000 episodes of care, and is thus a rich source of information.

AROC dataset

In 2005, AROC members submitted data using the AROC Version 2 Clinical Data Set, which was developed in September 2003. The dataset includes demographic, funding, episode, clinical, and outcome items. Demographic data items include date of birth, gender, indigenous status, residential postcode and employment status. Funding items identify the funding source for the episode of care. Episode items include admission date, discharge date, mode of episode start and mode of episode end, leave days, and program interruptions. Clinical items include type of accommodation and living arrangements before and after the episode of care, date of impairment onset, comorbidities present that may affect the program of rehabilitation, and the AROC impairment code, which describes the reason for rehabilitation. Outcome items include the admission and discharge Functional Independence Measure (FIM) scores. The dataset also includes sufficient information for each episode to be categorised into an AN-SNAP class, the subacute equivalent of casemix.²

Data audit process

All data received by AROC are screened for missing data, errors and inconsistencies. An

2 The FIM items and scoring levels

The FIM Items

Motor

Self-care	Sphincter control
Eating	Bladder management
Grooming	Bowel management
Dressing-upper	Transfers
Dressing-lower	Bed/chair/wheelchair
Bathing	Toilet
Toileting	Tub/shower
	Locomotion
	Walk/wheelchair
	Stairs

Cognitive

Communication
Comprehension
Expression
Social cognition
Social interaction
Problem solving
Memory

FIM Scoring Levels

7	Complete Independence (timely, safely)	No helper
6	Modified Independence (device)	
5	Supervision (set-up, cueing, coaxing)	
4	Minimal Assistance (Subject = 75%+)	
3	Moderate Assistance (Subject = 50% -74%)	Helper
2	Maximal Assistance (Subject = 25% - 49%)	
1	Total Assistance (Subject < 25%)	

audit report is sent to each facility on receipt of data with a request that highlighted episodes be reviewed, corrected if necessary and resubmitted to AROC. Staff using the FIM are required to be trained in the use of the tool and must sit a credentialling exam every 2 years to ensure consistency of reporting. These processes maximise the quality of the data in the AROC database.

Exclusions

In creating the dataset from which this report has been developed the following exclusion criteria have been applied:

- non-inpatient episodes are excluded from all analysis
- tables reporting length of stay (LOS) exclude those episodes where LOS is greater than 90 days or the patient died
- tables reporting FIM scores or FIM change exclude those episodes with any invalid or missing FIM item scores or the patient died
- tables with sector or national level data do not give details where the number of episodes is less than five
- missing data are excluded from analysis relevant to that field only.

Functional independence measure (FIM™)

The FIM instrument (Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities Inc, State University of New York, Buffalo, USA) measures the functional

ability of individuals. It is used to measure functional change and the burden of care at discharge. Studies have found the psychometric properties of the FIM instrument to be reliable and valid and with good predictive validity of FIM scores by outcome variables such as length of stay.³⁻⁹

AROC holds the territory license for the use of the FIM (and WeeFIM) in Australia, and is the national certification and training centre for these tools. All clinicians undertaking FIM assessments are trained in the use of the FIM instrument, and must sit a credentialling exam every 2 years. In Australia there are three levels of FIM credentialling: clinician, facility trainer and master trainer.

Each of the 18 items within the FIM Instrument is assessed against a seven point ordinal scale, where the higher the score for an item, the more independently the patient is able to perform the tasks assessed by that item (Box 2). Total scores range from 18 to 126. The items are divided into two major groups — 13 Motor and 5 Cognitive Items. The rating scale designates major graduations in behaviour from dependence to independence. The scale provides for the classification of individuals by their ability to carry out an activity independently, versus their need for assistance from another person or a device. If help is needed the scale assesses the degree of that help. FIM data can be reported in terms of FIM Motor scores (the sum of the 13 FIM motor items), FIM Cognitive scores (the sum of the 5 FIM cognitive items), or FIM Total (the sum of all 18 FIM items).

Assessment using the FIM

Function is assessed using the FIM instrument at admission and discharge. Admission data are required to be collected within 72 hours of admission, and discharge data within the 72

3 AN-SNAP classes for inpatient rehabilitation

- 201 Admit for assessment only
- 202 Brain, Neuro, Spine and MMT, FIM 13
- 203 All other impairments, FIM 13
- 204 Stroke and Burns, motor 63-91, cognition 20-35
- 205 Stroke and Burns, motor 63-91, cognition 5-19
- 206 Stroke and Burns, motor 47-62
- 207 Stroke and Burns, motor 14-46, age ≥ 75
- 208 Stroke and Burns, motor 14-46, age ≤ 74
- 209 Brain Dysfunction, motor 71-92
- 210 Brain Dysfunction, motor 29-70, age ≥ 55
- 211 Brain Dysfunction, motor 29-70, age ≤ 54
- 212 Brain Dysfunction, motor 14-28
- 213 Neurological, motor 74-92
- 214 Neurological, motor 41-73
- 215 Neurological, motor 14-40
- 216 Spinal Cord Dysfunction, motor 81-92
- 217 Spinal Cord Dysfunction, motor 47-80
- 218 Spinal Cord Dysfunction, motor 14-46
- 219 Amputation of limb, motor 66-92
- 220 Amputation of limb, motor 47-65
- 221 Amputation of limb, motor 14-46
- 222 Pain Syndromes
- 223 Orthopaedic conditions, motor 74-92
- 224 Orthopaedic conditions, motor 58-73
- 225 Orthopaedic conditions, motor 52-57
- 226 Orthopaedic conditions, motor 14-51
- 227 Cardiac
- 228 Major Multiple Trauma
- 229 All other impairments, motor 67-92
- 230 All other impairments, motor 53-66
- 231 All other impairments, motor 25-52
- 232 All other impairments, motor 14-24

hours before discharge. Assessment is undertaken by direct observation by clinicians familiar with the patient's daily activities, and is often a multi-disciplinary process. The score should reflect the actual performance observed.

As the patient's functional ability may change from day to day the timing of the FIM assessment at admission and at discharge is important. To measure the timeliness of FIM scoring on admission and discharge, the AROC dataset requires the collection of the date on which each of these scores was achieved. Timeliness of FIM assessment is an Australian Council on Healthcare Standards (ACHS) Rehabilitation Medicine clinical indicator.

In 2005, 73.1% of AROC episodes recorded an admission FIM assessment date. Of these, 91.7% completed the assessment within the 72-hour timeframe. Similarly, 71.7% of discharges recorded a discharge FIM assessment date, and of these 95.6% completed the assessment within the 72-hour timeframe. Overall, 67.1% of all AROC episodes at admission and 68.5% at discharge recorded an FIM assessment date that was within the 72-hour timeframe.

AN-SNAP Class¹⁰

Casemix classifications are used routinely in the health sector in Australia and internationally for a range of clinical, management and funding purposes. Diagnosis related groups (DRGs), for example, have been used to classify acute care episodes since the early 1980's.

The Australian National Sub-acute and Non-acute Patient (AN-SNAP) casemix classification is the subacute sector's version of casemix² which was developed in a national study completed by the Centre for Health Service Development, University of Wollongong in 1997. The outcome of the study was Version 1 of AN-SNAP. The study established the existence of an underlying episode classification for sub- and non-acute care in both overnight and ambulatory settings. The study results were published in the peer-reviewed literature and presented at relevant casemix and other health care conferences at the time.

The AN-SNAP Version 1 classification comprises 134 classes across five case types: palliative care, rehabilitation, psychogeriatric, geriatric evaluation and management (GEM), and maintenance care. The definition of each case type is based on both the characteristics of the patient and the goal of intervention. Cost weights were also developed for each class in the classification. A list of the 32 AN-SNAP version 1 inpatient rehabilitation classes is provided in Box 3.

Rehabilitation in Australia in 2005

The rehabilitation case type is described by impairment, and therefore, as well as analysing and presenting the data for the total cohort of patients discharged from rehabilitation in 2005, we analysed and presented the data for each of the AROC impairment code categories. Within each of these categories the data are casemix adjusted and presented by AN-SNAP class.

Box 4 describes the 2005 data by AROC impairment group, and also breaks the episodes into those that took place in the public sector and those that took place in the private sector. It is clear that the orthopaedic impairment group is by far the largest category of impairment in both public and private sectors. However, proportionally the private sector provides 72% of all ortho-

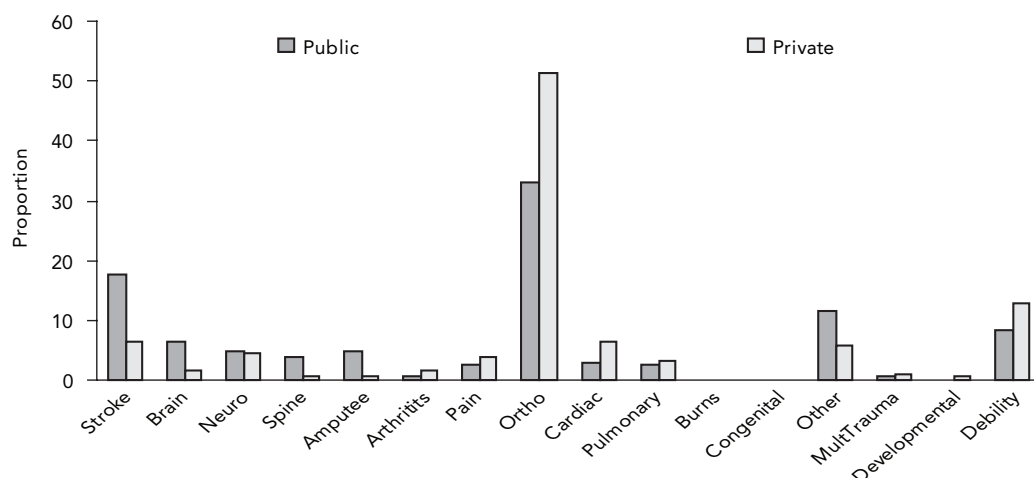
paedic rehabilitation episodes. The stroke impairment category is the second largest category, and here it is the public sector that provides the majority of stroke rehabilitation episodes (64%).

In Box 5, the funding sources for the 2005 data are described. Some 40% of episodes were funded by the public health system, 16% by the Department of Veterans' Affairs and 40% by the private health sector. Of those funded by the private health system, the pattern follows that of the market share of the major health funds, with Medibank Private funding the greatest percentage of the privately funded episodes. General, non-health insurers funded less than 3% of the episodes.

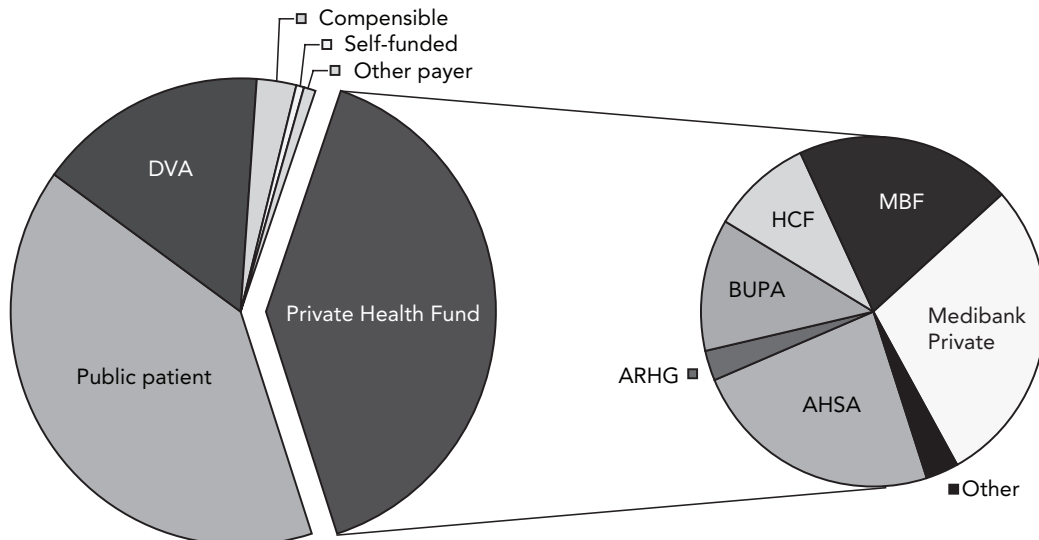
Outcomes by impairment

For each impairment category we present a figure describing the number of episodes by quarter over the last 5 years. These figures give the reader an indication of volume growth, and of any seasonality trends. We then present a table which details the key data for the impairment by AN-SNAP class. The third figure in each series graphically presents the discharge destination data in more detail, providing a visual representation of discharge destination patterns by AN-SNAP class. The final figure in the series

4 Proportion of episodes by impairment group and sector, 2005



5 Funding source for rehabilitation in Australia, 2005



provides a graphical representation of LOS and FIM improvement by AN-SNAP class. Commentary is provided to highlight the key points for each impairment.

Stroke

Stroke rehabilitation is clearly seasonal, as can be seen in Box 6, A. This phenomena has previously been identified and discussed.¹¹⁻¹³ Summary data about stroke patients is presented in Box 6, B. In 2005, the average age of stroke rehabilitation patients was 72.8 years. The average admission FIM was 77.4, although the range varied from 52.0 to 105.2. The average length of stay (ALOS) for stroke rehabilitation patients was 26.9 days overall, with the most functionally able class requiring only 16 days on average, but the least functionally able class requiring 41.5 days on average. FIM improvement achieved was greater for the least functionally able classes (207 & 208), and to some extent this is expected given that the lower the admission FIM, the greater the opportunity for improvement. However, FIM efficiency was greatest for the moderately disabled class 206. As shown in Box 6, C, and tends to be the trend

in all impairment categories, the likelihood of a patient being able to be discharged to the community decreases with the increasing level of functional disability on presentation.

Brain dysfunction

The key difference with the Brain Dysfunction cohort of rehabilitation patients is that they are substantially younger than the general rehabilitation patient (average age 50.8 years versus 73.6 years), and that they are predominantly male (65.7%). The majority of brain dysfunction rehabilitation is carried out in the public sector, with the ALOS of patients ranging from an average of 20 days for class 209 (least impaired group) to 43.6 days for class 212 (most impaired group). Once again, the FIM improvement achieved was far greater for the least functionally able classes (211 & 212), and in this impairment FIM efficiency was greatest for these classes as well. As with most disabling conditions the likelihood of a patient being able to be discharged to the community decreases with the increasing level of functional disability they present with. This information is shown in Box 7.

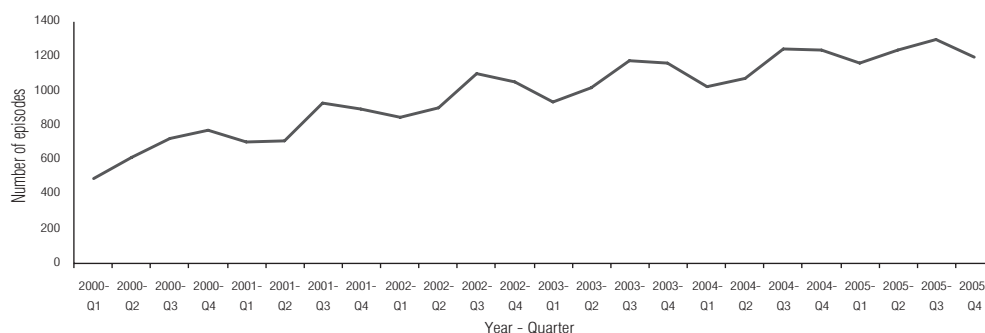
Neurological conditions

This impairment group contains patients undergoing rehabilitation for multiple sclerosis, parkinsonism, polyneuropathy, Guillain-Barre, cerebral palsy, and neuromuscular disorders. These patients also tend to be a little younger

than the average rehabilitation patient (average age 67.0 years), with the majority of episodes being provided in the private sector, except for the most impaired class (215), where the public sector provides 58.3% of episodes. As with stroke the most impaired class achieves the

6 Stroke

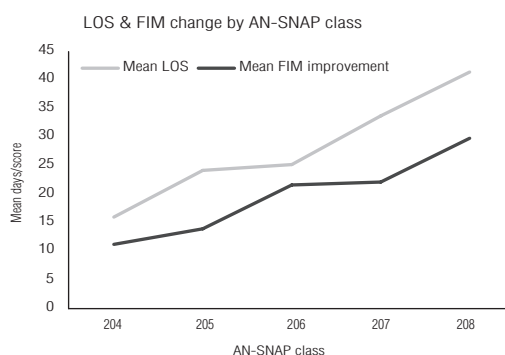
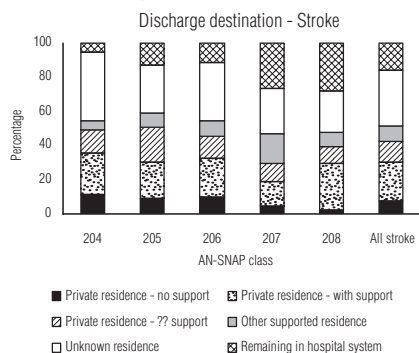
A: Change in number of stroke episodes over time (2000-2005)



B: Summary of stroke episodes in 2005

AN-SNAP class:	204	205	206	207	208	All stroke
Number of episodes	1,420	125	1,268	978	769	4,882
Sector (%)						
Private	42.2	25.6	42.1	35.1	21.6	35.8
Public	57.8	74.4	57.9	64.9	78.4	64.2
Gender (%)						
Female	47.6	40.3	49.5	53.9	40.2	48.1
Male	52.4	59.7	50.5	46.1	59.8	51.9
Age (Mean+95%CI)	71.8 (71.1–72.6)	68.1 (65.5–70.8)	74.9 (74.2–75.6)	82.5 (82.2–82.8)	62.2 (61.4–63.0)	72.8 (72.4–73.2)
Admission FIM (Mean+95%CI)	104.7 (104.2–105.2)	88.4 (86.7–90.0)	81.3 (80.8–81.7)	52.9 (52.0–53.9)	53.5 (52.4–54.6)	77.4 (76.7–78.2)
LOS (Mean+95%CI)	16.0 (15.5–16.6)	24.2 (21.7–26.6)	25.2 (24.3–26.1)	33.8 (32.5–35.1)	41.5 (39.7–43.3)	26.9 (26.4–27.5)
Discharge destination (%)						
Discharged to community	94.6	87.5	88.5	73.6	72.3	84.0
Remaining in hospital system	5.4	12.5	11.5	26.4	27.7	16.0
FIM improvement (Mean+95%CI)	11.3 (10.8–11.7)	13.9 (11.5–16.3)	13.9 (11.5–16.3)	22.2 (21.0–23.5)	29.8 (28.3–31.4)	19.5 (19.1–20.0)
FIM efficiency (FIM imp./LOS)	0.7	0.6	0.9	0.7	0.7	0.7

C: Stroke discharge destination, and LOS & FIM change by AN-SNAP class

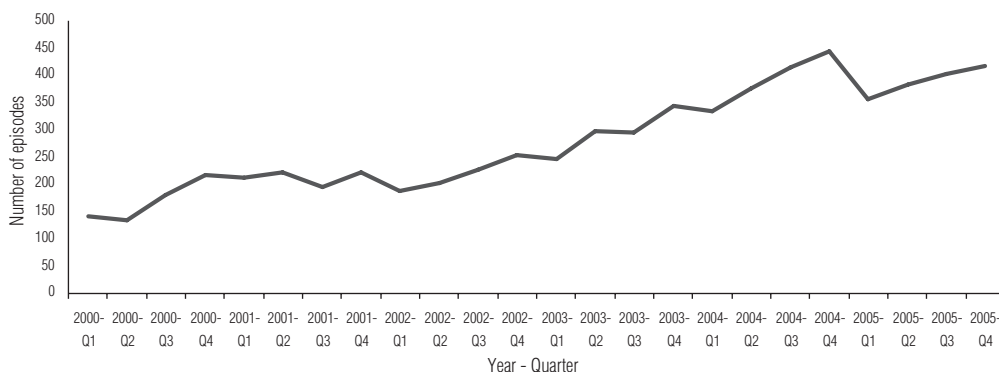


highest FIM improvement, but it is the moderately impaired group that achieves the greatest FIM efficiency. This impairment category also follows the trend for patients presenting with

the greatest disability having a lesser chance of being discharged back to the community. Details of neurological conditions described here can be seen in detail in Box 8.

7 Dysfunction

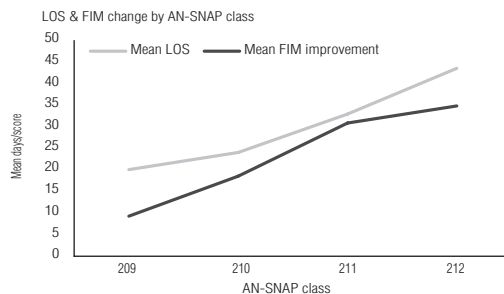
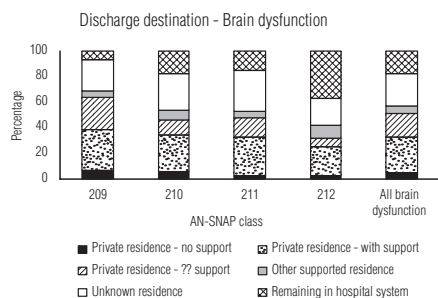
A: Change in number of brain dysfunction episodes over time (2000-2005)



B: Summary of brain dysfunction episodes in 2005

AN-SNAP class:	209	210	211	212	All Brain dysfunction
Number of episodes	438	380	276	156	1,559
Sector (%)					
Private	25.1	48.4	15.9	25.6	26.9
Public	74.9	51.6	84.1	74.4	73.1
Gender (%)					
Female	30.4	45.3	33.0	37.8	34.3
Male	69.6	54.7	67.0	62.2	65.7
Age (Mean+95%CI)	48.2 (46.3–50.1)	73.9 (72.9–75.0)	35.5 (34.1–37.0)	50.8 (47.3–54.3)	50.8 (49.7–51.8)
Admission FIM (Mean+95%CI)	108.0 (107.1–108.9)	77.7 (76.0–79.3)	74.9 (73.0–76.9)	36.4 (34.5–38.3)	81.2 (79.6–82.8)
LOS (Mean+95%CI)	20.0 (18.4–21.6)	24.1 (22.4–25.8)	33.0 (30.0–35.9)	43.6 (39.0–48.2)	28.7 (27.4–29.9)
Discharge destination (%)					
Discharged to community	93.4	82.7	85.1	63.0	82.7
Remaining in hospital system	6.6	17.3	14.9	37.0	17.3
FIM improvement (Mean+95%CI)	9.2 (8.4–10.0)	18.6 (16.7–20.5)	30.8 (28.2–33.3)	34.9 (29.2–40.6)	20.1 (18.9–21.3)
FIM efficiency (FIM imp./LOS)	0.5	0.8	0.9	0.8	0.7

C: Brain dysfunction discharge destination and LOS & FIM change by AN-SNAP class



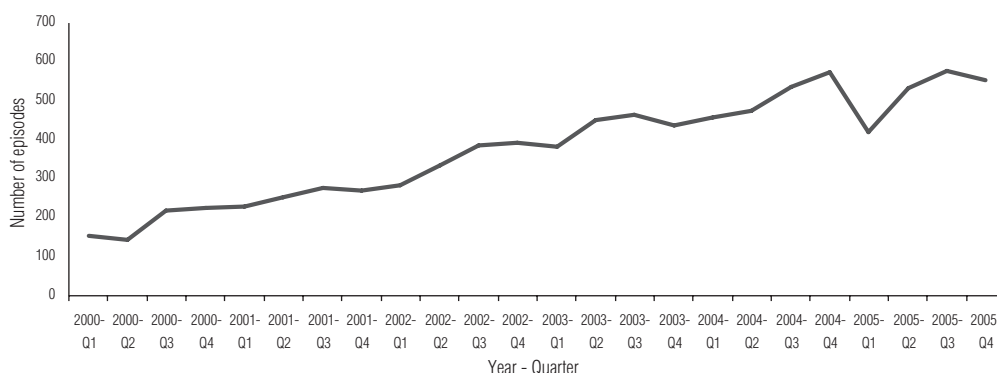
Spinal cord dysfunction

There are three AN-SNAP classes within this impairment category. The least impaired class (216) contains a small number of episodes, with some 95% of episodes split between classes 217

and 218. The public sector provides the care for the vast majority of the most impaired class, and the majority of episodes within class 217. Interestingly, the gender split is even for the two lesser impaired classes, but 70.2% of the episodes in the

8 Neurological conditions

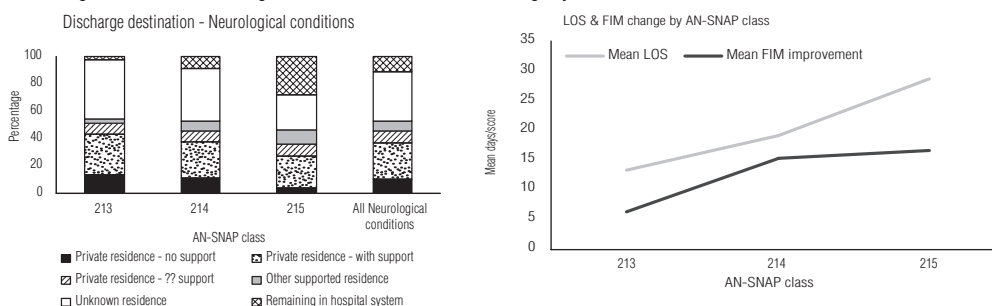
A: Change in number of Neurological conditions episodes over time (2000-2005)



B: Summary of Neurological conditions episodes in 2005

AN-SNAP class:	213	214	215	All Neurological conditions
Number of episodes	407	1190	369	2,084
Sector (%)				
Private	66.1	66.9	41.7	59.5
Public	33.9	33.1	58.3	40.5
Gender (%)				
Female	50.4	54.5	40.4	50.7
Male	49.6	45.5	59.6	49.3
Age (Mean+95%CI)	63.3 (61.7–64.9)	69.9 (69.0–70.7)	65.4 (63.6–67.2)	67.0 (66.3–67.7)
Admission FIM (Mean+95%CI)	112.6 (112.0–113.2)	88.9 (88.2–89.6)	54.6 (53.3–55.9)	87.5 (86.5–88.4)
LOS (Mean+95%CI)	13.3 (12.5–14.1)	19.1 (18.4–19.8)	28.6 (26.6–30.6)	19.9 (19.2–20.5)
Discharge destination (%)				
Discharged to community	97.5	91.4	72.2	89.1
Remaining in hospital system	2.5	8.6	27.8	10.9
FIM improvement (Mean+95%CI)	6.3 (5.8–6.9)	15.3 (14.5–16.0)	16.7 (14.6–18.7)	13.6 (13.0–14.2)
FIM efficiency (FIM imp./LOS)	0.5	0.8	0.6	0.7

C: Neurological conditions discharge destination, and LOS & FIM change by AN-SNAP class

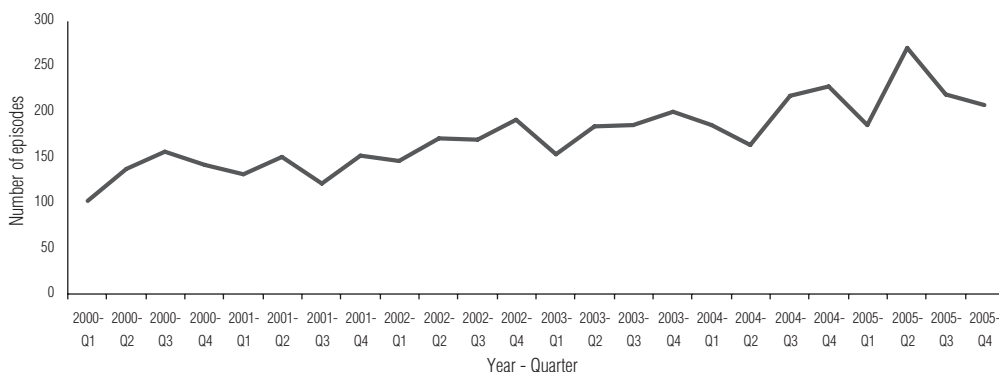


most impaired class are male. Once again, the average age of patients in this impairment category is younger than the general rehabilitation patient (55.6 years). The ALOS of patients increases significantly across the classes, with the most impaired

class staying an average 48.5 days. FIM improvement and FIM efficiency follow the same pattern as in the previous impairments. However, the FIM efficiency achieved for spinal cord dysfunction patients is, on average, lower than that achieved in

9 Spinal cord dysfunction

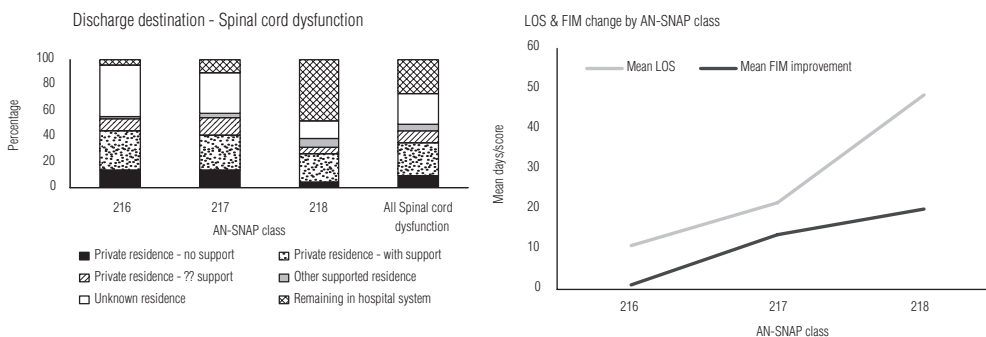
A: Change in number of spinal cord dysfunction episodes over time (2000-2005)



B: Summary of spinal cord dysfunction conditions episodes in 2005

	AN-SNAP class:	216	217	218 All Spinal cord dysfunction
Number of episodes		44	366	322
Sector (%)				
Private		43.2	39.9	9.9
Public		56.8	60.1	90.1
Gender (%)				
Female		40.9	50.0	29.8
Male		59.1	50.0	70.2
Age (Mean+95%CI)		57.2 (51.9-62.5)	60.8 (58.8-62.8)	54.1 (51.9-56.3)
Admission FIM (Mean+95%CI)		118.8 (118.0-119.7)	97.6 (96.4-98.8)	62.3 (61.0-63.6)
LOS (Mean+95%CI)		10.9 (8.4-13.3)	21.7 (19.6-23.9)	48.5 (44.8-52.2)
Discharge destination (%)				
Discharged to community		95.3	89.4	51.7
Remaining in hospital system		4.7	10.6	48.3
FIM improvement (Mean+95%CI)		1.2 (-1.3-3.8)	13.7 (12.7-14.8)	20.0 (17.5-22.4)
FIM efficiency (FIM imp./LOS)		0.1	0.6	0.4

C: Spinal cord dysfunction discharge destination, and LOS & FIM change by AN-SNAP class

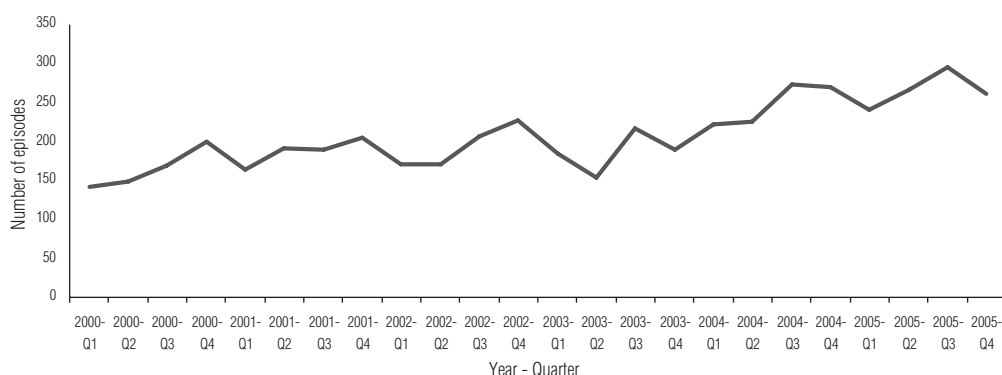


other impairment categories. This mirrors the usual slower recovery of these patients and the involvement of bladder and bowel function. This impairment group follows the general trend for discharge destination. Discharge destination out-

comes achieved for the least and moderately impaired classes are very good, but only one in two patients in the most impaired category are likely to be discharged to the community. Box 9 provides more details about spinal cord dysfunction.

I0 Amputation of limb

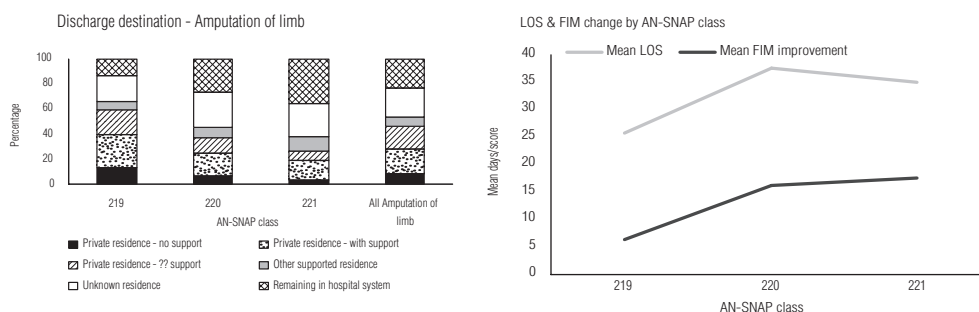
A: Change in number of amputation of limb episodes over time (2000-2005)



B: Summary of amputation of limb episodes in 2005

	AN-SNAP class: 219	220	221	All Amputation of limb
Number of episodes	369	336	221	1,063
Sector (%)				
Private	14.1	23.5	20.8	18.1
Public	85.9	76.5	79.2	81.9
Gender (%)				
Female	25.2	35.4	43.0	32.7
Male	74.8	64.6	57.0	67.3
Age (Mean+95%CI)	63.9 (62.4–65.3)	71.6 (70.3–73.0)	74.3 (72.8–75.9)	68.8 (67.9–69.6)
Admission FIM (Mean+95%CI)	107.6 (106.9–108.3)	88.6 (87.8–89.5)	61.2 (59.5–63.0)	90.5 (89.2–91.8)
LOS (Mean+95%CI)	25.7 (23.7–27.7)	37.6 (35.1–40.1)	35.0 (31.7–38.4)	32.3 (30.9–33.8)
Discharge destination (%)				
Discharged to community	86.6	73.8	64.1	77.0
Remaining in hospital system	13.4	26.2	35.9	23.0
FIM improvement (Mean+95%CI)	6.3 (5.6–7.1)	16.2 (15.1–17.2)	17.6 (15.2–20.0)	12.4 (11.6–13.1)
FIM efficiency (FIM imp./LOS)	0.2	0.4	0.5	0.4

C: Amputation of limb discharge destination, and LOS & FIM change by AN-SNAP class



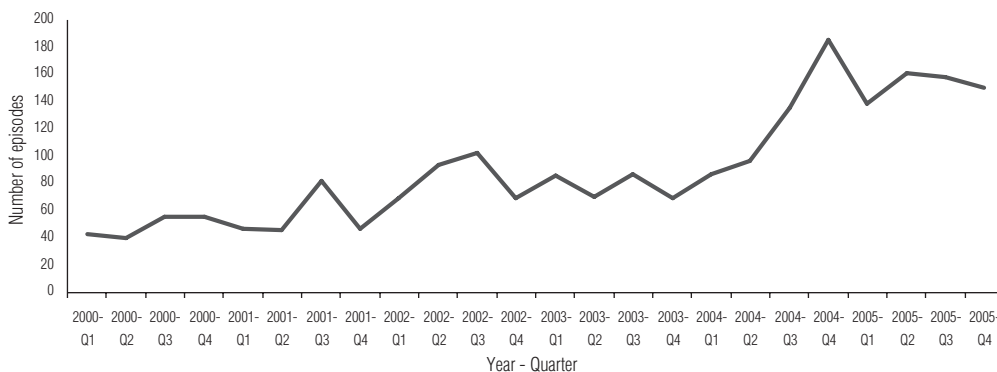
Amputation of limb

Amputation of limb episodes are described in Box 10. The vast majority of episodes in this category are provided by the public sector.

Patients are predominantly male, but interestingly the percentage of females increases as the impairment class changes, that is, in the most impaired class there is a greater percentage of

II Arthritis

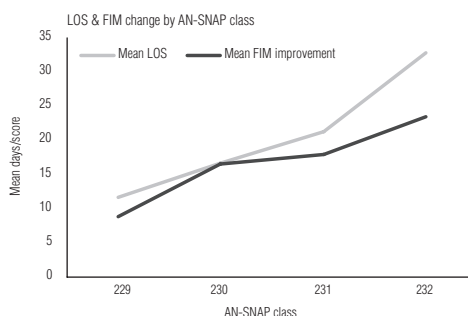
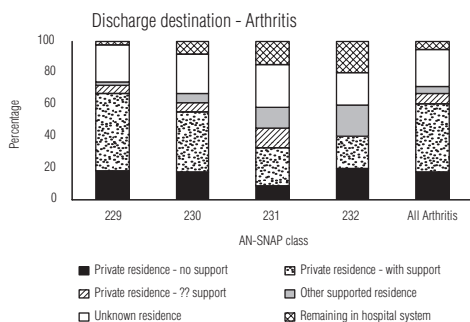
A: Change in number of arthritis episodes over time (2000-2005)



B: Summary of arthritis episodes in 2005

AN-SNAP class:	229	230	231	232 All Arthritis	
Number of episodes	392	147	59	6	608
Sector (%)					
Private	83.2	84.4	35.6	16.7	77.8
Public	16.8	15.6	64.4	83.3	22.2
Gender (%)					
Female	63.5	70.7	69.5	66.7	66.0
Male	36.5	29.3	30.5	33.3	34.0
Age (Mean+95%CI)	68.0 (66.7–69.2)	74.1 (72.0–76.2)	77.5 (74.7–80.4)	75.0 (60.6–89.4)	70.4 (69.3–71.4)
Admission FIM (Mean+95%CI)	108.2 (107.6–108.8)	94.3 (93.3–95.2)	70.8 (68.1–73.6)	46.2 (33.2–59.2)	00.6 (99.4–101.8)
LOS (Mean+95%CI)	11.7 (11.1–12.4)	16.7 (15.2–18.2)	21.3 (17.2–25.3)	32.8 (20.5–45.1)	14.0 (13.3–14.7)
Discharge destination (%)					
Discharged to community	97.7	91.8	85.5	80.0	95.0
Remaining in hospital system	2.3	8.2	14.5	20.0	5.0
FIM improvement (Mean+95%CI)	8.8 (8.1–9.4)	16.5 (15.1–17.8)	17.9 (14.2–21.7)	23.4 (14.2–32.6)	11.7 (11.0–12.5)
FIM efficiency (FIM imp./LOS)	0.8	1.0	0.8	0.7	0.8

C: Arthritis discharge destination, and LOS & FIM change by AN-SNAP class

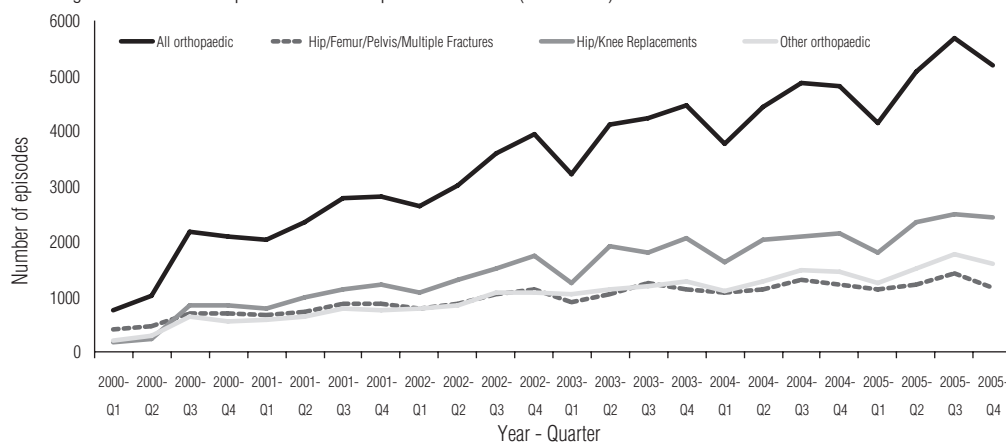


females than in the least impaired class. While FIM improvement follows the identified trend (greater improvement in the most impaired class), in this impairment category the FIM efficiency is also greatest in the most impaired class. As with spinal cord patients, the FIM

efficiency achieved is on average lower than that achieved in other impairment categories, meaning that it takes longer to achieve functional gain for patients with this type of impairment. Once again this impairment category follows the general trend for discharge destination, with the

12 Orthopaedic conditions

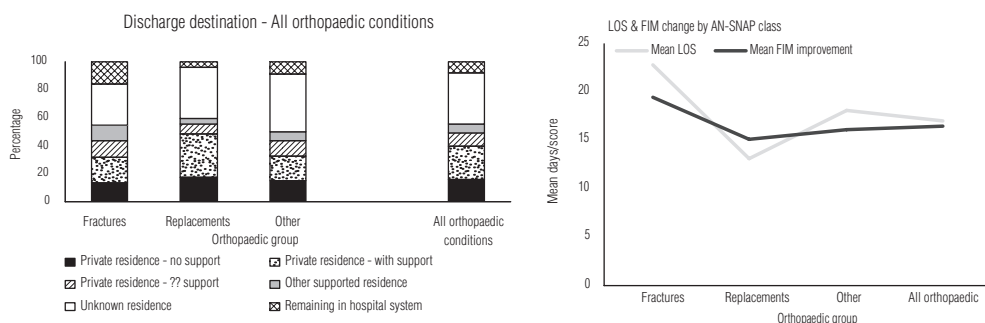
A: Change in number of orthopaedic conditions episodes over time (2000-2005)



B: Summary of orthopaedic conditions episodes in 2005

	Fractures	Replacements	Other	All orthopaedic conditions
Number of episodes	4,890	9,089	6,101	20,080
Sector (%)				
Private	46.9	82.5	71.5	70.5
Public	53.1	17.5	28.5	29.5
Gender (%)				
Female	73.4	66.3	72.3	69.9
Male	26.6	33.7	27.7	30.1
Age (Mean+95%CI)	78.4 (78.0–78.8)	72.5 (72.3–72.8)	74.9 (74.6–75.3)	74.7 (74.5–74.9)
Admission FIM (Mean+95%CI)	80.4 (79.8–81.0)	98.4 (98.1–98.6)	91.3 (90.9–91.8)	91.9 (91.6–92.1)
LOS (Mean+95%CI)	22.8 (22.4–23.2)	13.1 (13.0–13.3)	18.1 (17.8–18.4)	17.0 (16.8–17.1)
Discharge destination (%)				
Discharged to community	84.2	96.3	91.4	92.4
Remaining in hospital system	15.8	3.7	8.6	7.6
FIM improvement (Mean+95%CI)	19.5 (19.1–19.9)	15.1 (14.9–15.3)	16.1 (15.8–16.4)	16.5 (16.3–16.6)
FIM efficiency (FIM imp./LOS)	0.9	1.2	0.9	1.0

C: Orthopaedic conditions discharge destination, and LOS & FIM change by AN-SNAP class



most impaired class having the least chance of being discharged to the community.

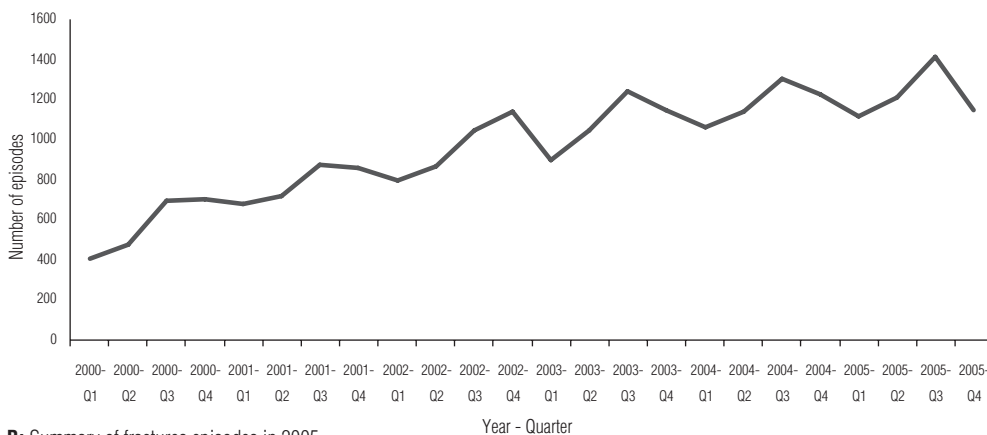
Arthritis

While there are four AN-SNAP classes into which patients with an arthritis impairment are classified,

there are only 6 episodes in the most impaired class. The majority of arthritis episodes fall within the least impaired category. The private sector provides the care for the majority of the least impaired episodes, while the public sector provides the majority of care for those episodes classi-

13 Orthopaedic: fractures

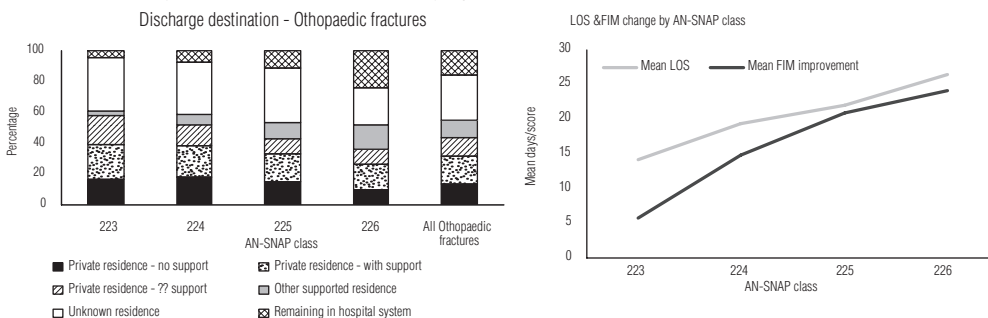
A: Change in number of fractures episodes overtime (2000-2005)



B: Summary of fractures episodes in 2005

	AN-SNAP class: 223	224	225	226 All Orthopaedic fractures	
Number of episodes	280	1,501	806	2,164	4,890
Sector (%)					
Private	48.9	52.5	52.9	40.8	46.9
Public	51.1	47.5	47.1	59.2	53.1
Gender (%)					
Female	66.8	74.9	76.4	72.0	73.4
Male	33.2	25.1	23.6	28.0	26.6
Age (Mean+95%CI)	71.7 (69.7–73.7)	76.9 (76.2–77.6)	78.3 (77.3–79.3)	80.3 (79.7–80.9)	78.4 (78.0–78.8)
Admission FIM (Mean+95%CI)	110.9 (110.4–111.5)	96.2 (95.9–96.5)	84.6 (84.2–85.0)	64.4 (63.8–65.0)	80.4 (79.8–81.0)
LOS (Mean+95%CI)	14.2 (13.2–15.2)	19.4 (18.8–20.0)	22.0 (21.2–22.9)	26.5 (25.8–27.1)	22.8 (22.4–23.2)
Discharge destination (%)					
Discharged to community	95.7	92.7	88.8	76.0	84.2
Remaining in hospital system	4.3	7.3	11.2	24.0	15.8
FIM improvement (Mean+95%CI)	5.8 (5.2–6.5)	14.8 (14.4–15.3)	20.9 (20.2–21.7)	24.1 (23.4–24.8)	19.5 (19.1–19.9)
FIM efficiency (FIM imp./LOS)	0.4	0.8	1.0	0.9	0.9

C: Fractures discharge destination, and LOS & FIM change by AN-SNAP class



fied into the 2 most impaired classes. Patients in this impairment group are most likely to be female, with an average age of 70.4 years, and an ALOS of 14 days. FIM efficiency is quite high for this impairment group across all classes, with FIM improvement being greater for the more impaired classes. Discharge destination follows the identified trend. Refer to Box 11 for more detailed information about arthritis episodes in 2005.

Orthopaedic conditions

The data for patients with orthopaedic conditions has been separated into three groups: fractures, joint replacements and other. Given that the resource needs and outcomes of patients with fractures and joint replacements are distinct,⁶⁻⁷ their outcomes are shown separately. Also presented is the data for the entire orthopaedic conditions cohort. While the Other category comprises almost one third of total episodes in this category, it is not presented in detail. These episodes are the subject of a current review, whose objective is further categorisation of this group. Information about all orthopaedic episodes in 2005 is presented in Box 12, while information specific to episodes with fractures is presented in Box 13 and information specific to episodes with joint replacements is presented in Box 14.

Orthopaedic: fractures

There appears to be a degree of seasonality in this category, with episode volumes peaking in the third quarter (winter months) of each year. The reason for this is unknown. While the private sector provides over 70% of all orthopaedic impairment rehabilitation, it can be seen that each sector provides about half of the orthopaedic fracture rehabilitation, with the public sector providing more than half in the most impaired category. Two categories contain the vast majority of fracture episodes, class 226, the most impaired category and class 224. Patients with a fracture requiring rehabilitation are three times more likely to be female than male, and have an average age of almost 78 years. As may be expected the average age and the ALOS of the patient increases with the degree of impairment. Once again this

impairment category follows the general trend for discharge destination, with the most impaired class having the least chance of being discharged to the community. FIM efficiency in this group is greater for the more impaired classes, and quite low for the most functionally able group.

Orthopaedic: joint replacements

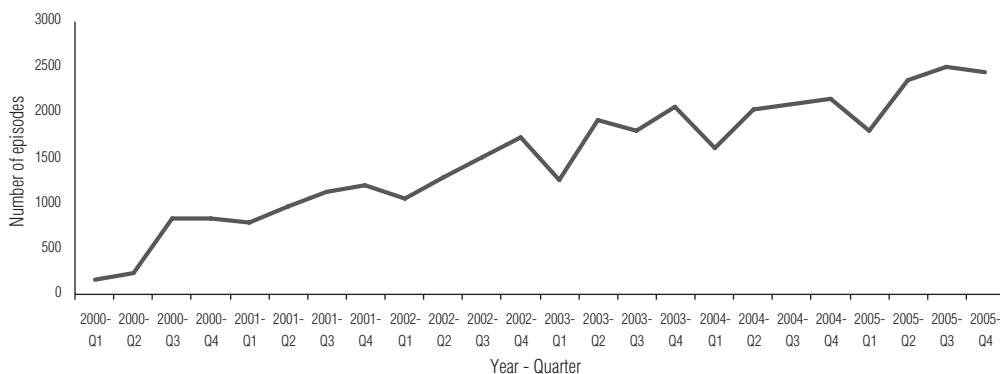
The vast majority of episodes in this category are provided by the private sector, although the public sector does increase its proportion to just over 30% in the most impaired category. More than three quarters of the episodes in this category fall into the two least impaired categories, perhaps reflecting the largely elective nature of joint replacement surgery and the clinical recognition that pre-surgical fitness aids efficient recovery. The average age of patients in the least impaired category is almost 9 years younger than patients in the most impaired category, and in this category patients are twice as likely to be female, with the proportion of females increasing as impairment increases. Again, FIM efficiency in this group is significantly greater for the more impaired classes, and quite low for the most functionally able group. Discharge destination again follows the identified trend.

Pulmonary

The pulmonary category has clear seasonality with the volume of episodes significantly peaking in the third (winter) quarter of each year, perhaps reflecting the increased incidence of pulmonary medical conditions, especially in older people, during the winter months of the year (Box 15, A). Box 15, B shows three quarters of the episodes in the least impaired category are provided by the private sector, but in the most impaired group the private sector provides only 45% of episodes. (noting that the volume in that most impaired category is very low). While details are provided for the most impaired category, it should be noted that there are only 18 episodes in this class, and that the average admission FIM of these 18 episodes indicates the patients in this category were very impaired. No further comment about this class will be made.

14 Orthopaedic: joint replacement

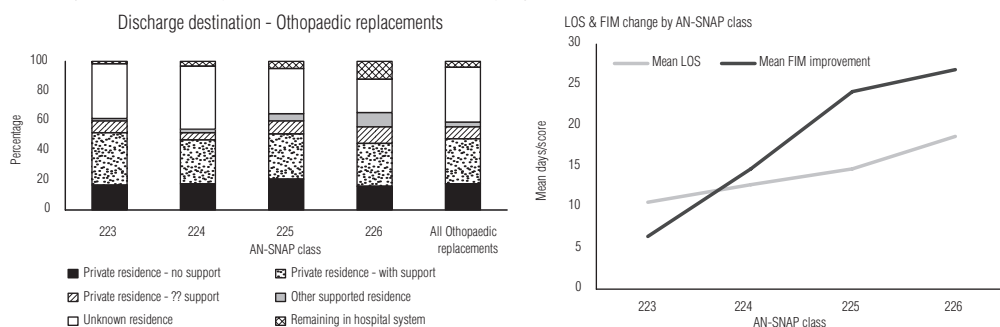
A: Change in number of joint replacements episodes over time (2000-2005)



B: Summary of joint replacements episodes in 2005

AN-SNAP class:	223	224	225	226	All Orthopaedic replacements
Number of episodes	2,083	4,887	1,007	928	9,089
Sector (%)					
Private	87.8	85.6	78.1	69.1	82.5
Public	12.2	14.4	21.9	30.9	17.5
Gender (%)					
Female	59.8	68.1	68.6	69.0	66.3
Male	40.2	31.9	31.4	31.0	33.7
Age (Mean+95%CI)	68.9 (68.5–69.4)	72.7 (72.4–73.0)	75.0 (74.3–75.6)	77.2 (76.6–77.9)	72.5 (72.3–72.8)
Admission FIM (Mean+95%CI)	111.7 (111.6–111.9)	99.9 (99.7–100.0)	86.3 (86.1–86.6)	73.2 (72.5–73.9)	98.4 (98.1–98.6)
LOS (Mean+95%CI)	10.6 (10.4–10.8)	12.8 (12.7–13.0)	14.7 (14.2–15.3)	18.7 (17.9–19.5)	13.1 (13.0–13.3)
Discharge destination (%)					
Discharged to community	98.7	97.2	95.0	87.8	96.3
Remaining in hospital system	1.3	2.8	5.0	12.2	3.7
FIM improvement (Mean+95%CI)	6.4 (6.2–6.5)	14.7 (14.5–14.9)	24.2 (23.6–24.8)	26.9 (26.0–27.8)	15.1 (14.9–15.3)
FIM efficiency (FIM imp./LOS)	0.6	1.1	1.6	1.4	1.2

C: Joint replacements discharge destination, and LOS & FIM change by AN-SNAP class



Across the whole category, the average age of patients is remarkably similar, with the least impaired category demonstrating a very slightly lower average age. As would be expected, ALOS increases with impairment as does the FIM improvement achieved during the episode. Once again, discharge destination follows the identified

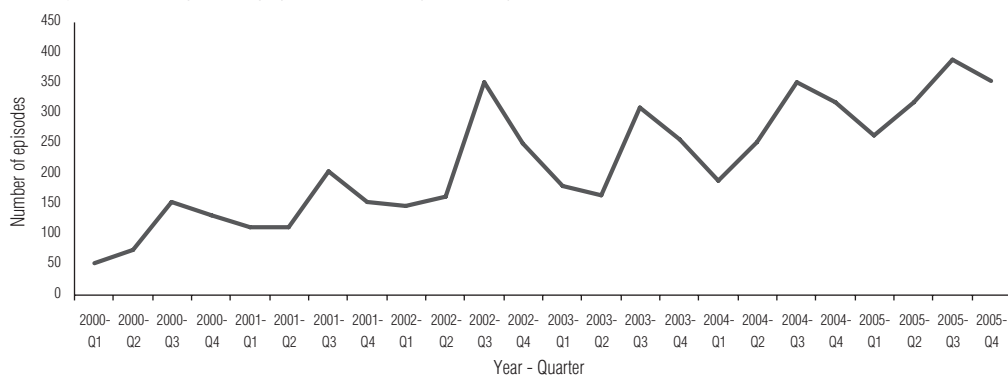
trend, and FIM efficiency values are least in the least impaired class (Box 15, C).

Debility

The debility category comprises four classes of impairment. The most impaired class comprises only a small number of episodes, and describes a

15 Pulmonary

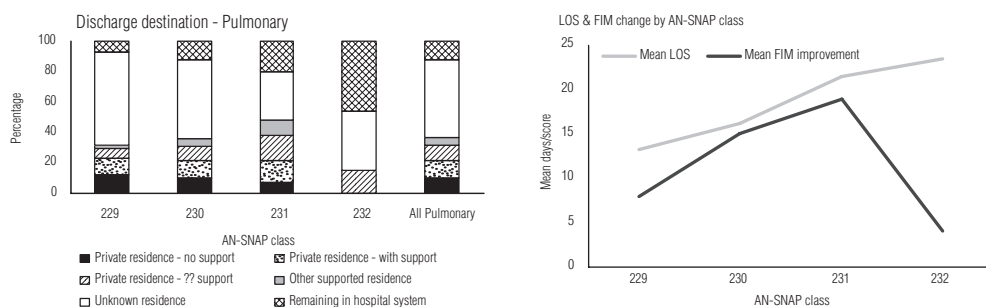
A: Change in number of pulmonary episodes over time (2000-2005)



B: Summary of pulmonary episodes in 2005

AN-SNAP class:	229	230	231	232	All Pulmonary
Number of episodes	563	420	287	18	1,324
Sector (%)					
Private	78.0	68.3	44.3	44.4	66.3
Public	22.0	31.7	55.7	55.6	33.7
Gender (%)					
Female	55.2	59.8	47.0	22.2	54.0
Male	44.8	40.2	53.0	77.8	46.0
Age (Mean+95%CI)	77.6 (76.8–78.4)	80.2 (79.3–81.2)	80.7 (79.5–81.9)	80.8 (76.7–85.0)	79.1 (78.5–79.7)
Admission FIM (Mean+95%CI)	108.5 (107.9–109.0)	90.4 (89.7–91.1)	68.4 (66.9–69.8)	37.0 (31.0–43.0)	92.8 (91.7–93.8)
LOS (Mean+95%CI)	13.3 (12.7–14.0)	16.2 (15.2–17.2)	21.5 (19.7–23.3)	23.5 (16.1–30.8)	16.3 (15.7–17.0)
Discharge destination (%)					
Discharged to community	93.0	87.7	79.9	53.8	87.9
Remaining in hospital system	7.0	12.3	20.1	46.2	12.1
FIM improvement (Mean+95%CI)	8.0 (7.2–8.7)	15.1 (13.9–16.3)	18.9 (16.7–21.0)	4.1 (-0.5–8.7)	12.6 (11.9–13.3)
FIM efficiency (FIM imp./LOS)	0.6	0.9	0.9	0.2	0.8

C: Pulmonary discharge destination, and LOS & FIM change by AN-SNAP class



different picture to that expected by trending across from the other three impairment classes. The class comprises more males than females; the average age is less than that in the next class up; while the ALOS does increase slightly above that of the next class, FIM improvement and FIM efficiency for this class drops below that of the

next class up. In the other classes there are more females than males, the average age increases with increasing impairment, as does ALOS, FIM improvement and FIM efficiency. Pleasingly, the percentage of patients discharged to the community from this category is very high, although the identified trend is still evident; that is, patients in

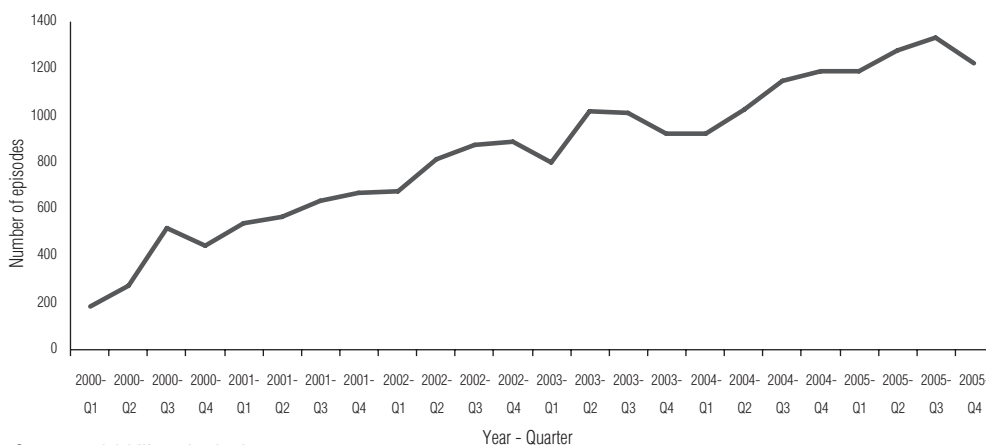
the most impaired class having the highest chance of remaining in the hospital system after discharge from rehabilitation (Box 16).

The debility category has grown to become the third largest of the impairment categories, perhaps reflecting not only the ageing popula-

tion but the growing desire of that population to maintain as much independence as possible for as long as possible. Consideration is currently being given to the sub-categorisation of this category to increase the granularity of the data collected.

16 Debility

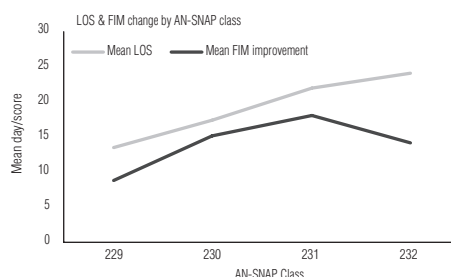
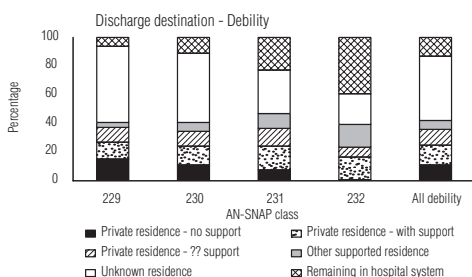
A: Change in number of debility episodes over time (2000-2005)



B: Summary of debility episodes in 2005

	AN-SNAP class:	229	230	231	232 All Debility
Number of episodes		1,687	1,792	1,296	5,023
Sector (%)					
Private		75.8	74.8	56.9	47.7
Public		24.2	25.2	43.1	52.3
Gender (%)					
Female		59.7	63.8	58.5	46.8
Male		40.3	36.2	41.5	53.2
Age (Mean+95%CI)		76.4 (75.7–77.1)	80.2 (79.7–80.8)	80.2 (79.5–80.9)	77.1 (74.7–79.5)
Admission FIM (Mean+95%CI)		107.0 (106.6–107.3)	89.7 (89.4–90.0)	67.7 (67.0–68.3)	40.5 (38.6–42.3)
LOS (Mean+95%CI)		13.5 (13.1–13.9)	17.4 (16.9–17.9)	22.0 (21.2–22.9)	24.1 (20.6–27.5)
Discharge destination (%)					
Discharged to community		93.8	88.7	77.1	60.8
Remaining in hospital system		6.2	11.3	22.9	39.2
FIM improvement (Mean+95%CI)		8.8 (8.4–9.1)	15.2 (14.7–15.7)	18.1 (17.1–19.0)	14.2 (10.6–17.9)
FIM efficiency (FIM imp./LOS)		0.7	0.9	0.8	0.6

C: Debility discharge destination, and LOS & FIM change by AN-SNAP class



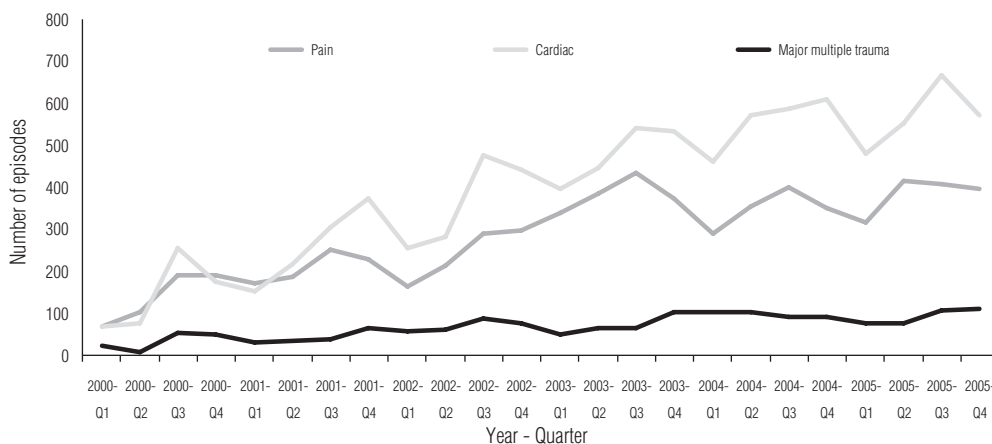
Pain, Cardiac, Major Multiple Trauma, Burns, Congenital Deformities, and Developmental Disabilities

The six categories included here have only a single impairment category; that is they are not

broken down by level of impairment, and are displayed together due to low volumes and for ease of presentation (Box 17). The major things that stand out across these categories is that the average age of patients in the MMT, Burns and

17 Other impairments

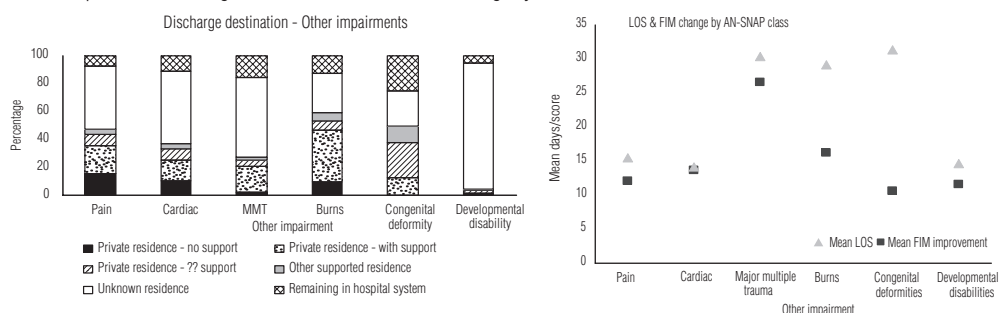
A: Change in number of other impairments episodes over time (2000-2005)



B: Summary of other impairments episodes in 2005

	Pain	Cardiac	MMT	Burns	Congenital deformity	Developmental disability
Number of episodes	6,818	9,495	1,615	133	41	225
Sector (%)						
Private	68.6	77.9	61.7	15.6	12.5	97.0
Public	31.4	22.1	38.3	84.4	87.5	3.0
Gender (%)						
Female	72.2	51.1	38.8	25.0	25.0	67.5
Male	27.8	48.9	61.2	75.0	75.0	32.5
Age (Mean+95%CI)	72.0 (71.2–72.9)	78.9 (78.5–79.3)	46.8 (44.6–49.0)	56.7 (47.9–65.5)	54.6 (37.0–72.3)	75.3 (73.0–77.6)
Admission FIM (Mean+95%CI)	97.3 (96.3–98.3)	96.1 (95.4–96.8)	79.6 (77.1–82.1)	93.4 (86.3–100.4)	84.0 (66.7–101.3)	90.7 (87.9–93.4)
LOS (Mean+95%CI)	15.5 (15.0–16.0)	14.1 (13.7–14.4)	30.4 (28.0–32.9)	29.2 (22.6–35.7)	31.3 (9.5–53.0)	14.6 (13.3–15.9)
Discharge destination (%)						
Discharged to community	92.5	89.2	84.3	87.5	75.0	94.6
Remaining in hospital system	7.5	10.8	15.7	12.5	25.0	5.4
FIM improvement (Mean+95%CI)	12.1 (11.5–12.6)	13.7 (13.2–14.2)	26.6 (24.4–28.9)	16.2 (11.3–21.1)	10.6 (1.0–20.3)	11.6 (10.0–13.2)
FIM efficiency (FIM imp./LOS)	0.8	1.0	0.9	0.6	0.3	0.8

C: Other impairments discharge destination, and LOS & FIM change by AN-SNAP class

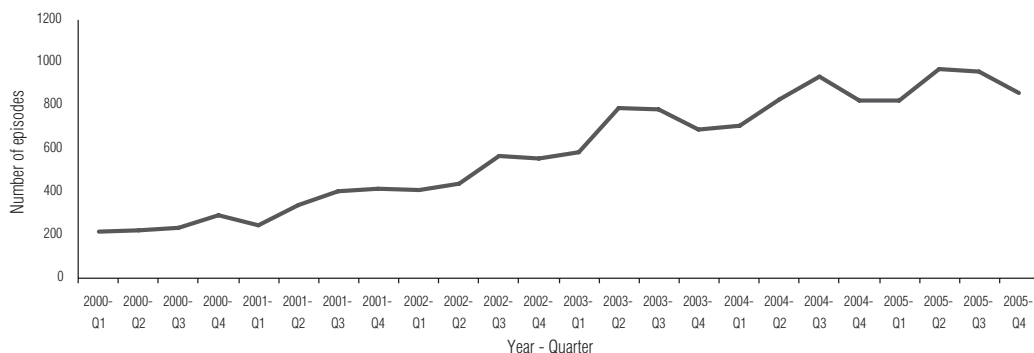


Congenital Deformity categories is much lower than in other impairment categories, with patients in these categories requiring a significantly higher ALOS to achieve functional improvement goals. Even after that LOS, the FIM improvement achieved and the FIM efficiency in

the Burns and Congenital Deformity categories is quite low by comparison to other impairments. However, more than three quarters of these patients are discharged to the community, which is a good outcome in itself. While the private sector provides the majority of episodes in the

I8 Other disabling impairments

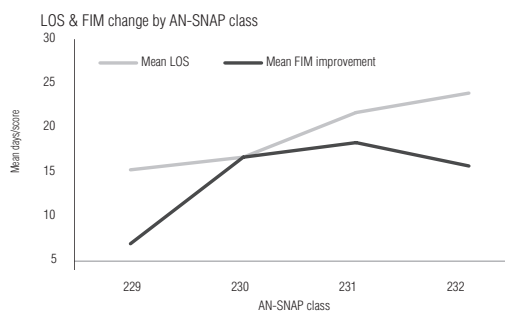
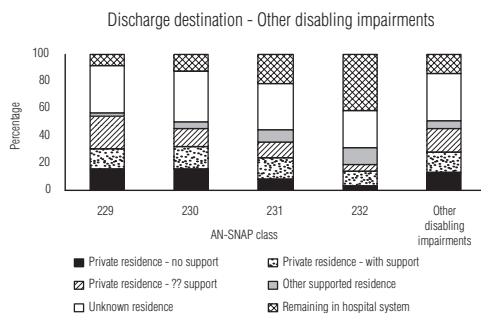
A: Change in number of other disabling impairments episodes over time (2000-2005)



B: Summary of other disabling impairments episodes in 2005

AN-SNAP class:	229	230	231	232	All Other disabling impairments
Number of episodes	1,154	1,229	1,010	98	3,616
Sector (%)					
Private	51.6	49.4	33.1	15.3	43.6
Public	48.4	50.6	66.9	84.7	56.4
Gender (%)					
Female	60.7	63.5	57.6	46.9	60.3
Male	39.3	36.5	42.4	53.1	39.7
Age (Mean+95%CI)	75.6 (74.9–76.3)	78.1 (77.5–78.8)	79.1 (78.4–79.9)	77.3 (74.3–80.3)	77.2 (76.8–77.7)
Admission FIM (Mean+95%CI)	108.1 (107.7–108.6)	88.9 (88.5–89.3)	67.6 (66.9–68.4)	40.4 (38.2–42.5)	87.8 (87.1–88.5)
LOS (Mean+95%CI)	15.3 (14.6–15.9)	16.7 (16.1–17.4)	21.8 (20.9–22.7)	24.0 (19.9–28.1)	18.1 (17.6–18.5)
Discharge destination (%)					
Discharged to community	92.1	87.3	78.5	58.9	85.7
Remaining in hospital system	7.9	12.7	21.5	41.1	14.3
FIM improvement (Mean+95%CI)	6.9 (6.4–7.5)	16.7 (15.9–17.5)	18.4 (17.2–19.5)	15.7 (11.2–20.2)	14.0 (13.5–14.5)
FIM efficiency (FIM imp./LOS)	0.5	1.0	0.8	0.7	0.8

C: Other disabling impairments discharge destination, and LOS & FIM change by AN-SNAP class



Pain, Cardiac, MMT and Developmental Disability categories, it is the public sector that provides the majority of care for patients in the Burns and Congenital Deformity categories, albeit that these two categories have low volumes. The Cardiac category displays some seasonality, with episodes peaking in the third quarter of each year.

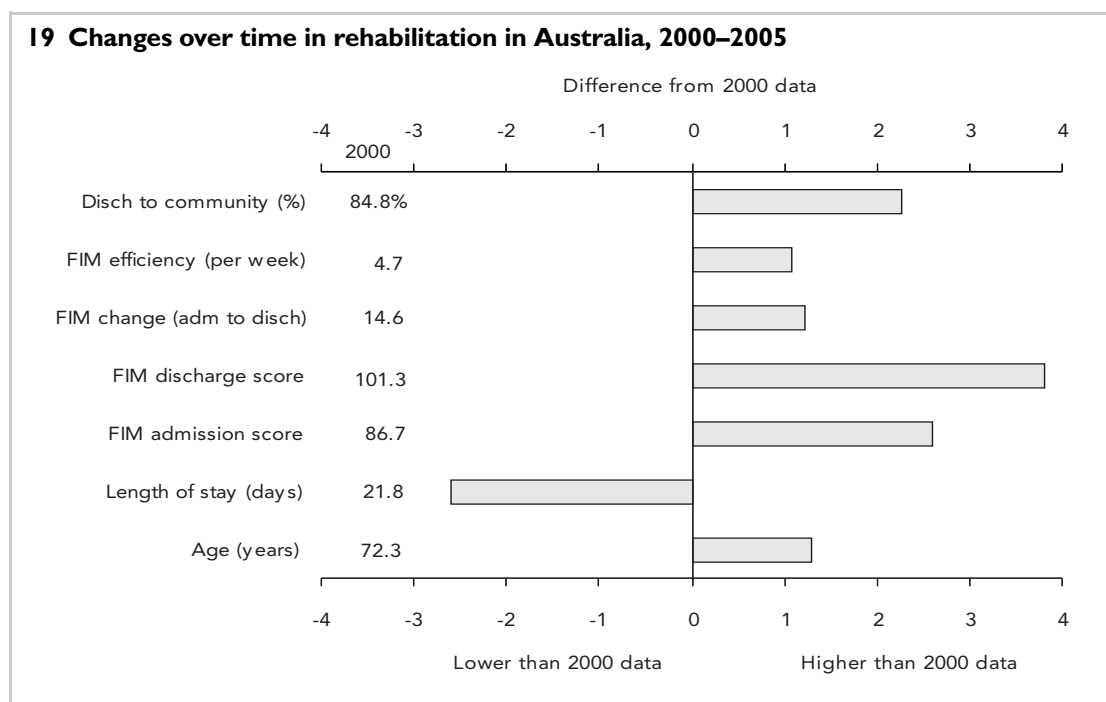
Other disabling impairments

In many ways this category provides a similar picture to that of the debility category. There are four classes of impairment and the most impaired class comprises only a small number of episodes and describes a different picture to that expected by trending across from the other three impairment classes. Being an “other” category it is hard to draw generalisations from the data. Refer to Box 18 for more detailed information about these episodes in 2005.

Change in rehabilitation between 2000 and 2005

As this is the inaugural comprehensive National Report of Rehabilitation Services by AROC, we

also comment on the changes in rehabilitation outcomes between 2000 and 2005. These changes are presented graphically in a way which attempts to tell the story of outcomes achieved for rehabilitation patients. An understanding of outcomes in rehabilitation cannot be obtained by using a single measure. Rather it is the combination of a number of elements that tell the story. Box 19 describes the overall changes in rehabilitation outcomes between 2000 and 2005. The vertical scale represents the average value in 2000 for each element described. The horizontal axis describes the difference between the 2000 average and the 2005 average. On the left of the graph the actual average for each data element is indicated. The story told by the figure in Box 19 is that, in an overall sense, outcomes in rehabilitation have improved significantly between 2000 and 2005. The ALOS has decreased, FIM improvement has increased, as has the efficiency with which this improvement is achieved, and patients are being discharged back to the community more frequently.



Discussion

In general, in 2005 the AROC dataset describes the following:

- there is a preponderance of female patients that are aged over 70 years
- there are more patients managed in the private sector rather than in the public sector
- the public sector tends to treat a greater percentage of the most impaired patients
- the greatest percentage of patients fall into the least disabled classes
- the greater the impairment, the greater the FIM gain, and the longer the LOS
- the vast majority of rehabilitation patients return to the community after discharge, although the proportion decreases with increasing impairment.

In many ways AROC is unique — it is supported by the entire sector, it covers the vast majority of inpatient rehabilitation episodes in both the public and private sectors, and it utilises an agreed and clinically endorsed standard outcome measure. Because of this it can, and does, provide benchmarking services for all member rehabilitation medicine services that allow the measurement of trends in clinical practice. This in turn leads to an improved understanding of factors that influence rehabilitation outcomes and costs and therefore performance of the sector. The rehabilitation sector is an example of a sector that is embracing transparency and accountability.

The volume of rehabilitation episodes has been steadily increasing over time, due in part to the ageing of the population, and in part to the fact that the community is better educated, more aware that rehabilitation may allow them to remain independent for longer, and less willing to accept dependence as their lot. Whilst the health sector places significant focus on acute care, and downstream on community care, it is rehabilitation that often provides the glue between those two sectors. In attempting to ensure an efficient and effective distribution of a limited budget the health sector is actively encouraging people to maintain their independence as long as possible (Ageing in Place, Home Based Care, etc). Rehabilitation deserves the recognition that it plays a

significant and important role in allowing this to be achieved.

The AROC database now comprises data describing some 300 000 episodes of rehabilitation, and is therefore a rich source of information. Pleasingly, AROC is increasingly being approached by individuals interested in utilising AROC's data to support their research into various aspects of rehabilitation. Again, this is an example that demonstrates that the rehabilitation sector is dedicated to continually improving clinical outcomes.

As a contribution to this end AROC intends to publish an Annual Report on the state of rehabilitation in Australia to highlight the achievements of the sector each year, and identify any trends and issues that are emerging.

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Competing interests

The authors declare that they have no competing interests.

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