

The distribution of health services for older people in Australia: where does transition care fit?

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Abstract

Introduction: The purpose of this study was to describe the distribution of hospital and aged care services for older people, with a particular focus on transition care places, across Australia and to determine the relationships between the provision of these services.

Methods: Aggregation of health and aged care service indicators by Aged Care Assessment Team (ACAT) region including: public and private acute and subacute (rehabilitation and geriatric evaluation and management) hospital beds, flexible and mainstream aged care places as at 30 June 2006.

Results: There was marked variation in the distribution of acute and subacute hospital beds among the 79 ACAT regions. Aged care places were more evenly distributed. However, the distribution of transition care places was uneven. Rural areas had poorer provision of all beds. There was no evidence of coordination in the allocation of hospital and aged care services between the Commonwealth and state/territory governments. There was a weak relationship between the allocation of transition care places and the distribution of health and aged care services.

Discussion: Overall, the distribution of services available to older persons is uneven across Australia. While the Transition Care Program is flexible and is providing rural communities with access to rehabilitation, it will not be adequate to address the increasing needs associated with the ageing of the Australian population. An integrated national plan for aged care and rehabilitation services should be considered.

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OLDER AUSTRALIANS are significant users of hospital and aged care services.¹ Resources servicing the needs of older people include hospitals which provide acute services, subacute services that

What is known about the topic?

As older people move between hospitals and the community and residential aged care sectors, problems may arise at the interface of the sectors. The distribution of specialised acute and subacute hospital services for older people at a state/territory level has been reported previously, prior to the introduction of the Transition Care Program which explicitly aims to improve the flow between sectors.

What does this paper add?

This study describes the distribution of both hospital and aged care services at Aged Care Assessment Team region level. The findings highlight the uneven distribution of many acute and subacute hospital services and aged care services, including transition care.

What are the implications for practitioners?

The findings demonstrate the importance of an integrated approach to optimise the delivery of health and aged care services. If population-based planning benchmarks of the ideal number of rehabilitation beds for older people could be developed in tandem with the expansion of the Transition Care Program, greater effects on flows across hospitals and community and residential aged care sectors would be likely to occur.

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include rehabilitation and geriatric evaluation and management (GEM) beds, and aged care services that include residential aged care facilities, Community Aged Care Packages (CACPs), Extended Aged Care at Home packages and the Home and Community Care program. Currently, the states and territories manage the acute hospital system, and the aged care sector is the responsibility of the Commonwealth government. Problems arise at the interface of these systems as older people move between acute hospital and aged care services. Towards the end of an acute hospital stay, older people may either wait unnecessarily in hospital for a place in residential aged care, be discharged prematurely to residential aged care before adequate completion of appropriate sub-acute services or return to community living without appropriate support services.^{2,3} Ensuring that hospital and aged care places (both residential and community) are available equitably across Australia reduces the possibility of inappropriate care provision at the interface of the two sectors.

In response to these problems, the Transition Care Program (TCP) was established at the interface of these two sectors with a particular focus on transitions between acute and community care.⁴ The TCP has the dual goals of reducing the number of older people inappropriately occupying an acute hospital bed and promoting the recovery of independence. It is jointly funded by the Commonwealth, state and territory governments, who all participated in the program design. Transition care is goal oriented, time limited and targets older people who, at the conclusion of a hospital episode, require more time and support in a non-hospital environment to complete their restorative processes, optimise their functional capacity and finalise access to their longer term care arrangements. It provides short-term support and active management for older people at the point of discharge from hospital, including up to 12 weeks of care in either the community or residential setting.⁵

The implementation of the TCP is set against a background of varying provision of services across the Australian states and territories.⁵ This is partly due to historical provision, which can

not be quickly redressed, varying levels of investment, poor planning, and long lead times for institutional programs, such as hospitals and residential aged care facilities. The short-term advantage of flexible programs such as the TCP is the low capital investment required. All 2000 transition care places have now been allocated, however, the method of allocation of transition care places was determined by the states and territories and it is unclear whether the allocation was made with consideration of the health and aged care services available in the region.² The importance of flexible aged care places, such as transition care, in the national system was highlighted with the commitment by the Australian Labor Party in the 2007 election to double the number of transition care places by 2012.⁶

Thus, the aim of this paper is to describe the distribution of hospital beds and aged care places across Australia with a particular focus on transition care places. While the distribution of specialised acute and subacute hospital services for older people at a state or territory level has been reported previously,⁷ this paper is the first to include hospital and aged care places (both flexible and mainstream) available across Australia at a finer geographic level.

Methods

Data from the Australian Government Department of Health and Ageing and the Australian Bureau of Statistics (ABS) were used in the analyses. All data were aggregated to Aged Care Assessment Team (ACAT) region level from either statistical local area (SLA) level or post-code, depending on the geographic unit by which data were stored. Concordance files for the aggregation were supplied by the ABS.⁸ The ACAT region was used for the aggregation as it reflects a national program with agreed boundaries in all states, unlike other regional frameworks. For example, the Australian Government Department of Health and Ageing uses "aged care planning regions" to plan the distribution of aged care services. In contrast, state and territory health departments use "health service planning regions"

to plan the distribution of hospital services. Aged care planning regions have different geographic boundaries to health service planning regions and there is no natural concordance between the two types of regions. Since all potential recipients of transition care must be first assessed by the local ACAT and enter transition care from that point of referral, the best option for the analyses was to compare the geographic distribution of health and aged care services according to ACAT regions.

The most recent population data available at an SLA level were for 30 June 2005, and this was aggregated to estimate the population in each ACAT region at 30 June 2005. The estimated resident population at a state/territory level was available for both 30 June 2005 and 30 June 2006. The population at ACAT region level at 30 June 2006 was therefore estimated by inflating the 2005 ACAT region populations by the growth in the estimated state/territory population between 2005 and 2006. The estimated number of older people in each ACAT region was also categorised as small (< 10 000), medium (10 001–25 000) or large (> 25 000) to ensure comparisons were made recognising different population bases.

The older population in the Northern Territory was estimated from the number of Aboriginal or Torres Strait Islander Australians aged at least 50 years, and non-Aboriginal Australians aged 70 years or more. In the other Australian states and territories and overall, older age was defined as 70 years or more. These population estimates were used as the denominator in all subsequent calculations where the availability of health and aged care places and the allocated transition care places were expressed as places per 1000 older persons in each ACAT region.

The availability of mainstream and flexible aged care places and packages was sourced from the Aged Care Stocktake of Places that was conducted on 30 June 2006.⁹ The provision ratio of aged care services (calculated as the number of places or packages per 1000 older persons) was calculated for each ACAT region and compared with the 2005–06 target provision ratio of 108 places

or packages per 1000 persons (comprised of 40 high care places, 48 low care places and 20 flexible packages). The aged care provision ratios in each ACAT region were also classified into quintile scores.

The estimated average number of public and private hospital beds by type of care was derived from the Admitted Care Data Set in the Public Hospital Establishment Collection 2005–06 and the Private Hospitals Data Bureau 2005–06, respectively. The type of care was classified as acute, subacute (rehabilitation or GEM) and other (palliative care, psychogeriatric, maintenance care, newborn, organ donation, boarder, other care, or unknown care type episodes).¹⁰ This classification for subacute was used as these care types were considered the most important for care provision for older people. For each type of care average daily utilisation, estimated from the number of episodes multiplied by the average length of stay divided by 365, was used as a proxy for bed availability. Quintile scores that classified each ACAT region depending on the number of hospital beds per capita were also derived.

A composite indicator score of the health and aged care services in each ACAT region was derived, based on the methodology developed by Baker and Beer.¹¹ This was calculated by summing the quintile scores for the acute hospital beds per 1000 older people, subacute hospital beds per 1000 older people and residential aged care places per 1000 older people to give a value between 3 (minimum) and 15 (maximum) for each ACAT region. The composite indicator score was then classified according to its quintiles.

Maps were constructed showing the spatial distribution of health and aged care services across Australia. Geographic information system (GIS) maps were drawn using ArcMap version 9.2 (ESRI, Redlands, Calif, USA). The maps displayed the spatial distribution of the quintiles for the acute, subacute, and aged care places as well as for the composite indicator. Scatterplots of transition care places versus hospital beds and aged care places per 1000 older people were also created. The correlations between the number of transition care places, hospital beds and aged care

places, all expressed per 1000 older persons, were calculated. All data extraction and manipulation was carried out using Microsoft Excel 2003 (Microsoft Corporation, Redmond, Wash, USA) and SPSS for Windows version 14.0 (SPSS Inc, Chicago, Ill, USA).

The distribution of each type of place was also examined using the Gini coefficient¹² which measures statistical dispersion with a value between 0 and 1. A value of 0 corresponds to perfect equality (each region having exactly the same level of service) and a value of 1 corresponds to perfect inequality (where one region has all the services, while every other region has no services). The Gini coefficient can be calculated from the relative mean difference of the distribution of service levels. For practical purposes, a Gini coefficient of 0.5 or higher is commonly taken to suggest high inequality.¹³

The analyses described here were undertaken as part of the National Evaluation of the Transition Care Program which ran from September 2006 until May 2008. Ethics approval for the evaluation overall was granted by the Department of Health and Ageing Departmental Ethics Committee and the Flinders Clinical Research Ethics Committee.

Results

The ACAT regions with the greatest provision of public and private hospital beds per 1000 older people corresponded to the ACAT regions with either the youngest population (in terms of the percent aged 70 years or more) or regions that incorporated large teaching hospitals such as the Queen Elizabeth II Jubilee Hospital in South Brisbane, the Royal Adelaide Hospital in Adelaide's Northern Area, the Austin Hospital in Melbourne's Heidelberg region and the Sir Charles Gairdner Hospital ACAT region in the Perth metropolitan area (Box 1).

Nationally there were 3.0 rehabilitation or GEM beds per 1000 older people. There was considerable diversity in the provision of subacute beds, with seven ACAT regions reporting more than five subacute hospital beds per 1000

older persons. Eight ACAT regions had zero or negligible subacute beds per 1000 older people, with six of these located in rural South Australia.

Overall, the national provision ratio for mainstream and flexible aged care places in 2005–06 was 105.5, compared with a target provision ratio of 108 aged care places per 1000 older people. There was heterogeneity between ACAT regions in terms of the provision of aged care places per 1000 older people. Five of the six ACAT regions with total provision ratios in excess of 160 were in sparsely populated areas of central or northern Australia. There were eight ACAT regions with an aged care provision ratio below 90.

The first 594 transition care packages were allocated across Australia in the 2004–05 financial year, with 913 packages allocated in 2005–06 and the remaining 493 packages allocated in 2006–07. At 30 June 2007, all 2000 transition care places were allocated and 1594 were operational around Australia.¹⁴ While the overall provision in each state was around one place per 1000 older people, there were many areas with no places allocated and 10 ACAT regions with an allocation in excess of two places per 1000 older people. Three of the latter corresponded to the location of a transition care service within a large teaching hospital in a capital city.

The composite indicator score based on acute, subacute, and aged care places per 1000 older people is presented in Box 2. This demonstrates the marked variability in terms of health service provision for older people in Australia. There were two South Australian ACAT regions (Barossa and Murray Mallee) that had the lowest possible score of 3 on the composite indicator, reflecting poor service provision in all three sectors for older people. A further six ACAT regions had a score of 4, and these were Kangaroo Island and Lower Eyre Peninsula (SA), Albany, Mandurah and Northam (WA), and Central West (QLD). However, South Australia and Western Australia were also represented among the ACAT regions with the highest composite indicator scores, with Northern Area (SA), Royal Perth and Sir Charles Gairdner (WA) each with a score of 14 or 15. Southern (TAS) and Heidelberg and St George's

I Distribution of population, aged care places, and hospital beds per 1000 older people by ACAT region, 2005–06¹

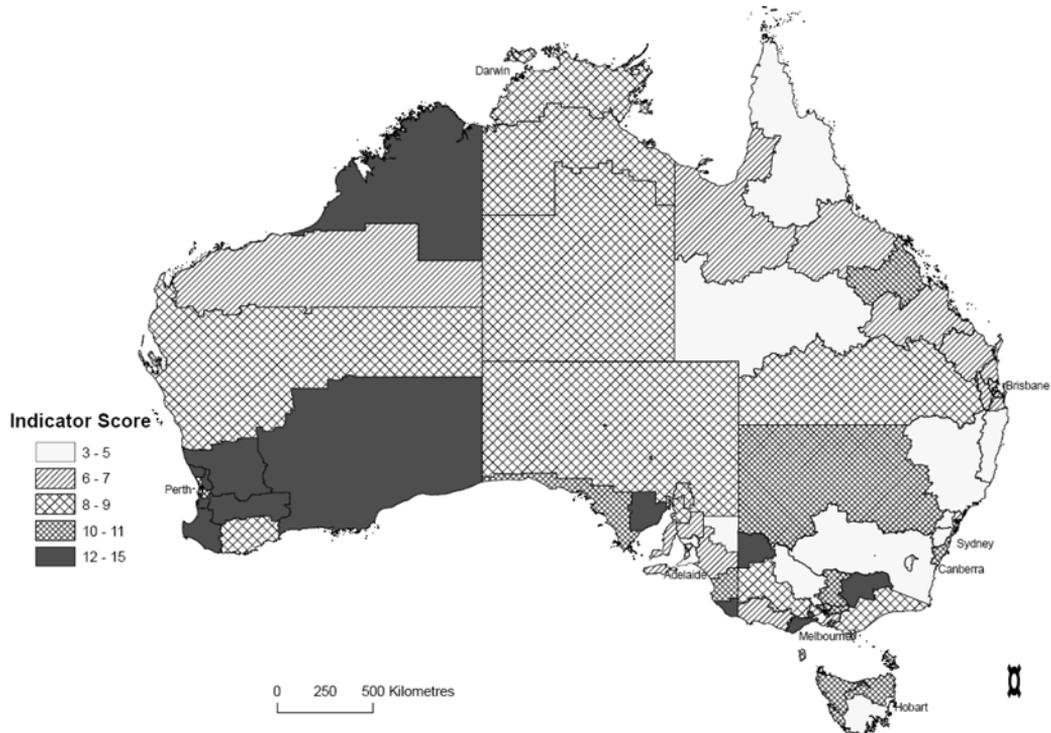
State ACAT region	Population			Aged care places					Hospital places			
	Total ²	% older	Size ⁴	Allocated TC places	Residential	CACP	Total main-stream ⁵	Flexible	Acute	Sub-acute ³	Other	Total ⁵
ACT ACT	328,817	6.7	M	1.6	72.1	20.4	92.5	4.2	32.8	2.6	5.1	40.4
NSW Greater Southern	472,418	10.9	L	1.3	76.5	17.0	93.5	4.6	16.8	2.0	6.5	25.1
Greater Western	305,327	10.4	L	0.9	87.6	18.2	105.8	12.9	25.3	3.1	7.4	35.7
Hunter New England	865,719	11.4	L	1.1	76.8	17.0	93.8	2.2	22.2	1.9	3.8	27.8
North Coast	477,702	13.6	L	1.0	76.3	18.0	94.3	3.9	19.3	1.2	1.7	22.1
Northern Sydney/Central Coast	1,116,508	11.3	L	1.0	91.3	15.3	106.6	2.0	24.1	3.8	2.8	30.7
South Eastern Sydney/ Illawarra	1,247,406	10.4	L	0.9	70.1	19.7	89.8	2.1	24.4	2.9	2.5	29.8
Sydney South West	1,262,683	8.1	L	1.0	95.1	15.8	111.0	1.7	29.2	2.8	2.8	34.8
Sydney West	1,078,761	6.7	L	1.1	89.7	20.0	109.7	2.1	31.8	3.4	4.5	39.7
Total	6,827,694	9.9		1.0	82.8	17.5	100.3	2.9	24.7	2.8	3.5	30.9
NT Alice Springs	34,141	6.7	S	1.8	60.1	92.6	152.7	21.9	90.6	0.5	19.7	110.8
Darwin	125,257	4.9	S	0.7	39.7	47.9	87.6	25.2	68.7	2.1	15.6	85.7
Katherine	13,946	6.0	S	9.5	68.0	68.0	136.0	38.2	48.1	0.0	14.6	62.7
Total	206,688	7.8		1.0	27.0	34.7	61.6	14.6	41.2	0.9	9.4	51.2
QLD Cairns	242,077	6.8	M	1.7	83.0	21.9	104.9	6.1	30.9	2.7	8.0	41.2
Central West	13,578	9.1	S	0.0	56.7	30.8	87.5	49.4	17.7	0.2	6.4	24.2
Fraser Coast	219,811	11.7	L	0.5	76.3	16.7	93.0	2.9	16.1	0.8	2.2	18.9
Gold Coast	564,208	9.2	L	0.8	82.7	15.0	97.7	2.5	19.0	2.0	3.3	24.2
Mackay	137,846	6.5	S	1.3	79.8	16.1	95.9	9.1	30.0	0.9	3.3	34.0
Mt Isa	34,606	4.1	S	0.0	79.4	54.4	133.8	11.1	44.6	1.3	14.9	60.8
Prince Charles Hospital	256,462	7.7	M	0.0	119.6	12.5	132.1	1.8	21.7	1.9	2.8	26.0
QEII	832,227	7.7	L	1.3	82.8	17.3	100.1	2.4	35.1	3.5	4.4	43.0
Red-Cab	207,518	9.6	M	0.0	80.8	14.0	94.8	2.0	17.9	1.3	3.0	22.2
Rockhampton	198,534	7.3	M	1.1	89.5	16.7	106.2	8.0	24.8	1.8	5.5	32.0
Royal Brisbane Hospital	325,099	8.6	L	2.5	76.9	21.4	98.3	0.5	56.4	3.1	5.0	64.3
Sunshine Coast	330,228	11.2	L	0.9	79.6	17.1	96.7	1.1	16.6	1.7	1.5	19.8
Toowoomba	271,954	9.4	L	0.6	88.9	19.0	107.9	2.9	20.0	0.7	17.0	37.8
Townsville	225,116	7.2	M	1.8	90.7	17.4	108.1	4.6	33.6	2.1	8.1	43.7
West Moreton	194,180	6.8	M	0.8	87.0	12.6	99.	2.6	22.7	4.9	6.1	33.7
Total	4,053,444	8.5		1.0	84.6	17.1	101.6	3.0	26.8	2.2	5.0	33.9
SA Adelaide Hills & Sth Fleur	102,913	10.5	M	0.0	84.7	13.4	98.1	1.8	24.4	0.3	0.5	25.2
Barossa	52,307	9.3	S	0.0	59.6	29.9	89.6	2.5	8.0	0.0	1.1	9.1
Flinders & Far North	22,215	7.9	S	0.0	77.9	52.1	130.0	33.2	43.7	0.3	17.0	61.0
Kangaroo Island	4,593	9.1	S	0.0	0.0	0.0	0.0	107.8	17.3	0.0	25.6	42.8
Lower Eyre Peninsula	29,903	9.8	S	0.0	52.3	20.2	72.4	40.7	17.8	0.1	10.0	28.0
Lower North	19,125	12.7	S	0.0	110.1	0.0	110.1	0.0	10.6	0.0	10.9	21.5
Lower South East	44,749	9.6	S	0.0	91.6	25.2	116.9	2.3	16.0	0.4	6.3	22.8
Mid North	29,841	12.0	S	0.0	74.9	22.3	97.2	14.8	20.2	0.4	20.1	40.7
Murray Mallee	35,776	11.6	S	0.0	50.0	27.8	77.7	10.6	11.1	0.0	9.4	20.5
Northern Area	567,870	10.2	L	2.0	108.6	22.3	131.0	4.5	33.6	5.1	4.6	43.3
Riverland	22,106	11.1	S	0.0	142.5	30.5	173.0	0.0	13.3	0.0	4.4	17.7
Southern Area	547,063	12.6	L	0.9	82.7	13.8	96.5	0.9	22.1	2.4	1.3	25.8

I Continued

State ACAT region	Population			Aged care places					Hospital places			
	Total ²	% Older	Size ⁴ older	Allocated TC places	Residential	CACP	Total main-stream ⁵	Flexible	Acute	Sub-acute ³	Other	Total ⁵
Upper South East	19,265	10.2	S	0.0	78.7	0.0	78.7	0.0	18.9	0.1	22.4	41.3
Whyalla	25,890	10.0	S	0.0	50.5	11.6	62.1	23.9	25.0	1.0	9.9	35.8
Yorke Peninsula	26,159	16.3	S	0.0	96.6	7.3	103.9	1.6	9.9	0.0	0.8	10.8
Total	1,554,656	11.2		1.0	90.3	18.0	108.3	4.4	25.2	2.7	4.4	32.3
TAS												
North West Tasmania	108,707	10.7	M	0.0	81.5	18.3	99.8	0.4	11.5	0.5	1.0	13.0
Northern	138,984	10.3	M	0.3	85.2	18.0	103.3	7.7	7.6	0.1	1.0	8.7
Southern	241,257	10.1	M	2.1	89.2	18.5	107.7	4.3	37.5	3.2	3.7	44.4
Total	488,948	10.3		1.1	86.3	18.3	104.6	4.4	26.0	1.7	2.4	30.1
VIC												
Ballarat	202,155	11.3	M	0.4	84.7	12.8	97.5	2.0	21.9	3.0	4.7	28.2
Bendigo	257,117	11.4	L	0.3	85.7	15.4	101.2	2.3	18.9	3.8	3.6	24.9
Bundoora	330,469	8.0	L	1.7	85.5	13.0	98.5	0.6	14.7	2.5	3.1	18.8
Caulfield	300,336	10.9	L	1.7	79.0	6.3	85.2	0.9	31.9	6.0	6.0	40.9
Central East	425,745	11.8	L	0.0	78.1	6.6	84.7	0.0	27.5	3.9	3.7	34.4
Geelong	256,417	11.8	L	0.7	87.0	18.6	105.5	2.8	20.1	3.1	2.8	25.2
Gippsland	252,444	11.9	L	0.0	77.8	15.2	93.0	3.4	16.9	2.1	2.7	20.6
Heidelberg	63,096	12.9	S	5.2	101.3	19.7	120.9	15.6	102.9	12.1	19.8	129.4
Kingston	358,227	11.4	L	1.3	91.0	24.7	115.6	1.1	13.7	4.8	3.6	20.8
Mildura	52,473	10.5	S	0.0	66.7	11.8	78.6	12.4	23.4	2.8	3.5	28.5
Mt Eliza	541,929	8.5	L	0.7	87.1	12.4	99.5	2.2	17.2	4.8	3.6	23.8
North West	468,071	8.8	L	1.7	81.8	23.4	105.2	2.3	41.9	5.2	7.0	51.3
Outer East	399,781	7.7	L	2.7	96.2	22.0	118.2	1.6	18.8	2.3	2.8	22.6
Shepparton/Hume	146,608	10.2	M	0.0	91.1	21.4	112.5	2.0	20.8	2.6	3.4	25.6
St George's	277,360	10.2	L	1.2	91.7	44.6	136.3	6.8	34.8	10.6	5.4	49.0
Wangaratta	119,480	10.9	M	0.0	78.4	16.1	94.5	12.7	25.8	3.1	4.1	32.5
Warnambool	102,867	11.8	M	0.0	84.9	19.1	104.0	1.6	23.4	1.5	4.0	28.9
Western	536,626	6.7	L	1.0	83.8	24.6	108.3	3.0	24.6	2.5	5.2	30.4
Total	5,091,666	9.8		1.0	85.1	18.0	103.2	2.7	24.9	4.2	4.4	31.9
WA												
Albany	54,841	10.4	S	3.5	63.8	12.5	76.3	28.7	18.5	0.3	7.7	26.5
Armadale/Kelmscott	160,762	6.2	M	0.0	76.7	13.6	90.3	0.0	14.2	2.1	2.4	18.7
Bentley Geriatric	142,743	9.9	M	0.0	103.4	22.7	126.1	7.3	5.5	2.3	2.4	10.3
Bunbury	143,707	8.5	M	1.6	75.8	20.1	95.9	6.4	19.3	0.3	9.1	28.7
Fremantle Hospital	235,221	9.3	M	2.3	70.4	20.8	91.3	0.0	31.5	3.1	2.8	37.4
Geraldton	62,885	7.5	S	4.2	42.4	27.7	70.1	32.3	20.8	0.3	5.3	26.4
Kalgoorlie Geriatric	54,558	4.6	S	0.0	87.2	15.1	102.3	12.7	37.0	1.0	8.6	46.6
Kimberley	36,451	2.9	S	0.0	122.1	56.3	178.4	0.0	72.9	1.1	25.0	99.0
Mandurah	170,594	10.2	M	0.0	77.4	7.2	84.5	1.2	5.2	0.0	1.3	6.5
Narrogin	18,369	8.8	S	0.0	91.7	27.1	118.8	19.1	17.5	0.1	13.6	31.3
Northam	44,782	9.3	S	0.0	26.1	17.0	43.1	57.1	12.8	0.9	5.2	18.9
Osborne Park	439,117	7.7	L	1.5	65.5	16.3	81.8	3.1	5.3	1.9	1.8	9.0
Pilbara	40,048	1.6	S	0.0	80.4	80.4	160.8	0.0	84.1	1.9	39.5	125.5
Royal Perth	152,406	10.5	M	0.0	135.5	20.4	155.9	0.9	54.8	8.1	2.6	64.6
Sir Charles Gairdner	92,135	11.1	M	0.0	114.1	19.7	133.8	4.9	145.6	5.3	21.7	172.6
Swan District	202,265	6.8	M	0.0	67.4	10.7	78.1	0.0	9.3	1.5	2.3	13.0
Total	2,050,884	8.3		0.9	80.9	17.5	98.4	5.8	26.0	2.4	4.7	33.0
Total	20,602,797	9.4		1.0	84.2	17.9	102.1	3.4	25.7	3.0	4.3	32.4

1: Hospital beds based on 2005–06 collection and aged care places from Aged Care Stocktake of Places, 30 June 2006; population estimate as at 30 June 2006. 2: Includes estimated resident population in unknown area; NSW = 1170; NT = 33 184; SA = 4881; VIC = 466. 3: Includes rehabilitation and Geriatric Evaluation and Management beds. 4: S = small older population <10 000; M = medium older population 10 001–25 000; L = large older population >25 000. 5: Due to rounding, total mainstream and total provision ratios may differ by 0.1 from sum of component ratios.

2 Composite indicator of acute, subacute and aged care places per 1000 older people



Data source: ABS Estimated Resident Population at 30 June 2005 (ABS Cat. No. 3235.0.55.001) and at 30 June 2006 (ABS Cat. No. 3201.0).

(VIC) ACAT regions also had high composite indicator scores, reflecting a high provision of acute, subacute, and aged care places in these ACAT regions relative to the other Australian ACAT regions (Box 2).

Aged care places were reasonably well distributed between the ACAT regions, with a Gini index of 0.11. The Gini indices for all hospital beds and subacute beds were higher at 0.34 and 0.50, respectively, indicating moderate levels of inequality in their distribution. In contrast, the Gini index for transition care places was the highest at 0.66, mainly due to the large number of ACAT regions with no allocated places (35 regions).

There was a weak relationship between the distribution of allocated transition care places and the distribution of health and aged care services.

Pearson's correlation coefficients for transition care places per 1000 older people and each of aged care places, acute hospital beds, subacute hospital beds and the composite indicator per 1000 older people were 0.19, 0.24, 0.21 and 0.27, respectively.

Discussion

Chronic illness and disability are highly prevalent in old age, and because both the volume of service demand of the older population and the frequency of service use by individuals are high, it is appropriate to make the majority of services easily accessible at a regional level. Where possible, older people should have local access to relevant health and support services, but this research suggests that older people in many areas

of Australia would struggle to access services. Our study gives the first detailed view of the provision of hospital and aged care places, particularly focusing on transition care places, for older people at the ACAT region level. It demonstrates that the distribution of health services varies widely with some regions particularly undersupplied in terms of acute and subacute hospital services and, to a lesser extent, access to aged care services.

While there were variations in the number of acute care beds across Australia, there were profound differences in the proportion of specialised beds allocated for the care of older people. Victoria had the greater provision of rehabilitation and GEM beds (13.5% of all hospital beds) due to its high provision of GEM beds compared with other jurisdictions. In contrast, older people in the Australian Capital Territory, Queensland, and Tasmania had the greatest disadvantage in terms of specialised hospital beds for their care, with 6.5% of hospital beds in both the Australian Capital Territory and Queensland and 5.6% of hospital beds in Tasmania dedicated to the provision of rehabilitation services, with no GEM beds. However, it is important to note that the distribution of services within each state or territory is obscured in these summaries. For example, South Australia has six ACAT regions with negligible subacute care beds, all located in rural areas albeit with relatively small populations of older people. Substantial imbalances in the provision of acute and subacute services for older people exist within and between states and territories.

The wide variability across states, territories and regions in the provision of rehabilitation beds is concerning, and in the absence of a national rehabilitation plan the establishment of population-based benchmarks (eg, the number of rehabilitation beds per 1000 persons over 70) would assist in planning the mix of acute and subacute care hospital beds across health regions. A large body of evidence suggests that failure to adequately address functional issues associated with hospitalisation in frail older people with complex needs results in higher readmission rates, poorer outcomes for individuals and poorly managed demand for services.^{15,16} Furthermore,

older adults in Tasmania and Queensland should have access to such services comparable with that of older adults in Victoria.

Crude estimates of the cost of the 2.1 million rehabilitation and GEM episodes of care in Australia in 2005–06 suggest that between \$841 million and \$1.26 billion was expended on these subacute hospital services, assuming a per diem rate of between \$400 and \$600. When fully operational, the 4000 transition care places will represent an investment of around \$300 million,² which represents between one quarter and one third of the total investment in the subacute sector. Allocation of these services to areas of need is important and coordination between sectors is likely to produce efficiencies in hospital flows.

The findings on flexible and mainstream aged care places are similar to aggregate figures published previously indicating that at a state/territory level, South Australia had the highest provision ratio (108.8) whereas the Australian Capital Territory had the lowest provision (94.8 places per 1000 older persons).¹⁷ The relatively even distribution of aged care services (flexible and mainstream) reflects the needs-based planning arrangements established by the Commonwealth government in 1986.¹⁸ In contrast, the uneven distribution of rehabilitation and GEM beds reflects variable levels of commitment to rehabilitation and geriatric beds across jurisdictions. The adoption of national population-based planning benchmarks for subacute care beds would improve the inequities of access that older people face in some jurisdictions.

The association between the allocation of transition care places and hospital and all aged care places was weak, suggesting that the allocation of these new places has not been based on any apparent needs assessment. The allocation of transition care places has not redressed inequities in the distribution of services. The TCP appears to offer particular promise to rural communities, however it is unlikely that the TCP will be sufficient to address the needs of the rapidly growing population over 80 years of age. Transition care is provided to older people post hos-

pitalisation with the aim that such services will reduce readmission and transfer to permanent residential aged care. It is, however, largely community-based and with low staffing ratios it is unlikely to substitute for hospital-based rehabilitation beds in either its return-home rates or levels of efficiency. While the TCP does provide some residential places, these do not appear to substitute for subacute care beds. The only Australian evaluation of a similar model of a residential transition unit undertaken before the TCP suggested that when all bed-days were counted such units had system efficiency problems.¹⁹ Although transferring older patients who were waiting for a high-level care bed saved 11.5 hospital bed-days it took a median of 21 days more for the older person to reach a residential aged care bed.

There are challenges in providing rehabilitation and geriatric assessment in rural Australia, including difficulties in attracting therapy workforce. However the TCP is flexible and does avoid rigid prescription of roles in the delivery of a multidisciplinary model. The known difficulties in attracting and retaining professionals in rural areas across a range of disciplines including pharmacy,²⁰ allied health,²¹ nursing²² and emergency medicine²³ will make it more difficult for rural communities to run efficient services, but the availability of such programs may also assist in attracting this workforce to the area.

More work needs to be undertaken at both tiers of government to correct the uneven distribution of transition care places nationally which should involve a more transparent process for the allocation of new places. However, the greater priority is to work with state and territory governments to address the marked geographical inequity in provision of acute and subacute care hospital beds for older people.

There are several limitations to the methodology used in this paper. The estimated bed numbers are based on average daily utilisation, and therefore obscure potentially important fluctuations in supply and demand. However, hospitals no longer report actual bed numbers, and therefore we used the best estimate available. The

hospital care-type definition for rehabilitation includes care provided in a psychiatric rehabilitation program. However, it appears that some states included psychiatric rehabilitation episodes of care in their count of rehabilitation episodes of care while others did not. Therefore, it is likely that the differences in rehabilitation beds between states are larger than reported here. The public and private hospital data collections were available at suburb and postcode level, which were then converted to SLA and aggregated to ACAT region. In a few localities, suburbs may not be entirely contained within an SLA and thus there is the potential for some, albeit small, error in the attribution of hospital beds to ACAT regions. Transition care services were matched to an ACAT region using the transition care service's postal address, and this may not always reflect the catchment area for the transition care service. The maps are based on ACAT regions, which have different boundaries to aged care planning regions (which are a Commonwealth responsibility), and health service planning regions (for which responsibility lies with the states and territories). It is possible that the ecologic fallacy is in operation, so that relationships (or lack thereof) at an aggregate level seen here may differ to the complex relationships between health and aged care services at a service level.

The analyses presented here were conducted early in the National Evaluation of the Transition Care Program and therefore reflect the service provision at a time of rapid evolution in the TCP. A snapshot of health and aged care services for older people carried out in 2009 would no doubt show changes from 2006. Similarly, analyses conducted in the next few years would also show differences to those presented here, reflecting the dynamic nature of the Transition Care Program and associated health and aged care services. Annual summaries that consider the availability of both health and aged care services for older people are needed to truly reflect how the provision of these services is changing over time.

The sizeable proportion of the NT population that could not be allocated to an ACAT region probably inflates the estimates of the aged care

and hospital places per 1000 older people at an ACAT region level. It is also important to bear in mind that the older population in the NT was estimated from a composite of the number of Aboriginal or Torres Strait Islander Australians aged at least 50 years, and non-Aboriginal Australians aged 70 years or more, and was therefore larger than if 70 years was used as a criterion for older age.

The TCP does not operate in isolation from other hospital, community, and aged care services. In particular, the availability of aged care places and hospital beds may impact on the delivery of transition care within a region. It seems likely that if an area has a high number of rehabilitation or GEM beds, a more disabled group of older people will be able to access transition care and potentially avoid permanent residential aged care. Similarly, in a region with a greater availability of aged care places it is likely that the level of disability of clients who enter the program will be lower. Given that the population aged 70 years or more is projected to increase from 9.5% at the last census to 16.7% by 2031²⁴ the approach to planning acute and rehabilitation hospital services, and flexible and mainstream aged care for older people across Australia requires review. This process needs to take into account some of the inequities in current systems and should target the development of services in rural regions.

Overall expenditure on both hospital and aged care services will accelerate with the ageing of Australia's population. Federal aged care expenditure alone is projected to increase from 0.8% of GDP in 2006–07 to 2.0% of GDP by 2046–47, while Commonwealth expenditure on public hospitals and private health insurance is projected to increase from 1.2% of GDP to 2.3% of GDP over the same period.²⁵ State and territory governments face similar increases to the Commonwealth government in the proportion of available funds that will be committed to health services in the coming decades, and achieving allocative efficiency is a priority so careful planning of services for older people is paramount.

It seems unlikely that simply adding more transition care places to regions will adequately

address the problem of elderly patients reducing hospital flows if there is an inadequate investment in geriatric rehabilitation beds. If population-based planning benchmarks of the ideal number of rehabilitation beds for older people could be developed in tandem with the expansion of the Transition Care Program, greater effects on flows across care sectors would be likely to occur.

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Competing interests

The authors declare that they have no competing interests.

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