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Original Study

Level of Need, Divertibility, and Outcomes of Newly Admitted Nursing Home Residents

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A B S T R A C T

Objectives: To describe the level of need and divertibility of newly admitted nursing home residents, describe the factors that drive need, and describe the outcomes of residents across different levels of need.
Design: Retrospective cohort study.
Setting: A total of 640 publicly funded nursing homes (also known as long-term care facilities) in Ontario, Canada.
Participants: All newly admitted residents between January 1, 2010 and March 1, 2012.
Measurements: We categorized residents into 36 groups based on different levels of (1) cognitive impairment, (2) difficulty in activities of daily living (ADL), (3) difficulty in instrumental ADLs, and (4) whether or not they had a caregiver at home. Residents were then categorized as having low, intermediate, or high needs; applying results from previous "Balance of Care" studies, we also captured the proportion who could have been cost-effectively diverted into the community. We then contrasted the characteristics of residents across the needs and divertible groupings, and compared 4 outcomes among these groups: hospital admissions, emergency department visits, mortality, and return to home.
Results: A population-level cohort of 64,105 incident admissions was captured. About two-thirds had great difficulty performing ADLs (65%) and had mild to severe cognitive impairment (66%); over 90% had great difficulty with instrumental ADLs. Just less than 50% of the new admissions were considered to be residents with high care needs (cognitively impaired with great ADL difficulty), while only 4.5% (2880 residents) had low care needs (cognition and ADL intact). Those with dementia (71.0%) and previous stroke (21.5%) were over-represented in the high needs group. Those that cannot be divertible to anywhere else but an institution with 24 hour nursing care comprised 41.3% (n = 26,502) of residents. Only 5.4% (n = 3483), based on community resources available, could potentially be cost-effectively diverted to the community. Those at higher needs experienced higher rates of mortality, higher total cost across all health sectors, and lower rates of return to home.
Conclusions: The majority of those admitted into nursing homes have high levels of need (driven largely by dementia and stroke) and could not have their needs met cost-effectively elsewhere, suggesting that

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This study has been approved by the research ethics board at the Institute for Clinical Evaluative Sciences (ICES), at Sunnybrook Health Sciences Centre in Toronto, Ontario, and by the research ethics board at the Ottawa Hospital Research Institute at Ottawa, Ontario (Protocol #20130579-01H).

Using encrypted health card numbers as unique identifiers, records of healthcare use and costs were linked across various administrative databases. No written consent was obtained; all data were encrypted using health card numbers as unique identifiers. Thus, all records used were deidentified and anonymized. All data were housed and analyzed at ICES, a prescribed entity for the purposes of section 45 Ontario's Personal Health Information Privacy Act.

The authors declare no conflicts of interest.

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the system is at capacity. Caring for the long-term care needs of the aging population should consider the balance of investments in institution and community settings.

As the population ages and life expectancy increases, the number of older adults with long-term care (LTC) needs—those with disability and disease who can no longer care for themselves independently—is expected to increase.[1] This increasing burden is expected to drive the need for more nursing home beds, known as LTC homes in Ontario. Nursing homes provide board and 24-hour care from nurses, along with care from other healthcare providers such as personal support workers. Nursing homes in Ontario admit those with LTC needs; those having postacute care needs are typically admitted into complex continuing care hospitals. Unlike private retirement homes, nursing homes in Ontario and across Canada are publically subsidized based on income. The vast majority of residents in nursing homes in Ontario are over 80 years of age, a population that is set to more than double in size by 2036.[2] The demand for nursing homes in Canada and other Organization for Economic Cooperation and Development countries is rising,[3–6] with those on wait lists experiencing negative outcomes, including death.[7,8]

The majority of seniors would prefer to age "in place" in the community.[9] Coupled with the high demand and limited supply of spaces, it is important that residents appropriately enter nursing homes when their care needs can no longer be cost-effectively managed in the community. Examining this issue, the Balance of Care (BoC) methodology was developed in the United Kingdom to examine the cost and feasibility of shifting institutional care to the community.[10,11] It categorizes those eligible for nursing home placement into several groups with similar needs, typically based on their ability to perform activities of daily living (ADL) and instrumental activities of daily living (IADL), their level of cognition, and the presence of a caregiver in the community.

The BoC method was adapted in the Canadian context to assess whether individuals on waiting lists for nursing homes could be cared for in the community at a lower cost.[12] The BoC projects in Ontario generated vignettes for 36 different care needs groups. The 36 groups were generated from permutations of 3 levels of IADL and ADL limitations (none, mild, and great), and from whether the resident had cognitive impairment or a caregiver prior to entry. A panel of experts then constructed community service packages that could possibly meet the need for each group in the community. The cost of each of the care packages was calculated using average unit costs of local health and social care services. It includes some indirect costs associated with services for caregivers (eg, in-home respite, counseling, and supports), but does not account for losses in productivity. It does not account for patient or family preferences but simply looks at the cost trade-offs for caring for individuals in the institution vs community settings. Some groups would then be deemed to not be divertible if their high needs lead to costs that exceed the cost of LTC; on the other end of the spectrum, some may be potentially cost-effectively and safely divertible to the community.

Ontario is an ideal population for such studies because of its large population size (over 13 million people) and because it captures population-level data for everyone applying for and using publically-funded home care and LTC. Such data is collected through internationally-validated Resident Assessment Instruments (RAI) by trained case managers. In Ontario, RAI data at time of application is used to generate a Method for Assigning Priority Levels score,[13] which in turn influences each resident's ranking on wait lists for individual homes. Method for Assigning Priority Levels score has previously been validated to predict need for LTC, caregiver distress, and requirement for alternative placement to improve outlook.[13] Currently, applicants choose to be placed on the wait list of 5 homes, with a median wait time of 98 days in 2011/2012.[14] BoC studies in Ontario have occurred across many of its current 14 local planning units.[12,15,16] For individuals deemed eligible for nursing homes, BoC studies have provided insight on additional services that might tip the balance of care toward the community, examining the care needs of those on the wait lists for nursing homes. However, these studies have not yet demonstrated who ultimately will be placed and what proportion of those who enter LTC are indeed divertible. Although bed occupancy is almost always high (97% in Ontario),[14] this information is important in assessing whether the system is truly at full capacity. This information would be helpful for policy makers in anticipating future need for expansion and/or reform. Furthermore, describing patient characteristics (eg, age, sex, chronic conditions, place prior to entry, etc.) that are prominent in both divertible and nondivertible groups can in turn inform targeted interventions to (1) increase community services aimed at reducing the burden of institutionalized care; and (2) increase institutional services that better meet resident needs.

In this study, we use the BoC methodology to characterize newly admitted residents in Ontario's 640 LTC homes over a 3-year period. We seek to answer 3 questions. First, what is the level of needs of individuals admitted into a nursing home for the first time (ie, is the system at capacity?). Second, what are the common characteristics of residents that reflect high vs low need upon admission? Lastly, upon entry into a nursing home what are the main healthcare outcomes of all residents (ie, rates of mortality, hospitalization, emergency department visits, and return to home) and do they differ on level of need and divertibility? The last question will determine if attention should be given to particular residents that may have higher rates of acute care use and mortality. It will also determine whether need and divertibility relates to future outcomes, including actual return to home. This study is the first to systematically examine a population newly admitted into LTC to determine their potential divertibility and major outcomes.

Methods

We carried out a retrospective cohort study to examine the characteristics of newly admitted LTC residents. We used the multiple databases available from the Institute for Clinical Evaluative Sciences (ICES), a comprehensive collection of administrative claims and billing data in the province of Ontario. These deidentified databases are linked at the individual level using encrypted healthcare numbers as unique identifiers and are made available through a data-sharing agreement with the Ministry of Health and Long-Term Care. We captured all incident admissions to LTC facilities between January 1, 2010 and March 31, 2012 in Ontario, Canada. To accomplish this, we used previously developed methods and applied several exclusions, including removing an admission if it was observed that the resident was transferred from another facility or had a previous admission in a LTC facility, as captured using a look-back window from time of admission to the inception of the use of the Continuing Care Reporting System (CCRS) in Ontario in 2007.[17] We also removed patients with an ineligible provincial healthcare card (used for linkage), those older than 105 years (likely moved or died without being captured), and those with an invalid death date (all combined to compose of less than 0.1% of the final population). Ethics approval was obtained from the