Transitions in Long-Term Care and Potential Implications for Quality Reporting in Ontario, Canada

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Purpose: To describe the proportion of long-term care (LTC) residents excluded from quality measurement because of standard length of stay inclusion criteria and the extent to which this varies across facilities.

Design and Methods: A 2005 province-wide census of LTC residents’ charts was linked to additional databases from Ontario, Canada. The proportion of residents who were newly admitted (≤90 days) and who exited the facility within 90 days were identified and interfacility variation in each was described.

Results: Of the 68,930 residents in 574 facilities, 5363 (7.8%) were admitted in the prior 90 days and 7833 (11.4%) were discharged in the subsequent 90 days. Overall, 55,734 (80.4%) residents were neither admitted nor discharged within 90 days and were defined as “stable”; however, this ranged from 67.2% to 95.1% across facilities.

Implications: Stable residents are the focus of most quality measurement in LTC but transitioning residents are an important part of the caseload for these facilities. In Ontario, transitioning residents accounted for 20% of the population but there was substantial variation in this proportion across facilities. This raises concerns about the comprehensiveness and comparability of publicly reported quality indicators for a population with frequent transitions in Ontario and elsewhere. (J Am Med Dir Assoc 2010; 11: 629–635)

Keywords: Quality indicators; care transitions; new admissions; nursing homes

The public reporting of quality indicators in health care has become standard practice in Canada, the United States, and elsewhere.1–3 Quality measurement and reporting are particularly challenging in long-term care (LTC) homes, also known as nursing homes, owing to a variety of factors that are not seen in other health care settings.4,5 One important issue is that, although the most residents tend to have very long stays overall, transitions into and out of facilities are frequent.6 Therefore, at a conceptual level, residents recently admitted to LTC, residents who have extended stays, and residents who leave the facility constitute 3 distinct populations and should present 3 distinct opportunities for quality assessment. Despite this, most reported quality indicators often focus only on extended stay populations. Most quality indicator measures are restricted to residents who have been in the facility for at least 90 days and often require that residents remain in the facility for the full measurement period.7 Such inclusion criteria are common across jurisdictions even though different data sources may be used to create quality indicators. For example, the quality measures derived from the federally mandated Minimum Data Set (2.0) use a 90-day cutoff to differentiate between short- and long-stay residents, the latter of which are the main focus on the Centers for Medicare and
Medicaid Services’ (CMS) Nursing Home Compare Web site. A subset of these measures requires 2 consecutive Minimum Data Set (MDS) assessments to quantify change in resident status. Even quality measures derived from the newly released MDS 3.0, which will be used shortly in the United States, do not address this problem.

Overall, there has been little quality measurement relative to the specific practices around resident transitions. Even though CMS includes measures of short-stay residents, these do not include assessment of specific intake activities; instead, they are replicas of the long-stay measures that do not require consecutive MDS assessments. The exclusion of transitioning residents is a potential lost opportunity for quality improvement and raises 2 important issues for quality reporting. First, LTC homes provide essential care services in the time periods following admission and preceding discharge. If only extended stay populations are included in quality indicators, these activities are omitted from discussions on quality. Second, individual facilities differ from one another in their resident “flow-through” rates and this has the potential to affect the reliability of interfacility comparisons.

In this study, our objectives were to describe the extent to which standard length of stay criteria for quality indicator measurement influence the representativeness of the long-term care population and to assess the extent to which this pattern varies across LTC facilities in Ontario.

**RESIDENT FLOW: INTERSECTION OF LTC HOME TRANSITIONS AND QUALITY INDICATORS**

The overarching framework for this research study seeks to place quality measurement within the context of LTC resident flow—specifically, the frequency of LTC resident admission and exit patterns (Figure 1). In the following section, we describe how current inclusion criteria introduce the potential for biased reporting of facility quality.

A prespecified resident length of stay in the facility at the time of measurement is a standard inclusion criterion for quality indicators. The rationale for this approach is to prevent attribution of resident problems present at admission to the LTC facility. The obvious benefit is that this criterion ensures that facilities are not penalized for problems that started in another setting. On the other hand, exclusion of newly admitted residents limits the ability to assess care activities that take place during admission and efforts to acclimate residents to their new environment. For example, residents newly admitted with pressure ulcers should not be included in a facility’s indicator of incident pressure ulcers, but they might be appropriate for an indicator examining pressure ulcer care planning. Length of stay inclusion criteria also have the potential to affect the reliability of interfacility comparisons, because facilities that serve a high proportion of newly admitted residents may be fundamentally different from others.

Definitions for quality indicators also often require a minimum duration of follow-up, although such criteria are not always explicitly described in the literature. Two common examples are that residents must remain in the facility for the full measurement period or that residents are present at 2 distinct times to quantify changes. From a quality attribution standpoint, such criteria ensure that facilities are evaluated on the quality of care provided to residents who are physically in the facility at the time of measurement. From a methodological perspective, it also negates the need to account for censoring, which can complicate the interpretation of measures that require follow-up time (ie, incident pressure ulcers). The disadvantage of these criteria is that they preclude the opportunity to include the experience of residents who exit the facility before the end of the measurement period. This is particularly problematic if the reasons for exit are related to the quality indicator. For example, an indicator of pressure ulcer worsening may require that a resident be in the facility for 2 measurement periods but a resident transferred to the hospital for pressure ulcer care between those periods would not be counted even though the transfer was relevant to the quality indicator. In this example, the fact of the acute care transfer is itself informative. This issue also has the potential to affect the reliability of comparisons between LTC facilities when there are different facility thresholds for transfer. Facilities that are more likely to transfer residents to the hospital for certain problems may appear to perform better than those that tend to continue to care for residents with similar problems.

**METHODS**

This research was conducted using linked administrative health databases from Ontario, Canada. Ontario is the largest Canadian province, with a population of more than 10 million. At the time of this study, there were nearly 70,000 LTC beds in Ontario in approximately 600 LTC facilities. Ontario LTC homes are designated to provide care to adults who require 24-hour nursing care and/or supervision within a secure setting; this does not include retirement homes or rehabilitation units. Unlike the United States, Ontario LTC homes generally are not used to provide postacute or rehabilitative care and most admissions are intended to become long-stay (comparable to the long-stay population in US nursing homes).

This study was approved by the research ethics board of Sunnybrook Health Sciences Centre.

**Design and Data**

In this cross-sectional study, we linked data from multiple sources so as to identify all LTC residents in Ontario on a given date and their location 90 days before and subsequent to that date. The primary data source was the Levels of Care (LOC) Classification System. The LOC consists of a census of resident charts to obtain data on clinical and functional characteristics. Before 2006, the LOC system was used for case-mix reimbursement and it was required that the charts of all residents in all LTC facilities undergo the census process. The census is typically conducted between October and December of each year. The date of the 2005 facility census was used to define the baseline time point for each resident in our cohort.
Using unique encrypted identifiers, we linked resident-level information from the LOC census to other data sources. The Ontario Drug Benefit Program database includes records for all medications dispensed to Ontarians aged 65 years and older. The Ontario Health Insurance Plan database includes claims for all medical services covered by the provincial health insurance plan. Drug and physician billing claims were used to track a resident’s stay in LTC. The Canadian Institute for Health Information Discharge Abstract Database includes records for all acute care hospital stays and was used to identify hospital discharge before LTC admission and hospital admission during follow-up. The Continuing Care Reporting System contains records for all complex continuing care hospital stays and the National Rehabilitation Reporting System contains records for all rehabilitation hospital stays. The Registered Persons Database includes vital statistics for Ontario residents.

**Sample**

The study sample included all residents of eligible Ontario LTC homes who underwent a facility census in 2005 (baseline). Facilities were exempt from the census if they were newly opened (within the year) or preparing to close. Within facilities, individual residents may not have been assessed if they had been in the facility for fewer than 7 days, died within the preceding 24 hours, or were in a designated respite bed. Beds registered under the Elderly Capital Assistance Program were excluded because they are found in hospital units or small stand-alone facilities that are dissimilar to standard LTC homes. No exclusions were made based on resident characteristics. The final sample consisted of approximately 98% of all residents who underwent the LOC census in 2005.

**Variable Definitions**

We calculated each resident’s length of stay in days by subtracting the recorded date of LTC home admission from the recorded facility census date. Residents were classified as being newly admitted if their length of stay at baseline was 90 days or less; they were otherwise not considered newly admitted. A 90-day cutoff was selected to be consistent with publicly reported measures used in the United States and Canada. For newly admitted residents only, we used hospital records to identify those who had been admitted directly from the hospital. We considered a resident admitted from hospital if the hospital discharge date was within 2 calendar days of the LTC admission date.

We followed residents for 90 days from baseline to identify all facility exits. A resident was considered to have exited a facility if he or she was admitted to the hospital, admitted to a continuing care or rehabilitation facility, had evidence of return to the community, or died. An emergency department visit that did not result in inpatient admission was not considered an exit. Return to the community was assessed using drug claims data; as prescriptions for LTC residents are filled for a 30-day maximum, we tracked drug claims for any that ceased to include a LTC flag. Because we were unable to capture reliably inter-LTC facility transfers, we did not include this as an exit destination. We chose a 90-day follow-up period to be consistent with the interval between MDS assessments.

Based on length of stay at baseline and exit within the subsequent 90 days, we classified all residents into mutually exclusive categories. The final sample consisted of approximately 98% of all residents who underwent the LOC census in 2005.

**Fig. 1. Intersection of long-term care home transitions and quality indicator measurement periods.**
### Table 1.  Resident Characteristics by Admission and Exit Patterns

<table>
<thead>
<tr>
<th></th>
<th>Newly Admitted*</th>
<th>Exiting Residents†</th>
<th>Stable Residents‡</th>
<th>All Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>with No Exit</td>
<td>with Exit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N = 4272</td>
<td>N = 1091</td>
<td>N = 7833</td>
<td>N = 55,734</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;65</td>
<td>270 (6.3%)</td>
<td>69 (6.3%)</td>
<td>353 (4.5%)</td>
<td>3405 (6.1%)</td>
</tr>
<tr>
<td>65–74</td>
<td>489 (11.4%)</td>
<td>138 (12.6%)</td>
<td>701 (8.9%)</td>
<td>5697 (10.2%)</td>
</tr>
<tr>
<td>75–84</td>
<td>1716 (40.2%)</td>
<td>382 (35.0%)</td>
<td>2709 (34.6%)</td>
<td>19,695 (35.3%)</td>
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<tr>
<td>85+</td>
<td>1797 (42.1%)</td>
<td>502 (46.0%)</td>
<td>4070 (52.0%)</td>
<td>26,937 (48.3%)</td>
</tr>
<tr>
<td>Female</td>
<td>2835 (66.4%)</td>
<td>629 (57.7%)</td>
<td>5182 (66.2%)</td>
<td>40,354 (72.4%)</td>
</tr>
<tr>
<td>Major diagnoses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circulatory disease</td>
<td>2871 (67.2%)</td>
<td>803 (73.6%)</td>
<td>5232 (66.8%)</td>
<td>34,354 (61.6%)</td>
</tr>
<tr>
<td>Mental disorders (including dementia)</td>
<td>2591 (60.7%)</td>
<td>585 (53.6%)</td>
<td>4896 (62.5%)</td>
<td>37,132 (66.6%)</td>
</tr>
<tr>
<td>Musculoskeletal disability</td>
<td>2591 (60.7%)</td>
<td>585 (53.6%)</td>
<td>4896 (62.5%)</td>
<td>37,132 (66.6%)</td>
</tr>
<tr>
<td>Number of Activities of Daily Living§ that require complete assistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>395 (9.2%)</td>
<td>64 (5.9%)</td>
<td>410 (5.2%)</td>
<td>4003 (7.2%)</td>
</tr>
<tr>
<td>1</td>
<td>485 (11.4%)</td>
<td>92 (8.4%)</td>
<td>497 (6.3%)</td>
<td>4725 (8.5%)</td>
</tr>
<tr>
<td>2</td>
<td>690 (16.2%)</td>
<td>143 (13.1%)</td>
<td>987 (12.6%)</td>
<td>7468 (13.4%)</td>
</tr>
<tr>
<td>3 or 4</td>
<td>2702 (63.2%)</td>
<td>792 (72.6%)</td>
<td>5939 (75.8%)</td>
<td>39,538 (70.9%)</td>
</tr>
<tr>
<td>Number of behavioral problems‖ reported</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1924 (45.0%)</td>
<td>538 (49.3%)</td>
<td>2549 (32.5%)</td>
<td>17,313 (31.1%)</td>
</tr>
<tr>
<td>1</td>
<td>1190 (27.9%)</td>
<td>290 (26.6%)</td>
<td>2268 (29.0%)</td>
<td>16,260 (29.2%)</td>
</tr>
<tr>
<td>2 or more</td>
<td>1158 (27.1%)</td>
<td>263 (24.1%)</td>
<td>3016 (38.5%)</td>
<td>22,161 (39.8%)</td>
</tr>
</tbody>
</table>

* Newly Admitted Residents are residents whose date of admission in LTC is within 90 days of the baseline date.
† Exiting Residents does not include newly admitted residents.
‡ Stable residents are those who are not newly admitted and do not exit the facility in the following 90 days.
§ Activities of Daily Living are eating, toileting, transferring, and dressing.
‖ Behavioral problems are wandering, aggressive or angry behavior, agitated behavior, and resists treatment/refuses care.
exclusive transition categories: (1) newly admitted residents (subdivided into residents who did not exit the facility and residents who exited the facility); (2) not newly admitted residents who exited the facility; and (3) stable residents (those who were not newly admitted and did not exit the facility). We chose to subdivide the newly admitted group because those who exited the facility are an important subset who experienced both transitions in a relatively short period of time. The stable group is intended to represent residents who would be included in LTC quality indicator denominators regardless of other length of stay criteria.

Analyses

We described the basic demographic and clinical characteristics of each transition category. To describe facility distribution, we estimated the proportion of residents within each facility for the 4 transition categories. We then described this distribution across facilities using medians and interquartile ranges as well as boxplots to visually display the full distribution. We further explored differences across facilities by describing the proportion of residents who exited for acute care hospital admission or death.

All analyses were completed using SAS 9.1 (SAS Institute Inc., Cary, NC).

RESULTS

Our sample consisted of 68,930 residents in 574 LTC homes. Of these, 7.8% of residents were newly admitted, of which 20.3% exited within the following 90 days (1.6% of total residents), 11.4% were not newly admitted but exited within 90 days, and 80.8% were stable (they were not newly admitted and did not exit within 90 days).

The 4 transition categories showed similar age and gender distributions with most residents older than 75 and female. Diagnostic and functional characteristics were also similar across the 4 groups, although stable residents had less circulatory disease and more behavioral problems. Additional details are presented in Table 1.

The prevalence of residents in each transition category ranged across facilities (Figure 2). Variability across facilities was lowest for the category of newly admitted residents who exited the facility (median 1.3%, range 0%–5.8%) followed by newly admitted residents who did not exit the facility (median 5.9%, range 0%–14.1%). Stable residents showed the widest interfacility variation (median 81.2%, range 67.2%–95.1%).

The prevalence of exiting residents ranged across facilities from a minimum of 1.8% to a maximum of 20.7% but differences were also seen by reason for exit (Figure 3). Hospital admission accounted for 57.5% of all exits but within facilities this ranged from 11.1% to 100.0% of exits. Meanwhile, death accounted for 38.2% of all exits but this ranged across facilities from 0% to 87.5% of exits. Other reasons for exit were much less frequent (Table 2).

DISCUSSION

We found that at a single point in time, 8% of all LTC home residents in Ontario were newly admitted and that another 11% percent exited the facility in the following 90 days. This suggests that 19% of all LTC residents in Ontario would be excluded from quality measurement activities if common length of stay criteria were applied. We also discovered that the proportion of residents in each of these transition categories varied substantially across individual facilities and would result in facility-level exclusion rates that range from 5% to 33%. These findings have important implications for the ability of standard quality indicators to describe individual LTC homes and for the reliability of interfacility comparisons.

These postadmission and predischarge transition points are critical periods when descriptors of care activities may provide useful markers of quality, yet they tend to be overlooked in many public reporting strategies. Although it may not be feasible or advisable to include all residents in current quality indicators, it may be reasonable to develop quality indicators that focus on these specific periods. CMS’ Nursing Home Compare reports on short-stay residents by restricting to quality indicators that do not require consecutive MDS assessments. More appropriate measures to describe the quality of the admission process may include those such as medication reconciliation or time to assessment by a physician. For residents who recently left a facility, it may be more difficult to
define specific indicators because the reasons for exit are varied but, when possible, the discharge itself should be incorporated into relevant quality indicators. For example, residents admitted to hospital for a fall-related injury should be included in a fall quality indicator even if they are in not in the facility at the time of measurement. By considering strategies to include as many residents as possible, we may be able to develop quality indicators that better describe the full spectrum of a facility’s care activities and enhance quality improvement activities. This should include exploration of other data sources and data collection strategies to supplement the MDS, which may not be adequate for describing experiences around the LTC stay.

The wide interfacility variation found in the proportion of residents in each transition category and the wide variation in the proportion of exits that went to hospital also have important policy implications. Because we looked at only a single point in time, it is possible that these facility-level descriptors would vary with time and are not reflective of specific facility characteristics. On the other hand, it is also possible, and likely, that at least some of these facilities behave differently in terms of their admission policies, care practices, or transfer threshold. Hospitalization rates vary widely across facilities and are influenced by a number of factors independent of resident diagnosis, including preferences, facility profit-status and specialization, staffing patterns, and external policies. This research illustrates that factors well beyond resident need affect their outcomes and hospitalization patterns. Incorporating data on exit patterns, including reasons for exit, into our strategies for quality measurement may improve our ability to fairly compare facilities.

Although we used data from a single Canadian province, we believe that this study raises issues relevant to other jurisdictions, including the United States. Quality indicators focused on a stable resident population do capture most residents; however, our data show that the presence of stable residents can vary dramatically between facilities with some reporting as low as 70%. Although our data do not allow us to draw conclusions about the situation in the United States, we anticipate that the proportion of transitioning residents at any given time is higher because of the postcode population and that this could raise additional difficulties for assessing the quality of care transitions and make this issue even more important. Under these circumstances, the utility of the current quality indicator paradigm for adequately capturing facility quality are questionable. Further, all residents experience admission and discharge. These periods of transition are well recognized as times of increased vulnerability for frail older adults, yet this issue is seldom taken into account in describing LTC quality. Quality indicators that focus on these transition points may help to provide a better understanding of these universal resident experiences and provide a more comprehensive picture of a facility’s capacity to provide quality care.

LIMITATIONS

Residents with a length of stay of fewer than 7 days were not required to be included in the facility census and are not identifiable in our data. The extent to which their inclusion in the census varies across facilities is not known. Although this results in an underestimate of the total number of newly admitted residents, it is unlikely to have had a serious effect on our results because our study sample is a near census of all LTC beds in the province. Second, we examined the whole province but there may be reason to consider the impact of local forces on LTC home populations. The availability of LTC beds, the availability of other services, and underlying demographics are likely to affect who accesses LTC and for how long. Third, we did not include interfacility transfers in our exit counts because we were unable to reliably capture them. A better understanding of this issue would be useful for future reporting efforts. Finally, we did not address the issue of resident-level risk adjustment because our focus was on facility-level factors that may be related to the appropriateness of interfacility comparisons.

SUMMARY

As jurisdictions move toward facility-level public reporting in LTC, it is important to understand how decisions about which residents are included in measures affect their fairness and interpretability. We found that newly admitted residents and residents who exit the facility before the end of the measurement period, 2 groups who are commonly excluded from quality indicator definitions, accounted for a relatively small percentage of the total resident population, but that their proportions varied dramatically across individual facilities. Our findings reinforce the need for quality indicators that describe
care during critical transition periods as well as a better understanding of the forces that lead to facility-level variation so that LTC homes that serve special populations can be differentiated from those that have true quality problems.

ACKNOWLEDGMENTS

The authors acknowledge the assistance of Hadas Fischer, Azim Bhamani, and Alice Newman, all at the Institute for Clinical Evaluative Sciences, for their assistance with project development and data analysis as well as Laura Berall and Rachel Laxer for their work in identifying background information.

REFERENCES