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Appendix 2

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Appendix to: Dyer SM, Liu E, Gnanamanickam ES, et al. Clustered domestic residential aged care in Australia: fewer hospitalisations and better quality of life. *Med J Aust* 2018; 208: 433-438. doi: 10.5694/mja17.00861.

Definition and derivation of selected variables

Variable	Definition, derivation and source
Perspective	Healthcare and RACF costs were estimated using a broad health and care cost perspective, following Pharmaceutical Benefits Advisory Committee (PBAC) guidelines.[1]
Residential care costs	Residential care costs were the annual costs of providing long term residential care for the study participants. Facility revenues and expenditures for financial years 2013-14 and 2014-15 were collected based on an established survey, in addition to information on operation costs.[2] The average of these two year's costs were used after adjusting to 2016 prices.
Average facility occupancy rate	The average of number of beds occupied at the facility for one year, the reference period was FY 2012-13 and 2013-14. The occupancy rate was collected from the facilities for each year and the mean value for each facility was used to determine the unit facility cost per resident per day.
Hospitalisations and costs	Calculated by grouping hospital separations into Australian Refined Diagnosis Related Groups (AR-DRGs) then applying the cost weights for each DRG produced through the Round 18 (2013-14) National Hospital Cost Data Collection (NHCDC).[3]
Emergency presentations and costs	Calculated by grouping the emergency presentations that did not lead to admissions into Urgency Related Groups (URGs) and applying costs from Round 18 of the NHCDC.
Medical service use and out-of-hospital attendances and costs	Usage obtained from the Medicare Benefits Schedule (MBS) and costed using the provider charged fee. 16% of data were missing (37% clustered, 10% standard models of care). MBS data was used to determine the outcomes of GP consultations and costs, a complete case analysis of only participants with complete MBS data showed no change in these outcomes.
Pharmaceutical use and costs	For details see Harrison et al 2018.[4] Majority of medication use was determined from dispensing records obtained from the pharmacy providing services to the facility (88.7%, n=480/541 participants). Data for dispensing of the medication in the 365 days prior to the study start date for the facility was collected; 3.5% (n=16) of study participants did not have pharmacy records available, for these data from medication chart review were used (3.5%, N = 19/541 of participants).

	For two standard care facilities (n= 35 participants) Pharmaceutical Benefits Scheme (PBS) as pharmacy records were inadequate (6.3%, n=34/541 of participants). For 8 of participants (1.5%) pharmaceutical data was missing. Costs were determined using the Dispensed Price for Maximum Quantity (DPMQ) for respective drugs as prescribed in the Pharmaceutical Benefits Scheme (PBS).
Costs to government	All out of hospital medical services and medical and in-hospital pharmaceutical services provided in private hospitals were costed using the net benefit reimbursed through the MBS and PBS. Out of hospital pharmaceutical costs were restricted to only those reimbursed through the PBS. Residential care costs that were attributable to government funding alone were included in costing residential care in the cost to government perspective. This was calculated by applying the government revenue proportion of total revenue of each facility to the total costs. Cost to government did not include indirect cost to government through private health insurance rebates. All costs were reported in Australian dollars (AU$) after adjusting to 2016 prices.
Cognitive status	Cognitive status according to the Psychogeriatric Assessment Scales – Cognitive Impairment Scale (PAS-Cog) was collected from facility records if the assessment had occurred within three months of data collection and/or the individual had severe cognitive impairment (PAS-Cog≥18). For all other participants, the PAS-Cog was administered by trained data collection personnel.
Social interactions	Frequency of social interactions was recorded for visits from (a) spouse, (b) other family or (c) friends and neighbours. Frequency was recorded as never, daily, 1-6 times per week, 1-3 times per month or rarely. These data were then grouped into three categories as social visits weekly, monthly or rarely or never.
Direct care hours	Data on staffing were collected from the facilities. Total staff time was determined as a sum of the direct care time provided by all staff including registered nurses, enrolled nurses, personal care workers, allied health professionals or allied health assistants.

References

1. Department of Health AG (AU). Manual of resource items and their associated unit costs: For use in submissions to the Pharmaceutical Benefits Advisory Committee involving economic analyses. Available from: http://www.pbs.gov.au/info/industry/useful-resources/manual

2. StewartBrown. Aged Care Financial Performance Survey: Summary of survey outcomes year ending June 2014. Sydney: StewartBrown Pty Ltd, 2013.

3. Independent Hospital Pricing Authority. National Hospital Cost Data collection. In: Authority IHP, (ed.). *Round 18*. 2016. Available from: https://www.ihpa.gov.au/publications/australian-public-hospitals-cost-report-2013-2014-round-18.

4. Harrison, S. L., Kouladjian O'Donnell, L., Milte, R., Dyer, S. M., Gnanamanickam, E. S., Bradley, C., . . . Crotty, M. (2018). Costs of potentially inappropriate medication use in residential aged care facilities. *BMC Geriatr, 18*(1), 9. doi:10.1186/s12877-018-0704-8.