



Royal Commission
into Aged Care Quality and Safety

INTERNATIONAL AND NATIONAL QUALITY AND SAFETY INDICATORS FOR AGED CARE

RESEARCH PAPER 8

AUGUST 2020

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.

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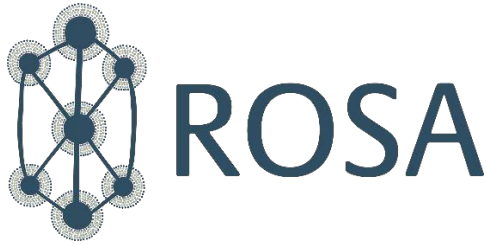
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International and National Quality and Safety Indicators for Aged Care

Report for the Royal Commission into Aged Care Quality and Safety

July 2020

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EXECUTIVE SUMMARY

Improving the quality and safety of care for older people living in aged care settings is a key imperative for national health and social care systems globally. Quality and safety indicator systems have been developed, validated and implemented internationally to measure and monitor quality of care constructs that reflect both care processes and outcomes in aged care. This report was commissioned by the Royal Commission into Aged Care Quality and Safety in July 2019 and was written by the Registry of Senior Australians (ROSA) team at the South Australian Health and Medical Research Institute (SAHMRI).

The overall aim of this report was to provide evidence-based suggestions for quality and safety indicators to routinely monitor the care provided to older Australians accessing aged care services. The report has two main parts:

Part 1 identifies quality and safety indicators currently used to monitor quality of care in aged care sectors nationally and internationally at the population level.

Part 2 examines the performance of Australian aged care facilities and home care providers against indicators developed by other national and international quality and safety monitoring systems. The identified indicators from Part 1 were summarised based on their potential to be analysed and likelihood of obtaining meaningful comparisons using existing data integrated from the health and aged care sectors in Australia.

Specifically, indicators that could be replicated or those that could be adapted using similar / comparable variables (proxy measures) were included in Part 2.

Eleven countries were identified with aged care quality and safety monitoring systems indicators at the population level. This includes seven European countries (Denmark, Finland, Germany, Iceland, Netherlands, Sweden and the United Kingdom), two North American countries (Canada and the United States of America) and two countries from Australasia (New Zealand, Australia). The Australian systems included both the Victorian and Aged Care National Mandatory Quality Indicator Program (NMQIP) indicator sets.

- A total of **305 quality and safety indicators** for residential aged care were identified from a range of domains, including physical and psychosocial function, health-related areas (including medication-related indicators), social well-being, safety and quality of life. In addition, 50 home care indicators were identified from Canada (n=16), Netherlands (n=20) and Sweden (n=14).

- While there is considerable heterogeneity between indicators measured internationally, several are consistently used, highlighting their importance and agreed value. These include:
 - Activities of daily living limitations and abilities
 - Use of physical restraints
 - Changes in cognition, mood and behavioural symptoms
 - Pressure injuries
 - Weight loss
 - Falls / fractures
 - Incontinence
 - Pain
 - Use of antipsychotic medications
- Overall, five of the 11 countries used the Resident Assessment Instrument (RAI) minimum data set (MDS) or an adaptation of this instrument, for their quality and safety indicator sets and data collection. The RAI data are self-reported or from active data collection by the aged care facility. The remaining countries used other sources of data including health care records, registries, national surveys, other forms of active data collection (i.e. different to RAI) and administrative claims data.
- The majority of the identified indicator sets are mandated to regularly assess and monitor quality and safety of care in their respective countries.
- A wide range of reporting systems were employed across the indicator sets to convey quality and safety of the services provided that includes public reporting and / or reporting to a regulator / public authority. These vary from simple visuals such as a five-star rating system (USA) and traffic-light systems (Sweden, UK, Victoria Australia), to regular online reporting summaries and highly interactive online platforms that allows detailed reporting at the individual provider, local area, state or national levels with benchmarking and national averages for comparisons.

For Part 2, **134 quality and safety indicators** were identified for a comparative analysis using linked health and aged care sector data from Australia. They cover 12 domains, including medication-related quality of care indicators (n=26), pressure injury (n=23), falls / fractures (n=19), weight loss / malnutrition (n=19), bowel / bladder incontinence (n=12), depressive symptoms / depression (n=10), pain (n=8), care-plans / medication review (n=6),

hospitalisations (n=6), infections (n=3), cognition (n=1) and mortality (n=1). This also includes identified home-care quality and safety indicators.

- Based on this analysis we identified several indicators that can easily be monitored in Australia, potentially in a timely manner, acknowledging their limitations using available routinely collected data. These include indicators related to:
 - Medication use (e.g. antipsychotic medication use)
 - Health service use (e.g. care plans)
 - Events that result in hospitalisations or emergency department presentations (e.g. admissions due to falls / fractures).
- The following criteria was used to develop suggestions for routine monitoring in the aged care setting in Australia:
 - i. international agreement on the measure;
 - ii. high prevalence and / or high impact / risk of harms;
 - iii. feasibility, consistency of measurement and data availability.
- **Suggested domains for routine monitoring of aged care quality and safety in Australia** that can be implemented using existing administrative data collections, and at no additional burden to aged care providers include:
 - i. Medication-related quality of care, namely antipsychotic medication use, high sedative load (or an index or measure that includes sedative and anticholinergic medications such as the drug burden index) and antibiotic use
 - ii. Falls and fractures
 - iii. Hospital re-admissions
 - iv. Hospitalisation for dementia / delirium in individuals with dementia
 - v. Pain (chronic opioid use)
 - vi. Premature mortality
 - vii. Pressure injury
 - viii. Utilisation of care plans and medication reviews
 - ix. Weight loss / malnutrition
- While recognising the significant differences in the identified monitoring systems from various countries, which limits the direct comparability of several of the indicators

examined, we have determined that **Australia's performance is varied** compared to other countries in terms of quality and safety of care provided.

Mixed performance by Australia was observed for:

- Antipsychotic or anti-anxiety / anti-hypnotic medication use
- Pressure injuries (stage II-IV)

Lower end of performance by Australia was observed for:

- Utilisation of care plans and medication reviews
- Significant unplanned weight loss

Higher end of performance by Australia was observed for:

- Re-hospitalisations and emergency department presentations within 30 days of discharge
- While it was not possible to evaluate **quality of life** and other measures of wellbeing or consumer experience such as **activities of daily living** or **physical restraint** in Australian aged care in this report, these are important quality and safety indicators and **should be included as part of Australia's routine monitoring** in aged care. These measures were not examined in Part 2 of this report due to a lack of appropriate available population-based data. They are part of routine monitoring of quality and safety for aged care recipients in other countries (e.g. USA, Canada, New Zealand, United Kingdom). Physical restraint is included in Australia's recently developed National Mandatory Quality Indicator Program.
- It is suggested that a strategy for obtaining **quality of life or other measures of wellbeing and consumer experience data** be developed to support routine evaluation and reporting using standard assessments performed within Australia's aged care sector. While a number of measures currently exist, the use of an instrument that has been developed specifically for assessing quality of life in aged care would be preferred. Longitudinal, repeated assessment of quality of life measures, which makes the data collection part of the inherent product of delivering person-centred care would be the optimal approach.
- A national set of quality and safety indicators of care for the aged care sector is necessary and a pragmatic approach should be taken to develop these. This means **leveraging the wealth of information available nationally** within the Australian aged care and health care sectors and **supplementing it with new standardised high-**

quality data collections that captures the domains of quality and safety that are not available within existing data sources.

- It is suggested that an **integrated national minimal dataset for the purpose of measuring quality and safety in care**, be developed which would: (1) use the existing data for the development of the indicators that are feasible; (2) standardise aged care providers management systems to capture additional elements as part of their ongoing processes of care that focus on complementing and not repeating data already elsewhere collected; (3) develop and include high quality instruments to capture domains of care not able to be collected elsewhere (e.g. quality of life, consumers' experience).
- **Real time data collection should be standard**, and frequent evaluation of these data should be carried out in a manner that provides both information on practice changes for specific providers (i.e. time series analysis) as well as opportunities for benchmarking (i.e. comparability of providers) in a timely manner.
- With the increasing utilisation and demand for home care packages to support older people to remain at home in the community, **routine monitoring of home care quality and safety** is also essential. Key domains commonly used by international monitoring systems in home care settings include changes in cognition, mood, functional abilities and pain (i.e. to measure improvements or decline), in addition to incidence of hospitalisations, falls and incontinence and medication use. Such indicators should be included in Australia's aged care monitoring, with preference in the first instance, given to those that can be examined using existing data sources.
- The establishment and inclusion of **evidence-based target ranges or benchmarks** for the indicators evaluated in this report are needed to facilitate the interpretation of the quality indicators and processes needed for improvement. The target ranges should be realistic and achievable, and should be created using a range of methods including the use of modelling and simulation studies to appropriately capture the influence of case mix, supplemented by expert input.
- **Adjustment for case mix** is necessary to allow meaningful comparisons between aged care providers and different patient populations.
- **Public reporting** of quality and safety indicators may increase transparency and accountability of the system, potentially improving performance, and provide aged

care recipients and their families the opportunity to make informed decisions regarding service use.

- It is suggested that ongoing examination of the indicators included in national quality and safety monitoring systems incorporate reassessment, to ensure they remain contemporary, useful, and meaningful.
- We suggest an **independent regulatory body** that oversees the monitoring of quality indicators, including data custodianship, management, and high quality reporting (which includes risk adjustment and reporting of benchmarking) to monitor facilities' and providers' quality and safety of care as another potential strategy to improve transparency and accountability in the system.

There is opportunity and necessity to improve health outcomes and quality of life for Australia's aged care population. It is evident from our evaluation, that with the existing data available in Australia, a well-designed, comprehensive, and effective quality and safety indicator reporting system can be implemented to capture important indicators of care that will inform and ultimately improve health and wellbeing outcomes for Australia's older population.

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ABBREVIATIONS

ADL	Activities of Daily Living
ACAP	Aged Care Assessment Program
ACAT	Aged Care Assessment Team
ACFI	Aged Care Funding Instrument
AIHW	Australian Institute of Health and Welfare
ASCS	Adult Social Care Survey
ATC	Anatomic, Therapeutic and Chemical Classification [#]
CIHI	Canadian Institute for Health Information
CCRS	Continuing Care Reporting System
CMS	Centers for Medicare and Medicaid Services
COPD	Chronic Obstructive Pulmonary Disease
CQ-Index	Consumer Quality Index
DHB	District Health Board
ED	Emergency Department
GP	General Practitioner
GPMP	General Practitioner Management Plan
HCRS	Home Care Reporting System
HMR	Home Medicines Reviews
IADL	Instrumental activity of daily living
ICD-10-AM	International Classification of Diseases, version 10, Australian Modification [#]
interRAI	International Resident Assessment Instrument
LTC	Long-term Care
LTCF	Long-term Care Facility
MBS	Medicare Benefits Schedule
MDS	Minimum Data Set
MRB	Medical Review Board
NACDC	National Aged Care Data Clearinghouse
NBHW	National Board of Health and Welfare
NMQIP	National Mandatory Quality Indicator Program
NDI	National Death Index
NHS	National Health Service
NSW	New South Wales
NZ	New Zealand
OMS	Outcome Monitoring System
PBS	Pharmaceutical Benefits Scheme
PRN	Pro Re Nata ('as needed')
PSRACS	Public Sector Residential Aged Care Services
RAI	Resident Assessment Instrument
RMMR	Residential Medication Management Review
ROSA	Registry of Senior Australians

ABBREVIATIONS (continued)

RPBS	Repatriation Pharmaceutical Benefits Scheme
SA	South Australia
SAHMRI	South Australian Health and Medical Research Institute
SCRQoL	Social Care-Related Quality of Life
SHELTER	Services and Health for Elderly in Long Term care
TCA	Team Care Arrangement
UK	United Kingdom
USA	United States of America
UTI	Urinary Tract Infection
VIC	Victoria
WHO	World Health Organisation

#For ATC and ICD-10-AM coding systems, the use of a * in the numerical coding system denotes an instructional notation to describe the inclusion of all subsequent codes within the described code level.

1. Introduction

The overall aim of this report is to provide *evidence-based findings* for quality and safety indicators to routinely monitor the care provided to older Australians accessing aged care services. This report was commissioned by the Royal Commission into Aged Care Quality and Safety in July 2019. This report was prepared by the Registry of Senior Australians (ROSA) team at the South Australian Health and Medical Research Institute (SAHMRI). Briefly, ROSA is a registry that monitors individuals in the aged care sector to understand their aged care service utilisation, health care service utilisation, medication utilisation, mortality and other health events that affect older individuals in aged care. ROSA's aim is to provide the evidence to support improvements within the aged care sector.

This report outlines and identifies:

- National information needs that will be met through the development of a comprehensive national quality and safety indicator set for aged care
- The selection criteria and evidence-base for the quality and safety indicators for aged care, including comparability with identified international indicator-based routine monitoring systems
- Potential data requirements, including current availability of data for the indicators together with identified areas of additional data collection and development work needed to ensure national comparability and standardised data collection
- National reporting, case-mix adjustments and benchmarking processes.

In order to meet the overall aim of the report, the report is divided into two parts:

- **Part 1** identifies from national and international literature, databases, websites and health care systems, quality and safety indicators for aged care that are currently used to monitor quality of care. The range of indicators used, the evidence base for their inclusion and comparability / differences in specifications for the indicators which overlap with the proposed ROSA Outcome Monitoring System indicators are described.

- **Part 2** uses the ROSA Outcome Monitoring System indicators and the ROSA data platform to compare, where possible, the performance of Australian aged care facilities and home care providers against those of national and international systems using the identified indicators from Part 1.

2. Background

As Australia's population continues to increase and age, the delivery of safe, high-quality, and sustainable aged care services is crucial.^{1,2} In 2017-18, there are over 242,000 people in Australia receiving permanent residential aged care across 2695 facilities at a cost of \$12.2 billion to the Australian Government.^{3,4} Over recent decades the provision of aged care in Australia has moved from an institutional-based model of care towards a more person centric model of care focusing on the needs and outcomes of aged care recipients (including both residents in aged care facilities and people receiving home care). This has been largely driven by the enactment of the Aged Care Act 1997⁵ and subsequent Government reforms aimed at ensuring the delivery of safe and high quality care to older people living in residential aged care services.^{6,7}

2.1 Quality of Care

Quality of care is broadly defined by the World Health Organisation (WHO) as the extent to which care services provided to individuals and populations produces the desired health outcome/s.⁸ Quality of care is a multi-faceted concept that includes a number of key domains^{8,9}.

- **Effective.** Delivering care that is evidence based and results in improved outcomes for individuals and populations based on need
- **Efficient.** Delivering care to maximise resource use and avoid waste
- **Appropriate.** Delivering care that is relevant to needs and most likely to produce desired outcome or outcomes
- **Accessible.** Delivering care that is timely, geographically reasonable, and provided in a setting where skills and resources are appropriate to need
- **Acceptable / Person-centred.** Delivering care that considers preferences and aspirations of individuals and the cultures of their communities
- **Equitable.** Delivering care which does not vary in quality because of personal characteristics such as gender, race, ethnicity, geographical location, or socioeconomic status
- **Safe.** Delivering care that minimises risks and harm.

The pursuit to improve the quality of care provided by health systems globally, has led to an increased need to measure care quality and safety.¹⁰ Quality and safety measures of care should provide meaningful and relevant indication of practices and outcomes, which if intervened on could ultimately improve quality of care.¹⁰

2.2 Quality and Safety Indicators

Indicators are commonly used to measure care quality and safety in a reliable, accurate and timely manner. They can be used to guide and monitor the quality and safety of care, providing both quantitative and qualitative information to help understand care performance.¹¹⁻¹³ In Australia for example, they have been used by hospitals to publicly report on their performance since 2010 with key quality metrics such as hospital acquired infections, wait lists, costs and time to admissions.¹⁴ Indicators are commonly divided in to three categories:

- **Structure indicators:** Measure organisational resource utilisation and resilience, and are used to measure the quality of the setting in which care is delivered.^{11,13} Examples include staffing levels, funding allocations or access to facilities.
- **Process indicators:** Measure quality of care delivery. They allow comparison of existing practices against evidence based or best practice standards and are commonly used to drive improvement initiatives¹¹. Examples include the proportion of individuals treated according to clinical guidelines or timeliness of radiology reporting.
- **Outcome indicators:** Measure the effects of health interventions on individuals' health and well-being.^{11,13} Examples include mortality, quality of life or hospitalisation rates.

Quality and safety indicators have a crucial role in assessing and monitoring care quality and provide health care institutions, regulators, funders, clinicians and individuals with the ability to understand care performance and care recipients' outcomes and quality.^{10,12} They can inform decision-making about overall priorities and system-level strategies for quality and safety improvement through educational feedback, accreditation and certification, contracts and financial incentives, and public reporting.

2.3 Monitoring Quality and Safety in Aged Care Internationally

The use of quality and safety indicators to monitor the care provided for the vulnerable population in the aged care sector has long been recognised internationally to be of significant value.^{15,16} It has been acknowledged for decades that ongoing monitoring can identify unwarranted service variation, poor and high performing facilities, opportunities for benchmarking, and underpin quality improvement initiatives. For example, countries such as the US, Canada, Sweden, Netherlands, and other countries have had complex mandatory, and in some instances public, reporting systems since the 1990s.^{15,17-21} While these are successful in increasing performance transparency, promoting higher standards of care (e.g. ratio of skilled workers to residents), and informing practices (e.g. quality use of medicines), some limitations are present. These limitations include, for example, the timely availability of data sources for monitoring or limited capture of the aged care population.^{15,16} However, both the strengths and limitations of these implemented international monitoring programs provide important lessons for the development of a sustainable and high-quality monitoring system in Australia.

2.4 Monitoring Quality and Safety in Aged Care in Australia

Until recently, little has been done from a population-monitoring and regulatory perspective to assess or ensure that high quality, safe and effective care is provided to Australia's older population receiving aged care services. In 2019 the Aged Care Quality and Safety Commission was established²² and the National Mandatory Aged Care Quality Indicator Program (NMQIP) (Box 1), limited initially to three quality and safety indicators (each with multiple components), was implemented in July 1, 2019.^{23,24} The aims of the program are to provide residential care services in Australia with robust, valid data from meaningful and measurable quality indicators to support continuous quality improvement of the care that is provided to aged care residents.²⁴

Under this program government subsidised residential aged care services must report against the three quality indicators every three months for each resident using a government developed data portal. Specific methods for collecting, recording, and submitting the data are provided, to facilitate reliability of the data included in the quality indicator program.

Box 1. 2019 Australian National Mandatory Aged Care Quality Indicator Program (NMQIP)**Quality Indicator 1: Pressure injuries**

- Stage I
- Stage II
- Stage III
- Stage IV
- Unstageable
- Deep tissue

Quality Indicator 2: Use of physical restraint

- Intent to restrain
- Use of physical restraint devices

Quality Indicator 3: Unplanned weight loss

- Significant unplanned weight loss

Reporting is provided quarterly, with the publication of the national results online. This includes reporting by state and remoteness (major cities or regional and remote). The most current reporting (January to March 2020) included data from 2,562 residential aged care services in Australia (accounting for 94% of aged care service providers subsidised by the Australian Government).²⁵ Currently, it is unclear how the reporting will account for case mix differences between different facilities or its utility for benchmarking purposes.²³

2.5 The Registry of Senior Australians Outcome Monitoring System

The Registry of Senior Australians (ROSA) is a national data platform linking information from both the health and aged care sectors, designed to monitor the health, service utilisation, medication use, mortality, and other outcomes of people receiving aged care services in Australia.²⁶ ROSA was established in 2017 by the Healthy Ageing Research Consortium, a partnership of researchers, clinicians, aged care providers and consumer advocacy groups.

ROSA's Historical National Cohort includes 2.9 million individuals who have had an eligibility assessment by an Aged Care Assessment Team (ACAT) and / or received aged care services between 1997-2017 in Australia.²⁷ ROSA links the national aged care data, including aged care eligibility assessments (Aged Care Assessment Program, ACAP), entry into permanent care assessments (Aged Care Funding Instrument, ACFI), to individuals' aged care service

records (from permanent care, respite care, transition care, home care package, and community care services), and health care records, from the Australian Government Medicare Benefits Schedule, Pharmaceutical Benefits Scheme, National Death Index records, and state-based hospitalisation and emergency department encounters currently for South Australia, New South Wales and Victoria.

Using the established platform that ROSA created, twelve indicators of quality and safety of aged care can now be ascertained at the population level.²⁸ The goal of the ROSA Outcome Monitoring System (OMS) is to focus on important and well-defined evidence-based measures that can influence care provision specific for the aged care population in Australia. These were developed using literature review and expert engagement.

Using national and international aged care literature, 23 initial safety and quality indicators for residential aged care facilities were considered for inclusion in the ROSA OMS (**Box 2**). These were selected because they have been implemented in other countries, *or* were recommended for monitoring in this population, *or* have been associated with poor outcomes and increased risk of harm, and are feasible using the ROSA data.²⁸

An initial consultation by an Expert Advisory Committee, which included the ROSA Executive Committee members, geriatricians, general practitioners, aged care providers, and aged care consumer representatives, examined the face and content validity and acceptability of a set of quality and safety indicators. Follow up consultations with an expert panel were undertaken. The 12 indicators prioritised for monitoring are described in **Box 2**. This includes pressure injury and malnutrition / weight loss, which are two of the three indicators included in the Australian mandatory quality indicator program.

Importantly, the ROSA indicators were developed to ensure that ongoing monitoring and reporting can be done without additional burden on the aged care providers, using routinely available data that are also less likely to be influenced by reporting biases. The indicators can be robustly case mix adjusted and geographical and other comparators of interest can be provided, which are important benchmarking features for quality improvement tools.²⁸ A summary of the indicators is described in *Appendix 1, Table 1.1*, and the full technical specifications are described in *Appendix 2*.

Box 2. Registry of Senior Australians (ROSA) Outcome Monitoring System (OMS)

Indicators for Aged Care

Considered Indicators for ROSA OMS

(n=23)

1. Potentially preventable hospitalisations
2. Emergency department presentation
3. Ambulance service use
4. Falls
5. Fractures
6. Polypharmacy
7. Potentially inappropriate medication use
8. Medication-related hospitalisations
9. Pressure injury
10. Delirium and / or dementia related hospitalisations
11. Weight loss / malnutrition
12. Premature mortality
13. Wait times for care
14. Changes in need related to activities of daily living
15. Use of 75+ health assessments
16. Use of comprehensive geriatric assessments
17. Use of chronic disease management plans
18. Use of medication reviews
19. Antipsychotic use
20. High sedative load
21. Use of cholinesterase-inhibitors or memantine in people with Alzheimer's disease
22. Antibiotic prescriptions for infection
23. Chronic opioid use

Developed Indicators for ROSA OMS²⁸ (n=12)

1. High sedative load
2. Antipsychotic use
3. Chronic opioid use
4. Antibiotic use
5. Premature mortality
6. Falls
7. Fractures
8. Medication-related adverse events
9. Weight loss or malnutrition*
10. Dementia and / or delirium-related hospitalisations
11. Emergency department admissions
12. Pressure injuries*

*Included in National Mandatory Quality Indicator Program

3. Research Methods

3.1 Part 1: International and National Aged Care Quality and Safety Monitoring Systems

This report used a range of search strategies to conduct a targeted review of international and national quality and safety monitoring systems in aged care, including academic literature, grey literature, and international government and relevant organisation reports and websites. In addition, supplementary searches were conducted using references in articles, reports or websites. From these searches, identified quality and safety outcome monitoring systems or indicators were included in the report if i) the indicator was aimed at monitoring / improving the quality of care at the population level; ii) data collection was population-based; iii) data collection was standardised; iv) data collection and reporting were current (last 10 years); v) reporting of indicators and/or outcomes were publicly available and vi) the study, report or website was in English. Full details of the search strategies, inclusion criteria and data extraction can be found in *Appendix 3, Table 3.1*.

For this report, indicators were defined as a measure that has been developed as a guide to assess, monitor and evaluate data on the quality or safety of care delivered in residential aged care. Residential aged care includes the terminology long-term care (LTC), supported living services, social care and nursing homes, which are defined as care for older people needing support in many facets of living over a prolonged period of time.²⁹

Key data that were extracted and summarised from the identified studies or indicator systems included:

- a general description of the indicators in place (country, name of indicator / system, start date)
- type of indicators (e.g. health, aged care, or other)
- methods of data collection
- framework (e.g. public reporting, rating systems)
- employment of indicators (e.g. measure absolute performance, comparative performance against other providers, inform standards, internal use, payment)
- reporting time frames

- type of output
- definitions and methods for calculation of indicators
- methods of risk adjustments
- broad country specific factors
- prevalence / rates of indicators
- any other additional details and relevant outputs from recent reports, and
- references

In addition, a summary of the Canadian Home Care Indicators, other home care indicators identified from countries identified from the above search strategy, and those from a recent systematic review of quality indicators for home care (community care), were included.^{30,31}

3.2 Part 2: Analysis of Identified Quality Indicators in Aged Care using the ROSA Data Platform

From the review described above in Section 3.1, a summary of the identified indicators and their potential to be examined using the ROSA data platform and likelihood of obtaining meaningful comparisons was compiled. Specifically, this included those indicators that could be replicated using the identified specific indicator data rules or those that could be adapted using similar / comparable variables or data rules (*for full details see Appendix 4, Table 4.1*).

The technical specifications from other countries (where available) were adapted to allow meaningful comparisons between international and Australian aged care quality and safety indicators using ROSA data. Differences between data collection procedures and data sources between countries (e.g. survey, clinical assessments, administrative claims data) dictate the quality of potential comparisons able to be undertaken. In some instances, proxy variables were used for these comparisons. Examples include chronic opioid use as a proxy for moderate to severe pain, hospitalisation (including Emergency Department (ED) presentations) for falls, pressure injuries or weight loss as a proxy for assessment and measurement of falls, pressure injuries or weight loss by care providers and the use of antibiotics as a proxy for infection.

A cross sectional analysis of the Historical National ROSA cohort (2.9 million participants)^{26,32} in 2016 was used to examine the international and national quality and safety indicators

identified from Section 3.1, and the 12 indicators that are included within the ROSA OMS for comparison. In brief, ROSA contains de-identified linked data provided by the Australian Institute of Health and Welfare (AIHW), National Aged Care Data Clearinghouse (NACDC), Medicare Benefits Schedule (MBS), and Pharmaceutical Benefits Scheme (PBS, including data from the Repatriation Benefits Scheme (RPBS)). The NACDC includes the Aged Care Assessment Program (ACAP)³³, the Aged Care Funding Instrument (ACFI)³⁴, the National Death Index (NDI)³⁴, and aged care services episodes datasets.

ROSA includes 2.1 million aged care eligibility assessments on 1.3 million individuals and resulting utilisation of aged care services, including 410,000 home care packages episodes and 2.2 million stays in residential aged care (respite and long-term care). The data analysis for Section 3.2 included all older Australians accessing aged care services in 2016. The cohort included those in residential aged care (including short-term, long-term and respite where applicable) or people receiving home care services, depending on the indicator being examined. Short-term was defined as having lived in a specific facility for a cumulative period of <100 days and long-term was defined as a cumulative period of ≥100 days.³⁵

Hospitalisation / ED records are currently available for South Australia (SA), Victoria (VIC) and New South Wales (NSW). SA hospitalisation and ED data includes only data from public hospitals at the time of this report, while VIC / NSW data has both public and private hospitalisations. Therefore, analysis of the indicators based on hospitalisation and ED data was examined for SA alone and VIC / NSW combined. The majority (92%) of emergency / unplanned hospitalisations are captured in public hospitals³⁶, and the indicators that rely on principal discharge diagnosis for hospitalisations that are typically emergency or unplanned (i.e. falls, fractures, ED presentations) are likely to be well captured using this data alone. Based on comparisons with the other states (VIC, NSW), it is likely that these events maybe underestimated by 0-12% in SA (depending on the indicator) by using only the public hospitals for these measures. For the indicators that rely on any diagnosis during the inpatient encounters (i.e. pressure injuries and weight loss or malnutrition) it is likely that SA estimates are underestimated by 3-26% (depending on the indicator).

In the ROSA dataset, medications are coded according to the Anatomic, Therapeutic and Chemical Classification (ATC)³⁷ and the Pharmaceutical Benefits Schedule (PBS).³⁸ Medicare subsidised services are coded according to the Medicare Benefits Schedule (MBS).³⁹

Hospitalisations are coded according to the International Classification of Diseases, version 10, Australian modification (ICD-10-AM).⁴⁰

This analysis also included reporting of the indicators included in the ROSA OMS as an additional comparison. For each indicator examined in Part 2, a description, study population, definitions and codes used, data sources, time periods, additional inclusion and exclusion criteria, numerator and denominator, prevalence and 95% CI were determined. Certain health conditions (i.e. dementia) were ascertained based on reporting of conditions from the aged care eligibility assessments, entry into permanent care assessments, and/or Rx-Risk-V (a pharmacy-based comorbidity index used to determine the presence of specific conditions⁴¹). Some of the indicators were stratified by the presence of dementia and this was determined by reporting of dementia in the aged care eligibility assessment, or at the time of an aged care funding instrument assessment at entry into residential aged care, or a history of dispensed acetylcholinesterase inhibitor or memantine within the six months prior to entry into aged care (*see Appendix 2, Table 2.1 for full details*). Palliative care or cancer were in some instances exclusion criteria and were identified from responses to ACFI question 12, R14 “The person needs a palliative care program involving end of life care where ongoing care will involve very intensive clinical nursing and / or complex pain management in the residential care setting” or use of an antineoplastic and immunomodulating agent (ATC Code L01) in the 6 months prior to study entry.

All analyses were performed in SAS 9.3 (SAS Institute, Cary NC) and descriptive statistics were employed to report the prevalence and / or rates per 1000 resident bed days for the calculated indicators as described within each section.

4. Part 1: International and National Aged Care Quality and Safety Monitoring Systems

Summary: A total of 11 countries were identified with aged care quality and safety monitoring systems using indicators at the population level that are routinely and publicly reported. This includes seven European countries (Denmark, Finland, Germany, Iceland, Netherlands, Sweden and the United Kingdom), two from North America (Canada and the United States of America) and two from Australasia (New Zealand and Australia including both the Victorian and National Mandatory Quality Indicator Program indicator sets). A total of **305 indicators** from these countries were identified across a range of domains, including physical and psychosocial function, health-related areas (including medication-related indicators), social well-being, safety and quality of life. An overview of each of the countries' indicators, including the methods and types of data collected, framework, how the indicators are employed and reported, and other country specific factors are provided in the next sections of this report (Sections 4.1.1-4.1.11).

A total of 50 home care indicators were identified from Canada (n=16), Netherlands (n=20) and Sweden (n=14). While Canada reports on these indicators separately, the latter two countries have them embedded within their overall routine quality and safety indicator sets of aged care.

Assessment / Data: Overall, five of the 11 countries used the Resident Assessment Instrument (RAI) minimum data set (MDS) or an adaptation of this for their quality and safety indicator sets and data collection. The RAI-MDS is composed of three parts, first the MDS collection form that includes over 400 items covering a number of domains: cognition, communication, mood and behaviour, psychosocial well-being, physical functioning, continence, health conditions, nutrition, activities, medications, treatments and procedures. The second part includes data descriptions and definitions, assessment process and coding rules. The third part includes Clinical Assessment Protocols that support development of care plans. The quality of data collected via the RAI has been reported to be consistently high in terms of reliability, validity and completeness.⁴² Other types of data used for the quality indicators included administrative claims data, data from registries, and surveys of residents, care providers or inspectors. Several countries use data from multiple sources for

their quality and safety indicator monitoring. For example, Sweden uses a combination of national surveys and rich datasets derived from national quality registers. Data collection for each of the countries ranges from every 90 days, six-monthly to annually.

Reporting: All of the identified indicator sets, except in Finland, are mandated to regularly assess and monitor quality and safety of care in their respective countries. In Finland where providers voluntarily participate, 54% of all long-term institutional care providers and 30% of home care services use the RAI for reporting their performance.^{43,44} In Canada, assessment and reporting is mandatory in eight of the 13 provinces and territories representing over 60% of Canada's aged care population.³⁰ Assessment of care quality in Victoria, Australia only includes public sector residential aged care.⁴⁵

A wide range of reporting systems were also employed across the indicator sets to convey quality and safety of the services provided. These include simple visuals such as a five-star rating system in the USA or traffic-light systems (e.g. Sweden, UK, Victoria Australia), regular online reporting summaries, to highly interactive online reporting that allows detailed reporting at the individual provider, local area, state or national based levels with benchmarking and national averages for comparisons. The timeliness of reporting ranged from every 90 days to annual reports that generally provided an overall high-level summary for the indicators at the national level.

Other potential monitoring systems: In addition to the 11 countries with indicator sets identified as described above, a validated quality and safety of care indicator set was identified from the Republic of Korea (South Korea) that was developed in 2009-10.⁴⁶ While Korea has a public long-term care system, financed by a national long-term care insurance scheme first introduced in 2008⁴⁷, they are currently developing a national evidence-based performance monitoring system to routinely monitor long-term care.⁴⁸ Further, a multinational cross-country prospective cohort study from seven European countries (Czech Republic, England, Finland, France, Germany, Italy, Netherlands) and Israel was identified, termed the Services and Health for Elderly in Long TERM care (SHELTER) study.^{18,49} This study was funded by the Seventh Framework Programme of the European Union and examined quality of aged care in these countries from a selected group of nursing homes. Part of the aim of this study was to provide validation for use of the international Resident Assessment Instrument (interRAI) for long-term care facilities (interRAI-LTCF) in Europe and

its ability to facilitate the creation of databases for each of the included countries to govern and monitor the quality of long-term care. Results from this study highlighted the utility of the interRAI-LTCF instrument to compare quality of care between long-term care facilities within and between countries.^{18,49} While South Korea did not meet the inclusion criteria for Part 1 (i.e. it does not have a current national outcome / quality indicator monitoring system)⁴⁸, the indicator sets identified for South Korea and the SHELTER study were included as part of the synthesis and summary of quality indicators to be examined using the ROSA data platform.

4.1 Canada

In Canada, long-term care is offered through a mix of public, private for-profit, private not-for-profit, and religious-based providers. All long-term care homes are legislated and funded by the province or territory (although accommodation costs are shared as co-payments with residents). Provinces and territories operate under the Canada Health Act (1984), which lists conditions required for federal funding of public health care services.⁵⁰

List of Indicators

The Canadian Institute for Health Information (CIHI) maintains the Continuing Care Reporting System (CCRS) Quality Indicators, a set of 19 indicators for use in residential care that include three domains; function (n=8), safety (n=5) and quality of life (n=6). The indicators were implemented in 2012 and are based upon the Resident Assessment Instrument Minimum Data Set (RAI-MDS 2.0) that has been modified for Canadian use.^{30,51}

CCRS Quality Indicators: Residential Aged Care

Function

1. **Improved or remained independent in mid-loss Activity of daily living (ADLs) (transfer or locomotion):** Percentage of residents who improved or remained independent in mid-loss ADLs
2. **Improved or remained independent in early-loss ADLs:** Percentage of residents who improved or remained independent in early loss ADLs
3. **Worsened or remained dependent in mid-loss ADLs (transfer or locomotion):** Percentage of residents who worsened or remained completely dependent in transferring and locomotion (mid-loss ADLs)
4. **Worsened or remained dependent in early-loss ADLs:** Percentage of residents who worsened or remained completely dependent in early - loss ADLs
5. **Has an indwelling catheter:** Percentage of residents with an indwelling catheter
6. **Worsened bladder continence:** Percentage of residents whose bladder continence worsened
7. **Worsened cognitive ability:** Percentage of residents whose cognitive ability worsened (assessed by Cognitive Performance Scale)

8. **Improved cognitive ability:** Percentage of residents whose cognitive ability improved (assessed by Cognitive Performance Scale)

Safety

9. **Taken antipsychotics without a diagnosis of psychosis:** Percentage of residents on antipsychotics without a diagnosis of psychosis
10. **Fall in the past 30 days:** Percentage of residents with a fall in the past 30 days
11. **Has one or more infections:** Percentage of residents who have had one or more infections
12. **Worsened stage 2 to 4 pressure ulcer:** Percentage of residents whose stage 2 to 4 pressure ulcer worsened since the prior assessment
13. **Has a new stage 2 to 4 pressure ulcer:** Percentage of residents who have a new stage 2 to 4 pressure ulcer since the prior assessment

Quality of Life

14. **Worsened behavioural symptoms:** Percentage of residents whose behavioural symptoms have worsened since prior assessment
15. **Improved behavioural symptoms:** Percentage of residents whose behavioural symptoms have improved since prior assessment
16. **Worsened mood symptoms of depression:** Percentage of residents whose mood from symptoms of depression have worsened. The Depression Rating Scale is calculated using seven different indicators of depression, anxiety and sad mood that may have been present in the last 30 days
17. **Daily physical restraints:** Percentage of residents who were physically restrained daily over 7 days prior to assessment (restraints include trunk restraint, limb restraint, chair prevents rising)
18. **Has pain:** Percentage of residents with moderate pain at least daily or horrible / excruciating pain at any frequency
19. **Worsened pain:** Percentage of residents whose pain worsened since the prior assessment.

Home Care Reporting System (HCRS)

Canada also has a Home Care Reporting System (HCRS) that includes 16 clinical quality indicators for home care, using the RAI Home Care (RAI-HC) Assessment Systems, that are reported by the CIHI since 2006-07. These assessment systems are designed to be used for all individuals who receive publicly funded home care services in home and community-based settings.^{30,51} It includes people who receive short-term care related to a time-limited acute condition, in addition to those who require longer term support to enable them to remain in a community setting.⁵² There are five main client groups: acute (accounting for 23.9% of HCRS), end of life (4.3%), rehabilitation (9.5%), long term supportive care (22.0%) and long term maintenance care (36.7%). It is expected that individuals receiving long term supportive and maintenance care are assessed using the RAI-HC, however only 62% of long term home care recipients were reported to have been assessed in 2018-19.⁵²

Physical

1. Instrumental activity of daily living (IADL)

Improved ADLs: Percentage of clients with baseline impairment and a better score on the ADL long form.

Stratified by IADL capacity scale score

Decline in ADLs: Percentage of clients with a score of less than 18 on the baseline ADL long form who decline further.

Stratified by IADL summary scale

2. Activity of daily living (ADL)

Improved ADLs: Percentage of clients with baseline impairment and a better score on the ADL long form.

Stratified by IADL capacity scale score

Decline in ADLs: Percentage of clients with a score of less than 18 on the baseline ADL long form who decline further.

Stratified by IADL summary scale

3. Communication: Percentage of clients receiving publicly funded home care for at least 60 days (such as for chronic / complex illnesses) who had problems understanding, or being understood by, other people

4. **Bladder continence:** Percentage of clients receiving publicly funded home care for at least 60 days (such as for chronic / complex illnesses) who had difficulty controlling urination

Psychosocial

5. **Cognition:**
 - Improved cognition:** Percentage of clients who had cognitive impairment (assessed by Cognitive Performance Scale) that improved
 - Decline in cognition:** Percentage of clients whose cognitive impairment (assessed by Cognitive Performance Scale) declinedStratified by IADL performance score
6. **Caregiver distress:** Percentage of long stay home care clients whose primary informal caregiver experienced distress, anger or depression in relation to their caregiving role or were unable to continue in that role (stratified by cognitive performance scale score)
7. **Social isolation:** Clients who are distressed by a decline in social activities and are alone for long periods or all the time at follow-up (stratified by clinical risk)
8. **Reduced community activity:** Clients who go out less or not at all
9. **Mood decline:** Clients with more depressive symptoms on the Depression Rating Scale (stratified by ADL hierarchy scale)

Safety

10. **Falls:** Percentage of clients receiving publicly funded home care for at least 60 days (such as for chronic / complex illnesses) who fell (stratified by clinical risk)
11. **Hospitalisation (hospital, emergency department, emergent care):** Clients who have been hospitalised or visited the emergency department (stratified by IADL capacity scale score)
12. **Injuries and breaks:** Clients with new injuries - fractures, second- or third-degree burns or unexplained injuries (stratified by clinical risk)

Other Clinical Issues

13. **Pain-Inadequate medication:** Clients who have pain and are receiving inadequate pain control or no pain medication.

14. **Daily pain:** Individuals with at least daily episodes of severe pain at follow-up (stratified by clinical risk)
15. **Weight loss:** Clients with any unintended weight loss at follow-up
16. **No flu vaccination:** Clients who did not receive an influenza vaccination at either baseline or 6-month follow-up assessments (stratified by clinical risk).

All of Canada's quality indicators (CCRS and HCRS) are risk-adjusted at the individual covariate level and through direct standardisation (case-mix index).

Framework

In 1994, CIHI was established by the Canadian Government as an independent, not-for-profit organisation to provide essential information on Canada's health system and the health of Canadians. CIHI created the CCRS to capture demographic, clinical, functional and resource utilisation on individuals receiving long-term care. Participating organisations provide information on facility characteristics to support comparative reporting and benchmarking. The information is gathered electronically at the point of care and provides real-time decision support for front-line care planning and monitoring. CCRS provides participating organisations with electronic reports, which include profiles of their populations, services and outcomes, including quality indicators. These reports are used for planning, quality improvement and accountability. Some of the indicators are part of a formal system to measure accountability of care providers and government agencies at local and provincial levels that link performance standards and expectations to funding. Information is also made available publicly through CIHI's website.⁵⁰

Method of data collection

The CCRS is currently mandated in eight provinces and territories (British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Nova Scotia Newfoundland and Labrador and the Yukon) in Canada using the RAI-MDS version 2.0 national database managed by CIHI. As of 2018-19 six provinces and territories have committed to submitting RAI-HC data to Canada's HCRS.⁵² CCRS and HCRS data are collected and reported every 90 days. The CCRS quality indicators are comparable within and across jurisdictions because of standardised data and a robust risk-adjustment processes.

Employment of indicators

The CIHI public reporting website of all quality and safety indicators from long-term care homes submitting data was first introduced in 2015³⁰ and is mandated to deliver comparable and actionable information to result in improvement in health care and health system performance.⁵¹ Currently, under CIHI's publicly available interactive "Your Health System" online tool, nine of the nineteen long-term quality indicators are reported across Canada allowing for comparison between long-term care providers and transparency of quality of care. The nine indicators available at this level include falls in the past 30 days, worsened pressure ulcers, potentially inappropriate use of antipsychotics, physical restraint, improved physical function, worsened physical function, worsened depressive symptoms, experiencing pain and experienced worsening pain and are available by individual long-term care facility, city, health region province or territory level.⁵³ The results for all 19 long-term quality indicators are publicly available annually (for most recent year i.e. 2018-2019) in online reports providing aggregate level data at the national level and by province or territory.⁵⁴

For the home care quality and safety indicators, participating jurisdictions can access detailed results through CIHI's private reporting environment and are available quarterly. Province-level clinical and administrative home care data are publicly available online (www.cihi.ca) and published in annual reports available online, similar to the long-term quality of care indicators.⁵⁴

Broad country specific factors

The indicators in Canada are designed to be used at the organisation or system level to support quality initiatives, program evaluation, peer comparisons and benchmarking including setting targets for improvement. Results can be monitored over time and track progress toward quality objectives, supporting accountability and public reporting requirements.

In October 2019 the Integrated interRAI Reporting System was implemented across several jurisdictions in Canada, with the CCRS planned to be decommissioned within the next five years. This will provide simpler data entry at the point of care allowing faster reporting and output using RAI-MDS 2.0.⁵³

4.2 Denmark

Denmark is considered to have one of the most universal and comprehensive systems for care of older people in the world.⁵⁵ Long-term care in Denmark is organised and delivered by the 98 municipalities across five regions of Denmark and largely includes residence in institutional care or special housing with nurses providing care or home help. It is financed through general taxation and is generally free of charge to individuals, with approximately 84% of healthcare expenditure publicly financed and the remaining 16% financed primarily through co-payments.⁵⁵ The goals of Danish long-term care are to increase the quality of life of older people in need of care and increase their ability to remain independent.⁵⁶

The long-term care system in Denmark consists of five core elements:

1. Preventative measures
2. Rehabilitation
3. Home help
4. Homes for the elderly
5. Other measures including personal assistance and food services.

List of Indicators

A total of 23 indicators of relevance to older people in long-term care are examined by the Ministry of Social Affairs Danish Government and the Local Government Denmark, with Statistics Denmark⁵⁷ responsible for the composition and publication of the statistics. The indicators were developed in cooperation with Local Government Denmark and the Ministry of Social Affairs. The indicators consist of frequency and length of referral and provided home care, home nursing, rehabilitation, preventative home visits, nursing homes, qualitative indicators, clinical pathways and readmissions and ratio of direct contact.

1. **Quality of help:** Satisfaction with practical help / personal help in own home / nursing home
2. **Stability of help:** Satisfaction with the stability of help
3. **Number of different helpers:** Satisfaction with the number of helpers
4. **Knowledge of free choice:** Share of elderly people knowledgeable about their right to choose between public and private suppliers of home help

5. **Knowledge of flexible home help:** Share of elderly knowledgeable about their right to choose between personal and practical help
6. **Average number of hospital bed days (> 67 years):** The number of bed days per exit according to diagnosis
7. **Average number of hospital re-admissions:** The number of hospital admissions taking place within 30 days of the last
8. **Number of referred and delivered home help to citizens covered by free choice (own home):** Number of hours of, respectively, personal and practical help
9. **Number of referred hours of home help to citizens in nursing homes:** Number of hours of, respectively, personal and practical help
10. **Number of recipients of practical help / personal care covered by free choice (own home):** Number of recipients of, respectively, personal and practical help
11. **Number of places in, respectively, nursing homes and care homes**
12. **Number of elderly people in receipt of training and rehabilitation:** Rehabilitation relating to alleviation of reduced physical functionality not treated as part of hospitalisation
13. **Number of preventative home visits:** Number of visits and number of citizens receiving a visit
14. **Share of home help recipients, and share of first time referred, who use a private provider**
15. **Number of home help recipients who change provider**
16. **Number of elderly people who use free accommodation offer to nursing home / care home and elderly housing:** Number of elderly people who have been on a waiting list for a specific accommodation, and the number of elderly people not making use of the right to choose accommodation
17. **User time percent:** No specification of how to calculate this means it has not been published since 2010
18. **Number of home help visits held as scheduled:** No distinction between personal and practical help
19. **Average waiting time to access care accommodation and nursing home:** Time from elderly people being granted the right to accommodation until an offer is made

The four indicators that are not listed here relate to expenditure on services (expenditure on home help; expenditure on nursing home / care accommodation; expenditure on support aids; and expenditure on training and rehabilitation) and are not published by Statistics Denmark.⁵⁷

In addition, every second year the Ministry of Social Affairs is responsible for a national qualitative survey to examine quality of the services provided and include five indicators that relate to user satisfaction. This survey is a representative sample of home care recipients aged 67 years and older.

Framework

The healthcare system in Denmark operates across three political and administrative levels: the country, the regions and the municipalities.⁵⁵ The Ministry of Health is responsible for establishing the overall framework for the provision of health and elderly care. This includes legislation on the organisation and provision of health and elderly care services, individuals' rights, healthcare professionals, hospitals and pharmacies, medicinal products, vaccinations, maternity care and child healthcare. The legislation covers the tasks of the regions, municipalities and other authorities within the area of health. The five regions are primarily responsible for the hospitals, primary care and for psychiatric care. The 98 municipalities are responsible for primary healthcare services in addition to elderly care.⁵⁵

Over the past two decades, Denmark has shifted towards a governance model that is based on quality of care and quality management rather than cost control alone. In 2016, the Danish Healthcare Quality Programme was introduced. It was a new national healthcare quality programme launched by the government together with the regions and the municipalities. The programme establishes a framework for continuously improving the quality of care in the healthcare system, with high quality defined by results considered of value to the individuals.^{55,58} It advocates for the use of individual-centred outcome measures that are utilised alongside quality improvement measures using real-time data and outputs.⁵⁵

Method of data collection

Most of the indicators are based on either annual municipal or other administrative data or from registries or from a bi-annual survey of older people that is conducted by either telephone interviews or personal interviews. There is minimal burden in terms of data collection for the indicators. Data from the municipalities' care systems is directly provided to Statistics Denmark, administrative data relating to clinical pathways and readmissions is also already collected by Statens Seruminstitut (from the Danish Ministry of Health), as is data from the Ministry of Social Affairs regarding quality of services.⁵⁷ Statistics Denmark receives the data either monthly or yearly, generally electronically, and municipalities are required to confirm their data before it is used.⁵⁹ It is mandatory in Denmark to participate in quality initiatives and to use data for quality management, quality improvement, transparency and accountability.⁵⁸

Employment of indicators

Quality of care data are fully transparent in Denmark and available at the national, regional and municipal level from Statistics Denmark online.⁴⁵ All indicators are reported annually and are generally comparable between municipalities and over time. It enables individuals, healthcare providers, planners and politicians to access all information and the results are used for identification of areas for improvement, benchmarking and monitoring of development over time.⁵⁸

In addition, in Denmark there is an e-health portal (sundhed.dk) that is a public internet-based system that collects and distributes healthcare data and quality of care data for Danish residents and healthcare professionals. It includes waiting times and ratings of healthcare providers, including hospitals. There is a secure part where individuals have access to their own data on treatment and care.

Broad country specific factors

Denmark has over the past two decades developed unique opportunities for quality measurement and benchmarking due to the well-developed health and social registries that are linked to a unique individual's identifier. This allows registries and administrative and medical registers to include individuals-level data.

4.3 Finland

In Finland, long-term care is provided by a publicly funded universal system that is open to all residents.⁴³ The Finnish Government Ministry of Social Affairs and Health is responsible for policy directives and supervision of long-term care for older people in the country and under Finnish law, the 342 municipalities are responsible for the funding and provision of long-term care including both health care and social services.^{43,44} Long-term care for older people in Finland is delivered either at home or in sheltered housings, residential homes (nursing homes), or health centre inpatient wards (chronic care hospitals). Over the last decade there has been an increase in provision of home care services in Finland.⁶⁰

List of Indicators

A total of 26 indicators are assessed in Finland based on the minimum data set (MDS) 2.0 resident assessment instrument (RAI) from the 1999 / 2000 Center for Health Systems Research and Analytics, University of Wisconsin.⁶¹ As of 2015, 54% of all long-term institutional care and 30% of home care services assess quality of care in Finland using the RAI.⁴⁴ Participation is voluntary.⁴³ Four of the indicators are risk adjusted.⁶⁰

1. Prevalence of occasional or frequent bowel / bladder incontinence without toileting plan
2. Prevalence of hypnotic use 3+ times / week
3. Prevalence of antianxiety / hypnotic use
4. Prevalence of little or no activity
5. Prevalence of antipsychotic use in absence of indication*
6. Lack of nursing rehabilitation in late-loss ADLs
7. Prevalence of bedfast residents
8. Prevalence of urinary tract infections
9. Prevalence of faecal impaction
10. Incidence of decline in range of motion
11. Prevalence of behavioural symptoms affecting others*
12. Prevalence of grade 1–4 pressure ulcers*
13. Prevalence of daily physical restraints
14. Incidence of decline in late loss ADLs

15. Prevalence of falls within 30 days prior to the assessment
16. Prevalence of in-dwelling catheters
17. Prevalence of tube feeding
18. Prevalence of symptoms of depression w/o antidepressant
19. Prevalence of symptoms of depression
20. Prevalence of dehydration
21. Incidence of new fractures
22. Incidence of cognitive impairment
23. Any injury
24. Prevalence of bowel / bladder incontinence*
25. Use of 9 or more different medications
26. Prevalence of weight loss 5% or more in the last 30 days or 10% or more in the last 6 months

*Risk-adjusted.

Framework

In Finland's Constitution (sections 6, 19 and 25) it is considered the obligation of the public sector to provide appropriate level of long-term care services for older people. There are two main laws that govern care services provision in Finland: i) the Primary Health Care Act, and ii) the Social Welfare Act. Under these laws the municipalities are responsible for public sector production of health care and social services for long-term care.^{43,44}

In the most recent update of the National Framework for High-Quality Services for Older People the Ministry of Social Affairs and Health (2008) outlined key principles for provision of long-term care in Finland which include:

- The right to self-determination. Older people must be allowed to make informed choices and obtain the information and help needed to make informed choices about long-term care
- Equality. Consistent principles in granting long-term care services should be followed together with prevention of discrimination, and that differences between people should be accepted

- Participation. Older people may influence the development of the society and environment in which they live.
- Individuality. People should be seen as unique individuals.
- Security. The safety of home and care environment against fire and other hazards should be ensured.

This framework defines the values and ethical principles guiding the provision of services for older people, and outlines strategies for boosting quality and effectiveness. It also sets national quantitative targets for LTC that municipalities can use as a basis for fixing their own targets.^{43,44} Legislation mandates that each resident is assessed for quality of care but it does not specify the use of RAI, although this is the most commonly used instrument.⁴⁴

Method of data collection

To facilitate consistent data collection using the RAI system, a commercial software program was developed by the National Research and Development Centre for Welfare and Health (STAKES), an institute also responsible for national health and welfare registers and functioning directly under the Ministry of Social Welfare and Health. A named quality manager coordinates the whole RAI-system in each organisation. Finnish official service provision statistics are based on mandatory notifications on residential care and an annual cross-sectional data collection of regular home care clients. These data are generally collected and reported nationwide at 6 monthly intervals and assessed for the most recent 90 day period.⁶⁰ Each resident is assessed, at least twice yearly or when there is significant change in their status. The resident and his / her family member are involved in the assessment.

Employment of indicators

Electronic copies are sent to the National Institute of Health and Welfare who administer the RAI database and produce feedback reports and the benchmarking databases. Unit level feedback reports are provided with benchmarking to comparable units and the national average. The benchmarking database are only available publicly for RAI-benchmarking participants. Twice a year, the feedback of RAI data are discussed at management / organisational level. The RAI contact person at the organisational level cooperates with head nurses on the ward and supports management and leadership. Head nurses support, with the RAI contact person at the organisational level, the staff to make RAI assessments,

discuss feedback with the staff monthly and develop the work on the ward based on feedback.

Broad country specific factors

The use of the RAI in Finland began in 2000, when the towns of Helsinki, Kokkola and Porvoo adopted the RAI MDS 2.0 to improve quality of care in long-term care institutions for the project 'Benchmarking and the Implementation of the RAI system in Older People's Care'. Since 2000 the number of residents assessed biannually has increased 4-fold with approximately 10,000 in 2009. The number of benchmarking facilities between 2000 and 2009 increased from 29 (16 residential homes, 13 health centres) to 95 (62 residential homes and 35 health centres). In 2010, the RAI benchmarking project covered most of the major cities in Finland, including public and private sector organisations.⁶⁰

4.4 Germany

In 1995, mandatory long-term care insurance of all statutory and private health insurance schemes was introduced in Germany, ensuring the entire population is covered for long-term care costs including nursing homes.^{62,63} Nursing homes in Germany are mostly run by non-profit (55%) or private (40%) institutions, and the remaining are public (5%).⁶⁴ Serving as an independent control body, the Medical Review Board (MRB) of the German Statutory Health Insurance is responsible for monitoring the quality of care provided in nursing homes.^{64,65} The MRBs are organised at the federal state level apart from three regions.

List of Indicators

A total of 64 quality-related criteria are used to examine the quality of care. They are divided into four domains: i) quality of nursing and medical care (n=35), ii) care of residents with dementia (n=10), iii) social care and arrangement of the daily routine (n=10), and iv) board lodging and hygiene (n=9).^{63,64}

Quality of nursing and medical care

1. Is an active communication with a physician comprehensible if required?
2. Does the application of the nursing treatments correspond to the physician's orders?
3. Does the supply of medicines correspond to the physician's orders?
4. Is the use of medicines appropriate?
5. Are compression stockings put on properly?
6. Is the individual pressure sore risk being assessed?
7. Are pressure ulcer prevention measures being applied?
8. Are place and time at which the chronic wound / pressure ulcer occurred verifiable?
9. Is a differentiated documentation in case of chronic wounds or pressure ulcer being carried out (in terms of actuality, verifiability of development, size, position, depth)?
10. Are the applied measures to treat chronic wounds or pressure ulcer based on state-of-the-art knowledge?

11. Are documents regarding the treatment of chronic wounds or bedsores analysed and, if necessary, the measures adjusted?
12. Do residents with chronic pain receive the prescribed medication?
13. Are individual nutritional resources and risks documented?
14. Are necessary measures taken in case of restrictions regarding independent supply of food?
15. Is the nutritional status appropriate given the conditions set by the institution?
16. Are individual resources and risks regarding the supply of fluids documented?
17. Are necessary measures taken in case of restrictions regarding independent supply of fluids?
18. Is the supply of fluids appropriate given the conditions set by the institution?
19. Is the sense of taste of residents with feeding tubes being stimulated?
20. Are systematic pain assessments conducted?
21. Does the nursing home cooperate closely with the treating physician?
22. Are individual risks and resources of residents with incontinence or a bladder catheter assessed?
23. Are necessary measures for residents with incontinence or a bladder catheter taken?
24. Is the individual risk of falling assessed?
25. Are fall incidents being documented?
26. Are necessary prophylaxes against fall incidents taken?
27. Is the individual risk of contracture collected?
28. Are necessary contracture prophylaxes taken?
29. Do measures restricting the individual freedom require consent?
30. Is the necessity of freedom restricting measures checked regularly?
31. Are individual needs and habits of the residents regarding personal hygiene taken into account and being carried out accordingly?
32. Are individual needs and habits of the residents regarding oral and dental hygiene taken into account and being carried out accordingly?
33. Is nursing care usually being carried out by the same nurse?
34. Are workers regularly trained regarding First Aid and emergency measures?

35. Do written procedural instructions regarding First Aid and emergency measures exist?

Care of residents with dementia

36. Is the biography of residents suffering dementia taken into account and being considered when planning daily activities?
37. Are accompanying and caring persons of residents suffering dementia incorporated into the nursing and caring process?
38. Is self-determination of residents suffering dementia taken into account in the nursing and caring process?
39. Is well-being of residents suffering dementia determined and documented, and appropriate measures for improvement deducted from that information?
40. Do suitable exercise and recreational areas for particular target groups exist (at night time also)?
41. Do secured recreational areas outside exist?
42. Do identification facilitating arrangements regarding design of surroundings exist in rooms and recreation rooms?
43. Are individual guidance measures, e.g. photographs, used?
44. Are residents suffering dementia offered adequate activities, e.g. regarding exercise, communication, or perception?
45. Are residents suffering dementia offered suitable food?

Social care and the arrangement of the daily routine

46. As part of social care, is group counselling available?
47. As part of social care, is individual counselling available?
48. Does the nursing home have annual celebrations?
49. Are there activities together with the local community?
50. Are there measures to promote contact with relatives?
51. Are the social care measures justified by the residents' composition and needs?
52. Is assistance or information provided to familiarise new residents with the nursing facility (e.g., contact person, support during the orientation, assessment interviews after six weeks)?
53. Is the orientation phase systematically evaluated?

54. Are there guidelines with respect to the provision of terminal care?
55. Does the nursing facility have a system for managing complaints?

Accommodation, provision, household management, and hygiene

56. Are residents allowed to decorate and design their rooms with their own furniture, personal effects, and memorabilia?
57. Do residents have a say in the design and decoration of the communal areas?
58. Does the facility give a good overall impression in terms of cleanliness and hygiene? For example, does it appear clean? Is it in order? Are there unpleasant odours?
59. Within a specified timeslot, are residents free to choose when to eat?
60. Is appropriate food provided for people with special dietary requirements (e.g., residents with diabetes)?
61. Is the food plan made available to the residents in a legible format?
62. Is the presentation of food and drinks tailored to the needs of each individual resident? For example, to facilitate eating and digestion, some residents require food to be pre-cut into smaller pieces or pureed.
63. Are the portions tailored to the preferences of the residents?
64. Are the food and drinks for the residents provided in a pleasant environment and relaxing atmosphere?

Framework

In 2008, the Care Transparency Agreement was introduced to increase transparency regarding services offered and quality of nursing homes in Germany to help individuals in need of nursing home care make more informed choice.⁶⁵ Mandatory evaluation of all nursing homes was introduced in 2009 and is carried out by trained representatives of the regional MRBs, at least once per year on site unannounced.^{65,66} The same 64 criteria are tested for all nursing homes guaranteeing standardisation of the results and comparability between nursing homes across Germany.

Method of data collection

Trained inspectors of the respective regional MRBs collect the data for the report cards and all nursing homes are surveyed at least once per year. The team usually comprises of a

qualified community worker, registered nurse and an administration employee, with physicians also sometimes attending.⁶³ Eighteen of the criteria that relate to satisfaction are collected via surveys that are completed by the residents, 38 criteria are determined from a sample of 5-15 residents (depending on facility size) and the remaining criteria are assessed per facility. Resident-related criteria are summed from the individual residents to form a final value per indicator on a scale from 1 (excellent) to 5 (inadequate or failed). Facility-related criteria are dichotomous, either existent or non-existent.⁶⁷

Employment of indicators

From the criteria a report card is generated for each nursing home that provides an overall score between 1.0 (excellent) and 5.0 (inadequate or failed) and a score for each of the four domains.⁶⁴ The results of the quality reports are published publicly online (where only the most recent report is available) and nursing homes are also required by law to display the results on the premises.^{64,67}

The indicator system in Germany together with the generation of publicly available report cards was developed to increase transparency of the quality of care provided in nursing homes. This enables comparability between nursing homes, facilitating consumers to make informed choices, in addition to serving as an incentive for quality improvement of nursing home providers.⁶⁴

Since implementation of mandatory evaluation of the quality indicators and the public reporting system, quality of care in German nursing homes has been reported to have improved.⁶⁶ A study of more than 3,000 German nursing homes using data from the report cards between 2009 and 2012 examined seven of the 64 indicators on the premise that these are care-sensitive.^{64,66} The assessment derived a quality score related to nutritional status and supply of fluids (quality criteria #15 and #18) and a general measure of quality of care which included the quality criteria #15 and #18, together with documentation of treatment of chronic wounds or bedsores (#11), systemic pain assessment (#20), assessment of incontinence (#22), risk of contracture (#27) and consent of restriction of individual freedoms (#29). From this analysis the authors concluded that the introduction in 2009 of increased transparency of quality indicator reporting using the nursing home report card, resulted in a positive impact on the quality of care. The benchmark criteria for these

seven quality indicators increased from 80% of examined nursing homes in 2009 to 91% in 2012 and the overall measure of care quality increased from 58% to 74% of nursing homes.^{64,66}

Broad country specific factors

The ability of the current indicator set to reliably measure quality of care in German nursing homes has been questioned. It is argued that these criteria are too focused on process and structural quality rather than quality outcomes and has been proposed that the German report card system be revised to include more care-sensitive outcome quality indicators and indicators that assess resident's quality of life.⁶⁴⁻⁶⁶ Further, a recent quality report conducted by Germany's MRB in 2016 concluded that while many nursing homes in Germany met the requirements for good care, recording of pain management and wound care was inadequate.⁶⁵

In response, a pilot study evaluating 15 care-sensitive outcome quality indicators and indicators of quality of life in two German federal states is being conducted in 40-50 nursing homes.⁶⁶ These indicators include mobility, ability to conduct activities of daily living, pressure ulcer, falls, weight loss, pain management and behavioural problems with many of the indicators stratified by residents with cognitive decline.⁶⁸ Results from this study have yet to be published or included within Germany's nursing home quality assessments.

4.5 Iceland

The Icelandic health care system is nationalised and universal for all Iceland residents and long-term care for the older population is shared between the government, local authorities and voluntary organisations (generally not-for-profit).^{23,69} It is funded by the government for services both at the central and local level, with the majority of nursing homes and formal service institutes being publicly operated.^{23,69} In Iceland a nursing home is an institution that provides nursing care to residents 24 hours a day. Home care is increasingly being utilised in Iceland, and an accompanying overall trend in decreased institutional and hospital-based care has been reported.⁶⁹

List of Indicators

A total of 20 quality indicators covering 9 domains (behavioural and emotional patterns, clinical management, elimination and continence, infection control, nutrition and eating, physical functioning, skin care, quality of life and accidents) are compiled using the Minimum Data Set (MDS) assessment as part of the Resident Assessment Instrument (RAI),⁷⁰ four of which are risk-adjusted. Modified Delphi methods (expert opinion obtained from structured and systematic questionnaires, interspersed with information and opinion feedback to establish a convergence of opinion) were used to determine thresholds for the 20 indicators. The range of the lower and upper thresholds are presented.⁷¹

Behavioural and Emotional Patterns

1. Prevalence of residents with behavioural symptoms affecting others (inappropriate behaviour)* (Range 12.5-41.7%)
2. Prevalence of symptoms of depression (Range 13.6-47.5%)
3. Prevalence of symptoms of depression without antidepressant therapy (Range 3.9-11.8%)

Clinical management

4. Prevalence of nine or more different medicines (Range 29.6-62.9%)
5. Prevalence of antipsychotic drug use in the absence of psychotic and related conditions*(Range 13.5-31.1%)
6. Prevalence of anti-anxiety or hypnotic drug use (Range 35.8-62.0%)
7. Prevalence of hypnotic drug use in > 2 days in past week (Range 25.7-53.1%)

Elimination and Continence

8. Prevalence of bladder or bowel incontinence* (Range 35.4-64.3%)
9. Prevalence of frequent bladder or bowel incontinence without a toileting plan (Range 3.7-17.3%)
10. Prevalence of indwelling catheters (Range 2.9-10.5%)
11. Prevalence of faecal impaction (Range 2.3-12.3%)

Infection Control

12. Prevalence of urinary tract infections (Range 4.8-16.3%)

Nutrition and Eating

13. Prevalence of weight loss (Range 4.3-15.1%)
14. Prevalence of tube feeding (Range 0.6-4.3%)
15. Prevalence of dehydration (Range 2.0-7.3%)

Physical Functioning

16. Prevalence of bedfast residents (Range 4.8-17.3%)

Skin Care

17. Prevalence of stages 1-4 pressure ulcers* (Range 2.7-11.0%)

Quality of Life

18. Prevalence of daily physical restraints (Range 3.1-12.1%)
19. Prevalence of little or no activity (Range 35.4-64.3%)

Accidents

20. Prevalence of falls (Range 6.1-17.3%)

*These indicators are risk-adjusted.

Framework

Long-term care for older people was originally overseen by the Ministry of Welfare, which in 2019 was split up into two separate ministries, the Ministry of Health and the Ministry of Social Affairs.⁷² The Directorate of Health is responsible for regulating long-term care quality and monitoring compliance and controls, under the framework of the National Health Plan.

A major policy of aged care in Iceland is the support of older people to remain in their own homes for as long as possible via access to home support and care services.^{69,72}

It has been mandatory to perform the RAI-MDS assessment in all nursing homes in Iceland since 1996.⁷³ From 2003 reimbursement for nursing home residents was based on data from the MDS assessment and Resource Utilization Groups III calculations on the costs of resident care (i.e. linking payments to nursing homes to the care needs of the residents).²³

In September 2016, the Ministry of Welfare published a report on policy aims to improve services and access for the older population that was based on a report from the health care sector that included wide consultation in the eldercare sector in Iceland.⁶⁹ A key focus for the policy was on supporting quality and coordination of long-term care services. The main goals included:

- better health care and social participation of older people
- stronger rights to independent accommodation and an independent existence
- the importance of utilising the most recent technology to improve services in the field
- the development of quality standards and surveillance of outcomes in the various fields of service to the older person
- increased stability of carers' tenure in service institutions and better possibilities for increasing skill levels
- improved services specifically for individuals with dementia
- the development of better information about ageing and the older person and their rights to services
- doing more to secure the rights of older people, for example by appointing an ombudsman for older people as a whole
- better coordination of services from different providers (clarifying 'grey areas') and increased consultation with service users.⁶⁹

In accord with the fourth goal of the policy, MDS home care quality indicators are currently being implemented in Iceland.²³

Method of data collection

The data are collected using RAI-MDS at a minimum of three times per year and stored on a central MDS database where all Icelandic nursing homes upload their data, which is managed by the Icelandic Ministry of Health.

Employment of indicators

While the monitoring of quality of care in aged care using the RAI-MDS indicators in Iceland has been mandated since 1996, little is available to describe how these indicators are used in terms of public reporting and availability or feedback of the data to care providers themselves, government agencies or monitoring quality of care.

Broad country specific factors

A 2012 study examined the change in prevalence of the RAI-MDS quality of care indicators in Icelandic nursing homes between 2003 and 2007 that included 11034 resident assessments for 3694 residents.⁷⁰ Declines in quality of care were observed for 16 of the 20 indicators during the study period. Key areas of quality improvement were identified, including treatment of depression, number of medications, resident activity levels and behavioural problems. The study highlighted the need for ongoing development of appropriate monitoring of quality of care for nursing home residents together with strategies to improve care by officials and policy makers.⁷⁰

4.6 Netherlands

Netherlands has comprehensive largely government funded coverage for long-term care, through a mandatory long-term care social insurance scheme, that is overseen and funded at the national level. The municipalities are responsible for the delivery of care and services, that includes nursing and residential care, as well as home care services.^{74,75}

List of Indicators

A total of 32 indicators are monitored (14 professional and 18 client-related).¹⁷ The 14 professional care indicators include:

1. **Pressure ulcer:** Proportion of clients with a pressure ulcer*
2. **Malnutrition:** Proportion of unintentional weight loss scored by a nurse
3. **Malnutrition according to client:** Proportion of unintentional weight loss (i.e. malnutrition) reported by the client*
4. **Falls:** Proportion of clients with an incident of falling*
5. **Medicine Incidents:** Proportion of clients who had an incident with medicines
6. **Psycho-pharmacy:** Proportion of clients who use psycho-pharmacy
7. **Use of antidepressants:** Proportion of clients who use antidepressants
8. **Level of vaccination:** Proportion of clients who have been vaccinated
9. **Incontinent:** Proportion of clients who are incontinent*
10. **Incontinence diagnosed by health professional:** Proportion of clients whereby a doctor or specialised nurse was involved diagnosing incontinence*
11. **Catheter:** Proportion of clients who have a catheter*
12. **Problem behaviour:** Proportion of clients with problem behaviour
13. **Physical restraint:** Proportion of clients with physical restraints
14. **Depression:** Proportion of clients suffering from depression*

*Included as an indicator of home care quality also

The 18 client-related indicators are used to measure care quality from the perspective of older people receiving long-term care. This enables a nation-wide comparison of the quality of long-term care for the purpose of transparency and quality assurance.⁷⁶

1. **Care plan and evaluation:** The presence of a care plan and the evaluation with the client of this plan*
2. **Shared decision-making:** Make decisions in consultation with the clients / representatives*
3. **Attitude:** The attitude of the care givers *
4. **Information:** The information given by the organisation *
5. **Telephone access:** The accessibility by telephone of the organisation or care givers*
6. **Body care:** The care for the body of the client given by care givers *
7. **Meals:** The taste of meals the organisation prepares and serves
8. **Competency and safety:** The competence of care givers and the safety of the care *
9. **Physical restraints:** The respect concerning the rights of restraining
10. **Comfort:** The cleaning of the home of the client
11. **Atmosphere:** The atmosphere in the organisation
12. **Housing and privacy:** Enough living space and respect for privacy
13. **Activities:** The possibilities for daytime activities *
14. **Mental well-being:** The experience of mental support *
15. **Safety living environment:** The safety of the environment of the client *
16. **Reliability of providers:** Reliability of care givers and workers of the organisation *
17. **Availability of personnel:** Presence and availability of workers in the organisation *
18. **Integrated care:** The level of consistency of care*

*Included as an indicator of home care quality also (in addition to Autonomy: determine daily schedule by client)

Framework

In 2006 the Dutch Government introduced the Health Insurance Act, reforming the traditional division between the mandatory social health insurance and private insurance into a single private health insurance that covers the entire population. Further, in 2006, the Dutch Ministry of Health, Welfare and Sport mandated the development of a national standard for the measurement and comparison of consumer experiences in healthcare, called the Consumer Quality Index (CQ-Index). The CQ-Index was largely based on the US Consumer Assessment of Healthcare Providers and Systems (CAHPS) questionnaires⁷⁷ and the Dutch 'Quality of care through the patient eyes' instruments (QUOTE).⁷⁸ The CQ-Index

includes multiple instruments, including the 'CQ-Index Long-term Care' for older people receiving nursing, residential or home care.⁷⁹ It was part of a national strategy 'Quality Framework Responsible Care for the sector Nursing, Care and Homecare,' which provided a nation-wide consensus of all parties and key stakeholders involved in the sector, such as consumer organisations, professionals and care providers, healthcare professionals, healthcare inspectorates, care insurers and The Ministry of Health. The CQ-Index was implemented nationally as part of the Dutch Health Care Transparency Program. The CQ-Index Long-term Care is a registered trademark owned by the Dutch Centre for Consumer Experience in Health Care, which coordinates the conduct of client surveys by certified organisations according to specific guidelines.

Current legislation requires all health care providers to report information about the quality of their services. The Dutch Ministry of Health, Welfare and Sport, the Inspectorate of Health Care and the Dutch organisation for care entrepreneurs (ActiZ) mandate the CQ-Index Long-term Care as the standard instrument for measuring quality from the clients' perspective.

Method of data collection

Data for the professional indicators is mandated to be collected by self-recording by the care providers every year for each client.

All long-term care facilities in Netherlands are mandated to conduct client surveys with the CQ-Index every two years. Certified research organisations are contracted to collect the data to be submitted to a central database for nationwide comparisons, benchmarking and public reporting on the internet (<http://www.kiesbeter.nl>). The surveys are conducted on a sample of clients that are representative of age and gender profiles in the older population. The CQ-Index is scored on a scale of 1 to 4 with a higher score reflective of a better result.

Employment of indicators

The Register of Care Institute contains all approved quality standards and measuring instruments and provides information about quality of care in the Netherlands.⁸⁰ All data are made publicly available. Care providers can use this information for quality improvement and for external accountability and public reporting. Results can also be used

by: a) consumers to select a health insurer or a care provider; b) client organisations for advocacy services; c) insurers to purchase good care; d) the Health Care Inspectorate and the Dutch Care Authority to supervise and regulate care; e) the Ministry of Health, Welfare and Sport to monitor healthcare.

Broad country specific factors

Care for older people in the Netherlands is divided into physical disabilities (somatic care) and mental disabilities (psychogeriatric care) and home care. The care can be delivered in nursing homes where intensive care is provided, residential care homes or home care.¹⁷

A 2013 Dutch study reported the implementation of quality indicators for long-term care between 2007 and 2009 may lead to improved somatic and home care but made little difference on psychogeriatric care as assessed by the CQ-Index. For the professional indicators, statistically significant improvements were observed for four out of the 14.¹⁷

4.7 New Zealand

Residents of New Zealand (NZ) are eligible for government financial assistance for the costs of residential aged care if they meet certain conditions involving both a needs assessment and a financial means assessment. NZ is the first country worldwide to use the interRAI tools nationwide for home care and residential aged care.⁸¹ According to the NZ Ministry of Health, the use of quality and safety indicators provides a comprehensive assessment for evaluating the needs, strengths and preferences of older people in residential aged care. The assessment enables a health care provider to assess key issues that will help with individualised care planning.

List of Indicators

Thirty-one quality and safety indicators covering nine domains including: safety, medication, cognitive functioning, weight, pain, incontinence, nutrition, ulcers and physical function are routinely assessed in residential aged care in NZ, using the interRAI long-term care facility (LTCF) Assessment System. Currently they are not risk adjusted but this is planned for 2019 / 2020.⁸¹

These indicators exclude first assessment and requires one assessment per resident within a 90 day period.

1. **Indwelling catheters:** Percent of residents with indwelling catheters
2. **Urinary tract infection:** Percent of residents with a urinary tract infection
3. **Fallen in the last 30 days:** Percent of residents who have fallen in the last 30 days
4. **Feeding tube:** Percent of residents with a feeding tube
5. **Pain:** Percent of residents with pain
6. **Pressure ulcer stage 2 to 4:** Percent of residents who have a Pressure Ulcer Stage 2 to 4
7. **Physical restraints:** Percent of residents in physical restraints
8. **Unexplained weight loss:** Percent of residents who have unexplained weight loss

The following indicators require a minimum of two assessments more than 90 days and less than 300 days apart, with latest assessment occurring in the reporting quarter.

9. **Unexpected loss of function:** Percent of residents who had an unexpected loss of function in some basic daily activities
10. **Declined status on mid-loss activities of daily living (ADL) functioning:** Percent of residents who declined status on mid-loss ADL functioning transfer, locomotion or remain completely dependent in mid-loss ADLs
11. **Declined status on early-loss ADL functioning:** Percent of residents who declined status on early-loss ADL functioning (dressing and personal hygiene) or remain completely dependent in early-loss ADLs
12. **Declined in ADLs:** Percent of residents who have declined in ADLs
13. **Declining behavioural symptoms:** Percent of residents who have declining behavioural symptoms
14. **Worsening bowel continence:** Percent of residents with worsening bowel continence
15. **Worsening bladder continence:** Percent of residents with worsening bladder continence
16. **Cognitive ability has worsened:** Percent of residents whose cognitive ability has worsened
17. **Ability to communicate has worsened:** Percent of residents whose ability to communicate has worsened
18. **Declined in their ability to locomote:** Percent of residents who have declined in their ability to locomote
19. **Decline in mood from symptoms of depression:** Percent of residents who have declined in their mood from symptoms of depression
20. **Worsening pain:** Percent of residents with worsening pain
21. **Worsening stage 2 to 4 pressure sores:** Percent of residents with worsening stage 2-4 pressure sores
22. **Newly recurring pressure ulcer stage 2 to 4:** Percent of residents who have a newly occurring pressure ulcer stage 2 to 4
23. **Improve status on mid-loss ADL functioning:** Percent of residents who improve status on mid-loss functioning transfer, or remain completely independent in mid-loss ADLs

24. **Improve status on early-loss ADL functioning:** Percent of residents who improve status on early-loss ADL functioning (dressing and personal hygiene) or remain completely independent in early-loss ADLs
25. **Improvement of function:** Percent of residents who had an improvement of function in some basic daily activities
26. **Improving bowel continence:** Percent of residents with improving bowel continence
27. **Improving bladder continence:** Percent of residents with improving bladder continence
28. **Cognitive ability has improved:** Percent of residents whose cognitive ability has improved
29. **Ability to communicate has improved:** Percent of residents whose ability to communicate has improved
30. **Improved in their ability to locomote:** Percent of residents who have improved in their ability to locomote
31. **Improving behavioural symptoms:** Percent of residents who have improved behavioural symptoms

Framework

The Ministry of Health's NZ Best Practice Guidelines (2003) identified interRAI as the tool best suited to improving the assessment and care of older people in their country. The NZ Government stated that the comprehensive clinical assessment will provide opportunities to support continuous quality improvement in aged care, which was emphasized as an important area in the 2012 Auditor General's report "Effectiveness of Arrangements to Check the Standard of Services Provided by Rest Homes". In June 2014 all aged residential facilities in NZ participated in the roll-out of the assessment tool (n=663 facilities). Following the successful implementation projects, interRAI Services was established as a business unit and the national service provider for interRAI in NZ at The Central Region's Technical Advisory Service in 2015. The NZ government then announced that use of the interRAI LTCF Assessment System would become mandatory in aged residential care in July 2015. InterRAI assessments are available for all age groups and apply to different situations. The use of interRAI assessments in NZ help support older people to stay at home or to plan their care if they are in a residential facility.⁸¹

Method of data collection

Aggregated data from all interRAI assessments in a facility, District Health Board (DHB) or region are collected every 90 days. The output for the quality indicators is created by The Central Region's Technical Advisory Service from standardised data entered on the national software platform from assessments of residents in each facility.

Employment of indicators

Each 90 day period, a national report for the interRAI NZ Governance Board is produced in addition to a regional report for each District Health Board (DHB) region, a report for each individual DHB, a report for each large provider and a report for each facility. The reports show patterns in service delivery over time. Providers may use the information in the reports to reflect on their practice, make changes and measure progress. This information also allows provider and DHBs to benchmark themselves against a national average. Further each quality indicator is presented by:

1. All care levels combined
2. Rest-home level of care
3. Dementia level of care
4. Hospital level of care

The reports at a national level by the five levels of stratification are available on a public website for the most current reporting period and previous reporting quarters. Bar graphs are presented for each of the indicators showing the current reporting period, the previous reporting period and the minimum and maximum range of scores for each quality indicator. In addition, interRAI Data Visualisation is available as an online publicly available website that allows people to look at interRAI data in a variety of ways. The interactive nature of the tool means that the level and details of the information can be selected. It allows people to access the interRAI data at a national, regional, DHB and population subgroup level.⁸²

Broad country specific factors

The assessment will assist nurses in aged care facilities in providing quality care for residents by supplying a comprehensive clinical assessment of needs that supports the development of tailor-made care plans.

4.8 Sweden

Sweden has a universal and comprehensive public long-term care system for older people. It is decentralised, with the 290 individual municipalities responsible for home care and nursing home care, overseen by Sweden's National Board of Health and Welfare (NBHW).^{83,84} In Sweden there are both public and private nursing homes and home care providers that are supported and regulated by the municipalities. Approximately 20.5% of residents lived in private nursing homes in 2016 with the majority (89%) operating as 'for-profit'.¹⁹ The 'Open Comparisons' national quality monitoring system for long-term care was established in 2007 by the Swedish Government, the National Board of Health and Welfare and the Swedish Association of Local Authorities and Regions.⁸⁵ The purpose of Open Comparisons is to stimulate knowledge development to promote equal social services and health and health care with good quality. Open Comparisons is a tool designed for analysing, monitoring and developing the activities of social services and health care at local, regional and national levels to improve the health, care and quality of life of older people based on their needs.

List of Indicators

A total of 28 indicators are used within Sweden's Open Comparisons monitoring system to measure quality and safety in long-term aged care; this includes both home care and residential aged care. These indicators are a compilation from several of Sweden's national registries and surveys of Sweden's older population and care providers conducted by the NBHW.⁸⁵ These include 19 for 'special living' (residential aged care) and 14 for home care recipients. All care recipients should also have a care plan.

1. **Attendance, trust and security in the home service:** Percentage of elderly people who answered positively to the three questions:
 - a. Do the staff respond well to you?
 - b. How safe or insecure does it feel to live at home with support from the home service?
 - c. Do you feel confident about the staff coming home to you?

2. **Influence and enough time in the home service:** Percentage of elderly people who answered positively to the three questions

- a. Do the staff take into account your opinions and wishes about how the assistance should be performed?
 - b. Ability to influence at what times the staff come?
 - c. Do the staff have enough time to be able to carry out their work with you?
3. **Risk prevention measures (home service):** Percentage of people 65 years and older with health care in ordinary living (home health care) with measures at risk of cases, malnutrition, pressure ulcers and impaired oral health.
 4. **Personnel continuity within the home service:** The average number of home service personnel helping with 14 days.
 5. **Change in self-perceived health between 2016 and 2017:** Percent change in self-perceived health (general state of health) between survey years 2016-2017.
 6. **Percentage of older people who are satisfied with the home service as a whole:** Percentage of elderly people who are, overall, very or quite satisfied with the 2017 home service.
 7. **Attendance, trust and security in special housing:** Percentage of elderly people who answered positively to the three questions
 - a. Do the staff respond well to you?
 - b. How safe or insecure does it feel in your special housing?
 - c. Do you feel confident in the staff of your special housing?
 8. **Contact with staff in special accommodation:** Percentage of elderly people who answered positively to the three questions
 - a. How easy or difficult it is to meet a nurse if needed?
 - b. How easy or difficult is it to see a doctor if needed?
 - c. How easy or difficult it is to get in touch with the staff at your retirement home?
 9. **Influence and enough time in special living:** Percentage of elderly people who answered positively to the three questions

- a. Do the staff take into account your views and wishes on how the assistance should be performed?
- b. Are you usually able to influence at what times the staff come?
- c. Do the staff have enough time to be able to carry out their work with you?

10. **Food and meal environment in special accommodation:** Percentage of elderly people who answered positively to the two questions

- a. How does the food taste?
- b. Do you feel that the meals at your elderly home are at a nice time of day?

11. **Living environment in special accommodation:** Percentage of elderly people who answered yes to the questions

- a. Do you like your room or apartment?
- b. Is it pleasant in the common areas?
- c. Is it comfortable outdoors around your accommodation?

12. **Social activities and loneliness in special housing:** Percentage of elderly people who answered positively to the question

- a. How satisfied or dissatisfied are you with the activities offered at your retirement home?
- b. Does it happen that you are disturbed by loneliness?

13. **Risk prevention measures:** Percentage of people 65 years and older who receive health care in their institutional dwelling with prevention measures when there is a risk of falls, malnutrition, bedsores, and poor oral health

14. **Use of pressure-relieving substances:** Percentage of people 65 years and older in special housing with assessed risk of pressure ulcer grade 1 with prescription of pressure equalisation basis.

15. **Proportion of older people who are satisfied with special housing as a whole:**

Percentage of elderly people who are, overall, very or quite satisfied with special accommodation.

16. **Waiting times for special housing for the elderly:** Waiting time (number of days) from date of application to the date when the person is offered a place in institutional care
17. **Fall injuries among people 80 years and older:** Number of people with fall injuries per 1,000 people 80 years and older admitted to hospital, average values for the years 2014–2016.
18. **Fractures of thigh and hip among people 65 years and older:** Number of thigh and hip fractures among people 65 years and older per 100,000 people, average values for the years 2014–2016.
19. **Discussions at a palliative turning point:** Share of persons deceased at age 65 or older who before death had a conversation in which they were informed about their situation.
20. **Assessment of pain during the last week of life:** Percentage of persons deceased at age 65 or older who had an assessment of pain during their last week in life.
21. **Three or more psychoactive drugs, persons 75 years and older in ordinary living with home service:** Proportion of persons 75 years and older with home care who were treated with three or more psychoactive drugs concurrently.
22. **Three or more psychoactive drugs, persons 75 years and older in special accommodation:** Proportion of persons 75 years and older in special housing treated with three or more psychoactive drugs concurrently.
23. **Ten or more drugs, persons 75 years and older in ordinary living with home service:** Proportion of people 75 years and older in the home service who were treated with ten or more drugs.
24. **Ten or more drugs, persons 75 years and older in special accommodation:** Proportion of persons 75 years and older in special housing treated with ten or more medicines.
25. **Inappropriate drugs, persons 75 years and older in ordinary living with home service:** Proportion of persons 75 years and older, in home care treated with at least one of four indicators of inappropriate drug use.

26. **Inappropriate drug use, persons 75 years and older in special accommodation:**

Proportion of persons 75 years and older in special housing treated with at least one of four indicators of inappropriate drug use.

27. **Use of antipsychotic drugs, persons 75 years and older in ordinary living with home**

service: Proportion of persons aged 75 years and older in home care who have been treated with an antipsychotic drug.

28. **Use of antipsychotic drugs, persons 75 years and older in special accommodation:**

Proportion of persons aged 75 years and older in special housing who have been treated with an antipsychotic drug.

A recent study (2017) also examined 14 quality measures in nursing homes that additionally included the proportion of residents who received in 12 months:

1. **An updated care plan:** Proportion of residents with an updated care plan
2. **Medication review:** Proportion of residents who received a medication review.¹⁹

Framework

Responsibility for health care and social services is divided between three levels of government. At the national level, parliament and the government set out policy aims and directives by means of legislation and economic steering measures. At the regional level, the county councils and regions are responsible for the provision of health and medical care. At the local level, the municipalities are legally obliged to meet the social care and housing needs of older people.^{83,84}

There are two key legislations supporting long-term care quality in Sweden:

1. The Sweden Social Services Act (1982, 2010) provides older people with the ability to receive support in their homes or from supported accommodations.
2. The Health and Medical Services Act supports care provided in hospital and primary care. The individual municipalities are part of a national framework addressing long-term care, with quality governed by the National Strategy of eHealth.^{83,84}

Since 1992 Sweden's 'ageing in place' policy dominates the organisation and performance of long-term care. This policy shifted responsibility of care for older people from county

councils to municipalities, which over time has resulted in de-institutionalisation of aged care in Sweden towards a home-based system. For example, in 2001 18% of older people aged 80 years and older received home help and 20% were living in institutions, by comparison to 2017 where 22% of older people aged 80 years and older received home help and 12% received institutional care.^{83,84}

The Swedish healthcare system is also decentralised; the National Board of Health and Welfare is responsible for supervision, follow-up and evaluation of municipal and county council services. Sweden's 290 municipalities also have a statutory duty to meet the social service and housing needs of older people, and regulate long-term care quality for older people. External quality assurance for nursing homes is carried out mostly by local authorities and in cases of complaints or reporting of abuse through external follow-ups by the National Board of Health and Welfare (NBHW).⁸⁶

In recent years a number national and regional level reforms have been implemented to improve care quality and safety for Sweden's aged care population, including those in long-term (nursing) care residences and receiving home services. This includes an incentivised national pay for performance scheme for the quality of care indicators across the 21 county councils and 290 municipalities responsible for care in Sweden. In Sweden, legislation sets specific rights for self-determination, fair funding, quality care from skilled workers, protection against abuse, and the legal duty to report any witnessed abuse of elderly or dependant persons. Within the framework of national legislation and varying healthcare policy initiatives by the national government, the county councils and municipalities have substantial decision-making powers and obligations to their citizens. Thus, focusing on the performance of the individual county councils and regions is a logical approach.

Method of data collection

In Sweden, data are collected by the municipalities once per year. The municipalities are obliged to provide information in order to receive national incentive grants for the development of elderly care services. Sweden has strengthened initiatives to report data for quality indicators on the care for the elderly derived from: i) national surveys and, ii) rich datasets from registries.

Data for the Open Comparisons quality indicators are derived from:

- National surveys^{87,88}
 - The NBHW survey “What do the elderly think about elderly care?”
 - The NBHW Unit Study on Elderly Care from municipalities and county councils (Kolada, Sweden)
- Official statistics (NBHW, Socialstyrelsen)⁸⁸
 - The Register of Social Services Interventions for the Elderly and Persons with Disability
 - The Patient Register
 - The Register of Medicines
- National quality registers
 - [Senior Alert Registry](#). Commenced in 2009 and collects individual-level data on fall-related injuries, pressure sores and malnutrition. This registry helps identifying older people at risk of these events that could be targeted for preventive interventions. By 2012, 274 municipalities (out of 290) reported data to the registry.
 - [Swedish Palliative Registry](#). Commenced in 2007 and collects information on structural inputs such as beds and access to staff, care plans associated with end-of-care, as well as information about fatalities. In 2011, 53% of all deaths were recorded in the registry.
 - [Swedish Dementia Registry](#). Commenced in 2007 and collects data on age, gender, heredity, body mass index, Mini-Mental State Examination scores, diagnoses, dementia development, medical treatment, community support, and time from referral to diagnosis. In addition, the [Swedish Registry on Behaviour and Psychiatric Symptoms in Dementia](#), was established in 2010, to collect individual data on care and treatment of people with dementia and behavioural and psychiatric symptoms.

Employment of indicators

Sweden publishes the Open Comparisons report annually (www.socialstyrelsen.se/statistik-och-data/oppna-jamforelser/socialtjanst/aldreomsorg/) showing providers’ quality of care to the elderly based on the quality indicators along with grading of their performance. The

aim is to increase accountability and transparency to the government and public, and to stimulate efficiencies through competition between care providers. The Open Comparisons report also includes the results for 28 indicators at the municipal level, county level and the state.⁸⁵ A relative comparison between municipalities is provided using a traffic light system. Green means that the municipality's value for the indicator belongs to the 25% of municipalities with the best values in relation to the other municipalities, red is for the 25% of the municipalities with the worst value, and yellow applies to the 50% of the municipalities that lie in between. The number of municipalities in the three groups vary depending on which indicator it concerns. To ensure sustainable comparisons, at least 30 municipal-level observations are required. Too few observations may be due to a low response rate in a survey or too few registrations in registers. The report does not analyse any reasons for differences or causes.

Broad country specific factors

Since 2009, the Swedish government introduced a [Provider Incentive Program](#) linking remuneration of municipalities for quality of care measures for older people in long-term care. Measures linked to payment include prevalence of pressure ulcers, falls, and malnutrition, reducing hospital admissions, use of inappropriate drugs, combination of drugs, psychotropic drug use, in addition to payment for registering appropriate individuals in the extensive registries in Sweden, such as the Dementia Registry and Palliative Registry.

In Sweden there is no national standard assessment for eligibility or level of dependency when accessing older people's care needs. Through a single-entry system, assessment is carried out by a municipal social worker or care manager, with municipalities deciding entitlement to services (including the level and eligibility criteria of entitlement). The development of a care plan is mandatory. Recently, the Swedish government has commissioned the NBHW to develop a standardised needs assessment tool to be used by the municipalities.

In recent years, Open Comparisons has developed into a valuable single instrument for analysis and support of monitoring of quality and safety of care for the older population in Sweden. The purpose of indicator-based comparisons is to provide decision makers at different levels (politicians, heads of administration, operations and quality managers in the

municipalities, county councils and regions) a basis for follow up and opportunity to improve their own operations' results. The report is stated to 'inspire local people, regional and national discussions about what can be improved, but also provide access to publicly funded care and care for older people of quality and efficiency'.⁸⁵

4.9 United Kingdom

The National Health Service (NHS) is the system of public healthcare providers in the United Kingdom (UK). Across the UK, each country (England, Scotland, Northern Ireland and Wales) and their associated council areas are responsible for the development and implementation of policies and funding of health and social care services. While the NHS provides some social care services to those with significant health-related care needs, most publicly funded social care is organised and supported financially by local councils. Most social care in the UK, including residential aged care services are largely privately funded; 40% of care home residents fund the entire cost of their care with 14% top-up local authority funding with additional private payments. The NHS provides financial support for elements of long-term residential care but this is means tested, with a life-time cap of EUR 85,000 individual contribution.^{89,90}

List of Indicators

In England, the Care Quality Commission, is the independent regulator of health and social care and is responsible for routine monitoring and inspection of care in nursing homes.

During inspections, there are five questions examined for all care providers.⁹¹

1. **Are they safe?** Are residents protected from abuse and avoidable harm?
2. **Are they effective?** Does the care, treatments and supports provided achieve good outcomes to maintain quality of life and is based on the best available evidence?
3. **Are they caring?** Do the staff involved in care treat you with compassion, kindness, dignity and respect?
4. **Are they responsive to people's needs?** Are services organised so that they meet your needs?
5. **Are the services well-led?** Does the leadership, management and governance of the organisation ensure it is providing high quality care that is based on individual's needs, encourages learning and innovation and promotes an open and fair culture?

In addition, a **National Adult Social Care Survey (ASCS)**⁹² is conducted annually administered by NHS and collected by the local councils to survey all long-term care recipients. It includes:

1. Overall, how satisfied or dissatisfied are you with the care and support services you receive?
2.
 - a. Thinking about the good and bad things that make up your quality of life, how would you rate the quality of your life as a whole?
 - b. Do care and support services help you to have a better quality of life?
3. Do care and support services help you in having control over your daily life?
4. Do care and support services help you in keeping clean and presentable in appearance?
5. Do care and support services help you to get food and drink?
6. Do care and support services help you in keeping your home clean and comfortable?
7. Do care and support services help you in feeling safe?
8. Do care and support services help you in having social contact with people?
9. Do care and support services help you in the way you spend your time?
10. Which of the following statements best describes how having help to do things makes you think and feel about yourself?
11. Which of these statements best describes how the way you are helped and treated makes you think and feel about yourself?
12. In the past year, have you generally found it easy or difficult to find information and advice about support, services or benefits?
13. How is your health in general?
14.
 - a. Which statements best describe your own health state today - Pain or discomfort
 - b. Which statements best describe your own health state today - Anxiety or depression
15.
 - a. Do you usually manage to get around indoors (except steps) by yourself?
 - b. Do you usually manage to get in and out of a bed (or chair) by yourself?
 - c. Do you usually manage to feed yourself?
 - d. Do you usually deal with finances and paperwork - for example, paying bills, writing letters - by yourself?
16.
 - a. Do you usually manage to wash all over by yourself, using either a bath or shower?

- b. Do you usually manage to get dressed and undressed by yourself?
 - c. Do you usually manage to use the WC / toilet by yourself?
 - d. Do you usually manage to wash your face and hands by yourself?
17. How well do you think your home is designed to meet your needs?
18. Thinking about getting around outside of your home, which of the following statements best describes your present situation?
19. Do you receive any practical help on a regular basis from your husband / wife, partner, friends, neighbours or family members?
20. Do you buy any additional care or support privately or pay more to 'top up' your care and support?

The ASCS survey uses in part, the Adult Social Care Outcomes Toolkit (ASCOT).⁹⁰ It aims to understand how services affect people's lives to enable choice and for informing future service development. This is designed to measure the domains of quality of life most affected by social care, termed **social care-related quality of life (SCRQoL)**, and includes factors such as good nutrition, safety, control over daily life, social interaction and dignity.⁹³

The SCRQoL scores are generated from residents' responses to eight questions:

1. Control
2. Personal Care
3. Food
4. Accommodation
5. Personal Safety
6. Social Life
7. Occupation
8. Dignity

A score of zero for SCRQoL indicates high level needs (i.e. low quality of life) and a maximum score of 24 is the highest quality of life.

Framework

All providers of residential, domiciliary and community-based care services must register with an independent regulator. In England, for example, the regulator is the Care Quality

Commission that was established in 2009. Under the Health and Social Care Act 2008, all providers are required to meet essential requirements of safety and quality (e.g. minimum standards). Under the 2014 Care Act an overall rating for the quality of the services provided is mandated.

The minimum national standards set an acceptable level of care across six key areas:

- involvement and information (respecting, services, consent, fees)
- personalised care, treatment and support (care and welfare of users, nutrition, co-operating with other providers)
- safeguarding people and environment (prevention of abuse, cleanliness and infection control, management of medicine, safety and sustainability of premises and equipment)
- staffing (sustainability, recruiting, supporting workers)
- quality and management (complaints, notifications of death and incidents and records)
- sustainability of management (registration of managers).

Method of data collection

Routine inspections carried out by an inspector and an expert-by-experience occur unannounced both regularly and in response to concerns.⁹⁴ An expert-by-experience is a person with experience of using or caring for someone in the particular type of care service. The unannounced inspections usually take place over two days. During the inspection, the inspectors speak to residents and relatives, registered managers, senior management teams, nursing staff, chef and activities coordinators as well as visiting healthcare professionals. A range of records are also reviewed including resident's care records and records relating to staff recruitment, training and supervision. Information relating to the management of the service, including the provider's policies and procedures, people's medication administration records and quality assurance records are also examined.

The ASCS is an online survey, which residential care and nursing care recipients complete individually or with help from a family member or care worker.

Employment of indicators

Each nursing home is given a rating for each of the five inspection questions and an overall rating of the service is provided visually as a traffic light system:

- ☆ Outstanding - The service is performing exceptionally well
- Good - The service is performing well and meeting our expectations
- Requires improvement - The service is not performing as well as it should, and we have told the service how it must improve
- Inadequate - The service is performing badly, and we've taken action against the person or organisation that runs it

A written summary of overall findings and each of the five key questions are provided. In addition, recommended actions for the care provider are provided. The provider is responsible for giving a report of subsequent actions that will be implemented to improve care.

Each care home is legally required to display their rating both at the home's location and on its website. Each home is also searchable on the Care Quality Commission website with the latest inspection report and ratings, and older reports available to download, along with information about who is responsible for running the home and contact details for the home.

Broad country specific factors

All UK countries have experienced significant cuts in budgets for health and social care over the past decade and together with fragmented policies and delivery of services, access and quality of publicly funded long-term care is of great concern.⁹⁵ There are differences between countries: for example personal care is free for older people in Scotland (those in residential care receive EUR 195 a week towards their personal care and EUR 90 for any nursing care), while in Wales social care users of all ages pay no more than EUR 80 a week in means-tested charges.⁹⁵

From the most recent results of the ASCS (2018-19), 72% of older people in residential care and 64% in nursing care said they were satisfied with the care and support received. Over

half of people in residential care and 62% of people in nursing care reported good or better quality of life, with over 90% for both care types responding that the care and support they receive gives them better quality of life.⁹⁶

4.10 United States of America

Long-term care in the United States of America (USA) is largely overseen by the Centers for Medicare and Medicaid Services (CMS).⁹⁷ Medicaid (a state and federal program) provides the majority of financial support for long-term care in the USA (52% in 2017) but is only available after individuals have exhausted their financial resources and assets.⁹⁸ Medicare is a federally funded social health insurance program in the USA for people aged 65 years and older, covering medical expenses, hospice and short-term care, only providing coverage for less than 100 days for post-acute care.⁹⁷ However, eligibility for services is highly limited, ultimately falling short for the large majority of individuals that need long-term care in the USA.⁹⁸ Other contributions for long-term care in the USA come from private long-term care insurance (11%), other public and private sources (20%) and out-of-pocket payments (16%).⁹⁸ In contrast, the USA is considered a leader in measuring the quality of care for older people in long-term care facilities (nursing homes) with one of the most comprehensive and systematic approaches to long-term care quality assessment, data collection, monitoring and public reporting, over the past two decades.⁹⁷

List of Indicators

The mandatory implementation of the Minimum Data Set (MDS), a database for the information collected using the Resident Assessment Instrument (RAI), was first introduced in the US in 1987. It is aimed at monitoring and improving quality outcomes for residents in a long-term care facility.⁹⁷ The USA's quality indicator set has evolved over time and as of October 2019 it has 23 Quality Measures on Nursing Home Compare with 15 of them being included as part of the Five Star Rating, based on the MDS 3.0 and Administrative Claims Based Quality Data.⁹⁹ There are eight short-stay (≤ 100 cumulative days in a facility) and 15 long-stay quality measures (> 100 cumulative days in a facility).^{99,100} This set of measures includes four administrative claims-based only quality indicators.¹⁰¹

Short-stay (* Denotes part of the Five Star Rating)

1. **Self-Report Moderate-Severe Pain***: Percent of short-stay residents who report daily pain with at least one episode of moderate / severe pain, or horrible / excruciating pain, of any frequency in the last 5 days.

2. **Pressure Ulcers that are New or Worsened^{*a}**: Percent of short-stay residents with new or worsening Stage II-IV pressure ulcers. In v12.0 Jan 2019 this was replaced with **Changes in Skin Integrity Post-Acute Care: Pressure Ulcer / Injury** but will not be reported until October 2020).
3. **Assessed and Appropriately Given the Seasonal Influenza Vaccine**: Percent of short-stay residents who are given, appropriately, the influenza vaccination during the most recent influenza season.
4. **Assessed and Appropriately Given the Pneumococcal Vaccine**: Percent of short-stay residents whose pneumococcal vaccine status is up to date during the 12-month reporting period.
5. **Newly Receiving an Antipsychotic Medication^{*}**: Percent of short-stay residents who are receiving an antipsychotic medication during the target period but were not on their initial assessment.
6. **Improvement in Function^{*a}**: Percentage of short-stay residents who were discharged that gained more independence in transfer, locomotion and walking during their episodes of care.
7. **Re-hospitalisation After Nursing Home Admission^{*a#}**: Percentage of short-stay residents who entered or re-entered the nursing home from a hospital and were readmitted to a hospital for an unplanned inpatient stay or observation stay within 30 days of the start of the nursing home stay.
8. **Outpatient Emergency Department (ED) Visit after Hospitalisation^{*a#}**: Percentage of short-stay residents who entered or re-entered the facility from a hospital, visited an ED within 30 days of the start of the stay and this visit did not result in an inpatient or observation stay.

Long Stay (* Denotes part of the Five Star Rating)

9. **Self-Report Moderate-Severe Pain^{*a}**: Percent of long-stay residents who self-report either almost constant or frequent pain with at least one episode of moderate / severe pain, or horrible / excruciating pain, of any frequency, in last 5 days.
10. **High-Risk Residents with Pressure Ulcers^{*}**: Percent of long-stay, high-risk residents with Stage II-IV pressure ulcers.

11. **Physically restrained***: Percent of long-stay residents who are physically restrained on a daily basis during a 7-day look-back.
12. **Increase in need for help with ADLs***: Percent of long-stay residents whose need for help with late-loss Activities of Daily Living (ADLs) has increased when compared to the prior assessment. The four late-loss ADL items are self-performance bed mobility, self-performance transfer, self-performance eating and self-performance toileting. This measures what the resident actually did (not what he or she might be capable of doing) within each ADL category during the 7-day look-back.
13. **Weight loss**: Percent of long-stay residents who had a weight loss of 5% or more in the last month or 10% or more in the last two quarters (six months) who were not on a physician prescribed weight-loss regimen during the selected quarter.
14. **Low-risk residents who lose control of bowel or bladder continence**: Percent of low-risk long-stay residents who frequently lose control of their bowel or bladder during the 7-day look-back period preceding the target assessment date. (Low-risk excludes residents with cognitive impairment, totally dependent bed mobility, transfer or locomotion).
15. **Catheter inserted and left in bladder*^a**: Percent of long-stay residents who have had an indwelling catheter in the past 7 days.
16. **Urinary tract infection***: Percentage of long-stay residents who have or had a urinary tract infection within the last 30 days.
17. **Depressive symptoms**: Percent of long-stay residents who have had symptoms of depression during the 2-week period prior assessment using the Resident Mood Interview (patient health questionnaire-9 (PHQ-9)) or Staff Mood Interview (PHQ-9-OV).
18. **One or More Falls with Major Injury***: Percent of long-stay residents who have experienced one or more falls with a major injury in the target or look back period.
19. **Assessed and Appropriately Given Seasonal Influenza Vaccine**: Percent of long-stay residents who are given, appropriately, the influenza vaccination during the most recent flu season.
20. **Assess and appropriately given Pneumococcal vaccine**: Percent of long-stay residents whose pneumococcal vaccine status is up to date.

21. **Antipsychotic medication***: Percent of long-stay residents who are receiving antipsychotic drugs in a 7-day look back period without indication.
22. **Anti-anxiety or hypnotic medication**: Percent of long-stay residents who received an anti-anxiety or hypnotic medication in a 7-day look-back period.
23. **Ability to move independently has worsened*^a**: Percent of long-stay residents who experienced a decline in independence of locomotion during the target period when compared to the prior assessment. Defined as a decline in their ability to move around their room and in adjacent corridors on same floor. If in a wheelchair, this measure reports a decline in self-sufficiency once in the chair.

In addition, there are two extra claims-based indicators using administrative data.

24. **Number of hospitalisations per 1000 long-stay resident days^{a#}**
25. **Number of outpatient emergency department visits per 1000 long-stay resident days^{a#}**

^aDenotes risk adjustment.⁹⁹ #The four claims-based quality measures are calculated for Medicare fee-for-service beneficiaries only. These measures are risk-adjusted based on claims-based and MDS-based covariates.¹⁰¹

Framework

The MDS obtained by the RAI was first introduced in the US in 1992 and was largely driven by the 1986 Institute of Medicine report “Improving the Quality of Care in Nursing Homes.” This report identified considerable problems with quality of care and recommended a ‘drastic overhaul’ of long-term care provision and regulation.⁹⁷ This report and subsequent policy reforms led to the establishment of nursing home providers to receive Medicare and Medicaid reimbursement pending compliance with quality measures and data submission.

Completion of the MDS is a federally mandated process for clinical assessment of all residents in CMS certified nursing homes (including Medicare- or Medicaid-certified nursing homes and non-critical access hospital with Medicare agreements). This is an attempt to provide a uniform, comprehensive assessment system of resident functional capabilities and helps nursing home staff identify health problems and a resident’s individual care plan.

The Five-Star Quality Rating System was implemented in 2008, where each nursing home is rated on a scale of one to five stars. In September 2014, the submission of data by long-term care facilities (including nursing home facilities) became mandatory under the federal Improving Medicare Post-Acute Transformation (IMPACT) Act. This legislation required specified clinical assessment using standardised data elements within the assessment instruments currently being used (RAI-MDS), examining five quality measure domains. The aim was to provide access to longitudinal resident outcomes to improve care coordination, outcomes and overall quality comparisons. Failure to comply with data submissions results in a fiscal penalty, with a reduction in payment rates.¹⁰²

Method of data collection

Data for the MDS 3.0 is collected every 90 days using the RAI, which includes care-provider assessments and residents' direct assessment input. Claims-based data are used for five of the indicators focused on hospitalisations and emergency department presentations and are calculated for Medicare fee-for-service beneficiaries.

Employment of indicators

The Nursing Home Compare reports the average adjusted quality measure values for the most recent three 90 day periods and are reported publicly on the CMS' website for all Medicare and Medicaid-certified nursing homes in the US.^{99 100} The Five-Star Quality Rating System contains information on quality indicators that have been selected for their validity, reliability, statistical performance, importance and the extent to which a facility's practices may affect the measure. The Five-Star Quality Rating System also includes information on health inspections and staffing measures. It is updated and posted every 90 days online and allows for facility level comparisons.^{99 100} Most nursing homes will have three quality measure ratings: an overall quality rating, a long-stay quality rating and a short-stay quality rating.

Broad country specific factors

The MDS 3.0 was introduced in 2010 in response to changes in nursing home care, characteristics of residents, changes in assessment of residents and concerns with the quality indicators measured from MDS 2.0. These concerns included limited resident input, need for improved reliability and accuracy, efficiency in data collection, and staff

satisfaction and perception of clinical utility. The aim of MDS 3.0 was to provide a more efficient instrument with improved quality information to facilitate the identification of residents needs and enhance resident-focused care planning.¹⁰³

Framework

The Commonwealth Government of Australia has primary responsibility for aged care services in Australia. The Victorian Government Department of Health and Human Services remains a major provider of aged care services in the State.⁴⁵ The Victorian Government Department of Health and Human Services developed and implemented its initial five quality indicators, which were to be collected by all PSRACS in 2006. In 2010, the department's 'Beyond Compliance Strategy' provided an expanded framework for PSRACS to improve quality and support care excellence. In 2010, reference ranges for each of the indicators were also developed through research and consultation with experts and the PSRACS sector.⁴⁵

Method of data collection

All PSRACS facilities are required to collect, record and report quality and safety indicator data to the Victorian Government Department of Health and Human Services on a quarterly basis. The 2014-15 reporting cycle showed that 99% of the 178 PSRACS reported their data.⁴⁵ The data are generally collected by a nurse or quality manager.¹⁰⁴ To measure the five quality indicators, 13 measures are captured using standardised data collection forms. These data are captured electronically using a Department of Health and Human Services online portal (HealthCollect) and submitted to the Ageing and Aged Care Branch Quality Improvement Unit by facilities at the close of each quarter. All indicators, apart from pressure injuries, are collected by aged care facility staff via audits of resident reports and medication charts generally within a nominated period for each quarter. Pressure injuries are assessed over a 14-day period within the quarter or a set assessment date for each resident that is repeated on the same day for each quarter.

Employment of indicators

The Victorian Ageing and Aged Care Branch Quality Improvement Unit collates and calculates the quality indicator rates and provides a summary of the information for each PSRACS and the Victorian PSRACS state rates. Three different types of reports are provided:

1. A detailed summary for each indicator is provided, aimed to support management and staff ability to monitor and improve resident care. This contains details such as

individual quality indicator rates compared with state rates, other providers with similar sized services, regional comparisons and reference range targets.

2. A summary report provides high-level information for each PSRACS and an aggregated summary for all PSRACS operated by each service provider aimed at health service boards and executives.
3. A consumer report is provided with information for residents, their families and care advocates.

A traffic light system is used to provide an indication of results and issues that may require closer monitoring or response.

Red: result exceeds upper limit of reference range. A quality indicator in this range is outside an acceptable range and requires immediate review

Amber: three consecutive increases or decreases constitute a trigger point for evaluation

Green: the result is within range and optimal level of performance

The quality indicator quarterly reports are not publicly reported, however each PSRACS owns its own quality and safety indicator data, which can be shared publicly to communicate successes and improvement activities. The state-wide data may not be publicly reported or shared but is provided in the annual quality of care reports written each financial year by the department.

Broad country specific factors

The overall focus of the Victorian quality and safety indicator program is to build local capacity to strengthen clinical governance and service improvement within PSRACS. The Victorian Government Department of Health and Human Services does not use the quality and safety indicator data for assessment of individual service providers within the performance framework but does monitor state-wide trends to identify opportunities for system improvement.

5. Part 2: Analysis of Identified Quality Indicators in Aged Care using the ROSA Data Platform

From Part 1 of this report **134 quality and safety indicators** were identified that could be included in a comparative analysis using the ROSA data platform. Specifically, these included:

- i. Indicators that could be replicated using their data rules
- ii. Indicators that could be adapted using similar / comparable variables or data rules

The indicators, which mostly focus on residential aged care but also include some home care quality indicators, cover 12 domains. These include indicators on medications (n=26), pressure injury (n=23), falls / fractures (n=19), weight loss / malnutrition (n=19), bowel / bladder incontinence (n=12), depressive symptoms / depression (n=10), pain (n=8), care plans / medication review (n=6), hospitalisations (n=6), infections (n=3), cognition (n=1) and mortality (n=1). We also included analysis of the 12 indicators that are included within the ROSA OMS for comparison. These include antipsychotic use, high sedative load, pressure injury, falls, fractures, weight loss / malnutrition, chronic opioid use, medication-related adverse events, emergency department admissions, antibiotic use, dementia / delirium related hospitalisations and unplanned mortality.

For some of the indicators sets (Netherlands, Korea, and Victoria, Australia) estimates of the indicators we identified and examined were not available. Therefore, we provided the estimates of their indicators within our data source but a comparison to these countries' estimates was not possible.

Appendix 4, Table 4.1, provides a summary of the data rules / specifications created for each of the 134 indicators from other countries / regions and the required adaptations for this analysis.

5.1 Medication-Related Indicators

With the increasing prevalence of multimorbidity (multiple chronic conditions) and associated polypharmacy (use of multiple medications) in the growing older population, the complexity has also increased in older people's medication regimens and medication-related needs. This complex medication use is associated with an increased risk of adverse events and poor health outcomes. There is a clear need to systematically and routinely monitor and assess medication-related quality of care.

Key considerations when developing and choosing quality medication-related indicators include^{105,106}:

- what are the most relevant and important medication issues in this population (e.g. high-risk medications, medication use in limited life-expectancy)
- what medications are likely to have the greatest impact on health outcomes
- only measure medication issues that potentially can be changed by providers
- focus on changes that are potentially meaningful to residents (person-centred).

5.1.1 Antipsychotic Medication Indicators

Rationale: This indicator identifies older people either living in residential aged care or in the community with home care support who are potentially inappropriately exposed to an antipsychotic medication and may be at higher risk of adverse events that may affect health, safety and quality of life.

Type of Indicator: Residential aged care (long-term care, short-stay), Home care

Countries: Canada, USA, Finland, Iceland, Sweden, SHELTER study

Background: Antipsychotic medications were originally developed for use in individuals with a diagnosis of schizophrenia or psychosis. However, they are commonly used for the management of behavioural and psychological symptoms in individuals with a diagnosis of dementia despite limited effectiveness and the potential for serious adverse events, including mortality.¹⁰⁷⁻¹¹⁰ Given the higher risk of harm in older people with dementia, the USA Food and Drug Administration (FDA) issued advisory warnings in 2005 and 2008, for atypical¹¹¹ and typical antipsychotics¹¹², respectively.

In Australia, short-term use of an antipsychotic may be indicated (meaning medically valid reason for treatment) for people with dementia who have associated behavioural symptoms such as severe agitation and aggression, if they have not responded to non-pharmacological approaches.¹¹³ Similar guidelines for prescribing antipsychotics for people with dementia are available in the USA and Canada.^{114,115} Despite such guidelines and safety warnings, there are concerns that antipsychotics are used inappropriately in response to mild behavioural symptoms such as wandering, insomnia or uncooperativeness.¹² A recent study of Australian aged care facilities estimated that 22% of residents were prescribed antipsychotics.⁹⁴ Similarly, the prevalence reported in USA long-term care nursing homes has also been reported at 22%.¹¹⁶ Non-pharmacological interventions should be first-line and when deemed appropriate, the use of antipsychotics should be used at the lowest possible effective dose, for ideally less than 12 weeks, and treatment reviewed and carefully monitored monthly.¹¹³ Inappropriate prescribing of antipsychotic medication is recognised as a marker of poor quality of care, especially if the prescribing is not regularly reviewed.

Indicator Summary: Five countries and the SHELTER study include antipsychotic medication use as a quality and safety indicator. The USA has two indicators based on antipsychotic use: short-stay for those who are a new user of an antipsychotic and long-stay for residents without an indication. Sweden examines the use in long-term care residents and home care recipients aged ≥75 years old and older. The SHELTER study also stratifies the results by those residents who are low-risk or high-risk; that is those who do and do not have an indication and therefore are at greater risk of adverse effects. The observation period ranges from 7 days to 12 months for the identified indicators. The ROSA OMS examines this indicator and stratifies the results by residents who do and do not have a diagnosis of dementia.

Calculation of the Indicator:

Data (Long-Term Care): These figures have been calculated using ROSA PBS / RPBS data for the period starting from January 1, 2016 or the 100th day of long-term care for the person. The exception to this is the 7 day look-back, which has been approximated using dose duration calculations for the period 7 days prior to June 30, 2016, with the denominator being persons alive at June 30, 2016, who had been in long-term-care for at least 100 days.

Data (Short-Stay): These figures have been calculated using ROSA PBS / RPBS data for residents who have had <100 days in long-term care (not including respite care) between January 1 and December 31, 2016.

Definitions: Antipsychotic Medications: ATC codes N05A* excluding lithium (N05AN01) and prochlorperazine (N05AB04) (*see Appendix 2, Table I2.1*). Low-risk antipsychotic users are defined as those people with an indication for an antipsychotic medication and high-risk antipsychotic users are those people who do not have an indication for an antipsychotic.

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in long-term aged care or short-stay or home care who have had one or more dispensing of an antipsychotic medication within the specified time period. A new user was defined as no antipsychotic dispensing in the 12 months prior to entering care.

Denominator = All persons in long-term aged care or short-stay or receiving home care

Exclusions: All countries excluded people who had an indication for an antipsychotic (e.g. Schizophrenia or Huntington's Disease), except for Sweden who limited it to people aged ≥ 75 years old. Some countries also excluded residents who were palliative (*see Figure 1 for details*).

Observation period: 7-days to 12 months (*see Table 1 for details*).

Interpretation of Results and Limitations: Overall for long-term residents the prevalence of antipsychotic use ranged from 16.7 to 24.7% regardless of the observation period examined. The Australian rates were similar to those reported for the comparison countries except for Sweden where the rates for both long-term care and home care were lower than those observed in Australia. The USA also examined incident use of an antipsychotic medication for short-stay residents; the observed rate was over 5-fold greater in Australia (8.7%) than that reported in the USA (1.6%). The SHELTER study stratified the results by residents considered low-risk (with an indication for an antipsychotic) and high-risk (no indication for an antipsychotic), with fewer low-risk residents receiving an antipsychotic (8.0% compared with 29.9% for high-risk). *See Table 1 and Figure 1 for details*.

Summary: The identification of residents who are using an antipsychotic without an appropriate indication is an important indicator to monitor quality and safety in aged care, given the increased risk of adverse effects, including stroke and death. Internationally there is consensus on the need to monitor these medications, evidenced by the number of countries reporting on this indicator. Further stratification of this indicator by residents with and without dementia will provide additional insight into the use of these medications by those potentially at greatest risks of harms. In addition, since the use of antipsychotics has been shown to be higher after entry into residential aged care in Australia (26% increase)¹¹⁷, and similar to the USA short-stay indicator, this indicator should also monitor the proportion of residents who are new users of an antipsychotic within three months after entry to residential aged care.

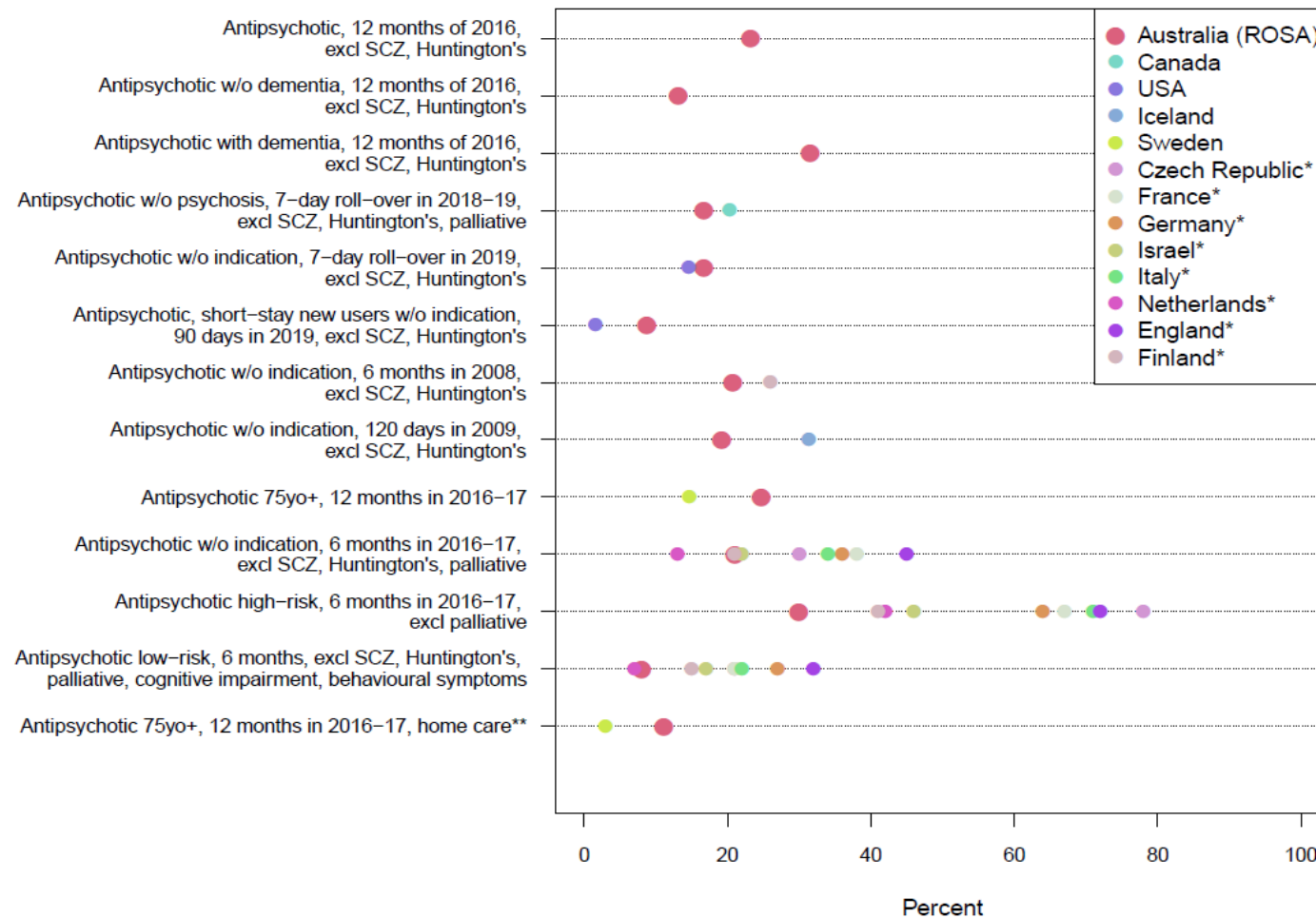
Table 1. Antipsychotic Medication Indicators Comparison by Country^a

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Antipsychotic	LTC	12 months	Yes	2016	23.2	
<ul style="list-style-type: none"> Antipsychotic without dementia 					13.1	
<ul style="list-style-type: none"> Antipsychotic with dementia 					31.5	
Antipsychotic without psychosis	LTC	7 days*	Yes	2018-2019	16.7	Canada: Unadjusted 20.2 Adjusted 20.3 Ontario: 19.6 Alberta: 17.4
Antipsychotic without indication	LTC	7 days*	No	2019	16.7	USA: 14.6
New user of antipsychotic without indication	Short-stay	90 days	No	2019	8.7	USA: 1.6
Antipsychotic without indication	LTC	6 months	Yes	2008	20.7	Finland: 26.0
Antipsychotic without indication	LTC	120 days	Yes	2009	19.2	Iceland: 31.3
Antipsychotic	≥75 yrs	12 months	No	2016-2017	24.7	Sweden: 14.7
Antipsychotic	≥75 yrs Home Care	12 months	No	2016-2017	11.1	Sweden: 3.0
Antipsychotic without indication	LTC	6 months	No	2012	21.0	SHELTER Study: Czech Republic: 30 Finland: 21 France: 38 Germany: 36

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
						Israel: 22 Italy: 34 Netherlands: 13 England: 45
High-risk antipsychotic use					29.9	SHELTER Study: Czech Republic: 78 Finland: 41 France: 67 Germany: 64 Israel: 46 Italy: 71 Netherlands: 42 England: 72
Low-risk antipsychotic use					8.0	SHELTER Study: Czech Republic: 21 Finland: 15 France: 21 Germany: 27 Israel: 17 Italy: 22 Netherlands: 7 England: 32

^a7 Day lookback period estimated using ROSA data based on 75th Percentile dose-duration intervals of dispensed medications. LTC: long-term care.

Figure 1. Antipsychotic Medication Indicators Comparison by Country^{#,a}



[#]Long-term residential care (unless stated otherwise). ^a7 Day lookback period estimated using ROSA data based on 75th Percentile dose-duration intervals of dispensed medications. *Countries from SHELTER study. **Home care. SCZ: schizophrenia

5.1.2 Polypharmacy Indicators

Rationale: This indicator identifies older people either living in residential aged care or in the community with home care support who may be at increased risk of adverse medication events and poor health outcomes associated with polypharmacy.

Type of Indicator: Residential aged care (long-term care), Home care

Countries: Australia (Victoria), Finland, Iceland, Sweden

Background: Polypharmacy, commonly defined as the use of five or more medications, is common in the older population.¹¹⁸ The use of nine or more medications is the most commonly used definition of polypharmacy in aged care.¹¹⁹ Polypharmacy is associated with a higher risk of adverse health outcomes including mortality, falls, adverse drug reactions (ADRs), frailty, poor functional status and cognition, increased length of hospital stay and readmission.¹²⁰⁻¹²² The risks of adverse effects and harm increases with increasing numbers of medications.¹²³

Polypharmacy is highly prevalent in residential aged care, with reports from international studies of up to 91% of residents using of \geq five medications, 74% using \geq nine medications or 64% using \geq 10 medications.¹¹⁹ Residents in aged care are generally more susceptible to the harms associated with polypharmacy than older community-living people, due in part to increasing age, decreased renal and hepatic function, and frailty.^{124,125} The high prevalence of polypharmacy in residential aged care poses considerable challenges to clinicians, nursing staff, aged care providers and the residents themselves.^{126,127}

While the numerical definition of polypharmacy does not discriminate between appropriate and inappropriate medication use, residents with polypharmacy are more likely to use potentially inappropriate medications.¹²⁸ Medication reviews or other interventions that target inappropriate or unnecessary medication use in residents with polypharmacy may improve health outcomes and quality of life.

Indicator Summary: Four countries use this indicator in residential aged care facilities; Australia (Victoria only), Finland, Iceland and Sweden. Sweden also assesses this indicator for older people receiving home care services. All countries except Sweden use the

definition of ≥ 9 medications, where they use ≥ 10 medications and a specific age-range of ≥ 75 years old. Victoria in Australia is the only one to specify the exclusion of *prn* (pro re nata, 'as needed') or short-term medications (such as antibiotics, eye-drops), lotions / creams / ointments for wound care or dietary supplements. ROSA OMS does not have polypharmacy as part of its indicator set.

Calculation of the Indicator:

Data: These figures have been calculated using ROSA PBS / RPBS data for the period starting from January 1, 2016 or the 100th day of long-term care for the person.

Definitions: Polypharmacy: ≥ 9 or ≥ 10 unique medications dispensed.

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in long-term aged care or home care who receive ≥ 9 or ≥ 10 medications within specified time period

Denominator = All persons in long-term aged care or receiving homecare

OR

$$\frac{\text{Numerator}}{\text{Denominator bed-days}} \times 1000$$

Numerator = All persons in long-term aged care and respite care who receive ≥ 9 medications within 90 days

Denominator = All persons in long-term aged care or receiving homecare

Exclusions: *Prn*, short-term medications such as antibiotics, eye or ear drops or dietary supplements (Victoria, Australia only).

Observation period: 90 days to 12 months (*see Table 2 for details*).

Interpretation of Results and Limitations: The prevalence of polypharmacy ranged from 24.2% to 63.6% in Victoria using the ROSA data and varied considerably depending on the other countries' definitions, such as exclusion of medications (i.e. *prn* and short-term) and nutritional supplements, and the time frame of analysis (90 days to 12 months). The Victorian indicator for polypharmacy is presented as a rate per 1000 bed days, however we also examined this as a percentage to allow comparison with other countries. Analysis of the rate per 1000 bed days was 2.88 using the ROSA data and while the rate for Victoria is not

currently publicly available, this observed rate was within the target range included within the Victorian PSRACS quality indicators. The prevalence of polypharmacy observed was higher than in Finland (63.6% v 41.4%) but lower than in Iceland (41.8% v 65.0%). The prevalence of polypharmacy using the Sweden's definition of ≥ 10 medications and people ≥ 75 years old was lower for home care services (45.1%) than residential aged care (56.4%) but both rates were almost double the reported rates from Sweden.

While in many instances' polypharmacy may be clinically appropriate, it is important to identify individuals with inappropriate polypharmacy that may place them at higher risk of adverse events and poor health outcomes. A numerical definition of polypharmacy does not distinguish between appropriate and inappropriate medication use. Consideration of which medications contribute to polypharmacy, especially identification of 'high-risk medications', is important for residents in aged care, who are more likely to be older, frailer and at higher risk of medication-associated harms. There are prescribing tools and criteria in the literature aimed at facilitating the identification of appropriate and inappropriate medications, facilitating the deprescribing of potentially inappropriate medications and optimising the use of appropriate therapy. These include the drug burden index¹²⁹, anticholinergic scales such as the anticholinergic risk scale¹³⁰ or anticholinergic drug scale¹³¹ and sedative load⁵⁹.

The Victorian polypharmacy indicator is intended to be used as a 'trigger' for the identification of residents who may benefit from a medication review. We were able to examine this in the ROSA data of the 24.2% of residents with polypharmacy, and almost a third (32.3% [n=14,124 / 43,700]) had a medication review (residential medication management review, MBS code 903). *See Table 2 and Figure 2 for details.*

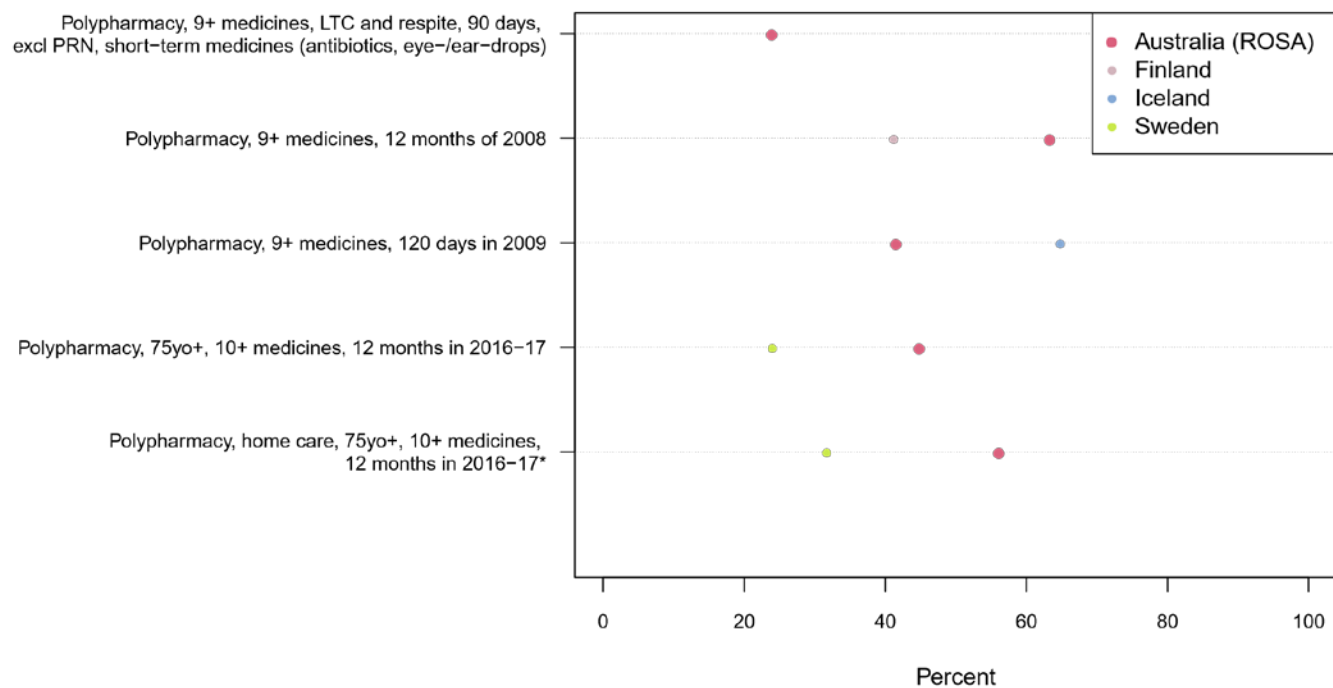
Summary: Due to the inability to provide a clinically meaningful evaluation of inappropriate medication use in the older population and inability to robustly identify those individuals at higher risk of harm from their medications, this indicator is not suggested for use as a quality and safety indicator for aged care in Australia.

Table 2. Polypharmacy Indicators Comparison by Country*

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
≥9 medications	LTC and respite	90 days	No		2.88 per 1000 bed days (or 24.2%)	Victoria, Australia per 1000 bed days: N/A TARGET: 2.1-3.5 %: N/A
≥9 medications	LTC	12 months	No	2008	63.6	Finland: 41.4
≥9 medications	LTC	120 days	Yes	2009	41.8	Iceland: 65.0
≥10 medications	≥75 yrs LTC	12 months	No	2016-2017	56.4	Sweden: 31.9
≥10 medications	≥75 yrs Home Care	12 months	No	2016-2017	45.1	Sweden: 24.2

*Medications with same ATC code but different strengths are counted as single medication. LTC: long-term care

Figure 2. Polypharmacy Indicators Comparison by Country^{#,a}



[#]Long-term residential care (unless stated otherwise). ^aMedications with same ATC code but different strengths are counted as single medication. *Home care. LTC: long-term care; PRN: *pro re nata* ('as needed').

5.1.3 Sedative Load, Anti-Anxiety or Hypnotic Medications, Multiple Psychotropics Indicators

Rationale: These indicators identify older people either living in residential aged care or in the community with home care support who may be at higher risk of adverse events and poor health outcomes associated with use of certain medications or medication classes or multiple medications, specifically: i) high sedative load, ii) use of anti-anxiety or hypnotic medications, or iii) use of multiple psychotropic medications.

Type of Indicator: Residential aged care (long-term care), Home care

Countries: USA, Finland, Iceland, Sweden, Netherlands

Background: The use of psychotropic medications, which include antipsychotics, antidepressants and benzodiazepines, and other medications with sedative properties, is highly prevalent among older people in aged care facilities. A recent Australian study of 11,368 residents in aged care reported 61% of residents regularly use a psychotropic medication¹³² and 84% of residents use a medication with sedating properties.¹³³ High rates of multiple psychotropic use has also been reported and evidence suggests these medications may be over prescribed in residential aged care facilities in many countries, including Australia.^{132,134} The use of psychotropic medications has been associated, particularly in older individuals, with a range of adverse effects and harms including increased risk of falls, fractures, hospitalisation, stroke, mortality,¹³⁵⁻¹³⁸ and cognitive and physical function impairments.^{139,140}

The prescribing of multiple medications with sedative properties in older people is also common.¹⁴¹ Some medications like benzodiazepines for example, are prescribed for their intended sedative action but others, like opioids and anti-epileptics have sedation as a prominent side-effect. Additionally, there are medications that are not generally viewed as sedative but can be associated with impaired motor function and potential for sedation (e.g. selective serotonin re-uptake inhibitors).¹⁴²

Given the higher likelihood of multiple sedating medications use in the older population and the potential cumulative effect, the sedative load model was developed to quantify the effect of taking multiple medications with sedating properties.⁵⁹

Indicator Summary: A total of six indicators from five countries have been grouped under this heading, all relating to use of sedating or multiple psychotropic medication use. The ROSA indicator ‘High Sedative Load’ is also stratified by residents who do and do not have dementia. The USA, Finland and Iceland all use data from the RAI-MDS to examine anti-anxiety or hypnotic medication use. Sweden’s indicator includes the use of multiple (≥ 3) psychotropic medications, in people aged ≥ 75 years old from either residential aged care or home care and the Netherlands examines use of ‘psycho-pharmacy’ that includes anti-anxiety, hypnotic medications and antidepressants.

Calculation of the Indicators:

Data: These figures have been calculated using ROSA PBS / RPBS data for the period starting from January 1, 2016 or the 100th day of long-term care for the person. A 7 day look-back period was approximated using a 30 day dispensing period prior to June 30, 2016.

High Sedative Load Indicator

Definitions: Calculated by summing the sedative rating of each primary sedating medication (sedative rating of 2) and medications with sedating components (sedative rating of 1) dispensed (*see Appendix 2, Table I1.1*). A high sedative load is defined as a score of ≥ 3 .

$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$
--

Numerator = All persons in residential aged care who have at least one 91 day period of high sedative load (≥ 3) within a year

Denominator = All persons in residential aged care

Exclusions: Schizophrenia, Huntington’s Disease, Cancer, Palliative Care.

Observation period: 91 day cross-sectional periods over 12 months.

Anti-Anxiety or Hypnotic Medications Indicator

Definitions: Use of at least one anti-anxiety (ATC codes N05B*) or hypnotic medications (ATC codes N05C*) (see Appendix 4, Table 4.2).

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in residential aged care who have had ≥ 1 dispensing of an anti-anxiety or hypnotic medication within the specified time period

Denominator = All persons in residential aged care

Exclusions: No exclusions

Observation period: 7 day look back, 120 days and 6 months

Psychotropic Medications or Psycho-Pharmacy Medication Indicator

Definitions: Use of three or more unique psychotropic medications (ATC Class N*) or at least one dispensing of a psycho-pharmacy medication (psycholeptic, ATC codes N05* or psychoanaleptic, ATC codes N06*).

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in residential aged care or home care recipients who have had ≥ 3 dispensing of unique N class psychotropic medications OR all persons in residential aged care who have had ≥ 1 dispensing of a psycholeptic or psychoanaleptic medication over 12 months

Denominator = All persons in residential aged care or home care recipients (where appropriate)

Exclusions: Psychotropic medications: Persons ≥ 75 years or older. Psycho-pharmacy: no exclusions.

Observation period: 12 months

Interpretation of Results and Limitations: Overall, use of the medications that make up these indicators ranged from 17.5% for use of an anti-anxiety or hypnotic medication within the past seven days as defined by the USA indicator to 68.3% for use of at least one 'psycho-pharmacy' medication within 12 months as defined by the Netherlands indicator.

Approximately 50% of residents in Australia experienced high-sedative load as defined in the ROSA indicators, with the rate higher in residents with dementia (51.0%) compared to residents without dementia (45.6%). No other country used this indicator.

The rates of anti-anxiety or hypnotic medication use, which was used by countries that use the RAI-MDS (USA, Finland, Iceland), were comparable between Australia and the USA (assessed for the past seven days). The rates from Finland (38.7%) and Iceland (67.5%) were considerably higher than those observed in Australia for six month (26.6%) and 120-day reporting periods (24.5%), respectively. However, the rates available for comparison in these countries were ten years old. The rates of three or more psychotropic medications used in people aged 75 years and older, as used for older people in residential care and home care from Sweden, were 3-4 fold higher in Australia. *See Table 3 and Figure 3 for details.*

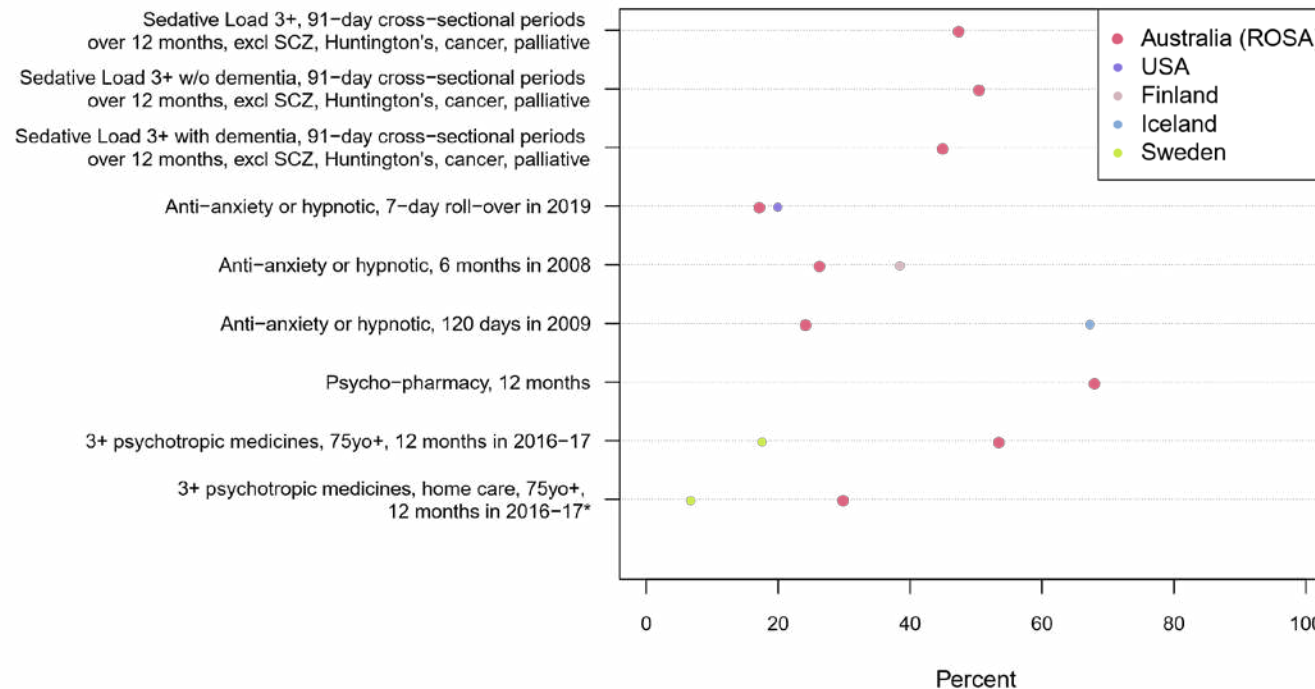
Summary: The identification of residents who have a high sedative load is an important indicator to monitor quality and safety in aged care in Australia, given the increased risk of adverse effects, including falls, fractures, hospitalisation, stroke and mortality¹³⁵⁻¹³⁸ and cognitive and physical function impairments^{139,140}. Importantly, the identification of medications that contribute to this burden will facilitate the identification of target medications that need to be reviewed. Stratification of this indicator by residents with and without the diagnosis of dementia will provide additional insight into the use of these medications in those potentially at greatest risks of harms.

Table 3. Sedative Load, Anti-Anxiety or Hypnotic Medications, Multiple Psychotropics Medications Indicators Comparison by Country*

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Sedative Load ≥ 3	LTC	91-day cross sectional periods over 12 months	Yes	2016	47.7	
<ul style="list-style-type: none"> Sedative Load ≥ 3, without dementia 					50.8	
<ul style="list-style-type: none"> Sedative Load ≥ 3 with dementia 					45.3	
Anti-anxiety or hypnotic	LTC	7 days*	No	2019	17.5	USA: 20.2
Anti-anxiety or hypnotic	LTC	6 months	No	2008	26.6	Finland: 38.7
Anti-anxiety or hypnotic	LTC	120 days	No	2009	24.5	Iceland: 67.5
≥ 3 psychotropic medications	≥ 75 yrs LTC	12 months	No	2016-2017	53.8	Sweden: 17.8
≥ 3 psychotropic medications	≥ 75 yrs Home Care	12 months	No	2016-2017	30.2	Sweden: 7.0
Psycho-pharmacy	LTC	12 months	No	N/A	68.3	Netherlands: N/A

Approximated using 30-day dispensing prior to 30 Jun 2016. Sedative load (see Appendix 2, Table I1.1); Anti-anxiety (ATC codes N05B) or hypnotic (ATC codes N05C*); ≥ 3 psychotropic medications (ATC codes N*); Psycho-pharmacy (ATC codes N05* and N06*).

Figure 3. Sedative Load, Anti-Anxiety or Hypnotic Medications, Multiple Psychotropics Medications Indicators Comparison by Country^{#,a}



[#]Long-term residential care (unless stated otherwise). ^aApproximated using 30-day dispensing prior to 30 Jun 2016. Sedative load (see Appendix 2, Table I1.1); Antianxiety (ATC codes N05B*) or hypnotic (ATC codes N05C*); ≥3 psychotropic drugs (class N); Psycho-pharmacy (ATC Codes N05* and N06*). *Home care. SCZ: schizophrenia

5.1.4 Inappropriate Medication Use Indicators

Rationale: This indicator assesses the proportion of older people either living in residential aged care or in the community with home care support who use a potentially inappropriate medication and may be at a higher risk of adverse events and poor health outcomes.

Type of Indicator: Residential aged care (long-term care), Home care

Countries: Sweden

Background: There are several medications considered potentially inappropriate for use in the older population, due to higher risk of adverse effects and harms. Inappropriate medication use is defined as the use of a medication where the risks associated with their use outweighs the benefits, especially where more effective and safer alternatives are available.¹⁴³ The use of potentially inappropriate medications is high in residential aged care; approximately half of the residents use potentially inappropriate medication¹⁴⁴ which places residents at higher risk of adverse drug events, falls, fractures, hospitalisation, delirium and mortality.¹⁴⁵ There are a number of tools / criteria that have been developed to identify and avoid the use of potentially inappropriate medications. Two recent reviews have identified between 36 and 42 different potentially inappropriate medication lists internationally.^{145,146} The most commonly used, include the Beers Criteria¹⁴⁷, STOPP / START criteria (Screening Tool of Older People's Prescriptions and Screening Tool to Alert to Right Treatment)¹⁴⁸. Medications with anticholinergic properties are also a concern in the older population as they may be associated with impaired physical and cognitive function, and people with dementia may be particularly susceptible to these effects.¹⁴⁹

Indicator Summary: Only Sweden examines this indicator for both residential care and home care for people aged 75 years and older (*see Appendix 4, Table 4.3*). This Swedish indicator includes four components of inappropriate medication use: long acting benzodiazepines (N05BA01, N05CD02, N05CD03), drugs with significant anticholinergic properties (*see Appendix 4, Table 4.4*), tramadol (N02AX02) and propiomazine (N05CM06) and is reported as the overall proportion of residents who have used at least one. Propiomazine is not subsidised by the Australian Government PBS.

Calculation of the Indicator:

Data: These figures have been calculated using ROSA PBS / RPBS data for the period starting from January 1, 2016 or the 100th day of long-term care for the person.

Definitions: At least one dispensing of the three available components of this indicator (see Appendix 4, Tables 4.3 and 4.4) for people aged ≥75 years old:

1. Long acting benzodiazepines (ATC codes N05BA01, N05CD02, N05CD03)
2. Drugs with significant anticholinergic properties (see Appendix 4, Table 4.4 for ATC codes)
3. Tramadol (ATC code N02AX02)

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in residential aged care or home care recipients aged ≥75 years old who have ≥1 dispensing of 1) a long acting benzodiazepine, 2) moderate to significant anticholinergic medication, 3) tramadol within a year, and 4) ≥1 of 1-3.

Denominator = All persons in residential aged care or home care recipients aged ≥75 years old

Exclusions: Persons <75 years old

Observation period: 12 months

Interpretation of Results and Limitations: Around one third of older Australians in residential aged care (34.6%) and home care (33.0%) were exposed to at least one potentially inappropriate medication, according to the Swedish indicator definition. Even though we were only able to include three of the four components of this indicator for Australia, the rates were approximately three times higher than that reported in the older Swedish population of long-term care (8.3%) and home care (9.6%). Moderate to severe anticholinergic medications contributed to most of this prevalence with 28% receiving at least one of these medications. Long acting benzodiazepines, which are recommended to be avoided in the older population due to higher risk of harms,¹⁵⁰ were used by 5-6% of the study population. See Table 4 and Figure 4 for details.

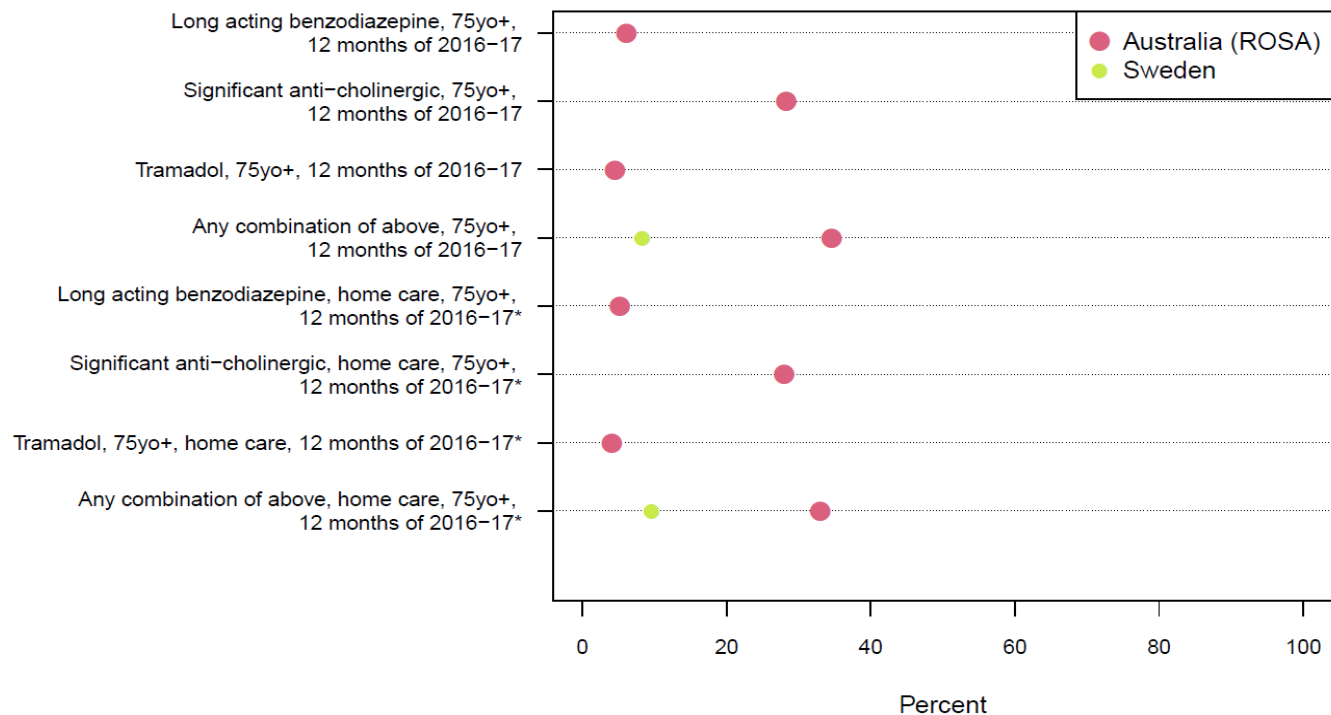
Summary: The monitoring, identification and deprescribing of potentially inappropriate medications in older people, especially in residential aged care, is of critical importance to improve quality use of medicines and reduce harm. The current indicator includes only select medications / medication classes. Increasing the utility of this indicator with a more holistic measure of potentially inappropriate medication use such as the drug burden index¹⁵⁰, which includes both sedative (e.g. opioids and benzodiazepines) and anticholinergic medications, may provide a more appropriate indicator to monitor in aged care. Studies have shown associations of the drug burden index with increased risk of hospitalisations and physical and cognitive harms.¹⁵¹

Table 4. Inappropriate Medication Use Indicators Comparison by Country

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison rate by Country %</i>
1. Long acting benzodiazepine 2. Significant anti-cholinergic 3. Tramadol 4. ≥ 1 of 1-3	≥ 75 yrs LTC	12 months	No	2016-2017	1. 6.1 2. 28.3 3. 4.5 4. (≥ 1 of 1-3) 34.6	Sweden: 8.3 (4. ≥ 1 of 1-3)
1. Long acting benzodiazepine 2. Significant anti-cholinergic 3. Tramadol 4. ≥ 1 of 1-3.	≥ 75 yrs Home Care	12 months	No	2016-2017	1. 5.2 2. 28.0 3. 4.1 4. (≥ 1 of 1-3) 33.0	Sweden: 9.6 (4. ≥ 1 of 1-3)

LTC: long-term care.

Figure 4. Inappropriate Medication Use Indicators Comparison by Country#



#Long-term residential care (unless stated otherwise). Sweden; Inappropriate medication defined as ≥ 1 of long acting benzodiazepine, medications with significant anticholinergic effects or tramadol. *Home care.

5.1.5 Antidepressant Medication Indicators

Rationale: This indicator assesses the proportion of older people either living in residential aged care or in the community with home care support who use an antidepressant.

Type of Indicator: Residential aged care (long-term care), Home care

Countries: Netherlands, SHELTER study

Background: Antidepressant medications are used to treat the symptoms of depression. A recent Australian study reported 46% of older people in residential aged care used an antidepressant.¹⁵² Non-pharmacological therapy is recommended before pharmacological therapies.¹⁵³ There are a number of different types of antidepressants, including selective serotonin-reuptake inhibitors and tricyclic antidepressants. Depression and depressive symptoms are highly prevalent in older people, especially in residential aged care where the prevalence of major depressive disorder ranges from 5–25% and the prevalence of depressive symptoms ranges from 14–82%.¹⁵⁴ Depression is associated with considerable morbidity and mortality. Despite the high prevalence, depression is commonly under-recognised and under-treated in aged care, with a reported quarter of residents with depression not receiving an antidepressant.¹⁵⁵ Potential reasons include lack of training / screening for depressive symptoms and fear of potential adverse drug reactions. Conversely, concerns have been raised regarding the over-use of antidepressants in the older population with an appropriate indication.¹⁵⁶

Indicator Summary: This indicator is used only in the Netherlands for both long-term care and home care recipients and was also examined in the SHELTER study.

Calculation of the Indicator:

Data: These figures have been calculated using ROSA PBS / RPBS data for the period starting from January 1, 2016 or the 100th day of long-term care for the person.

Definitions: At least one dispensing of an antidepressant (ATC codes N06A*) in 6 or 12 months

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in residential aged care or home care recipients who have ≥ 1 dispensing of an antidepressant during observation period

Denominator = All persons in residential aged care or home care recipients

Exclusions: No exclusions

Observation period: 6-12 months

Interpretation of Results and Limitations: The use of antidepressants in a year by people in residential aged care and home care in Australia is high, 68.3% and 46.2%, respectively. A recent Australian study has reported that 52% of people in residential aged care in 2012 had symptoms of depression.¹⁵⁷ When examining in a 6-month period, the Australian prevalence (44.5%) was higher than seven of the eight countries in the SHELTER study. The SHELTER countries ranged 8-50% with an average of 31.8%. *See Table 5 and Figure 5 for details.*

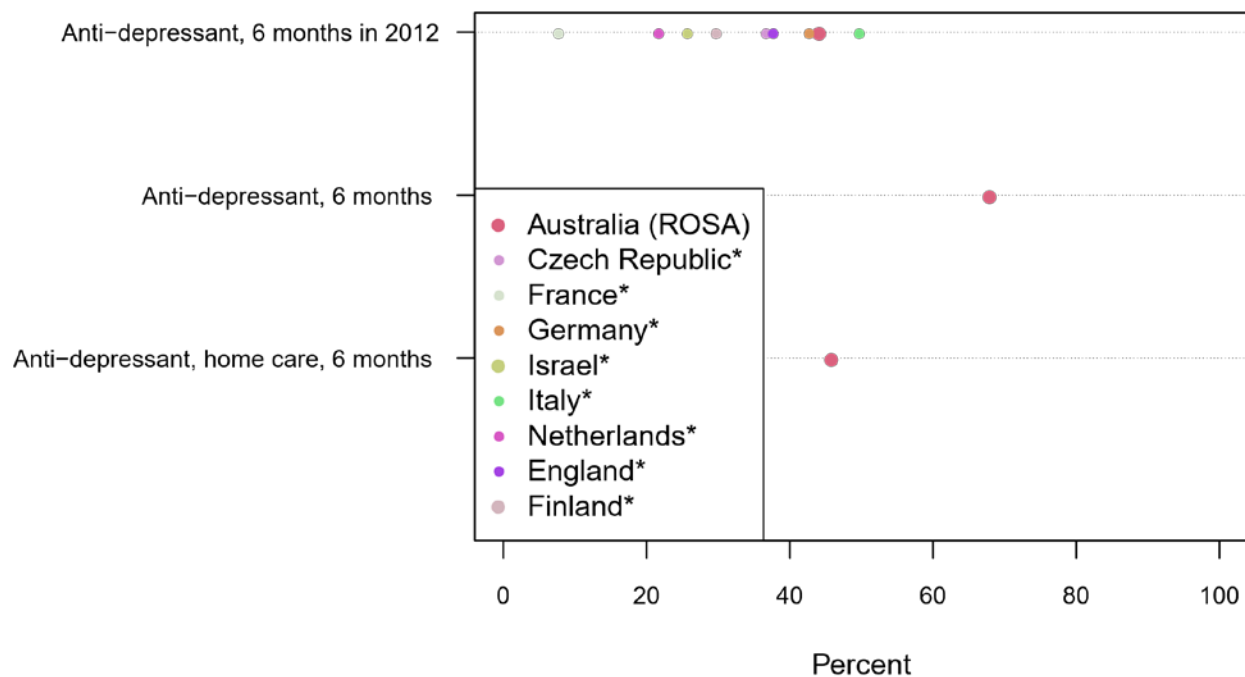
Summary: It is unclear from the review of countries' indicators sets if this indicator aims to identify older people with depression who may be undertreated or those people who are using this medication without an indication. Other indicators have been identified that clinically ascertain the presence of depression or depressive symptoms, together with the use of an antidepressant (*see Section 4.2.10*). This current indicator is a simple metric of antidepressant utilisation and the lack of clinical information supporting the use of this indicator makes interpretation difficult from a medication appropriateness perspective.

Table 5. Antidepressant Medication Indicators Comparison by Country

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Antidepressant	LTC	12 months	No	N/A	68.3	Netherlands: N/A
Antidepressant	Home care	12 months	No	N/A	46.2	Netherlands: N/A
Antidepressant	LTC	6 months	No	2012	44.5	SHELTER Study: Czech Republic: 37 Finland: 30 France: 8 Germany: 43 Israel: 26 Italy: 50 Netherlands: 22 England: 38

LTC: long-term care

Figure 5. Antidepressant Medication Indicators Comparison by Country#



#Long-term residential care (unless stated otherwise). *Countries from SHELTER study. **Home care.

5.2 Pressure Injury Indicators

Rationale: This indicator measures the proportion of older people either living in residential aged care or in the community with home care support who have pressure injuries. Pressure injuries are common in individuals in aged care, are associated with significant morbidity and mortality, and are largely preventable.

Type of Indicator: Residential aged care (short-stay, long-term care), Respite, Home care

Countries: Australia, Canada, Finland, Iceland, Korea, Netherlands, New Zealand, USA, SHELTER Study

Background: Pressure injuries are a localised injury to the skin and / or the underlying tissue that usually occurs over a bony prominence that arises from pressure, friction, and shear.¹⁵⁸ The older population are at higher risk of developing pressure injuries, as a consequence of skin and soft-tissue changes associated with ageing, in addition to other age-related impairments such as malnutrition, immobility, incontinence, impaired cognitive status and frailty.^{158,159} Pressure injuries are common in long-term care. Up to 42% of aged care residents in Australia have a pressure injury¹⁶⁰ at an estimated cost of \$13.6 million in 2012.¹⁵⁹ Pressure injuries are associated with increased pain, discomfort, immobility and mortality in addition to decreased quality of life.¹⁶¹ However, they are considered to be largely preventable.

Indicator Summary: Pressure injuries are monitored for eight countries, including Australia. They are reported as an overall prevalence of pressure injuries and by each stage of pressure injury. Some countries such as the USA include a specific indicator for short-stay residents and also report for more severe stages (II-IV) for long-term care recipients. In addition, they are also reported by whether they are new (incident) pressure injuries, or by specific resident groups such as those with diagnoses of dementia (New Zealand) or those considered to be at high-risk due to immobility (USA, Korea, SHELTER study).

Calculation of the Indicator:

Data: These figures have been calculated using ROSA hospitalisation data (SA alone using public emergency department presentations and hospitalisations; VIC & NSW combined using public and private emergency department presentations and hospitalisations), for residents alive on June 30, 2016, who had ≥100 days of long-term care.

Definitions: Pressure injury: ICD-10-AM codes L89.0*-L89.5*, L89.9*(see Appendix 2, Table I12.1). Hospitalisation for pressure injury is used as a proxy for pressure injury assessment by a care provider.

High-risk of Pressure Injury: ACFI response Q12_R5 (need of complex skin integrity management) “yes”, Q12_R10 (management of chronic wounds) “yes” or Q02 “D” (requires physical or mechanical assistance with both transfers and locomotion) (see Appendix 2, Table I12.2).

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = Number of residents (long-term care and / or respite care, or short-term care, or home care recipients) who had an emergency department presentation or hospitalisation for a pressure injury during the specified time period.

Denominator = All persons in long-term and / or respite care, or short-term care, or home care, respectively at June 30, 2016

Exclusions: Stages of pressure injury, prior pressure injuries, high or low-risk residents or presence of dementia, where relevant, depending on indicator.

Observation period: 90 days – 12 months

Interpretation of Results and Limitations: The overall rates of pressure injuries or by classification of pressure injury stages was considerably lower using hospitalisation data (as a proxy) to ascertain the cases, compared to other countries or the Australian (NMQIP) reporting systems that use active data collection. The incidence of pressure injuries using data from Australia’s recently established National Mandatory Quality Indicator Program was 8.7% in a 90 day reporting period, compared with the recording of pressure injuries during a hospital admission which was 0.6-1.1% using the ROSA data. The ROSA rates are

2.9-3.3% of long-term care residents when calculated for a 12 month period. For home care recipients pressure injury was recorded in 7.6-10.8% of hospitalisations in a 12 month period.

When the analyses were stratified by more severe stages (II-IV) only or those who are considered to be at increased risk of pressure injury, some comparable results were observed. For example, 2.7% and 2.2% of residents from Canada and New Zealand, respectively were reported to have stage II-IV pressure injuries in a 90 day period, compared to 0.51-0.55% using ROSA hospitalisation data. Similarly, when analysis was limited to residents with dementia, 0.3% of residents in New Zealand reported a stage II-IV pressure injury compared to 0.40-0.48% using ROSA hospitalisation data. While the use of data from hospitalisation records as a proxy for active reporting of pressure injuries by a care provider underestimates the prevalence of pressure injuries overall, there is likely greatest under-capture of people with Stage I pressure ulcers as they are less likely to be hospitalised for this or have this contributing to the reason for admission or care. *See Table 6 and Figure 6 for details.*

Summary: There is significant national and international consensus on the importance of monitoring pressure injuries as a measure reflective of quality of care. The current national reporting program (NMQIP) relies on active collection, which may be burdensome for providers, but enables the robust collection of pressure injuries in aged care if implemented properly, in addition to the identification of less severe pressure injuries that are unlikely to be captured from hospital data. The use of hospitalisation data (including emergency department presentations) as done in ROSA, although more limited, will still identify practice variation in the care of pressure injuries and should be considered for inclusion in routine monitoring. Further it appears that pressure injuries are likely contributing to hospitalisations for home care recipients and this data can be used to monitor burden and practice variations.

Table 6. Pressure Injury^a Indicators Comparison by Country

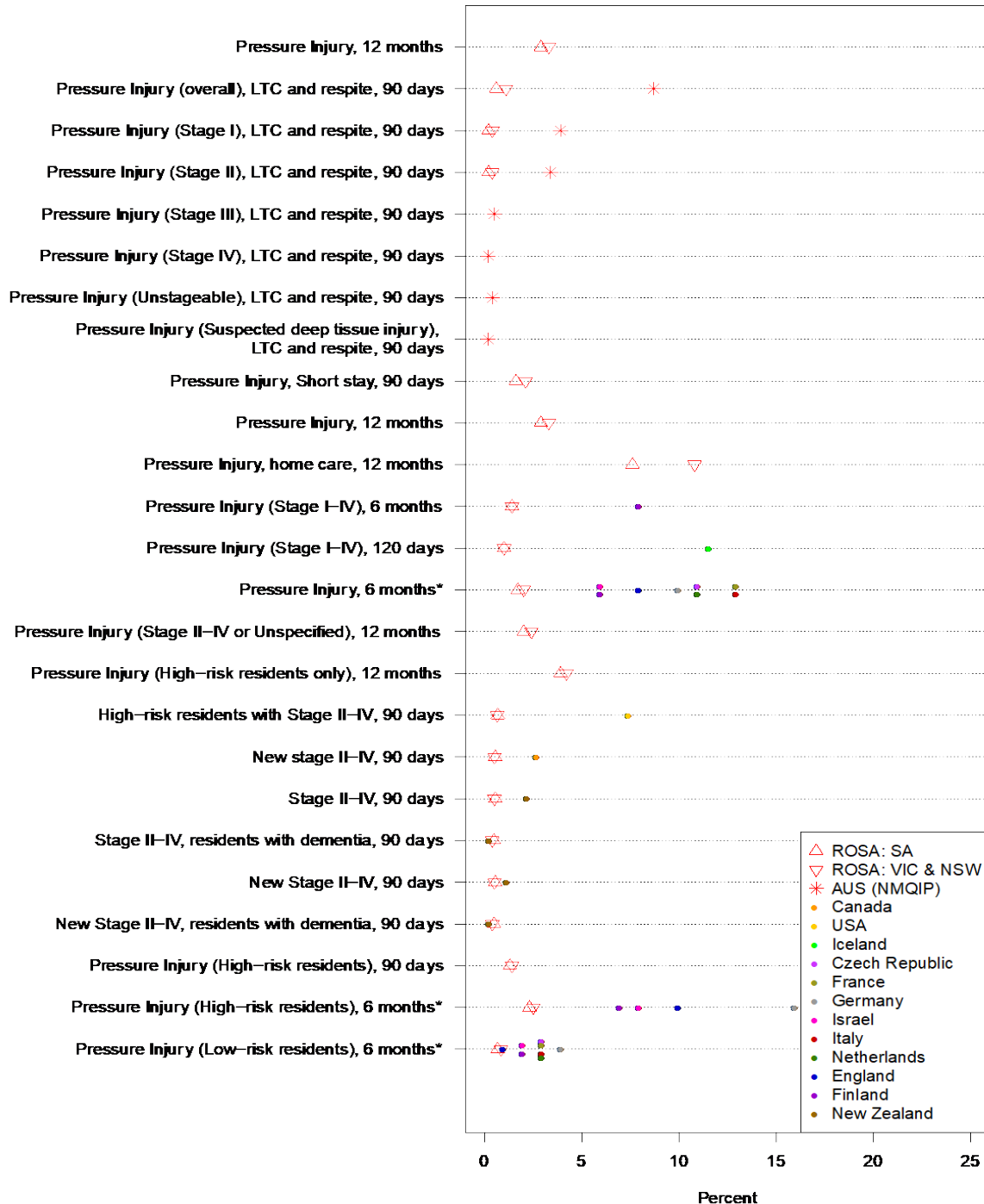
<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Pressure Injury	LTC	12 months	Yes	2016	SA: 2.9 VIC & NSW: 3.3	
Pressure Injury (overall)	LTC and respite	90 days	No	2019	SA: 0.06 per 1000 (or 0.6%) VIC & NSW: 0.13 per 1000 resident days (or 1.1%)	Australia (NMQIP): 0.83 per 1000 resident days (or 8.7%)
Pressure Injury (Stage I)	LTC and respite	90 days	No	2019	SA: 0.02 per 1000 resident days (or 0.2%) VIC & NSW: 0.04 per 1000 resident days (or 0.4%)	Australia (NMQIP): 0.36 per 1000 resident days (or 3.9%)
Pressure Injury (Stage II)	LTC and respite	90 days	No	2019	SA: 0.02 per 1,000 resident days (or 0.2%) VIC & NSW: 0.04 per 1000 resident days (or 0.4%)	Australia (NMQIP): 0.34 per 1000 resident days (or 3.4%)
Pressure Injury (Stage III)	LTC and respite	90 days	No	2019	Unable to be reported*	Australia (NMQIP): 0.05 per 1000 resident days (or 0.5%)
Pressure Injury (Stage IV)	LTC and respite	90 days	No	2019	Unable to be reported*	Australia (NMQIP): 0.02 per 1000 resident days (or 0.2%)
Pressure Injury (Unstageable)	LTC and respite	90 days	No	2019	Unable to be reported*	Australia (NMQIP): 0.04 per 1000 resident days (or 0.4%)

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Pressure Injury (Suspected deep tissue injury)	LTC and respite	90 days	No	2019	Unable to be reported*	Australia (NMQIP): 0.02 per 1000 resident days (or 0.2%)
Pressure Injury (overall)	LTC and respite	90 days	No	2019	SA: 0.06 VIC & NSW: 0.13 per 1000 bed days	Australia (Victoria): N/A per 1000 bed days
Pressure Injury	Short-stay	90 days	No	2019	SA: 1.6 VIC & NSW: 2.1	USA: N/A
Pressure Injury	LTC	12 months	No	N/A	SA: 2.9 VIC & NSW: 3.3	Netherlands: N/A
Pressure Injury	Home care	12 months	No	N/A	SA: 7.6 VIC & NSW: 10.8	Netherlands: N/A
Pressure Injury (Stage I-IV)	LTC	6 months	Yes		SA: 1.4 VIC & NSW: 1.4	Finland: 8.0
Pressure Injury (Stage I-IV)	LTC	120 days	Yes	2009	SA: 1.0 VIC & NSW: 1.0	Iceland: 11.6
Pressure Injury	LTC	6 months	No	2012	SA: 1.7 VIC & NSW: 2.0	SHELTER Study: Czech Republic: 11.0 Finland: 6.0 France: 13.0 Germany: 10.0 Israel: 6.0 Italy: 13.0 Netherlands: 11.0 England: 8.0

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Pressure Injury Stage II-IV or High-Risk						
Pressure Injury (Stage II-IV or Unspecified)	LTC	12 months	Yes	2016	SA: 2.0 VIC & NSW: 2.4	
Pressure Injury High-risk residents only	LTC	12 months	Yes	2016	SA: 3.9 VIC & NSW: 4.2	
High-risk residents with Stage II-IV	LTC	90 days	No	2019	SA: 0.68 VIC & NSW: 0.65	USA: 7.43
New stage II-IV ^b	LTC	90 days	Yes	2018-19	SA: 0.55 VIC & NSW: 0.51	Canada: 2.7 - unadjusted 2.2 - adjusted
Stage II-IV	LTC	90 days	No	2018-2019	SA: 0.55 VIC & NSW: 0.51	New Zealand: 2.2
Stage II-IV, residents with dementia	LTC	90 days	No	2018-19	SA: 0.48 VIC & NSW: 0.40	New Zealand: 0.3
New Stage II-IV	LTC	90 days	No	2018-2019	SA: 0.55 VIC & NSW: 0.51	New Zealand: 1.2
New Stage II-IV, residents with dementia ^b	LTC	90 days	No	2018-2019	SA: 0.48 VIC & NSW: 0.40	New Zealand: 0.3
Pressure Injury High-risk residents	LTC	90 days	No	N/A	SA: 1.3 VIC & NSW: 1.4	Korea: N/A
Pressure Injury High-risk residents	LTC	6 months	No	2012	SA: 2.3 VIC & NSW: 2.5	SHELTER Study: Czech Republic: 17.0 Finland: 7.0 France: 18.0 Germany: 16.0 Israel: 8.0 Italy: 17.0

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
						Netherlands: 18.0 England: 10.0
Pressure Injury Low-risk residents	LTC	6 months	No	2012	SA: 0.67 VIC & NSW: 0.84	SHELTER Study: Czech Republic: 3.0 Finland: 2.0 France: 3.0 Germany: 4.0 Israel: 2.0 Italy: 3.0 Netherlands: 3.0 England: 1.0

^a Hospitalisation for Pressure injury is used as a proxy for pressure injury assessment by a care provider. ^bUnable to identify 'new pressure injury' in hospitalisation data. *Unable to be reported due to small numbers. LTC: long-term care, NMQIP: National Mandatory Quality Indicator Program

Figure 6. Pressure Injury Indicators Comparison by Country^{#,a}


[#]Long-term residential care (unless stated otherwise). ^aHospitalisation for Pressure injury is used as a proxy for pressure injury assessment by a care provider. *Countries from SHELTER study. NMQIP: National Mandatory Quality Indicator Program

5.3 Falls / Fractures Indicators

Rationale: These indicators measure the proportion of older people either living in residential aged care or in the community with home care support who have a: i) fall or ii) fracture. Falls, which result in fractures, are a major public health problem in older people. Both falls and fractures are associated with increased mortality and are the leading cause of non-fatal injury in the older population.

Type of Indicator: Residential aged care (long-term care and respite), home care

Countries: Australia (Victoria), Canada, Iceland, Finland, Netherlands, New Zealand, Sweden, USA

Background: Falls in older people are a public health priority due to their high prevalence, related injuries, increased mortality and reduced quality of life.^{162,163} In Australia, falls are the leading cause of hospitalised injury (41%) and injury-related deaths (37% of all deaths).¹⁶⁴ It is estimated that the total healthcare costs associated with fall-related injuries in the older population in Australia in 2021 will be \$790 million.¹⁶⁵ A third of older people living in the community and up to 50% of people in residential aged care fall at least once yearly.¹⁶⁶ The presence of dementia increases the risk of falling over 3-fold in older people in residential aged care compared to those without dementia.¹⁶⁷

Falls can be prevented. Risk factors associated with falls can be divided into two broad categories: intrinsic factors (e.g. mobility problems, cognitive impairment, frailty) and extrinsic factors (e.g. environmental factors such as lighting or flooring, organisation factors (e.g. staff)).¹⁶⁶ Medication use is categorised as either intrinsic or extrinsic but is considered to be one of the most modifiable risk factors for falls.¹⁶⁸ There are a number of medication classes associated with increased risk of falls including antidepressants, antipsychotics, hypnotics and benzodiazepines.¹⁶⁸

Fractures, especially hip fractures are a common injury associated with a fall. Approximately a third of fall-related injuries in community dwelling older people are for a fracture.¹⁶⁹ In 2015-16 in Australia, 93% of hip fractures were the result of a fall-related injury, and 87% were minimal trauma (low-impact) falls.¹⁷⁰ Hip fracture is associated with decreased

mobility and quality of life, admission to residential aged care, and death.^{171,172}

Approximately 25% of those with a hip fracture die within one year of the fracture and over 50% will have some degree of functional impairment after this period.^{171,172}

Indicator Summary: Eight countries include falls as a quality and safety indicator, this includes three countries that use it for both residential aged care and home care (Canada, Netherlands, Sweden). Sweden and USA include falls *with* injury and New Zealand includes stratification by residents with dementia. Four countries (Victoria Australia, Canada, Finland and Sweden) included fracture indicators. Victoria Australia's indicator was specifically fracture associated with a fall, Canada's indicator was for home care and hospitalisation for a fracture or burn, while Sweden included a hip fracture indicator for both residential and home care.

Calculation of the Indicators:

Data: Falls: These figures have been calculated using ROSA hospitalisation data (SA using public emergency department presentations and hospitalisations; VIC & NSW using public and private emergency department presentations and hospitalisations).

Fractures: These figures have been calculated using ROSA hospitalisation data (SA using public emergency department presentations and hospitalisations; VIC & NSW using public and private emergency department presentations and hospitalisations) and ROSA MBS data (SA alone and VIC & NSW)

For the period starting from January 1, 2016 or the 100th day of long-term care.

Definitions: Falls: ICD-10-AM External causes codes W00*-W19* onset not in hospital (*see Appendix 2, Table 16.1*)

Injuries: ICD-10-AM codes S00*-T14.9* or T79*

Hospitalisations (including emergency department presentations) that have a diagnosis of a fall are used as a proxy for falls.

Fractures: ICD-10-AM codes for fractures as described in *Appendix 2, Table 17.1*. MBS codes for non-surgical and surgical treatment of fractures as described in *Appendix 2, Table 17.2*.

Burns: ICD-10-AM codes T20*-T31*

Falls

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in long-term care or respite care, or home care recipients who have had a fall within the specified time frame

Denominator = All persons in long-term care or respite care, or home care recipients within the specified time frame

OR

Numerator = All persons in long-term care or respite care, or home care recipients who have had a fall associated with injury within the specified time frame

Denominator = All persons in long-term care or respite care, or home care recipients within the specified time frame

OR

Numerator = All persons in long-term care with dementia who have had a fall within the specified time frame

Denominator = All persons in long-term care with dementia within the specified time frame

OR

Numerator = Number of residents in long-term care and respite care who have had a fall in 90 days

Denominator = Total number of bed (resident) days in 90 days

$$\frac{\text{Numerator}}{\text{Denominator}} \times 1000 \text{ bed days}$$

Fractures

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in long-term care or respite care, or home care recipients who have had a fall-related fracture, fracture or burns, or hip fracture within the specified time frame

Denominator = All persons in long-term care or respite care, or home care recipients within the specified time frame

OR

$\frac{\text{Numerator}}{\text{Denominator}} \times 1000 \text{ bed days}$
--

Numerator: Number of residents in long-term care and respite care who have had a fall-related fracture in 90 days

Denominator: Total number of bed (resident) days in 90 days

Exclusions: Onset of fall in hospital. For Swedish falls indicator <80 years old and fracture indicator <65 years old.

Observation period: 30 days -12 months

Interpretation of Results and Limitations: Over 12 months, 10.0% to 11.9% of Australian aged care residents had a hospital encounter because of a fall. When examined over a 30-day period, 1.2% to 1.6% of residents experienced a fall associated hospitalisation using ROSA data compared to 8.7% in Finland, 13.8% in Iceland and 18.2% in New Zealand. In a 90 day period 3.4% to 4.3% of residents had a fall associated hospitalisation, compared to 14.8% in Canada. The observed incidence of falls estimated from hospitalisation data in ROSA were at-least 5-fold less than those reported in the comparison countries. This is reflective of the use of hospitalisation data to ascertain falls, resulting in under-capture of falls, namely those not requiring hospitalisation. This was also observed for home care recipients where 8.3% to 8.4% were hospitalised for a fall, which was lower than the reported rate in Canada (26.4%). The inclusion of injury associated with a fall resulted in more consistent findings with the comparison countries. For example, 2.9% to 3.1% of Australian residents had a fall that was associated with an injury using the ROSA data in a 90-day period, similar to the reported rate in the USA of 3.4%. Examination of falls with injury for people aged 80 years and older, as specified in the Swedish indicator, was 10.9% to 12.8% for Australian residents compared to 6% in Swedish residents.

Over a 12 month period 4.8% to 5.5% of Australian aged care residents were hospitalised for a fracture. Examination of fracture as described by the Victorian indicators showed that 1.3% to 1.4% of residents had a fracture with the majority (76.9% to 81.3%) resulting from a fall. In a 6 month period the prevalence of fractures was 2.7% to 3.3% compared to Finland

which was 1.1%. Sweden specifically looks at hip fractures in people aged 65 years and older in a 12-month period, with the rate observed in Australia using the ROSA data (2.7% to 3.3%) being higher than the rate reported in Sweden 0.86%.

Canada and Sweden both examine this for home care recipients. The rate of hip fractures for Sweden over 12 months is 0.86% which compares to 2.0% to 2.9% in Australia. Canada also includes hospitalisation for burns and fractures, with rates in Australia of 2.9-3.3% in a 90-day period similar to the 2.5% reported in Canada. *See Table 7 and Figure 7 for details.*

Summary: Given that falls are a major public health problem for older people, are associated with increased mortality and morbidity, and in part can be prevented, it is essential that this is included as a quality and safety measure in Australia. This indicator should be monitored for both residents in residential aged care and home care recipients. While the use of hospitalisation data likely under-captures the actual rate of those who fall, the use of injury associated with a fall resulting in hospitalisation as an indicator provides a reliable estimate of the likely harms associated with a fall.

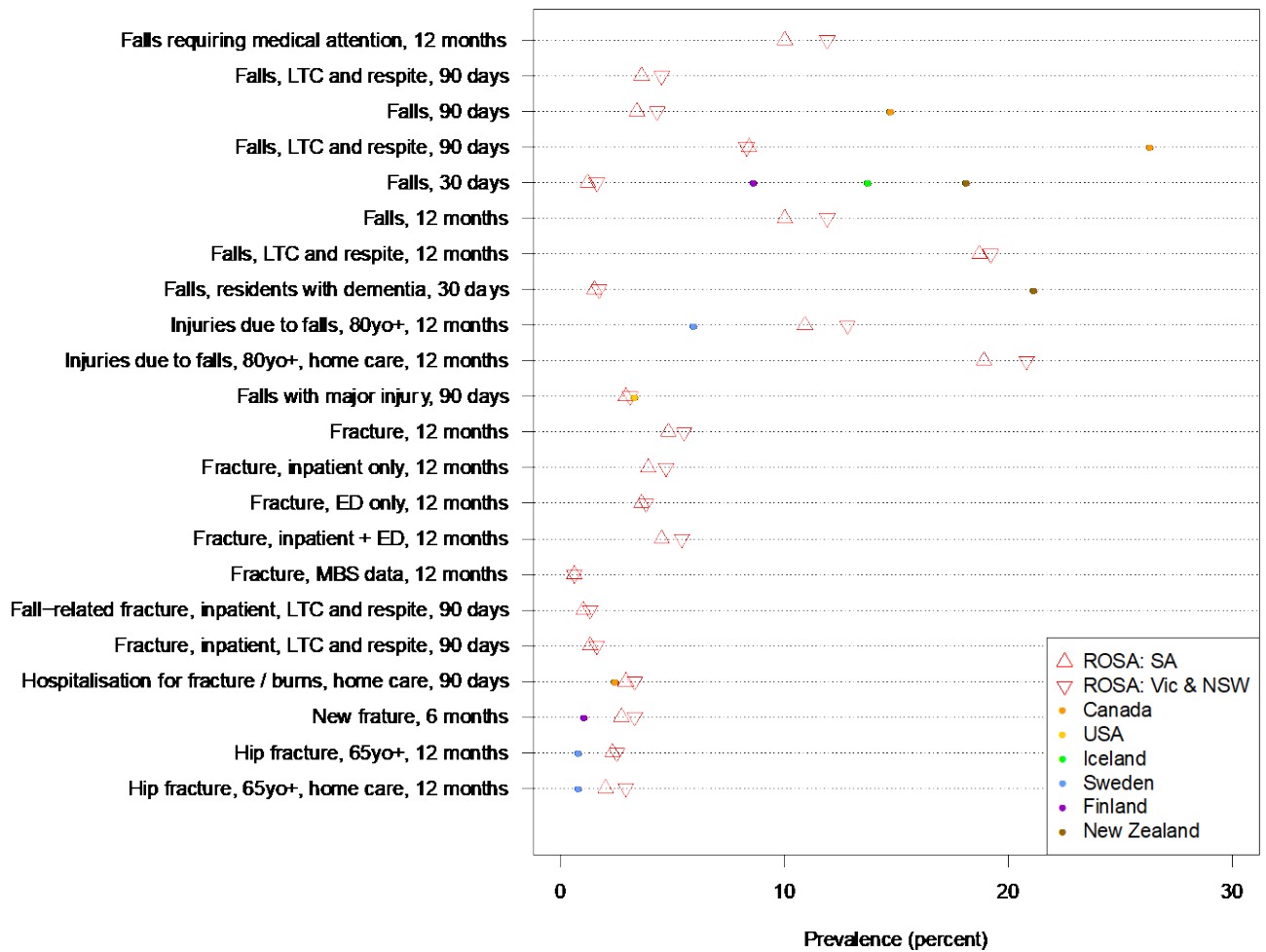
Table 7. Falls^a / Fractures Indicators Comparison by Country

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Falls requiring medical attention	LTC	12 months	Yes	2016	SA: 10.0 VIC & NSW: 11.9	
Falls	LTC and respite	90 days	No	N/A	SA: 0.42 per 1000 bed days (or 3.6%) VIC & NSW: 0.53 per 1000 bed days (or 4.5%)	Australia (Victoria): N/A per 1000 bed days (or N/A%)
Falls	LTC	90 days	Yes	2018-2019	SA: 3.4 VIC & NSW: 4.3	Canada: Unadjusted: 14.8 Adjusted: 16.7
Falls	Home care	90 days	Yes	2018-2019	SA: 8.4 VIC & NSW: 8.3	Canada: 26.4
Falls	LTC	30 days	No	2008	SA: 1.2 VIC & NSW: 1.6	Finland: 8.7
Falls	LTC	30 days	No	2009	SA: 1.2 VIC & NSW: 1.6	Iceland: 13.8
Falls	LTC	12 months	No	N/A	SA: 10.0 VIC & NSW: 11.9	Netherlands: N/A
Falls	Home care	12 months	No	N/A	SA: 18.7 VIC & NSW: 19.2	Netherlands: N/A
Falls	LTC	30 days	No	2018-2019	SA: 1.2 VIC & NSW: 1.6	New Zealand: 18.2
Falls, residents with dementia	LTC	30 days	No	2018-2019	SA: 1.5 VIC & NSW: 1.7	New Zealand: 21.2
Injuries due to falls ≥80 yrs	LTC	12 months	No	2016-2017	SA: 10.9 VIC & NSW: 12.8	Sweden: 6.0 or 60 per 1000 persons
Injuries due to falls ≥80 yrs	Home care	12 months	No	2016-2017	SA: 18.9 VIC & NSW: 20.8	Sweden: N/A

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Falls with major injury	LTC	90 days	No	2019	SA: 2.9 VIC & NSW: 3.1	USA: 3.37
Fractures						
Fractures (total)	LTC	12 months	Yes	2016	SA: 4.8 VIC & NSW: 5.5	
Fractures Hospitalisation (Inpatient data only)	LTC	12 months	Yes	2016	SA: 3.9 VIC & NSW: 4.7	
Fractures Hospitalisation (ED data only)	LTC	12 months	Yes	2016	SA: 3.6 VIC & NSW: 3.8	
Fractures Hospitalisation (Inpatient + ED data)	LTC	12 months	Yes	2016	SA: 4.5 VIC & NSW: 5.4	
Fractures (MBS data)	LTC	12 months	Yes	2016	SA: 0.6 VIC & NSW: 0.6	
Fall-related fracture (%)	LTC and respite	90 days Inpatient data	No	N/A	SA:1.0 VIC & NSW: 1.3	Australia (Victoria): N/A
Fracture	LTC and respite	90 days Inpatient data	No	N/A	SA:1.3 VIC & NSW: 1.6	Australia (Victoria): N/A
Fall-related fracture (rate)	LTC and respite	90 days Inpatient data	No	N/A	SA: 0.12 per 1000 VIC & NSW: 0.15 per 1000 bed days	Australia (Victoria): N/A per 1000 bed days
Hospitalisation for fracture / burns	Home care	90 days	Yes	2018-2019	SA: 2.9 VIC & NSW: 3.3	Canada: 2.5
New fractures	LTC	6 months	No	2008	SA: 2.7 VIC & NSW: 3.3	Finland: 1.1
Hip fracture	≥65 yrs LTC	12 months	No	2016-2017	SA: 2.3 VIC & NSW: 2.5	Sweden: 0.86 858 per 100000 persons ^b

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Hip fracture	≥65 yrs Home care	12 months	No	2016-2017	SA: 2.0 VIC & NSW: 2.9	Sweden: 0.86 858 per 100000 persons ^b

^a Hospitalisations (including emergency department presentations) that have a diagnosis of a fall are used as a proxy for falls. ^bData for this indicator in Sweden is available for all people aged ≥65 years old. LTC: long-term care. ED: Emergency department.

Figure 7. Falls / Fractures Indicators Comparison by Country[#]


[#]Long-term residential care (unless stated otherwise). ^aHospitalisations (including emergency department presentations) that have a diagnosis of a fall are used as a proxy for falls. ^bData for this indicator in Sweden is available for all people aged ≥65 years old.

5.4 Weight Loss / Malnutrition / Tube Feeding / Dehydration Indicators

Rationale: These indicators examine weight loss, malnutrition, or dehydration in older people either living in residential aged care or in the community with home care support. Malnutrition in the older population is associated with increased morbidity and mortality. Weight loss and dehydration can be useful indicators of nutritional status and health issues when examined within the context of personal history and overall health status.

Type of Indicator: Residential aged care (long-term care), home care

Countries: Australia (National, Victoria), Canada, Finland, Iceland, Korea, New Zealand, Netherlands, USA, SHELTER study

Background: Unintended weight loss and malnutrition are highly prevalent in individuals living in residential aged care settings and often associated with poor health outcomes, reduced quality of life and related healthcare costs.^{173,174} Unplanned weight loss can be a clinical symptom and consequence of poor health or presence of disease, and is one of the best indications of poor nutrition in the older population.¹⁷⁵ It is reported that up to 50% of Australian aged care residents are malnourished and up to 30% of older adults report unplanned weight loss.^{176,177} Unplanned weight loss and malnutrition are associated with higher mortality and morbidity, including increased risk of falls and fracture, pressure injury development, hospitalisations, infections, poor recovery from disease or surgery, reduced physical and mental function, and lower quality of life.¹⁷⁴ Dehydration affects up to 30% of older people and can be associated with serious health issues and reduced quality of life. Poor health outcomes associated with dehydration include higher risk of falls and fractures, delirium, urinary tract infections, renal failure, prolonged recovery from illness or surgery, and mortality.^{178,179}

While malnutrition is a geriatric syndrome, its causes are not well understood and not just the result of age-related changes. The presence of chronic conditions such as cancer or dementia, medication-related adverse effects (i.e. altered taste or smell, anorexia, nausea and vomiting) and polypharmacy are known to result in weight loss and malnutrition.^{174,180} In addition, other non-clinical external factors are also known to play a role, including

quality of meals provided, dining environment, financial constraints, and assistance provided by staff.¹⁷⁴

Indicator Summary: Eight countries examine weight loss as a quality and safety indicator, including both Australia's NMQIP and Victorian indicators for aged care. The Australian indicators include two measures of weight loss: significant weight loss (defined as ≥ 3 kg) and consecutive weight loss (defined as any amount of weight loss every month in the 90-day time period). New Zealand stratifies its unexplained weight loss indicator by the presence of dementia in residents. Canada examines this indicator for recipients of home care only. The Netherlands' indicator is termed malnutrition but is defined as unintentional weight loss. Two countries (New Zealand and Iceland) and the SHELTER study include the presence of a feeding tube in their indicator sets. Dehydration is also included as a quality and safety measure in Finland and Iceland.

Calculation of the Indicators:

Data: Weight loss / malnutrition / dehydration: These figures have been calculated using ROSA hospitalisation data (SA using public emergency department presentations and hospitalisations; VIC & NSW using public and private emergency department presentations and hospitalisations).

Feeding tube: These figures have been calculated using ACFI data and ROSA MBS data.

For the period starting from January 1, 2016 or the 100th day of long-term care.

Definitions: Hospitalisation (including ED presentation) for weight loss (ICD-10-AM codes R63.4, R63.6, R64*, Z68.1) or malnutrition (ICD-10-AM codes E43*, E44.0, E44.1, E46*, E63.9) included as primary or secondary diagnosis will be used as a proxy for measured weight loss (including significant, consecutive, unexplained or unintentional weight loss).

Feeding tube: ACFI Q12 Complex health care needs (Item R17) or having one of the MBS items (MBS codes 30481 30482 30483 31456 31458 31460).

Dehydration: ICD-10-AM codes E86* (onset not in hospital)

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in long-term care or home care who have had a hospitalisation for: i) weight loss or malnutrition, ii) feeding tube, or iii) dehydration within the specified time period.

Denominator = All persons in residential aged care or home care at June 30, 2016

$$\frac{\text{Numerator}}{\text{Denominator}} \times \frac{1000 \text{ resident days}}{\text{resident days}}$$

Numerator = Number of residents in long-term care who have had a hospitalisation for weight loss or malnutrition in 90 days.

Denominator = Total number of bed (resident) days in 90 days

Exclusions: Palliative care, cancer, respite care or residents without dementia (New Zealand) depending on the indicator

Observation period: 30 days - 12 months

Interpretation of Results and Limitations: Using the ROSA data from hospitalisations and emergency department presentations as a proxy to capture the proportion of residents in aged care with weight loss / malnutrition, the Australian rates were 0.11-0.26% using a 30 day time period and 0.70-1.8% for a 12 month period. The rate of weight loss or malnutrition hospitalisations was 0.04 to 0.10 per 1000 resident days for a 90-day time period compared to 0.74 to 0.76 per 1000 resident days using data from the NMQIP. Similarly, the prevalence of weight loss / malnutrition was 0.4-1.0% of residents using ROSA hospitalisation data compared to 10.9% incidence reported in the NMQIP. Overall, both the proportions and rate observed using hospitalisation as a proxy for weight loss or malnutrition were considerably less (16.6 to 48.7-fold less) than the comparison prevalence or rates from other countries that were derived from active data collection measuring residents' weight.

For home care recipients, 4.0-9.3% had weight loss / malnutrition reported as either the reason for hospital admission or contributing to the hospital admission in 6 months, similar to that reported for Canadian home care recipients (7.0%) that was derived from active data collection of weight.

The use of hospitalisations as a proxy for this indicator is likely under-capturing the proportion of residents with weight loss, as only the most extreme of cases are likely to be hospitalised for this or have this reported as a secondary diagnosis contributing to hospitalisation. Prevalence of feeding tubes and dehydration were similar between the rates reported in other countries and those observed using the ROSA hospitalisation data. However, these indicators are more likely to be reflective of healthcare needs rather than outcomes associated with care. *See Table 8 and Figure 8 for details.*

Summary: Monitoring the prevalence of unplanned weight loss provides an indication of important aspects of care. Many causes of weight loss can potentially be addressed if detected and acted upon in a timely manner.^{177,180} There is significant national and international consensus on the importance of monitoring weight loss as a measure reflective of quality of care. The current Australian NMQIP relies on active data collection, which may be burdensome for providers, but provides a more accurate, sensitive and timely measure of weight loss that cannot be captured from other data sources such as hospitalisation data. However, the use of hospitalisation data may still give insights into variation in care across aged care providers and an opportunity to monitor weight loss as a quality of care metric for home care recipients.

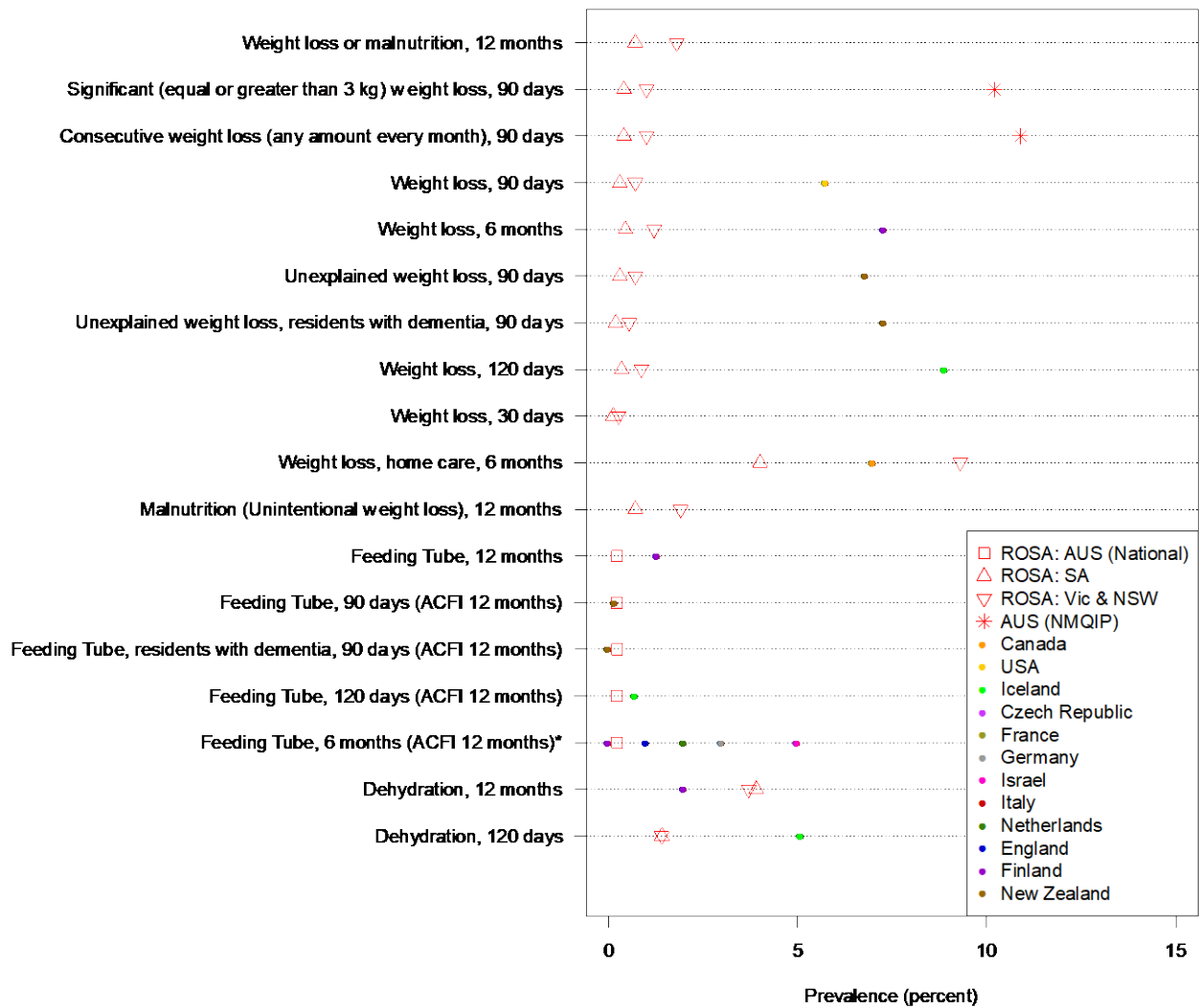
Table 8. Weight Loss / Malnutrition / Tube Feeding / Dehydration Indicators Comparison by Country

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Weight loss or malnutrition	LTC	12 months	Yes		SA: 0.70 VIC & NSW: 1.8	
Significant (≥ 3 kg) weight loss ^a	LTC	90 days	No	2019	SA: 0.04 per 1000 resident days (or 0.4%)	Australia (NMQIP): 0.74 per 1000 days (or 10.2%)
Consecutive weight loss (any amount every month) ^a	LTC	90 days	No	2019	VIC & NSW: 0.10 per 1000 resident days (or 1.0%)	Australia (NMQIP): 0.76 per 1000 days (or 10.9%)
Significant (≥ 3 kg) weight loss ^a	LTC	90 days	No	2019	As above	Australia (VIC): N/A per 1000 bed days
Consecutive weight loss (any amount every month) ^a	LTC	90 days	No	2019		Australia (VIC): N/A per 1000 bed days
Weight loss ^a	LTC	90 days	No	2019	SA: 0.29 VIC & NSW: 0.70	USA: 5.75
Weight loss ^a	LTC	6 months	No	2008	SA: 0.44 VIC & NSW: 1.2	Finland: 7.3
Unexplained weight loss ^a	LTC	90 days	No	2018-2019	SA: 0.29 VIC & NSW: 0.70	New Zealand: 6.8
Unexplained weight loss, residents with dementia ^a	LTC	90 days	No	2018-2019	SA: 0.18 VIC & NSW: 0.54	New Zealand: 7.3
Weight loss ^a	LTC	120 days	No	2009	SA: 0.34 VIC & NSW: 0.86	Iceland: 8.9
Weight loss ^a	LTC	30 days	No	N/A	SA: 0.11 VIC & NSW: 0.26	Korea: N/A
Weight loss ^a	Home care	6 months	Yes	2018-2019	SA: 4.0 VIC & NSW: 9.3	Canada: 7.0

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Malnutrition (Unintentional weight loss) ^a	LTC	12 months	No		SA: 0.7 VIC & NSW: 1.9	Netherlands: N/A
Feeding Tube						
Feeding Tube	LTC	12 months	No	2008	0.22	Finland: 1.3
Feeding Tube	LTC	90 days ACFI 12 months ^b	No	2018-2019	0.22	New Zealand: 0.17
Feeding Tube, residents with dementia	LTC	90 days ACFI 12 months ^b	No	2018-2019	0.22	New Zealand: 0
Feeding Tube	LTC	120 days ACFI 12 months ^b	No	2009	0.22	Iceland: 0.7
Feeding Tube	LTC	6 months ACFI 12 months ^b	No	2012	0.22	SHELTER Study: Czech Republic: 1.0 Finland: 0 France: 0 Germany: 3.0 Israel: 5.0 Italy: 2.0 Netherlands: 2.0 England: 1.0
Dehydration						
Dehydration	LTC	12 months	No	2008	SA: 3.9 VIC & NSW: 3.7	Finland: 2.0
Dehydration	LTC	120 days	No	2009	SA: 1.4 VIC & NSW: 1.4	Iceland: 5.1

^aHospitalisation for weight loss / malnutrition is used as a proxy for measured weight loss (termed significant, consecutive, unexplained or unintentional weight loss) available from active data collection. ^bBased on ACFI data within a 12-month period (2016), therefore unable to look at specific observation time periods of indicator. LTC: long-term care, NMQIP: National Mandatory Quality Indicator Program

Figure 8. Weight Loss / Malnutrition / Feeding Tube / Dehydration Indicators Comparison by Country^{#,a,b}



[#]Long-term residential care (unless stated otherwise). ^aHospitalisation for weight loss / malnutrition is used as a proxy for measured weight loss (termed significant, consecutive, unexplained or unintentional weight loss) that are collected through active data collection.

*Countries from SHELTER study. ^bBased on ACFI data within a 12-month period (2016), therefore unable to look at specific observation time periods of indicator.

5.5 Incontinence Indicators

Rationale: These indicators measure the prevalence of bladder / bowel incontinence in older people either living in residential aged care or in the community with home care support. While prevalent in the older population, incontinence should not be considered as part of the normal ageing process. It can significantly reduce quality of life and can often be successfully treated or managed to mitigate impact.

Type of Indicator: Residential aged care (long-term care), Home care

Countries: Canada, Finland, Iceland, Korea, Netherlands, USA and SHELTER study

Background: There are two types of incontinence: urinary and faecal (or bowel) incontinence.¹⁸¹ Incontinence is not a physiological part of the ageing process, but age-related changes to the urinary tract together with other ageing factors such as frailty, cognitive conditions or impaired mobility, for example, result in older adults being at increased risk.^{182,183}

There are limited Australian incontinence prevalence data and it is likely to be underestimated due to a lack of assessment and under-reporting.¹⁸² The 2009 Australian Survey of Disability, Ageing and Carers reported that 7.2% of people aged ≥ 65 years old and nearly a quarter (24.5%) of people aged 85 experience severe incontinence that has severely or profoundly limited core activities, reflective of high care needs.¹⁸⁴ The prevalence of incontinence is higher in the residential aged care population, with 75.6% of people in cared accommodation in Australia having severe incontinence, requiring assistance with managing their bladder or bowel control.¹⁸⁴ A recent Australian review reported 12% of the older population to have faecal incontinence and 50% for residents in aged care.¹⁸⁵

Incontinence increases the risk of poor health outcomes, such as falls, fractures and mortality.^{186,187} It is also associated with poor quality of life, functional impairment and deterioration in mental health.^{182,188} The financial costs in Australia associated with incontinence are estimated to be \$1.6 billion in 2008-09.¹⁸⁴ Residential aged care contributes to the majority of this (\$1.3 billion) which was reflective of 30% of the total Australian government subsidy for residential aged care (\$4.8 billion).¹⁸⁴

Indicator Summary: A total of six countries and the SHELTER study examine bladder / bowel incontinence. All but Canada and Korea include both bladder and bowel continence together in the indicator. Canada includes bladder incontinence for home care recipients, and Korea examines bladder and bowel incontinence as individual indicators. The USA examines incontinence as an indicator for ‘low-risk’ residents (residents with dementia, moderate to high cognitive impairment, or dependant mobility are excluded). The SHELTER study also stratifies this indicator by high- and low-risk residents.

Calculation of the Indicators:

Data: These figures have been calculated using ROSA ACFI data for residential aged care or ACAP data for home care recipients, for the period starting from January 1, 2016 or the 100th day of long-term care for the person. The use of ACFI data precludes the examination of this indicator by different time periods and can only be looked at over the 12-month period of 2016 for residents who entered residential aged care.

Definitions: The presence of incontinence for residential aged care is determined using health conditions reported at the time of the ACFI assessment using ACFI question 5, urinary incontinence codes 1-4 and faecal incontinence codes 5-7. For home care recipients it was derived from health conditions listed in the ACAP assessment: urinary incontinence (ACAP codes 7002, 1403, 1499, 1708) and faecal / bowel incontinence (ACAP code 1707).

Low-risk residents: exclude people with dementia, moderate to high cognitive impairment, dependant mobility, palliative care.

High-risk residents: exclude low-risk residents.

$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$
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Numerator = All persons in long-term residential aged care with incontinence (bladder, faecal or both) within the specified time period

Denominator = All persons in long-term residential aged care at June 30, 2016

OR

Numerator = All low-risk persons in long-term residential aged care with incontinence (bladder or faecal) within the specified time period

Denominator = All low-risk residents in long-term residential aged care at June 30, 2016

OR

Numerator = All high-risk persons in long-term residential aged care with incontinence (bladder or faecal) within the specified time period

Denominator = All high-risk residents in long-term residential aged care at June 30, 2016

OR

Numerator = All home care recipients with incontinence (bladder or, bladder and faecal) within the specified time period

Denominator = All home care recipients at June 30, 2016

Exclusions: High- or low-risk where appropriate

Observation Period: 30 days-12 months

Interpretation of Results and Limitations: Over half (53.6%) of low-risk residents have incontinence as measured using ACFI data, which is comparable to the reported rate in the USA (48.5%). Over a 12 month period 83.3% of residents were reported to have some form of incontinence (urinary or faecal), comparable to 72% reported in Finland and 54.2% in Iceland. The overall Australian rate of observed incontinence (83%) was within the reported range of countries in the SHELTER study (63-91%). The Australian rate for high-risk residents (89.1%) was below the range for the SHELTER countries (96-99%). The reported rates for low-risk residents in the SHELTER study countries were generally considerably lower than that observed using the ROSA data.

Using the reporting of conditions in the ACAP, incontinence was much lower (20.5%) for aged care residents, which reflects their condition prior to their entry to residential care, and compares to 17.2% for home care recipients. Bladder incontinence was 15.8% for home care recipients in Australia and the reported rate in Canada was 15.1%. *See Table 9 and Figure 9 for details.*

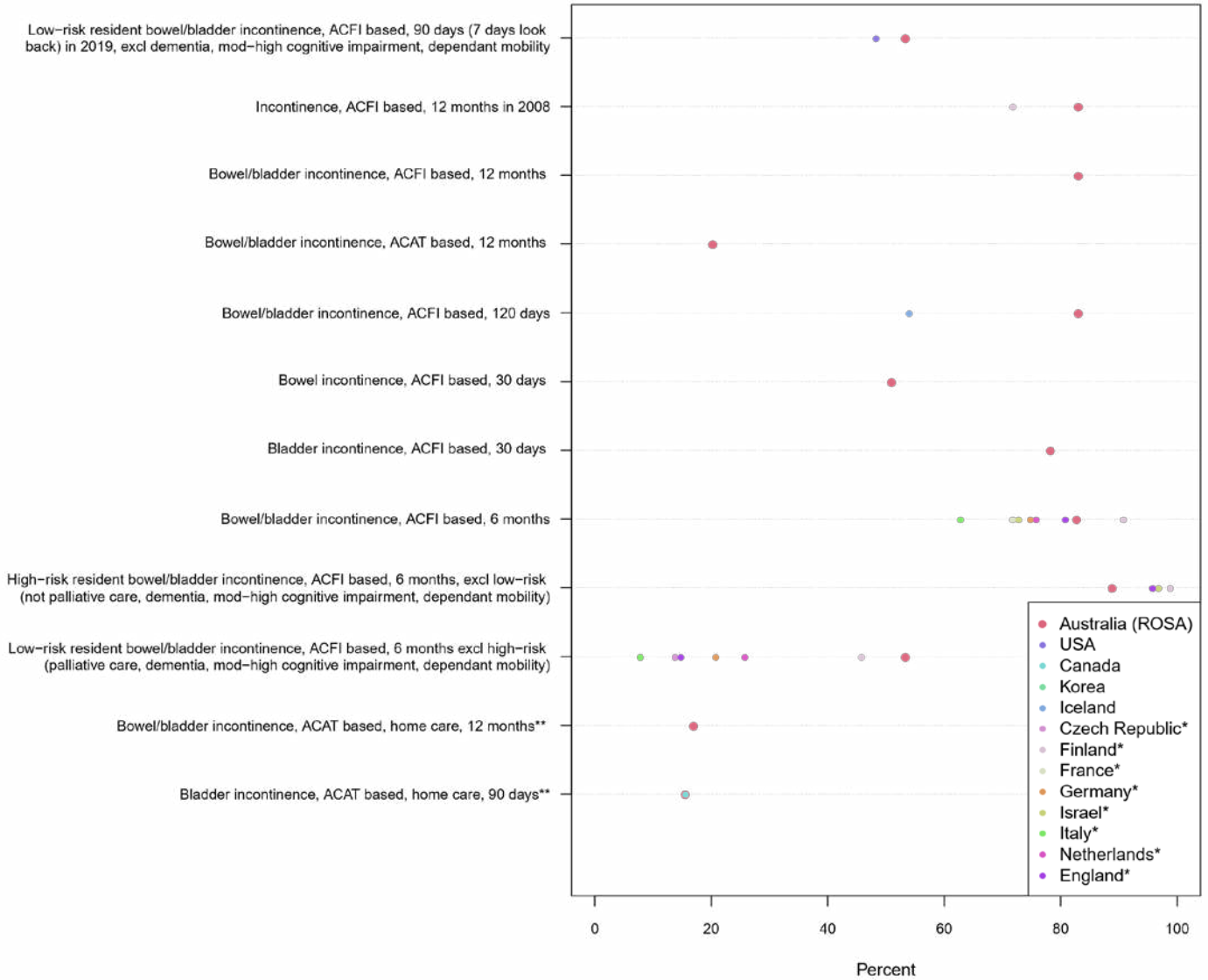
Summary: Incontinence in residential aged care is highly prevalent and is associated with distress, poor quality of life and poor health outcomes for residents. A lack of recognition and priority given to appropriate evidence-based management strategies are likely contributing factors, despite the severe impact it has on quality of life for older people. It is a major challenge and burden for care, especially in the residential aged care setting. Specifically, the appropriate management of residents who are incontinent (e.g. number of linen or clothing changes or utilisation of preventative measures such as barrier emollients) may provide a more reflective measure of quality of care and should be monitored as a quality and safety indicator in residential aged care.

Table 9. Incontinence Indicators Comparison by Country^{a,b}

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Bowel / bladder incontinence Low-risk resident ^a ACFI 12 months	LTC	90 days (7 day look back)	No	2019	53.6	USA: 48.5
Incontinence ^a ACFI 12 months	LTC	12 months	Yes	2008	83.3	Finland: 72.0
Bowel / bladder incontinence ^a ACFI 12 months	LTC	12 months	No	N/A	83.3	Netherlands: N/A
Bowel / bladder incontinence ^b ACAP data	LTC	12 months	No	N/A	20.5	Netherlands: N/A
Bowel / bladder incontinence ^b ACAP data	Home care	12 months	No	N/A	17.2	Netherlands: N/A
Bowel / bladder incontinence ^a ACFI 12 months	LTC	120 days	No	2009	83.3	Iceland: 54.2
Bowel incontinence ^a ACFI 12 months	LTC	30 days	N/A	N/A	51.2	Korea: N/A
Bladder incontinence ^a ACFI 12 months	LTC	30 days	N/A	N/A	78.5	Korea: N/A
Bladder incontinence ^b ACAP data	Home Care	90 days	Yes	2018-2019	15.8	Canada: 15.1
Bowel / bladder incontinence ^a ACFI 12 months	LTC	6 months	No	2012	83.0	SHELTER Study: Czech Republic: 72 Finland: 91 France: 72 Germany: 75 Israel: 73 Italy: 63 Netherlands: 76

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
						England: 81
Bowel / bladder incontinence High-risk resident ^a ACFI 12 months	LTC	6 months	No	2012	89.1	SHELTER Study: Czech Republic: 97.0 Finland: 99.0 France: 97.0 Germany: 96.0 Israel: 97.0 Italy: 96.0 Netherlands: 96.0 England: 96.0
Low-risk resident Bowel / bladder incontinence ^a ACFI 12 months	LTC	6 months	No	2012	53.6	SHELTER Study: Czech Republic: 14.0 Finland: 46.0 France: 8.0 Germany: 21.0 Israel: 8.0 Italy: 8.0 Netherlands: 26.0 England: 15.0

^a Based on ACFI data within a 12-month period (2016), therefore unable to look at specific observation time periods of indicator. ^b Based on ACAP data within 12-month period (2016), therefore unable to look at specific observation time periods of indicator. LTC: long-term care.

Figure 9. Incontinence Indicators Comparison by Country^{#,a,b}


[#]Long-term residential care (unless stated otherwise). ^aBased on ACFI data within a 12-month period (2016), therefore unable to look at specific observation time periods of indicator. ^bBased on ACAP data within 12-month period (2016), therefore unable to look at specific observation time periods of indicator. *Countries from SHELTER study. **Home care.

5.6 Depressive Symptoms / Depression Indicators

Rationale: These indicators identify the prevalence of depression in older people either living in residential aged care or in the community with home care support. Depression is common in the older population, especially for those receiving long-term care. The presence of depression is associated with poor quality of life and health outcomes. Monitoring of depression and / or depressive symptoms in aged care is important to identify people affected and provide appropriate treatment strategies to improve symptoms and quality of life.

Type of Indicator: Residential aged care (long-term care), Home care

Countries: USA, Finland, Iceland, Netherlands, SHELTER Study

Background: Depression is a mood disorder characterised by feelings of sadness, loss of interest in daily life, feelings of hopelessness and suicidal thoughts.¹⁸⁹ Depression is a serious medical condition but is manageable and symptoms can be improved or resolved through behavioural or pharmacological therapies.¹⁸⁹ Depression is associated with increased mortality, morbidity and decreased quality of life.¹⁸⁹ In Australia, it is the second leading cause of burden of disease due to disability and is especially common in the older population. Over half (52%) of residents living in permanent residential aged care in Australia have depression and is associated with higher care needs than residents without depression.¹⁹⁰ Older people in aged care are at increased risk of developing depression for a multitude of reasons including chronic pain and illness, bereavement of spouse, family or friends, adjusting to living in a long-term care facility and presence of cognitive impairment.

Indicator Summary: The USA, Finland, and Iceland include presence of depressive symptoms as a quality and safety indicator, with Finland and Iceland also including depressive symptoms without use of an antidepressant. In the Netherlands depression and depression without use of an antidepressant was also an indicator for both long-term care recipients and those receiving home care. The SHELTER study examined depression as a quality and safety indicator.

Calculation of the Indicators:

Data: These figures have been calculated using the ROSA ACFI data and PBS / RPBS data for antidepressant use for the period starting from January 1, 2016 or the 100th day of long-term care for the person.

Definitions: Depressive symptoms was defined as the reporting of mild-high depressive symptoms and depression was defined as moderate-high depressive symptoms using the ACFI classification for long-term care recipients. ACAP data was used for a diagnosis of depression (code 0552) for home care recipients. No antidepressant use (ATC codes N06A*) was defined as no dispensing in the 12-month period.

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in long-term care with depressive symptoms or a diagnosis of depression within the specified time period.

Denominator = All persons in long-term residential aged care at June 30, 2016

OR

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in long-term care with depressive symptoms or a diagnosis of depression, who were not dispensed an antidepressant within the specified time period.

Denominator = All persons in long-term residential aged care at June 30, 2016

OR

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons receiving home care who had depression within the specified time period.

Denominator = All persons receiving home care at June 30, 2016

Exclusions: None

Observation period: 14 days - 12 months. The analysis for depressive symptoms is based on ACFI data that is only available within a 12-month period (i.e. of people who had an ACFI assessment within 2016) and therefore unable to look at different observation periods.

Interpretation of Results and Limitations: Using the ROSA ACFI data, almost 62% of residents were identified to have depressive symptoms within the 12-month period examined. This was higher than the rates reported from other countries, likely as a result of differing definitions associated with this measure and an inability to look at comparable time periods. The rate of Australian residents with depressive symptoms not dispensed an antidepressant was 28.8%, which is higher than observed in Finland in 2008 (15.9%) and Iceland in 2009 (19.7%). Almost a third (31.3%) of Australian aged care residents were reported to have depression and 11.1% were not dispensed an antidepressant during the study year. The rates of depression in Australian residents were comparable to the rates observed in the SHELTER study that ranged from 24% in Germany to 45% in the Netherlands. Using the ACAP data 16.0% of home care recipients had a diagnosis of depression. *See Table 10 and Figure 10 for details.*

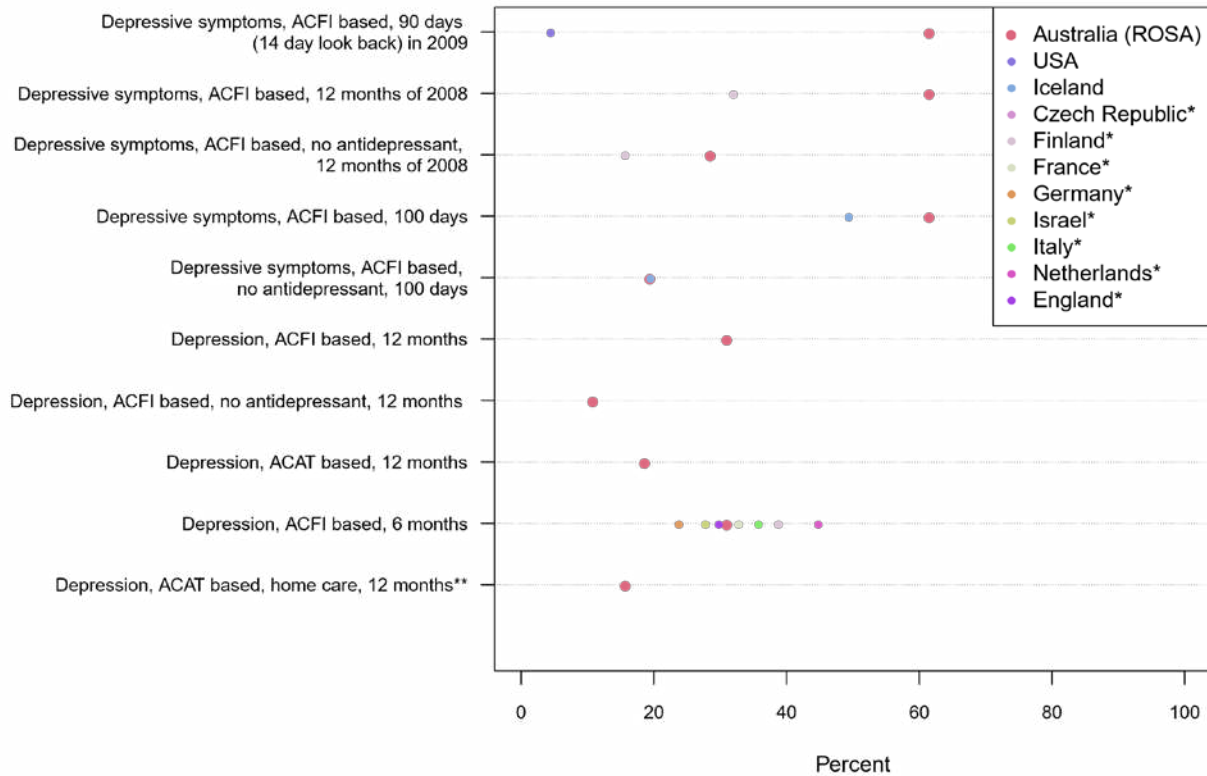
Summary: The diagnosis of depression and its appropriate management are key issues for the quality of life of aged care recipients. The inclusion of changes in depressive symptoms over time as a quality and safety indicator may help to monitor appropriate care and potentially overall mental well-being in aged care. This is included in other international aged care indicator monitoring systems such as Canada and New Zealand but was unable to be examined using the current data available in ROSA. Another potential quality and safety indicator could include individuals with depressive symptoms / depression who are not receiving appropriate therapy (either behavioural / psychotherapy therapies or an antidepressant medication).¹⁹¹ This may potentially provide greater insight into appropriate care of people with depression. In addition, due to the high burden of depression and its potential influence of other outcomes, depression should also be included in case-mix or risk adjustment of other indicators, where appropriate.

Table 10. Depressive Symptoms / Depression Indicators Comparison by Country

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Depressive symptoms ^a ACFI 12 months	LTC	90 days (14 day look back)	No	2019	61.8	USA: 4.66
Depressive symptoms ^a ACFI 12 months	LTC	12 months	No	2008	61.8	Finland: 32.2
Depressive symptoms ^a , no antidepressant ^b ACFI 12 months	LTC	12 months	No	2008	28.8	Finland: 15.9
Depressive symptoms ^a ACFI 12 months	LTC	120 days	No	2009	61.8	Iceland: 49.6
Depressive symptoms ^a , no antidepressant ^b ACFI 12 months	LTC	120 days	No	2009	28.8	Iceland: 19.7
Depression ^a ACFI 12 months	LTC	12 months	No	N/A	31.3	Netherlands: N/A
Depression ^a , no antidepressant ^b ACFI 12 months	LTC	12 months	No	N/A	11.1	Netherlands: N/A
Depression ^c ACAP 12 months	LTC	12 months	No	N/A	18.9	Netherlands: N/A
Depression ^c ACAP 12 months	Home care	12 months	No	N/A	16.0	Netherlands: N/A
Depression ^a , ACFI 12 months	LTC	6 months	No	2012	31.3	SHELTER Study: Czech Republic: 24.0 Finland: 39.0 France: 33.0 Germany: 24.0 Israel: 28.0 Italy: 36.0

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
						Netherlands: 45.0 England: 30.0

^a Depressive symptoms were defined as the reporting of mild-high depressive symptoms and depression was defined as moderate-high depressive symptoms using the ACFI classification for long-term care recipients. This was based on ACFI data within a 12 month period (2016), therefore unable to look at specific observation time periods for indicator. ^b No dispensing of antidepressant=no use of N06A* the 12 month period. ^cACAP data was used for a diagnosis of depression (code 0552) for home care recipients. This was based on ACAP data within a 12 month period (2016), therefore unable to look at specific observation time periods of indicator. LTC: long-term care.

Figure 10. Depressive Symptoms / Depression Indicators Comparison by Country[#]


[#]Long-term care (unless stated otherwise). ^a Depressive symptoms were defined as the reporting of mild-high depressive symptoms and depression was defined as moderate-high depressive symptoms using the ACFI classification for long-term care recipients. This was based on ACFI data within a 12 month period (2016), therefore unable to look at specific observation time periods for indicator. ^b No dispensing of antidepressant=no use of N06A* the 12 month period. ^c ACAP data was used for a diagnosis of depression (code 0552) for home care recipients. This was based on ACAP data within a 12 month period (2016), therefore unable to look at specific observation time periods of indicator. * Countries from SHELTER study. **Home care

5.7 Pain / Opioid Medication Indicators

Rationale: This indicator assesses the proportion of older people either living in residential aged care or in the community with home care support who are experiencing moderate to severe pain. Pain significantly limits individuals' function, affects their quality of life, and may put them at risk of complications associated with treatment.

Type of Indicator: Residential aged care (long-term care, short-stay), Home care

Countries: USA, Canada, New Zealand, Korea

Background: Pain affects a significant and increasing portion of older adults receiving aged care services.^{192,193} Pain affects people's functional capabilities, activities of daily living, quality of life, and overall disability.^{192,193} In a geriatric, frail person, or person with diagnosis of dementia, pain's effect may be even more pronounced and cause more serious complications.¹⁹⁴⁻¹⁹⁷ The pharmacological management of pain is common in older people, but the older population are more susceptible to the potential complications and side effects associated with particular pain medications, such as non-steroidal anti-inflammatory drugs (NSAIDs) and opioids. Adverse events include functional impairment, falls, respiratory depression, constipation, dependency from opioids¹⁹⁸ as well as associated renal, gastrointestinal and cardiovascular effects from NSAIDs.^{199,200}

The use of opioids has increased globally since the late 1990s.²⁰¹ This is in part due to recommendations encouraging the use of opioids for controlling cancer pain as part of a three steps ladder for cancer pain relief,²⁰² followed by an expansion of opioid indications to include non-cancer pain.^{203,204} In Australia, there was a 15-fold increase in the volume of opioids supplied between 1992 and 2012²⁰⁵, with 15.4 million opioid prescriptions dispensed in 2016-17 in Australia.²⁰⁶ Alongside the increase in opioid use has been an increase in hospital admissions for opioid overdose and harms, increased healthcare expenditure, and a 1.7 fold increase in the number of opioid related deaths.^{198,205} The Australian Government has responded to this increase in opioid use and related adverse events by supporting the Ministerial Council on Drug Strategy to develop a National Pharmaceutical Drug Misuse Framework for Action focusing on these medications in

2013-15. This included the rescheduling of codeine, a frequently prescribed opioid, to Schedule 4 (prescription-only) in 2018.²⁰⁷

Indicator Summary: A total of seven indicators from four countries assess pain in aged care, this includes short-stay and long-term care (USA), residential and home care (Canada), and New Zealand stratifies its analysis by the presence of dementia. All countries use the RAI MDS to actively collect data about the presence of pain and is generally categorised as either the presence of moderate to severe pain or the presence of pain. Due to the lack of regular pain assessments available within the ROSA data, the ROSA OMS uses chronic opioid use as a proxy for moderate to severe pain. While we recognise the limitations of using this measure as a proxy for pain, it is particularly pertinent in the setting of the ‘opioid epidemic’ occurring both in Australia and internationally.

Calculation of the Indicator:

Data: These figures have been calculated using ROSA PBS / RPBS data for the period starting from January 1, 2016 or the 100th day of long-term care for the person.

Definitions: While the presence of pain is collected during an aged care assessment this is not regularly or routinely monitoring in the data sets within the ROSA data platform. Therefore, chronic opioid use was used as a proxy for moderate to severe pain. In Australia the indication for opioid use is chronic severe disabling pain that is unresponsive to non-opioid analgesics. Chronic opioid use is defined as receiving any number of opioid medications for at least 90 days continuously, or for 120 non-consecutive days within a 180-365 day period (*see Appendix 2, Table 13.1*). The number of days of medication use is determined based on the number of units dispensed and estimated dose per day. No gap days between one opioid medication dispensing and another were allowed when determining consecutive use of opioids.

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = Number of long-term residents or home care recipients that are chronic opioid users that do not have a current diagnosis or history of cancer or are not receiving palliative care

Denominator = All persons in residential aged care or home care recipients who do not have a current diagnosis or history of cancer or are not receiving palliative care

Exclusions: Cancer diagnosis or history (six months prior) or palliative care

Observation period: Five days - 12 months

Interpretation of Results and Limitations: Overall, the rate for people in residential aged care was 20-25%, which was higher than the rates of pain from the comparison countries (6-8%). While this may be reflective of chronic opioid use as an unsuitable proxy for measurement of pain using the RAI MDS, it does not negate from the concerning high rates of chronic opioid use and potentially pain observed in Australian aged care residents. For short-stay residents the rates were comparable to that of the USA (10.9%) with 14.6% of residents chronically using an opioid. Rates were also comparable between older people receiving home care services (12.8%) with the reported rate of daily pain in Canada (15.2%). These latter two findings potentially support the use of chronic opioid use as a proxy for pain. Rates of chronic opioid use were similar when stratified by the presence of dementia, which is in contrast to New Zealand which observes much lower reporting of pain by residents with Dementia. *See Table 11 and Figure 11 for details.*

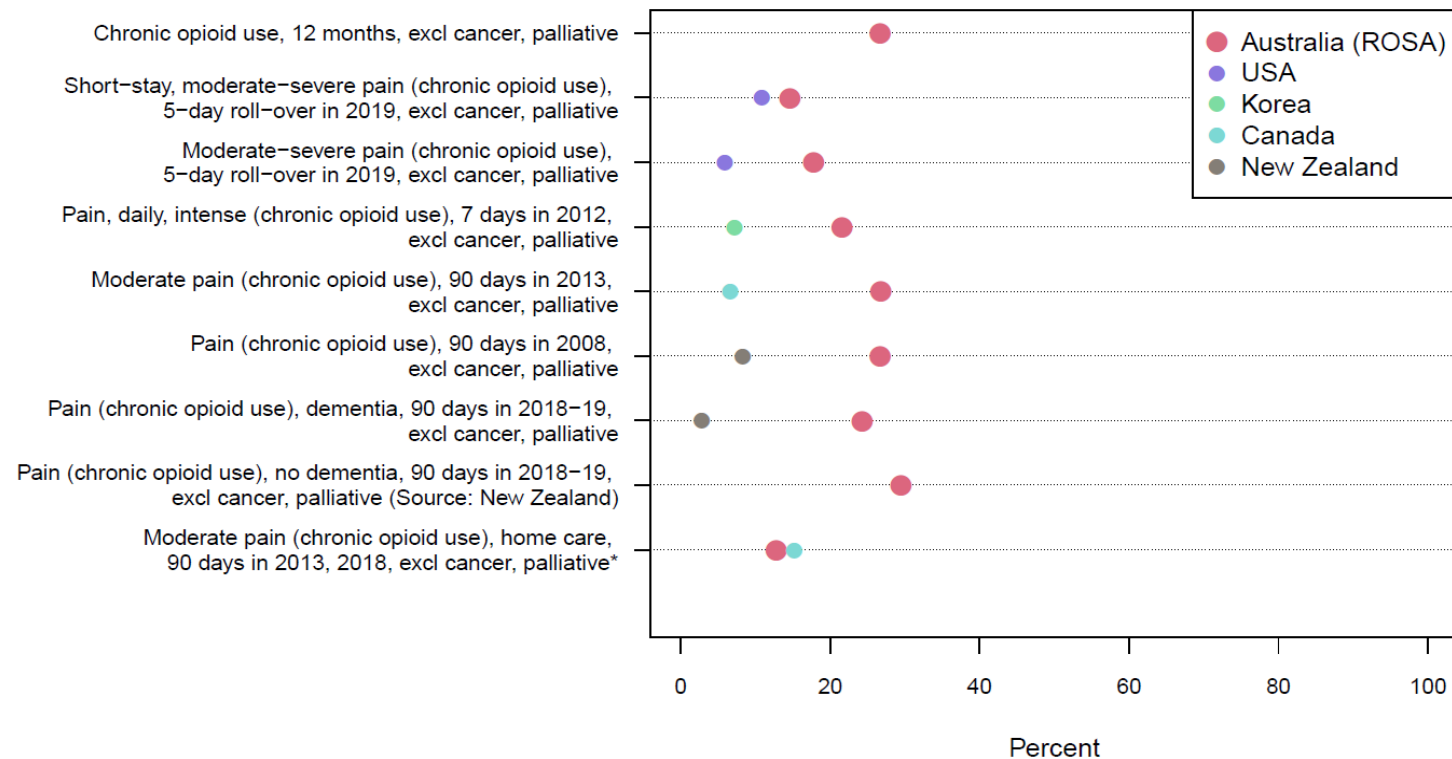
Summary: The appropriate management of pain in aged care is especially important in older people given the debilitating effects on functional capabilities, activities of daily living and quality of life. Resident's pain and appropriate pain management should be regularly evaluated. The use of opioids for pain management should be monitored in the aged care setting based on the concerning rates of opioid utilisation for pain management, the increasing incidence of opioid-related harms in Australia, and the high prevalence of chronic opioid use observed in residents of aged care.

Table 11. Pain / Chronic Opioid^{a,b} Medication Indicators Comparison by Country

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Chronic opioid use ^a	LTC	12 months	Yes	2016	26.7	
Moderate-severe pain (chronic opioid use)	Short-stay	5 days	No	2019	14.6	USA: 10.85
Moderate-severe pain (chronic opioid use)	LTC	5 days	Yes	2019	17.8	USA: 5.89
Pain-daily, intense (chronic opioid use)	LTC	7 days	N/A	2012	21.6	Korea: 7.2
Moderate pain (chronic opioid use)	LTC	90 days	No	2013	26.8	Canada: 6.6
Daily pain (chronic opioid use)	Home care	90 days	Yes	2013 2018 ^a	12.8	Canada: 15.2 Ontario: 21.0 ^a
Pain (chronic opioid use)	LTC	90 days	No	2008	26.7	New Zealand: 8.3
Pain (chronic opioid use) Dementia	LTC	90 days	No	2018-2019	24.3	New Zealand: 2.8
Pain (chronic opioid use) No Dementia	LTC	90 days	No	2018-2019	29.5	New Zealand: N/A

^a Chronic opioid use is used as a proxy for pain. ^bChronic opioid use determined in 90-120 day look back from 30 June, 2016 and 5-7 day look-back exposure determined from this date. LTC: long-term care

Figure 11. Pain / Chronic Opioid Medication Indicators Comparison by Country^{#,a,b}



[#]Long-term residential care (unless stated otherwise). ^aChronic opioid use is used as a proxy for pain. ^bChronic opioid use determined in 90-120 day look back from June 30, 2016 and 5-7 day look-back exposure determined from this date. *Home care.

5.8 Care Plans / Medication Review Indicators

Rationale: These two indicators assess the proportion of older people either living in residential aged care or in the community with home care support who have had i) a care plan or ii) a medication review within 12 months. The use of care plans and medication reviews can facilitate care of older individuals with multiple chronic conditions and improve health outcomes and overall satisfaction with care.

Type of Indicator: Residential aged care (long-term care), Home care

Countries: Sweden, Netherlands

Background: Multidisciplinary models of care and the use of care plans have been shown to be effective in improving care and health outcomes in older individuals and should be included as part of routine primary care.²⁰⁸ The Australian government funds the Chronic Disease Management programme to encourage improved and coordinated multidisciplinary care for individuals with chronic conditions and complex care needs. The programme provides fees for a general practitioner (GP) initiated care plan, known as a general practitioner management plan (GPMP).

The Australian government funds home medicines reviews (HMR) for people living in the community and residential medication management reviews (RMMR) for aged care residents. Medication reviews are a collaborative service with a clinical pharmacist and GP examining drug interactions, adverse medication events, dosage problems or medication adherence. These reviews can facilitate the identification and resolution of medication-related problems and have been associated with improved health outcomes.²⁰⁹ The regular review of medications is in accordance with quality use of medicines. However, this service is underutilised in aged care in Australia.²¹⁰

Indicator Summary: Care plans were an indicator in two countries, Sweden and Netherlands, and both included residential aged care and home care. Medication reviews were only included as an indicator in Sweden and are done for both residential aged care and home care recipients.

Calculation of the Indicators:

Data: These figures have been calculated using ROSA MBS data for the period starting from January 1, 2016 or the 100th day of long-term care for the person.

Definitions: **Care Plans** include GP management plan (GPMP, MBS item 721, 729), team care arrangement (TCA, MBS item 723) and a review of either GPMP or TCA (MBS item 731, 732).

Medication reviews include Home Medicines Review (HMR, MBS item 900) and Residential Medication Management Review (RMMR, MBS item 903).

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in residential aged care or home care recipients who have had a claim for a care plan (GPMP, TCA or review) within 12 months

OR

Numerator = All persons in residential aged care or home care recipients who have had a claim for HMR or RMMR, respectively within 12 months

Denominator = All persons in residential aged care or home care recipients

Exclusions: No exclusions

Observation period: 12 months

Interpretation of Results and Limitations: In Sweden, 86.7% of residents in aged care have a care plan, compared to only 9.5% in Australia. Sweden was the only country that had medication review as an indicator, with 66.3% of Swedish residents having a medication review, which compares to 29.8% in Australia. Due to the policies related to the service access, subsidies offered by the government, limitation with the capture of services that are privately funded or under arrangements with the Department of Veterans' Affairs in Australia, it is difficult to compare the overall provision of these services in different countries. *See Table 12 and Figure 12 for details.*

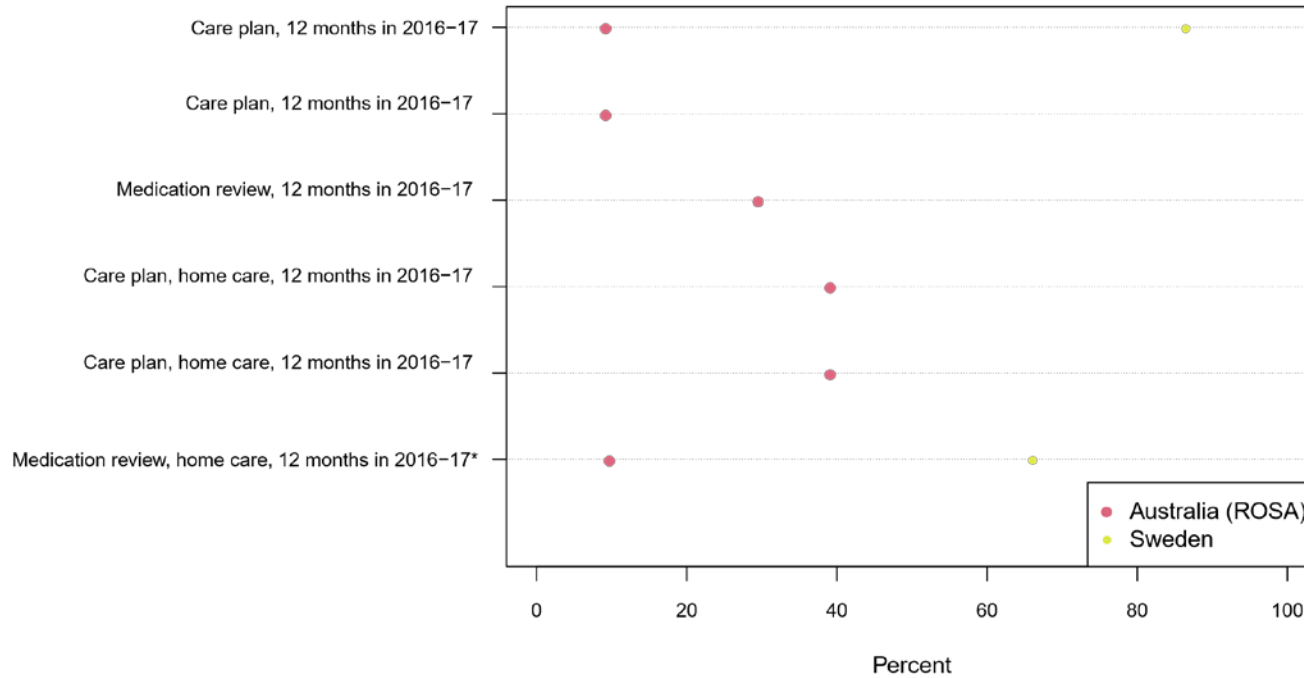
Summary: The inclusion of care plans and / or medication reviews within quality and safety indicators internationally is limited. Based on the current data analysis, both services are under-utilised in Australia by comparison to Sweden, despite being funded by the Australian Government under the Medicare Benefits Schedule. Given the high prevalence of multimorbidity and polypharmacy in the older population, and the high prevalence of medication-related harms, the inclusion of both care planning and medication review annually as a quality and safety indicator for all recipients of aged care services in Australia should be viewed as a fundamental metric of good quality care. The care plan should also include advanced care directives that will facilitate individuals' preferences and priorities for their care. Annual medication reviews, together with the use of additional medication reviews at points in vulnerability of care (such as hospitalisation, significant changes in medications or the diagnosis of a new disease), needs to be included as a strategy to reduce the harms associated with medication use in older people in Australia. While the identification of barriers and enablers of both these services will facilitate their uptake, the mandated inclusion as indicators will also improve their uptake by older Australians and their care providers. This applies to both residential aged care and home care recipients.

Table 12. Care Plans, Medication Review Indicators Comparison by Country

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Care plan ^a	LTC	12 months	No	2016-2017	9.5	Sweden: 86.7
Care plan ^a	Home care	12 months	No	2016-2017	39.4	Sweden: N/A
Care plan ^a	LTC	12 months	No	N/A	9.5	Netherlands: N/A
Care plan ^a	Home care	12 months	No	N/A	39.4	Netherlands: N/A
Medication review ^b	LTC	12 months	No	2016-2017	29.8	Sweden: 66.3
Medication review ^b	Home care	12 months	No	2016-2017	10.0	Sweden: N/A

^a Includes GPMP, TCA or a review of GPMP or TCA. ^b Includes a RMMR for LTC or HMR for Home care. LTC: long-term care.

Figure 12. Care Plans / Medication Review Indicators Comparison by Country[#]



[#]Long-term residential care (unless stated otherwise). ^a Includes GPMP, TCA or a review of GPMP or TCA. ^b Includes a RMMR for LTC or HMR for Home care. *Home care.

5.9 Hospitalisation Indicators

Rationale: These indicators measure the incidence of hospitalisations by older people living in residential aged care or in the community with home care support. Hospitalisations in older people can be associated with an increased risk of harms, poor health outcomes and reduced quality of life. Many hospitalisations are potentially preventable with the provision of appropriate care.

Type of Indicator: Residential aged care (short-stay, long-term care), Home care

Countries: Canada, Korea, USA

Background: Older people in aged care have a higher frequency of emergency department presentations and hospitalisations as a result of their increased prevalence of multimorbidity, polypharmacy, as well as increased functional and cognitive impairment when compared to those living in the community.²¹¹ Hospitalisations or emergency department presentations frequently result in unintended consequences, including increased cognitive and functional decline, falls, and hospital-acquired infections. They are associated with considerable distress and reduced quality of life.^{212,213} Many hospitalisations are considered to be potentially avoidable with appropriate care.^{214,215}

Indicator Summary: Three countries, Canada, Korea and USA examine emergency department presentations or hospitalisations. The USA examines emergency department presentations and rehospitalisation within 30 days of discharge from hospital for both short-stay and long stay residents. In addition, the USA also includes two indicators using administrative claims data looking at the number of hospitalisation and emergency department presentations per 1000 long-term care residents. Canada includes hospitalisation or emergency department presentations for home care recipients. The ROSA OMS includes emergency department presentations within 30 days of discharge from hospital for people in short-stay and long-term care. In addition, the ROSA OMS examines hospitalisations specifically for medication-related problems and dementia and delirium.

Calculation of the Indicators:

Data: These figures have been calculated using ROSA hospitalisation data (SA alone; public emergency department presentations and hospitalisations, VIC & NSW; public and private emergency department presentations and hospitalisations), for the period starting from January 1, 2016 or the 100th day of long-term care.

Definitions: Re-hospitalisation within 30 days of discharge: This includes discharge from hospital for any reason that is then followed by another hospitalisation (unplanned) or emergency department presentation within 30 days.

Short-stay: <100 days

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in residential aged care (short-stay or long-term care) who have an emergency department presentation or rehospitalisation (unplanned) within 30 days from a prior hospital discharge within a specified time frame

Denominator = All persons in short-stay or long-term care that have been discharged from hospital within a specified time frame

OR

Numerator = All short-stay persons in residential aged care who have an emergency department presentation but are not admitted within 30 days from a prior hospital discharge within a specified time frame

Denominator = All persons in short-stay care that have been discharged from hospital within a specified time frame

OR

Numerator = All persons receiving home care who have an emergency department presentation or hospitalisation (unplanned) within 90 days

Denominator = All persons receiving home care within 90 days

OR

Numerator = All persons in long-term care with an emergency department presentation within 90 days

Denominator = All persons in long-term care within 90 days

OR

<i>Numerator</i>	1000
<hr/>	x resident
<i>Denominator</i>	days

Numerator = Number of hospitalisations (unplanned) or emergency department presentations for long-term care residents

Denominator = Total number of resident days

Exclusions: No exclusions except the number of hospitalisations per 1000 long-term resident days excludes planned hospital admissions

Observation period: 90 days - 12 months

Interpretation of Results and Limitations: Hospitalisations for a medication-related event occurred for 0.5-0.7% of long-term care residents in Australia in a year. Approximately 20% of short-stay (<100 days) or long-term care residents had an emergency department presentation within 30 days from hospital discharge within a year.

Between 3.7% and 4.8% of short-stay residents had an emergency department presentation (but were not admitted) within 30 days from hospital discharge using the ROSA data, which compares to the reported rate in the USA that was 10.7% over a 90-day period. Rates of rehospitalisation 30 days after discharge were also slightly less for Australia (15.7% to 18.0%) compared to the USA (22.3%). The number of unplanned hospitalisations per 1000 long-term resident days was similar between the two countries; 1.72 /1000 days for USA and 1.57 to 1.59 / 1000 resident days for Australia (ROSA). However, the number of emergency department presentations per 1000 resident days was double in the ROSA data (2.01 to 2.03 / 1000 days) by comparison to that reported in the USA (1.02 / 1000 resident days) for long-term care residents. In 90 days between 13.0% and 13.6% of Australian long-term care residents had an emergency department presentation.

For home care recipients 34.6 to 36.9% had an unplanned hospitalisation or emergency department presentation within a 90-day period, similar to the 30% rate reported in Canada. *See Table 13 and Figure 13 for details.*

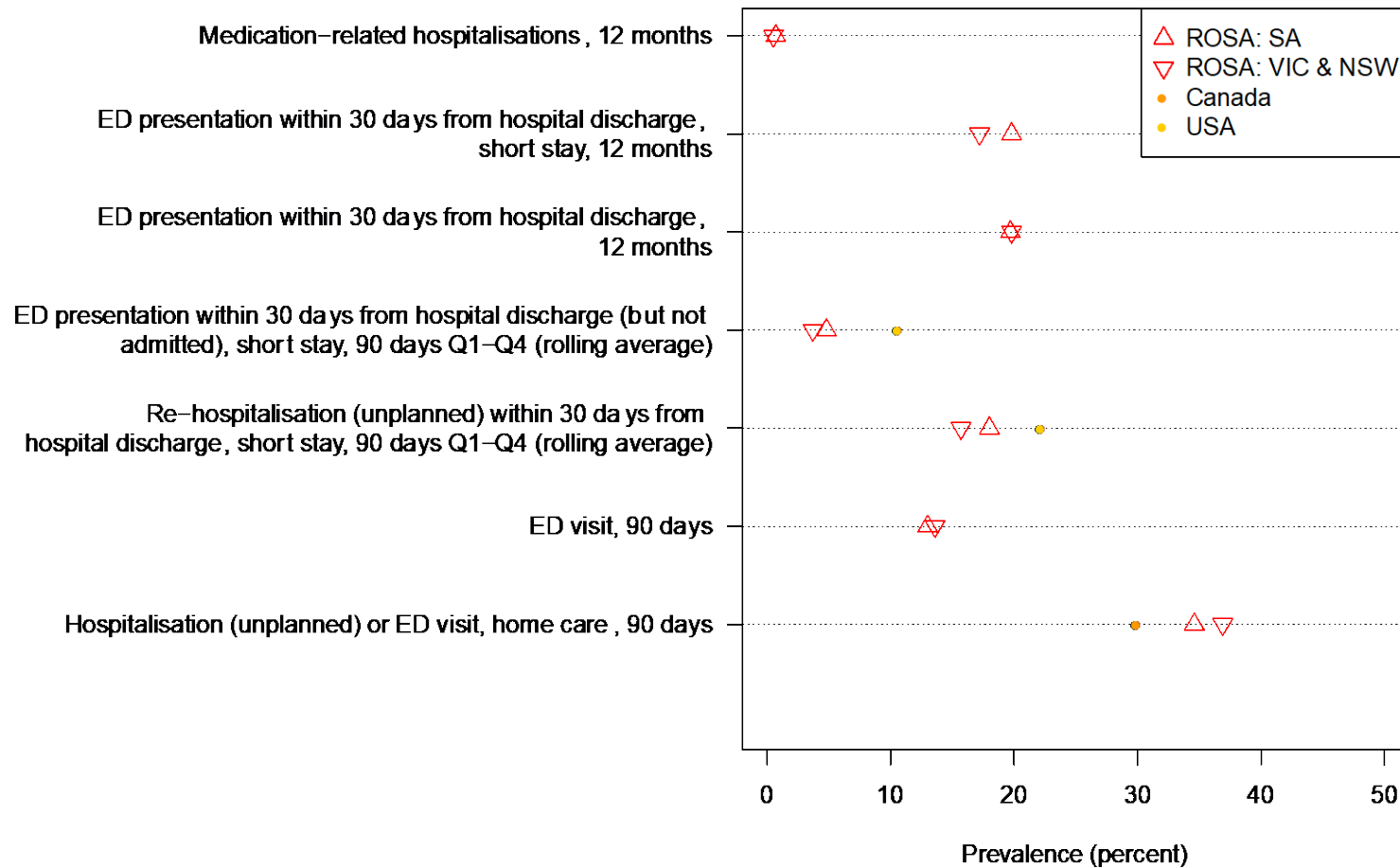
Summary: Hospital readmissions following recent discharge have long been a metric of quality of care across many health care systems. Furthermore, if a long-term aged care facility has a high proportion of its residents presenting to an emergency department then this may be indicative of suboptimal care management. Given the significant burden associated with hospitalisation and transfer for residents and potential for higher risks of harms, these measures are suggested. These measures can provide insight into the safety and quality of care in the aged care setting using existing administrative data.

Table 13. Hospitalisation Indicators Comparison by Country

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Medication-related hospitalisations	LTC	12 months	Yes	2016	SA: 0.7 VIC & NSW: 0.5	
ED presentation within 30 days from hospital discharge ^a	Short-stay	12 months	Yes	2016	SA: 19.8 VIC & NSW: 17.2	
ED presentation within 30 days from hospital discharge ^a	LTC	12 months	Yes	2016	SA: 19.7 VIC & NSW: 19.8	
ED presentation within 30 days from hospital discharge (but not admitted)	Short-stay	90 days Q1-Q4 (rolling average)	Yes	2018	SA: 4.8 VIC & NSW: 3.7	USA: 10.67
Re-hospitalisation (unplanned) within 30 days from hospital discharge ^a	Short-stay	90 days Q1-Q4 (rolling average)	Yes	2018	SA: 18.0 VIC & NSW: 15.7	USA: 22.26
Number of hospitalisations (unplanned) per 1000 LTC resident days ^b	LTC	90 days Q1-Q4	Yes	2018	SA: 1.59 VIC & NSW: 1.57 per 1000 resident days	USA: 1.72 per 1000 LTC resident days
Number of ED presentations per 1000 LTC resident days ^b	LTC	90 days Q1-Q4	Yes	2018	SA: 2.01 VIC & NSW: 2.03 per 1000 resident days	USA: 1.02 per 1000 LTC resident days
ED presentation	LTC	90 days	No	N/A	SA: 13.0 VIC & NSW: 13.6	Korea: N/A
Hospitalisation (unplanned) or ED presentation	Home care	90 days	Yes	2018-2019	SA: 34.6 VIC & NSW: 36.9	Canada: 30.0

^a Index admission is unplanned (i.e. hospitalisations for dialysis and other planned day procedures are excluded). ^bCan have multiple unplanned hospitalisations and ED presentation per person. LTC: long-term care; ED: Emergency department

Figure 13. Hospitalisation Indicators Comparison by Country[#]



[#]Long-term residential care (unless stated otherwise). ^aIndex admission is unplanned (i.e. hospitalisations for dialysis and other planned day procedures are excluded).

5.10 Infections / Antibiotic Use Indicators

Rationale: These indicators measure incidence of infections and antibiotic use in residential aged care. Antibiotic resistance is major global public health problem and the older population in aged care are some of the highest users of antibiotics, often inappropriately. This increases the risk of antibiotic resistance and pathogen transmission. Appropriate use and monitoring of antibiotics in aged care is a national quality use of medicines priority across all health care sectors.

Type of Indicator: Residential aged care (long-term care)

Countries: Canada, Korea, SHELTER Study

Background: Older people, especially those living in residential aged care facilities are at increased risk of infection, in part due to age-related factors such as pathological changes to the immune system, malnutrition, incontinence, functional disability, impaired cognitive status and presence of chronic diseases.²¹⁶ In addition, high rates of antibiotic use, poor antimicrobial stewardship, high potential for microbial transmission between residents, and regular transitions between care settings, also contribute to higher risks of infection for older people.²¹⁶ These are also the key contributors to the growing rates of antibiotic resistance in the aged care setting.²¹⁷

Antibiotic resistance is a global public health problem, with inappropriate use of antibiotics as a major contributor.²¹⁷ Antibiotic resistance is associated with poor health outcomes and significant economic costs, placing increased pressure on healthcare systems worldwide.^{216,217} Antibiotic use in aged care residents is among the highest for any individual population. It is reported that between 47-79% of residents receive an antibiotic annually and approximately half are considered to be potentially inappropriate.^{216,218-220}

Risk factors for the acquisition of resistant pathogens include prior antibiotic use, the presence of invasive devices, such as urinary catheters and feeding tubes, lower functional status, and a variety of other resident- and facility-related factors. Infection with antibiotic-resistant pathogens is associated with increased morbidity, mortality, and health care costs. It accounts for an estimated 700,000 deaths annually worldwide, which is projected to increase to 10 million by 2050.²²¹

Indicator Summary: Canada, Korea and the SHELTER study measure infections as a quality and safety indicator. Canada examines one or more infections in a 90-day period, with the recording of this as specific infection diagnoses within the RAI-MDS 2.0, such as clostridium difficile infection, antibiotic resistance infection, pneumonia or urinary tract infection. Given the large number and range of infection diagnoses included in this indicator, the dispensing of antibiotics will serve as a proxy. Korea and the SHELTER study examine specific types of infections (SHELTER determined from interRAI LTCF instrument) that will be examined using hospitalisation data.

Calculation of the Indicators:

Data: These figures have been calculated using ROSA PBS / RPBS data (ROSA, Canada) or ROSA hospitalisation data (SA alone using public emergency department presentations and hospitalisations; VIC & NSW using public and private emergency department presentations and hospitalisations), for the period starting from January 1, 2016 or the 100th day of long-term care for the person.

Definitions: Systemic antibiotic prescribing using ROSA PBS / RPBS Data and ATC / PBS Codes as described in *Appendix 2 Table 14.1*, will be used as a proxy for the calculation of infection.

Pneumonia hospitalisation: ICD-10-AM codes J12*-J18*

Hospitalisation for infections (Pneumonia, chronic obstructive pulmonary disease (COPD), septicaemia, sexually transmitted disease, urinary tract infection (UTI) or viral hepatitis):

ICD-10-AM codes Pneumonia J12*-J18*, COPD J43*-44*, septicaemia A40*-A41*, sexually transmitted disease A50*-64*, UTI N39.0*, viral hepatitis B15*-B19*

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in long-term care who have had one or more dispensing of an antibiotic within the specified time period.

Denominator = All persons in residential aged care at June 30, 2016

Exclusions: None

Observation period: 90 days

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in long-term care who have had at-least one infection-related hospitalisation (as defined above) within the specified time period.

Denominator = All persons in residential aged care at June 30, 2016

Exclusions: None

Observation period: 120 days – six months

Interpretation of Results and Limitations: Over a third (38.2%) of residents were dispensed an antibiotic (as a proxy for infection), in 90 days, which increased to 66.7% when examined in a 12-month period. The 90 day rate was higher than that reported for specific infection-diagnoses in Canada (8.7%), which reflects the use of antibiotic dispensing as a proxy for this indicator. The high rates of observed antibiotic prescribing rates are likely to be in part reflective of potentially inappropriate use of antibiotics (often in the absence of a diagnosis), which has been estimated to be at least half of all antibiotic prescribing in aged care settings.^{216,218-220}

Hospitalisation for pneumonia occurred in 1.0% to 1.2% of residents over a 120-day period. The use of specific infection diagnoses codes for residents hospitalised with an infection in 6 months was 3.9% to 4.2%. This was lower than rates reported in the SHELTER study (range 6-25%), however use of hospitalisation data likely only captures those with more severe infections that require hospitalisation and potentially intravenous antibiotics. For example, urinary tract infections, a common type of infection in older people, are most likely to be treated by a GP with systemic antibiotics. *See Table 14 and Figure 14 for details.*

Summary: In accord with recent WHO recommendations, appropriate surveillance and monitoring of antibiotic consumption in long-term aged care facilities is urgently needed to improve antibiotic prescribing and should be an essential component of antimicrobial stewardship programs.²²² Therefore, monitoring antibiotic use is an important quality and safety indicator needed for aged care in Australia, not only to improve health outcomes but to also facilitate addressing the global health problem of antibiotic resistance. Given the likelihood of a person receiving multiple antibiotic prescriptions in a monitoring period and

the increased duration of use observed in aged care^{79,80}, this indicator should include the proportion of residents receiving an antibiotic and a measure of total antibiotic exposure using total defined daily doses / 1000 resident days. Further, with an estimated 50% of antibiotic prescriptions being potentially inappropriate, the inclusion of an indication for prescribing and the judicious selection of an appropriate antibiotic for the identified infection is also important. Given the magnitude of this problem, the monitoring of antibiotic use should also be done for home care recipients.

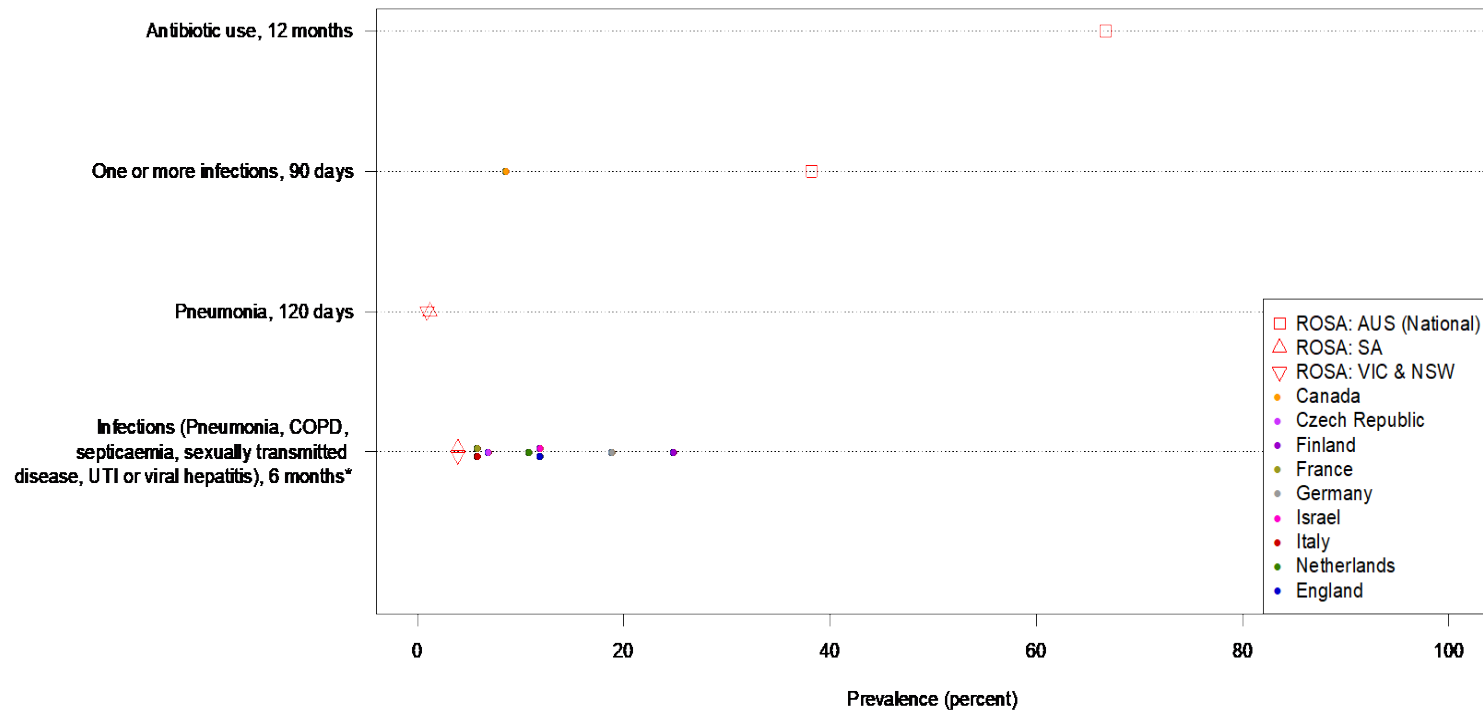
Table 14. Infections / Antibiotic Use Indicators Comparison by Country

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Antibiotic Use	LTC	12 months	Yes	2016	66.7	
One or more infections ^a	LTC	90 days	Yes		38.2	Canada: 8.7 -unadjusted 8.7 - adjusted
Pneumonia	LTC	120 days	Yes	N/A	SA: 1.2 VIC & NSW: 0.98	Korea: N/A
Infections (Pneumonia, COPD, septicaemia, sexually transmitted disease, UTI or viral hepatitis)	LTC	6 months	No	2012	SA: 3.9 VIC & NSW: 4.2	SHELTER Study: Czech Republic: 7.0 Finland: 25.0 France: 6.0 Germany: 19.0 Israel: 12.0 Italy: 6.0 Netherlands: 11.0 England: 12.0

^aDispensing of an antibiotic is used as a proxy for one or more infections

LTC: long-term care; COPD: chronic obstructive pulmonary disease; UTI: urinary tract infection

Figure 14. Infections / Antibiotic Use Indicators Comparison by Country^{#,a}



[#]Long-term residential care (unless stated otherwise). ^aDispensing of an antibiotic is used as a proxy for one or more infections in 90 days.

*Countries from SHELTER study. COPD: chronic obstructive pulmonary disease; STDs: sexually transmitted diseases; UTI: urinary tract infection

5.11 Cognitive Impairment / Dementia Indicators

Rationale: These indicators measure the prevalence and progression of cognitive impairment / dementia, including behavioural symptoms in older people living in residential aged care, conditions that are highly prevalent in this population.

Type of Indicator: Residential aged care (long-term care)

Countries: Finland

Background: Dementia is a clinical syndrome that includes numerous specific diseases that are characterised by an acquired loss of cognition over multiple domains sufficiently severe to affect social or occupational function.²²³ There is currently an estimated 459,000 Australians diagnosed with dementia, which is the second leading cause of death and greatest cause of disability in older Australians.²²⁴⁻²²⁶ Mild cognitive impairment is an intermediate stage between expected cognitive decline of normal ageing and the more serious declines associated with dementia.²²⁷ Between 5% and 20% of people annually with cognitive impairment will develop dementia.²²⁷

Older people, particularly those with dementia are at a higher risk of developing delirium, which is an acute syndrome characterised by altered levels of cognitive function, including confusion, disorientation and attention deficits. Delirium is commonly a result of serious medical illness such as an infection or certain medications, but causes are often multifactorial.²²⁸ It is considered a potentially preventable complication in individuals with dementia and cognitive impairments.²²⁹ Delirium is associated with increased mortality and morbidity including falls, increased functional and cognitive impairments and greater rates of entry into aged care.²²⁸

Indicator Summary: Only Finland included the incidence of cognitive impairment as a quality and safety indicator in aged care. It is unclear due to limited descriptions of this indicator in English if this indicator was aimed specifically at capturing people with various levels of cognitive impairment or dementia. Countries such as Canada and New Zealand included changes in cognitive function between assessments, i.e. improved cognitive function (Canada) and a decline in cognitive function (Canada and New Zealand, the latter

stratified by the presence of dementia). This was unable to be examined using the ROSA data. The ROSA delirium / dementia indicator includes only people with dementia in aged care who have been hospitalised for either delirium or dementia.

Calculation of the Indicator:

Data: These figures have been calculated using ROSA hospitalisation data (SA using public emergency department presentations and hospitalisations; VIC & NSW using public and private emergency department presentations and hospitalisations), and ROSA ACFI data (cognitive impairment). ACFI, ACAP or PBS / RPBS data were used for identification of dementia for the period starting from January 1, 2016 or the 100th day of long-term care for the person.

Definitions: The presence of dementia is determined using at least one of the following data sources: ACAP, ACFI, or dispensing of an acetylcholinesterase inhibitor or memantine within the six months prior to entry into aged care (*see Appendix 2, Table 2.1*). The outcome of hospitalisation for dementia and / or delirium is defined using ICD-10-AM codes (*see Appendix 2, Table 110.1*).

Cognitive impairment using ROSA ACFI data is defined as the reporting of dementia or response to ACFI question 6, 'C' or 'D' moderate or severe cognitive impairment, respectively, based on either Psychogeriatric Assessment Scales Cognitive Impairment (PAS CIS) or categorisation by an assessor. A description of the codes used from ACFI data are shown in *Appendix 4, Table 4.1*.

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All persons in long-term care with dementia who are hospitalised for dementia and / or delirium within the specified time period

Denominator = All persons in long-term residential aged care with dementia at June 30, 2016

OR

Numerator = All persons in long-term care with cognitive impairment

Denominator = All persons in long-term residential aged care at
June 30, 2016

Exclusions: No dementia

Observation Period: 12 months

Interpretation of Results and Limitations: Between 2.4% and 3.0% of residents with dementia in Australia were hospitalised for delirium and / or dementia in a 12-month period. Over two thirds of Australian aged care residents (68.1%) were identified with moderate to severe cognitive impairment using the ROSA ACFI data. This rate is not comparable to Finland's cognitive impairment measure due to the differences in definitions and observation period for data collection.

The utility of incidence of cognitive impairment as a quality and safety indicator is limited; it is unlikely to be altered with the provision of better care. By contrast, the stratification of indicators by the presence of dementia such as antipsychotic use, where in some instances its use is clinically indicated in older people with dementia, provides important additional information to monitor quality and safety in aged care. This is done for all indicators in the recently developed New Zealand long-term care facility quality and safety indicators and two of the ROSA OMS. In addition, the use of dementia in case-mix or risk adjustment, where appropriate, is also important. *See Table 15 for details.*

Summary: Given the high prevalence of people with dementia in aged care, and the potential for delirium to be prevented²²⁹, the inclusion of hospitalisation for dementia and/or delirium in individuals with dementia as a quality and safety indicator for aged care is suggested. This indicator has also recently been included as one of 18 clinical quality indicators proposed to measure quality of care for individuals with dementia via a national Australian dementia registry.²³⁰ In addition, dementia should be included in case-mix or risk adjustment, or used to stratify the results of other indicators, where appropriate.

Table 15. Cognitive Impairment^a / Dementia^{*}

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Delirium and / or Dementia Hospitalisation in residents with dementia	LTC	12 months	Yes	2016	SA: 2.4 VIC & NSW: 3.0	
Cognitive impairment ^a *ACFI 12 months	LTC	6 months	No	2008	68.1 (prevalence)	Finland: 15.2 (incidence)

*Based on ACFI data that is available within a 12-month period (i.e. of people who had an ACFI assessment within 2016), therefore unable to look at timing of assessment. ^a Cognitive impairment is defined as reporting of dementia or response to ACFI Q6 ('C' or 'D' i.e. moderate to severe cognitive impairment / PAS CIS 10-21).

LTC: long-term care.

5.12 Mortality Indicator

Rationale: This indicator assesses the proportion of residents in aged care who died within 90 days.

Type of Indicator: Residential aged care (long-term care)

Countries: Korea

Background: Mortality data can be used as an indicator of overall population health and quality of health care systems. However, in the older population and in particular those in residential aged care, mortality rates are high due to higher age, frailty status and increased prevalence of both acute and chronic disease. The identification of those deaths that are likely premature and potentially preventable for older people in aged care may provide a more sensitive marker of suboptimal care. A recent Australian study reported the incidence of premature and potentially preventable deaths in residential aged care has increased from 1.2 per 1000 admissions in 2001-02 to 5.3 per 1000 in 2011-12.²³¹ Strategies to prevent these potentially avoidable deaths together with the development of a national policy framework and regulatory body to reduce harm in aged care has since been advocated in Australia.²³¹

Indicator Summary: Only Korea assesses the proportion of long-term residents who die (all-cause mortality) within a 90 day period. The ROSA indicator examines premature mortality, that is, deaths that are considered to be potentially avoidable, as described in the recent Australian study above.²³¹

Calculation of the Indicator:

Data: These figures have been calculated using ROSA mortality data for residents alive on the June 30, 2016, who had ≥ 100 days of long-term care.

Definitions: Mortality (all-cause) in 90 days

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = All long-term care residents who were alive at June 30, 2016 and died within 90 days

Denominator = All persons in residential aged care at June 30, 2016

Exclusions: None

Observation period: 90 days

Interpretation of Results and Limitations: Almost 8% of older people in residential aged care died within 90 days in Australia, however a comparison of this rate with Korea was unavailable. *See Table 16 for details.*

Summary: The lack of modifiable risk factors (factors that can be changed) makes mortality unsuitable to monitor quality and safety in aged care. This is likely recognised by many countries, as this is not an indicator regularly monitored by most. The increasing prevalence of multimorbidity and frailty in the aged care population makes it difficult to discriminate between deaths from progression of disease or other causes of death. The use of premature mortality from potentially avoidable causes however, as used in the ROSA OMS, provides a suitable indicator to monitor quality and safety in residential aged care.

Table 16. Mortality

<i>Indicator Description</i>	<i>Study Population</i>	<i>Observation Period</i>	<i>Risk Adjusted</i>	<i>Year</i>	<i>Rate Australia (ROSA) %</i>	<i>Comparison Rate by Country %</i>
Premature Mortality	LTC	12 months	Yes		0.6	
Mortality	LTC	90 days 2012	No	2012	7.7	Korea: N/A

LTC: long-term care

6. Summary

Improving the quality of care for older people living in aged care settings has become a key imperative for national health and social care systems globally. This is in part, due to increasing awareness of suboptimal care quality and associated poor health and quality of life outcomes for this population. In response, quality and safety indicator systems based on evidence and expert consensus have been developed, validated and implemented. If utilised appropriately, these quality and safety indicators can identify care needs and potential harms, inform and facilitate quality improvement initiatives, and facilitate the development of individualised care plans. Additionally, they provide a benchmark for aged care providers, facilities and policy makers to track the impact of quality improvement initiatives over time.

Part 1 of this report identified 11 countries with routine monitoring and public reporting of indicators of quality and safety of care in aged care settings. These indicators cover a range of quality and safety domains and employ various data sources for surveillance and reporting. While there is considerable heterogeneity between the types of quality indicators measured internationally, several indicators are consistently used, highlighting their importance and agreed value. Indicators consistently employed in international reporting systems included activities of daily living limitations and abilities, use of physical restraints, changes in cognition, mood and behavioural symptoms, pressure injuries, weight loss, falls / fractures, incontinence, pain, and use of antipsychotic medications.

All of these indicators except for activities of daily living and use of physical restraints were able to be examined for Australia in Part 2 of this report using the ROSA data platform either as a direct comparison or using proxy variables. The ROSA includes available Australian aged care data linked with health care data. We examined 134 quality indicators across 12 domains and identified several indicators that can easily be monitored in Australia, potentially in a timely manner, while acknowledging their limitations. These include indicators related to medication and health service use and events that result in hospitalisations or emergency department presentations (e.g. fractures).

While recognising the significant differences in the identified monitoring systems from various countries, which limits the direct comparability of several of the indicators examined, we have determined that Australia's performance is varied compared to other countries in terms of quality and safety of care provided. For indicators where comparisons could be made, the use of antipsychotic medications (apart from incident use in short-stay residents) was comparable between Australia, Canada and the USA, but performance was mixed compared to countries such as Finland, Iceland or Sweden. Similarly, the use of anti-anxiety / anti-hypnotic medications was mixed comparing Australia to countries such as the USA, Finland and Iceland. Australia's performance of incidence of pressure injury (stage II-IV) using data from Australia's NMQIP was mixed; the rates observed were higher when compared to Canada or New Zealand but lower than that observed in USA. Utilisation of care plans or medication reviews were considerably lower in Australia by comparison to Sweden. However, in general, Sweden was found to be consistently at the high end of performance for quality and safety in aged care across all indicators examined. The incidence of significant weight loss using Australia's NMQIP was on the lower end of performance compared to Canada, USA and New Zealand. By contrast, Australia performed better than USA for re-hospitalisations and emergency department presentations within 30 days of discharge from hospital, potentially reflective of Australia's lower reliance on acute tertiary care. For indicators such as pain where opioid use was used as a proxy, infections where antibiotic use was a proxy, and the use of hospitalisation data for falls, pressure injuries and weight loss, direct performance comparisons were unable to be made due to the considerable differences in data collection and definitions used in other countries compared with the proxy variables employed in the current analyses.

Suggestions for routine monitoring in Australia that can be implemented using existing data collections, importantly at no additional burden to aged care providers include:

- i. Medication-related quality of care, namely antipsychotic medication use, high sedative load (or some form of index that includes sedative and anti-cholinergic medications such as the drug burden index) and antibiotic use
- ii. Falls and fractures
- iii. Hospital re-admissions

- iv. Hospitalisation for dementia / delirium in individuals with dementia
- v. Pain (chronic opioid use)
- vi. Premature mortality
- vii. Pressure injury
- viii. Utilisation of care plans and medication reviews
- ix. Weight loss / malnutrition

These suggestions are based on international agreement on the measure, high prevalence and / or high impact / risk of harms, and feasibility, consistency of measurement and data availability.

Further, while unable to be examined in Part 2 of this report due to a lack of suitable available population level data, assessment of **quality of life** and other measures of wellbeing such as **activities of daily living** or **physical restraint** are important quality and safety indicators and **should also be included as part of Australia's routine monitoring** in aged care. Physical restraint is currently part of Australia's recently developed NMQIP. The omission of these indicators from this report, should not be interpreted as a lack of recognition for the importance of these as integral components of quality of care assessment, but rather a current lack of adequate data available for this evaluation.

Currently, there are no systematic data collections that monitor the quality of life, consumer experience, or other important consumer or carer assessments about the care that is received in Australian aged care settings. The largest published assessment of consumer experience evaluation was conducted by the Australian Aged Care Quality and Safety Commission and recently published by the Australian Institute of Health and Welfare. This report included the responses of 31,000 aged care residents or carers (out of 189,000 yearly residents)²³² who were interviewed regarding aspects of the care environment, organisational aspects of care provision, and impressions of respect for autonomy. The challenges with this assessment and overall report includes limited capture of individuals, investment of time, cost, and infrastructure for conducting interviews. Additionally, there is

limited information available on the psychometric properties of the 10 item tool employed and the results likely suffer from limited generalisability.

While some of the countries identified in Part 1 of this report included quality of life domains within their indicator sets (including Canada and Iceland), they did not measure individuals-reported quality of life *per se*, but rather surrogate measures such as behavioural symptoms, mood or use of physical restraints.^{28 70} By contrast, the UK have developed a quality of life measure from a survey tool designed to assess residents' quality of life, termed Social-Care Quality of Life (SCRQoL), which includes eight domains from control over daily life to social interactions and dignity.⁹³ However, this was developed for all adults receiving social care and is not specific for older people or aged care recipients.⁹³ Sweden also uses a national survey to assess residents' quality of life, that includes multiple questions such as satisfaction with care and happiness with the level of social interactions and mood.⁸⁵ The Netherlands have also developed an 18 question survey termed the Consumer Quality Index (CQ-Index) that measures care quality from the clients' perspective.⁷⁹ While it is generally acknowledged that inclusion of this type of data can be time-consuming and resource intensive, it is evident from the international use of indicators around these measures that the inclusion of individual-reported outcomes and experiences is recognised as important in understanding how to improve experiences, satisfaction and quality of life for older people.²³³ This includes the most challenging cohorts within aged care such as people with dementia or those with difficulty communicating. Further, it seems that there is uncertainty surrounding the best measures for specific cohorts and within specific settings.^{234,235}

In order to address concerns of care quality and provision of acceptable and person-centred care, additional work is needed in this area. This includes clear goal setting related to the purpose of the measurement (i.e. regulatory, benchmarking, surveillance), employment of measures that are broad in scope (i.e. can work across various groups), have well documented psychometric properties, and finally are not burdensome to implement. This last point is particularly important if assessments are supposed to be periodic and ongoing as it will influence not only the willingness of participants and carers to respond but impede its viability from a cost perspective. One strategy for obtaining quality of life data is integrating standard measures into routine assessments within the aged care sector or

follow-up and delivery of care plans performed by aged care providers. The use of longitudinal, repeated, consistent and systematic assessment of quality of life measures will make the data collection process part of the inherent product of delivering person-centred care.²³³ Currently, an Australian team is developing a preference-based older person-specific quality of life instrument that aims to incorporate the values of older Australians into the measurement and valuation of quality of life for the purposes of quality assessment and economic evaluation in aged care.²³⁶

A national set of quality and safety indicators of care for the aged care sector is necessary and a pragmatic approach should be taken to develop these. This means leveraging the wealth of information already available nationally within the Australian aged care and health care sectors and supplementing it with new standardised high-quality data that captures the domains of quality and safety that are not possible to capture within existing data sources. To date, there are several agencies systematically collecting information about the individuals in aged care. Some of the largest, and likely most important, data collections on the individuals in aged care are collected by the Australian Government, State health authorities, and aged care providers. While most of the largest and most consistent data collections are mainly administrative / transactional data (e.g. aged care service records, PBS, MBS, state health authorities' hospitalisation records), some do include clinical assessments (e.g. Aged Care Eligibility Assessment). These collectively can be used to derive substantial health and clinical status about individuals in aged care and examine important quality and safety indicators of care.²⁸

It would be remiss not to leverage the enormous amount of data that is already available on individuals and learn from these experiences before implementing new data collection systems for quality and safety monitoring. The ROSA indicators illustrate that several quality and safety indicators of care can be ascertained using the existing data within aged care and health care sectors in Australia.²⁸ While these indicators have several limitations, they are a starting point for the development of robust indicators to inform the sector. Therefore, based on our experience with these data our suggestion is for the development of an **integrated national minimal dataset for the purpose of measuring quality and safety in care**, which would:

- 1) Use the existing data for the development of the indicators that are feasible
- 2) Standardise aged care providers management systems to capture additional elements as part of their ongoing processes of care that focus on complementing and not repeating data already elsewhere collected
- 3) Develop and include high quality instruments to capture domains of care not able to be collected elsewhere (e.g. quality of life, individuals' satisfaction of care).

The type of data used for the quality and safety indicators we examined was a driver of the comparability between the Australian ROSA data and the comparison countries. Five of the 11 international quality and safety indicator systems identified used a version of the MDS-RAI. The RAI instrument was originally developed in the USA in response to a call by USA lawmakers to improve the quality of long-term care in the country.⁹⁷ It has since evolved into a 35-country consortium of clinicians and researchers focused on the implementation, application and ongoing development of the instruments, termed interRAI™.²³⁷ It aims to promote evidence-informed clinical practice and policy decision support through standardised data collection and interpretation of the characteristics and outcomes of people across a range of health and social settings, including long-term care.²³⁷ However, interRAI™ is a not for profit corporation in the USA and the use of the MDS-RAI for monitoring the quality and safety of care through the use of its assessment tool and quality indicators are associated with considerable financial costs. One of the most recent countries to implement and mandate the interRAI system to monitor quality and safety of individuals in residential care is New Zealand.⁸¹ The interRAI system was implemented in 2015 in New Zealand following pilot studies and mandated for all residential care providers, with the first publicly available annual report published in 2019 for the 2017 / 2018 year.⁸¹ The interRAI system provides an opportunity for measuring quality and safety of care using standardised documentation and clinical assessment protocols that have been validated and implemented in other countries (e.g. New Zealand, Canada). However, the interRAI encompasses much more than a minimal dataset for the purpose of quality and safety indicators of care monitoring. The interRAI instruments provide an opportunity for ongoing, systematic monitoring of the population in various settings, covering multiple areas (i.e. quality indicators, clinical assessment, and decision support). Some of the areas captured in the interRAI instruments overlap with other assessments currently in place in Australia,

namely in the ACAT, ACFI and the Australian National Aged Care Classification (AN-ACC) which is expected to soon replace the ACFI, in addition to existing management system records within individual aged care providers. In addition, the interRAI requires assessments to be carried out in person, hence require significant investment from assessors and individuals in care or carers. Therefore, the implementation of the interRAI instruments would be most efficient, from both an implementation and evaluation perspective, if it replaced other assessments instead of being used in addition to existing assessments.

Registry data or administrative claims data have also contributed to the quality and safety indicator assessments performed internationally. In the USA, for example, five quality measures focused on key outcomes such as hospitalisation and emergency department presentations are based on claims data.⁹⁹ It has been argued that the use of outcome measures for monitoring quality of care should be prioritised over process measures, given the poor correlation generally observed with improvements in process measures and resident health outcomes.²³⁸ Increasing utilisation of administrative claims data for routine monitoring of quality and safety of care, similar to that employed by the ROSA OMS indicators using Australian aged care and health care linked data, can provide a broad range of important outcome measures across key domains with minimal additional data collection required by aged care providers. Minimising active data collection for specific quality and safety indicators that can be measured with existing sources can reduce the bias and burden involved with mandatory reporting by the providers. It also allows for resources invested in active surveillance to be redirected to indicators that cannot be ascertained with existing records, namely the quality of life measures previously discussed.

The gold standard for using data for quality improvement is to examine a specific set of quality and safety indicators that have been agreed upon by the individuals receiving and providing care so that action can be taken when changes occur.²³⁹ **Real time data collection should be standard**, and frequent evaluation of these data should be carried out in a manner that provides both information on practice changes for specific providers (i.e. time series analysis) as well as opportunities for benchmarking (i.e. comparability of providers). In the absence of real time data collection and reporting, indicators should ideally be reported as frequently as providers agree that is useful to support their quality improvement

initiatives. If reporting of quality and safety indicators like those included in ROSA OMS (i.e. employing existing Australian federal and state data collections) were to be done more frequently than yearly, then these data collections would need to be accessible and promptly linked more frequently.

With the ageing population, and increased demand on healthcare services, many countries are adapting their health and aged care systems to provide community-based appropriate and affordable care. This is in part in response to older people's preference to remain at home for as long as possible.³¹ Australia's federal government, like many countries (e.g. Canada, Sweden), provide home care packages dependent on level of need, to provide aged and health care services to assist people to remain at home for as long possible, and provide choice and flexibility in the support and care they receive.²⁴⁰ Routine monitoring of home care quality and safety indicators is therefore also essential to ensure appropriate and high quality community care and services are provided. Unlike Australia, other countries that provide home care support such as Canada, Netherlands and Sweden have implemented home care quality and safety indicators that are routinely monitored, with New Zealand also currently implementing these nationally. Key domains commonly examined include changes in cognition, mood, functional abilities and pain, in addition to incidence of hospitalisations, falls, incontinence and medication use. Home care quality and safety indicators should be included in Australia's aged care monitoring, with preference given to those that can be examined using existing data sources. Such indicators include those related to medication use (e.g. high sedative load), health service use (e.g. home medicines review) and events that result in hospitalisations or emergency department presentations (e.g. falls / fractures).

Of the identified indicators across international systems, the measures overall highlight negative aspects of care, such as inappropriate use of medications or use of physical restraints. The lack of positive care outcomes may make appropriate interpretation of overall quality of care more difficult for residential and home aged care. However, the inclusion of target ranges for each of the quality indicators facilitates the interpretation and understanding of the level of safety and care provided. Reference ranges provide an objective measure for targets and facilitate identification of areas where care is potentially suboptimal and requires improvement. Only the Australian Victorian PSRACS quality

indicators and Iceland quality and safety indicator set included reference ranges with upper and lower 'thresholds' for each of the indicators. The Australian Victorian PSRACS reference ranges were developed based on literature review, modelling and analysis of the data, together with expert consensus²⁴¹, whilst in Iceland they were derived from expert consensus alone (modified Delphi technique).⁷¹ The inclusion of more rigorous evidence-based target ranges or benchmarks that are also realistic and achievable, using a range of methods including use of modelling and simulation studies, may facilitate the interpretation of the quality indicators and processes needed for improvement.

All countries examined in this report employ some form of public reporting of their quality and safety indicator program, which is aimed to increase transparency and accountability of the system, potentially helping to improve performance and giving residents and their families the opportunity to make informed decisions regarding service use. However, to date the evidence regarding the impact of public reporting on influencing decision making or improving quality and safety of care is mixed.^{242,243} The effectiveness of public reporting may be improved by the use of more visually appealing and interactive tools or decision aids to facilitate understanding using evidence-based methods that display and convey this important information in a succinct manner. Such strategies are being used in many of the Nordic countries and Canada. Furthermore, the inclusion of indicators that include quality metrics that residents perceive as important, such as quality of life, may improve understanding of quality indicators assessment.²⁴³ Ongoing examination of the indicators developed and reassessment of whether they are contemporary, useful, and meaningful is important.²³⁸ Another potential strategy to improve transparency and accountability is the establishment of independent regulators of quality assessment, that are separate from the national bodies that oversee the funding of the services or providers themselves. For example, Canada and New Zealand have established independent regulatory bodies that oversee the monitoring of quality indicators, including data management, compilation of statistics and reports (including risk adjustment and reporting of benchmarking) to monitor facilities quality and safety of care.^{28, 81}

Assessment of overall quality of care is complex due to the multidimensional factors that influence its measurement, including differentiation between the residents' quality of

health care received and the natural trajectory of health, functional and mental deterioration associated with ageing and associated health conditions. However, there is the opportunity to improve health outcomes and quality of life for this population. It is evident from our evaluation, that with the existing data available in Australia, a well-designed, comprehensive, and effective quality and safety indicator reporting system can be implemented to capture important indicators of care that will inform the current sector. As it evolves and matures, this quality and safety reporting system can and should build additional capability to capture the elements identified as important but not available in current national data collections, including quality of life or other measures of wellbeing and consumer experience.

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