An Analysis of Health Outcomes Among Senior Housing Residents

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Dianne Munevar, Alex Hartzman, Tyler Oberlander, Claudia Gorman
Contents

01 Background & Study Overview
02 Executive Summary
03 Key Findings
04 Quality Measure Results
05 CCRC Sensitivity Analysis
This research measures differences in health outcomes among individuals who moved into senior housing facilities compared to older adults living in the community

- Senior housing has the potential to support the **housing and healthcare needs** of vulnerable older adults.

- People move into senior housing for a multitude of reasons, often because they’ve become medically complex and **can no longer live independently**. Changes in relationship dynamics and living situations, like widowhood or dependents moving away, also impact older adults' ability to live independently.

- This is a **vulnerable time for older adults**—characterized by an increase in frailty, adverse health events, and a higher risk of mortality.

- Previous NORC analyses found that older adults who move into senior housing **experience decreased vulnerability to adverse health outcomes** and **increased access to physician services**, and that **senior housing residents experience greater longevity** than the non-congregate comparison group in the first two years following move-in.
The National Investment Center on Seniors Housing & Care (NIC) commissioned NORC at the University of Chicago (NORC) to assess the relationship between senior housing and health outcomes for older adults.

- NORC conducted a comparative analysis of emergency department (ED) visits, hospital inpatient stays, hospitalizations for physical injury and/or falls, and select Prevention Quality Indicators (PQIs).

- The study focuses on older adults who moved into senior housing properties in 2017 and resided in properties until their death, or the end of the two-year study period. We tracked individuals for two years (730 days) following their move-in date.

- Individuals who moved into senior housing properties ("senior housing residents") were matched with a comparable non-congregate population ("non-congregate peer group") based on age, gender, frailty (claims-based frailty) level groups, and select chronic conditions.

**Study limitations:** This study does not analyze longevity outcomes of residents who resided in senior housing properties before 2017. We highlighted results based on a p value of less than or equal to 0.05.
NORC’s risk adjustment methodology relied on establishing a comparison group that closely resembled the non-congregate population.

**NORC used a weighting approach to create an analogous non-congregate comparison group.** The specific approach used is called “entropy balancing”.

1. Attribute Medicare beneficiaries to senior housing or non-congregate comparison group
2. Remove beneficiaries who do not meet study inclusion criteria (i.e., must live in a NIC Map Vision property zip, not have hospice in prior year, etc.)
3. This approach assigns a weight to every member of the non-congregate group based on how similar they are to the senior housing group
   - Frailty (CFI) groups
   - Demographics (e.g., age, gender)
   - Enrollment information (e.g., Duals status)
   - Select condition groups
4. Multiply weights against each observation’s outcomes measures to form an average weighted outcome to give the most apt population comparison
Executive Summary

• The Outcomes study evaluated health care utilization and outcomes for individuals who moved into a senior housing property in 2017 over a two-year period (2017-2019, or until death) compared with a matched community-dwelling peer group.  

• Older adults who recently moved into private pay senior housing experienced the same or better outcomes across several preventive care measures compared to their matched non-congregate peers.

• These findings suggest that senior housing operators have been effective in managing resident clinical risk, even during the transition to senior housing—a particularly vulnerable time for older adults.

• Further research is needed to estimate the resulting cost savings for Medicare and to evaluate the potential impact of new value-based arrangements with senior housing facilities.

1 Please see Appendix for details about the methodology, data sources, and study limitations.
Measures were selected for their clinical significance, relevance to health outcomes, and influence on quality of life for older adults

- **Emergency Department Visits**

- **Hospitalizations for Physical Injuries:**
  - Hip fractures
  - Wounds

- **Prevention Quality Indicators (PQIs),** hospitalizations for:
  - Chronic Obstructive Pulmonary Disorder (COPD)
  - Hypertension
  - Dehydration
  - Urinary Tract Infections (UTIs)
  - Community-acquired pneumonia
  - Uncontrolled diabetes

Measures of high-cost, high-acuity events are important to a variety of stakeholders and audiences, including consumers; senior housing owners, operators, and investors; and ultimately CMS and Medicare Advantage (MA) plans

- CMS quality programs for MA plans emphasize prevention of high-cost, high-acuity events through high-quality preventive care, screening, and chronic condition management
- PQIs identify admissions that may have been avoided through effective preventive and rehabilitative care
- This information is vital for consumers and caregivers in considering where to live safely and independently
Senior housing residents experienced the following outcomes, relative to a matched non-congregate peer group.

**Lower rates of...**
- Inpatient admissions from the Emergency Department
- Inpatient admissions due to:
  - Physical injury
  - Hip fracture
  - Wounds
  - COPD
  - Dehydration
  - UTIs

**Higher rates of...**
- Emergency Department utilization

**Not meaningful differences* in rates of...**
- Inpatient admissions due to:
  - Falls
  - Hypertension
  - Community-acquired pneumonia
  - Uncontrolled diabetes

These findings demonstrate alignment between the role that senior housing owners and operators play while considering consumers’ need for improved access to high-quality, safe and equitable care for older adults.

*Not statistically significant at p<0.05
Across all property types, individuals in senior housing were admitted to the hospital from the ED less frequently than their non-congregate peers.

Senior housing residents experienced 18% fewer hospitalizations from ED compared to their non-congregate peers (557.3 claims per 1,000 beneficiaries vs. 677.4 claims per 1,000 beneficiaries, respectively).

* The difference in means are statistically significant at p<0.05.

Measure Definition: Any Inpatient Fee-For-Service (FFS) claim with at least one line item containing an ED Revenue Center code (mirrors the CCW’s Inpatient Emergency Room Visits annual summary measure).
CCRC residents had **24% fewer hospitalizations for physical injuries** compared to their matched counterparts.

Overall, senior housing residents **had fewer inpatient admissions for physical injuries** than their non-congregate peers, largely driven by CCRC performance.

*The difference in means are statistically significant at p<0.05.*

Findings that are not statistically significant at the p<0.05 value have been greyed out.

**Measure Definition:** Any Inpatient FFS claim with a principal ICD-10 Diagnosis code in the S00 to S99 range or T14.
Overall, senior housing residents experienced about **four fewer hospitalizations due to a hip fracture**, per one thousand residents, compared to their non-congregate peers.

**Measure Definition:** Any Inpatient FFS claim with a principal ICD-10 Diagnosis code matching any ICD-10 code from CMS’ Comprehensive Care for Joint Replacement Model value set for a hip fracture diagnosis.¹

IL residents experienced **15% fewer hospitalizations due to hip fractures** compared to their matched counterparts (23.6 claims per 1,000 residents vs. 27.9 per 1,000 matched beneficiaries).

* The difference in means are statistically significant at $p<0.05$.

Findings that are not statistically significant at the $p<0.05$ value have been greyed out.
Senior housing residents experienced fewer hospitalizations for wounds than their non-congregate peers across all settings.

AL residents experienced 36% fewer hospitalizations for wounds compared to their matched counterparts (47.8 claims per 1,000 residents vs. 75.1 claims per 1,000 matched beneficiaries).

* The difference in means are statistically significant at p<0.05.

Measure Definition: Any Inpatient FFS claim with ICD-10 Diagnosis code matching CMS MS-DRG value set for Diseases & Disorders of the Skin, Subcutaneous Tissue & Breast Skin Ulcers, that was present on admission.
Overall, senior housing residents used the ED more frequently than their non-congregate peers.

CCRC residents experienced 11% fewer ED visits per beneficiary compared to their matched counterparts (1.08 visits on average, per beneficiary vs. 1.21 visits per average, per beneficiary, respectively).

* The difference in means are statistically significant at p<0.05.

**Measure Definition:** Count of distinct visits to the emergency department per Beneficiary during the study period. This measure includes ED visits that resulted in discharge to home, hospital observation, or hospital admission.
CCRC residents experienced **18% fewer hospitalizations due to falls** compared to their matched counterparts.

Overall, there is no meaningful difference between the number of hospitalizations due to falls between senior housing residents and those residing in a non-congregate setting.

*The difference in means are statistically significant at p<0.05.*

Findings that are not statistically significant at the p<0.05 value have been greyed out.

**Measure Definition:** Any Inpatient FFS claim with at least one line item containing an ED Revenue Center code and a primary ICD10 external cause code of a fall (W00 to W19).
NORC implemented Prevention Quality Indicators (PQIs) to evaluate the extent to which living in a senior housing community reduced the risk of hospitalizations for potentially-preventable conditions.

- PQIs were developed by the Agency for Healthcare Research and Quality (AHRQ) to monitor hospitalizations that may have been avoided through high-quality preventative and rehabilitative care.
- These are rare events among beneficiaries who have recently moved into senior housing—for some PQI measures, fewer than 1% of residents experienced an event during the study period.
- In several cases, we were not able to detect statistically significant differences in outcomes for senior housing residents compared to their non-congregate peers.
Older adults who recently moved into senior housing had fewer hospital admissions resulting from COPD/Asthma compared to their matched peers.

AL residents experienced 15% fewer hospitalizations due to COPD compared to their matched peers (22.7 claims per 1,000 residents vs. 26.8 per 1,000 matched beneficiaries, respectively).

* The difference in means are statistically significant at p<0.05.

Findings that are not statistically significant at the p<0.05 value have been greyed out.

Measure Definition: Inpatient FFS admissions with a principal diagnosis of Chronic Obstructive Pulmonary Disease (COPD) or asthma; rate per thousand beneficiaries.

NOTE: Findings relevant among people with a hospitalization for a PQI-qualifying event.
Hospital admissions for dehydration were **21% lower** for CCRC residents compared to their non-congregate peers.

There were **fewer hospital admissions due to dehydration** for senior housing residents compared to their matched peers, largely driving by CCRC performance.

* The difference in means are statistically significant at p<0.05.

Findings that are not statistically significant at the p<0.05 value have been greyed out.

**Measure Definition:** Inpatient FFS admissions with a principal diagnosis of Dehydration OR secondary diagnosis of Dehydration with a principal diagnosis of either Hyperosmolality and/or Hypernatremia, Gastroenteritis, or Acute Kidney Injury; rate per thousand beneficiaries.

**NOTE:** Findings relevant among people with a hospitalization for a PQI-qualifying event.
The incidence of **hospitalizations due to UTIs was lower** across all senior housing property types compared to their non-congregate peers.

Senior housing residents experienced **20% fewer hospitalizations due to UTIs** compared to their matched counterparts (26.3 claims per 1,000 residents vs. 32.7 per 1,000 matched beneficiaries, respectively).

* The difference in means are statistically significant at p<0.05.

**Measure Definition:** Inpatient FFS admissions with a principal diagnosis of urinary tract infection. Excludes kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, and obstetric admissions; rate per thousand beneficiaries.

**NOTE:** Findings relevant among people with a hospitalization for a PQI-qualifying event.
Hospital admissions for hypertension are such rare events—only 0.38% of senior housing residents were hospitalized for hypertension during the study period.

There was no statistically significant difference in hospital admissions for hypertension for senior housing residents relative to their matched peers.

Measure Definition: Inpatient FFS admissions with a principal diagnosis of hypertension. Excludes kidney disease combined with dialysis access procedure admissions, cardiac procedure admissions, and obstetric admissions; rate per thousand beneficiaries.

NOTE: Findings relevant among people with a hospitalization for a PQI-qualifying event. Findings that are not statistically significant at the p<0.05 value have been greyed out.
Only about 1.5% of senior housing residents were hospitalized for community acquired pneumonia during the study period.

Measure Definition: Inpatient FFS admissions with a principal diagnosis of community acquired pneumonia. Excludes sickle cell or hemoglobin-S admissions, other indications of immunocompromised state admissions, and obstetric admissions; rate per thousand beneficiaries.

NOTE: Findings relevant among people with a hospitalization for a PQI-qualifying event.

There was no meaningful difference in hospital admissions for community acquired pneumonia for senior housing residents relative to their matched peers.

Findings that are not statistically significant at the p<0.05 value have been greyed out.
Less than 1% of CCRC residents were hospitalized for uncontrolled diabetes during the study period.

Measure Definition: Inpatient Fee-For-Service admissions with a principal diagnosis of diabetes without mention of short-term (ketoacidosis, hyperosmolarity, or coma) or long-term (renal, eye, neurological, circulatory, or other unspecified) complications. Excludes obstetric admissions. Rate per thousand beneficiaries.

Findings that are not statistically significant at the p<0.05 value have been greyed out.

NOTE: Findings relevant among people with a hospitalization for a PQI-qualifying event.

There was no meaningful difference in hospital admissions for uncontrolled diabetes for senior housing residents relative to their matched peers.
In our study, CCRCs were found to have more favorable outcomes than their matched non-congregate peer group, relative to other property types. Additional research into area-level income inequality does not have a significant influence on CCRC health outcomes.

- Published literature suggests that higher levels of income and wealth are associated with improved health outcomes.¹ NORC examined the relationship between high and low levels of income inequality and health outcomes among CCRC residents and a comparable non-congregate population.

- **Overall, we found no systematic pattern of advantage for CCRC residents in areas with either high or low levels of income inequality.**

- We observed some fluctuation in health outcomes among these subgroups compared to the general CCRC rates. For example, areas with lower levels of income inequality were associated with an increase in hospitalizations for certain Prevention Quality Indicators.

- As a limitation of the study design, we note that area-level income distributions do not fully account for variation at the person-level.

¹ *Health Affairs* | Health Policy Brief: Health, Income, & Poverty: Where We Are & What Could Help
Thank you.

Dianne Munevar
VP, Health Care Strategy
Munevar-Dianne@norc.org