



Royal Commission
into Aged Care Quality and Safety

**DOES THE QUALITY OF
RESIDENTIAL AGED CARE VARY WITH
RESIDENTS' FINANCIAL MEANS?**

RESEARCH PAPER 19

FEBRUARY 2021

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

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

The Royal Commission releases consultation, research and background papers. This research paper has been prepared by staff of the Office of the Royal Commission, for the information of Commissioners and the public. The views expressed in this paper are not necessarily the views of the Commissioners.

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Executive summary

This paper investigates whether the quality of care differs across Australian aged care facilities with the financial means of the residents. The paper was prepared by the Office of the Royal Commission into Aged Care Quality and Safety.

The topic was investigated initially by reviewing public submissions to the Royal Commission and the views expressed by the public in a series of focus groups. In the public submissions from or about people with lower financial means, older people with low financial means saw themselves (or were seen) as having less choice and being more at risk of financial stress when making decisions in times of crisis. But otherwise these submissions describe issues which are common for people in the Australian aged care system, regardless of their financial means. Focus group participants believed people with greater financial means are more easily able to find a comfortable aged care facility and a higher quality of service.

The topic was then investigated using quality indicator data from across the aged care system. Facilities were grouped based on the share of residents 'supported' (meaning their accommodation was partially or fully paid by the Australian Government) and whether the facilities receive revenue for extra and/or additional services ('extra services' for brevity) which is more common among facilities with low shares of supported residents. A small number of the quality indicators showed statistically significant differences between these groups of facilities but the large majority did not. The main statistically significant differences ($p < 0.05$) found in the analysis were:

- Care minutes—Residents in facilities with less than 30% of supported residents received more allied health and lifestyle care minutes on average than facilities with 50% or more supported residents. Also, residents in facilities with extra service revenue received more care time overall and for most staff types. Staff expenditure had similar patterns. The data on care minutes and staff expenditure was not adjusted to take into account the complexity of residents' care needs at the facility level which might partially or fully explain the differences. In addition, because there is a correlation between extra service status and lower numbers of supported residents, it is possible that the differences are driven by the fees paid by residents for extra services, rather than being evidence of financially disadvantaged residents receiving lower quality care.
- Assaults—The number of total assaults and serious physical assaults were higher on average in the facilities with 50% or more supported residents than in those with less than 30%. However, the number of sexual assaults were higher in facilities offering extra services.
- Mandatory indicators—The use of physical restraints was higher on average in the facilities with 50% or more supported residents than in those with less than 30%. The use of physical restraints was also higher in facilities without extra service revenue than in those with extra service revenue. However, facilities with extra services had higher rates of stage 1 pressure injuries.
- Clinical indicators—The number of chronic opioid users was higher on average in facilities with 50% or more supported residents than in facilities with less than 30% or 30–39% supported residents. Facilities with 50% or more supported residents also had higher hospital or emergency department readmission rates for long-term residents.

The quality indicator data used in these results was at the facility level. Quality indicators for individual residents are not widely available in the current aged care system. Their development would be useful to enable researchers and policy makers to continue research such as this, and help ensure all residents receive a high quality of care in the future.

1. Introduction

This paper investigates whether the quality of care differs across Australian aged care facilities with the financial means of the residents.

Funding of residential aged care is currently structured so that a resident's financial means do not affect the total payment received by their aged care provider to give personal and clinical care. A resident's financial means also do not affect the total payment received by their aged care provider for services such as meals, cleaning, facilities management and laundry.¹ The financial means of each resident instead determine the share they contribute towards these types of fees, with the Government contributing the remainder.

There is some scope for other types of payments to vary with resident's financial means. The amount that a provider receives for accommodation is related to means for some residents (those who receive no government assistance with their accommodation costs). In addition, if a resident has the financial means to pay a significant lump sum accommodation payment, this may be preferred by the aged care provider. The resident's financial means also can affect their ability to pay for extra and/or additional services ('extra services' for brevity) offered by the aged care provider such as upgraded hotel-type services and other services beyond the minimum care requirements.² An approved provider may use these sources of revenue to fund a higher quality of care for residents.

Whether the quality of care varies with residents' financial means was investigated for this paper qualitatively and quantitatively.

- The qualitative investigation involved a review of the submissions made to the Royal Commission and the comments by focus group participants in Ipsos's study *They look after you, you look after them: Community attitudes to ageing and aged care*.³
- The quantitative investigation involved using quality of care indicators to see if there were statistically significant differences in the results for groups of facilities. Facilities were grouped according to the percentage of residents that have all or some of their accommodation costs paid by the Australian Government (in the aged care system these residents are described as 'supported'). Facilities were also grouped according to whether they receive revenue for extra services.

¹ <https://www.myagedcare.gov.au/aged-care-home-costs-and-fees>

² <https://www.myagedcare.gov.au/aged-care-home-costs-and-fees>

³ Ipsos, *They look after you, you look after them: Community attitudes to ageing and aged care*, 2019, A report on focus groups for the Royal Commission into Aged Care Quality and Safety, https://agedcare.royalcommission.gov.au/sites/default/files/2020-07/they_look_after_you_you_look_after_them.pdf.

2. Qualitative results

Public submissions to the Royal Commission that were relevant to this paper were found through keyword searches using terms such as 'low income', 'pension', 'hardship' or 'supported resident'. A sample was then taken from these submissions and further refined based on whether the submission was flagged as belonging to financially or socially disadvantaged people, or people who were homeless or at risk of homelessness. Submissions were excluded if they were duplicated, outside the Royal Commission's Terms of Reference, or the submitter had not consented to the submission's publication. A total of 79 submissions were selected and then reviewed through this process.

In the public submissions from or about people with lower financial means, older people with low financial means saw themselves (or were seen) as having less choice and being more at risk of financial stress when making decisions in times of crisis. Otherwise, the experiences described in these submissions are common for people in the Australian aged care system, regardless of their financial means. The submissions described concerns about the vulnerability of older people, difficulty accessing aged care services, the challenges of meeting the financial demands of ageing, and financial and housing security. The submissions also discussed accommodation lump sum payments (known as Refundable Accommodation Deposits (RAD)) and the difficulties of negotiating contracts with aged care providers.

The Royal Commission also engaged Ipsos to convene a series of focus groups during July to September 2019 which included people who are financially and socially disadvantaged, homeless or at risk of homelessness.⁴ Participants believed that access to aged care would generally be easier for people with greater financial means. They believed it would be easier to find a comfortable aged care facility and a higher quality of service could be accessed (e.g. better environment, staffing ratios and quality of food). Participants who were homeless or at risk of being homeless perceived they would have limited choice and end up in a low quality facility.

⁴ Ipsos, *They look after you, you look after them: Community attitudes to ageing and aged care*, 2019, A report on focus groups for the Royal Commission into Aged Care Quality and Safety, https://agedcare.royalcommission.gov.au/sites/default/files/2020-07/they_look_after_you_you_look_after_them.pdf.

3. Quantitative results

The quantitative analysis used quality indicator data such as staff minutes and expenditure on care, the compulsory reporting and national mandatory indicators, the Registry of Senior Australians (ROSA) clinical indicators, and consumer experience, complaints and compliance data from the Aged Care Quality and Safety Commission (ACQSC). The coverage and time period of this data varies.

The analysis also used data from StewartBrown about 'supported' residents (the term used in aged care to mean the Australian Government partially or fully pays for accommodation) and data about extra services. This data was collected in StewartBrown's *Aged Care Sector Financial Performance Survey*. The datasets are based on a voluntary sample of 921 facilities in 2016/17 and 1021 facilities in 2018/19. In these years about 92–93% of the facilities in the data are not-for-profit, with for-profit facilities comprising just 4–6% and government facilities just 2–3%. Alternative data showing residents' income and assets was obtained from the Australian Department of Human Services (DHS) for the purpose of this analysis. The DHS data was not used because its coverage was also incomplete and the identifiers contained in it did not adequately link to the other aged care records.

In the analysis, facilities were grouped according to the percentage of residents that are supported, split into 4 bands selected from the distribution of the individual facility results:

- under 30% supported residents
- 30–39% supported residents
- 40–49% supported residents
- 50% or more supported residents

The percentage of all residents that were supported residents in the 2016/17 data averaged 38% in for-profit facilities, compared to 47% in not-for-profit facilities and 57% in government facilities. In the 2018/19 data, the percentages of residents who were supported averaged 33% in for-profit facilities, compared to 47% in not-for-profit facilities and 53% in government facilities.

Facilities were also split into those with and without extra service revenue. The percentage of facilities with extra service revenue was 48% for those with under 30% supported residents. This gradually falls as the share of supported residents increase. Just 21% of the facilities have extra service revenue among those with 50% or more supported residents.

The quality indicator results for each of these facility groups are presented below including the number of facilities in the analysis, the means, 95% confidence intervals and medians. Statistical tests were conducted to check which differences between groups are statistically significant and these are reported within the text. We refer to $p < 0.05$ as 'significant' and $p < 0.1$ as 'marginally significant'. The full significance test results are presented in appendices 1 and 2.

- For the supported resident bands, one-way analysis of variance (ANOVA) or Kruskal-Wallis tests have been performed. ANOVA was used where normality was present, and the Kruskal-Wallis test was used where normality was not present. We also performed post-hoc analysis to determine which of the pairs of categories were different.
- For the extra service status, t-tests were performed where normality was present and the Wilcoxon test was performed where normality was not present.

3.1. Care minutes

The StewartBrown data contains care minutes per resident per day for various types of staff. The data was not adjusted to take into account the complexity of residents' care needs at the facility level which could partially or fully explain differences.

In 2018/19, average total staff minutes was highest in the facilities with less than 30% of supported residents. These facilities had the highest result for all staff types except for enrolled nurses and agency staff. The differences were statistically significant for only one set of pairs: facilities with less than 30% of supported residents received significantly more allied health and lifestyle on average than facilities with 50% or more supported residents. However, because there is a correlation between extra service status and lower numbers of supported residents, it is possible this difference is driven by the fees paid by residents for extra services, rather than being evidence of financially disadvantaged residents receiving lower quality care. Residents in facilities with extra services received more care minutes overall than those in facilities without extra services (a difference between averages of about 16.9 minutes per resident per day or 11%). They also received more care minutes across all staff types. These results were statistically significant except for registered nurses and allied health and lifestyle.

Table 1: Average care minutes per resident per day, by supported resident share, 2018/19

Indicator	<30% supported			30–39% supported			40–49% supported			≥50% supported		
	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md
Care management	131	6.7 [5.7, 7.7]	5.9	168	5.5 [4.8, 6.2]	5.5	323	6.4 [5.3, 7.4]	5.2	423	6.6 [5.9, 7.2]	5.3
Registered nurses	131	21.3 [19.3, 23.3]	22.3	168	20.5 [18.6, 22.5]	22.1	323	20.1 [18.7, 21.4]	20.6	423	19.8 [18.6, 21]	20.6
Enrolled nurses	131	13.1 [8.8, 17.3]	6.3	168	12.7 [9.5, 16]	4.1	323	17.6 [14.4, 20.9]	8.7	423	17 [13.9, 20]	9.5
Personal care workers	131	114.4 [105.8, 123.1]	123.6	168	107.8 [99.7, 116]	119.1	323	107.5 [101.2, 113.7]	125.4	423	111.3 [106.2, 116.4]	124.4
Allied health and lifestyle	131	10.4 [9.1, 11.6]	9.9	168	8.6 [7.5, 9.7]	7.9	323	8.9 [8.1, 9.6]	8.6	423	8.2 [7.6, 8.9]	7.4
Agency staff	131	0.7 [0.3, 1]	0	168	1.3 [0.8, 1.8]	0	323	1.2 [0.9, 1.6]	0	423	1 [0.7, 1.2]	0
Total	131	166.5 [155, 178]	181.1	168	156.5 [146.1, 167]	172.7	323	161.7 [153.7, 169.6]	182.9	423	163.8 [157.1, 170.6]	179.2

Notes: N = Number of facilities. CI = Confidence Intervals. Md = Median.

Table 2: Average care minutes per resident per day, by extra service status, 2018/19

Indicator	No Extra Services			Extra Services		
	N	Mean [95% CI]	Median	N	Mean [95% CI]	Median
Care management	745	6.2 [5.6, 6.8]	5.2	296	6.8 [6.2, 7.3]	5.7
Registered nurses	745	19.8 [18.9, 20.7]	21.3	296	21 [19.6, 22.4]	21
Enrolled nurses	745	15 [13.1, 16.8]	7	296	18.7 [14.6, 22.8]	11.3
Personal care workers	745	107.1 [103.1, 111.1]	122.1	296	116.8 [111.2, 122.4]	126.7
Allied health and lifestyle	745	8.4 [8, 8.9]	8.4	296	9.6 [8.7, 10.5]	8.6
Agency staff	745	0.9 [0.7, 1.1]	0	296	1.5 [1.1, 1.8]	0
Total	745	157.5 [152.3, 162.6]	177.5	296	174.4 [166.9, 181.8]	184.3

Notes: N = Number of facilities. CI = Confidence Intervals.

3.2. Staff expenditure

The StewartBrown data also contains expenditure on staff per resident per day. The data has not been adjusted to take into account variation in the complexity of residents' care needs at the facility level (casemix).

In 2018/19, facilities with less than 30% of supported residents spent more on total staff, and more on care management, registered nurses and allied health and lifestyle, than facilities in all other bands. The differences were only statistically significant for allied health and lifestyle. Again, because there is a correlation between extra service status and lower numbers of supported residents, it is possible this difference is driven by the fees paid by residents for extra services, rather than being evidence of financially disadvantaged residents receiving lower quality care.

Facilities receiving extra service fees spent more on average across all staff types. The statistical tests showed that the differences were significant for care management, enrolled nurses, allied health and lifestyle, and total staff.

Table 3: Average dollars spent per resident per day, by supported resident share, 2018/19

Indicator	<30% supported			30–39% supported			40–49% supported			≥50% supported		
	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md
Care Management	131	8.6 [7.7, 9.6]	8	168	8.1 [7.2, 9]	7.2	323	8 [7.4, 8.6]	7	423	7.7 [7.1, 8.2]	6.9
Registered nurses	131	23.6 [22.1, 25.2]	24.3	168	23.3 [21.7, 25]	23.2	323	22.9 [21.8, 24]	22.6	423	21.7 [20.5, 22.8]	20.9
Enrolled nurses	131	9.7 [7.6, 11.9]	5.8	168	10.3 [7.9, 12.6]	5.4	323	12.5 [10.6, 14.4]	7.8	423	12.7 [10.9, 14.5]	8.3
Personal care workers	131	83.5 [80.1, 86.9]	82.2	168	80.4 [77.3, 83.5]	79.5	323	81.5 [78.9, 84.1]	84.8	423	82 [79.8, 84.2]	82.4
Allied health and lifestyle	131	10.6 [9.6, 11.6]	11	168	8 [7.2, 8.8]	7.2	323	8.4 [7.9, 9]	8.5	423	7.2 [6.7, 7.7]	7.1
Agency staff	131	3.5 [2.9, 4.2]	2.8	168	4.3 [3.4, 5.3]	2.6	323	4.7 [4, 5.3]	2.8	423	4.6 [4.1, 5.2]	2.6
Total	131	142.2 [138.2, 146.1]	142.6	168	137.2 [133.7, 140.6]	138.9	323	140.8 [138.1, 143.4]	143.1	423	138.7 [136.1, 141.3]	139.4

Notes: N = Number of facilities. CI = Confidence Intervals. Md = Median.

Table 4: Average dollars spent per resident per day, by extra service status, 2018/19

Indicator	No Extra Services			Extra Services		
	N	Mean [95% CI]	Median	N	Mean [95% CI]	Median
Care management	745	7.8 [7.4, 8.3]	7	296	8.2 [7.7, 8.8]	7.6
Registered nurses	745	22.5 [21.7, 23.2]	21.9	296	22.7 [21.4, 24]	23.2
Enrolled nurses	745	11.5 [10.3, 12.7]	6.9	296	12.9 [11, 14.8]	9.3
Personal care workers	745	81.5 [79.8, 83.2]	82.2	296	82.6 [80.3, 84.9]	82.8
Allied health and lifestyle	745	7.3 [7, 7.7]	7.2	296	10.1 [9.5, 10.7]	10.1
Agency staff	745	4.5 [4.1, 4.9]	2.5	296	4.3 [3.8, 4.9]	3
Total	745	137.8 [135.9, 139.7]	138.9	296	143.8 [141.3, 146.4]	144.3

Notes: N = Number of facilities. CI = Confidence Intervals.

3.3. Compulsory reporting

The *Aged Care Act 1997* requires that approved providers of residential aged care report suspicions or allegations of assaults, and when residents are absent without explanation.

In 2018/19, facilities with 50% or more supported residents had the highest average incidents of total, serious physical, and sexual assaults per resident, as well as residents reported missing. The differences were only statistically significant for total and serious physical assaults between the facilities with 50% or more supported residents and those with less than 30% (the differences between the averages exceed 50%).

Facilities offering extra services had higher assaults but fewer reported missing residents on average than facilities not offering extra services. The differences were only statistically significant for sexual assaults.

Table 5: Compulsory reporting indicators, average per 100 residents, by supported resident share, 2018/19

Indicator	<30% supported			30–39% supported			40–49% supported			≥50% supported		
	N	Mean	Md	N	Mean	Md	N	Mean	Md	N	Mean	Md
		[95% CI]			[95% CI]			[95% CI]			[95% CI]	
Total assaults	125	1.95 [1.48, 2.42]	1.05	166	2.62 [2.13, 3.12]	1.84	314	2.41 [2.11, 2.72]	1.56	412	3.05 [2.65, 3.45]	2.06
Serious physical assault	125	1.59 [1.17, 2.01]	0.8	166	2.2 [1.75, 2.64]	1.44	314	2.05 [1.77, 2.33]	1.23	412	2.52 [2.17, 2.86]	1.69
Sexual assault	125	0.3 [0.18, 0.43]	0	166	0.4 [0.25, 0.55]	0	314	0.33 [0.23, 0.44]	0	412	0.5 [0.39, 0.61]	0
Reported missing	125	0.58 [0.4, 0.75]	0	166	0.58 [0.41, 0.75]	0	314	0.78 [0.54, 1.02]	0	412	1.14 [0.57, 1.7]	0

Notes: N = Number of facilities. CI = Confidence Intervals, Md = Median.

Table 6: Compulsory reporting indicators, average per 100 residents, by extra service status, 2018/19

Indicator	No Extra Services			Extra Services		
	N	Mean [95% CI]	Median	N	Mean [95% CI]	Median
Total assault	723	2.57 [2.32, 2.81]	1.69	290	2.86 [2.44, 3.29]	2.05
Serious physical assault	723	2.15 [1.94, 2.37]	1.28	290	2.36 [1.99, 2.72]	1.54
Sexual assault	723	0.39 [0.32, 0.47]	0	290	0.44 [0.33, 0.55]	0
Reported missing	723	0.99 [0.65, 1.32]	0	290	0.58 [0.45, 0.71]	0

Notes: N = Number of facilities. CI = Confidence Intervals.

3.4. National mandatory indicators

The National Aged Care Mandatory Quality Indicators Program (NACMQIP) run by the Australian Department of Health collects data from residential aged care services every 3 months. This analysis uses the data from the first quarter of 2019/20, whereas the data used to group facilities by supported resident share and extra service status are for 2018/19.

Facilities with less than 30% supported residents had fewer instances of intent to restrain and use of physical restraints than other facilities. The differences were only statistically significant for use of physical restraints between the lowest and highest supported resident bands (a difference between the averages of about 59%). Rates of pressure injury and weight loss did not follow a clear pattern and the differences were only statistically significant for unstageable pressure injuries between the 30–39% and 40–49% groups.

Facilities not offering extra services had more instances of physical restraint on average than facilities offering extra services, but fewer instances of intent to restrain. The differences were only significant for use of physical restraints (a difference between the averages of about 35%). Facilities with extra services had higher rates across most other national mandatory indicators, however, the results were only significant for stage 1 pressure injuries and marginally significant for stage 2 pressure injuries.

Table 7: NACMQIP indicators, average per 100 residents, by supported resident share, first quarter of 2019/20

Indicator	<30% supported			30–39% supported			40–49% supported			≥50% supported		
	N	Mean [95%CI]	Md	N	Mean [95%CI]	Md	N	Mean [95%CI]	Md	N	Mean [95%CI]	Md
Intent to restrain	116	7.29 [4.13, 10.46]	0	163	10.75 [6.52, 14.99]	0	306	11.37 [8.2, 14.54]	0	405	16.09 [12.1, 20.05]	0
Physical restraints	116	32.38 [21.07, 43.7]	5.81	163	40.94 [30.87, 51.01]	13.27	306	34.06 [27.92, 40.19]	10.75	405	51.35 [43.6, 59]	19.34
Stage 1 pressure injuries	121	3.61 [2.91, 4.3]	2.42	160	3.64 [2.86, 4.41]	2.25	302	3.59 [3.05, 4.14]	2.06	401	3.73 [3.29, 4.18]	2.44
Stage 2 pressure injuries	121	3.28 [2.73, 3.83]	2.94	160	3.02 [2.42, 3.62]	2.27	302	3.1 [2.71, 3.49]	2.27	402	3.38 [3, 3.76]	2.31
Stage 3 pressure injuries	121	0.58 [0.39, 0.76]	0	160	0.71 [0.5, 0.91]	0	302	0.51 [0.38, 0.65]	0	401	0.62 [0.46, 0.78]	0
Stage 4 pressure injuries	121	0.12 [0.05, 0.19]	0	160	0.1 [0.02, 0.17]	0	302	0.15 [0.09, 0.21]	0	401	0.17 [0.09, 0.24]	0
Deep tissue pressure injury	120	0.27 [0.11, 0.42]	0	160	0.25 [0.04, 0.46]	0	302	0.15 [0.09, 0.2]	0	401	0.24 [0.16, 0.33]	0
Unstageable pressure injury	121	0.32 [0.17, 0.47]	0	160	0.31 [0.03, 0.6]	0	302	0.48 [0.29, 0.67]	0	401	0.31 [0.21, 0.42]	0
Total pressure injuries	121	8.17 [7.12, 9.23]	7.22	160	8.02 [6.68, 9.37]	5.45	302	7.98 [7.13, 8.83]	6.13	402	8.45 [7.77, 9.13]	6.78
Unplanned weight loss	100	8.51 [7.09, 9.94]	7.86	140	9.31 [8.01, 10.6]	8.64	275	8.07 [7.38, 8.76]	7.14	353	8.68 [7.89, 9.46]	7.41
Significant weight loss	100	8.37 [7.43, 9.32]	8.19	140	8.21 [7.36, 9.06]	7.89	275	8.74 [8.1, 9.38]	7.94	352	9.36 [8.7, 10.02]	8.45

Notes: N = Number of facilities. CI = Confidence Intervals. Md = Median.

Table 8: NACMQIP indicators, average per 100 residents, by extra service status, first quarter of 2019/20

Indicator	No Extra Services			Extra Services		
	N	Mean [95% CI]	Median	N	Mean [95% CI]	Median
Intent to restrain	705	12.05 [9.91, 14.19]	0	281	14.5 [9.62, 19.37]	0
Physical restraint	705	45.5 [40.26, 50.74]	15.32	281	33.66 [26.63, 40.69]	10.56
Stage 1 pressure injuries	702	3.6 [3.25, 3.95]	2.19	278	3.8 [3.28, 4.32]	2.5
Stage 2 pressure injuries	703	3.11 [2.85, 3.37]	2.22	278	3.54 [3.08, 4]	2.76
Stage 3 pressure injuries	702	0.59 [0.48, 0.7]	0	278	0.6 [0.45, 0.74]	0
Stage 4 pressure injuries	702	0.15 [0.1, 0.2]	0	278	0.13 [0.08, 0.18]	0
Deep tissue pressure injury	702	0.21 [0.15, 0.28]	0	277	0.23 [0.14, 0.32]	0
Unstageable pressure injury	702	0.36 [0.26, 0.46]	0	278	0.38 [0.2, 0.56]	0
Total pressure injuries	703	8.01 [7.48, 8.55]	6.32	278	8.68 [7.78, 9.58]	6.67
Unplanned weight loss	627	8.58 [8.03, 9.14]	7.41	237	8.55 [7.65, 9.44]	7.87
Significant weight loss	626	8.78 [8.33, 9.24]	8.06	237	9.06 [8.39, 9.74]	8.96

Notes: N = Number of facilities. CI = Confidence Intervals.

3.5. ROSA indicators

The ROSA indicators use data for 2016/17 sourced from the Pharmaceutical Benefits Scheme (PBS), hospital and emergency departments, and the National Death Index. The indicators are case-mix adjusted to allow for meaningful comparisons between facilities with residents who have differing health conditions. The indicators are explained in detail in ROSA's Outcome Monitoring System.⁵

The results by share of supported residents mostly do not have a clear pattern. The number of chronic opioid users was significantly higher on average in facilities with 50% or more supported residents than in facilities with less than 30% or 30–39% supported residents. Facilities with 50% or more supported residents also had significantly higher readmissions for long-term residents.

Results were also mixed when the ROSA indicators are examined by extra service status. The only statistically significant results were that facilities not delivering extra services had lower rates of high sedative load and hospitalisations for fractures.

⁵ MC Inacio, C Lang, GE Caughey, SCE Bray, SL Harrison, C Whitehead, R Visvanathan, K Evans, M Corlis, V Cornell, S Wesselingh, 'The Registry of Senior Australians outcome monitoring system: quality and safety indicators for residential aged care', *International Journal for Quality in Health Care*, Vol 32, 8, October 2020, pp 502–510, <https://doi.org/10.1093/intqhc/mzaa078>

Table 9: ROSA indicators, average per 100 residents, by supported resident share, 2016/17

Indicator	<30% supported			30–39% supported			40–49% supported			≥50% supported		
	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md
Antibiotic use	137	66.66 [65.23, 68.1]	66.79	144	65.07 [63.73, 66.41]	65.43	290	65.01 [64, 66.03]	65.52	375	65.8 [64.82, 66.77]	66.44
Antipsychotic use	137	22.73 [21.53, 23.93]	23.33	144	21.95 [20.69, 23.21]	21.63	290	21.99 [21.18, 22.79]	21.74	375	22.55 [21.75, 23.34]	22.59
Chronic opioid use	137	28.14 [26.74, 29.55]	28.59	144	29.04 [27.65, 30.42]	28.71	290	30.37 [29.37, 31.37]	29.1	375	31.9 [30.87, 32.93]	32.09
Premature deaths	137	0.71 [0.55, 0.87]	0	144	0.65 [0.49, 0.81]	0	290	0.61 [0.52, 0.71]	0	375	0.64 [0.52, 0.76]	0
High sedative load	137	46.33 [44.52, 48.14]	46.98	144	45.14 [43.35, 46.93]	44.51	290	46.7 [45.64, 47.77]	47.34	375	46.43 [45.32, 47.55]	47.47
<i>Emergency department or hospital visits for:</i>												
Delirium or dementia	105	2.36 [1.87, 2.85]	1.93	117	2.74 [2.19, 3.28]	1.73	213	2.27 [1.92, 2.61]	1.62	229	2.99 [2.52, 3.47]	2.05
Readmission—long term residents *	105	18.39 [16.48, 20.3]	17.78	111	19.13 [17.17, 21.08]	18.67	208	20.32 [18.8, 21.85]	19.34	225	22.05 [20.42, 23.68]	20.88
Readmission—short term residents *	81	18.53 [15.57, 21.5]	16.3	89	18.93 [16.07, 21.79]	17.46	150	18.21 [16.23, 20.19]	16.3	153	20.43 [18.09, 22.77]	17.43
Falls	105	12.21 [11.19, 13.23]	12.13	117	11.57 [10.38, 12.77]	11.27	213	11.95 [11.14, 12.77]	11.56	231	12.39 [11.47, 13.31]	10.8
Fractures	105	5.45 [4.95, 5.94]	4.97	117	5.09 [4.57, 5.61]	4.92	213	5.26 [4.84, 5.68]	4.82	231	5.12 [4.69, 5.54]	4.94
Medication-related events	105	0.42 [0.25, 0.6]	0	117	0.34 [0.2, 0.48]	0	213	0.6 [0.46, 0.74]	0	231	0.63 [0.49, 0.76]	0
Pressure injuries	105	2.97 [2.53, 3.4]	2.36	117	2.79 [2.41, 3.18]	2.52	213	2.84 [2.53, 3.15]	2.41	231	3.24 [2.91, 3.57]	2.92
Weight loss or malnutrition	105	2.14 [1.75, 2.54]	1.78	117	1.77 [1.39, 2.15]	1.39	213	1.69 [1.41, 1.97]	1.06	231	2.05 [1.73, 2.37]	1.21

Notes: N = Number of facilities. CI = Confidence Intervals. Md = Median. * = Readmission within 30 days of entry/re-entry to aged care from hospital.

Table 10: ROSA indicators, average per 100 residents, by extra service status, 2016/17

Indicator	No Extra Services			Extra Services		
	N	Mean [95% CI]	Median	N	Mean [95% CI]	Median
Antibiotic use	753	65.49 [64.83, 66.15]	65.9	193	65.89 [64.78, 67.01]	65.9
Antipsychotic use	753	22.38 [21.83, 22.92]	22.53	193	22.06 [21.13, 22.99]	21.7
Chronic opioid use	753	30.6 [29.92, 31.28]	30.08	193	29.88 [28.72, 31.03]	28.9
Premature deaths	753	0.65 [0.58, 0.73]	0	193	0.62 [0.5, 0.73]	0
High sedative load	753	45.88 [45.12, 46.63]	46.9	193	47.97 [46.6, 49.34]	48.22
<i>Emergency department or hospital visits for:</i>						
Delirium or dementia	540	2.61 [2.34, 2.87]	1.76	124	2.65 [2.13, 3.18]	1.94

Indicator	No Extra Services			Extra Services		
	N	Mean [95% CI]	Median	N	Mean [95% CI]	Median
Readmission—long term residents *	525	20.71 [19.72, 21.71]	19.47	124	19.1 [17.29, 20.91]	19.17
Readmission—short term residents *	383	19.52 [18.14, 20.89]	17.31	90	17.43 [14.75, 20.11]	15.6
Falls	542	11.97 [11.42, 12.51]	11.3	124	12.57 [11.51, 13.63]	11.82
Fractures	542	5.09 [4.83, 5.36]	4.75	124	5.72 [5.24, 6.2]	5.6
Medication-related events	542	0.52 [0.44, 0.6]	0	124	0.6 [0.44, 0.76]	0
Pressure injuries	542	3 [2.8, 3.2]	2.56	124	2.97 [2.58, 3.36]	2.59
Weight loss or malnutrition	542	1.91 [1.72, 2.1]	1.24	124	1.86 [1.49, 2.22]	1.28

Notes: N = Number of facilities. CI = Confidence Intervals. * = Readmission within 30 days of entry/re-entry to aged care from hospital.

3.6. Consumer experience

Data on consumer experience is collected from 10% or more of the residents in a facility when an ACQSC team visits the facility to undertake a site audit. The questions are:

- “Do staff treat you with respect?” (Respect)
- “Do you like the food here?” (Food)
- “Do you feel safe here?” (Safety)
- “This place is well run” (Well run)
- “Do staff meet your healthcare needs?” (Care)
- “The staff know what they are doing” (Competent)
- “I am encouraged to do as much as possible for myself” (Independent)
- “Do staff explain things to you?” (Explain)
- “If I’m feeling a bit sad or worried, there are staff here who I can talk to” (Caring)
- “Do staff follow up when you raise things with them?” (Follow Up)

In the analysis, we have considered the number of negative responses to these questions, where a negative response is “some of the time” or “never”, or “disagree” or “strongly disagree”.

Comparing the results for 2018/19 by supported resident shares, there are no clear patterns. The only statistically significant differences are in the indicator Well Run; facilities with 30–39% supported residents had significantly fewer residents disagree the facility is well run than facilities with less than 30% or 40–49% supported residents.

There were also no patterns or significant differences in the results by extra service status.

Table 11: Negative responses to the consumer experience questions, average per resident, by supported resident share, 2018/19

Indicator	<30% supported			30–39% supported			40–49% supported			≥50% supported		
	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md
Respect	42	0.01 [0, 0.02]	0	66	0.01 [0, 0.02]	0	124	0.02 [0.01, 0.03]	0	183	0.02 [0.01, 0.02]	0
Food	42	0.14 [0.1, 0.17]	0.13	66	0.15 [0.12, 0.19]	0.13	124	0.15 [0.12, 0.17]	0.13	183	0.14 [0.12, 0.15]	0.13
Safety	42	0.02 [0, 0.03]	0	66	0.01 [0, 0.02]	0	124	0.01 [0.01, 0.02]	0	183	0.01 [0.01, 0.02]	0
Well Run	42	0.03 [0.01, 0.05]	0	66	0.01 [0, 0.02]	0	124	0.02 [0.02, 0.03]	0	183	0.02 [0.02, 0.03]	0
Care	42	0.02 [0.01, 0.03]	0	66	0.02 [0.01, 0.03]	0	124	0.02 [0.01, 0.03]	0	183	0.02 [0.01, 0.02]	0
Competent	42	0.01 [0.01, 0.02]	0	66	0.01 [0, 0.02]	0	124	0.02 [0.01, 0.03]	0	183	0.01 [0.01, 0.02]	0
Independent	42	0.01 [0, 0.02]	0	66	0.01 [0, 0.02]	0	124	0.01 [0, 0.01]	0	183	0.01 [0.01, 0.01]	0
Explain	42	0.04 [0.02, 0.06]	0	66	0.04 [0.03, 0.06]	0	124	0.05 [0.03, 0.06]	0	183	0.04 [0.03, 0.05]	0
Caring	42	0.02 [0.01, 0.03]	0	66	0.02 [0.01, 0.04]	0	124	0.02 [0.02, 0.03]	0	183	0.02 [0.02, 0.03]	0
Follow up	42	0.04 [0.03, 0.06]	0	66	0.04 [0.02, 0.06]	0	124	0.05 [0.04, 0.06]	0	183	0.04 [0.03, 0.05]	0

Notes: N = Number of facilities. CI = Confidence Intervals. Md = Median.

Table 12: Negative responses to the consumer experience questions, average per resident, by extra service status, 2018/19

Indicator	No Extra Services			Extra Services		
	N	Mean [95% CI]	Median	N	Mean [95% CI]	Median
Respect	281	0.02 [0.01, 0.02]	0	133	0.01 [0.01, 0.02]	0
Food	281	0.14 [0.13, 0.16]	0.13	133	0.14 [0.11, 0.16]	0.13
Safety	281	0.01 [0.01, 0.02]	0	133	0.01 [0.01, 0.02]	0
Well Run	281	0.02 [0.02, 0.03]	0	133	0.02 [0.02, 0.03]	0
Care	281	0.02 [0.01, 0.02]	0	133	0.02 [0.02, 0.03]	0
Competent	281	0.01 [0.01, 0.02]	0	133	0.02 [0.01, 0.02]	0
Independent	281	0.01 [0.01, 0.01]	0	133	0.01 [0, 0.01]	0
Explain	281	0.04 [0.03, 0.05]	0	133	0.05 [0.04, 0.06]	0
Caring	281	0.02 [0.02, 0.03]	0	133	0.03 [0.02, 0.04]	0
Follow up	281	0.04 [0.03, 0.05]	0	133	0.05 [0.04, 0.06]	0

Notes: N = Number of facilities. CI = Confidence Intervals.

3.7. Complaints and issues

The ACQSC receive complaints from aged care facility residents or people associated with residents. During the complaints process multiple issues can be recorded. The data on complaints and issues used in this analysis is for 2018/19.

Facilities with less than 30% supported residents had the highest complaints and issues overall, but facility with 50% or more supported residents were close behind. Facilities with less than 30% supported residents had the highest rate of issues about consultation and communication, food and catering, and personal care. In contrast, facilities with 50% or more supported residents had the highest rate of issues about abuse, client assessment and service implementation, choice and dignity, and health care. None of the differences was statistically significant.

Extra service facilities had more complaints and issues overall than facilities without extra services, however the differences were not statistically significant. For most types of issues the rates were very similar, and the only difference that was statistically significant was in goods and equipment, which was higher for extra service facilities.

Table 13: Complaints and issues, average per 100 residents, by supported resident share, 2018/19

Indicator	<30% supported			30–39% supported			40–49% supported			≥50% supported		
	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md
Complaints	125	2.91 [2.25, 3.57]	2	166	2.42 [1.86, 2.98]	1.85	314	2.49 [2.09, 2.88]	1.47	412	2.72 [2.35, 3.09]	1.95
Issues	125	7.61 [5.41, 9.8]	2.91	166	6.34 [4.65, 8.03]	2.65	314	6.71 [5.46, 7.96]	2.42	412	7.56 [6.36, 8.76]	3.97
<i>Type of issue:</i>												
Abuse	125	0.17 [0.08, 0.27]	0	166	0.22 [0.1, 0.34]	0	314	0.21 [0.13, 0.29]	0	412	0.28 [0.18, 0.37]	0
Client assessment and service implement'n	125	0.45 [0.23, 0.67]	0	166	0.48 [0.27, 0.7]	0	314	0.47 [0.33, 0.61]	0	412	0.52 [0.38, 0.66]	0
Choice and dignity	125	0.47 [0.29, 0.64]	0	166	0.41 [0.23, 0.59]	0	314	0.36 [0.24, 0.49]	0	412	0.56 [0.43, 0.69]	0
Consultation and communic'n	125	0.81 [0.52, 1.09]	0	166	0.53 [0.36, 0.71]	0	314	0.63 [0.44, 0.82]	0	412	0.69 [0.56, 0.83]	0
Financial matters	125	0.27 [0.15, 0.38]	0	166	0.26 [0.13, 0.39]	0	314	0.27 [0.18, 0.36]	0	412	0.24 [0.15, 0.33]	0
Food and catering	125	0.57 [0.33, 0.82]	0	166	0.46 [0.24, 0.67]	0	314	0.41 [0.27, 0.55]	0	412	0.41 [0.28, 0.53]	0
Goods and equipment	125	0.12 [0.05, 0.19]	0	166	0.19 [0.09, 0.28]	0	314	0.14 [0.07, 0.2]	0	412	0.16 [0.09, 0.22]	0
Health care	125	2.07 [1.35, 2.8]	0	166	1.37 [0.93, 1.81]	0	314	1.77 [1.36, 2.17]	0	412	2.38 [1.91, 2.86]	0
Personal care	125	0.88 [0.39, 1.38]	0	166	0.66 [0.4, 0.92]	0	314	0.73 [0.53, 0.93]	0	412	0.72 [0.55, 0.89]	0
Personal property	125	0.11 [0.04, 0.18]	0	166	0.17 [0.08, 0.26]	0	314	0.16 [0.09, 0.23]	0	412	0.15 [0.09, 0.21]	0
Personnel	125	0.9 [0.62, 1.19]	0	166	0.92 [0.6, 1.24]	0	314	0.74 [0.56, 0.92]	0	412	0.79 [0.61, 0.97]	0
Physical environment	125	0.55 [0.17, 0.93]	0	166	0.47 [0.26, 0.69]	0	314	0.65 [0.46, 0.84]	0	412	0.5 [0.37, 0.62]	0

Notes: N = Number of facilities. CI = Confidence Intervals. Md = Median.

Table 14: Complaints and issues, average per 100 residents, by extra service status, 2018/19

Indicator	No Extra Services			Extra Services		
	N	Mean [95% CI]	Median	N	Mean [95% CI]	Median
Complaints	723	2.55 [2.29, 2.81]	1.76	290	2.83 [2.36, 3.29]	1.9
Issues	723	6.99 [6.14, 7.84]	2.82	290	7.47 [6.05, 8.9]	3.42
<i>Type of issue:</i>						
Abuse	723	0.25 [0.19, 0.31]	0	290	0.19 [0.11, 0.27]	0
Client assessment and service implement'n	723	0.51 [0.41, 0.62]	0	290	0.46 [0.32, 0.59]	0
Choice and dignity	723	0.47 [0.37, 0.56]	0	290	0.46 [0.33, 0.6]	0
Consultation and communic'n	723	0.62 [0.52, 0.72]	0	290	0.76 [0.57, 0.96]	0
Financial matters	723	0.27 [0.2, 0.34]	0	290	0.22 [0.15, 0.29]	0
Food and catering	723	0.44 [0.34, 0.54]	0	290	0.43 [0.29, 0.58]	0
Goods and equipment	723	0.13 [0.09, 0.17]	0	290	0.2 [0.12, 0.29]	0
Health care	723	1.9 [1.61, 2.2]	0	290	2.23 [1.71, 2.75]	0
Personal care	723	0.74 [0.6, 0.89]	0	290	0.71 [0.5, 0.91]	0
Personal property	723	0.16 [0.11, 0.2]	0	290	0.14 [0.08, 0.19]	0
Personnel	723	0.8 [0.67, 0.93]	0	290	0.84 [0.62, 1.05]	0
Physical environment	723	0.53 [0.42, 0.64]	0	290	0.6 [0.41, 0.79]	0

Notes: N = Number of facilities. CI = Confidence Intervals.

3.8. Compliance

Organisations providing Commonwealth subsidised aged care services are required to comply with the Accreditation Standards. The data used for this analysis shows whether the expected outcomes of the Accreditation Standards were not met during the conduct of unannounced site audits during 2018/19. When an aged care service failed to comply with the standards, a decision was then made whether there is evidence that the failure has placed, or may place, the safety, health or well-being of a consumer of the service at serious risk.

Outcomes not met and serious risk decisions were, on average, lowest among the facilities with less than 30% supported residents and highest among facilities with 50% or more supported residents. However, the differences were not statistically significant.

Facilities with extra services had, on average, more serious risk decisions than facilities without extra services. This difference was marginally statistically significant.

Table 15: Compliance indicators, average per facility, by supported resident share, 2018/19

Indicator	<30% supported			30–39% supported			40–49% supported			≥50% supported		
	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md	N	Mean [95% CI]	Md
Outcomes not met	111	0.34 [0.1, 0.58]	0	132	0.42 [0.07, 0.77]	0	260	0.4 [0.23, 0.57]	0	343	0.66 [0.4, 0.93]	0
Serious risk decisions	111	0.03 [0.00, 0.07]	0	132	0.03 [0.00, 0.07]	0	260	0.05 [0.01, 0.1]	0	343	0.06 [0.03, 0.09]	0

Notes: N = Number of facilities. CI = Confidence Intervals. Md = Median.

Table 16: Compliance indicators, average per facility, by extra service status, 2018/19

Indicator	No Extra Services			Extra Services		
	N	Mean [95% CI]	Median	N	Mean [95% CI]	Median
Outcomes not met	598	0.5 [0.33, 0.66]	0	246	0.49 [0.26, 0.72]	0
Serious risk decisions	598	0.04 [0.02, 0.07]	0	246	0.07 [0.03, 0.11]	0

Notes: N = Number of facilities. CI = Confidence Intervals.

4. Conclusion

The qualitative investigation found some members of the community have a perception that the quality of residential aged care can vary with residents' financial means. This perception was supported by a small number of the quality indicators, but the large majority of indicators did not show statistically significant differences or were contrary to expectations. The main statistically significant differences ($p < 0.05$) found in the analysis were:

- Care minutes—Residents in facilities with less than 30% of supported residents received more allied health and lifestyle care minutes on average than facilities with 50% or more supported residents. Also, residents in facilities with extra service revenue received more care time overall and for most staff types. Staff expenditure had similar patterns. The data on care minutes and staff expenditure was not adjusted to take into account the complexity of residents' care needs at the facility level which might partially or fully explain the differences. In addition, because there is a correlation between extra service status and lower numbers of supported residents, it is possible that the differences are driven by the fees paid by residents for extra services, rather than being evidence of financially disadvantaged residents receiving lower quality care.
- Assaults—The number of total assaults and serious physical assaults were higher on average in the facilities with 50% or more supported residents than in those with less than 30%. However, the number of sexual assaults were higher in facilities offering extra services.
- Mandatory indicators—The use of physical restraints was higher on average in the facilities with 50% or more supported residents than in those with less than 30%. The use of physical restraints was also higher in facilities without extra service revenue than in those with extra service revenue. However, facilities with extra services had higher rates of stage 1 pressure injuries.
- Clinical indicators—The number of chronic opioid users was higher on average in facilities with 50% or more supported residents than in facilities with less than 30% or 30–39% supported residents. Facilities with 50% or more supported residents also had higher hospital or emergency department readmission rates for long-term residents.

These results were produced using quality indicator data at the facility level. Quality indicators for individual residents are not widely available in the current aged care system. Their development would be useful to enable researchers and policy makers to continue research such as this and help ensure all residents receive a high quality of care in the future.

Appendix 1—Significance tests by supported resident share

Indicator	Analysis	Mean score/LSMEANS				Test statistic				Probability			
		<30	30–40	40–50	50+	Chi-sq/ F Value	Pr>Chi-sq/ Pr>F	<30 v 30–40	<30 v 40–50	<30 v over 50	30–40 v 40–50	30–40 v 50+	40–50 v 50+
Care minutes													
Care management	KW	557	502	513	529	3.08	0.379	0.388	0.458	0.790	0.986	0.753	0.895
Registered nurses	KW	553	537	515	514	2.22	0.529	0.972	0.623	0.579	0.862	0.847	1.000
Enrolled nurses	KW	505	485	537	533	4.55	0.208	0.906	0.703	0.754	0.252	0.288	0.998
Personal care workers	KW	519	496	530	530	1.80	0.615	0.877	0.982	0.979	0.668	0.591	1.000
Allied health and lifestyle	KW	594	510	535	497	11.20	0.011	0.094	0.215	0.007	0.840	0.980	0.327
Agency staff	KW	479	537	539	519	7.60	0.055	0.111	0.045	0.232	1.000	0.811	0.596
Total	KW	526	485	542	523	3.91	0.271	0.618	0.941	1.000	0.186	0.541	0.858
Staff expenditure													
Care management	KW	572	535	520	506	5.13	0.163	0.689	0.314	0.140	0.942	0.736	0.907
Registered nurses	ANOVA	23.6	23.3	22.9	21.7	1.73	0.159	0.995	0.902	0.266	0.971	0.340	0.442
Enrolled nurses	KW	491	479	539	538	7.05	0.070	0.974	0.393	0.387	0.160	0.144	1.000
Personal care workers	KW	531	493	534	524	2.15	0.541	0.623	0.997	0.996	0.498	0.715	0.970
Allied health and lifestyle	KW	656	514	541	472	39.16	<.0001	0.000	0.001	<.0001	0.767	0.382	0.009
Agency Staff	KW	496	508	533	530	1.99	0.574	0.993	0.658	0.661	0.823	0.867	0.999
Total	KW	557	499	540	509	4.77	0.190	0.334	0.944	0.398	0.434	0.991	0.497

Does the quality of residential aged care vary with residents' financial means?

Indicator	Analysis	Mean score/LSMEANS				Test statistic				Probability			
		<30	30–40	40–50	50+	Chi-sq/ F Value	Pr>Chi-sq/ Pr>F	<30 v 30–40	<30 v 40–50	<30 v over 50	30–40 v 40–50	30–40 v 50+	40–50 v 50+
Compulsory reporting													
Total assaults	KW	445	508	502	534	9.30	0.026	0.284	0.225	0.014	0.997	0.798	0.450
Serious physical assault	KW	446	508	506	530	8.45	0.038	0.273	0.175	0.020	1.000	0.831	0.669
Sexual assault	KW	505	518	494	518	2.66	0.448	0.962	0.955	0.940	0.636	1.000	0.414
Reported missing	KW	510	494	505	517	1.23	0.747	0.930	0.995	0.987	0.957	0.718	0.919
National mandatory indicators													
Intent to restrain	KW	448	502	492	509	5.40	0.145	0.228	0.373	0.111	0.982	0.991	0.796
Physical restraints	KW	435	488	473	533	14.59	0.002	0.419	0.514	0.007	0.944	0.311	0.023
Stage 1 pressure injuries	KW	509	479	485	499	1.21	0.752	0.803	0.842	0.987	0.994	0.888	0.920
Stage 2 pressure injuries	KW	525	477	486	495	2.28	0.516	0.416	0.561	0.777	0.993	0.920	0.974
Stage 3 pressure injuries	KW	510	525	482	482	5.64	0.131	0.954	0.638	0.606	0.198	0.188	1.000
Stage 4 pressure injuries	KW	504	476	499	491	3.57	0.311	0.305	0.992	0.815	0.337	0.649	0.896
Deep tissue pressure injury	KW	510	484	489	492	2.29	0.515	0.506	0.578	0.706	0.985	0.934	0.990
Unstageable pressure injury	KW	498	464	517	484	10.18	0.017	0.361	0.806	0.876	0.022	0.597	0.101
Total pressure injuries	KW	521	463	481	505	4.27	0.234	0.258	0.487	0.983	0.886	0.440	0.686
Unplanned weight loss	KW	436	464	423	431	2.55	0.466	0.859	0.969	0.998	0.352	0.587	0.988
Significant weight loss	KW	424	409	429	451	3.28	0.350	0.962	0.999	0.759	0.881	0.342	0.695

Indicator	Analysis	Mean score/LSMEANS				Test statistic		Probability					
		<30	30–40	40–50	50+	Chi-sq/ F Value	Pr>Chi-sq/ Pr>F	<30 v 30–40	<30 v 40–50	<30 v over 50	30–40 v 40–50	30–40 v 50+	40–50 v 50+
<i>ROSA indicators</i>													
Antibiotic use	ANOVA	66.66	65.07	65.01	65.80	1.27	0.283	0.448	0.290	0.771	1.000	0.842	0.681
Antipsychotic use	ANOVA	22.73	21.95	21.99	22.55	0.57	0.635	0.816	0.768	0.995	1.000	0.846	0.768
Chronic opioid use	KW	407	429	467	520	23.22	<0.0001	0.897	0.154	0.000	0.507	0.004	0.055
Premature deaths	KW	505	483	480	453	5.38	0.146	0.855	0.729	0.151	1.000	0.571	0.452
High sedative load	ANOVA	46.33	45.14	46.70	46.43	0.74	0.529	0.776	0.985	1.000	0.455	0.585	0.987
<i>Emergency department or hospital visits for:</i>													
Delirium or dementia [^]	KW	327	342	319	343	2.20	0.532	0.928	0.977	0.857	0.726	1.000	0.556
Readmission—long term residents *	KW	292	308	324	349	7.97	0.047	0.944	0.471	0.047	0.894	0.224	0.504
Readmission—short term residents *	KW	231	234	231	248	1.38	0.711	0.999	1.000	0.821	0.998	0.889	0.716
Falls	KW	342	318	334	337	1.04	0.791	0.735	0.987	0.997	0.894	0.847	0.997
Fractures	KW	354	331	333	325	1.67	0.644	0.784	0.776	0.610	0.999	0.991	0.971
Medication-related events	KW	312	296	350	347	11.75	0.008	0.829	0.195	0.290	0.019	0.030	0.999
Pressure injuries	KW	332	322	321	352	3.44	0.329	0.974	0.962	0.817	1.000	0.487	0.350
Weight loss or malnutrition	KW	367	327	318	336	5.15	0.161	0.349	0.096	0.569	0.971	0.967	0.771
<i>Consumer experience</i>													
Respect	KW	200	200	221	204	4.35	0.226	1.000	0.516	0.995	0.383	0.986	0.356
Food	KW	211	212	209	205	0.25	0.970	1.000	1.000	0.993	0.999	0.975	0.986
Safety	KW	214	206	213	204	1.28	0.734	0.943	1.000	0.864	0.934	0.999	0.765

Does the quality of residential aged care vary with residents' financial means?

Indicator	Analysis	Mean score/LSMEANS				Test statistic				Probability			
		<30	30–40	40–50	50+	Chi-sq/ F Value	Pr>Chi-sq/ Pr>F	<30 v 30–40	<30 v 40–50	<30 v over 50	30–40 v 40–50	30–40 v 50+	40–50 v 50+
Well Run	KW	222	180	214	211	8.17	0.043	0.057	0.969	0.908	0.039	0.066	0.993
Care	KW	213	213	210	204	0.86	0.834	1.000	0.998	0.926	0.995	0.867	0.927
Competent	KW	217	199	215	205	2.80	0.424	0.599	0.999	0.771	0.556	0.949	0.676
Independent	KW	207	210	207	208	0.10	0.992	0.996	1.000	1.000	0.992	0.995	1.000
Explain	KW	201	200	213	209	0.88	0.830	0.999	0.907	0.974	0.843	0.932	0.991
Caring	KW	202	206	208	210	0.32	0.957	0.997	0.985	0.957	0.999	0.987	0.997
Follow up	KW	211	190	215	209	2.36	0.501	0.702	0.996	1.000	0.445	0.598	0.969
Complaints and issues													
Complaints	KW	536	487	495	520	3.41	0.333	0.472	0.526	0.954	0.991	0.587	0.667
Issues	KW	533	484	494	523	3.89	0.273	0.493	0.546	0.991	0.983	0.452	0.559
<i>Type of issue:</i>													
Abuse	KW	508	504	507	513	0.51	0.917	0.997	1.000	0.990	0.998	0.929	0.950
Client assessment and service implementation	KW	521	499	507	511	0.83	0.843	0.812	0.930	0.969	0.977	0.932	0.994
Choice and dignity	KW	526	496	491	523	5.67	0.129	0.608	0.342	0.999	0.994	0.517	0.175
Consultation and communication	KW	535	496	495	517	3.59	0.309	0.495	0.370	0.876	1.000	0.768	0.621
Financial matters	KW	530	516	515	495	4.62	0.202	0.929	0.899	0.212	1.000	0.538	0.437
Food and catering	KW	548	520	498	501	6.84	0.077	0.678	0.090	0.111	0.643	0.729	0.996
Goods and equipment	KW	515	527	506	502	4.20	0.240	0.899	0.926	0.804	0.415	0.211	0.983
Health care	KW	524	472	499	527	5.79	0.122	0.337	0.809	0.999	0.702	0.117	0.527

Indicator	Analysis	Mean score/LSMEANS				Test statistic		Probability					
		<30	30–40	40–50	50+	Chi-sq/ F Value	Pr>Chi-sq/ Pr>F	<30 v 30–40	<30 v 40–50	<30 v over 50	30–40 v 40–50	30–40 v 50+	40–50 v 50+
Personal care	KW	525	498	507	510	1.00	0.801	0.750	0.893	0.928	0.977	0.936	0.999
Personal property	KW	512	524	511	501	3.03	0.387	0.911	1.000	0.870	0.825	0.308	0.788
Personnel	KW	540	522	503	499	3.33	0.344	0.929	0.472	0.364	0.846	0.751	0.996
Physical environment	KW	514	494	519	506	1.68	0.640	0.823	0.996	0.986	0.608	0.922	0.853
Compliance													
Outcomes not met	KW	405	415	424	432	2.99	0.392	0.934	0.669	0.387	0.947	0.742	0.934
Serious risk decisions	KW	417	419	422	429	3.04	0.385	0.994	0.899	0.542	0.967	0.635	0.770

Notes: KW test = Kruskal-Wallis test. Appropriate where normality is not present.

ANOVA = One-way Analysis of Variance. Appropriate where normality is present.

LSMEANS = Least Squares Means

^ = Only residents with a dementia diagnosis from an aged care assessment or previous year hospitalisation are included

* = Readmission within 30 days of entry/re-entry to aged care from hospital.

■ = significant at $p < 0.05$

■ = significant at $p < 0.1$

Appendix 2—Significance tests by extra service status

Indicator	Analysis	Mean score/Mean		Test result	
		Extra services	No extra services	Test statistic	Probability
Care minutes					
Care management	Wilcoxon	559	506	6.56	0.011
Registered nurses	Wilcoxon	536	515	0.99	0.320
Enrolled nurses	Wilcoxon	559	506	6.80	0.009
Personal care workers	Wilcoxon	556	507	5.78	0.016
Allied health and lifestyle	Wilcoxon	545	512	2.60	0.107
Agency staff	Wilcoxon	557	507	10.87	0.001
Total	Wilcoxon	572	501	11.83	0.001
Staff expenditure					
Care management	Wilcoxon	554	508	5.10	0.024
Registered nurses	Wilcoxon	524	520	0.05	0.821
Enrolled nurses	Wilcoxon	556	507	5.67	0.017
Personal care workers	Wilcoxon	533	516	0.65	0.419
Allied health and lifestyle	Wilcoxon	627	479	51.59	<0.0001
Agency staff	Wilcoxon	539	514	1.42	0.233
Total	Wilcoxon	573	500	12.19	0.001
Compulsory reporting					
Total assaults	Wilcoxon	529	498	2.41	0.121
Serious physical assault	Wilcoxon	522	501	1.14	0.286
Sexual assault	Wilcoxon	532	497	5.44	0.020

Indicator	Analysis	Mean score/Mean		Test result	
		Extra services	No extra services	Test statistic	Probability
Reported missing	Wilcoxon	502	509	0.21	0.650
National mandatory indicators					
Intent to restrain	Wilcoxon	513	486	2.26	0.133
Physical restraints	Wilcoxon	462	506	5.01	0.025
Stage 1 pressure injuries	Wilcoxon	519	479	4.08	0.044
Stage 2 pressure injuries	Wilcoxon	519	480	3.80	0.051
Stage 3 pressure injuries	Wilcoxon	505	485	1.60	0.205
Stage 4 pressure injuries	Wilcoxon	495	489	0.49	0.484
Deep tissue pressure injury	Wilcoxon	497	487	0.84	0.360
Unstageable pressure injury	Wilcoxon	497	488	0.54	0.463
Total pressure injuries	Wilcoxon	512	483	2.23	0.135
Unplanned weight loss	Wilcoxon	434	432	0.01	0.910
Significant weight loss	Wilcoxon	452	424	2.20	0.138
ROSA indicators					
Antibiotic use	t-test	65.89	65.49	0.61	0.540
Antipsychotic use	t-test	22.06	22.38	-0.58	0.562
Chronic opioid use	t-test	29.88	30.60	-1.06	0.288
Premature deaths	Wilcoxon	485	470	0.57	0.451
High sedative load	t-test	47.97	45.88	2.50	0.013
<i>Emergency department or hospital visits for:</i>					
Delirium or dementia^	Wilcoxon	339	331	0.20	0.654
Readmission—long term residents *	Wilcoxon	308	329	1.22	0.269

Does the quality of residential aged care vary with residents' financial means?

Indicator	Analysis	Mean score/Mean		Test result	
		Extra services	No extra services	Test statistic	Probability
Readmission—short term residents *	Wilcoxon	218	241	2.06	0.151
Falls	Wilcoxon	347	330	0.78	0.378
Fractures	Wilcoxon	372	325	5.96	0.015
Medication-related events	Wilcoxon	358	328	3.39	0.066
Pressure injuries	Wilcoxon	335	333	0.01	0.915
Weight loss or malnutrition	Wilcoxon	339	332	0.15	0.701
Consumer experience					
Respect	Wilcoxon	206	208	0.09	0.767
Food	Wilcoxon	203	210	0.29	0.589
Safety	Wilcoxon	211	206	0.46	0.498
Well Run	Wilcoxon	212	205	0.58	0.445
Care	Wilcoxon	216	204	1.69	0.193
Competent	Wilcoxon	215	204	1.95	0.162
Independent	Wilcoxon	201	211	1.69	0.194
Explain	Wilcoxon	208	207	0.01	0.909
Caring	Wilcoxon	218	203	2.51	0.113
Follow up	Wilcoxon	212	205	0.38	0.537
Complaints and issues					
Complaints	Wilcoxon	525	500	1.52	0.218
Issues	Wilcoxon	523	501	1.26	0.261
<i>Type of issue:</i>					
Abuse	Wilcoxon	500	510	0.72	0.396

Indicator	Analysis	Mean score/Mean		Test result	
		Extra services	No extra services	Test statistic	Probability
Client assessment and service implementation	Wilcoxon	507	507	0.00	0.991
Choice and dignity	Wilcoxon	508	507	0.01	0.914
Consultation and communication	Wilcoxon	515	504	0.48	0.488
Financial matters	Wilcoxon	511	505	0.21	0.648
Food and catering	Wilcoxon	513	504	0.42	0.519
Goods and equipment	Wilcoxon	524	500	5.82	0.016
Health care	Wilcoxon	527	499	2.36	0.125
Personal care	Wilcoxon	512	505	0.21	0.644
Personal property	Wilcoxon	515	504	1.09	0.297
Personnel	Wilcoxon	515	504	0.43	0.513
Physical environment	Wilcoxon	516	503	0.69	0.405
Compliance					
Outcomes not met	Wilcoxon	431	419	1.05	0.305
Serious risk decisions	Wilcoxon	430	419	3.53	0.060

Notes: ^ = Only residents with a dementia diagnosis from an aged care assessment or previous year hospitalisation are included

* = Readmission within 30 days of entry/re-entry to aged care from hospital.

■ = significant at $p < 0.05$

■ = significant at $p < 0.1$

Does the quality of residential aged care vary with residents' financial means?