Examining Health Service Rates Among Residents of Retirement Homes and Other Older Adult Populations in Ontario, Canada: A Population-Based Cohort Study

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Running Title: “EXAMINING RESIDENTS OF RETIREMENT HOMES”

Word Count: 2,464 (Max: 2,500)
Abstract: 250 (Max: 250)
References: 38
Exhibitions: 1 Figure; 3 Tables
Supplementary Material: 6 Tables

Funding: This work was supported partially by Schlegel Chair in Clinical Epidemiology in Aging at McMaster University, as well as the Ontario Ministry of Health System Research Fund (2017-01097).

Keywords: Retirement Homes; Assisted Living; Long-Term Care; Home Care; Older Adults

Competing Interests: We have no competing interests, financial or otherwise, to disclose.
ABSTRACT

Background: There are no standardized reporting systems or assessments specific to residents of retirement homes in North America. As such, little is known about these older adults as a distinct population. We created a new population-level cohort of residents of retirement homes and examined their health service rates relative to other older adult populations.

Methods: We conducted a population-based retrospective cohort study in Ontario, Canada in 2018. The postal codes of all licensed retirement homes ($n = 757$) were classified and linked to individual-level health system administrative data to derive a cohort of residents of retirement homes. A generalized linear model with a gamma distribution and log link function was used to model rates of emergency department visits, hospitalizations, alternate levels of care (ALC) days, primary care visits, and specialist physician visits.

Results: Residents of retirement homes comprised two percent of the older adult population in Ontario ($n = 54,773; 2.3\%)$. After adjustment for relevant characteristics, residents of retirement homes had 10 times the rate of emergency department visits (Relative Rate [RR] 10.02, 95% Confidence Interval [CI] 9.83 to 10.21), 20 times the rate of hospitalizations (RR 20.43, 95% CI 20.08 to 20.78), and 44 times the rate ALC days (RR 43.91, 95% CI 43.28 to 44.54) compared to community-dwelling older adults.

Interpretation: Residents of retirement homes are a distinct older adult population with high rates of hospital-based care. Our findings contribute to policy debates about the provision of health care in privately operated congregate care settings for older adults.
INTRODUCTION

Retirement homes are private, congregate living environments that deliver supportive care to adults who are 65 years of age and older (1,2). Retirement homes are often marketed to provide a lifestyle and community, and these homes provide a range of assisted living care services (e.g., meals, administration of medication, nursing services, etc.) on a cost recovery basis (2). These homes predominately operate on a private, for-profit business model, and the room, board, and services are purchased by residents and/or their family or friend caregivers (1,2).

Retirement homes are referred to as assisted living facilities in other North American jurisdictions. The legislative and regulatory operating requirements for these homes vary (3); Ontario is the only jurisdiction to regulate and license retirement homes through an independent, not-for-profit regulator (i.e., Retirement Homes Regulatory Authority [RHRA]) (2). There are more than 700 licensed retirement homes in Ontario that can house over 70,000 older adults, which is comparable to the number of beds in the long-term care home sector (1,2,4). Unlike long-term care homes where the validated Resident Assessment Instrument Minimum Data Set (RAI-MDS) is used, there are no standardized assessments specific to residents of retirement homes (5). The absence of standardized assessments that are periodically conducted on residents of retirement homes, coupled with the privately financed nature of the sector, presents unique challenges to identify these older adults using health system administrative data and understand their health service use relative to other older adult populations.

While there is a body of research describing the assisted living sector and residents of assisted living facilities in the United States (6–12), the Canadian literature requires a more in-depth investigation. Canadian studies have investigated transitions to a long-term care home, risk of hospitalization among those who live with dementia, and events and health conditions associated with the transition to a congregate care setting for older adults (13–17). To date, no population- or
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A provincial-level cohort of residents of retirement homes in Canada has been created to define the retirement home and assisted living sector, describe the characteristics and health service use of older adults who purchase these services, and position the sector in the gradient of care services and housing needs for older adults. In this study, we create a new population-level cohort of residents of retirement homes and examine their health service rates relative to other older adult populations (i.e., residents of long-term care homes, home care recipients in the community, and community-dwelling older adults) in Ontario, Canada.

METHODS

Study Design and Setting

We conducted a population-based retrospective cohort study using linked, individual-level health system administrative data in 2018 in Ontario, Canada at ICES. ICES is an independent, non-profit research institute whose legal status under Ontario’s health information privacy law allows it to collect and analyze health care and demographic data, without consent, for health system evaluation and improvement. The use of the data in this project is authorized under section 45 of Ontario’s Personal Health Information Protection Act (PHIPA) and does not require review by a Research Ethics Board. We followed the REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) statement guideline (Supplemental Table 1) (18).

Data

The RHRA shared their public register of licensed retirement homes, which contains historical data on the license of the home, resident and suite capacities, provision of regulated care services, and full postal address. There were 757 licensed retirement homes in 2018 (Supplemental Table 2). We verified and visualized the postal code of each licensed retirement home through a variety of sources (i.e., Canada Post, Statistics Canada, and Google Maps). Building off research that examined the feasibility of using postal codes to identify residents of retirement homes (19), we used...
a modified taxonomy to classify the postal code of each licensed retirement home as unique, or not unique, to the retirement home. We imported the RHRA’s public register and our classified postal code data on licensed retirement homes to ICES. The health system administrative datasets used are listed and described in Supplemental Table 3. These datasets were linked using unique encoded identifiers and analyzed at ICES.

Identification of Residents of Retirement Homes

We identified adults who were 65 years of age of and older and had a postal code that ever matched to a licensed retirement home with a unique postal code classification in 2018 (Figure 1). There were substantially more adults who were 65 years of age and older and had a postal code that matched to a licensed retirement home with a not unique postal code classification than beds in licensed retirement homes. We limited our identification of residents of retirement homes with not unique postal codes to those who received home care services in a retirement home, as the receipt of home care services specified whether the services were provided in a retirement home. We defined the index date as when the adults’ postal code matched to the postal code of a licensed retirement home; we terminated follow-up when the adult transitioned to a long-term care home, complex continuing care facility, or died.

We excluded adults who were institutionalized in a long-term care home that was co-located with a retirement home and adults who resided in a long-term care home for more than half of 2018 (i.e., six months plus one day) \( (n = 15,626) \). Adults who resided in a continuing care facility for the whole year in 2018 were excluded \( (n = 57) \). We also excluded adults who received shift nursing in retirement homes \( (n = 168) \), as these individuals were temporarily housed in the retirement home through convalescent government programs, and so these individuals were not true residents of retirement homes. We excluded duplicate adults who moved from one retirement home to another during the year \( (n = 807) \). According to the RHRA’s register, there were 75,822 beds in all licensed
retirement homes in 2018, and our approach identified a cohort of 54,733 residents of retirement homes ($n = 54,733$; 72.2%).

**Identification of Other Older Adult Populations**

For comparison purposes, we identified residents of long-term care homes, older adults who received home care services in the community, and community-dwelling adults who were 65 years of age and older in 2018. Residents of long-term care homes were identified by their inclusion in the Continuing Care Reporting System ($n = 96,528$). Adults who received home care services in their community were differentiated from residents of retirement homes by their postal code that never matched to a postal code associated with a licensed retirement home ($n = 290,245$). Community-dwelling adults were defined as those who were 65 years of age and older and never met any of the above criteria ($n = 1,967,612$). We defined the index date as when the adult met the criteria to be categorized as one of the mutually exclusive older adult populations in 2018; we terminated follow-up when the adult met the criteria to be categorized as a different older adult population or died.

**Measures**

The outcomes of interest were annual rates of emergency department visits, hospitalizations, alternate levels of care (ALC) days, primary care visits, and specialist physician visits. These rates were standardized at the level of the individual (i.e., from index to end of follow-up). Emergency department visits were defined as any care received in an emergency department. Hospitalizations were defined as any hospitalization. ALC days were obtained from the Discharge Abstract Database.

Primary care visits among residents of retirement homes, home care recipients in the community, and community-dwelling older adults were defined as any billing by a family or community medicine physician to the universal health insurance plan where the location of the visit occurred in an office, home, or via the telephone. Primary care visits among residents of long-term care homes were similarly defined in accordance with the Monthly Management System and
included a long-term care home as the visit location. Specialist physician visits were defined as any physician billing whose speciality was not family or community medicine to the universal health insurance plan. All individuals could only have one primary care and/or specialist physician visit per physician per day.

Sociodemographic (i.e., age and sex) and community characteristics (i.e., urban location, neighborhood income quintile, Ontario Marginalization Index) were obtained at the index date. Clinical comorbidities were also obtained at the index date from physician-diagnosed billing codes to the universal health insurance plan in Ontario, ICD-9 or ICD-10 diagnosis codes, and validated ICES-derived cohorts (20–27).

Statistical Analysis

Counts and proportions were calculated for categorical sociodemographic, community, and clinical variables; means and standard deviations were calculated for continuous, normally distributed sociodemographic variables, and medians and interquartile ranges were calculated for continuous, not normally distributed sociodemographic variables. A generalized linear model with a gamma distribution and log link function was used to model the standardized health service rates among the different older adult populations, and community-dwelling older adults were used as the reference population. The gamma distribution and log link function is appropriate to model dispersed rates and/or costs in dollars (28). Crude and adjusted relative rates and 95% confidence intervals were calculated from exponentiated beta coefficients. All statistical tests were two-tailed, and the level of statistical significance was $P < .05$. Variance inflation factors were calculated to assess for multicollinearity. A sex-stratified subgroup analysis was conducted. Dataset processing and statistical analyses were conducted in SAS Enterprise 9.4 (Cary, NC, USA).

RESULTS
Residents of retirement homes comprised two percent of adults aged 65 and older in Ontario in 2018 ($n = 54,773; 2.3\%)$. More than two thirds of residents of retirement homes were female ($n = 37,768; 69.0\%)$, and residents of retirement homes had a mean age of 87.7 years (Table 1). Hypertension ($n = 47,212; 86.2\%$), osteoarthritis ($n = 36,978; 67.5\%$), mood disorders ($n = 35,000; 63.9\%$) and dementia ($n = 20,651; 37.7\%$) were the most prevalent clinical comorbidities among residents of retirement homes. More than 90\% of all residents of retirement homes resided in urban communities ($n = 50,650; 92.5\%$).

The crude and sex-stratified health service rates are described in Supplemental Table 4. After adjustment for sociodemographic characteristics and clinical comorbidities at index, residents of retirement homes had 10 times the rate of emergency department visits (Relative Rate [RR] 10.02, 95\% Confidence Interval [CI], 9.83 to 10.21), 20 times the rate of hospitalizations (RR 20.43, 95\% CI 20.08 to 20.78), 44 times the rate of ALC days (RR 43.91, 95\% CI 43.28 to 44.54), and nearly twice the rate of primary care (RR 1.99, 95\% CI 1.97 to 2.02) and specialist physician visits (RR 1.62, 95\% CI 1.59 to 1.65), compared to community-dwelling older adults (Table 2). Male residents of retirement homes had higher rates of emergency department visits, hospitalizations, and ALC days than female residents of retirement homes, but similar rates of primary care and specialist physician visits (Table 3). Adjusted beta coefficients and standard errors are available in Supplementary Tables 5 and 6.

**INTERPRETATION**

Residents of retirement homes had the highest rates of emergency department visits, hospitalizations, and ALC days relative to the other older adult populations in Ontario, Canada in 2018. These older adults purchase health care services from their retirement home to support independent living, yet we found they consume more publicly funded hospital-based care and have lower rates of primary care and specialist physician visits. Our findings contribute to on-going policy
debates about privately financed and delivered health care, and the provision of health care in
privately operated congregate care settings for older adults, in jurisdictions that provide universal
health insurance to its citizens (29,30).

The variation in legislative and operating requirements for retirement homes has been shown
to affect rates of hospital-based use among these residents (31,32). Previous studies found residents
of retirement homes have substantially higher rates of emergency department visits and
hospitalizations compared to community-dwelling older adults and residents of long-term care
homes (11,33). Our findings align with the literature and may suggest residents of retirement homes
have higher needs for care compared to other older adult populations.

Residents of retirement homes had the highest rates of ALC days relative to the other older
adult populations in our study, which suggests the needs of some residents may exceed the capacity
of their home to provide the level and scope of care needed. Moreover, some of these residents may
not be able to afford additional care from their retirement home, as rates for heavy care in Ontario
can exceed $6,000 per month (34). Nearly half of the residents of retirement homes lived in middle-
and low-income neighborhoods. The costs for heavy care are likely out of reach for many of these
older adults (35–37), which underscores the need for equitable policies that support health and
housing for older adults.

Residents of retirement homes had lower rates of primary care and specialist physician visits
relative to home care recipients who lived in the community. Residents of long-term care homes
receive primary care through the Monthly Management System, but no similar model exists for
retirement homes. Our findings suggest the implementation and expansion of similar medical
models of care in retirement homes may be an important intervention to promote continuity of care
and reduce rates of hospital-based care among this population.
Retirement home and assisted living markets in North America are rapidly expanding to accommodate the varying preferences of older adults for housing, health, and social care (2,5–7,35,38). The growth and availability of beds in retirement homes and assisted living facilities outpaces that of long-term care homes (2,38), and this growth is likely attributed to fewer legislative and regulatory requirements than long-term care homes. The increased supply of retirement homes may suggest that retirement homes are a substitute for a long-term care home (7,38), which suggests that retirement homes are an important link in the continuum of care settings for older adults and should be subject to similar regulatory oversight.

There are limitations to our study. We conducted a secondary analysis of health system administrative data; as such, there is the possibility of misclassification bias and residual confounding could influence our results and interpretation. We were unable to identify residents of retirement homes who did not receive home care services in licensed retirement homes with not unique postal codes. We were also unable to determine the occupancy of each retirement home, as the RHRA does not require operators to disclose this statistic as a condition for licensing (2). As the occupancy of each retirement home is unknown, the size of our cohort of residents of retirement homes may reflect the actual population size.

Residents of retirement home are a unique older adult population in Ontario, Canada. Future research should examine with more granularity the reasons why residents of retirement homes visited emergency departments and/or were hospitalized to understand their needs for hospital-based care that may not be met in their retirement home.

ACKNOWLEDGMENTS

This study was supported by ICES, which is funded by an annual grant from the Ontario Ministry of Health (MOH) and the Ministry of Long-Term Care (MLTC). Parts of this material are based on data and/or information compiled and provided by CIHI. The analyses, conclusions,
opinions, and statements expressed herein are solely those of the authors and do not reflect those of
the funding or data sources; no endorsement is intended or should be inferred. We extend our
gratitude to Paul Pham, Adriane Castellino, and Chloé Ma at the Retirement Homes Regulatory
Authority for sharing the registry of licensed retirement homes.
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**Figure 1.** Creation of the Residents of Retirement Homes Cohort in 2018 ($n = 54,773$)

- **757 Retirement Homes (RH) identified in 2018**
  - Classify postal codes (PC) of RH as: Unique; Not Unique
  - **Unique PC ($n = 486$)**
    - Unique RH ($n = 486$)
    - Bed Capacity ($n = 61,723$)
  - **Not Unique PC ($n = 247$)**
    - Not Unique RH ($n = 271$)
    - Bed Capacity ($n = 14,099$)

- **General population ($\geq 65$ years) with PC in RPDB and other data sources (e.g., CCRS, DAD, HCD, NACRS)** ($n = 2,784,802$)
  - **Potential RH residents in Unique PC ($n = 64,030$)**
  - **Potential RH residents in Not Unique PC ($n = 118,052$)**

- **Exclude:**
  - In long-term care home (LTCH) that shared a PC with RH/spent 6 months or more in LTCH ($n = 15,626$)
  - In continuing care facility for the whole year ($n = 57$)

- **Exclude:**
  - Individuals receiving shift nursing in RH ($n = 168$)
  - Duplicates ($n = 807$)

- **RH residents ($n = 52,023$)**
  - RH residents who received home care services ($n = 6,521$)

- **Total RH residents identified ($n = 54,773$)**
Table 1. Sociodemographic Characteristics and Clinical Comorbidities Among Residents of Retirement Homes, Residents of Long-Term Care Homes, Home Care Recipients in the Community, and Community-Dwelling Older Adults in 2018 (n = 2,419,158)

| Demographic Characteristics, n (%) | Residents of Retirement Homes | Residents of Long-Term Care Homes | Home Care Recipients in the Community | Community-Dwelling Older Adults |
|---|---|---|---|---|
| Age, mean (SD) | 87.7 (7.21) | 85.3 (8.22) | 79.3 (8.41) | 73.8 (6.68) |
| Female | 37,768 (69.0) | 66,097 (68.5) | 163,216 (56.2) | 1,046,805 (53.2) |
| Clinical Comorbidities, n (%) | | | | |
| Asthma | 8,334 (15.2) | 13,903 (14.4) | 52,169 (18.0) | 250,749 (12.7) |
| Cancer | 14,557 (26.6) | 19,578 (20.3) | 93,550 (32.2) | 316,863 (16.1) |
| Cardiac Arrhythmias | 19,723 (36.0) | 28,585 (29.6) | 90,111 (31.0) | 320,234 (16.3) |
| Cerebrovascular Accident | 11,796 (21.5) | 26,781 (27.7) | 51,683 (17.8) | 109,713 (5.6) |
| Chronic Coronary Disease | 23,210 (42.4) | 31,033 (32.1) | 97,929 (33.7) | 370,765 (18.8) |
| Chronic Obstructive Pulmonary Disease | 17,486 (31.9) | 31,033 (32.1) | 97,929 (33.7) | 370,765 (18.8) |
| Congestive Heart Failure | 16,063 (29.3) | 25,119 (26.0) | 73,498 (25.3) | 130,132 (6.6) |
| Dementia | 20,651 (37.7) | 76,485 (79.2) | 52,952 (18.2) | 51,372 (2.6) |
| Diabetes | 15,097 (29.3) | 36,513 (37.8) | 119,516 (41.2) | 566,716 (28.8) |
| Hypertension | 47,212 (86.2) | 80,882 (83.8) | 240,470 (82.9) | 1,317,840 (67.0) |
| Mood Disorders | 35,000 (63.9) | 66,365 (68.8) | 168,785 (58.2) | 951,562 (48.4) |
| Myocardial Infarction | 6,542 (11.9) | 10,554 (10.9) | 35,141 (12.1) | 116,275 (5.9) |
| Osteoarthritis | 36,978 (67.5) | 65,335 (67.7) | 169,423 (58.4) | 794,611 (40.4) |
| Osteoporosis | 8,334 (15.2) | 13,903 (14.4) | 49,938 (16.9) | 261,113 (13.3) |
| Other Mental Health | 20,651 (37.7) | 76,485 (79.2) | 52,952 (18.2) | 51,372 (2.6) |
| Renal Disease | 8,236 (15.0) | 13,487 (14.0) | 50,374 (17.4) | 118,137 (6.0) |
| Rheumatoid Arthritis | 2,091 (3.8) | 3,261 (3.4) | 12,639 (4.4) | 46,713 (2.4) |
| Community Characteristics, n (%) | | | | |
| Urban Location | 50,650 (92.5) | 83,171 (86.2) | 253,336 (87.3) | 1,712,634 (87.0) |
| Neighborhood Income Quintile | | | | |
| 1 (Least) | 13,037 (23.8) | 28,683 (29.7) | 72,124 (24.9) | 370,961 (18.9) |
| 2 | 12,685 (23.2) | 21,047 (21.8) | 64,141 (21.1) | 405,261 (20.6) |
| 3 | 10,409 (19.0) | 16,892 (17.5) | 56,242 (19.4) | 396,043 (20.1) |
| 4 | 10,409 (19.0) | 15,936 (16.5) | 48,907 (16.9) | 378,654 (19.2) |
Table 1. Sociodemographic Characteristics and Clinical Comorbidities Among Residents of Retirement Homes, Residents of Long-Term Care Homes, Home Care Recipients in the Community, and Community-Dwelling Older Adults in 2018 (*n* = 2,419,158)

|                                | Residents of Retirement Homes | Residents of Long-Term Care Homes | Home Care Recipients in the Community | Community-Dwelling Older Adults |
|--------------------------------|-------------------------------|-----------------------------------|---------------------------------------|---------------------------------|
| 5 (Highest)                    | 7,639 (13.9)                  | 13,291 (13.8)                     | 48,093 (16.6)                         | 412,074 (20.9)                  |
| Missing                        | 598 (1.1)                     | 679 (0.7)                         | 728 (0.3)                             | 4,614 (0.2)                     |
| Ontario Marginalization Index  |                               |                                   |                                       |                                 |
| Summary Score, median (IQR)    | 3 (3 to 4)                    | 4 (3 to 4)                        | 3 (3 to 4)                            | 3 (3 to 4)                      |

Abbreviations: IQR, Interquartile Range; SD, Standard Deviation
Table 2. Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018

|                      | Crude Relative Rates (95% CI) | Adjusted Relative Rates (95% CI) |
|----------------------|-------------------------------|---------------------------------|
|                      | ED Visits                     | ALC Days                        | Primary Care Visits | Specialist Physician Visits | ED Visits | Hospitalizations | ALC Days | Primary Care Visits | Specialist Physician Visits |
| Residents of Retirement Homes | 12.63 (12.23 to 13.04) *     | 166.40 (152.51 to 181.56) *    | 2.29 (2.26 to 2.32) * | 1.62 (1.57 to 2.69) * | 10.02 (9.83 to 10.21) * | 20.43 (20.08 to 20.78) * | 43.91 (43.28 to 44.54) * | 1.99 (1.97 to 2.02) * | 1.62 (1.59 to 1.65) * |
| Residents of Long-Term Care Homes | 4.90 (4.72 to 5.09) *        | 75.53 (69.09 to 82.57) *       | 13.69 (13.55 to 13.82) * | 0.76 (0.73 to 0.80) * | 3.76 (3.70 to 3.82) * | 7.37 (7.27 to 7.48) * | 29.19 (28.87 to 29.52) * | 13.30 (13.15 to 13.45) * | 0.87 (0.86 to 0.89) * |
| Home Care Recipients in the Community | 10.58 (10.36 to 10.80) *     | 72.04 (66.32 to 78.25) *       | 2.27 (2.26 to 2.28) * | 3.68 (3.63 to 3.73) * | 8.89 (8.81 to 8.96) * | 11.97 (11.88 to 12.06) * | 27.49 (27.31 to 27.68) * | 2.03 (2.01 to 2.04) * | 3.15 (3.12 to 3.17) * |
| Community-Dwelling Older Adults | 1.00 (Ref)                    | 1.00 (Ref)                      | 1.00 (Ref)           | 1.00 (Ref)           | 1.00 (Ref)           | 1.00 (Ref)           | 1.00 (Ref)           | 1.00 (Ref)           | 1.00 (Ref)           |

Abbreviations: ALC, Alternate Levels of Care; CI, Confidence Interval; ED, Emergency Department; Ref, Reference

*Adjusted for all demographic and community characteristics and clinical comorbidities in Table 1

* P < .001
Table 3. Sex-Stratified Subgroup Analysis of Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018

|                          | Residents of Retirement Homes (n = 1,094,635) | Residents of Long-Term Care Homes (n = 1,313,038) | Home Care Recipients in the Community |
|--------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------|
|                          | ED Visits | Hospitalizations | ALC Days | Primary Care Visits | Specialist Physician Visits | ED Visits | Hospitalizations | ALC Days | Primary Care Visits | Specialist Physician Visits | ED Visits | Hospitalizations | ALC Days | Primary Care Visits | Specialist Physician Visits |
| Males (n = 1,094,635)    | 15.57     | 35.69           | 148.40   | 2.48             | 1.90             | 12.15     | 22.30            | 51.07     | 2.03             | 1.64             | 15.08 to 144.46     | 36.78 to 152.44  |
| Residents of Retirement Homes | 16.07     | 36.17           | 145.36   | 2.54             | 1.95             | 12.65     | 22.99            | 52.37     | 2.07             | 1.69             | 15.08 to 144.46     | 36.78 to 152.44  |
| Residents of Long-Term Care Homes | 6.22     | 12.97           | 83.60    | 14.67            | 0.87             | 4.88      | 8.77             | 58.72     | 13.61            | 0.86             | 6.17 to 85.31       | 13.27 to 149.34  |
| Home Care Recipients in the Community | 6.47     | 13.27           | 85.31    | 14.93            | 0.89             | 5.01      | 9.00             | 59.89     | 13.88            | 0.88             | 6.17 to 85.31       | 13.27 to 149.34  |
| Community-Dwelling Older Adults | 1.00     | 1.00            | 1.00     | 1.00             | 1.00             | 1.00      | 1.00             | 1.00      | 1.00             | 1.00             | (Ref)             | (Ref)            |
| Females (n = 1,313,038)  | 11.11     | 30.92           | 120.23   | 2.18             | 1.52             | 8.89      | 19.38            | 40.09     | 2.00             | 1.66             | 10.87 to 118.07     | 31.54 to 122.41  |
| Residents of Retirement Homes | 11.36     | 31.54           | 122.41   | 2.22             | 1.55             | 9.10      | 19.78            | 40.80     | 2.03             | 1.69             | 10.87 to 118.07     | 31.54 to 122.41  |
| Residents of Long-Term Care Homes | 4.19     | 10.78           | 45.62    | 13.09            | 0.73             | 3.17      | 6.61             | 15.26     | 13.31            | 0.92             | 4.12 to 45.00       | 10.95 to 13.24   |
| Home Care Recipients in the Community | 4.26     | 10.95           | 46.26    | 13.24            | 0.74             | 3.24      | 6.73             | 15.48     | 13.50            | 0.93             | 4.12 to 45.00       | 10.95 to 13.24   |
| Community-Dwelling Older Adults | 1.00     | 1.00            | 1.00     | 1.00             | 1.00             | 1.00      | 1.00             | 1.00      | 1.00             | 1.00             | (Ref)             | (Ref)            |

Abbreviations: ALC, Alternate Levels of Care; CI, Confidence Interval; ED, Emergency Department; Ref, Reference

1Adjusted for all demographic and community characteristics and clinical comorbidities in Table 1
*P < .001
SUPPLEMENTARY MATERIAL

Supplemental Table 1. RECORD Checklist

Supplemental Table 2. Characteristics of Licensed Retirement Homes in 2018

Supplemental Table 3. Descriptions of the Health System Administrative Databases

Supplemental Table 4. Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018

Supplemental Table 5. Adjusted Beta Coefficients (Standard Errors) from Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018

Supplemental Table 6. Sex-Stratified Subgroup Analysis Adjusted Beta Coefficients (Standard Errors) from Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018
### Supplemental Table 1. RECORD Checklist

| Item No. | STROBE items | Location in manuscript where items are reported | RECORD items | Location in manuscript where items are reported |
|----------|--------------|-----------------------------------------------|--------------|-----------------------------------------------|
| **Title and Abstract** | | | | |
| 1 | (a) Indicate the study's design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found | p. 1,2 | RECORD 1.1: The type of data used should be specified in the title or abstract. When possible, the name of the databases used should be included. | p. 1,2 |
| | | | RECORD 1.2: If applicable, the geographic region and timeframe within which the study took place should be reported in the title or abstract. | |
| | | | RECORD 1.3: If linkage between databases was conducted for the study, this should be clearly stated in the title or abstract. | |
| **Introduction** | | | | |
| Background rationale | 2 | Explain the scientific background and rationale for the investigation being reported | p. 3,4 | |
| Objectives | 3 | State specific objectives, including any prespecified hypotheses | p. 4 | |
| **Methods** | | | | |
| Study Design | 4 | Present key elements of study design early in the paper | p. 4 | |
**Supplemental Table 1. RECORD Checklist**

| Item No. | STROBE items | Location in manuscript where items are reported | RECORD items | Location in manuscript where items are reported |
|----------|--------------|------------------------------------------------|--------------|------------------------------------------------|
| Setting  | 5            | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | p. 4         | RECORD 6.1: The methods of study population selection (such as codes or algorithms used to identify subjects) should be listed in detail. If this is not possible, an explanation should be provided. |
| Participants | 6          | (a) Cohort study - Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up. Case-control study - Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls. Cross-sectional study - Give the eligibility criteria, and the sources and methods of selection of participants. | p. 5,6       | RECORD 6.2: Any validation studies of the codes or algorithms used to select the population should be referenced. If validation was conducted for this study and not published elsewhere, detailed methods and results should be provided. |
|          |              | (b) Cohort study - For matched studies, give matching criteria and number of exposed and unexposed |              | RECORD 6.3: If the study involved linkage of databases, consider use of a flow diagram or other graphical display to demonstrate the data linkage process, including the number of individuals with linked data at each stage. |
**Supplemental Table 1. RECORD Checklist**

| Item No. | STROBE items | Location in manuscript where items are reported | RECORD items | Location in manuscript where items are reported |
|----------|--------------|-------------------------------------------------|--------------|-------------------------------------------------|
|          |              |                                                 |              |                                                 |
| **Case-control study** - For matched studies, give matching criteria and the number of controls per case |
| Variables 7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable. | p. 6,7 | RECORD 7.1: A complete list of codes and algorithms used to classify exposures, outcomes, confounders, and effect modifiers should be provided. If these cannot be reported, an explanation should be provided. | p. 6,7 |
| Data sources/measurement 8 | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group | p. 6,7 |
| Bias 9 | Describe any efforts to address potential sources of bias | |
| Study size 10 | Explain how the study size was arrived at | |
| Quantitative variables 11 | Explain how quantitative variables were handled in the analyses. If applicable, | p. 6,7 |
**Supplemental Table 1. RECORD Checklist**

| Item No. | STROBE items | Location in manuscript where items are reported | RECORD items | Location in manuscript where items are reported |
|----------|--------------|-------------------------------------------------|--------------|-------------------------------------------------|
| describe which groupings were chosen, and why | | | | |
| Statistical methods 12 | (a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) Cohort study - If applicable, explain how loss to follow-up was addressed (e) Case-control study - If applicable, explain how matching of cases and controls was addressed (f) Cross-sectional study - If applicable, describe analytical methods taking account of sampling strategy (g) Describe any sensitivity analyses | p. 7-8 | | |
| Data access and cleaning methods | .. | | RECORD 12.1: Authors should describe the extent to which the investigators had access to the | p. 6 |
### Supplemental Table 1. RECORD Checklist

| Item No. | STROBE items | Location in manuscript where items are reported | RECORD items | Location in manuscript where items are reported |
|----------|--------------|-----------------------------------------------|--------------|-----------------------------------------------|
|          |              | database population used to create the study population. | RECORD 12.2: Authors should provide information on the data cleaning methods used in the study. |          |
| Linkage  | ..           | RECORD 12.3: State whether the study included person-level, institutional-level, or other data linkage across two or more databases. The methods of linkage and methods of linkage quality evaluation should be provided. | p. 6       |

### Results

**Participants**  
13  
(a) Report the numbers of individuals at each stage of the study (e.g., numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed)  
(b) Give reasons for non-participation at each stage.  
(c) Consider use of a flow diagram  
(Record 13.1: Describe in detail the selection of the persons included in the study (i.e., study population selection) including filtering based on data quality, data availability and linkage. The selection of included persons can be described in the text and/or by means of the study flow diagram.  
| p. 8, 24 |

**Descriptive data**  
14  
(a) Give characteristics of study participants (e.g.,  
| p. 8, 15-19 |
Supplemental Table 1. RECORD Checklist

| Item No. | STROBE items | Location in manuscript where items are reported | RECORD items | Location in manuscript where items are reported |
|----------|--------------|-------------------------------------------------|--------------|------------------------------------------------|
|          | demographic, clinical, social) and information on exposures and potential confounders | | | |
| (b) Indicate the number of participants with missing data for each variable of interest | | | | |
| (c) Cohort study - summarise follow-up time (e.g., average and total amount) | | | | |
| Outcome data 15 | Cohort study - Report numbers of outcome events or summary measures over time | p. 8-9 | | |
| | Case-control study - Report numbers in each exposure category, or summary measures of exposure | | | |
| | Cross-sectional study - Report numbers of outcome events or summary measures | | | |
| Main results 16 | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make | p. 8-9 | | |
## Supplemental Table 1. RECORD Checklist

| Item No. | STROBE items | Location in manuscript where items are reported | RECORD items | Location in manuscript where items are reported |
|----------|--------------|-------------------------------------------------|--------------|-------------------------------------------------|
|          | clear which confounders were adjusted for and why they were included |          |          |
|          | (b) Report category boundaries when continuous variables were categorized |          |          |
|          | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period |          |          |
| Other analyses | Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses | p. 8-9 |
| Discussion | | |
| Key results | Summarise key results with reference to study objectives | p. 10 |
| Limitations | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias | p. 12 |
| | RECORD 19.1: Discuss the implications of using data that were not created or collected to answer the specific research question(s). Include discussion of misclassification bias, unmeasured confounding, missing data, and changing eligibility over | p. 12 |
### Supplemental Table 1. RECORD Checklist

| Item No. | STROBE items | Location in manuscript where items are reported | RECORD items | Location in manuscript where items are reported |
|----------|--------------|-------------------------------------------------|--------------|-------------------------------------------------|
| **Interpretation** 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence | p. 10,11 |  |  |
| **Generalisability** 21 | Discuss the generalisability (external validity) of the study results | p. 10,11 |  |  |

### Other Information

| Funding 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | p. 1 |
| Accessibility of protocol, raw data, and programming code | RECORD 22.1: Authors should provide information on how to access any supplemental information such as the study protocol, raw data, or programming code. | p. 2 |
### Supplemental Table 2. Characteristics of Licensed Retirement Homes in 2018 ($n = 757$)

| Characteristic                                                | $n$ (%)     |
|---------------------------------------------------------------|-------------|
| Urban                                                         | 632 (83.5)  |
| Facility Capacity, median (IQR)                               | 87 (50 to 140) |
| Suites Capacity, median (IQR)                                 | 71 (42 to 115) |
| Chain Facility                                                | 358 (47.3)  |
| Residential Home                                              | 80 (10.6)   |
| Co-Located with a Long-Term Care Home                         | 134 (17.7)  |

#### Care Services

| Service                      | $n$ (%)     |
|------------------------------|-------------|
| Assistance with Bathing      | 722 (95.4)  |
| Assistance with Hygiene      | 672 (88.8)  |
| Assistance with Ambulation   | 651 (86.0)  |
| Assistance with Feeding      | 285 (37.6)  |
| Assistance with Dressing     | 670 (88.5)  |
| Continence Care              | 596 (78.7)  |
| Skin and Wound Care          | 165 (21.8)  |
| Dementia Care                | 126 (16.6)  |
| Provision of Meals           | 751 to 757 (99.2 to 100.0)* |
| Administration of Medications| 751 to 757 (99.2 to 100.0)* |
| Pharmacist Services          | 664 (87.7)  |
| Nursing Services             | 714 (94.3)  |
| Medical Services             | 519 (68.6)  |

Abbreviations: IQR, Interquartile Range

* Small cell sizes (i.e., where six or fewer retirement homes do not have a characteristic) are suppressed due to privacy restrictions at ICES.
### Supplemental Table 3. Descriptions of the Health System Administrative Databases

| Database                                                      | Description                                                                                                                                 |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Client Agency Program Enrolment Data (CAPE)                  | Contains enrolment data on individuals in Ontario who are eligible for coverage under the universal health insurance plan in the province and enrolled or rostered to a health care program with a specific practitioner or group. |
| Continuing Care Reporting System (CCRS)                      | Contains person-level data (i.e., clinical, demographic) in nursing homes in Canada using the validated Resident Assessment Instrument Minimum Data Set (RAI-MDS) version 2.0. Complete assessments are conducted when people are admitted to the nursing home, every year thereafter, and after any significant change in the person’s health by a health care provider. |
| Corporate Provider Database (CPDB)                           | Contains information on physician and allied health care practitioners (i.e., demographic characteristics, practice location, billing status and specialty) and/or groups (i.e., hospital groups and affiliated institutions, geographic location, group affiliation and composition) that are eligible to receive payments under the universal health insurance plan in Ontario. |
| Discharge Abstract Database (DAD)                            | Contains person-level data (i.e., demographic, administrative, diagnoses, procedures) for all admissions to acute care hospitals. The DAD is compiled and maintained by the Canadian Institute for Health Information. |
| Home Care Database (HCD)                                     | Contains person-level data (i.e., social, clinical) for publicly funded home care services in Ontario, including types and volume of service provision. |
| National Ambulatory Care Reporting System (NACRS)            | Contains person-level data (i.e., demographic, administrative, diagnoses, procedures) for all patient visits to ambulatory care centres in hospitals and communities (i.e., emergency departments, day surgery units, hemodialysis units, cancer care clinics). The NACRS is compiled and maintained by the Canadian Institute for Health Information. |
| Ontario Health Insurance Plan (OHIP) Database                | Contains physician billings claims data among physicians who are remunerated by fee-for-service for outpatient visits. It also contains “shadow billings” for physicians who are remunerated through alternate payment schemes. |
| Ontario Marginalization Index (ONMARG)                       | Contains geographic, Census-based indices that quantity the extent of marginalization in communities in Ontario. There are four dimensions: residential instability, material deprivation, dependency, and ethnic concentration. |
| Postal Code Conversion File (PCCF+)                          | Specialized macro containing geographic identifiers based on Census data. This macro is based on 2016 Census information, identifies communities with less than 10,000 residents as rural, and includes related data from Canada Post Corporation. |
| Registered Persons Database (RPDP)                           | Contains demographic information (i.e., sex, age, date of birth, date of death for deceased individuals, area of residence, including postal code) and establishes eligibility for publicly funded universal health insurance in Ontario. |
**Supplemental Table 4.** Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018

|                        | ED Visits ¹ | Hospitalizations ¹ | ALC Days ¹ | Primary Care Visits ¹ | Specialist Physician Visits ¹ |
|------------------------|------------|--------------------|-----------|-----------------------|------------------------------|
| **Total Crude Rate**   | 0.0001 (0.0001 to 0.029231) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0576923 (0.0192308 to 0.0961538) | 0.0192308 (0.001 to 0.576923) |
| Residents of Retirement Homes | 0.019337 (0.0001 to 0.07) | 0.0001 (0.0001 to 0.0216049) | 0.0001 (0.0001 to 0.0001) | 0.0769231 (0.0192308 to 0.1573034) | 0.0192308 (0.001 to 0.0576923) |
| Residents of Long-Term Care Homes | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.2307692 (0.2178988 to 0.2763158) | 0.0001 (0.0001 to 0.0001) |
| Home Care Recipients in the Community | 0.0001 (0.0001 to 0.0551181) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0514706 (0.0192308 to 0.1555556) | 0.0269231 (0.001 to 0.1609195) |
| Community-Dwelling Older Adults | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0384615 (0.0192308 to 0.0961538) | 0.0192308 (0.001 to 0.0384615) |
| **Males Crude Rate**   | 0.0001 (0.0001 to 0.0192308) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0393258 (0.0192308 to 0.0961538) | 0.0192308 (0.001 to 0.0576923) |
| Residents of Retirement Homes | 0.0233333 (0.0001 to 0.0823529) | 0.0001 (0.0001 to 0.0290456) | 0.0001 (0.0001 to 0.0001) | 0.0769231 (0.0192308 to 0.1655405) | 0.0192308 (0.001 to 0.0769231) |
| Residents of Long-Term Care Homes | 0.0001 (0.0001 to 0.0191208) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.2307692 (0.2115385 to 0.2884615) | 0.0001 (0.0001 to 0.0192308) |
| Home Care Recipients in the Community | 0.0001 (0.0001 to 0.0707071) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0492958 (0.0001 to 0.168) | 0.0384615 (0.001 to 0.1891892) |
| Community-Dwelling Older Adults | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0384615 (0.0192308 to 0.0769231) | 0.0192308 (0.001 to 0.0576923) |
| **Females Crude Rate** | 0.0001 (0.0001 to 0.0192308) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0576923 (0.0192308 to 0.1153846) | 0.0192308 (0.001 to 0.0576923) |
Supplemental Table 4. Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018

|                           | ED Visits | Hospitalizations | ALC Days | Primary Care Visits | Specialist Physician Visits |
|---------------------------|-----------|------------------|----------|---------------------|---------------------------|
| Residents of Retirement Homes | 0.0192308 (0.0001 to 0.0644172) | 0.0001 (0.0001 to 0.0196629) | 0.0001 (0.0001 to 0.0001) | 0.0769231 (0.0192308 to 0.1538462) | 0.0001 (0.0001 to 0.0576923) |
| Residents of Long-Term Care Homes | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.2307692 (0.2210526 to 0.2705314) | 0.0001 (0.0001 to 0.0001) |
| Home Care Recipients in the Community | 0.0001 (0.0001 to 0.0384615) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0532319 (0.0001 to 0.15) | 0.0192308 (0.0001 to 0.014) |
| Community-Dwelling Older Adults | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0001 (0.0001 to 0.0001) | 0.0576923 (0.0192308 to 0.0961538) | 0.0192308 (0.0001 to 0.0384615) |

Abbreviations: ALC, Alternate Levels of Care; ED, Emergency Department

1 Medians and Interquartile Ranges are presented
Supplemental Table 5. Adjusted Beta Coefficients (Standard Errors) from Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018

| Demographic Characteristics | ED Visits     | Hospitalizations | ALC Days       | Primary Care Visits | Specialist Physician Visits |
|----------------------------|---------------|------------------|----------------|---------------------|-----------------------------|
| Age                        | 0.002 (0.000) | 0.001 (0.000)    | 0.034 (0.000)  | -0.002 (0.000)      | -0.018 (0.000)              |
| Sex                        |               |                  |                |                     |                             |
| Male (Ref)                 |               |                  |                |                     |                             |
| Female                     | -0.026 (0.003) | -0.163 (0.003)  | -0.092 (0.002) | -0.023 (0.002)      | -0.100 (0.003)              |
| Clinical Comorbidities     |               |                  |                |                     |                             |
| Asthma                     | 0.159 (0.004) | 0.089 (0.004)    | -0.115 (0.003) | 0.160 (0.003)       | 0.131 (0.004)              |
| Cancer                     | 0.238 (0.004) | 0.694 (0.003)    | 0.645 (0.003)  | 0.178 (0.003)       | 0.222 (0.003)              |
| Cardiac Arrhythmias        | 0.301 (0.004) | 0.335 (0.003)    | 0.138 (0.003)  | 0.119 (0.003)       | 0.052 (0.005)              |
| Cerebrovascular Accident   | 0.251 (0.005) | 0.525 (0.005)    | 1.080 (0.004)  | 0.005 (0.004)       | 0.052 (0.005)              |
| Chronic Coronary Disease   | 0.188 (0.003) | 0.238 (0.003)    | -0.108 (0.003) | 0.064 (0.002)       | 0.158 (0.003)              |
| Chronic Obstructive Pulmonary Disease | 0.267 (0.003) | 0.329 (0.003) | 0.256 (0.003) | 0.079 (0.003) | 0.054 (0.003) |
| Congestive Heart Failure   | 0.254 (0.005) | 0.630 (0.004)    | 0.787 (0.004)  | 0.001 (0.004)       | 0.072 (0.005)              |
| Dementia                   | -0.107 (0.006)| 0.007 (0.005)    | 1.083 (0.004)  | -0.138 (0.004)      | -0.237 (0.005)             |
| Diabetics                  | 0.060 (0.003) | 0.079 (0.003)    | 0.124 (0.002)  | 0.215 (0.002)       | 0.075 (0.003)              |
| Hypertension               | 0.134 (0.003) | 0.238 (0.003)    | 0.088 (0.003)  | 0.298 (0.002)       | 0.132 (0.003)              |
| Mood Disorders             | 0.203 (0.003) | 0.023 (0.003)    | 0.126 (0.002)  | 0.222 (0.002)       | 0.192 (0.003)              |
| Myocardial Infarction      | 0.207 (0.006) | 0.473 (0.005)    | 0.302 (0.004)  | -0.030 (0.004)      | -0.005 (0.005)             |
| Osteoarthritis             | 0.155 (0.003) | 0.326 (0.003)    | -0.140 (0.002) | 0.212 (0.002)       | 0.287 (0.003)              |
| Osteoporosis               | 0.003 (0.004) | -0.062 (0.004)   | 0.150 (0.003)  | 0.174 (0.003)       | 0.191 (0.004)              |
| Other Mental Health        | 0.165 (0.003) | 0.122 (0.003)    | 0.397 (0.003)  | 0.161 (0.002)       | 0.228 (0.003)              |
| Renal Disease              | 0.223 (0.005) | 0.440 (0.005)    | 0.665 (0.004)  | 0.056 (0.004)       | 0.475 (0.005)              |
| Rheumatoid Arthritis       | 0.166 (0.008) | 0.196 (0.008)    | 0.307 (0.007)  | 0.056 (0.006)       | 0.301 (0.008)              |
| Community Characteristics  |               |                  |                |                     |                             |
| Location                   |               |                  |                |                     |                             |
| Rural (Ref)               |               |                  |                |                     |                             |
| Urban                      | -0.532 (0.004) | -0.126 (0.004)  | -0.152 (0.003) | 0.289 (0.003)       | 0.243 (0.004)              |
| Neighborhood Income Quintile |           |                  |                |                     |                             |
Supplemental Table 5. Adjusted Beta Coefficients (Standard Errors) from Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018

|                  | ED Visits      | Hospitalizations | ALC Days      | Primary Care Visits | Specialist Physician Visits |
|------------------|----------------|------------------|---------------|---------------------|-----------------------------|
| 1 (Least)        | (Ref)          | (Ref)            | (Ref)         | (Ref)               | (Ref)                       |
| 2                | -0.084 (0.004) * | -0.040 (0.004) * | -0.289 (0.003) * | 0.032 (0.003) *       | 0.081 (0.004) *             |
| 3                | -0.121 (0.005) * | -0.069 (0.004) * | -0.422 (0.004) * | 0.050 (0.003) *       | 0.124 (0.004) *             |
| 4                | -0.168 (0.005) * | -0.071 (0.005) * | -0.419 (0.004) * | 0.062 (0.004) *       | 0.167 (0.005) *             |
| 5 (Highest)      | -0.226 (0.005) * | -0.065 (0.005) * | -0.447 (0.004) * | 0.053 (0.004) *       | 0.257 (0.005) *             |
| Ontario Marginalization Index Summary Score | -0.043 (0.002) * | -0.042 (0.002) * | -0.009 (0.002) * | 0.033 (0.002) *       | 0.062 (0.002) *             |
| Constant         | -5.016 (0.017) * | -7.243 (0.016) * | -10.781 (0.013) * | -3.694 (0.013) *      | -3.364 (0.016) *            |

Abbreviations: ALC, Alternate Levels of Care; ED, Emergency Department

* $P < .001$
**Supplemental Table 6.** Sex-Stratified Subgroup Analysis Adjusted Beta Coefficients (Standard Errors) from Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018

| Demographic Characteristics | ED Visits | Hospitalizations | ALC Days | Primary Care Visits | Specialist Physician Visits |
|-----------------------------|-----------|------------------|----------|---------------------|-----------------------------|
| **Males**                   |           |                  |          |                     |                             |
| **Demographic Characteristics** |           |                  |          |                     |                             |
| Age                         | 0.003 (0.000) * | 0.002 (0.000) * | 0.038 (0.000) * | 0.002 (0.000) * | -0.011 (0.000) * |
| **Clinical Comorbidities**  |           |                  |          |                     |                             |
| Asthma                      | 0.156 (0.007) * | 0.080 (0.006) * | -0.044 (0.005) * | 0.181 (0.005) * | 0.129 (0.006) * |
| Cancer                      | 0.251 (0.005) * | 0.677 (0.005) * | 0.635 (0.004) * | 0.164 (0.004) * | 0.744 (0.005) * |
| Cardiac Arrhythmias         | 0.282 (0.005) * | 0.341 (0.005) * | 0.004 (0.004) | 0.105 (0.004) * | 0.216 (0.005) * |
| Cerebrovascular Accident    | 0.233 (0.007) * | 0.491 (0.006) * | 1.208 (0.005) * | -0.008 (0.005) | 0.036 (0.006) * |
| Chronic Coronary Disease    | 0.190 (0.005) * | 0.283 (0.004) * | -0.171 (0.004) * | 0.071 (0.004) * | 0.186 (0.004) * |
| Chronic Obstructive Pulmonary Disease | 0.270 (0.005) * | 0.312 (0.005) * | 0.208 (0.004) * | 0.092 (0.004) * | 0.048 (0.005) * |
| Congestive Heart Failure    | 0.256 (0.007) * | 0.584 (0.006) * | 0.829 (0.005) * | -0.013 (0.005) ** | 0.083 (0.006) * |
| Dementia                    | -0.081 (0.009) * | 0.015 (0.008) | 1.214 (0.006) * | -0.122 (0.007) * | -0.169 (0.008) * |
| Diabetes                    | 0.046 (0.004) * | 0.064 (0.004) * | 0.097 (0.003) * | 0.248 (0.003) * | 0.086 (0.004) * |
| Hypertension                | 0.104 (0.005) * | 0.215 (0.004) * | 0.031 (0.004) * | 0.316 (0.003) * | 0.158 (0.004) * |
| Mood Disorders              | 0.173 (0.004) * | 0.026 (0.004) * | 0.175 (0.003) * | 0.211 (0.003) * | 0.168 (0.004) * |
| Myocardial Infarction       | 0.189 (0.007) * | 0.410 (0.007) * | 0.180 (0.006) * | -0.035 (0.005) * | -0.026 (0.007) * |
| Osteoarthritis              | 0.163 (0.004) * | 0.297 (0.04) * | -0.136 (0.003) * | 0.209 (0.003) * | 0.272 (0.004) * |
| Osteoporosis                | 0.004 (0.010) | -0.002 (0.010) | 0.309 (0.008) * | 0.190 (0.008) * | 0.209 (0.009) * |
| Other Mental Health         | 0.156 (0.005) * | 0.116 (0.004) * | 0.324 (0.004) * | 0.152 (0.003) * | 0.222 (0.004) * |
| Renal Disease               | 0.195 (0.007) * | 0.407 (0.007) * | 0.761 (0.006) * | 0.052 (0.005) * | 0.490 (0.006) * |
| Rheumatoid Arthritis        | 0.175 (0.015) * | 0.187 (0.014) * | -0.109 (0.012) * | 0.052 (0.001) * | 0.305 (0.014) * |
| **Community Characteristics** |           |                  |          |                     |                             |
| Location                    |           |                  |          |                     |                             |
| Rural                       | (Ref)     | (Ref)            | (Ref)    | (Ref)               | (Ref)                       |
| Urban                       | -0.531 (0.006) * | -0.094 (0.006) * | -0.011 (0.005) | 0.302 (0.004) * | 0.235 (0.005) * |
**Supplemental Table 6.** Sex-Stratified Subgroup Analysis Adjusted Beta Coefficients (Standard Errors) from Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018

|                 | ED Visits | Hospitalizations | ALC Days | Primary Care Visits | Specialist Physician Visits |
|-----------------|-----------|------------------|----------|----------------------|-----------------------------|
| **Neighborhood Income Quintile** |           |                  |          |                      |                             |
| 1 (Least)  | (Ref)     | (Ref)             | (Ref)    | (Ref)                | (Ref)                       |
| 2             | -0.105 (0.007) * | -0.068 (0.006) * | -0.446 (0.005) * | 0.034 (0.005) * | 0.077 (0.006) * |
| 3             | -0.129 (0.007) * | -0.094 (0.007) * | -0.516 (0.005) * | 0.047 (0.005) * | 0.121 (0.006) * |
| 4             | -0.187 (0.008) * | -0.099 (0.007) * | -0.502 (0.006) * | 0.058 (0.006) * | 0.162 (0.007) * |
| 5 (Highest)  | -0.245 (0.008) * | -0.074 (0.007) * | -0.524 (0.006) * | 0.046 (0.006) * | 0.247 (0.007) * |
| **Ontario Marginalization Index Summary Score** | -0.040 (0.003) * | -0.019 (0.003) * | -0.029 (0.002) * | 0.031 (0.003) * | 0.051 (0.003) * |
| **Constant** | -5.121 (0.026) * | -7.395 (0.024) * | -11.058 (0.018) * | -4.049 (0.019) * | -3.857 (0.024) * |
| **Females**  |           |                  |          |                      |                             |
| **Demographic Characteristics** |           |                  |          |                      |                             |
| Age            | 0.001 (0.000) * | 0.000 (0.000) * | 0.029 (0.000) * | -0.005 (0.000) * | -0.022 (0.000) * |
| **Clinical Comorbidities** |           |                  |          |                      |                             |
| Asthma         | 0.157 (0.005) * | 0.092 (0.005) * | -0.173 (0.004) * | 0.148 (0.004) * | 0.130 (0.005) * |
| Cancer         | 0.223 (0.005) * | 0.710 (0.005) * | 0.679 (0.004) * | 0.180 (0.004) * | 0.675 (0.005) * |
| Cardiac Arrhythmias | 0.315 (0.005) * | 0.332 (0.005) * | 0.266 (0.004) * | 0.128 (0.004) * | 0.222 (0.005) * |
| Cerebrovascular Accident | 0.267 (0.007) * | 0.566 (0.006) * | 0.971 (0.005) * | 0.014 (0.005) * | 0.063 (0.007) * |
| Chronic Coronary Disease | 0.192 (0.005) * | 0.201 (0.004) * | -0.041 (0.004) * | 0.055 (0.003) * | 0.128 (0.004) * |
| Chronic Obstructive Pulmonary Disease | 0.264 (0.005) * | 0.344 (0.004) * | 0.331 (0.004) * | 0.064 (0.003) * | 0.055 (0.004) * |
| Congestive Heart Failure | 0.260 (0.007) * | 0.672 (0.006) * | 0.750 (0.005) * | 0.016 (0.005) * | 0.061 (0.006) * |
| Dementia       | -0.119 (0.008) * | 0.001 (0.007) * | 1.095 (0.005) * | -0.146 (0.005) * | -0.285 (0.007) * |
| Diabetes       | 0.074 (0.004) * | 0.094 (0.004) * | 0.128 (0.003) * | 0.184 (0.003) * | 0.066 (0.004) * |
| Hypertension   | 0.162 (0.004) * | 0.257 (0.004) * | 0.189 (0.003) * | 0.290 (0.003) * | 0.117 (0.004) * |
| Mood Disorders | 0.224 (0.004) * | 0.017 (0.004) * | 0.102 (0.003) * | 0.228 (0.003) * | 0.207 (0.004) * |
| Myocardial Infarction | 0.244 (0.009) * | 0.565 (0.008) * | 0.553 (0.007) * | -0.030 (0.007) * | 0.012 (0.008) * |
### Supplemental Table 6. Sex-Stratified Subgroup Analysis Adjusted Beta Coefficients (Standard Errors) from Annual, Standardized Health Service Rates Among Residents of Retirement Homes, Residents of Long-Term Care Homes, and Home Care Recipients in the Community in 2018

|                     | ED Visits  | Hospitalizations | ALC Days   | Primary Care Visits | Specialist Physician Visits |
|---------------------|------------|------------------|------------|----------------------|-----------------------------|
| Osteoarthritis      | 0.149 (0.004) * | 0.351 (0.003) * | -0.133 (0.003) * | 0.217 (0.003) * | 0.299 (0.004) * |
| Osteoporosis        | 0.006 (0.004)  | -0.067 (0.004) * | 0.108 (0.003) * | 0.172 (0.003) * | 0.191 (0.004) * |
| Other Mental Health | 0.178 (0.005) * | 0.128 (0.004) * | 0.348 (0.004) * | 0.171 (0.003) * | 0.233 (0.004) * |
| Renal Disease       | 0.250 (0.007) * | 0.470 (0.007) * | 0.599 (0.006) * | 0.050 (0.005) * | 0.448 (0.007) * |
| Rheumatoid Arthritis| 0.166 (0.010) * | 0.201 (0.009) * | 0.501 (0.008) * | 0.058 (0.007) * | 0.297 (0.009) * |

#### Community Characteristics

|                     | ED Visits  | Hospitalizations | ALC Days   | Primary Care Visits | Specialist Physician Visits |
|---------------------|------------|------------------|------------|----------------------|-----------------------------|
| **Location**        |            |                  |            |                      |                             |
| Rural (Ref)         |            | (Ref)            | (Ref)      | (Ref)                | (Ref)                       |
| Urban               | -0.534 (0.006) * | -0.153 (0.005) * | -0.203 (0.005) * | 0.276 (0.004) * | 0.250 (0.005) * |

|                  | ED Visits  | Hospitalizations | ALC Days   | Primary Care Visits | Specialist Physician Visits |
|------------------|------------|------------------|------------|----------------------|-----------------------------|
| **Neighborhood Income Quintile** |            |                  |            |                      |                             |
| 1 (Least) (Ref)  |            | (Ref)            | (Ref)      | (Ref)                | (Ref)                       |
| 2                 | -0.066 (0.006) * | -0.015 (0.005) | -0.130 (0.005) * | 0.030 (0.004) * | 0.082 (0.005) * |
| 3                 | -0.117 (0.006) * | -0.049 (0.006) * | -0.328 (0.005) * | 0.051 (0.005) * | 0.123 (0.006) * |
| 4                 | -0.151 (0.007) * | -0.044 (0.006) * | -0.328 (0.005) * | 0.063 (0.005) * | 0.167 (0.007) * |
| 5 (Highest)       | -0.211 (0.007) * | -0.057 (0.007) * | -0.358 (0.006) * | 0.056 (0.005) * | 0.261 (0.007) * |
| Ontario Marginalization Index Summary Score | -0.046 (0.003) * | -0.062 (0.003) * | -0.001 (0.002) | 0.035 (0.002) * | 0.070 (0.003) * |

| Constant          | -4.999 (0.023) * | -7.294 (0.021) * | -10.640 (0.017) * | -3.468 (0.017) * | -3.109 (0.022) * |

Abbreviations: ALC, Alternate Levels of Care; ED, Emergency Department

* P < .001