

Literature Review and Environmental Scan: Identifying Quality Measures in Assisted Living

A report to the Minnesota Department of Human Services

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Executive Summary

The objective of this report is to conduct a national review of quality measures for assisted living and determine how assisted living (AL) quality is conceptualized, types of domains for AL quality that are measured, and indicators used to assess these domains. The overarching goal is to inform the development of a quality framework for the AL report card in Minnesota, which is part of the new AL legislation.¹

Our methodology involved a comprehensive review of peer-reviewed literature and an environmental scan of grey literature (i.e., reports or papers not included in traditional journals or books) to identify previous research and current practices related to assessing quality in AL and providing information to consumers about AL. We first searched the peer-reviewed published literature. For this, we searched bibliographic databases (Ovid Medline, CINAHL) for literature published in 2009 and later. We also searched the grey literature, in the form of reports and analyses from websites of relevant state and federal agencies and research organizations, citation searches of articles, and online search engines using relevant keywords. We also conducted phone interviews with 14 national stakeholders in AL quality and held two technical expert panels of 9 experts. We asked the following three questions:

- 1) Which domains have been identified in previous or proposed efforts to assess quality in AL?
- 2) What indicators (associated measures) have been developed to assess quality in AL with respect to each domain?
- 3) Which indicators have been implemented in previous efforts to assess quality in AL?

Our bibliographic database search strategies identified 833 references. Title and abstract screening eliminated 719 of those references. Citation searching identified an additional 46 references. We screened the full text of 160 references. We excluded 111 references because they were not based in the U.S., did not address AL quality, did not provide domains or indicators, or were published prior to 2000. This resulted in 49 references meeting our eligibility criteria from peer-reviewed literature. Grey literature sources identified an additional 45 references.

Overall, the national review surfaced a number of useful, existing quality measurement approaches and tools. These included a key set of domains both from peer-reviewed and published literature: 1) resident quality of life; 2) resident/family satisfaction; 3) staffing and staff-related outcomes; 4) resident safety; 5) resident health outcomes; 6) care services and integration; 7) physical and social environment; 8) service availability; and 9) core values and philosophy. Among these domains, quality of life and satisfaction emerged as essential measures of AL quality both from the published and grey literature as well as key informant interviews and technical expert panels. However, staffing, safety, and resident health outcomes (especially medication management), along with other identified domains like care integration, are also of vital importance, especially as AL residents become increasingly more complex and have higher clinical care needs.

¹ Laws of Minnesota 2019, Regular Session, chapter 60, article 5, section 1:
<https://www.revisor.mn.gov/laws/2019/0/Session+Law/Chapter/60/> (Accessed July, 2019)

Introduction: Assisted living and the need for quality measures

Definition and extent of assisted living

Assisted living (AL) has many different definitions but is commonly defined as the “senior living option that combines housing, support services, and health care, as needed.”² AL is meant to provide more assistance than an independent retirement community but less medical and nursing care than a nursing facility. A typical AL community offers assistance with everyday activities such as meals, medical management, or assistance bathing, dressing, and transportation. Nationally, as well as in MN, many AL communities provide care for people with dementia. According to the new licensing framework passed by the 2019 Minnesota Legislature (subd.7), AL is defined as “a licensed facility that provides sleeping accommodations and assisted living services to one or more adults.”³ The new licensing framework also defined an additional license category AL with dementia care (subd 8).³ It is defined as “a licensed assisted living facility that is advertised, marketed, or otherwise promoted as providing specialized care for individuals with Alzheimer's disease or other dementias. An assisted living facility with a secured dementia care unit must be licensed as an assisted living facility with dementia care.” The full list of AL services is listed in Appendix B. ³

There are approximately 31,000 AL communities in the United States, with over 750,000 older adults living there (Park-Lee et al., 2011; S. Zimmerman et al., 2015). In Minnesota, there are approximately 1,300 assisted living communities serving over 43,000 older adults and persons with disabilities. ⁴

History

AL appeared in the 1980s and grew out of two tracks: a) boarding homes, where care was provided at homes in the community caring for a limited number of older adults; and b) independent living, with older adults choosing to live in congregate care setting for health and social needs. (Pratt, 2010) Underpinning both of these tracks has been the focus on choice, independence and dignity for those receiving care. AL is now offered and licensed under a variety of names. States have different licensure policies that may offer or prohibit certain services, leading to great variability in types of AL. It is worth noting that the terminology used varies from state to state. For instance, California refers to this setting as an “Assisted living community”, Ohio uses the term “Residential care facility”, while some other states use “Assisted living *facility*” or “Assisted living *community*”. The use of the word facility versus community, is dependent on how each state regulates this setting. That is, whether it is treated closer to that of nursing facilities, or more like a home and community-based services setting, on the long-term care (LTC) spectrum.

² Argentum (formerly Assisted Living Federation of America) via Nevada Care Connection: <https://www.nevadaadrc.com/resources/learn-about/item/291-assisted-living-federation-of-america> (Accessed July 2019)

³ Minnesota Legislature, Office of Revisor Statutes: Article 1 Assisted Living Licensure: https://www.revisor.mn.gov/bills/text.php?number=HF90&type=bill&version=6&session=ls91&session_year=2019&session_number=0 Accessed July 2019)

⁴ Minnesota Department of Health, Housing With Services Registration, September 2018 (Accessed July 2019)
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For the purposes of this report, we use the term AL community.

A key development in the history of AL was the development of the AL Workgroup in 2001, when the U.S. Senate Special Committee on Aging convened a meeting of over 50 AL stakeholders across the nation requesting that they make recommendations on quality for AL. AL Workgroup made over 100 recommendations on quality, with the focus on prioritizing person-centered care and quality of life, as well as accountability and oversight, affordability, direct care services, medication management, staffing and residents' rights.^{5,6}(Kajonius & Kazemi, 2016)

Philosophy of care

AL is distinguished from other residential long-term care options, and especially skilled nursing facilities, by its philosophy of service delivery that aims to maximize independence, individual choice, dignity, autonomy, and quality of life. According to the National Center for Assisted Living, key aspects of AL philosophy include: a) maximizing personal dignity, autonomy, independence, privacy and choice; and b) providing a homelike environment; while also c) providing personal care services; d) accommodating residents' changing care needs; and e) minimizing the need to change facilities.⁷

National profile

Nationally, the majority of ALs are owned and operated by for-profit agencies (82%), with the remainder being non-profit and government owned. About half of all ALs are small, with 4-10 beds. Another 16% have 11-25 beds, about 1/3 (28%) have 26-100 beds, and 7% have more than 100 beds. (Park-Lee et al., 2011) About 56% of ALs are chain-affiliated.⁸ Most of assisted living is still private pay, but the proportion of state Medicaid investment, while small, is growing. (Park-Lee et al., 2011) In 2010, about 4 out of 10 Residential Care Facilities had at least one resident who had some or all of their LTC services paid by Medicaid. (Park-Lee et al., 2011) The percentage of facilities having residents who received LTC services paid by Medicaid varied by facility size. The average AL consumer is an 87-year-old woman, with majority having family living nearby. Most AL residents move from home (70%), with 9% moving from independent living communities, 5% from another assisted living, 9% from nursing homes, and 7% from another residence.⁹

⁵ Center for Excellence in Assisted Living (CEAL). 2013. Assisted Living Workgroup Report: <https://www.theceal.org/component/content/article/2-uncategorised/15-assisted-living-workgroup-report> (Accessed July 2019)

⁶ Agency for Health Care Administration (AHCA) Assisted Living Workgroup – Final Report and Recommendations (via Center for Excellence in Assisted Living(CEAL): http://www.theceal.org/information/assisted-living-resource-center/clearinghouse/item/download/116_5452710a8d91b261f94a249453d7c891 (Accessed July, 2019)

⁷ Center for Excellence in Assisted Living (CEAL). 2013. Assisted Living Workgroup Report: <https://www.theceal.org/component/content/article/2-uncategorised/15-assisted-living-workgroup-report> (Accessed July 2019)

⁸ National Center for Assisted Living (NCAL). 2019. Assisted Living Resident Profile. Retrieved from <https://www.ahcancal.org/ncal/facts/Pages/Communities.aspx> (Accessed July, 2019)

⁹ National Center for Assisted Living (NCAL). 2019. Assisted Living Resident Profile. Retrieved from <https://www.ahcancal.org/ncal/facts/Pages/Communities.aspx> (Accessed July, 2019)

Minnesota profile

Approximately 72% of the 1,300 AL communities in Minnesota are for profit, 25% are non-profit, and 3% are publicly owned.¹⁰ In the current regulatory environment, it is difficult to estimate what portion of assisted living is paid for through Medicaid waiver programs. However, based on state waiver program data and AL occupancy data, it appears that roughly a quarter of the people served in AL communities are supported by Medicaid.¹¹ The average age of older adults served in AL communities with the support of Minnesota's Elderly Waiver program is 84 years old, and 76% of those served are female.¹²

A key feature of MN long-term care policy context is the relatively small and decreasing number of skilled nursing facilities, in part due to the 2005 moratorium on new nursing home beds and the state long term care rebalancing efforts toward home and community-based services. In fact, the number of existing skilled nursing facilities has been steadily decreasing, with two more facilities scheduled to close in the summer of 2019 alone (out of 378). Thus, since MN has three times more ALs than skilled nursing facilities, and AL industry is growing, the resident acuity in AL will also continue to rise in the shift from traditional skilled nursing homes to assisted living. This trend is also evidenced nationally. According to a national survey conducted in 2014 by PointClickCare and McKnight's Long Term Care News, 87% of AL providers who responded to the survey acknowledged a surge in resident acuity levels while 45% stated they did not know how to respond to the trend.¹³ Thus, these shifts underscore the urgency of this undertaking to develop an AL report card.

Significant trends and their impact on quality

Key significant issues in AL have included: a) the ability of residents to age in place; in part leading to b) increasing resident acuity; c) growth in managed care (both private and government); and d) increasing regulation. In addition: e) the growing investment through HCBS waivers, nationally and in MN, has resulted in providers needing to address variability in quality of AL services provided to better help consumers choose settings and report to payers.

Concerns about quality in assisted living

AL is recognized as one of the fastest-growing components of the long term care industry (N. G. Castle, Wagner, Ferguson-Rome, Smith, & Handler, 2012). However, concerns have surfaced regarding the quality of AL nationally and in MN. Many of the concerns include poor staffing, inadequate teamwork, and poor management, which negatively impact resident well-being. A national study surveyed 572 administrators and

¹⁰ Minnesota Department of Health, Housing With Services Registration, September 2018 (Accessed July, 2019)

¹¹ DHS, Data Warehouse, State Fiscal Year 2018

¹² DHS, Data Warehouse, State Fiscal Year 2018

¹³ Berdzik, C.J., McMillen, J. Best Practices for Managing Acuity Creep in Assisted Living American Health Lawyers Association-Long Term Care and the Law. New Orleans, Louisiana February 23-25, 2015: <https://www.ahcancal.org/ncal/operations/risk-management/Documents/Private%20Caregiver%20Resources/Best%20Practices%20for%20Managing%20Acuity%20Creep%20in%20Assisted%20Living.pdf> (Accessed July, 2019)

3,600 workers in AL and found that the patient safety culture was lacking in many AL communities and could result in resident neglect. (Nicholas G Castle, Wagner, Sonon, & Ferguson-Rome, 2012)

Research questions

The growth in the number of AL communities and the number of individuals residing in ALs nationally, as well as the passage of the new AL legislation in Minnesota, create the impetus for this report. The goal of this report is to conduct a national literature review and environmental scan of existing domains and indicators used to assess quality in AL and develop recommendations. We ask the following research questions:

- 1) Which domains have been identified in previous or proposed efforts to assess quality in AL?
- 2) What indicators (associated measures) have been developed to assess quality in AL with respect to each domain?
- 3) Which indicators have been implemented in previous efforts to assess quality in AL?

Conceptual framework

In searching and reviewing literature on AL quality, we were guided by the Donabedian model {Donabedian, 1988 #176}: one of the most well-known and commonly used conceptual framework to evaluate quality in health care settings, including long-term care services and supports. This model is useful for our report because it helps to operationalize quality, broadly described as “the capacity to satisfy the needs and wants of the users of a service or product,” as measurable indicators (Crick, Backman, & Angus, 2017) (Kajonius & Kazemi, 2016; Stewart, 2001). Since it is our belief that AL quality is ultimately best judged by the consumers (i.e., residents and families), the Donabedian framework offers an inclusive view of quality and helps identify indicators for evaluation.

Based on the model, quality of care consists of three fundamental components: “structure”, “process”, and “outcomes”. Structure refers to factors that impact the conditions of care-giving, such as the physical and social characteristics of the AL, the philosophy of care delivery, AL ownership and location, and the methods of reimbursement. Process factors denote what actually takes place in the transaction of care delivery for AL residents, such as interaction, communication, and decision-making, happening between staff and residents, health information exchange between the AL community and other settings, etc. Process factors are considered more challenging to measure than structural variables, which are usually more straightforward. Finally, outcomes refer to the effects of the care setting (i.e., AL) on resident’s well-being and health outcomes. The lists below provide an example of how AL quality domains can be organized using the Donabedian framework.

Structure

- Physical environment (e.g., equipment and types of services provided)
- Payment sources (e.g., % private pay vs % Medicaid)
- Social aspects (e.g., types of programming)
- Organizational structure (e.g., types of staffing; total staff hours, RN hours)

- Regulatory compliance (e.g., citations)
- Ownership, location, chain affiliation

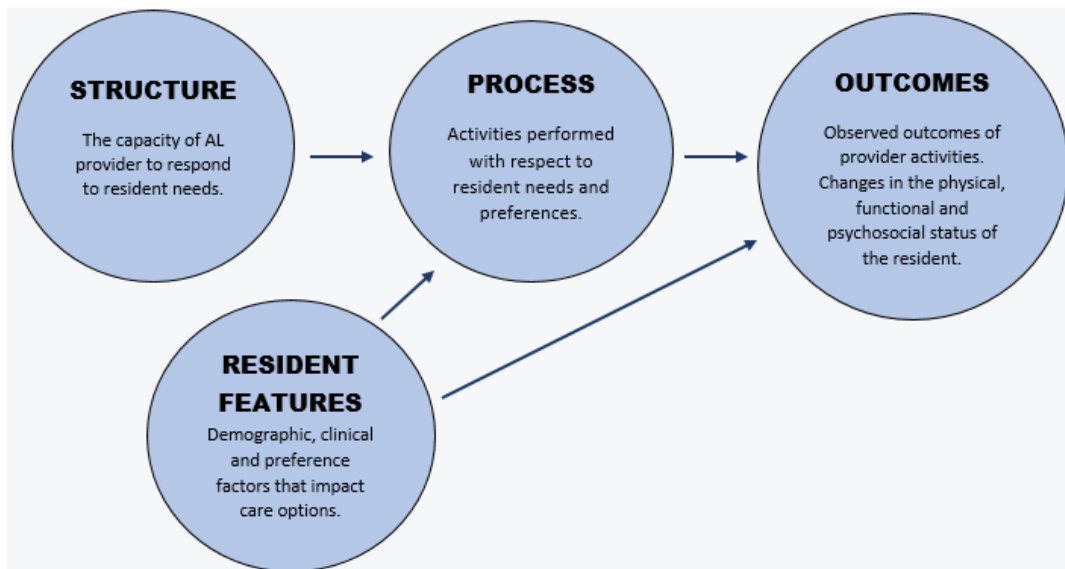
Process

- Care coordination (information transmission)
- Care transitions (e.g., efficiency, patient preferences, admissions and discharge criteria)
- Workforce-related: turnover, consistent assignment, stress/burnout, staff satisfaction
- Communication between residents/families and staff: care councils, resident engagement in decision-making

Outcomes

- Person-reported outcomes: quality of life, family satisfaction, resident satisfaction, experience of care
- Person-centered care: resident direction; staff empowerment
- Quality of care: clinical QIs, critical incident reports, medication management (including errors, reconciliation, medication risk)

Figure 1: Donabedian model, applied to AL quality.



Using the Donabedian framework, AL quality domains can be categorized into “structure,” “process,” and “outcomes” to help determine gaps in measures after the literature review and environmental scan. Structure includes elements of physical-, financial-, social-, and organizational environments, as well as the regulatory compliance. Process denotes communication around care coordination, care transitions, and interactions between staff and residents/families. Finally, outcomes include both clinical as well as person-reported measures of well-being.

It is important to note that because AL includes both healthcare and housing, Donabedian framework has some limitations by primarily focusing on housing. Although this framework is more focused on the healthcare

aspect of AL, it offers a broad view of quality, targeted toward resident outcomes (who are ultimately the best judges of quality)

Methods

We started by reviewing the nursing home quality literature, which is larger and longer-running than AL literature. Of particular relevance is that Minnesota is a nationally-recognized leader in measuring and reporting nursing home (NH) quality, which include validated, person-centered measures of quality of life, experience of care, and family satisfaction, which are missing from the Center for Medicare and Medicaid's (CMS) Nursing Home Compare tool and have been recognized by CMS as key gaps in measurement. Minnesota's NH quality measures have been developed through rigorous testing and have been validated to capture key aspects of residents' overall well-being and satisfaction with care.¹⁴ These measures reflect a growing recognition of the importance of person-centered outcomes such as resident experience and quality of life by CMS and other payers and policy makers. MN NH Report Card also include Clinical Care Quality (from Minimum Dataset), which are more comprehensive and nuanced than CMS-reported NH Compare. These measures are also case-mix adjusted based on research evidence, using complex statistical techniques (Bayesian approach).

Although quality in skilled nursing homes and AL communities share a number of things in common, NHs and AL communities also have significant differences (as noted in the introduction). For this reason, our primary focus in this review was on quality domains based on AL literature. For a detailed summary of quality in nursing homes and the history of the nursing home report card in Minnesota, see Appendix C.

Bibliographic databases: searching, screening

We conducted an environmental scan to identify previous research and current practices related to assessing quality in AL and providing information to consumers about AL. We first searched the traditionally published literature. We searched bibliographic databases (e.g., Ovid Medline, CINAHL) for literature published in 2009 and later. The Medline search strategy appears in Appendix A. We relied on systematic reviews on the topic to identify literature published prior to 2009.

We developed inclusion criteria to guide decisions about the relevance of search results to the research questions. We included references if they reported data on AL communities in the U.S.; reported domains or indicators related to AL quality; and were published after 1999. A research librarian reviewed the titles and abstracts to determine potential relevance to each reference. Research team members reviewed the full text of each of the potentially relevant reference to determine whether the reference met inclusion criteria.

¹⁴ Nursing home Compare: <https://www.medicare.gov/nursinghomecompare/search.html?> Accessed July 2019.
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Grey literature: searching, screening

The term grey literature typically describes reports or papers not included in traditional journals or books. These may include reports from associations, societies, city, state, and federal governments, and other organizations. Electronic versions of these reports are typically available on websites. We searched for grey literature to supplement our bibliographic database searches. We conducted this search by reviewing references of systematic reviews and websites of highly relevant organizations and states we know to be working on AL quality issues.

We used the same inclusion criteria for grey literature as was used for the peer-reviewed published literature. Data sources included Open Grey, the New York Academy, and Henry J Kaiser Family Foundation. We also searched Yahoo and Google search engines, which yielded multiple pages of results. Furthermore, we included searches based on key informant interview referrals and recommendations and kept relevant results that matched search criteria. State-level grey literature searches were conducted via google search engine, based on key informant interview recommendation, and references from peer-reviewed articles. In our review, we included states that had information on consumer fact sheets, conducted AL surveys and/or had plans to implement a quality-based performance system.

Data extraction and analysis

We extracted data from eligible references into evidence tables. References reporting the same study were extracted together. Data extracted included: author, year of publication, population studied, description of the study or reference, quality domains, and/or indicators. We summarized the information for all relevant studies in summary tables (Appendix D and E).

Key informant interviews

We supplemented our literature search with key informant interviews. We sent interview invitations to individuals that were research, policy and/or program experts in AL Quality Assessment. We conducted 14 phone interviews from February through June of 2019. Each phone call was approximately 30 to 60 minutes long. The key informants shared their ideas about quality in AL and what to consider based on Donabedian's general framework of structure, process, and outcomes. The key informant interview questions and prompts we used for discussion are outlined in Appendix F.

Technical expert panel calls

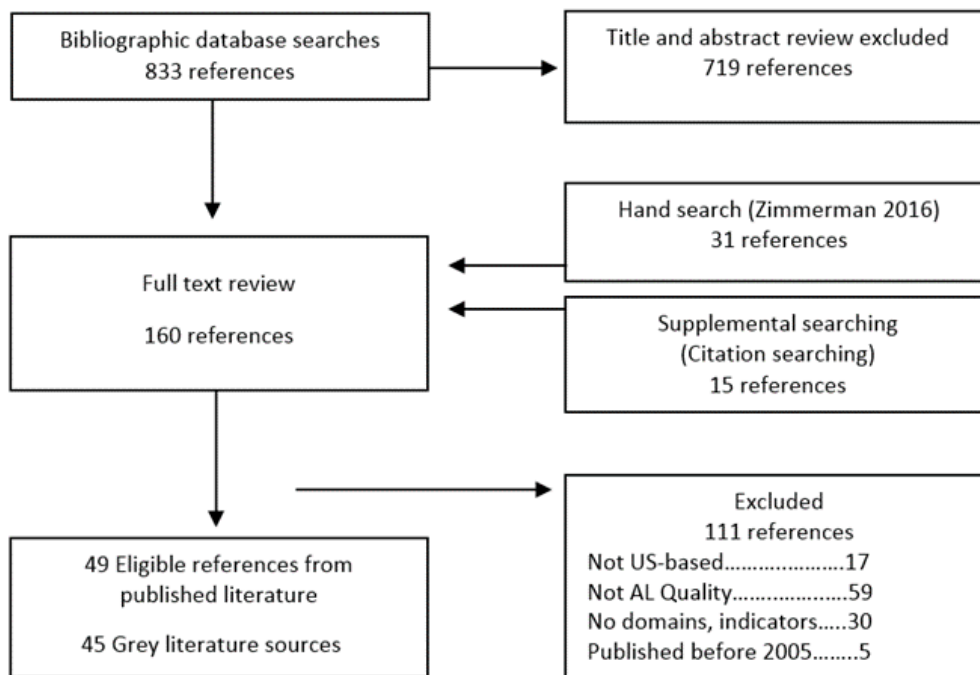
We conducted conference calls with a group of individuals known to be experts in AL quality or representatives of states currently implementing AL quality initiatives. We conducted two 60-minute calls: in May 2019 with 5 panelists; and in June 2019 with 4 panelists. Each call consisted of a mix of research, policy, and practice experts, who were asked to comment on and critique our published and grey literature findings, reflecting on the AL quality domains and indicators we had identified.

Results

Studies from peer-reviewed literature

Our bibliographic database search strategies identified 833 references (Figure 1). Title and abstract screening eliminated 719 of those references. Citation searching identified an additional 46 references. We screened the full text of 160 references. We excluded 111 references because there were not based in the U.S., did not address assisted living quality, did not provide domains or indicators, or were published prior to 2000. This resulted in 49 references meeting our eligibility criteria. Grey literature sources identified an additional 45 references.

Figure 2: Published literature flow diagram



We extracted details from unique studies identified in the published literature into evidence tables (Appendix D and E). We separated studies by whether they reported domains (i.e., topical areas for which information is needed or desired about assisted living facilities) or indicators (i.e., methods that could be used to measure particular domains). This separation was not always straightforward, but we tried to classify studies as domains when the purpose appeared to be to study, suggest, or recommend categories of indicators that were important to AL quality. We classified studies under indicators if they reported specific data elements or instruments that could be used to measure particular domain(s).

Key informant interviews

We used a standard set of interview questions to solicit information from 14 key informants (Appendix F). These interviews guided us to additional grey literature resources and helped us focus the literature searches and organization of data.

The interviews also helped us strategize how to organize domains and indicators using the Donabedian conceptual framework, and contributions to what domains and measures should be explored for the AL report card. There was agreement in understanding what AL measures are feasible and actionable (e.g., quality of life, satisfaction), and which would be harder to operationalize (clinical quality of care). There was also general enthusiasm for creating an AL report card based on research evidence and comprehensive stakeholder engagement. At the same time, key informants acknowledged the complexity of implementing a report card. Informants across the board recognized that there is variation in consumer experience and types of service offerings among AL providers, and this variation should be taken into consideration when developing the scoring approach for the report card. Some participants recommended drawing upon quality measurement tools and frameworks already available, such as the National Quality Forum Measures, National Core Indicators, and CoreQ. They also discussed the importance of engaging providers, family and consumers throughout the AL report card development process.

Technical expert panel (TEP) calls

We conducted two separate TEP calls (Appendix F). Two calls were held due to participant availability and not separated based on contextual issues. These calls served to provide external validity for the peer-reviewed and grey literature findings and identify any possible gaps or other areas that were missing.

TEP participants overall expressed consensus that our literature review findings captured the primary domains and indicators currently available to address AL quality. In our first call in May, four main themes emerged. First, TEP experts highlighted that clinical indicators of quality were underrepresented in our review, including quality of transitions post hospitalization, and pain and infection management. As AL has become more medicalized, they noted that such medical competence is important to track. Second, emphasis was placed on discharge policies and the central role they play in AL quality for consumers. Third, despite the heavy focus on clinical measures, TEP participants agreed that AL measures should not be overly clinical in place of more comprehensive view of care, and thus should include quality of life and licensing procedures as well. Finally, the participants discussed the changing meaning of AL nationally and new regulations in MN and how they might differ from other states.

Five main themes emerged from the second TEP. First, there was overall agreement that person-centered measures such as quality of life and family/resident satisfaction, are essential for any AL quality measurement. Experts on this second call focused on quality of life measures and weighted this domain as more important compared to other domains that were less focused explicitly on measuring quality of life. They emphasized that AL should be considered more as a “living” community versus a “care” setting, as AL communities are similar to the concept of Aging in Place versus an institutionalized setting such as nursing homes. Second, participants emphasized that person-centeredness is at the foundation of AL care and hence should be assessed. Participants discussed Person-Centered Practices in Assisted Living (PC-PAL) tool, developed by the Identifying Quality Measures in Assisted Living

partnership between the University of North Carolina at Chapel Hill and the Center for Excellence in Assisted Living, as well as other stakeholders (e.g., AARP). Thus, while QOL is important, other domains of person-centered care (e.g., caregiver/resident relationships, workplace practices for staff) should also be assessed. The participants also noted that some domains were multi-dimensional and should include participation by resident, family members, and staff. Third, similar to the first TEP call, participants acknowledged the broadening scope of integrated services provided in AL settings, and that it would be important to reflect a balance between autonomy, choice, and safety domains, for instance. Fourth, there was strong emphasis concerning development of measures and processes inclusive of understanding the experience of people with cognitive impairment and diagnoses of dementia. Finally, participants emphasized the need to engage diverse stakeholders in future stages of this work and generate consensus throughout the measure development process.

Domains

Of the 49 references determined eligible from bibliographic database searching, 25 references reported on 23 unique studies considered to report on domains relevant to AL quality (Appendix C). (M. M. Ball et al., 2004; Mary M Ball et al., 2000; Bonifas, Hedgpeth, & Kramer, 2013; Cartwright, Miller, & Volpin, 2009; Nicholas G Castle et al., 2012; Chao, Dwyer, Houser, Jacques, & Tennstedt, 2008; Chao, Dwyer, Houser, Tennstedt, & Jacques, 2008; Chao, Houser, Tennstedt, Jacques, & Dwyer, 2007; Chou, 2012; Chou & Robert, 2008; Curtis, Sales, Sullivan, Gray, & Hedrick, 2005; Gray et al., 2006; Horowitz & Vanner, 2010; Mitchell & Kemp, 2000; Morgan, Perez, Frankowski, Nemec, & Bennett, 2016; Perkins, Ball, Kemp, & Hollingsworth, 2013; Simmons, Coelho, Sandler, Shah, & Schnelle, 2018; P. D. Sloane et al., 2004; Philip D. Sloane, Zimmerman, Williams, & Hanson, 2008; Walsh & LaJoie, 2018; Young et al., 2008; S. Zimmerman, Love, Cohen, Pinkowitz, & Nyrop, 2014; S. Zimmerman et al., 2011; Sheryl Zimmerman et al., 2003) Most studies were mixed-method studies incorporating observations and/or interviews with review of resident or facility records. Most of the studies we identified that addressed domains of quality focused on overall quality at the facility, and resident-level quality of life and satisfaction.

Facility-related domains included service availability (e.g., pharmacy/medication-related services; (Gray et al., 2006; P. D. Sloane et al., 2004; Young et al., 2008; S. Zimmerman et al., 2011) food and nutrition services; (Chao, Dwyer, Houser, Jacques, et al., 2008; Chao, Dwyer, Houser, Tennstedt, et al., 2008) hospice services (Cartwright et al., 2009)) Also mentioned in this literature were outcomes associated with these services (e.g., aging in place; (M. M. Ball et al., 2004) unmet needs related to dying with dementia; (Philip D. Sloane et al., 2008) quality of hospice care; (Cartwright et al., 2009) meal quality; (Chao, Dwyer, Houser, Jacques, et al., 2008; Chao, Dwyer, Houser, Tennstedt, et al., 2008) medication errors (P. D. Sloane et al., 2004; Young et al., 2008; S. Zimmerman et al., 2011)). Other facility-related domains suggested as important were related to characteristics of the resident population (e.g., prevalence of mental health disorders; (Morgan et al., 2016) rates of alcohol misuse (N. G. Castle et al., 2012)). One study, with much influence on the field, discussed an overarching domain of person-centeredness which cuts across many domains and sub-domains (e.g., Core values and philosophy: personhood, respect and dignity, autonomy, independence and choice, privacy; Relationships and Community: belonging; Governance/Ownership; Leadership; Workforce practices; Meaningful life and engagement; Environment; Accountability). (S. Zimmerman et al., 2014)

Studies identified as suggesting resident-level domains important to AL quality predominantly discussed resident quality of life. Three studies specifically mentioned quality of life. (Mary M Ball et al., 2000; Horowitz & Vanner, 2010; Mitchell & Kemp, 2000) However, other studies focus on resident empowerment, (Bonifas et al., 2013) social engagement, (Sheryl Zimmerman et al., 2003) and well-being. (Perkins et al., 2013) With resident-level domains and sub-domains, there is likely overlap among these domains and terms. For instance, one study that reports on quality of life mentions sub-domains or components of psychological well-being, independence and autonomy. Other studies address those specifically. It is challenging to group domains and sub-domains without a standardized taxonomy.

Two other types of domains were mentioned less frequently. Staff-related domains of job satisfaction and resident-focused job satisfaction were mentioned in two studies. (Chou, 2012; Chou & Robert, 2008) The built environment and social capital were discussed in one study. (Walsh & LaJoie, 2018)

Indicators

Of the 49 eligible references, 24 reported on 22 unique studies about indicators relevant to AL quality (Appendix E). (Aud & Rantz, 2005; Aud, Rantz, Zwygart-Stauffacher, & Flesner, 2007; Aud, Rantz, Zwygart-Stauffacher, & Manion, 2004; Biola et al., 2007; N. Castle & Beach, 2011; Nicholas G Castle et al., 2012; Edelman, Guihan, Bryant, & Munroe, 2006; Flannery, Resnick, Galik, Lipscomb, & McPhaul, 2012; Flores & Newcomer, 2009; Gesell, 2001; June, Meng, Dobbs, & Hyer, 2019; Kuhn, Kasayka, & Lechner, 2002; Molony, McDonald, & Palmisano-Mills, 2007; Munn et al., 2007; Rodiek, Nejati, Bardenhagen, Lee, & Senes, 2016; P. D. Sloane et al., 2007; P. D. Sloane et al., 2005; Smith, Hansen, Sayles, Brodersen, & Medcalf, 2011; White, Newton-Curtis, & Lyons, 2008; S. Zimmerman et al., 2015; S. Zimmerman, Sloane, et al., 2005; S. Zimmerman, Williams, et al., 2005) Several studies reported on multiple instruments or assessment tools.

Resident satisfaction and quality of life were the most frequently addressed domains by the indicators studied. Three studies of indicators addressed satisfaction in AL in general; all three featured were resident surveys. (Edelman et al., 2006; Molony et al., 2007; Sikorska-Simmons, 2001) Another survey specifically assessed the quality of dying in AL communities. (Munn et al., 2007) Several other indicators included data collection techniques to assess quality of life for people living with dementia. (Kuhn et al., 2002; P. D. Sloane et al., 2007; P. D. Sloane et al., 2005; S. Zimmerman, Sloane, et al., 2005) Most of these indicators were surveys. Two studies used dementia care mapping to assess quality of life for people with dementia.

Indicators related to safety were the second most frequent studied among our set of eligible studies. Three of these studies conducted assessments with surveys (N. Castle & Beach, 2011; Nicholas G Castle et al., 2012; Smith et al., 2011), and two conducted assessments with administrative data. (Flores & Newcomer, 2009; June et al., 2019)

Quality of care indicators were the third most commonly studied among our eligible studies. Two studies assessed quality of care with administrative data. (Aud & Rantz, 2005; Biola et al., 2007) Two other studies assessed quality of care using the same survey. (Aud et al., 2007; Aud et al., 2004)

Two studies assessed person-directed or person-centered care; one study appears to be the precursor to the development of the PC-PAL survey. (White et al., 2008; S. Zimmerman et al., 2015)

The environment was only addressed in one study with indicators using a survey. (Rodiek et al., 2016)

Analysis

After reviewing all eligible studies, and relevant grey literature findings, we compiled and summarized the domains and indicators identified into a table (Table 1). We arrived at a set of domains and sub-domains and listed specific indicators broadly identified with each domain. Our final set of domains (in relative order of prevalence) includes:

- Resident quality of life
- Resident and family satisfaction
- Safety
- Resident health outcomes
- Staff
- Physical and social environment
- Service availability
- Core values and philosophy
- Care services and integration

When compared to the Donabedian framework and the deductive domains listed in the introduction, we found fewer domains and especially indicators for “structure” and “process” measures of quality.

Each domain has a set of elements of subdomains and potential indicators that can be used to measure those elements.

Table 1: Summary of domains, sub-domains and indicators of quality in assisted living communities

Domain	Sub-Domains	Indicators
Resident quality of life	<ul style="list-style-type: none"> • Food quality • Connectedness • Meaningful life/activities/engagement • Social relationship • Community • Privacy • Choice • Religion/Spirituality • Independence /Autonomy • Social activities* • Physical activity* • Relationships [friends & family] * • Financial well-being* • Community integration* 	<ul style="list-style-type: none"> • Dementia Care Mapping • Experience of Home Scale (EOH) • Quality of Life in Dementia (QOL-D) • Quality of Life in Alzheimer’s Disease (QOL-AD)-resident • Quality of Life in Alzheimer’s Disease (QOL-AD)-care provider • Alzheimer Disease Related Quality of Life (ADRQL) • Dementia Quality of Life (DQoL) • Resident and Staff Observation Checklist- Quality of Life Measure (RSOC-QOL) • Philadelphia Geriatric Center Affect Rating Scale (PGC-ARS) • Fitness and exercise* • NCI-AD AL resident questions* • Ohio – Residential Care Survey*
Resident and family satisfaction	<ul style="list-style-type: none"> • Overall satisfaction • Unmet needs • Care experience • Well being • Choice/preferences met* • Personal care needs met* • Respect from staff* • Burden of care* • Housekeeping* • Staff competency* • Meal choice satisfaction* • Cost of care* • Quality of Staff care* • Recommendation to others* 	<ul style="list-style-type: none"> • Assisted Living Resident Satisfaction Survey (ALRSS) • Quality of Dying in Long-Term Care (QOD-LTC) (all descendants) • Quality of Dying in Long-Term Care (QOL-LTC-C) (cognitively intact descendants) • Resident Satisfaction Index (RSI) • Person-Centered Practices in Assisted Living questionnaire – resident • CoreQ (5 measures) * • Ohio Long-term Care Resident Satisfaction Survey* • Ohio Long-term Care Family Satisfaction Survey* • California Assisted Living Association Survey (2016)*
Safety	<ul style="list-style-type: none"> • Resident empowerment opportunities/perceived safety • Accountability and continuous quality improvement • Policies around resident safety • Elder abuse • Safety culture 	<ul style="list-style-type: none"> • Regulatory compliance • Citations • Substantiated complaints* • Safety culture indicators

Domain	Sub-Domains	Indicators
Resident health outcomes	<ul style="list-style-type: none"> • Physical function • Psychosocial well-being • Adverse/avoidable critical incidents • Medication errors • Nursing home admissions • Mental health/Behavioral health 	<ul style="list-style-type: none"> • ADLs/IADLs • Social role function • Falls • Avoidable hospitalization • Under prescribing • Incorrect medication • Incorrect timing of medication • NH admissions from AL • Rates of alcohol misuse and abuse
Staff	<ul style="list-style-type: none"> • Close staff relationships • Staff empowerment • Collaboration among staff • Communication (among providers/direct care workers) • Burnout/stress • Supports (institutional, supervisor, emotional, coworker) • Job satisfaction • Resident-centered job satisfaction • Consistent assignment • Employee qualifications 	<ul style="list-style-type: none"> • Observable Indicators of Quality-Assisted Living • Person-Directed Care (PDC) and Environmental Support for PDC measure • Work Stress Inventory • Person-Centered Practices in Assisted Living questionnaire – staff • Job Attitude Scale (JAS) • Staff Experience working with Demented Residents • Dementia care quality indicators • Turnover • RN Hours • Staff training • Staff Performance Reviews* • Nurse/staff availability* • CoreQ-staff* • Assisted Living Provider Tool for Consumer Education*
Physical and social environment	<ul style="list-style-type: none"> • Safety/Security • Dining room environment • Social climate • Ability to get outside • Occupancy rate* • Fire safety and emergency preparedness* 	<ul style="list-style-type: none"> • Physical characteristics • Service availability • Indexes, including Nursing Home Survey on Patient Safety and Culture • Pandemic preparedness tool • Seniors’ Outdoor Survey (SOS) • State criminal background checks* • North Carolina’s Star Rating Program* • Wisconsin Dept. of Health Services Assisted Living Facility Survey*
Service availability	<ul style="list-style-type: none"> • Meal service • Medication assistance/management/quality • Wellness • Nutrition services • Pharmacy services/use • Personal and emotional care* • Transportation* 	<ul style="list-style-type: none"> • Could be pulled from internal data • Assisted Living Provider Tool for Consumer Education* • State AL associations*

Domain	Sub-Domains	Indicators
Core values and philosophy*	<ul style="list-style-type: none"> • Rules / Resident Rights* • Family and Resident councils* • Workplace practices* • Scope of services* 	<ul style="list-style-type: none"> • Move in/discharge criteria* • Medicaid discrimination* • Consumer information Guide: Assisted Living Residence (NY)* • State AL associations*
Care services and integration	<ul style="list-style-type: none"> • Information transmission • Efficiency of HIT sharing • Care quality • Collaboration among providers • Communication with family • Service plan* • Case management* 	<ul style="list-style-type: none"> • ADL care quality • Dementia care quality • Advanced care planning* • Individualized service plan, Record keeping*

Note: Domains, sub-domains, and indicators in this table come from published and grey literature. Elements marked by * come from grey literature.

Indicators used in practice

Many of the identified indicators have been used in the research studies described previously. Most importantly, some indicators have been used in state efforts to assess the quality of AL facilities in their states and implement quality assurance and improvement strategies.

Ohio is one of the states who has both resident and family focused satisfaction surveys, beginning in 2005, based on research studies of quality of life measures and domains that span the structure, process and outcomes domains. Ohio's satisfaction survey is focused on quality of life domains such as facility culture, facility environment, meals and dining and general satisfaction.

Oregon plans to implement mandated facility-reported metrics to improve quality, resident safety, and consumer information, and to reduce asymmetry in how care providers assess quality. They formed a council that will direct implementation of the state's quality measurement program. The first report on quality is slated for 2020. The measures include tracking falls, use of antipsychotic medications for non-standard purposes, compliance with staff training requirements, and retention of direct care staff.

Most states have AL licensure regulations and track compliance at the minimum, and also offer some sort of consumer guide based on providers and services they provide.

Most providers are affiliated with a state or national assisted living provider association. On the national level this include entities such as National Center for Assisted Living (NCAL), which is part of the American health Care Association (AHCA), Center for Excellence in Assisted Living (CEAL), National Association of States United for Aging and Disabilities (NASUAD), Argentum and LeadingAge. There are several state level associations including Ohio Assisted Living Association (OALA), Oregon Health Care Association (OHCA), and Wisconsin Assisted Living Association (WALA) to name a few. These provider associations work closely with states and provide licensure support, advocacy, networking, workforce development, LTC financing support, work to

support payment reform, and quality improvement support through research and quality measure tracking over time available exclusively to members.^{15,16}

Discussion

The aim of this review was to examine published and grey literature on assisted living (AL) domains and measures of quality. The national review of the published and grey literature in AL, although considerably smaller than NH, and still developing, surfaced a number of useful, existing quality measurement approaches and tools for AL quality.

Summary from literature review

First, most of the measures focused on quality of life (QOL) and resident/family satisfaction. In fact, 31 out of 49 eligible studies from peer-reviewed literature focused on QOL and/or satisfaction as a key domain of AL quality. Although there was heterogeneity in terminology and specific definitions of QOL, most studies relied on a set of core indicators believed to constitute multiple dimensions of QOL. These core groupings resulted in consensus around themes and ideas. These common indicators from peer-reviewed published literature on QOL included: 1) food quality; 2) connectedness among residents; 3) meaningful activities/engagement for residents; 4) social relationships within and outside of AL; 5) sense of community; 6) privacy; 7) choice; 8) religion/spirituality; 9) independence; and 10) autonomy. Additional QOL domains were identified from grey literature; these included: 1) social activities (especially outside of the AL); 2) physical activities; 3) relationships with friends and family; 4) financial well-being; and 5) community integration. Overall, there was strong agreement between published and grey literature on QOL being a key indicator of quality in AL, which reflects the person-centered care AL purports to provide.

Second, resident/family satisfaction is a distinct but a related construct to QOL. Key indicators of satisfaction from peer-reviewed published literature included: 1) unmet needs; 3) care experience; 4) overall satisfaction; and 5) one's satisfaction with their current well-being. A number of additional indicators emerged from the grey literature, including a sense of satisfaction with: 1) whether or not one's choice or preferences and/or personal care needs were met; 2) respect from staff; 3) burden of care; 4) housekeeping; 5) staff competency; 6) meal choices; 7) cost of care; 8) quality of staff care; and 9) whether or not one would recommend facility to others. Grey literature had more items on satisfaction compared to peer-reviewed published literature, in part because satisfaction measures are more common in provider-collected surveys and are more prominent in some state efforts, which constituted many of the grey sources of literature.

Besides QOL and satisfaction, we identified seven other broad domains of quality. It is difficult to establish direct prevalence of these domains because some of them had more indicators available than others. In

¹⁵ Examples of national level provider associations: National Center for Assisted Living: <https://www.ahcancal.org/ncal/Pages/index.aspx>, Center for Excellence in Assisted Living: <https://www.theceal.org/>, National Association of States United for Aging and Disabilities (NASUAD): <http://www.nasuad.org/>, Argentum: <https://www.argentum.org/>, LeadingAge: <https://www.leadingage.org/>

¹⁶ Examples of state level provider associations: Ohio Assisted Living Association (OALA): <http://ohioassistedliving.org/>, <https://www.ohca.com/>, Wisconsin Assisted Living Association (WALA): <https://ewala.org/>

general, staff-focused quality domain was the third most prevalent both in domains and indicators, and included indicators related to: resident relationships with staff, staff empowerment, the degree of collaboration among staff, consistency of staffing assignments, job satisfaction/burnout, employee qualifications, and staffing ratios. This domain also received the highest level of assigned importance across the published and grey literature.

Fourth, safety received much coverage in grey literature and also in some of the peer-reviewed studies, with common indicators focusing on safety culture in AL communities (i.e., a facility level measure). Other indicators included AL policies around resident safety and tracking of complaints and citations. Safety was also a prevalent theme in both TEPs (with some acknowledgment of the possibility of tension with resident autonomy).

Fifth, resident health outcomes, are in some ways related to the safety domain above, especially in terms of potential injuries due to falls and medication errors. Resident health outcomes include indicators such as: residents' physical function, psychosocial well-being, adverse events, medication errors, and nursing home admissions, among others. Some of these measures (especially around medication management) are prominent in both published and grey literature and are being implemented by some states (e.g., Oregon).

Sixth, the domain of physical and social environment was prominent in many reports from grey literature as well as some peer-reviewed published studies. Common indicators included physical characteristics of the AL that impact resident safety and security, ability to get outside, dining room environment, as well as some metrics of social cohesion such as overall AL social climate (with some overlap with satisfaction items noted above). Occupancy rate and emergency preparedness were other key sub-domains from grey literature.

Seventh, the domain of AL core values and philosophy was prevalent in the grey literature but also in some published literature. Common indicators for this domain include residents' rights for autonomy and privacy as well as protections around move in/discharge criteria, ability to pay (e.g., Medicaid discrimination), and information on services offered.

The domain of service availability had some related constructs to physical environment items, but with the explicit focus on types of services offered, for example: whether or not medication management was available, and the types of meal services, personal and emotional care, etc.

The remaining domain of care services and integration, with indicators related to overall care quality, case management, information transmission across settings, and collaboration among providers, is partially related to resident outcomes but with the focus on more process-based measures of quality. This domain was less prevalent, in part due to lack of data available.

State efforts

Our review of current state efforts around AL quality measurement resulted in general consensus on domains of AL quality from published and grey literature (note: some state reports were used for grey literature sources). Many states have moved to providing consumer resources for selecting AL communities, with some also including additional quality indicators.

Most states provide websites for consumers to select AL communities, with varying levels of information (e.g., number of licensed beds in Florida or substantiated complaints in New York) and degree of navigation ease.¹⁷ Some states have also implemented QOL and satisfaction surveys of AL residents as part of quality improvement. For example, the California Assisted Living Association implemented a survey in 2016 to understand how residents and family members rate their quality of life, sense of belonging and sense of control in AL communities.¹⁸ Three examples below: Ohio, North Carolina, and Oregon describe different types of AL quality metrics in more detail.

Ohio is often compared to MN in their similar “report card” approach to nursing home quality measurement. For example, both states conduct in-person resident interviews and family satisfaction surveys in NHs. With over 600 licensed residential care facilities (OH term for ALs), Ohio developed and implemented “Resident Care Facility Satisfaction surveys” in 2005. These surveys were then refined in 2007 and the family version was implemented in 2016. Results from these surveys (along with some indicators regarding type of licensure, etc.) are used for AL rankings across the state and published on a public website.¹⁹

North Carolina, another early adopter of an AL quality report card, implemented a star rating program in 2009 to help consumers select AL communities. The rating system uses and reports results from annual inspection surveys focusing on standards and requirements related to AL physical plants, admission and discharge, resident assessment and care plans, resident care services, medication administration, special care units for Alzheimer and related disorders, use of physical restraints and alternatives, and resident rights.²⁰

Finally, the state of Oregon has been working to implement their quality measures for RC/AL communities for the last few years. The Oregon legislature mandated the creation of a council that will direct implementation of an AL report card and “establish a uniform system for AL communities to report the quality metrics”.²¹ Their plan includes mandated facility metrics to improve quality, resident safety and consumer information. Measures (so far) to be reported by RC/ALs starting in 2019/2020 will include: a) retention of direct care staff; b) compliance with staff training requirements; c) number of resident falls that result in injury; d) incidence of use of antipsychotic medications for non-standard purposes; and e) results of annual resident satisfaction survey conducted by an independent entity. These measures represent resident quality outcomes, staffing, and resident satisfaction, consistent with the domains identified from the literature search and described in the prior section.²²

¹⁷ New York State Department of Health- Adult Care Facilities/Assisted Living: https://www.health.ny.gov/facilities/adult_care/, Florida Agency for Health Care Administration- Assisted Living Facility: https://ahca.myflorida.com/MCHQ/Health_Facility_Regulation/Assisted_Living/alf.shtml

¹⁸ California Assisted Living Association (CALA) 2016 Study:
http://caassistedliving.org/online_publication/resident_quality_of_life/files/assets/basic-html/index.html#2

¹⁹ Jane K. Straker, Jyotsana Parajuli, Danielle Eynon-Black, Matt Nelson, Ryan Shanley, Karl Chow. Implementation of the 2016 Ohio Nursing Home and Residential Care Facility Family Satisfaction Surveys:
<https://sc.lib.miamioh.edu/bitstream/handle/2374.MIA/6162/Straker-Implementation-2016-Family-Satisfaction-Survey-08-2017.pdf>

²⁰ North Carolina Division of Health Service Regulation- Adult Care Licensure Section – Star Rating Program:
<https://www2.ncdhhs.gov/dhsr/acls/star/index.html>

²¹ 2017 ORS 443.446, 443.447. Oregon Revised Statutes

²² Oregon Department of Human Services – Residential Care Quality Measurement Program:
<https://www.oregon.gov/DHS/PROVIDERS-PARTNERS/LICENSING/CBC/Pages/Quality-Metrics.aspx>
Identifying Quality Measures in Assisted Living

Key informant interviews and technical expert panels

Conducting key informant interviews (n=14) and technical expert panels (n=9) served as an essential strategy to make our findings more comprehensive and address any gaps in the literature. The interviews included researchers, providers, and policy makers with expertise in AL and quality measurement. Some key informants also served on a technical expert panel (see Appendix E). Overall, four key messages emerged from these two efforts.

First, there was a strong level of agreement that based on AL philosophy and the preferences of AL consumers, QOL and satisfaction are essential measures of AL quality. There was some discussion as to the logistics of collecting QOL measures from AL residents since many have dementia and the role of family members in reporting on resident QOL but there was also agreement that: a) family members and residents have low levels of agreement on QOL scores and hence, should be surveyed separately; and b) that there is enough evidence that people with cognitive impairment and dementia can participate in such surveys {Andresen, Vahle, & Lollar, 2001; Crespo, Bernaldo de Quiros, Gomez, & Hornillos, 2012; Kane et al., 2005; Shippee et al. 2017}.

Second, many key informants and TEP participants linked Minnesota's AL quality measurement efforts to broader, ongoing national efforts to measure home and community-based quality. Thus, there were recommendations about possible ways to leverage other existing data efforts such as National Core Indicators survey (collected in MN and a number of other states) and lessons learned from quality domains in HCBS to see how translatable those are for AL quality indicators (e.g., community integration). However, some of the existing HCBS quality frameworks and indicators do not always address quality in AL communities.

Third, there was strong agreement among all key informants and TEP participants that staff play a vital role in AL quality. While there was not uniform agreement on exact measures of staffing that should be collected, one of the national experts stated: "Staffing is one of the most universally agreed upon domains of quality in long-term care and should be collected in some way."

Finally, there was some disagreement about resident clinical quality indicators, with some key informants and TEP participants prioritizing QOL and satisfaction, while others felt that report cards should provide information that would otherwise be unavailable, and thus, including some measures of safety and resident care (e.g., falls with injury, medication management) is vital to make a report card successful.

Limitations

This work is not without limitations, in part because the literature and work in the area of AL quality is still relatively small, and still maturing, so there are areas where further development is needed. For example, some of our quality domains are more represented through grey literature (e.g., AL philosophy) because of data limitations.

Conclusions

Based on our review of the literature, review of other state efforts, key informant interviews and technical expert panels, it is evident that quality of life and satisfaction are essential measures of AL quality. However, staffing and resident health outcomes (as well as medication management), along with other identified domains, are also of vital importance, especially as AL residents become increasingly more complex and have higher clinical care needs.

Guided by the conceptual framework on structure-process-outcomes and our a-priori deductive domains, we identified the fewest AL quality domains in the “structure” category (e.g., ownership of facility, type of management) and most in “outcomes”, especially in quality of life and satisfaction measures (rather than clinical outcomes). Thus, as the field develops, there is a need for more measures of structure, process, and consideration of both quality of life and physical health outcomes for AL residents.

Appendices

Appendix A: Search strategies

Ovid MEDLINE Search Strategy:

- 1) residential facilities / or assisted living facilities / or homes for the aged
- 2) assisted living.ti.
- 3) residential care.ti.
- 4) 1 or 2 or 3 (20028)
- 5) (domain* or framework* or model*).ti.
- 6) (measure* or indicat* or indic* or index* or metric* or questionnaire* or survey* or instrument* or tool* or scale* or assess* or inventory).ti.
- 7) 5 or 6
- 8) 4 and 7
- 9) limit 8 to yr="2009 -Current"

Appendix B: Minnesota Legislative Definition of Assisted Living Services

ARTICLE 1 ASSISTED LIVING LICENSURE

Sec. 2 [144I.01]

DEFINITIONS

Subd. 9.

Assisted living services.

"Assisted living services" includes one or more of the following:

- (1) assisting with dressing, self-feeding, oral hygiene, hair care, grooming, toileting, and bathing;
- (2) providing standby assistance;
- (3) providing verbal or visual reminders to the resident to take regularly scheduled medication, which includes bringing the resident previously set up medication, medication in original containers, or liquid or food to accompany the medication;
- (4) providing verbal or visual reminders to the resident to perform regularly scheduled treatments and exercises;
- (5) preparing modified diets ordered by a licensed health professional;
- (6) services of an advanced practice registered nurse, registered nurse, licensed practical nurse, physical therapist, respiratory therapist, occupational therapist, speech-language pathologist, dietitian or nutritionist, or social worker;
- (7) tasks delegated to unlicensed personnel by a registered nurse or assigned by a licensed health professional within the person's scope of practice;
- (8) medication management services;
- (9) hands-on assistance with transfers and mobility;
- (10) treatment and therapies;
- (11) assisting residents with eating when the residents have complicated eating problems as identified in the resident record or through an assessment such as difficulty swallowing, recurrent lung aspirations, or requiring the use of a tube or parenteral or intravenous instruments to be fed;
- (12) providing other complex or specialty health care services; and
- (13) supportive services in addition to the provision of at least one of the services listed in clauses (1) to (12).

Appendix C: Nursing home quality measures and implications for the AL report card

I. The evolution of national nursing home quality measurement

Historically, the federal government has played a leading role in the development of quality assessment and public reporting mechanisms for the long-term care sector. Most of this work has focused on nursing homes, which are more heavily regulated than assisted living facilities or other residential care settings. In 1998, the Centers for Medicare and Medicaid Services (CMS) launched the online Nursing Home Compare (NH Compare) database to promote increased transparency and facilitate consumer choice. At the time, NH Compare included information related to regular health inspections (i.e., results of the survey process) and information related to nurse staffing levels. In late 2002, NH Compare was expanded to include several quality measures, which had gone through a rigorous development and pilot testing process (Zinn, Spector, Hsieh & Mukamel, 2005). In 2008, CMS expanded the NH Compare to include the 5-star ratings, which are based on 3 domains: health inspection/regulatory findings, nurse staffing levels, and quality measures for care provided to short- and long-stay residents.

One limitation of NH Compare is that it fails to include a measure related to consumer (resident and family) experience (satisfaction and/or quality of life). Although Consumer Assessment of Healthcare Providers and Systems (CAHPS) surveys have been developed for nursing home residents and their families, these surveys have not been systematically implemented in nursing homes due to concerns related to the feasibility of implementing such a measure.

Recent changes to the NH Compare database include the transition to a payroll-based journal process for reporting staffing levels and the addition of six quality measures, including three measures based on Medicare claims (community discharge, emergency department visits, and hospitalizations for short-stay residents) and three measures based on MDS data. Currently, 16 quality measures related to services provided to short- and long-stay residents are included in NH Compare. Recently, the government has moved toward value-based purchasing as another mechanism to promote improved nursing home quality.

Between 2009 and 2012, CMS piloted a pay-for-performance program for nursing homes in 3 states. An external evaluation revealed little impact of the program on costs or quality (Grabowski et al., 2017). Despite these findings, beginning in fiscal year 2019, CMS began its first value-based payments to nursing homes based on rates of hospitalizations.

II. Nursing home quality measurement activities in Minnesota

Minnesota stands out as an innovator in long-term care quality. Minnesota has been consistently ranked #1 by AARP long-term care scorecard (<http://www.longtermscorecard.org/>) for quality of its long-term services and supports. Minnesota was an early adopter of innovative strategies for payment models that included shared risk. Value-based purchasing in Minnesota was implemented in 2016.

Minnesota is a nationally-recognized leader in measuring and reporting nursing home quality, which span Clinical Care Quality (from Minimum Dataset), which are more comprehensive and nuanced than CMS-

reported NH Compare. These measures are also case-mix adjusted based on research evidence and using complex statistical techniques (Bayesian approach).

Of particular innovation is the inclusion of person-reported measures of quality of life (QOL), experience of care, and family satisfaction, which are missing from the NH Compare and have been recognized by CMS as key gaps in measurement. These measures have been developed through rigorous testing and have been validated to capture key aspects of residents' overall well-being and satisfaction with care. These measures reflect a growing recognition of the importance of person-centered outcomes such as resident experience and quality of life by CMS and other payers and policy makers. Quality of care asks if health care services are delivered appropriately and with sufficient skill, and can be less meaningful to residents and family members than care experience and resident overall QOL.

Long-stay resident quality of life

Minnesota first implemented its QOL measures in 2005, based on the work by Drs. Robert and Rosalie Kane from the University of Minnesota- School of Public Health, initially done for a CMS contract. The QOL measures are collected via the Resident Quality of Life and Satisfaction with Care Survey, which uses annual face-to-face interviews.

The survey is done in person with a random sample of NH residents in all Medicaid-certified Minnesota NHs (in 2017, 10,000 complete interviews out of 20,000 eligible long-stay residents in 355 participating facilities). Vital Research, a contracted research and evaluation firm from Los Angeles, California has carried out this work. This is the only tool in the country that uses face-to-face interviews for such a large random sample of residents on annual bases. Residents are eligible to participate if they were not very severely cognitively impaired, in isolation due to communicable illness and if they or their guardian did not decline participation. In each year, 95% of around 21,000 long-stay residents are eligible to be randomly selected to participate. The survey has a response rate of 77%.

The measures have been validated, and consist of 48 items, grouped into eight domains of QOL. These include satisfaction with "environment", "food enjoyment", "relationships" "caregiving", and "mood", among others. (See Appendix for complete list). Resident responses for QOL domains are aggregated at the facility level for the report card.

Findings from MN QOL work have been presented at multiple national conferences as a model to emulate. QOL measures are also used for Performance-based Incentive Payment Program (PIPP) and Quality Improvement Payment Program (QIPP) projects to stimulate quality improvement by providers and informed choice by consumers.

Family satisfaction with nursing home residents' QOL

MN has also developed measures of family satisfaction with nursing home residents' QOL, which have been used since 2010. Family members play a key role as consumers of long-term care and as an important source of information about quality in NHs. Previous work has shown family and resident satisfaction are distinct concepts (Kane et al., 2005; Shippee, Henning-Smith, Gaugler, Held, & Kane, 2017), and that family satisfaction complements other measures of NH quality (Li, Li, & Tang, 2016). Therefore, collecting family member

satisfaction data can guide performance improvement programs and enhance efforts to include satisfaction along with other publicly-reported quality measures.

Family members of Minnesota NH residents are recruited to participate in the annual state-wide family satisfaction survey of all Medicaid-certified NHs (in 2017, 355 facilities). Family members are identified by facilities using the following criteria: 1) the person who visits the nursing facility most often; 2) the person who attends the care conferences for the resident (in person or by phone); 3) the person who is the resident's Power of Attorney for Healthcare; or 4) the person who is notified of any change in the resident's health or functional status. Selected family members need to meet at least one of these criteria. Facilities provided the state with a list of participants, including their name, address, and phone number. Selected participants are mailed a survey by the state DHS, with an option to complete the survey online. To increase response rates, reminder postcards are sent, and phone interviews are conducted with family members who do not respond to the initial mailing. An average response rate is about 60% (about 11,000 surveys from 18,000 mailed). Of the completed surveys, 88% (about 9,500) are completed by mail. An average of 30 family surveys are completed per facility (range 2-120).

Similar to resident QOL, the family members' satisfaction instrument was developed Drs. Rosalie and Robert Kane from the University of Minnesota to address the need for multi-domain measures of family satisfaction with NH care and has been pilot tested for reliability and validity (Kane et al., 2003; Kane, 2003; Kane et al., 2005; Vital Research, 2010). Item development followed an extensive literature review on existing family satisfaction measures (Kane, 2008). Vital Research, a contracted research and evaluation firm from Los Angeles, California, conducted the data collection. The pilot test in four NHs (two urban and two rural) showed that it was feasible to collect data on family satisfaction, (Kane, 2008) however modifications were made to the original version. In particular, the original tool included responses on a scale of 1-10 in order to capture the most variation, but feedback from the pilot study suggested that respondents found the wide range difficult to use. Additionally, the original instrument did not include measures of staff responsiveness, but qualitative feedback from pilot study respondents suggested that such measures would be useful and appropriate. The instrument otherwise demonstrated validity across settings and types of respondents (Kane, 2008). The original instrument was modified to have a narrower rating scales (1-5 vs. the original 1-10) and to include measures of staff responsiveness (Vital Research, 2010). Following the pilot test and subsequent modifications, the survey was implemented state-wide in 2010 and included 33 items related to family member satisfaction with the NH on a range of topics. (See Appendix for complete list.) Respondents were asked to give the facility a grade between "A" ("Excellent") and "F" ("Failing") on each item. The responses are aggregated to the facility level.

Short-stay resident experience of care

In addition to QOL measures and family satisfaction, MN DHS has recently (2016) implemented measures of short-stay resident experience of care. This was done in response to provider and consumer feedback that experience of care is an important metric for post-acute rehab residents who usually stayed in the facility for brief rehab and were focused on successful discharge to home. Similar to QOL survey, Vital Research has carried out the data collection.

The short-stay resident experience of care includes 8 domains: admissions, clinical care, therapy, assistance, communication, dining, environment and safety, and discharge, and two questions on global satisfaction. The Identifying Quality Measures in Assisted Living

tool has been previously used by Vital Research and was also validated in sample of 100 Minnesota skilled nursing facilities that had relatively high proportions of Medicare patient-days in 2015. These surveys were mailed to a sample of short-stay residents in each facility. In facilities with fewer than 25 residents, surveys were sent to each resident in the facility. In larger facilities, surveys were sent to a randomly generated list of eligible residents. Residents were assigned an arbitrary, sequential ID number for selection and data management. The number of surveys per facility was determined by facility size in order to achieve an acceptable margin of error. If the number of completed surveys per facility did not meet the margin of error, additional surveys were set to capture an adequate number of interviews. Individuals who did not respond to the mailed survey received a telephone follow-up. 1,537 surveys (50.8% response rate) were either returned or completed by telephone.

III. Nursing home quality measurement activities occurring across other states

Much of innovation in quality measurement in NHs has been happening at the state level through the development of value-based purchasing (VBP) strategies connected with ratings. Value-based purchasing is similar to P4P and is another mechanism that some states are implementing (in collaboration with CMS and managed care plans) in a bid to increase the quality and value of paid LTC provided in acute and post-acute settings.

In particular, Arizona, Colorado, Indiana, Kansas, Maryland, Minnesota, Ohio, Oklahoma, Utah, Tennessee, and Texas, all have VBP NH programs (voluntary or mandatory). Quality metrics under VBP typically include clinical measures, regulatory and compliance measures, claims-based measures (e.g., re-hospitalization), and person-centered measures.

For example, Ohio VBP – or Nursing Home Quality Incentive System (2009), includes the following domains: Utilization (Avoidable inpatient admissions), Clinical Care Quality (MDS long stay), Resident Experience (Culture of change measure (PELI)), and Staff related measures (Self-reported retention rate). Another example of an innovator state is Kansas, which includes staffing Measure using cost reports, Clinical QI measures based on care plans, and Resident QOL measures based on interviews (environment and psychosocial wellbeing), culture of change measures based on PEAK evaluations and consumer satisfaction measures based on a satisfaction survey report card. Colorado has been another innovator state where VBP includes NF inspection measure based on a licensure and certification survey (site visits), Clinical QI Measures, and Resident QOL measure based on P4P applications such as Dining, daily activities, physical environment, and resident interactions etc. The state also includes consumer satisfaction measure based on surveys. Finally, Tennessee is another good example where a portion of NF reimbursement is determined by residents' assessed levels of need and on NF performance on quality metrics using a quality framework. (TennCare). In 2015 developed their Quality Improvement in Long Term Services and Supports initiative (QuILTSS) Quality Framework based on input from community forums. Domains include: Clinical Care Quality, Resident Experience, Staffing and staff Experiences, Satisfaction of Member/Resident, Family and Staff.

Integrated Care Resource Center (ICRC) suggest that states with dual eligibility where they combine Medicaid and Medicare, may view VBP as an “attractive” solution to improving NH care, especially as these dual-eligibles move in an out of different types of care settings.

Another way states have been innovating has been through the inclusion of person-centered measures of quality. For example, in 2013 Iowa, Minnesota, Oklahoma and Utah all had person centered/quality of life measures in the P4P programs (Public Administration Review, 2013). States are using NCI-AD survey and other person-reported quality measures, such as CAHPS-HCBS Survey, NOMS, NCI, NCI-AD and Mental Health Survey to collect feedback about the quality of LTSS from Medicaid recipients receiving HCBS.

IV. Challenges/issues that remain in nursing home quality measurement

Despite much improvement to the NH quality measures, challenges remain. These include the skepticism about facility self-reported data, which CMS is trying to address via the addition of claims-based measures (e.g., hospitalization rates) and payroll-based staffing. Other issues are that measures are collected at one point in time, which may not be representative of what's happening in the whole year (e.g., surveys). Despite these challenges, there is general agreement that clinical measures and staffing are valuable quality metrics.

The key gap in current NH quality measures on the national level and for most states is the lack of resident QOL or experience data, or family satisfaction or employee satisfaction. Existing research shows that these types of measures are highly valued by consumers and there is strong agreement by researchers, policy makers and providers that it's an important missing domain. As mentioned previously, NH CAHPS was developed but not used. Individual states have recognized that it's an important domain and have made some progress in this area.

V. Implications for assisted living quality measurement

Although NH work is not directly translatable to AL settings, certain aspects are helpful in moving the AL work forward. Specifically, it is important to keep in mind what assisted living aims to be when compared to NHs and what consumes value about AL, which include more home like setting, choice, and independence. These values and priorities also help individual ALs set themselves apart from other ALs via marketing to consumers. Thus, person-centered measures of quality for AL are essential and may be even more important than for NH residents and family members. Another consideration is that we don't have much information about clinical quality. Report cards should provide information that consumers are missing, thus, making the case for some measures of quality of care.

Hence, the suggestion is to focus on all three domains below: a) Consumer experience because that's how AL's set themselves apart in the LTC market; b) Some aspects of clinical quality; and c) Staffing, as the domain that is valued by both providers and policy makers and consumers/family members. Thus, there needs to be a balance between person-centered, clinical and administrative measures to provide a comprehensive view of AL quality to consumers and providers.

Appendix D: Domains of quality in assisted living communities in published literature

Study/ Reference ID	Study Design/Description	Population (i.e., # ALs; location, special populations)	Domain(s) [Sub-domains]
Ball 2000(Mary M Ball et al., 2000)	Mixed methods: interviews; observations of environment; records review	Residents of 17 AL facilities in suburban Atlanta (n=55)	Quality of Life [psychological well-being; independence and autonomy; social relationships and interactions; meaningful activities; care from facility; comfort; cognitive functioning/memory; sleep; food; connectedness to community outside facility; physical functioning; religion/spirituality/ physical environment; safety and security]
Ball 2004(M. M. Ball et al., 2004)	Mixed methods: interviews; observations; records review	5 AL facilities in Georgia (home (at least 30 days) to 185 residents during study year)	Aging in place - managing decline
Bonifas 2013(Bonifas et al., 2013)	Mixed methods study: evaluation of facility-sponsored intervention effort aiming to build leadership opportunities among AL residents	AL facilities in SW U.S. with different leadership models (n=2)	Resident empowerment opportunities
Cartwright 2009(Cartwright et al., 2009)	Qualitative study designed to describe good quality care at the end of life for hospice-enrolled AL residents	AL facilities (n=5) and hospice facilities (n=5) in Oregon. Semi-structured interviews of nurses, medication aides, caregivers	Quality of hospice care [staff commitment to resident dying in AL facility; respectful collaboration among multiple care providers]
Castle 2012(N. G. Castle et al., 2012)	Secondary data analysis	Nurse aides included in the Pennsylvania nurse aide registry (n=832)	Alcohol misuse and abuse in AL among residents
Castle 2015(N. Castle, Ferguson-Rome, & Teresi, 2015)	Literature review to synthesize available literature on definitions of abuse, theoretical and conceptual models, prevalence rates, outcomes and costs, and sources.	NA	Elder abuse
Chao 2008(Chao, Dwyer, Houser, Jacques, et al.,	Survey	National experts specializing in health, aging, nutrition, and AL facilities; survey consisted of four scenarios (home-style;	4 scenarios (home-style; restaurant/hotel, health/medical, combination); 6 Food and nutrition service areas (dining room

Study/ Reference ID	Study Design/Description	Population (i.e., # ALs; location, special populations)	Domain(s) [Sub-domains]
2008; Chao, Dwyer, Houser, Tennstedt, et al., 2008; Chao et al., 2007)		restaurant/hotel, health/medical, combination) (n=135)	environment; meal services, meal quality, nutrition services, employee's qualifications, therapeutic nutrition services)
Chou 2008(Chou & Robert, 2008)	Quantitative data analysis of survey data to examine relationships between job satisfaction, role overload, and workplace support	Direct care workers in 108 AL facilities (n=984)	Job satisfaction [role overload; institutional support; supervisor instrumental and emotional support; coworker emotional support]
Chou 2012(Chou, 2012)	Mixed methods: survey	Convenience sample of AL facilities in Wisconsin (n=108)	Resident-centered job satisfaction
Curtis 2005(Curtis et al., 2005)	Interviews with data analyzed to identify factors associated with satisfaction	Community residential care residents (n=176 residents from 115 facilities (included 51 residents from 21 AL facilities)	Satisfaction [physical characteristics and policies; services]
Grey 2006(Gray et al., 2006)	Interviews with residents and providers; pharmacist review of medication records.	Residents in community residential care facilities in Puget Sound region of Washington (n=349; 94 in AL); facility administrators (n=184;24 in AL)	Service availability and quality [medication assistance; pharmacy services use; medication records quality]
Horowitz 2010(Horowitz & Vanner, 2010)	Quantitative data analysis of survey data to examine relationships between engagement in activities and quality of life.	Residents in one of 12 AL facilities in Long Island and New York City (n=131)	Quality of Life [Active Engagement in activities]
Mitchell 2000(Mitchell & Kemp, 2000)	Quantitative data analysis of survey data to examine relationships between	55 AL facilities in California (n=201 residents with functional impairments)	Quality of Life [demographic characteristics and health status; social involvement; facility characteristics; social climate]
Morgan 2016(Morgan et al., 2016)	Qualitative study assessing the impact of the presence of mental illness among residents on resident quality of life	5 purposively(?) sampled AL facilities in the mid-Atlantic region (n=62 residents; 39 family members; 55 staff and managers)	Resident characteristics [Presence of mental illness among residents]
Perkins 2012(Perkins et al., 2013)	Mixed methods study (face to face interviews and social network mapping)	9 AL facilities in Georgia (n=192 residents)	Well-being [family ties; ties to nonfamily members and co-residents;
Simmons 2018(Simmons et al., 2018)	Standardized observation of measure activities of daily living care quality	Dementia care residents in a 42-bed dementia care unit housed within a care community (Abe's Garden, Nashville, Tennessee) that	Quality of care [activities of daily living care quality; necessary unlicensed staff time; management approach]

Study/ Reference ID	Study Design/Description	Population (i.e., # ALs; location, special populations)	Domain(s) [Sub-domains]
	and staff time to deliver care to residents with dementia	also included 22 AL beds and 85 independent-living apartments (n=29)	
Sloane 2004(P. D. Sloane et al., 2004)	Medical records review and in-person patient assessments; interviews with facility administrators.	193 AL facilities in Florida, Maryland, New Jersey, and North Carolina (n=2014 residents).	Medication under-treatment [non-prescribing of certain medications established to decrease morbidity (ACE inhibitors in CHF; aspirin in persons with prior MI; one or more in persons with osteoporosis (calcium, estrogen, alendronate, risedronate, raloxifene, calcitonin)
Sloane 2008(Philip D. Sloane et al., 2008)	After-death interviews with staff and family caregiver interviews who cared for persons with dementia	Persons dying with dementia in 199 residential care/AL facilities in Florida, Maryland, New Jersey, and North Carolina. (n= staff caring for 422 persons with dementia; family caregivers of 293 decedents)	Unmet needs [care provided; communication]
Walsh 2018(Walsh & LaJoie, 2018)	Interviews with AL residents	12 AL facilities in Louisville, Kentucky (n=76 residents)	Built environment, social capitol
Young 2008(Young et al., 2008)	Medication administration observation, chart review	12 AL facilities in 3 states (Oregon, Washington, and New Jersey) (n=29 unlicensed AL staff and 510 AL residents)	Medication administration errors
Zimmerman 2003(Sheryl Zimmerman et al., 2003)	To categorize the constructs underlying social activity participation in residential care/AL	193 AL facilities in Florida, Maryland, New Jersey, and North Carolina (n=2014 residents).	Social engagement [service provision]
Zimmerman 2011(S. Zimmerman et al., 2011)	Medication administration observation, chart review	11 AL facilities in South Carolina (n=4,957 administrations for 301 residents)	Medication administration errors
Zimmerman 2014(S. Zimmerman et al., 2014)	Consensus process; literature review for indicators measuring person centeredness; prioritization of indicators	National group of LTC experts	Person-centeredness [Core values and philosophy: personhood, respect and dignity, autonomy, independence and choice, privacy; Relationships and Community (belonging); Governance/Ownership; Leadership; Workforce practices; Meaningful life and engagement; Environment; Accountability]

Appendix E: Studies of assisted living quality indicators in published literature

Study/ Reference ID Indicator Name No. Items	Indicator Level Indicator Type Mode Psychometrics	Population (i.e., # ALs; location, special pops?)	Domain(s) [subdomain(s)]
Aud 2004(Aud et al., 2004) Residential Care Facility Version of the Observable Nursing Home Care Quality Instrument 34	Facility Process Site visits Yes	35 resident care facilities in Missouri	Quality of Care [communication; care; staff; environment; environment (odor/cleanliness/condition); environment (lighting/noise/atmosphere); home/family
Aud 2005(Aud & Rantz, 2005) NH admissions from AL 1	Person Outcome Administrative data NA	AL residents in Missouri minimum database (n=1,735)	Quality of Care NH admissions
Aud 2007(Aud et al., 2007) Rantz 2008(Rantz et al., 2008) Observable Indicators of Quality- Assisted Living 34	Facility Process Site visits Yes	207 AL facilities in Missouri and Wisconsin	Quality of Care [communication; care; staff; environment; environment (odor/cleanliness/condition); environment (lighting/noise/atmosphere); home/family
Biola 2007(Biola et al., 2007) Administrative data and interviews	Person (resident) Process Administrative data and interviews No	94 residential care/AL facilities; 1 family caregiver for each of 440 residents who died interviewed between 6 weeks and 6 months after resident's death	Communication with family caregivers at end of life [family kept informed; received information; understood what doctor was saying; discussed wishes for medical treatment; had opportunity to ask questions; felt listened to; felt understood]
Castle 2011(N. Castle & Beach, 2011) Unclear (mail survey to nursing aides) 46	Person (DCW) Process? Mail survey Yes	Nurse aides included in Pennsylvania nurse aide registry that reported previous employment in AL (n=832)	Elder abuse [verbal abuse; physical abuse; psychological abuse; caregiving abuse; medication abuse; material exploitation abuse; sexual abuse]
Castle 2012(Nicholas G Castle et al., 2012)	Facility Process Mail survey Yes	Random sample of 1,000 AL facilities in U.S.(n= 572 administrators and 3,620 DCWs)	Safety culture [teamwork; staffing; compliance with procedures; non-punitive response to mistakes; handoffs; feedback &

Study/ Reference ID Indicator Name No. Items	Indicator Level Indicator Type Mode Psychometrics	Population (i.e., # ALs; location, special pops?)	Domain(s) [subdomain(s)]
Nursing Home Survey on Patient Safety and Culture (NHPSC), modified			communication about incidents; communication openness; supervisor expectations & actions promoting resident safety; overall perceptions of safety; management support for resident safety; organizational learning]
Edelman 2006(Edelman et al., 2006) Assisted Living Resident Satisfaction Survey (ALRSS) 18/18	Person (resident, family) Outcome Mail survey Yes	AL facilities in Illinois and Indiana (n=204 residents; 232 family members)	Satisfaction-resident [safety/peace of mind; personal attention; general satisfaction; staff; residents; knowledge; autonomy; aides; socialization with family; transportation; privacy; activities] Satisfaction-family [staff responsiveness; safety; transportation; activities; resident responsibilities]
Flannery 2012(Flannery et al., 2012) Job Attitude Scale (JAS) 17	Person (staff) Process Mail survey Yes	Nursing assistants in 4 AL facilities in Maryland (n=96)	Job satisfaction [pay, interaction/organizational factors, task requirement, jobs status, autonomy]
Flores 2009(Flores & Newcomer, 2009) Administrative data	Facility Outcome Administrative data NA	Evaluated data from 340 facilities in Northern and Central California data to compile information system for residential care facilities for the elderly..	Safety [survey reports, complaint investigations, personnel reports, fire clearance, admission agreements, plans of operation, licensee information, incident and death reports]
Gesell 2001(Gesell, 2001) Unclear 45	Person (resident, family) Outcome Mail survey Yes	12 AL facilities in 8 states (Connecticut, Illinois, Indiana, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania) (n=475 residents and 350 family members)	Satisfaction [global satisfaction; planned activities; assistance/interpersonal manner of aides; dining; structure/ambience of apartments, facility, and grounds; management/finances; personal issues (resident rights, staff responsiveness)]
June 2019(June et al., 2019) Deficiencies 1	Facility Outcome Administrative data NA	Administrative data from 2,457 licensed AL facilities in Florida.	Safety [Number of deficiencies by severity]
Kuhn 2002(Kuhn et al., 2002)	Person Outcome Observation NA	Residents (n=131) of 10 AL facilities in Wisconsin.	Quality of Life [daily interactions and activities]

Study/ Reference ID Indicator Name No. Items	Indicator Level Indicator Type Mode Psychometrics	Population (i.e., # ALs; location, special pops?)	Domain(s) [subdomain(s)]
Dementia Care Mapping NA			
Molony 2007(Molony et al., 2007) Experience of Home Scale (EOH)25	Person Outcome Administrative data NA	Individuals in a range of settings (community and residential) (n=200; 113 from residential care (AL/continuing care retirement communities (n=63), residential care homes, nursing homes)	Resident Satisfaction [Experience of home: separation; connection, dynamic transaction; atmosphere]
Munn 2007(Munn et al., 2007) Quality of Dying in Long- Term Care (QOD-LTC) (all descendants) 11	Person (resident) Process Staff survey Yes	Stratified random sample of 199 RC/AL facilities and 31 NHs across 4 states (Florida, Maryland, North Carolina, and New Jersey) participating in the Collaborative Studies of Long-Term Care	Resident Satisfaction [Quality of Dying-personhood; purpose; closure; control; social connection; preparatory tasks]
Munn 2007(Munn et al., 2007) Quality of Dying in Long- Term Care (QOL-LTC-C) (cognitively intact descendants) 23	Person (resident) Process Staff survey Yes	Stratified random sample of 199 RC/AL facilities and 31 NHs across 4 states (Florida, Maryland, North Carolina, and New Jersey) participating in the Collaborative Studies of Long-Term Care	Resident Satisfaction [Quality of Dying-personhood; purpose; closure; control; social connection; preparatory tasks]
Rodiek 2016(Rodiek et al., 2016) Seniors' Outdoor Survey (SOS) 60	Facility Structure Site-visits, survey Yes	12 long term care facilities; resident surveys (n=1,128)	Environment (outdoor) [access to nature; outdoor comfort and safety; walking and outdoor activities; indoor-outdoor connection; connection to the world]
Sikorska- Simmons 2001(Sikorska- Simmons, 2001) Resident Satisfaction Index (RSI) 27	Person (resident) survey Yes	13 AL facilities in Maryland (n=156 residents)	Resident Satisfaction [autonomy; health care; provision of services; physical environment; relationships with staff; social life/activities]

Study/ Reference ID Indicator Name No. Items	Indicator Level Indicator Type Mode Psychometrics	Population (i.e., # ALs; location, special pops?)	Domain(s) [subdomain(s)]
Sloane 2005(P. D. Sloane et al., 2005) Zimmerman 2005b(P. D. Sloane et al., 2005) (Dementia...) Quality of Life in Dementia (QOL-D) 15	Person (resident) Resident Survey Yes	45 facilities in four states (Florida, Maryland, North Carolina, and New Jersey)	Quality of Life [Active participation]
Sloane 2005(P. D. Sloane et al., 2005) Zimmerman 2005b(S. Zimmerman, Sloane, et al., 2005) (Dementia...) Quality of Life in Dementia (QOL-D) 6	Person (resident) Care provider survey Yes	45 facilities in four states (Florida, Maryland, North Carolina, and New Jersey)	Quality of Life [positive and negative affect]
Sloane 2005(P. D. Sloane et al., 2005) Zimmerman 2005b(S. Zimmerman, Sloane, et al., 2005) (Dementia...) Quality of Life in Alzheimer's Disease (QOL-AD) 47	Person (resident) Resident Survey Yes	45 facilities in four states (Florida, Maryland, North Carolina, and New Jersey)	Quality of Life [physical condition; mood; interpersonal relationships; ability to participate in meaningful activities; financial situation]
Sloane 2005(P. D. Sloane et al., 2005) Zimmerman 2005b(S. Zimmerman, Sloane, et al.,	Person (resident) Care provider Survey Yes	45 facilities in four states (Florida, Maryland, North Carolina, and New Jersey)	Quality of Life [physical condition; mood; interpersonal relationships; ability to participate in meaningful activities; financial situation]

Study/ Reference ID Indicator Name No. Items	Indicator Level Indicator Type Mode Psychometrics	Population (i.e., # ALs; location, special pops?)	Domain(s) [subdomain(s)]
2005) (Dementia...) Quality of Life in Alzheimer's Disease (QOL- AD) 47			
Sloane 2005(P. D. Sloane et al., 2005) Zimmerman 2005b(S. Zimmerman, Sloane, et al., 2005) (Dementia...) Alzheimer Disease Related Quality of Life (ADRQL) 47	Person (resident) Care provider survey Yes	45 facilities in four states (Florida, Maryland, North Carolina, and New Jersey)	Quality of Life] [social interaction; awareness of self, feeling, and mood, enjoyment of activities, response to surroundings]
Sloane 2005(P. D. Sloane et al., 2005) Zimmerman 2005b(S. Zimmerman, Sloane, et al., 2005) (Dementia...) Dementia Quality of Life (DQoL) 29	Person (resident) Resident survey Yes	45 facilities in four states (Florida, Maryland, North Carolina, and New Jersey)	Quality of Life] [social interaction; awareness of self, feeling, and mood, enjoyment of activities, response to surroundings]
Sloane 2005(P. D. Sloane et al., 2005) Zimmerman 2005b(S. Zimmerman, Sloane, et al., 2005) (Dementia...) Dementia Care Mapping (DCM) 24	Person (resident) Observation NA	45 facilities in four states (Florida, Maryland, North Carolina, and New Jersey)	Quality of Life] [activities, well-being]

Study/ Reference ID Indicator Name No. Items	Indicator Level Indicator Type Mode Psychometrics	Population (i.e., # ALs; location, special pops?)	Domain(s) [subdomain(s)]
Sloane 2005(P. D. Sloane et al., 2005) Zimmerman 2005b(S. Zimmerman, Sloane, et al., 2005) (Dementia...) Resident and Staff Observation Checklist- Quality of Life Measure (RSOC-QOL) NA	Person (resident) Observation NA	45 facilities in four states (Florida, Maryland, North Carolina, and New Jersey)	Quality of Life [appearance; location; activity; behavior; affect; restraint use; interactions of residents]
Sloane 2005(P. D. Sloane et al., 2005) Zimmerman 2005b(S. Zimmerman, Sloane, et al., 2005) (Dementia...) Philadelphia Geriatric Center Affect Rating Scale (PGC-ARS) NA	Person (resident) Outcome Observation NA	45 facilities in four states (Florida, Maryland, North Carolina, and New Jersey)	Quality of Life [positive affect; negative affect]
Sloane 2007(P. D. Sloane et al., 2007) Dementia Care Mapping NA	Person (resident) Outcome Observation Yes	Secondary data analysis using several data sets with observations on dementia residents in the UK, Illinois, Wisconsin, and other locations (n=413 AL/RC residents in 47 AL/RC facilities)	Quality of Life [activity/interactions, well-being]
Smith 2011(Smith et al., 2011) Pandemic preparedness tool 61	Facility Process Survey No	123 long term care facilities in Nebraska of 231 contacted responded that they had a plan and completed the survey	Safety [pandemic influenza preparedness planning]

Study/ Reference ID Indicator Name No. Items	Indicator Level Indicator Type Mode Psychometrics	Population (i.e., # ALs; location, special pops?)	Domain(s) [subdomain(s)]
White 2008(White et al., 2008) Person- Directed Care (PDC) and Environmental Support for PDC Measure 64	Person (resident) Process Staff survey Yes	8 long term care sites in Oregon (n=430 staff)	Person-Directed Care [personhood; knowing the person; autonomy and choice; nurturing relationships; comfort care] and Environmental Supports Constructs [support for work with residents; person-directed environment; management/structural support]
Zimmerman 2005a(S. Zimmerman, Williams, et al., 2005) (Attitudes...) Approaches to Dementia 19	Person (staff) Process Staff survey Yes	Data from 41 long-term care facilities (n=154 direct care workers; 64 worked in residential care or AL)	Workforce Attitudes about residents with dementia [attitudes; person-centeredness]
Zimmerman 2005a(S. Zimmerman, Williams, et al., 2005) (Attitudes...) Work Stress Inventory 45	Person (staff) Process Staff survey Yes	Data from 41 long-term care facilities (n=154 direct care workers; 64 worked in residential care or AL)	Job Stress [stress related to events; resident care; relations with coworkers; relations with supervisors; workload and scheduling; physical design]
Zimmerman 2005a(S. Zimmerman, Williams, et al., 2005) (Attitudes...) Staff Experience working with Demented Residents 21	Person (staff) Process Staff survey Yes	Data from 41 long-term care facilities (n=154 direct care workers; 64 worked in residential care or AL)	Job Satisfaction [(satisfaction with) feedback; organization; expectations; resident contact; expectations of others; environment]
Zimmerman 2015(S. Zimmerman et al., 2015) Person- Centered Practices in	Person (resident) Process Resident survey Yes	Cognitive testing in 2 AL facilities in North Carolina (n=8 residents) of initial survey; field testing of revised survey in 19 diverse, stratified AL facilities considered to embrace person-centered care in 6 states (n=228 residents)	Person-centeredness [well-being and belonging; individualized care and services; social connectedness; atmosphere]

Study/ Reference ID Indicator Name No. Items	Indicator Level Indicator Type Mode Psychometrics	Population (i.e., # ALs; location, special pops?)	Domain(s) [subdomain(s)]
Assisted Living questionnaire - resident 49			
Zimmerman 2015(S. Zimmerman et al., 2015) Person- Centered Practices in Assisted Living (PC-PAL) questionnaire - staff 62	Person (resident) Process Staff survey Yes	Cognitive testing in 2 AL facilities in North Carolina (n=8 staff) and field testing in 19 diverse, stratified AL facilities considered to embrace person-centered care in 6 states (n=123 staff)	Person-centeredness [workforce practices; social connectedness; individualized care and services; atmosphere; caregiver- resident relationships]

Notes: Level refers to unit of analysis [Person (resident, family, staff)/Facility/System)]; Indicator type refers to the specific aspect of care (structure/process/outcome); Indicator mode refers to how data is collected; Psychometrics refers to psychometric properties reported that are relevant for certain types of indicators; DCW is an abbreviation for direct care worker.

Appendix F: Key informant interview and technical expert panel list and key questions

Name	Email	Affiliation	State
Tamara Konetzka*	konetzka@uchicago.edu	University of Chicago, Professor	IL
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Diana White	dwhi@pdx.edu	Portland State University	OR

Note: Individuals marked with * also participated in a technical expert panel.

Key informant Interview prompts:

- 1) From your experience, what are the key things AL/RCF residents are looking for, and from your work with states, what are key takeaways we should be aware of when thinking about measuring quality in this space?
- 2) What are the current gaps in understanding/measuring factors that impact AL quality that states should be collaborating to improve and address with providers?
- 3) Who are the key stakeholders we should be reaching out to for these conversations?

Key technical expert panel discussion questions:

- 1) Based on our findings, are there gaps either in published or grey literature based on your knowledge of the field/experience? Are you surprised by any of the findings?
- 2) Is there value in bringing the published literature and grey literature findings together in one summary table to identify areas of agreement/gaps? Other suggestions?
- 3) What key implications to the findings suggest for measure selection?

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