RESEARCH ARTICLE

Hospital and Skilled Nursing Facility Networks: Informal Relationships and Their Role in the Placement of Traditional Medicare Beneficiaries With Serious Mental Illness

Taylor I. Bucy[1] | Donovan T. Maust[2,3] | Dori A. Cross[4]

[1]Department of Population Health, University of Kansas School of Medicine, Kansas City, Kansas, USA | [2]Department of Psychiatry, University of Michigan Medical School, Ann Arbor, Michigan, USA | [3]Center for Clinical Management Research, VA Ann Arbor Healthcare System, Ann Arbor, Michigan, USA | [4]Division of Health Policy & Management, University of Minnesota School of Public Health, Minneapolis, Minnesota, USA

Correspondence: Taylor I. Bucy (tbucy@kumc.edu)

Received: 4 October 2024 | **Revised:** 17 January 2025 | **Accepted:** 15 February 2025

Funding: This project was supported by the Agency for Healthcare Research and Quality (AHRQ) under grant number R36HS029644 [T. Bucy] and by the National Institute on Aging (NIA) under grant number(s) R03AG072215 [D. Cross] and RF1AG082011 [D. Maust]. The open access use of LTCFocus data is sponsored by the National Institute on Aging [1P01AG027296] through a cooperative agreement with the Brown University School of Public Health.

Keywords: care transitions | Medicare | post-acute care | provider networks | serious mental illness

ABSTRACT

Objective: To examine the role of hospitals' high-volume preferred provider networks in skilled nursing facility (SNF) placement for traditional Medicare beneficiaries with serious mental illnesses (SMI).

Study Setting and Design: We describe the differential effect of preferred provider networks on the location of observed SNF admission (i.e., placement) for patients with and without SMI using ordinary least squares (OLS) regression and conditional logistic regression. We also consider the moderating effect of having a co-occurring condition targeted by value-based payment programs.

Data Sources and Analytic Sample: A 100% sample of Medicare Provider Analysis and Review (MedPAR) files used to identify acute care hospital-to-SNF transitions between 2017 and 2019.

Principal Findings: Overall, patients with SMI have a lower probability of being admitted to a referring hospital's preferred SNF partner (48.0% vs. 52.4%; $p < 0.001$). We find evidence that incentives introduced through the hospital readmission reduction program (HRRP) moderate this observed relationship, where, relative to their SMI counterparts, individuals with SMI and an HRRP condition have a greater probability of being admitted to a preferred SNF (47.6% vs. 51.1%; $p < 0.001$). We find similar effects using conditional logistic regression, where preferredness is significantly more predictive of admission to the most proximate SNF for patients without SMI versus those with SMI. This effect is again moderated by the presence of a co-occurring HRRP condition.

Conclusions: Volume-driven preferred partner relationships differentially impact referral patterns for traditional Medicare patients with SMI. Our findings suggest that patients with complex mental and behavioral health conditions may not benefit equally from more targeted investments in transitional care practices that are made in response to these partnerships. Yet our findings are also suggestive of opportunities to leverage existing hospital-SNF relational dynamics to improve the quality of care for a broader group of medically and socially complex patients.

© 2025 Wiley Periodicals LLC.

Summary

- What is known on this topic
  - Patients with complex mental and behavioral health conditions, including those with serious mental illness (SMI), represent a growing proportion of skilled nursing facility (SNF) patients.
  - Hospitals are known to concentrate investments in transitional care practices among their highest-volume SNF partners.
  - Hospitals have been rewarded for the quality of care they provide to specific subsets of Medicare patients; for example, through the hospital readmission reduction program (HRRP).
- What this study adds
  - Volume-based preferred provider relationships between hospitals and SNFs are significantly predictive of where traditional Medicare beneficiaries with SMI receive SNF care.
  - For Medicare beneficiaries with SMI, the effect of preferredness on SNF placement is significantly moderated by having a co-occurring condition targeted by the HRRP.

1 | Introduction

Each year, approximately 1.2 million traditional (i.e., fee-for-service) Medicare beneficiaries receive care in a skilled nursing facility (SNF) following a hospital stay [1–3]. Individuals with serious mental illness (SMI) represent a growing number of SNF patients nationally, where the combination of multiple chronic conditions and functional impairment increases the likelihood that post-acute SNF care will be necessary following a hospital stay [4–8]. Given the multifaceted needs that require coordination between medical, behavioral, and social service providers [9, 10], individuals with SMI are uniquely positioned to benefit from carefully considered post-acute placement decisions. However, people with SMI are more likely to receive care in lower-quality SNFs and are at an increased risk of experiencing poor SNF outcomes, including transition to long-stay residence despite lower care status [11–16].

Historically, fragmentation between hospitals and SNFs has been reinforced by a misalignment of incentives across settings. But with the advent of financial penalties linked to post-hospitalization quality, hospital providers are now paying more attention to *where* their patients end up after discharge and the outcomes associated with that care [17–20]. Strategies to improve the quality of hospital and SNF relationships include informal integration efforts, like joint participation in value-based purchasing or pay-for-performance efforts and/or collaborative clinical leadership [20]. However, exposure has been heterogeneous, and concentrated investments in improving post-acute relationships tend to be selective toward a hospital's high-volume network of preferred SNF providers [19, 21–25]. SNFs that fall within these preferred-provider networks benefit from improved coordination practices, such as enhanced information sharing or shared clinical staff, allowing for more "hands on" management of patients during care transitions and improved post-acute outcomes (e.g., lower hospital readmission rates) [24, 26, 27]. Yet, it is unclear how patients with SMI fare under these evolving, network-based referral relationships [28–30].

Preferred SNFs, receiving a consistent source of patient referrals, may be better positioned to avoid complex patients, who likely require more intensive services or longer SNF stays [31, 32]. Alternatively, preferred SNFs may act as team players and exhibit a greater sense of indebtedness or willingness to accept the occasional complex patient in exchange for a more favorable referral later [24]. What might additionally complicate these strategic organizational decisions is that some patient cases might represent competing incentives [33]. This includes, for example, patients with the complexities of an SMI diagnosis who also have conditions targeted by value-based payment initiatives such as the Hospital Readmission Reduction Program (HRRP), where referring hospitals are particularly invested in the quality of SNF care with the goal of avoiding financial penalties associated with hospital readmission [34–36]. It is unknown whether and how hospitals—when incentivized—may exert more of their own agency to place these patients in preferred sites of care despite possible SNF hesitations.

It is important for policymakers and payers to understand how targeted investments in selective relationships and specific patient groups have affected persons with more complex psychosocial needs, specifically individuals with SMI. Using a discrete choice modeling approach, this research seeks to answer two related questions: (1) do hospitalized patients with SMI experience reduced access to high-volume preferred sites for SNF care, and (2) do value-based incentive programs, specifically the HRRP, moderate any potential selection behavior for patients with SMI.

2 | Methods

2.1 | Data & Study Population

This study uses a 100% sample of 2017 to 2019 Medicare Provider Analysis and Review (MedPAR) data. MedPAR data includes Medicare Part A administrative claims for beneficiaries accessing inpatient services, which allows for the identification of all beneficiary-level hospital (short-term, general, and specialty) to SNF transitions occurring within this 3-year time period. Given that we are unable to observe and account for the full continuum of additional heterogeneous influences on placement decisions (e.g., plan-based contract networks, care coordination programs) introduced by participation in Medicare Advantage, we restrict our sample to traditional Medicare beneficiaries only.

We first identify inpatient observations followed by a SNF admission dated within 2 days (48 h) of hospital discharge [37, 38]. Beneficiary and provider characteristics were supplemented using the Master Beneficiary Summary File and 27 Chronic Conditions Warehouse (CCW)—Chronic Conditions segment, as well as publicly available Medicare Provider of Service, Nursing Home Compare, and LTCFocus data files, respectively. We retained observations for which there was a

100% match on provider identification number, year of record, and beneficiary ID number. We additionally drop observations without a matching beneficiary residential ZIP code ($n = 918$) and without a matching hospital-level major diagnostic category ($n = 890$).

We then identify individuals with SMI using International Classification of Diseases (ICD-10-CM or ICD-10-PCS) clinical modification and procedure codes [Table S1]. SMI, narrowly defined, is a binary indicator of whether any of a patient's hospital-associated diagnosis codes indicate the presence of schizophrenia and/or bipolar disorder. This definition aligns with both the narrow definition of SMI used by the Preadmission Screening and Resident Review (PASRR) program Technical Assistance Center and existing literature [15, 39–42]. We expand this definition in our sensitivity analyses (see below).

2.2 | Variables & Measure Construction

2.2.1 | Outcome

Our primary outcome of interest is *choice*, a binary measure that denotes which SNF in an individual's choice set aligns with the observed location of SNF placement. The choice set is hospital-specific and includes all SNFs with whom the hospital shares at least one patient per year. We assume that patients receiving care in the same hospital will be faced with similar options for SNF care and that within a choice set, the choice of SNF is mutually exclusive [32]. The observed location of patient-level SNF placement, or *choice*, is coded one. All other SNFs to which a patient's originating hospital has referred patients in the prior year—but were not the observed site of SNF placement—are coded zero, allowing for within-person comparisons. As part of a random utility model, we can establish the relative importance of each SNF based on observable characteristics, where the choice of SNF is a function of both characteristics of the patient (chooser) and SNF (choice), as detailed below [43].

Although choice implies agency, we cannot directly observe the nuances of the selection process, including collaboration that may occur between patients, case managers, the broader care team, and the SNF during the discharge planning process. It is important to note that for the purpose of this study, choice is synonymous with the observed site of SNF placement, and we retain the variable name *choice* to remain consistent with the selected methodological approach (discrete choice model, see below).

2.2.2 | Primary Predictor

We are primarily interested in the effect of preferredness on choice. That is, how patient choice might be impacted by whether the admitting SNF falls within the referring hospital's high-volume, preferred provider network. Preferred partner status is based on yearly shared patient volume between a hospital and their complete SNF referral network (i.e., choice set). Based on existing work in this space, we define preferred SNF partners as the set of SNFs that receive a cumulative 50% of a hospital's patient discharge volume when rank sorted [31,44]. Volume-based cut points have been previously used to define preferred provider networks [31,45,46].

2.2.3 | SNF-Level Covariates

In addition to preferred partner status, we include in our models several SNF characteristics previously documented as playing a role in the care of people with SMI and influencing the market of available SNF beds [11–15,40,47,48]. This includes profit status (non- vs. for-profit), chain affiliation, bed size, proportion of Medicaid residents, proportion of Medicare residents, occupancy percentage, five-star quality measure rating, and urban vs. rural designation. Additionally, the proximity of a SNF to both the hospital and a patient's home plays an important role in choice [49]. We include in our model the geographic distances for every hospital SNF dyad using exact physical address (street address, ZIP code, county, state), identified via batch geocoding, the U.S. Census geocoding service using *tidygeocoder* in R Studio, and/or ZIP code to latitude and longitude crosswalks [50]. Due to the restricted nature of beneficiary residential addresses in Medicare claims data, distance between SNF and patient home address uses the centroid of the beneficiary's residential five-digit ZIP code. We calculate straight-line geographic distances using the *geodist* command in Stata version 18 [51].

2.2.4 | Patient-Level Covariates

We consider patient-level demographic and clinical characteristics as being predictive of choice. This includes conditions associated with the preceding hospital stay, where we identify whether a patient has a designated SMI diagnosis and/or a condition covered under the hospital readmission reduction program (HRRP). CMS-defined HRRP conditions include acute myocardial infarction, heart failure, chronic obstructive pulmonary disease (COPD), and surgical procedures including coronary artery bypass graft (CABG) and total hip/total knee arthroplasty (THA/TKA) [36]. We identify all primary HRRP hospital diagnoses using the Yale New Haven Health Services Corporation—Center for Outcomes Research and Evaluation (YNHHSC/CORE) methodology, which is used in the CMS quality-reporting program; specifically, readmission cohort inclusion principal diagnosis codes, synonymous with the first diagnosis code in the patient-level claim [52]. We construct a four-level categorical variable to denote the co-occurrence of SMI and any HRRP condition—SMI only, HRRP only, neither, or both. We control for additional patient-level characteristics (e.g., sex, dual-eligible status) via the construction of a 1:1 matched sample, as described below.

2.3 | Analytic Approach

The primary goal of this research is to examine whether traditional Medicare beneficiaries with SMI experience inequitable access to their discharging hospital's network of preferred SNF partners. We are also interested in the potential moderating effect of having a co-occurring condition targeted by value-based programs, specifically, the HRRP. The main covariates of interest are SMI—defined as schizophrenia and/or bipolar

disorder—and a four-level categorical indicator of whether the patient has HRRP only, SMI only, neither, or both. To answer these questions, we adopt a twofold approach. First, we describe the full sample of hospital-SNF referral networks, as well as the relationship between key patient and SNF characteristics. Next, we run both independent and interacted models, using postestimation margins to estimate the predicted probability of preferred SNF placement for our populations of interest. This includes ordinary least squares (OLS) regression, where the outcome of interest is a binary measure of whether the patient is admitted to one of their originating hospitals preferred SNF partners. We estimate the OLS model with patient- and SNF-level covariates (e.g., age [continuous], sex, profit status, bed size), hospital fixed effects, and clustered robust standard errors. For patients with multiple observed hospitalizations, we include only the index (first) hospitalization to ensure we capture full consideration of the choice set.

We subsequently apply a discrete choice model using conditional logistic regression [32,53,54]. Conditional logistic regression allows us to predict/explain a choice between two or more mutually exclusive alternatives—in this case, choice within a hospitals' network of SNF referral partners. The underlying assumption of this modeling approach is that an individual will choose the option (i.e., SNF) that maximizes their individual utility and offers the most benefit [43,55–57]. To more directly control for individual-level characteristics that influence both choice and discharge patterns, we create a matched sample (without replacement) of patients with and without SMI. We match on characteristics of the patient and their hospital stay, including hospital provider of origin, year of MedPAR record, hospital length of stay (+/− one day), Elixhauser summative score (+/− one point), type of Major Diagnostic Category (medical vs. surgical), patient's home ZIP code, sex, categorical age (<65 or 65+ years), dual-eligible status, and race/ethnicity as reported in Medicare administrative data and classified using the Research Triangle Institute imputation algorithm, which builds on Social Security Administration records using name and geography [58]. We adjust for race/ethnicity given existing research describing disparities in the quality of long-term and post-acute care based on patient and resident race/ethnicity [59]. As described above, we retain observations for each patient's index/first hospitalization.

2.3.1 | Simulated Marginal Effects

In our models, coefficients assigned to predictors of choice represent patient-level utility. These values cannot be compared across individuals, so we must rely on interpreting within-individual variation in observed preferences (i.e., individual valuation of SNF characteristics) [43]. This also precludes us from using a traditional approach to calculating marginal effect estimates. Instead, we calculate the simulated average change in predicted probability [31,32]. This approach allows us to force a discrete change in preferredness and manually calculate predicted probability at different values of a given covariate, like marginal effect estimation. Using this method, we calculate the change in the likelihood of an individual being discharged to the closest SNF in their choice set if that SNF were preferred versus not preferred, with all other characteristics of the closest and competing SNFs unchanged [31,32]. We present the simulated average change in predicted probability for the five closest SNFs in a choice set. We model this change using the proximity of the SNF to a patient's home ZIP code due to the known role of proximity in SNF selection [49]. Analyses were performed using Stata version 18.

2.3.2 | Sensitivity & Supplemental Analyses

We conduct several sensitivity and supplemental analyses to assess the robustness of our findings. First, we test the independence from irrelevant alternatives (IIA) assumption by removing, at random, SNFs from an individual's choice set. Subsequent sensitivity analyses are grouped as follows:

2.3.2.1 | Alternative Measures of Relationship Strength. Lacking an objective source defining these informal relationships, we replicate our analyses using three related specifications. First, we run the conditional logistic regression analyses substituting preferred partner status for a binary indicator of a hospital's single top-volume SNF partner. We infer that the top-volume SNF partner will give us the strongest estimate of relationship strength, considering preferredness on a gradient. Second, as a proxy measure for more vertical integration efforts, we estimate the interaction of hospital-SNF co-location with SMI—replacing preferredness—defined as a distance less than one-mile apart. This serves as both a proxy for more formal measures of relationship strength (e.g., acquisitions), and/or relationship strength based on proximity. Finally, we test an operational definition of relationship strength that incorporates both volume and geography-based restrictions [44,46,54]. In this analysis, we define SNFs as preferred if they are either a hospital's top volume partner or are located within a 4.2-mile radius. This 4.2-mile cut point is the 75th percentile distance between a hospital and their top-volume SNF partner.

2.3.2.2 | Population Parameters. The second set of supplemental analyses is meant to assess the effect of additional medical and social complexity. Given that SMI describes a group of mental health conditions, with some variation in condition inclusion [15,60], we replicate the OLS and choice model analyses using an expanded group of mental health conditions. This expanded definition includes, in addition to schizophrenia and bipolar disorder, severe major depressive disorder and depression broadly defined, as well as neurotic, stress-related, and somatoform disorders [Table S1]. Lastly, we run subgroup analyses stratified by whether the patient has a concurrent Alzheimer's Disease or Related Dementias (AD/ADRD) CCW flag.

3 | Results

3.1 | Descriptive Findings

From 2017 through 2019, traditional Medicare beneficiaries experienced 3,299,534 hospital-to-SNF transitions, or approximately 1.1 million transitions per calendar year. These transitions occurred between 3294 unique hospitals and 15,362 unique SNFs, which represent nearly the entire population of

Medicare-certified facilities in the U.S. at the end of 2019 (3306 hospitals, 15,472 SNFs) [61]. On average, each hospital in our sample has a network of about 37 SNF partners, with a median of 3 high-volume preferred partners (i.e., SNFs that receive a cumulative 50% of a hospital's patient discharge volume when rank sorted) (mean = 4).

Patients with SMI (4.4%, $n = 144{,}467$) who experience a hospital-to-SNF transition differ significantly from their non-SMI counterparts [Table 1]. On average, the population of patients with SMI is younger (69.2 vs. 79.4 years), more likely to be male (42.3% vs. 39.8%), dual-eligible for Medicaid (70.9% vs. 31.0%), Black, Asian/Pacific Islander, Hispanic, or American Indian/Alaska Native (23.7% vs. 18.1%) and have a co-occurring AD/ADRD diagnosis (66.7% vs. 49.81%). 27.9% of patients with SMI have an HRRP condition associated with their hospital stay, and 10.8% of patients with SMI have an HRRP condition as their primary diagnosis.

SNFs that admit SMI patients also vary significantly from their counterparts on key organizational characteristics [Table 2]. At the patient-transfer level, SNFs that admit SMI patients are significantly more likely to be for-profit (75.8% vs. 65.2%), to have a higher average Medicaid resident census (60.9% vs. 49.5%), and to have a higher number of certified beds (139.6 vs. 127.4). SNFs that admit SMI patients are also significantly less likely to score within the highest five-star quality rating (4 or 5 stars, 59.1% vs. 63.7%) and are marginally more likely to be chain affiliated (56.7% vs. 54.6%). These structural differences align with existing literature describing institutional-based long-term and post-acute care (LTPAC) for people with SMI [11–15,40,47,48].

3.2 | Linear Probability Model

Relative to patients without SMI, we identify a 4.4 percentage-point decrease in the probability of a patient with SMI admitting to one of their originating hospital's preferred SNF partners (48.0% vs. 52.4%) [Tables S2 and S3]. We do find some evidence that incentives introduced by the HRRP moderate the observed relationship between SMI status and SNF placement. Compared to their counterparts with only SMI, individuals with SMI and a co-occurring HRRP condition experience a 3.5 percentage-point increase in the probability of admitting to a preferred SNF partner (47.6% vs. 51.1%) [Figure 1]. The probability of admission for patients with both SMI and an HRRP diagnosis is approximately 2 percentage-points lower than the probability of being admitted to a preferred SNF partner for patients with an HRRP diagnosis only.

3.3 | Choice Model & Simulation Analyses

Choice model and simulation analyses were performed using a matched sample of patients with and without SMI ($N = 80{,}292$), which largely removes variation in patient-level demographic characteristics [Table 1]. Through the application of conditional logistic regression, we find that preferredness is significantly more predictive of choice for patients without SMI versus those with SMI. Simulated marginal effect estimates, presented as the simulated average change in predicted probability of being admitted to a SNF if it is preferred versus not preferred, are provided for both patients with and without SMI. We focus explicitly on the interaction of preferred partner status and SMI, noting a 2.6 percentage-point decrease, relative to patients without SMI, in the probability of a patient with SMI being admitted to the closest SNF in their choice set if it is preferred [Figure 2; Table S4]. This difference persists as we consider the next four closest SNFs in each patient's choice set and the number of close preferred SNFs [Figure S1]. Like the linear probability model, we again find evidence of co-occurring HRRP moderating this relationship between SMI, preferred status, and patient placement. We observe that patients with SMI *and* a principal HRRP condition experience a 2.9 percentage-point increase in the probability of being admitted to the closest SNF in their choice set when it is preferred [Figure 3]. This finding is again similar in magnitude and direction when modeled for the next 4 closest SNFs.

3.3.1 | Sensitivity Analyses

Coefficient estimates from a random subset of the choice model were qualitatively similar in magnitude and directionality to the parameter estimates using the complete choice set, meaning we do not detect IIA violations. Analyses substituting preferred partner status for top-volume SNF partner, hospital-SNF co-location, and the volume- and geography-based restriction, meant to examine alternative definitions or conceptualizations of preferredness, were consistent with our primary findings. Results designed to examine the role of additional medical and social complexity (i.e., expanded group of mental health conditions, AD/ADRD stratification) only strengthen our findings.

4 | Discussion

We used a 100% sample of Medicare inpatient claims data from 2017 to 2019 to examine the extent to which patients with SMI receive care at preferred SNF partner sites. We found that individuals with SMI have a significantly lower probability of being admitted to a hospital's preferred SNF partner (4.4 percentage points; 48.0% vs. 52.4%). These results were robust to alternative specifications of hospital-SNF relationship strength and added measures of patient complexity (i.e., expanded group of mental health conditions, AD/ADRD). However, when individuals with SMI also had a condition targeted under HRRP value-based payment incentives, their likelihood of admission to a preferred SNF partner roughly mirrored the general population. These findings are novel in that they are the first to document the competing incentives that hospitals and SNFs navigate when making discharge placement decisions for patients with SMI, and prompt further examination of the underlying mechanisms by which volume-based preferred networks may exacerbate the existing, tiered structures of the long-term and post-acute care delivery system.

We typically think of decision-making surrounding SNF placement as being rooted in patient choice; however, there is growing evidence to suggest that hospitals play a more active role in shaping where patients go based on the partners/partnerships they have invested in [21,23,24,30,31]. Conceivably,

TABLE 1 | Demographic characteristics of the full sample of hospital-to-skilled nursing facility (SNF) transitions (left) and 1:1 matched sample (right) of people without and with serious mental illness (SMI) from 2017 to 2019. Within-sample comparisons reflect chi-squared tests for categorical variables and t-tests for continuous variables.

	Full sample = 3,299,534			Matched sample = 80,292		
	Without (*n* = 3,155,067)	SMI (*n* = 144,467)	*p*	Without SMI (*n* = 40,146)	SMI (*n* = 40,146)	*p*
Age [mean (std. dev.)]	79.38 (10.85)	69.24 (11.96)	< 0.001	79.16 (11.59)	74.26 (9.96)	< 0.001
Age Group (%)						
< 65	7.39%	31.67%	< 0.001	9.85%	9.85%	1.00
65+	92.61%	68.33%		90.15%	90.15%	
Gender (%)						
Male	39.84%	42.25%	< 0.001	33.98%	33.98%	1.00
Female	60.16%	57.75%		66.02%	66.02%	
Race (%)						
American Indian/Alaska Native	0.51%	0.50%	< 0.001	0.05%	0.05%	1.00
Asian/Pacific Islander	1.93%	1.54%		0.59%	0.59%	
Black	10.17%	14.84%		10.12%	10.12%	
Hispanic	4.89%	6.21%		3.37%	3.37%	
Non-Hispanic White	81.35%	75.71%		85.80%	85.80%	
Other	0.59%	0.58%		0.05%	0.05%	
Unknown	0.56%	0.62%		0.02%	0.02%	
Co-occurring HRRP condition(s) (%)						
No	59.86%	72.12%	< 0.001	60.49%	71.14%	< 0.001
Yes	40.14%	27.88%		39.51%	28.86%	
HRRP condition is primary diagnosis (%)						
No	82.78%	89.16%	< 0.001	84.77%	88.35%	< 0.001
Yes	17.22%	10.84%		15.23%	11.65%	
Co-occurring ADRD (%)						
No	50.19%	33.32%	< 0.001	42.99%	28.70%	< 0.001
Yes	49.81%	66.68%		57.01%	71.30%	
MDC type (%)						
Medical	65.79%	77.01%	< 0.001	82.93%	82.94%	0.99
Surgical	34.21%	22.99%		17.07%	17.06%	
RUCA (%)						
Metropolitan	80.40%	83.03%	< 0.001	83.59%	83.59%	1.00
Micropolitan	11.28%	9.94%		11.51%	11.51%	
Small town	5.01%	4.57%		3.61%	3.61%	
Rural	3.31%	2.45%		1.21%	1.21%	
Dual eligible (%)						

(Continues)

TABLE 1 | (Continued)

	Full sample = 3,299,534			Matched sample = 80,292		
	Without (n = 3,155,067)	SMI (n = 144,467)	p	Without SMI (n = 40,146)	SMI (n = 40,146)	p
No	68.99%	29.11%	< 0.001	44.44%	44.44%	0.99
Yes	31.01%	70.89%		55.56%	55.56%	
Elixhauser summative score [mean (std. dev.)]	4.56 (2.21)	4.88 (2.12)	< 0.001	4.76 (1.84)	4.80 (1.86)	0.04
Hospital LOS [mean (std. dev.)]	7.13 (6.82)	9.41 (11.92)	< 0.001	6.81 (6.05)	7.97 (8.37)	< 0.001

Abbreviations: ADRD, Alzheimer's disease and related dementias; HRRP, hospital readmission reduction program; LOS, length of stay; MDC, major diagnostic category; RUCA, rural–urban commuting area; SMI, serious mental illness; Std. dev., standard deviation.

TABLE 2 | Organizational characteristics for skilled nursing facility (SNF)-admitted patients with versus without serious mental illness (SMI) between 2017 and 2019, presented at the patient transfer level of observation. Within-sample comparisons reflect chi-squared tests for categorical variables and t-tests for continuous variables.

	Full sample (N = 3,299,534)			Overall		
	2017	2018	2019	Total without SMI (n = 3,155,061)	Total with SMI (n = 144,467)	p
Distance between hospital & SNF [median (IQR)]	4.42 (9.50)	4.49 (9.63)	4.43 (9.17)	4.43 (9.45)	4.67 (9.77)	< 0.001
Profit status (%)						
For profit	66.84%	66.14%	63.91%	65.16%	75.80%	< 0.001
Non-profit	28.72%	28.93%	7.66%	29.19%	17.84%	
Multi-facility/chain affiliated (%)						
No	37.54%	37.53%	36.70%	37.24%	37.57%	< 0.001
Yes	56.30%	55.17%	52.50%	54.56%	56.68%	
Rural–urban commuting area (%)						
Metropolitan	78.26%	78.07%	76.19%	77.47%	78.15%	< 0.001
Micropolitan	10.95%	10.77%	10.31%	10.75%	9.10%	
Small town	4.43%	4.36%	4.10%	4.29%	4.39%	
Rural	1.81%	1.76%	1.63%	1.73%	1.88%	
Quality rating (%)						
1	4.59%	4.32%	4.12%	4.28%	5.86%	< 0.001
2	9.94%	9.61%	9.43%	9.59%	11.28%	
3	15.34%	14.95%	14.42%	14.84%	16.24%	
4	20.22%	19.89%	19.12%	19.74%	19.82%	
5	44.38%	44.22%	42.73%	43.97%	39.31%	
% Medicaid	50.05 (24.96)	49.97 (25.01)	49.88 (24.96)	49.45 (24.96)	60.89 (22.73)	< 0.001
% Medicare	22.49 (18.39)	22.45 (18.31)	22.40 (18.16)	22.71 (18.41)	16.84 (14.48)	< 0.001
Occupancy (%)	82.67 (13.42)	82.85 (13.34)	83.02 (13.26)	82.83 (13.36)	83.13 (13.05)	< 0.001
Certified no. beds [mean (std. dev.)]	127.72 (75.70)	127.79 (76.77)	128.20 (77.19)	127.37 (76.24)	139.56 (82.15)	< 0.001

Abbreviations: IQR, interquartile range; SMI, serious mental illness; SNF, skilled nursing facility; Std. dev., standard deviation.

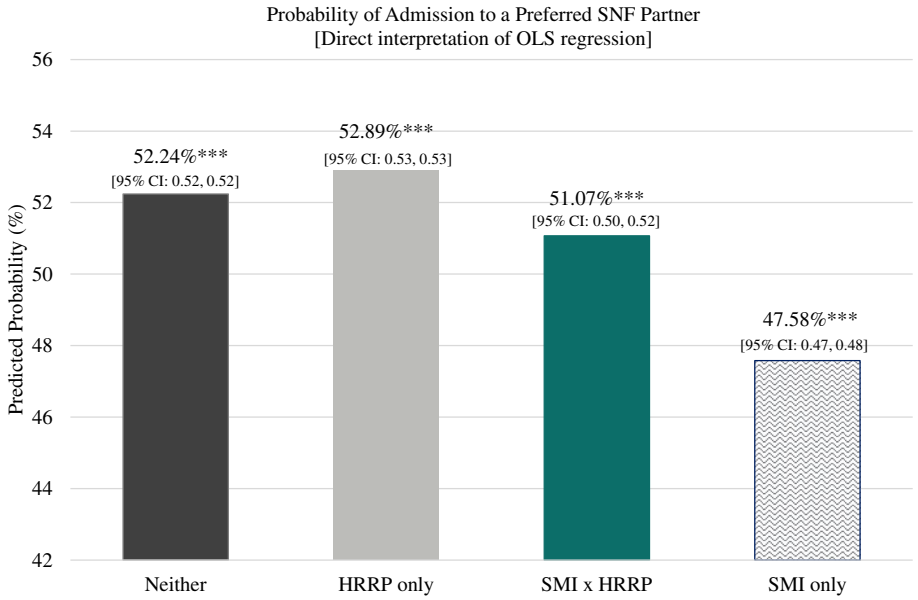

FIGURE 1 | Linear probability model (ordinary least squares (OLS) regression) executed on the full sample (3,299,534) of hospital-to-skilled nursing facility (SNF) transitions between 2017 and 2019. The outcome is a binary measure of whether the patient is admitted to one of their originating hospitals preferred SNF partners, and the primary independent variable of interest is whether the patient has serious mental illness (SMI) only, a hospital readmission reduction program (HRRP) condition only, or a co-occurrence of the two. The model is estimated using clustered robust standard errors and hospital fixed effects. *** denotes significance at $p < 0.001$.

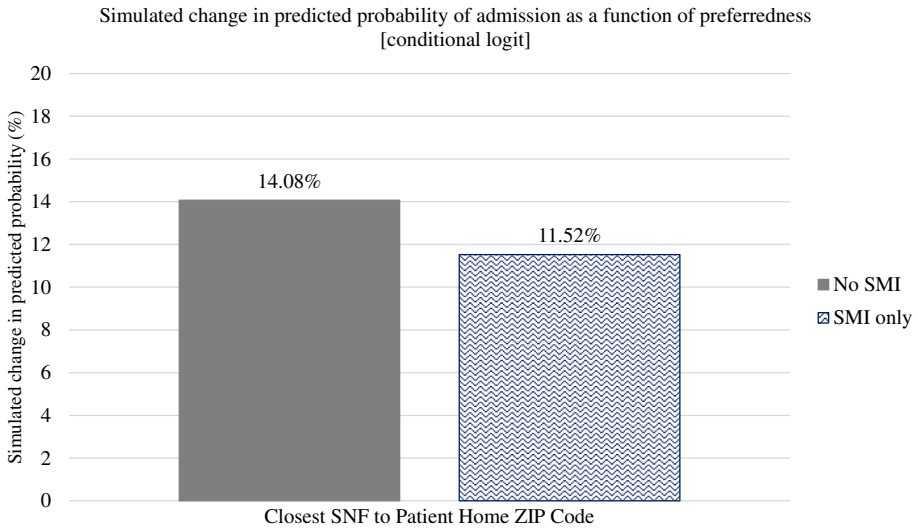

FIGURE 2 | Conditional logistic regression/choice model results presented as simulated average change in predicted probability. We manually calculate the mean of the change in the predicted probability for the closest skilled nursing facility (SNF) in the choice set for patients with and without serious mental illness (SMI). The value presented below is interpreted as the change in the likelihood of an individual being discharged to the *closest* SNF in their choice set if that SNF were preferred versus not preferred, with all other characteristics of the closest and competing SNFs unchanged. Findings are significant at $p < 0.001$.

hospital-directed, informal integration efforts allow hospitals to manage their patients through the continuum of care, better positioning them to control both cost and quality of the care trajectory [22–25]. However, our results suggest that hypothesized benefits that come from concentrated investments in transitional care practices—a key benefit of preferred partner status—may not systematically extend to individuals with mental and behavioral health conditions. This is concerning because these patients could disproportionately benefit from more robust transitional care practices, given that they are at an increased risk of poor outcomes, including hospital readmission and medication errors [16,62–64]. The divergent placement practices we identify in this study may be a mechanism to help explain, and ultimately mitigate, these disparities, given the documented association of patients with SMI receiving care at lower-quality facilities (e.g., CMS star rating, deficiency citations) [11–15,40,47,48]. And yet, if certain SNFs are exhibiting a willingness to care for a disproportionate share of medically and socially complex patients as a means of adapting to newly emerging relational dynamics with hospital partners, concentrating specialized resources to support this patient population where they are more likely to be placed might be a necessary organizational strategy.

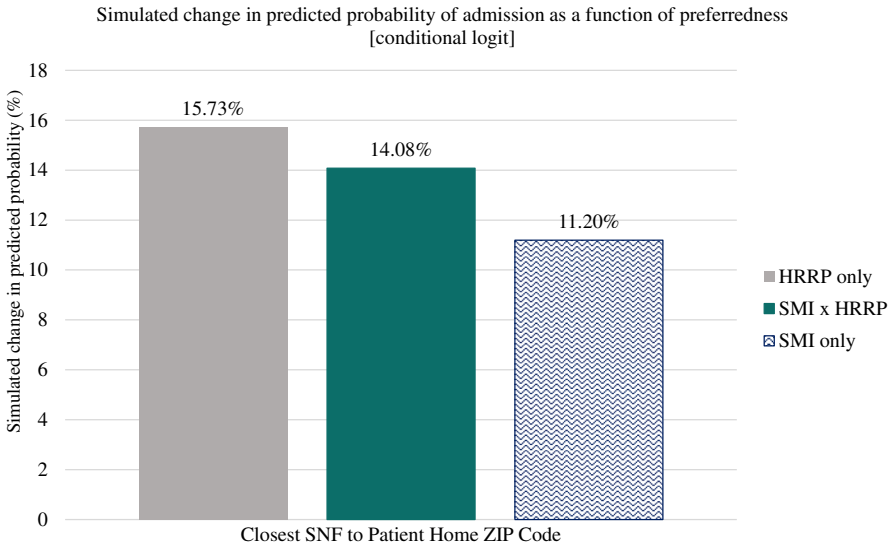

FIGURE 3 | Conditional logistic regression/choice model results presented as simulated average change in predicted probability. We manually calculate the mean of the change in the predicted probability for the closest skilled nursing facility (SNF) in the choice set for patients with serious mental illness (SMI) only versus SMI and a co-occurring hospital readmission reduction program (HRRP) condition. The value presented below is interpreted as the change in the likelihood of an individual being discharged to the *closest* SNF in their choice set if that SNF were preferred versus not preferred, with all other characteristics of the closest and competing SNFs unchanged. Findings are significant at $p < 0.001$.

Our finding that a co-occurring HRRP condition moderates the relationship between SMI diagnosis and a lower probability of admission to hospitals' preferred SNF partners is consistent with existing research describing changes in organizational behavior in response to market incentives [30–32,65]. When hospitals are facing external pressures (i.e., financial penalties) to improve the quality of PAC transitions, they are then more inclined to send target patients—even patients with complex co-occurring conditions like SMI—to SNF providers with whom they maintain closer relationships. While greater integration between hospital and SNF providers has been shown to improve care quality for older adults broadly, it is unclear whether patients with SMI who receive care in higher quality facilities have better outcomes, highlighting an important direction for future work [30].

4.1 | Implications for Policy & Practice

Hospitals will likely continue to prioritize network-based relationships that benefit them financially [22,24,25,30,44,53,66]. Preparation for a successful post-acute period should begin before the SNF stay and hold accountable SNF *and* hospital providers for the quality of transitional care outcomes [20,66,67]. For hospitals, this includes administrative and clinical collaboration efforts [66]. For example, creating clear practices around information sharing and multidisciplinary collaboration during transfers of care that include accreditation-linked guidelines on information completeness (what is captured), timeliness (when information is shared), usability (how information is shared, methods of information retrieval, and overall data usability), and how/when to best engage SNF clinicians [18,68]. Specific to persons with SMI, this might include detailed information on mental/behavioral and social status, as well as the degree of informal care partner involvement and information pertinent to ensuring continuity with behavioral health providers during the SNF stay.

For sustainability and scalability, practice-based solutions require parallel policy change and investment. It is especially important that these policy changes consider the growing proportion of consumers with mental and behavioral health needs [30,39,69,70]. This includes concentrated payment reform efforts centered on more holistically capturing mental, social, and behavioral health needs. For example, amending risk-adjusted payments to separately account for social service needs to better support PAC care delivery that includes behavioral health professionals [71,72]. Better alignment between reimbursement and patient/consumer needs may have the added benefit of better positioning SNFs to adopt and/or develop robust (e.g., comprehensive, accessible) behavioral and mental health services within these settings [39,69,70,73,74].

Lastly, to the extent that integration across acute and post-acute settings continues to grow in response to value-based incentives, organizations will likely be increasingly pushed to think about how to adapt their referral practices to accommodate more than just a set list of physical chronic conditions. While our work shows that individuals with SMI are likely receiving care outside of hospital-driven preferred networks, this serves as only one mechanism to understand divergent placement patterns for this population. A complete picture of how hospital-SNF relationships can be leveraged to improve the quality of care for patients with SMI is limited by a gap in empirical evidence surrounding what it means for a SNF to be adequately equipped to care for patients with specific mental and behavioral health needs [39,75–77]. Further information with respect to what might better position a SNF to provide high-value, high-quality

post-acute care to this growing population of SNF consumers, especially if they are at risk of missing out on the more traditional investments associated with high-volume partnerships, is crucial.

4.2 | Limitations

This study has several limitations. First, it is important to note that when discussing preferredness, we are exploring this concept at the hospital level (i.e., hospital preferred SNF). Although methodologically, a choice model explores individual 'choice' of a skilled provider, choice is likely driven by numerous individual and interpersonal characteristics and circumstances that we cannot capture with secondary administrative data alone. Second, this is a cross-sectional, point-in-time study using a 100% sample of Medicare claims data. Thus, we are unable to assess the more nuanced elements of transitional care planning that would come with direct observation, necessitating future qualitative or mixed-methods research. Third, we recognize that preferredness, as defined solely by shared patient volume, is an imperfect measure of relationship strength. We cannot comment on informal partnerships that may not be tied to volume-based metrics; however, our findings were consistent when considering alternative relationship-based measures (co-location, top-volume). Finally, the mechanism by which we capture and record diagnoses assumes consistent coding in claims data. We cannot identify the length of SMI diagnosis, and instead, we rely on hospital-associated conditions, assuming the initial diagnosis is unlikely to occur in older adulthood.

4.3 | Conclusion

Hospitalized individuals with SMI experience restricted access to post-acute placement at high-volume preferred SNFs, where investments in transitional care practices are known to be concentrated. Policy solutions include a mix of targeted approaches to both address selection behavior and improve the quality of transitional care practices across all SNF partners. This includes policies that prioritize robust and transparent information-sharing practices, aligning payment and reimbursement structures to reflect integration across acute and post-acute providers, and resourcing organizational adaptability among facilities that disproportionately care for complex patients (i.e., risk-adjustments for social service needs).

Acknowledgments

This project was supported by the Agency for Healthcare Research and Quality (AHRQ) under grant number R36HS029644 [T. Bucy] and by the National Institute on Aging (NIA) under grant number(s) R03AG072215 [D. Cross] and RF1AG082011 [D. Maust]. The open access use of LTCFocus data is sponsored by the National Institute on Aging [1P01AG027296] through a cooperative agreement with the Brown University School of Public Health.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the Centers for Medicare & Medicaid Services (CMS). Restrictions apply to the availability of these data, which were used under license for this study. Data are available from https://resdac.org/ with the permission of the Centers for Medicare & Medicaid Services (CMS).

References

1. Medicare Payment Advisory Commission, "Health Care Spending and the Medicare Program" Medicare Payment Advisory Commission (MedPAC) (2023), https://www.medpac.gov/document-type/report/.

2. S. Schotland, R. M. Werner, and J. Weiner, "Medicare Payment Policy for Post-Acute Care in Nursing Homes" (2023), https://ldi.upenn.edu/our-work/research-updates/medicare-payment-policy-for-post-acute-care-in-nursing-homes/.

3. Medicare Payment Advisory Comission, "Chapter 7: Skilled Nursing Facility Services," in *Report to Congress* (2023), https://www.medpac.gov/wp-content/uploads/2023/03/Ch7_Mar23_MedPAC_Report_To_Congress_SEC.pdf.

4. National Institute of Mental Health, "Mental Illness" (2024), https://www.nimh.nih.gov/health/statistics/mental-illness.

5. L. S. Richmond-Rakerd, S. D'Souza, B. J. Milne, A. Caspi, and T. E. Moffitt, "Longitudinal Associations of Mental Disorders With Physical Diseases and Mortality Among 2.3 Million New Zealand Citizens," *JAMA Network Open* 4, no. 1 (2021): e2033448, https://doi.org/10.1001/jamanetworkopen.2020.33448.

6. J. Wertz, A. Caspi, A. Ambler, et al., "Association of History of Psychopathology With Accelerated Aging at Mi Dlife," *JAMA Psychiatry* 78, no. 5 (2021): 530–539, https://doi.org/10.1001/jamapsychiatry.2020.4626.

7. O. M. Wolkowitz, "Accelerated Biological Aging in Serious Mental Disorders," *World Psychiatry* 17, no. 2 (2018): 144–145, https://doi.org/10.1002/wps.20546.

8. K. M. Scott, C. Lim, A. Al-Hamzawi, et al., "Association of Mental Disorders With Subsequent Chronic Physical Conditions: World Mental Health Surveys From 17 Countries," *JAMA Psychiatry* 73, no. 2 (2016): 150–158, https://doi.org/10.1001/jamapsychiatry.2015.2688.

9. A. Simning, J. Orth, H. Temkin-Greener, Y. Li, K. V. Simons, and Y. Conwell, "Skilled Nursing Facility-To-Home Trajectories for Older Adults With Mental Illness or Dementia," *American Journal of Geriatric Psychiatry* 30, no. 2 (2022): 223–234, https://doi.org/10.1016/j.jagp.2021.06.013.

10. R. Fremont, C. Hicks, and H. Pincus, "Care Transitions for Older Adults With Serious Mental Illness: Triple Jeopardy for the Triple Aim," *American Journal of Geriatric Psychiatry* 28, no. 3 (2020): 378–380, https://doi.org/10.1016/j.jagp.2019.10.001.

11. D. J. Jester, K. Hyer, and J. R. Bowblis, "Quality Concerns in Nursing Homes That Serve Large Proportions of Residents With Serious Mental Illness," *Gerontologist* 60, no. 7 (2020): 1312–1321, https://doi.org/10.1093/geront/gnaa044.

12. D. J. Jester, V. Molinari, J. R. Bowblis, D. Dobbs, J. C. Zgibor, and R. Andel, "Abuse and Neglect in Nursing Homes: The Role of Serious Mental Illness," *Gerontologist* 62, no. 7 (2022): 1038–1049, https://doi.org/10.1093/geront/gnab183.

13. K. Aschbrenner, D. C. Grabowski, S. Cai, S. J. Bartels, and V. Mor, "Nursing Home Admissions and Long-Stay Conversions Among Persons With and Without Serious Mental Illness," *Journal of Aging & Social Policy* 23, no. 3 (2011): 286–304, https://doi.org/10.1080/08959420.2011.579511.

14. Y. Li, X. Cai, and P. Cram, "Are Patients With Serious Mental Illness More Likely to Be Admitted to Nursing Homes With More Deficiencies in Care?," *Medical Care* 49, no. 4 (2011): 397–405, https://doi.org/10.1097/MLR.0b013e318202ac10.

15. T. Bucy, K. Moeller, J. R. Bowblis, et al., "Serious Mental Illness in the Nursing Home Literature: A Scoping Review," *Gerontology and Geriatric Medicine* 8 (2022): 23337214221101260, https://doi.org/10.1177/23337214221101260.

16. H. Temkin-Greener, L. Campbell, X. Cai, M. J. Hasselberg, and Y. Li, "Are Post-Acute Patients With Behavioral Health Disorders Admitted to Lower-Quality Nursing Homes?," *American Journal of Geriatric Psychiatry* 26, no. 6 (2018): 643–654, https://doi.org/10.1016/j.jagp.2018.02.005.

17. P. A. Valverde, R. Ayele, C. Leonard, E. Cumbler, R. Allyn, and R. E. Burke, "Gaps in Hospital and Skilled Nursing Facility Responsibilities During Transitions of Care: A Comparison of Hospital and SNF Clinicians' Perspectives," *Journal of General Internal Medicine* 36, no. 8 (2021): 2251–2258, https://doi.org/10.1007/s11606-020-06511-9.

18. M. C. Britton, G. M. Ouellet, K. E. Minges, M. Gawel, B. Hodshon, and S. I. Chaudhry, "Care Transitions Between Hospitals and Skilled Nursing Facilities: Perspectives of Sending and Receiving Providers," *Joint Commission Journal on Quality and Patient Safety* 43, no. 11 (2017): 565–572, https://doi.org/10.1016/j.jcjq.2017.06.004.

19. K. S. Thomas, M. Rahman, V. Mor, and O. Intrator, "Influence of Hospital and Nursing Home Quality on Hospital Readmissions," *American Journal of Managed Care* 20, no. 11 (2014): e523–e531.

20. R. E. Burke, J. Phelan, D. Cross, R. M. Werner, and J. Adler-Milstein, "Integration Activities Between Hospitals and Skilled Nursing Facilities: A National Survey," *Journal of the American Medical Directors Association* 22, no. 12 (2021): 2565–2570 In en, https://doi.org/10.1016/j.jamda.2021.05.005.

21. "Q&A: On the Risks and Benefits of Preferred Skilled-Nursing Networks and Other Improvement Strategies" (2018), https://www.commonwealthfund.org/publications/2018/mar/qa-risks-and-benefits-preferred-skilled-nursing-networks-and-other.

22. V. Mor, M. Rahman, and J. McHugh, "Accountability of Hospitals for Medicare Beneficiaries' Postacute Care Discharge Disposition," *JAMA Internal Medicine* 176, no. 1 (2016): 119–121, https://doi.org/10.1001/jamainternmed.2015.6508.

23. J. P. McHugh, A. Foster, V. Mor, et al., "Reducing Hospital Readmissions Through Preferred Networks of Skilled Nursing Facilities," *Health Affairs* 36, no. 9 (2017): 1591–1598, https://doi.org/10.1377/hlthaff.2017.0211.

24. J. P. McHugh, J. Zinn, R. R. Shield, et al., "Strategy and Risk Sharing in Hospital–Postacute Care Integration," *Health Care Management Review* 45, no. 1 (2020): 73–82, https://doi.org/10.1097/HMR.0000000000000204.

25. J. P. McHugh, T. Rapp, V. Mor, and M. Rahman, "Higher Hospital Referral Concentration Associated With Lower-Risk Patients in Skilled Nursing Facilities," *Health Services Research* 56, no. 5 (2021): 839–846, https://doi.org/10.1111/1475-6773.13654.

26. B. Uzzi, "The Sources and Consequences of Embeddedness for the Economic Performance of Organizations: The Network Effect," *American Sociological Review* 61, no. 4 (1996): 674–698, https://doi.org/10.2307/2096399.

27. P. D. Shay and S. S. Mick, "Post-Acute Care and Vertical Integration After the Patient Protection and Affordable Care Act," *Journal of Healthcare Management* 58, no. 1 (2013): 15–27.

28. J. Banaszak-Holl, J. S. Zinn, and V. Mor, "The Impact of Market and Organizational Characteristics on Nursing Care Facility Service Innovation: A Resource Dependency Perspective," *Health Services Research* 31, no. 1 (1996): 97–117.

29. J. S. Zinn, V. Mor, and P. Gozalo, *Market and Regulatory Forces and the Transformation of the Nursing Facility Industry* (Advances in Health Care Management: Emerald Group Publishing Limited, 2000), 369–391.

30. R. Shield, U. Winblad, J. McHugh, E. Gadbois, and D. Tyler, "Choosing the Best and Scrambling for the Rest: Hospital-Nursing Home Relationships and Admissions to Post-Acute Care," *Journal of Applied Gerontology: The Official Journal of the Southern Gerontological Society* 38, no. 4 (2019): 479–498, https://doi.org/10.1177/0733464817752084.

31. D. A. Cross, T. I. Bucy, M. Rahman, and J. P. McHugh, "Access to Preferred Skilled Nursing Facilities: Transitional Care Pathways for Patients With Alzheimer's Disease and Related Dementias," *Health Services Research* 59, no. 2 (2023): e14263, https://doi.org/10.1111/1475-6773.14263.

32. M. Rahman, D. C. Grabowski, P. L. Gozalo, K. S. Thomas, and V. Mor, "Are Dual Eligibles Admitted to Poorer Quality Skilled Nursing Facilities?," *Health Services Research* 49, no. 3 (2014): 798–817, https://doi.org/10.1111/1475-6773.12142.

33. J. Payne and J. Leiter, "Structuring Agency: Examining Healthcare Management in the USA and Australia Using Organizational Theory," *Journal of Health Organization and Management* 27, no. 1 (2013): 106–126, https://doi.org/10.1108/14777261311311825.

34. "CMS' Value-Based Programs | Centers for Medicare & Medicare Services", https://www.cms.gov/medicare/quality/value-based-programs.

35. M. L. Barnett, J. Hsu, and J. M. McWilliams, "Contribution of Patient Characteristics to Differences in Readmission Rates," *JAMA Internal Medicine* 175, no. 11 (2015): 1803–1812, https://doi.org/10.1001/jamainternmed.2015.4660.

36. Medicare Payment Advisory Commission, "Mandated Report: The Effects of the Hospital Readmissions Reduction Program" (2019), https://www.medpac.gov/wp-content/uploads/import_data/scrape_files/docs/default-source/reports/jun18_ch1_medpacreport_rev_nov2019_v2_note_sec.pdf.

37. J. M. Liao, R. T. Konetzka, and R. M. Werner, "Trends in Hospital-SNF Relationships in the Care of Medicare Beneficiaries," *Health* 6, no. 3 (2018): 175–179, https://doi.org/10.1016/j.hjdsi.2018.05.001.

38. B. H. Bardenheier, M. Rahman, C. Kosar, R. M. Werner, and V. Mor, "Successful Discharge to Community Gap of FFS Medicare Beneficiaries With and Without ADRD Narrowed," *Journal of the American Geriatrics Society* 69, no. 4 (2021): 972–978 In en, https://doi.org/10.1111/jgs.16965.

39. L. B. Gerlach and D. T. Maust, "Falling off a Cliff: Psychiatric Care of Nursing Home Residents," *Journal of the American Geriatrics Society* 71, no. 4 (2023): 1014–1016, https://doi.org/10.1111/jgs.18249.

40. D. C. Grabowski, K. A. Aschbrenner, Z. Feng, and V. Mor, "Mental Illness in Nursing Homes: Variations Across States," *Health Affairs* 28, no. 3 (2009): 689–700, https://doi.org/10.1377/hlthaff.28.3.689.

41. R. G. Jackson, R. Patel, N. Jayatilleke, et al., "Natural Language Processing to Extract Symptoms of Severe Mental Illness From Clinical Text: The Clinical Record Interactive Search Comprehensive Data Extraction (CRIS-CODE) Project," *BMJ Open* 7, no. 1 (2017): e012012, https://doi.org/10.1136/bmjopen-2016-012012.

42. R. Jacobs, L. Aylott, C. Dare, et al., *The Association Between Primary Care Quality and Health-Care Use, Costs and Outcomes for People With Serious Mental Illness: A Retrospective Observational Study* (NIHR Journals Library, 2020).

43. K. Train, *Discrete Chocie Methods With Simulation*, 2nd ed. (Cambridge University Press, 2009).

44. M. Rahman, A. D. Foster, D. C. Grabowski, J. S. Zinn, and V. Mor, "Effect of Hospital–SNF Referral Linkages on Rehospitalization," *Health Services Research* 48, no. 6 Pt 1 (2013): 1898–1919, https://doi.org/10.1111/1475-6773.12112.

45. E. M. White, C. M. Kosar, M. Rahman, and V. Mor, "Trends in Hospitals and Skilled Nursing Facilities Sharing Medical Providers, 2008-16," *Health Affairs* 39, no. 8 (2020): 1312–1320, https://doi.org/10.1377/hlthaff.2019.01502.

46. G. Kennedy, V. A. Lewis, S. Kundu, J. Mousques, and C. H. Colla, "Accountable Care Organizations and Post-Acute Care: A Focus on Preferred SNF Networks," *Medical Care Research and Review* 77, no. 4 (2020): 312–323, https://doi.org/10.1177/1077558718781117.

47. M. Rahman, D. C. Grabowski, O. Intrator, S. Cai, and V. Mor, "Serious Mental Illness and Nursing Home Quality of Care," *Health Services Research* 48, no. 4 (2013): 1279–1298 In en, https://doi.org/10.1111/1475-6773.12023.

48. H. Xu, O. Intrator, E. Culakova, and J. R. Bowblis, "Changing Landscape of Nursing Homes Serving Residents With Dementia and Mental Illnesses," *Health Services Research* 57, no. 3 (2022): 505–514 In en, https://doi.org/10.1111/1475-6773.13908.

49. E. A. Gadbois, D. A. Tyler, and V. Mor, "Selecting a Skilled Nursing Facility for Post-Acute Care: The Patient and Family Perspective Running Title: Skilled Nursing Facility Selection," *Journal of the American Geriatrics Society* 65, no. 11 (2017): 2459–2465, https://doi.org/10.1111/jgs.14988.

50. Tidygeocoder. https://cran.r-project.org/web/packages/tidygeocoder/vignettes/tidygeocoder.html.

51. R. Picard, "GEODIST: Stata Module to Compute Geographical Distances," *Statistical Software Components* (2019), https://ideas.repec.org//c/boc/bocode/s457147.html.

52. Readmission Measures Methodology, https://qualitynet.cms.gov/inpatient/measures/readmission/methodology.

53. M. Rahman, J. McHugh, P. L. Gozalo, D. C. Ackerly, and V. Mor, "The Contribution of Skilled Nursing Facilities to Hospitals' Readmission Rate," *Health Services Research* 52, no. 2 (2017): 656–675 (In eng)., https://doi.org/10.1111/1475-6773.12507.

54. P. J. Huckfeldt, L. Weissblum, J. J. Escarce, P. Karaca-Mandic, and N. Sood, "Do Skilled Nursing Facilities Selected to Participate in Preferred Provider Networks Have Higher Quality and Lower Costs?," *Health Services Research* 53, no. 6 (2018): 4886–4905, https://doi.org/10.1111/1475-6773.13027.

55. G. Feng, X. Li, and Z. Wang, "Technical Note—On the Relation Between Several Discrete Choice Models," *Operations Research* 65, no. 6 (2017): 1516–1525, https://doi.org/10.1287/opre.2017.1602.

56. D. McFadden, *Modelling the Choice of Residential Location*, Cowles Foundation for Research in Economics, Yale University (1977), 477, https://econpapers.repec.org/paper/cwlcwldpp/477.htm.

57. D. McFadden, "Conditional Logit Analysis of Qualitative Choice Behavior," In *Frontiers in Econometrics*, edited by P. Zarembka. (Academic Press, 1973), 105–142.

58. O. F. Jarrin, A. N. Nyandege, I. B. Grafova, X. Dong, and H. Lin, "Validity of Race and Ethnicity Codes in Medicare Administrative Data Compared With Gold-Standard Self-Reported Race Collected During Routine Home Health Care Visits," *Medical Care* 58, no. 1 (2020): e1–e8, https://doi.org/10.1097/MLR.0000000000001216.

59. T. P. Shippee, C. D. Fabius, S. Fashaw-Walters, et al., "Evidence for Action: Addressing Systemic Racism Across Long-Term Services and Supports," *Journal of the American Medical Directors Association* 23, no. 2 (2022): 214–219, https://doi.org/10.1016/j.jamda.2021.12.018.

60. T. Bucy, K. Moeller, T. Skarphol, et al., "Serious Mental Illness in Nursing Homes: Stakeholder Perspectives on the Federal Preadmission Screening Program," *Journal of Aging & Social Policy* 34, no. 5 (2022): 1–19, https://doi.org/10.1080/08959420.2022.2083882.

61. Provider Information | Provider Data Catalog, Centers for Medicare & Medicaid Services, https://data.cms.gov/provider-data/dataset/4pq5-n9py.

62. E. A. Coleman, "Falling Through the Cracks: Challenges and Opportunities for Improving Transitional Care for Persons With Continuous Complex Care Needs," *Journal of the American Geriatrics Society* 51, no. 4 (2003): 549–555, https://doi.org/10.1046/j.1532-5415.2003.51185.x.

63. H. D. Germack, M. Noor-E-Alam, X. Wang, and N. Hanrahan, "Association of Comorbid Serious Mental Illness Diagnosis With 30-Day Medical and Surgical Readmissions," *JAMA Psychiatry* 76, no. 1 (2019): 96–98, https://doi.org/10.1001/jamapsychiatry.2018.3091.

64. S. R. Roberts, J. Crigler, C. Ramirez, D. Sisco, and G. L. Early, "Working With Socially and Medically Complex Patients: When Care Transitions Are Circular, Overlapping, and Continual Rather Than Linear and Finite," *Journal for Healthcare Quality* 37, no. 4 (2015): 245, https://doi.org/10.1097/JHQ.0000000000000006.

65. K. L. Kim, L. Li, M. Kuang, L. I. Horwitz, and S. M. Desai, "Changes in Hospital Referral Patterns to Skilled Nursing Facilities Under the Hospital Readmissions Reduction Program," *Medical Care* 57, no. 9 (2019): 695–701, https://doi.org/10.1097/MLR.0000000000001169.

66. M. Rahman, E. A. Gadbois, D. A. Tyler, and V. Mor, "Hospital–Skilled Nursing Facility Collaboration: A Mixed-Methods Approach to Understanding the Effect of Linkage Strategies," *Health Services Research* 53, no. 6 (2018): 4808–4828, https://doi.org/10.1111/1475-6773.13016.

67. M. D. Naylor, E. C. Shaid, D. Carpenter, et al., "Components of Comprehensive and Effective Transitional Care," *Journal of the American Geriatrics Society* 65, no. 6 (2017): 1119–1125. (In eng), https://doi.org/10.1111/jgs.14782.

68. M. C. Labson, "Adapting the Joint Commission's Seven Foundations of Safe and Effective Transitions of Care to Home," *Home Healthcare Now* 33, no. 3 (2015): 142–146, https://doi.org/10.1097/NHH.0000000000000195.

69. A. Muralidharan, W. L. Mills, D. R. Evans, D. Fujii, and V. Molinari, "Preparing Long-Term Care Staff to Meet the Needs of Aging Persons With Serious Mental Illness," *Journal of the American Medical Directors Association* 20, no. 6 (2019): 683–688, https://doi.org/10.1016/j.jamda.2019.03.018.

70. J. Orth, Y. Li, A. Simning, and H. Temkin-Greener, "Providing Behavioral Health Services in Nursing Homes Is Difficult: Findings From a National Survey," *Journal of the American Geriatrics Society* 67, no. 8 (2019): 1713–1717, https://doi.org/10.1111/jgs.16017.

71. E. Plys, C. R. Levy, L. A. Brenner, and A.-M. Vranceanu, "Let's Integrate! The Case for Bringing Behavioral Health to Nursing Home-Based Post-Acute and Subacute Care," *Journal of the American Medical Directors Association* 23, no. 9 (2022): 1461–1467, https://doi.org/10.1016/j.jamda.2022.06.004.

72. Patient Driven Payment Model | Centers for Medicare & Medicaid Services, https://www.cms.gov/medicare/payment/prospective-payment-systems/skilled-nursing-facility-snf/patient-driven-model.

73. A. Ulyte, A. Mehrotra, H. A. Huskamp, D. C. Grabowski, and M. L. Barnett, "Specialty Care After Transition to Long-Term Care in Nursing Home," *Journal of the American Geriatrics Society* 71, no. 4 (2023): 1058–1067, https://doi.org/10.1111/jgs.18129.

74. About Us–Center for Excellence for Behavioral Health in Nursing Facilities, https://nursinghomebehavioralhealth.org/about-us/.

75. D. Gammonley, X. Wang, K. Simons, K. M. Smith, and M. Bern-Klug, "Serious Mental Illness in Nursing Homes: Roles and Perceived Competence of Social Services Directors," *Journal of Gerontological Social Work* 64, no. 7 (2021): 721–739, https://doi.org/10.1080/01634372.2021.1912241.

76. D. C. Grabowski, K. A. Aschbrenner, V. F. Rome, and S. J. Bartels, "Quality of Mental Health Care for Nursing Home Residents: A Literature Review," *Medical Care Research and Review* 67, no. 6 (2010): 627–656, https://doi.org/10.1177/1077558710362538.

77. E. Plys, A. Fleet, G. Epstein-Lubow, M. Bern-Klug, and A. Bonner, "Policy Changes to Promote Better Quality of Life for People With Serious Mental Illness Living in U.S. Nursing Homes," *Public Policy Aging Reports* 34, no. 2 (2024): 65–70, https://doi.org/10.1093/ppar/prae004.

Supporting Information

Additional supporting information can be found online in the Supporting Information section.