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CareTrack Aged - The appropriateness of care delivered to Australians living in residential aged care facilities: a study protocol

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CareTrack Aged – the appropriateness of care delivered to Australians living in residential aged care facilities: a study protocol

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ABSTRACT

Introduction

The aged population is increasing rapidly across the world and this is expected to continue. People living in Residential Aged Care Facilities (RACFs) represent the sickest and frailest cohort of the aged population, with a high prevalence of chronic conditions and complex co-morbidities.

Given the vulnerability of RACF residents and the demands on the system, there is a need to determine the extent that care is delivered in line with best practice ('appropriate care') in RACFs. There is also a recognition that systems should provide care that optimises Quality of Life (QoL) which includes support for physical and psychological well-being, independence, social relationships, personal beliefs and a caring external environment. The aims of CareTrack Aged are to develop sets of indicators for appropriate care and processes of care for commonly managed conditions, and then assess the appropriateness of care delivered and QoL of residents in RACFs in Australia.

Methods and analysis

We will extract recommendations from clinical practice guidelines (CPGs) and, using expert review, convert these into sets of indicators for 15 common conditions and processes of care for people living in RACFs. We will recruit RACFs in three Australian states, and residents within these RACFs, using a stratified multistage sampling method. Experienced nurses, trained in the CareTrack Aged methods ('surveyors'), will review care records within a one-month period of recruited residents in 2019 and 2020, and assess the care documented against the indicators of appropriate care. Surveyors will concurrently assess residents' QoL using validated questionnaires.

Ethics and dissemination

The study has been reviewed and approved by the Human Research Ethics Committee of Macquarie University (5201800386). The research findings will be published in international and national journals and disseminated through conferences and presentations to interested stakeholder groups including consumers, national agencies, healthcare professionals, policy makers and researchers.

Strengths and limitations of this study

- Obtaining national agreement on clinical indicators of appropriate care in residential aged care facilities (RACFs) that may be used for clinical point-of-care decision-making and benchmarking.
- Securing population-level data on the appropriateness of care delivered in RACFs for 15 conditions and residents' quality of life.
- Providing baseline data for ongoing monitoring of appropriateness of care and residents' quality of life in RACFs in Australia.
- Selection bias may be introduced by refusal of consent for the study from some of the randomly selected RACFs.

INTRODUCTION

The aged population is increasing rapidly across the world.[1-4] In 2017, 15% of the Australian population were aged 65 and older and 2% were aged 85 and older. This is projected to increase to 22% and 4% respectively by 2066.[5] People living in Residential Aged Care Facilities (RACFs) represent the sickest and frailest cohort of the ageing population; this manifests with this group having the highest rate of disability in the Australian population.[6] The prevalence of chronic conditions among RACF residents is estimated to be 80% for sensory loss, 60% for dementia, 40-80% for chronic pain, 50% for urinary incontinence, 45% for sleep disorder, and 30-40% for depression.[6] In the 2017-18 financial year, over 215,000 people entered RACFs, representing an increase of 31% in admissions over the last decade.[7] People entering RACFs have increasingly high levels of dependency and more complex medical needs than other similar cohorts in relation to chronic illness, physical disability and dementia.[6]

The current aged care system needs to be ready for these future demands whilst providing high quality care. Consequently, there is a need to understand if appropriate care (defined as care in line with evidence-based or consensus-based guidelines) in RACFs can be delivered reliably.[8,9] Two recent large-scale studies on the quality of care showed that, for adults living in Australia, appropriate care was offered, on average, 57% of the time[10] and for children 60% of the time.[11] However, the level of appropriate care provided to people living in Australian RACFs and their corresponding cohorts in other countries is largely unknown. Some studies on single conditions undertaken in a limited number of RACFs have shown that only: 13-41% of residents at risk of falls receive vitamin-D supplementation;[12,13] 34% of residents received appropriate non-pharmacological pain management;[14] 57% of diabetic residents who were actively managed (i.e., with insulin or oral medication) and had a HbA1c test performed every six months;[15] and 50% were malnourished with 20% of these severe.[16] However, a study on appropriateness of care for

multiple conditions in multiple RACFs across more than one state, using a standardised methodology, has not been undertaken.

There is a growing consensus that healthy ageing is more than just the absence of disease or infirmity but is a state of physical, mental and social well-being, with a focus on optimising opportunities for health, safety, social participation and security.[4] Measuring the impact of care provided in RACFs therefore needs to begin with the recognition that quality of life (QoL) is a multi-dimensional concept which views a person's health status in the context of support for physical and psychological well-being, independence, social relationships, positive personal beliefs and a caring environment.[16] The Organisation for Economic Co-operation and Development (OECD), reporting on improving the quality of aged care services, has focused attention on deficiencies in the aged care sector common to many countries. This includes overemphasis on measuring structural inputs (e.g., resource utilisation) to the disadvantage of measures of client outcomes and satisfaction and QoL.[17,18] While there is some evidence to suggest a link between quality of care and QoL, with factors such as depression,[19,20] hydration and falls[20] being associated with poorer resident QoL, study findings are limited by the use of small, non-random samples, and a lack of process measures for quality of care.

Given the pressures on the system and the need for a sustainable and high quality residential aged care model, it is vital and urgent to assess to what extent care delivered to Australians in RACFs are in line with the evidence (appropriate care) and to assess the QoL. The *CareTrack Aged* study will address these with three aims:

1. To obtain national agreement on sets of indicators for appropriate care of commonly managed conditions and processes of care in RACFs in Australia.
2. To measure the appropriateness of care delivered in RACFs in Australia.
3. To assess the QoL of residents in RACFs in Australia.

METHODS AND ANALYSIS

The *CareTrack Aged* protocol is based on the previously validated methodology used in the American[21] and our Australian studies of the quality of healthcare, *CareTrack Australia*[9,10] and *CareTrack Kids.*[11,22,23] We will develop a set of indicators relevant to common conditions and processes of care for people living in RACFs, recruit RACFs and residents within RACFs, review care records for a one-month period in 2019 and 2020 and assess these against indicators of appropriate care, while concurrently assessing residents' QoL (Box 1). The study will be conducted in seven stages (Figure 1).

Box 1. CareTrack Aged study definitions [9]

- A **resident** is a person aged 65 years and older living in an RACF
- **Condition** refers to acute (e.g. pressure injuries, hip fractures) and chronic conditions (e.g. dementia, incontinence) or care processes (e.g. medication management, oral and dental care)
- **Healthcare provider** includes any healthcare professional offering services to residents within a RACF, and whose scope of practice is covered by identified CPG recommendations
- **Appropriate care** is care considered to be evidence- or consensus-based by a panel of experts in Australia in the context in which it was delivered in the years 2019 and 2020
- A **clinical indicator** is a measurable component of a standard or guideline, with explicit criteria for inclusion, exclusion, time frame and setting. In the context of this study, an indicator is relevant for Australian practice during 2019 and 2020. Each indicator is scored as to whether eligible processes for prevention, monitoring or treatment of a condition have been carried out by answering 'yes' or 'no'
- An **encounter** is an interaction between a resident and a healthcare provider defined by the inclusion criteria of the clinical indicators

- **Adherence** with indicators is expressed as the percentage of eligible encounters at which appropriate care was received
- **Surveyor** is a person with appropriate clinical and audit experience who has been trained and accredited for this study to review care records in relation to the care indicators

Stage 1. Selecting conditions and developing indicators

1.a. Selecting conditions

Fifteen conditions relevant to estimating appropriateness of care at the population level (Table 1) were identified from published research,[19,20,24] prevalence and burden of disease data,[16,25] clinical practice guidelines (CPGs), and indicator sets relevant to RACF settings. The importance of assessing appropriateness of care provision unrelated to specific medical conditions, such as routine care processes (e.g., oral health care), was recognised by the research team and these were incorporated into the list of conditions and care processes. The defined scope for each condition and care process was informed and further refined using prevalence data, and the approaches of related CPGs,[26-30] and indicator sets such as interRAI[31] and the Assessing Care of Vulnerable Elders-3 (ACOVE-3) Quality Indicators.[32-34] Condition and care process labels were assigned in accordance with contemporary terminology in the field and the expected likelihood and level of documentation of conditions or care processes in resident care records, such as dementia and delirium being grouped under the more commonly used term 'cognitive impairment' (Table 1). Appendix 1 shows the estimated prevalence of conditions or care processes in RACF.

Table 1. Candidate conditions and processes of care, and relevant CPGs supporting their inclusion.

	REFERENCE AND NUMBER				
Candidate conditions	**RACCG(a)[26]**	**Victorian DHHS(b)[27]**	**ANZSGM(c)[28]**	**AACQA(d)[29]**	**O,Reilly et al[30]**
Bladder and bowel	●			●	●
Cognitive impairment	●		●	●	●
Depression	●				
Dysphagia and aspiration	●		●		
End of life / palliative care	●		●	●	
Hearing and vision				●	●
Infection*	●		●	●	●
Medication	●	●		●	●
Mobility and falls	●	●	●	●	●
Nutrition and hydration		●	●	●	●
Oral and dental care				●	●
Pain	●		●	●	●
Restraint	●	●	●		●
Skin integrity	●	●		●	●
Sleep			●	●	●

*Includes respiratory infections (influenza, pneumonia), vaccination, and urinary tract infections.
(a) Royal Australian College of General Practitioners
(b) Department of Health and Human Services
(c) Australian and New Zealand Society of Geriatric Medicine
(d) Australian Aged Care Quality Agency

1.b. Developing indicators

The definition of a clinical indicator is shown in Box 1.[10,22] The source of indicators for selected conditions will be recommendations in CPGs. The CPGs will be identified by a systematic search, developed in conjunction with an academic librarian at the University of South Australia, using MeSH and keyword terms in the peer-reviewed literature[35] and targeted searches of national and international sites, e.g. the Royal Australian College of General Practitioners (RACGP), the National Health and Medical Research Council (NHMRC), and the UK's National Institute for Health and Care Excellence (NICE). We will also draw on the indicators developed by the interRAI collaborative which have been found to have robust psychometric properties.[36-38]

Candidate recommendations will be extracted from the CPGs and recorded in a spreadsheet including level or grade of evidence. Duplicate recommendations will be merged. Some recommendations will be excluded based on: the strength or certainty of their wording, such as citing weak evidence for the recommendation or the use of words such as 'may' or 'could'; low likelihood of the information being documented in residents' records; and guiding statements without recommended actions. The extracted recommendations will be collated and used to inform the content and format of proposed clinical indicators. All indicators will be written using a structured and standardised format starting with the inclusion criteria followed by the adherence action. Indicators will be arranged according to phases of care (i.e., admission, screening, diagnosis, assessment, treatment, ongoing management, and prevention) and will address both underuse and overuse of care provision.

1.c. Review of the indicators

Indicators for each condition will be embedded within a secure online survey for open, transparent and formal review by national experts (such as clinicians and researchers with appropriate experience) and consumer representatives and groups. The aim is to get a minimum of five independent expert reviews for each condition. Experts will rate the indicators on a nine-point Likert scale for their representativeness for appropriate aged care delivered in RACFs during 2019 and 2020, and rank them according to their acceptability, feasibility and clinical impact.[22] A clinical champion for each condition, appointed from within the expert group or by drawing on their professional networks, will follow-up and manage external reviewers' ratings and make final recommendations regarding the inclusion, content, structure and format of indicators. A final list of indicators will be collated to represent appropriate care for those living in RACFs for selected conditions during 2019 and 2020.

Stage 2. Testing the data collection system

A web-based tool for data collection has been modified from that used in the *CareTrack Australia*[10] and *CareTrack Kids*[11] studies. The tool supports secure data access, encryption, off-line data collection and database synchronisation to mitigate against potential problems with fire-walls and poor internet connectivity. In this stage, the data collection system and processes will be piloted by a trained surveyor in five RACFs with the support of the research team. The testing will include: accessibility of residents' records; the structure and depth of information recorded; time taken to access and review records; data collection workflow; usability of the records to score indicators; processes for inter-rater reliability (IRR) testing; frequency of the conditions treated; and care processes documented. Findings from the pilot study will be used to help determine the types of problems that may be encountered and will inform the final selection of conditions, their indicators, and the logistical and practical aspects of recruiting RACFs and residents, of accessing records, and of extracting, recording, storing, and analysing the data. The data obtained from the pilot will not be included in the main results.

Stage 3. Sampling and recruitment

Data on appropriateness of care will be collected from three states in Australia—New South Wales (NSW), Queensland (Qld), and South Australia (SA). The sampling frame for RACFs will be the list maintained by the Australian Aged Care Quality Agency (AACQA),[39] which groups RACFs into Aged Care Planning Regions (ACPR).[40] The list includes the number of licensed beds at each facility, the five category Australian Standard Geographical Classification of Remoteness Areas (i.e., Major Cities, Inner Regional, Outer Regional, Remote and Very Remote) and ownership type (e.g., Not for Profit, Private, and Government). The three selected states have 59% of RACFs and 62% of residential beds in Australia. For logistical practicality, RACFs in the following categories will be removed prior to sampling:

- RACFs with <20 approved beds;

- RACFs located in Remoteness Areas classified as Remote or Very Remote;
- Major City RACFs in ACPRs with <500 Major City beds;
- Inner Regional RACFs in ACPRs with <200 Inner Regional beds; and
- Outer Regional RACFs in ACPRs with <100 Outer Regional beds.

Using 2017 AACQA service list data, there are 1,571 RACFs in the three selected states, with 123,520 approved beds. Removing the ineligible RACFs removes 80 RACFs (5.1%), and 2,461 approved beds (2.0%). After these exclusions, the sampling frame will contain 1,491 RACFs containing 121,059 approved beds.

A stratified multistage sampling design with five-stages will be used:

1. States will be treated as strata, and allocated sampling units proportional to the number of approved beds they contain (NSW 56.2%, Qld 29.7%, and SA 14.1%);
2. Within each state, ACPRs will be organised into five sub-strata: 1) Major City RACFs; 2) Major City and Inner Regional RACFs; 3) Inner Regional RACFs; 4) Inner and Outer Regional RACFs; and 5) Outer Regional RACFs. Each sub-stratum will be allocated a quota of planning regions and facilities to be sampled, the latter being allocated approximately proportional to the number of approved beds in the sub-stratum;
3. Within each sub-stratum, the allocated number of ACPRs will be selected randomly, with the probability of selection being proportional to the number of approved beds in the ACPR;
4. Within each selected ACPR, facilities will be randomly selected, with the probability of selection proportional to the number of approved beds in the facility, sequentially ordered from first to last and approached for approval starting at the top – if consent is denied the next facility will be approached until an allocated quota is reached;
5. Within each consented facility, the eligible residents will be listed in a random order and approached sequentially until a quota of 10 consented individuals is reached. A threshold resident

Psychogeriatric Assessment Scale Cognitive Impairment (PAS-Cog) score of 12 will be used to determine cognitive impairment.[41] Residents who are cognitively impaired will be consented to participate in *CareTrack Aged* through a nominated proxy (i.e. carer, family member). Eligibility criteria for residents are: aged 65 years and older; resident in the RACF at least 30 days; and English speaking.

To achieve precision of +/-5% around the estimate of adherence for each condition or care process under examination with 95% confidence, 384 eligible indicator encounters will need to be assessed. Conservatively assuming a point estimate of adherence of 50%, an intra-cluster correlation co-efficient of 0.3 for RACFs and only one eligible indicator per sampled resident, 143 RACFs would need to be sampled, with 10 residents sampled per RACF, to ensure broad cover. To improve the representativeness of the sample, we intend sampling around 150 RACFs which will provide a total of 1500 individuals and their care records for review.

Stage 4. Recruitment and training of surveyors

Experienced registered healthcare professionals will be recruited as surveyors to review care records. As part of the recruitment process, prospective surveyors will perform a test which involves assessment of artificially constructed care records which will be designed by the research team. After being recruited, surveyors will receive training including: further assessment of artificially constructed care records; education about included conditions such as the evidence in the literature and in CPGs; indicator inclusion and exclusion criteria; assessment and management procedures; IRR testing; and database orientation and training. Each surveyor will be provided with a detailed manual that outlines the conditions, indicators, definitions, abbreviations, criteria, and processes for arranging and conducting record reviews.

IRR testing will be conducted prior to data collection for all the surveyors against one of the experienced *CareTrack Aged* researchers. Artificial records will be used for coding and IRR testing. Before being approved to collect data, each surveyor must achieve a minimum Kappa score of 0.7 against the gold standard for: i) correctly identifying the eligibility of an indicator ('Yes' vs 'No'); and ii) correctly scoring the indicator ('Yes' vs 'No'). After all surveyors have met the minimum threshold, a series of complete real records (i.e., in excess of 500 indicators) will be assessed by all qualified surveyors to estimate final Kappa scores.

Stage 5. Care records review

During the data collection surveyors will review the previous one month of care records for 10 residents per participating RACF. The surveyors will compare the content in the care records against the indicators in order to assess whether the adherence actions have been met. Data will be extracted by surveyors in an explicit criterion-based record review and recorded with the data collection tool that was developed for the *CareTrack Australia*[10] and *CareTrack Kids*[11] studies.

Stage 6. Assessment of QoL

Residents who consent to the care record review will also be asked to participate in a face-to-face interview to assess their QoL. Surveyors will recruit the residents and undertake the interviews. For cognitively impaired residents, a nominated family member or carer will act as a proxy for the assessment. The instruments that will be used for assessing QoL are the EQ-5D-5L[42] for RACF residents without cognitive impairment (i.e. PAS-Cog <12) or both the QoL-AD[43] and InterRAI SQoL[44] for residents deemed to have cognitive impairment (i.e. PAS-Cog score of 12 or more).

Stage 7. Analysis

In addition to producing a set of indicators that represent appropriate care in RACFs, the study will produce three outputs: 1. estimates of the percentage of appropriate care in RACFs; 2. estimates of

QoL scores of residents living in RACFs; and 3. exploratory analysis of the association between appropriateness of care and QoL scores. Analysis will be performed in SAS /STAT software version 9.4 (SAS Institute).

Estimates of percentage of appropriate care

Indicators will be aggregated to estimate the percentage of appropriate care for each condition or care process, and to estimate the percentage of appropriate care overall. The percentage of appropriate care is the total number of 'yes' responses divided by the total number of eligible indicators, adjusted with sampling weights. Exact 95% CIs will be generated by the modified Clopper-Pearson method and variance by Taylor series linearization.

Estimates of QoL scores

Individual QoL scores will be calculated for each instrument (EQ-5D-5L for residents without cognitive impairment and the QoL-AD and InterRAI SQoL for residents with cognitive impairment).[42-44] Means and 95% CIs will be calculated by level for each factor (e.g., individual characteristics, facility characteristics, state, geographical location), adjusted by sampling weights.

Exploratory analysis of the association between appropriateness of care and QoL scores

The relationship between appropriateness of care and the QoL scores will be explored, adjusted with multiple factors. Mixed effects models will be used to take account of repeated measures within clusters.[19]

PATIENT AND PUBLIC INVOLVEMENT

This research study has a policy and advisory group which includes consumer representatives who were involved its design and ongoing conduct.

ETHICS AND DISSEMINATION

Ethics

Human Research Ethics Committee (HREC) approval has been granted from Macquarie University (5201800386) and site-specific approvals will be sought prior to recruitment of participants and before undertaking the care record reviews and QoL assessments. Informed consent will be obtained from all participants or, when relevant, from a nominated family member or carer acting as a proxy.

Dissemination

The research findings will be published in international and national journals and disseminated through conferences and presentations to the various stakeholder groups including consumers, healthcare professionals, policy makers, RACF organisations and facilities, and researchers.

DISCUSSION

Population-level information regarding appropriateness of care delivery for RACF residents is not available in Australia nor in other countries. This is clearly a gap in infrastructure and knowledge about the performance of care delivered by the system. Based on the results of *CareTrack Aged*, empirically-driven priorities for improvement at a systems level can be set by federal and state governments, and peak bodies and colleges to address improving the level of appropriate care for commonly occurring clinical processes and conditions. Care systems will be unaffordable unless funds are diverted to more appropriate care with reduced adverse events, less waste, more efficient

use of limited resources and towards care which optimises opportunities for health, safety, social participation and security.

There is a growing acceptance that healthy ageing is more than just the absence of disease or infirmity and more a complex mix of physical, mental and social well-being factors, with a focus on optimising opportunities for health, participation and security. Our intention to measure the impact of care provided in aged care settings therefore needs to begin with the recognition that QoL is as important as the delivery of evidence- or consensus-based care and while they are two sides of the same coin, the two concepts may be relatively independent of each other.

AUTHOR'S CONTRIBUTIONS

JB and PDH initiated the project and led the NHMRC grant proposal. JB, PDH, IC, AK, RR, AG and LG co-led all design aspects and shared in the development of the protocol and the initial drafting of the grant application and protocol. Drawing on the JB, PDH grant proposal, HA, LW, GA and PT did the first drafting of the protocol manuscript. JW, CM, RM, FR, SG and WBR helped write the grant proposal, protocol and manuscript and all authors reviewed all revisions.

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COMPETING INTERESTS STATEMENT

None

FIGURE LEGENDS

Figure 1. Schematic diagram of stages in the *CareTrack Aged* study.

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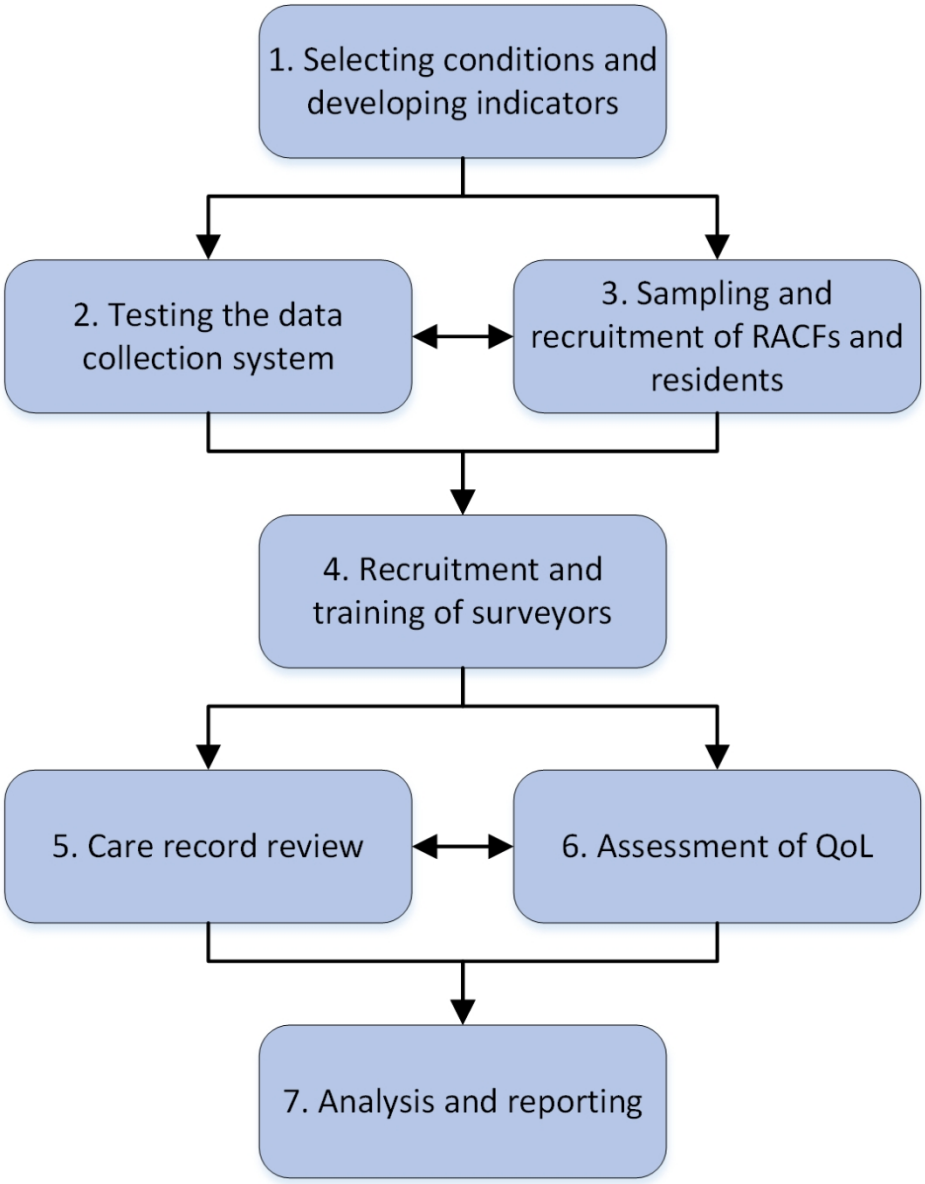

Figure 1. Schematic diagram of stages in the CareTrack Aged study.

92x117mm (300 x 300 DPI)

APPENDIX 1: Estimated prevalence of conditions or care processes in RACF

Condition	Rate	Reference	Method	Country where data collected	Comments
Falls, Mobility	50%,	[1] in [2] (pg13), GET national ACFI data	Literature review	Australia	Data are 14 years old. Figure is incidence per 12 months
Cognitive impairment	1. 52% 2. 58% (dementia) 78% (behavioural symptoms in dementia)	1. [3] (pg16) 2. [4] (pg1027)	1. Aged Care Funding Instrument (ACFI), June 2011 2. Systematic review	1. Australia 2. International	2. Of 74 included studies, 30 focused on the prevalence of dementia. Databases searched from inception to 2009.
Pain	40 - 60%	[5] (pg218)	Literature review: using mixed methods of interview and observation	International	Includes one Australian study from 2002 (McClean & Higginbotham, 2002), 28%
Skin integrity, Pressure ulcer	1. 19 - 23% 2. 16 - 26% 3. 10 - 24%	1. [6] (pg4281) 2. [7] (pg17) 3. [6]	1. Chart audits 2. Point prevalence survey 3. Chart audits	1. Australia 2. Australia 3. Australia	
Depression	1. 52% 2. 10% major depressive disorder, 29% depressive symptoms	1. [8] (pg6) 2. [4] (pg1032)	1. Aged Care Funding Instrument (ACFI), June 2012 2. Systematic review	1. Australia 2. International	2. Of 74 included studies, 26 focused on the prevalence of depression. Databases searched from inception to 2009.

Condition	Rate	Reference	Method	Country where data collected	Comments
	3. 16.9%	3. [9] (pg85)	3. Major depressive disorder (MDD) diagnosed via structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 1997).	3. Australia	3. Sampled 290 residents from 10 low-level aged care facilities in Melbourne. 59.2% of residents who met DSM-IV criteria for MDD did not have a diagnosis recorded on their medical file.
Nutrition and hydration	1.65%, 2. 35-70%	1. [10] 2. [11] (pg30)	1. Nutritional intake assessed by three-day weighed food records, and nutritional status by haematological and biochemical markers and body composition (dual energy X-ray absorptiometry) 2. Resident subjective survey: Malnutrition Screening Tool (MST)	1. Australia 2. Australia	1. … had two or more indicators of undernutrition. 2. severely or mildly malnourished
Bladder and bowel care	75-81%	[12] Section 3.16 Incontinence (pg1)	Aged Care Funding Instrument (ACFI), June 2014	Australia	81% of women and 75% of men some degree of incontinence that was not self-managed. The majority of people (71% of women and 65% of men) were in the most dependent category, experiencing three or more episodes of incontinence a week that required assistance.
Dysphagia and aspiration	40-50%	[13] (pg2)	Unsure	USA and The Netherlands	Note, based on very old data, 1990-91
Sleep	1. 40-65% 2. 13-31%	1. [14] (pg6) 2. [15] (pg2034)	1. Resident subjective survey 2. InterRAI	1. Australia 2. 8 countries	

Condition	Rate	Reference	Method	Country where data collected	Comments
Restraint	1. 12-49% 2. 5-25%	1. [16] (pg11) 2. [17] (pg122)	1. Literature review 2. Systematic review	1. Mix of Australia and other countries 2. International	1. Old data: 1997-2009 but most recent Australian was 1998.
Hearing and vision	Hearing: 86% Vision: 30%	[18] (pg201-202)	Resident subjective survey and quantitative tests	Australia	
Oral and dental care	11-72%	[19] (pg18)	Personal care assistant assessment of oral health using the Oral Health Assessment Tool	Australia	There were eight components (lips, gums, dentures) scored 0-2 depending on level of problem (0-none, 2- pathology). Cumulative scores assessed showed scored 6 or more in total 72 scored 3 or less and 11 six or more.
End of life - palliation	4%	[20] (pg1)	Aged Care Funding Instrument (ACFI), June 2015	Australia	4% indicated a need for palliative care
Medication	1. 91% 2. 37.1% 3. 64%	1. [21] (pg414) 2. [22] (pg277) 3. [23] (pgs46-47)	1. Record review 2. Prescription (encashed) data 3. Medical record review	1. Australia 2. Scotland 3. Netherlands	1. Average 9.75 medications per person 2. Per person mean 113 prescriptions (95% CI: 110.37-115.56), 11.6 (95% CI: 11.39-11.77) drug classes. 3. Only 36% of residents with heart failure and a reduced ejection fraction received a combination of an ACE-

Condition	Rate	Reference	Method	Country where data collected	Comments
					inhibitor/ARB-antagonist and a β-blocker. Metoprolol was prescribed with a median dose of 87 mg, which is less than half of the target dose stated in guidelines (200mg/day).
Infection	4.5%	[24] (pg10)	Point prevalence survey	Australia	

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BMJ Open

CareTrack Aged - The appropriateness of care delivered to Australians living in residential aged care facilities: a study protocol

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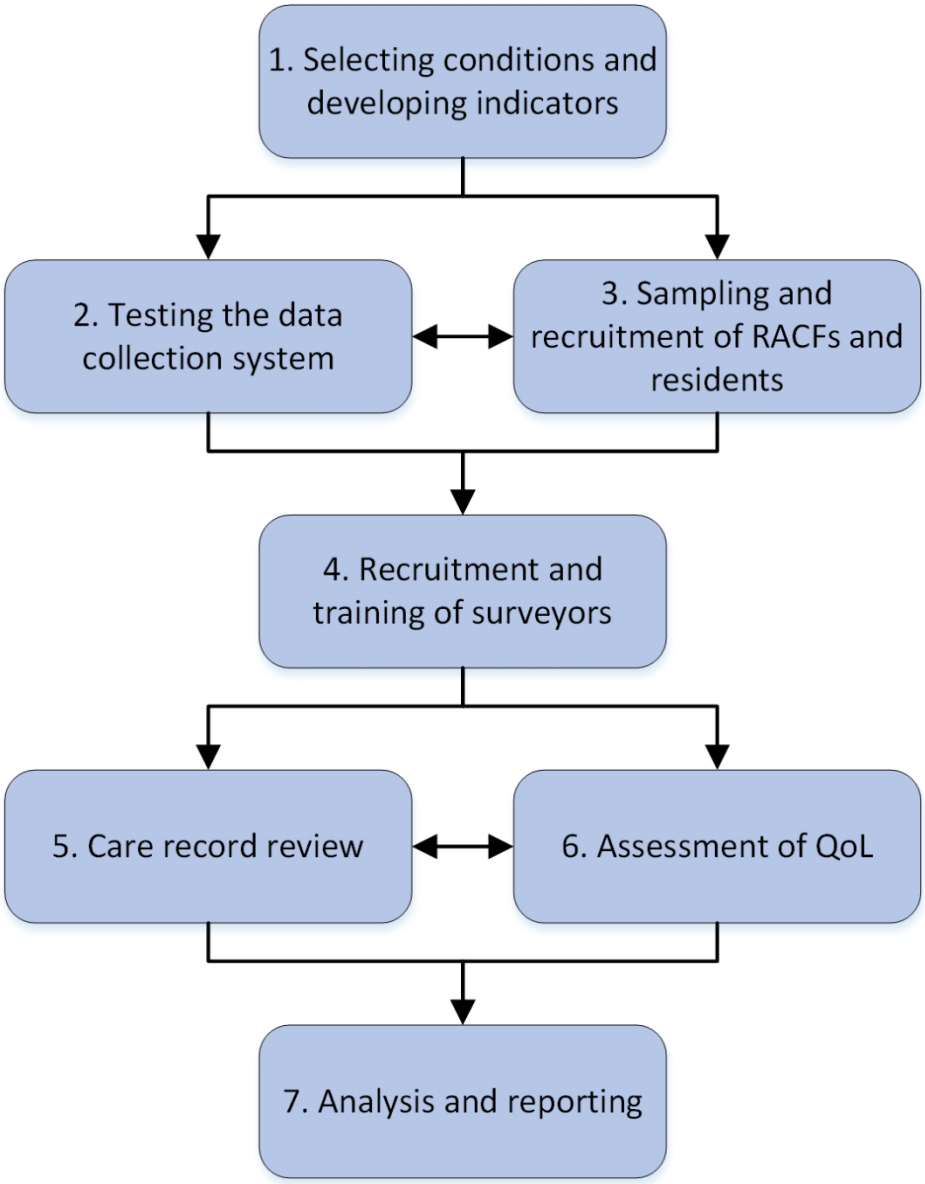

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