Longitudinal Analysis of Medical and Long-Term Services and Supports Use in the National Health and Aging Trends Study

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Funding Statement

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Final Report

Aditi Pathak, Manxi Yang, Jing Dong

**Advancing Evidence.
Improving Lives.**

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Study Purpose and Policy Relevance

This study reports findings from quantitative analyses of patterns of medical and long-term services and supports (LTSS) service use among older Americans, both those who are Medicare eligible only and those dually eligible for Medicare and Medicaid. We describe rates of enrollment among individuals with different characteristics in traditional fee-for-service (FFS) Medicare or Medicare Advantage (MA) managed care plans, including various types of special needs plans (SNPs), some of which (D-SNPs) enroll only dual-eligible seniors. Our study has two primary policy-relevant goals. One is to measure differences in acute and post-acute medical care and LTSS among enrollees in traditional FFS Medicare compared to various types of MA managed care plans, controlling for individual characteristics that might indicate greater or lesser need for these services. Our other primary policy relevant goal is to identify variables that predict transitions of community-dwelling older Americans (aged 65 and older) to nursing home residency (excluding short-term, post-acute stays lasting no more than 30 days). Past research has found that despite the greater prevalence of chronic medical conditions and resulting disabilities at older ages, population aging per se does not determine rates of admission to long-stay nursing home care among older Americans. Other factors affect long-stay nursing home use, and the past several decades have seen a decline in nursing home use even as the U.S. population continues to grow older. Up-to-date information about current rates and predictors of transitions from home- and community-based settings to nursing homes could help to prevent or defer long-stay nursing home admissions.

Nursing homes are one of three settings in which older Americans with chronic illnesses and resulting functional dependencies receive the LTSS they require, which may include paid services; unpaid caregiving from family, friends, and neighbors; or differential combinations of paid and unpaid assistance. The three settings are nursing homes, noninstitutional "assisted living" and related congregate eldercare facilities (to which we will subsequently refer to as "assisted living" even though not all are classified as such for purposes of government regulation), and private homes (where disabled elders reside alone, with spouses, or other family members).

Medicare's post-acute skilled nursing facility benefit, which covers up to 100 days but seldom pays for stays over 3 weeks, is cost-effective in shortening hospital stays and better serves older people who need convalescent care or rehabilitation therapies in skilled nursing facilities. Some

older Americans with chronic conditions and severe disabilities require the amounts and types of 24/7 access to skilled nursing and intensive monitoring of their medical conditions that is cost prohibitive to provide in settings other than nursing homes. The rationale for minimizing otherwise unnecessary long-stay nursing home use to the extent possible is threefold. First, most older people would prefer to live either at home or in the more homelike congregate care settings offered by assisted living. Second, concerns about the quality of LTSS provided in nursing homes compared to home- and community-based care settings have always been greater. Third, nursing homes are the most expensive setting for the provision of LTSS and pose the greatest public (predominantly Medicaid-funded) cost burden.

Data Sources and Methods

We performed multivariate regression analyses on a dataset that linked Medicare/Medicaid administrative data, including FFS claims and managed care plan encounter data, to the National Health and Aging Trends Survey (NHATS). The NHATS gathers information on a nationally representative sample of Medicare beneficiaries aged 65 and older. Annual in-person interviews collect detailed information about functional impairment, cognitive impairment, and activities that are not recorded in insurance claims or encounter data but are important predictors of health care utilization. For example, NHATS includes detailed information about activities of daily living such as eating, bathing, and walking and instrumental activities of daily living; elective but valued activities such as participating in clubs; visiting friends and family; and well-being in terms of feelings, self-efficacy, and self-realization. In addition, the longitudinal nature of the NHATS allows for studying changes over time in outcomes such as functional impairment, cognitive impairment, and participation in activities for different cohorts of participants. The NHATS also collects information about household members, including information about unpaid and paid caregivers based on a detailed roster constructed from different questions in the sample person interview. Analysis of NHATS data linked with Centers for Medicare & Medicaid Services data—Medicare and Medicaid claims and encounter data, and nursing home resident assessment data that contain accurate information about characteristics of health care plans and health care utilization—can help provide a more complete picture of medical care and LTSS utilization among older adults. The NHATS's companion survey, the National Survey of Caregiving, periodically gathers information on NHATS participants' family and unpaid caregivers, including types of care, activities, duration, interactions with health care providers, and payment sources for caregivers, in addition to caregiver characteristics such as employment status as well as physical and mental health.

Until recently, only FFS Medicare and Medicaid data have been available for linkage to NHATS (launched in 2011 and ongoing annually) or its predecessor survey, the National Long-Term Care Survey (first fielded in 1982, again in 1984, and repeated every 5 years until 2004). Lack of

availability of managed care encounter data had become increasingly problematic for research because as of 2024, 54% of Medicare beneficiaries were enrolled in such MA plans.[1] We believe that ours may be the first study to analyze the impact of enrollment in MA managed care plans, including various types of SNPs; in particular, Medicare/Medicaid integrated SNPs that serve only dually eligible seniors on utilization of medical and post-acute care and long-term services and supports.

Findings and Policy Implications

Enrollees in MA managed care plans other than SNPs were found to be roughly comparable with respect to their medical conditions and other individual characteristics to enrollees in traditional FFS Medicare. In other words, non-SNP MA plans are not disproportionately enrolling healthier older adults. However, analyses controlling for individual characteristics found that non-SNP MA plan members used less acute care, post-acute care, and LTSS. D-SNPs enrollees, all of whom are dual eligibles, were more likely to have health conditions and functional disabilities compared to enrollees in other Medicare plan types. However, after controlling for differences in enrollee characteristics, there were no significant differences in the likelihood of emergency department visits and inpatient stays between D-SNP and FFS enrollees, whereas D-SNP enrollees were significantly less likely than FFS enrollees to use home health visits or nursing home care, or to have an outpatient visit. MA plans, including SNPs, are authorized to cover benefits not available in the traditional FFS Medicare program. Traditionally, these were primarily dental, vision, and hearing benefits; however, since 2019 MA plans have been permitted to cover the health and social needs of older Americans who need LTSS due to chronic conditions and functional disabilities. Our study could not address whether or to what extent these kinds of supplemental benefits might play a significant role in preventing or deferring long-stay nursing home use; that is a topic for future research.

FULL REPORT

Introduction

As the United States population ages, the risk of functional disability and chronic conditions, and demand for acute care and long-term services and supports (LTSS) is likely to increase substantially in the coming decades.[2] Acute care involves active treatment for injury or a health condition, whereas LTSS refer to long-term assistance with activities of daily living (ADLs) such as eating, bathing, and walking, or with instrumental activities of daily living (IADLs) such as medication management. Although the total number of Americans needing these services is certain to grow, a variety of factors such as patient demographics, health conditions, caregiver characteristics, and different delivery and payment models for health insurance plans influence rates of acute care and LTSS utilization among older adults.[3,4,5] However, lack of data sources with detailed and accurate information about a broad range of factors has posed serious limitations on studying acute care and LTSS utilization patterns. The National Health and Aging Trends Study (NHATS) data, linked with Medicare fee-for-service (FFS) claims and Medicare Advantage (MA) encounter data, as well as with Medicaid FFS and Managed Care data in the Transformed Medicaid Statistical Information System (T-MSIS), is well suited to comprehensively examine acute care and LTSS use patterns and factors affecting the type and intensity of acute and LTSS use among older adults.

NHATS gathers information on a nationally representative sample of Medicare beneficiaries ages 65 and older. Annual in-person interviews collect detailed information about functional impairment, cognitive impairment, and activities that are not recorded in insurance claims or encounter data but are important predictors of health care utilization. For example, the NHATS includes detailed information about ADLs and IADLs, elective but valued activities such as participating in clubs, visiting friends and family, and well-being in terms of feelings, self-efficacy and self-realization. In addition, the longitudinal nature of the NHATS allows for studying changes over time in outcomes such as functional impairment, cognitive impairment, and participation in activities for different cohorts of participants. The NHATS also collects information about household members, including information about unpaid and paid caregivers based on a detailed roster constructed from different questions in the sample person interview. Analysis of NHATS data linked with CMS data—Medicare and Medicaid claims and encounter data, and minimum data set (MDS) that contain accurate information about characteristics of health care plans and health care utilization—can help provide a more complete picture of medical care and LTSS utilization among older adults. In addition, the National Survey of Caregiving (NSOC) periodically gathers information on NHATS participants'

family and unpaid caregivers, including types of care activities, duration, interactions with health care providers, and payment sources for caregivers, in addition to caregiver characteristics such as employment status, and physical and mental health.

This project examines the ways in which acute and long-term service utilization patterns of older adults vary by the type of Medicare plans they are enrolled in and by own and caregiver characteristics.

Objectives and Research Questions

This project uses linked NHATS and CMS data from 2015 to 2019 and focuses on two key areas:

- **Focus Area 1**. Characteristics and patterns of acute and LTSS utilization of enrollees in Medicare managed care plans

- **Focus Area 2**. Predictors of nursing home placement

Focus Area 1. Characteristics and patterns of acute and long-term care utilization of enrollees in Medicare managed care plans. For older adults, Medicare is the primary source of coverage for acute and post-acute care services including skilled nursing facilities and home health care for a limited period of time following a hospital stay. The federal–state Medicaid program finances LTSS for older people who meet the means-tested eligibility and need-based coverage criteria in the states where they live. Older adults not financially eligible for Medicaid who receive paid LTSS typically pay for these services privately (either out of pocket or through private long-term care insurance coverage) although small numbers receive other publicly funded assistance (e.g., from the Veterans Administration or Older Americans Act, or state revenue-funded programs). Medicare is the largest payer of acute and post-acute care for older adults and pays for more than 66% of all healthcare costs of adults ages 65 and over.[6] Medicaid is the largest payer of LTSS, financing more than 44% of all paid LTSS in 2021.[7] Effectively, Medicare and Medicaid service delivery and payment models play an important role in predicting acute, post-acute, and LTSS service use patterns.

The traditional Medicare (Part A) used an FFS model, in which the program reimbursed providers a fixed fee for each service provided. In recent years, however, enrollment in managed care models in which the program contracts with private health insurance plans to provide covered services for a fixed monthly payment per beneficiary has increased considerably. Enrollment in Medicare managed care plans, i.e. MA plans increased from 11 million in 2010 or 25% of all Medicare enrollees to 31 million in 2023, representing 54% of all Medicare enrollees.[8] MA Special Needs Plans (SNPs)--which enroll Medicare beneficiaries who

are dually eligible for Medicare and Medicaid, have certain chronic conditions, or are institutionalized, accounted for more than 30% of the growth in MA plans between 2017 and 2023. But little is known about enrollee characteristics and healthcare utilization across types and SNPs and how they compare with traditional fee-for-service Medicare and non-SNP MA plans. We conduct multivariate analyses to understand how enrollee characteristics, and acute and LTSS use patterns differ according to the participation of beneficiaries among FFS, MA SNPs and non-SNP MA plans.

Under Focus Area 1, we aim to address two research questions:

- **Research Question 1 (characteristics of enrollees across FFS and managed care plans)**. How do characteristics of enrollees in various types or combinations of Medicare and Medicaid FFS and managed care plans differ? Are older adults who enroll in D-SNPs more severely functionally or cognitively impaired than those who elect traditional FFS Medicare or who enroll in non-SNP MA managed care plans?

- **Research Question 2 (acute and LTSS use patterns under FFS and managed care plans)**. After controlling for differences in functional and cognitive impairment status and other measures available in NHATS, how do acute and LTSS use patterns differ according to enrollment in Medicare FFS and MA managed care plans?

Focus Area 2. Predictors of long-term nursing home placement. Currently, more than 6.3 million older adults and individuals with disabilities need LTSS or medical and nonmedical services necessary to perform daily activities such as eating and bathing.[9] Costs of receiving LTSS in institutional settings are often prohibitive.[10] And people receiving LTSS in institutional settings such as nursing homes are more likely than those receiving home or community based long-term care to experience preventable adverse health outcomes including falls, delirium, drug events, health care–associated infections and overuse of antipsychotic medications.[11,12,13] Furthermore, older adults consistently report a preference to age in their own homes and communities. Accordingly, states have implemented policies to expand home and community-based services (HCBS) under Medicaid and other public programs to reduce unnecessary institutionalization of people whose needs can be met in community-based settings. Thus, understanding factors that predict placement in institutional settings such as nursing homes for LTSS is important to inform targeted efforts for providing HCBS, as well as policies related to healthcare, housing, and caregiver supports to meet LTSS needs of older adults in the community.

In this study, we estimate prediction models to examine long-stay nursing home placement using individual and caregiver characteristics as key independent variables. In addition, while

controlling for individual and caregiver characteristics, we examine whether and how enrollment in Medicare managed care plans predict long-term care placement.

Under Focus Area 2, we answer the following research question:

- **Research Question 3 (predictors of nursing home placement among Medicare population).** What are the characteristics of enrollees (Medicare-only or dually eligible individuals) and their informal family caregivers that predict long-stay nursing home admissions? Controlling for these factors, are long-stay nursing home admissions influenced by enrollment in Medicare FFS and MA managed care plans?

Data and Methods

We performed multivariate regression analyses on a dataset that linked Medicare/Medicaid administrative data, including fee-for-service claims and managed care plan encounter data, to the National Health and Aging Trends Survey (NHATS) over four years (2015–2019). The NHATS gathers information on a nationally representative sample of Medicare beneficiaries aged 65 and older. Annual in-person interviews collect detailed information about functional impairment, cognitive impairment, and activities that are not recorded in insurance claims or encounter data but are important predictors of health care utilization. For example, the NHATS includes detailed information about ADLs and IADLs, elective but valued activities such as participating in clubs, visiting friends and family, and well-being in terms of feelings, self-efficacy and self-realization. These data can be used to measure the extent of community integration versus social isolation among older Americans. In addition, the longitudinal nature of the NHATS allows for studying changes over time in outcomes such as functional impairment, cognitive impairment, and participation in activities for different cohorts of participants. The NHATS also collects information about household members, including information about unpaid and paid caregivers based on a detailed roster constructed from different questions in the sample person interview. Analysis of NHATS data linked with CMS data—Medicare and Medicaid claims and encounter data, and MDS that contain accurate information about characteristics of health care plans and health care utilization—can help provide a more complete picture of medical care and LTSS utilization among older adults. In addition, the National Survey of Caregiving (NSOC) periodically gathers information on NHATS participants' family and unpaid caregivers, including types of care activities, duration, interactions with health care providers, and payment sources for caregivers, in addition to caregiver characteristics such as employment status, and physical and mental health. Analysis of NHATS/NSOC data enabled us to investigate the role of community integration versus social

isolation among older Americans and family caregivers' reports to experiencing various forms of caregiver stress (e.g. financial, physical, and emotional) on disabled older Americans' transitions from the community to long-stay nursing home care.

Until recently, only fee-for-service Medicare and Medicaid data had been available for linkage to NHATS (launched in 2011 and ongoing annually) or its predecessor survey, the National Long-Term Care Survey (first fielded in 1982, again in 1984 and repeated every five years until 2004). Lack of availability of managed care encounter data had become increasingly problematic for research because as of 2024, 54% of Medicare beneficiaries were enrolled in such Medicare Advantage plans.[14] We believe that ours is the first study to analyze the impact of enrollment in Medicare Advantage managed care plans, including various types of special needs plans (SNPs); in particular, Medicare/Medicaid integrated SNPs that serve only dually eligible seniors.

Focus Area 1. Characteristics and Patterns of Acute and Long-Term Care Utilization of Enrollees in Medicare Managed Care Plans

Introduction

The share of enrollment in Medicare managed care or MA plans has doubled, from 25% in 2010 to 51% in 2023, among all Medicare enrollees.[15] With iterative legislative and regulatory changes, the MA program has become increasingly diverse in terms of the enrollee population and types of plans to address health care needs of specific populations.[16,17] For example, as of 2019, half of all Black Medicare beneficiaries and 56% of Hispanic beneficiaries were enrolled in a MA plan, compared with 37% of White beneficiaries.[18] Furthermore, introduction of MA Special Needs Plans (SNPs), specifically designed to provide targeted care and limit enrollment to special needs individuals such as dually-eligible beneficiaries and individuals with chronic conditions, have resulted in a growing share of these population groups in the MA program.

SNPs, a subset of plans within the MA program, were launched in 2006 to serve specific populations within Medicare managed care. There are three types of SNPs: dual eligible SNPs (D-SNPs), institutional SNPs (I-SNPs) and chronic conditions SNPs (C-SNPs). D-SNPs only enroll dually eligible beneficiaries; I-SNPs serve individuals who are in institutions or receiving LTSS in the community; and C-SNPs serve individuals with specific chronic conditions. Approximately 85% of all SNP enrollees are in D-SNPs, 10% are in C-SNPs and about 2% are enrolled in I-SNPs. Enrollment in all three types of SNPs has been growing steadily in recent years.[19] Despite their increasing importance in delivery and payment for Medicare enrollees, little is known about the characteristics of enrollees or utilization patterns of enrollees in these MA plans and how they compare with FFS and non-SNP MA plans.

Medicare enrollees may choose to enroll in MA plans for various reasons including supplemental benefits such as dental and vision coverage, or to allow for streamlining between Medicare Parts A, B and D services.[20] Within MA plans, enrollees may further select between the different types of plans based on their healthcare needs and plan features. For example, D-SNPs solely enroll dually eligible individuals, and state Medicaid agencies can use their contracts with D-SNPs to integration of Medicare and Medicaid benefits. Dually eligible beneficiaries may enroll in D-SNPs for better care coordination, as they often have serious health conditions that may require complex medical services to be coordinated between Medicare and Medicaid. D-SNPs represent the largest category of SNPs in terms of enrollment and number of plans offered.[19] I-SNPs restrict enrollment to MA-eligible individuals who, for 90 days or longer, have had or are expected to need the level of services provided in a long-term care skilled nursing

facility (SNF), a long-term nursing facility (NF), a SNF/NF, an intermediate care facility for individuals with intellectual disabilities, or an inpatient psychiatric facility. Accordingly, individuals with advanced LTSS needs, those with severe functional or cognitive impairment are likely to be enrolled in I-SNPs. Finally, C-SNPs cater to individuals with specific disabling or severe chronic conditions who may require a combination of services from primary care professionals, medical and mental health specialists, inpatient and outpatient facilities, and other diagnostic testing and treatment services. C-SNPs help coordinate multiple types of care needed to manage enrollee's specific health condition and can provide enrollees to access a network of healthcare professionals with specific expertise in their chronic condition or more comprehensive coverage for necessary prescription drugs. The Centers for Medicare and Medicaid Services (CMS) approved 15 chronic conditions that met the requirements to be eligible for a C-SNP.[21]

Existing literature has provided some insights into enrollee characteristics and utilization patterns within MA plans.[22,23,24] There are, however, gaps in the literature about utilization within the different types of MA plans including limited evidence on utilization outcomes, such as emergency department (ED) visits, outpatient services, and any nursing home stays. For example, a systematic review of integrated care plans found that evidence generally showed associated reductions in long-term nursing home stays in Programs of All-Inclusive Care for the Elderly (PACE), and Fully Integrated Dual-Eligible Special Needs Plan (FIDE SNP) and related aligned models.[25] But the review found mixed or inconclusive evidence regarding hospitalization. Furthermore, most prior research has focused on overall MA plans or a specific plan type such as D-SNPs without examining utilization patterns across SNP, non-SNP MA and FFS Medicare plans. We address these gaps by analyzing temporal enrollment trends, enrollee characteristics, and health care utilization across three types of health care services—acute care, post-acute care, and LTSS—providing a comparative perspective on MA plans.

Linked NHATS–CMS data provides a rich dataset to examine the individuals who enroll in the different types of MA plans and whether and how enrollees in MA plans differ from those in traditional Medicare FFS plans. Data from Medicare FFS claims, MA encounters, and Transformed Medicaid Statistical Information System (T-MSIS) allow us to accurately measure and compare acute, post-acute, and LTSS utilization across the plan types. We identify the type of MA plan that a respondent was enrolled in by linking the plan information in the Medicare Beneficiary Summary File (MBSF) to CMS SNP reports which provide monthly enrollment information for all SNPs. This is the first study to link CMS SNP reports with survey data to systematically examine enrollee characteristics and health care service use patterns across FFS plans, non-SNP MA plans, and SNPs.

Methods

In this section, we describe the data sources, the study sample, and key variables used in the analysis.

Data and Study Sample

We use the Master Beneficiary Summary File (MBSF) cost and use data, Medicare encounter data, and the Minimum Data Set (MDS) for nursing home users to construct health care utilization measures. We use NHATS data to identify enrollee demographic, health, and health insurance characteristics and primary caregiver characteristics.

General Sample. We use pooled person-year data for all NHATS respondents. The full dataset included 32,446 observations of 8,334 individuals. We use a pooled person-year sample and account for multiple observations of the same individuals by clustering standard errors at individual level. We then exclude all observations of individuals who (a) died between 2015 and 2019 (excluded 296 individuals and 2,012 person-year observations) and (b) did not have a record in the MBSF (excluded 3 individuals and 16 person-year observations). The final sample included 30,418 person-year observations of 8,035 individuals. This dataset allows us to report trends for all three types of SNPs (C-SNPs, D-SNPs, and I-SNPs).

Sample of Community-Dwelling Individuals. To examine enrollee characteristics and health care utilization patterns across Medicare FFS and managed care plans, we further exclude 1,993 observations of individuals who reported residing in nursing homes or other residential facility settings in any survey wave. Older adults in institutional or residential care facilities differ substantially from those living in the community in terms of plan choice, health care needs, service utilization, and health outcomes. Including data from these individuals in the analysis may result in misleading findings when comparing service utilization across plan types. However, because of the limited sample size, we are unable to report enrollee characteristics or acute and LTSS utilization patterns separately for this group. Finally, we also exclude one observation for a respondent enrolled in I-SNP but who did not reside in an institutional or residential care facility in any wave. The community-dwelling sample included 28,424 person-year observations of 7,511 individuals.

Outcome Variables

We focus on six health care service use outcomes within three categories:

* Acute care: any hospital outpatient visit, any inpatient visit, any emergency department (ED) visit

- Post-acute care: any Medicare covered home health visit, and any Medicare covered skilled nursing facility (SNF) use

- Long-term care: any long-stay nursing home admission

For constructing acute care and post-acute care outcomes, we used the person-level Medicare MBSF cost and use segment to identify utilization by FFS enrollees and used Part C encounter data to identify utilization by MA enrollees with relevant claim type code and revenue center codes. For dually eligible enrollees, we used the T-MSIS Analytic Files (TAF) to identify utilization covered by Medicaid. All variables were binary, indicating whether the sampled person had used each of the six types of care in each study year.

We used the Minimum Data Set (MDS) to identify enrollees' long-stay nursing home admissions. A "sampled person" is defined as one having any nursing home admission in each study year by the start and end date of their stay. For example, a person who started a stay before or in 2015 and ended the stay in or after 2015 was defined as having a nursing home stay in 2015. A "long-stay nursing home admission" is a sampled person's nursing home stay lasting longer than 30 consecutive days during a calendar year. The length of stay is defined using cumulative days in a facility, per the *MDS 3.0 Quality Measures User's Manual*. For more details about variable definitions, see Appendix B.

Independent Variables

The key independent variables in this analysis were indicators for types of MA plans. To identify types of MA SNPs, we linked NHATS data with CMS SNP data. The CMS SNP data provided comprehensive monthly reports for each SNP, including plan ID, plan name, type of plan, and geographic area covered by the plan. To identify SNPs and corresponding types, we used plan information from January in each year and linked plan contract numbers and plan benefit package IDs with those in the MBSF. We used plan type information in the CMS SNP data to identify and construct binary variables for C-SNP, D-SNP (includes CO and FIDE-SNP), and I-SNP.

Statistical Analysis

We conducted descriptive analysis to examine the differences in enrollment trends, characteristics of enrollees, and health care service utilization patterns across FFS and MA plans, overall and by types of SNPs. To examine enrollment trends, we report the percentage of NHATS respondents enrolled in FFS and different MA plans (C-SNP, D-SNP, I-SNP, and non-SNP MA) across years. We then present descriptive statistics showing the differences across the Medicare plans in enrollee characteristics such as demographics, health conditions, and other insurance coverage for the sample of community-dwelling individuals.

To understand whether service use patterns differ across the different plans after controlling for chronic conditions, functional and cognitive impairment, we estimated multivariate logistic regressions, controlling for individual characteristics examined in the descriptive analysis. All estimates incorporate sampling weights and design variables to adjust for complex survey design of the NHATS.

Findings

Trends in FFS and MA Enrollment

Exhibit 1-A shows the weighted percentage of the general sample (described in the "Data and Study Sample" section) enrolled in FFS and MA plans between 2015 and 2019. Although a majority of the sample respondents were enrolled in FFS Medicare, enrollment in FFS Medicare declined during our study period. MA enrollment increased consistently over the period, from 37.6% in 2015 to 44.5% in 2019. Compared with estimates from the Medicare Trustees Report (2022)[26], estimates for our full dataset are slightly higher (34% vs. 37.6% in 2015 and 41% vs. 44.5% in 2019). However, both estimates show a consistent increasing trend in enrollment during the period.

Exhibit 1-A. Trends in FFS and MA Enrollment
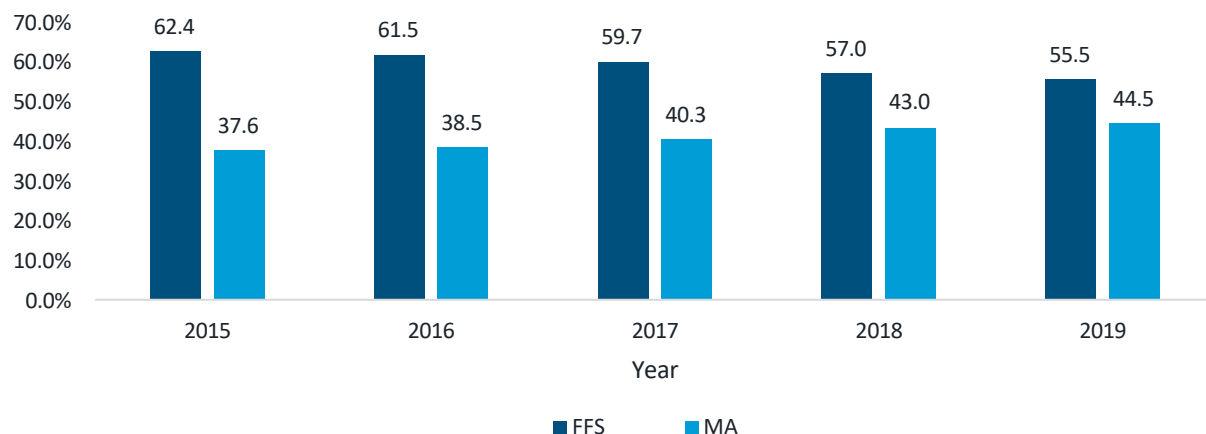
Note. FFS = fee-for-service; MA = Medicare Advantage. All percentages were weighted.

Exhibit 1-B presents the composition of MA enrollment, stratified by the type of SNP and non-SNP MA plans. Although more than 80% of the enrollees in MA plans were enrolled in non-SNP plans, the proportion of enrollees in these plans declined slowly in the period between 2015 (84.9%) and 2019 (77.4%). Non-SNP MA plans include Health Maintenance Organization (HMO), Preferred Provider Organization (PPO), Private Fee-for-Service (PFFS), and Special Needs and Medical Savings Account (MSA).[27] In contrast, the share of enrollment in SNPs has

been continually growing between 2015 and 2019. Specifically, the share of enrollment in D-SNPs increased from 10.7% in 2015 to 15.2% in 2019. The share of C-SNPs also increased during the period from 2.9% of MA enrollees in 2015 to 5.1% in 2019. I-SNPs experienced an increase, too, but I-SNPs represent less than 1% of the MA enrollees.

Exhibit 1-B. Trends in MA Enrollment, by Plan Type

Year	MA SNPs				Non-SNP MA	Total MA
	C-SNP	D-SNP	I-SNP	Total SNP		
	%	%	%	%	%	N
2015	2.9	8.5	0.5	15.1	84.9	3,022
2016	2.6	8.0	0.6	16.6	83.4	2,610
2017	2.7	8.9	0.7	18.6	81.4	2,360
2018	4.7	9.1	0.7	19.9	80.1	2,214
2019	5.1	15.2	1.0	22.6	77.4	2,047

Note. MA = Medicare Advantage; SNP = Special Needs Plan; C-SNP = Chronic Conditions SNP; D-SNP = Dual-Eligible SNP, including Fully Integrated Dual-Eligible SNP and Coordination-Only plans; I-SNP = Institutional SNP; non-SNP MA = any other MA plan that is not SNP. All percentages were weighted.

Exhibit 1-C presents plan enrollment patterns by enrollees' dual-eligible status. Among enrollees with *Medicare only*, the vast majority were enrolled in either Medicare FFS (61.4%) or non-SNP MA plans (37.81%). Only a small fraction (0.79%) of Medicare-only beneficiaries were enrolled in a SNP, specifically in a C-SNP.

In contrast, dually eligible beneficiaries exhibited markedly different enrollment patterns. Although the majority of enrollees were still enrolled in FFS or non-SNP MA plans, nearly a quarter were enrolled in a SNP. Among dually eligible enrollees in SNPs, most were enrolled in Coordination Only (CO) D-SNP plans (18.67% of all dually eligible enrollees), followed by 2.25% in FIDE-SNPs and 2.18% in C-SNPs.

Exhibit 1-C. Enrollment in Medicare Plans for Medicare-Only and Dually Eligible Respondents

Medicare-Only

0.79%
0.00%
37.81%
61.40%

■ FFS ■ Non-SNP MA ■ D-SNP ■ C-SNP

Dually eligible

2.25% 2.18%
18.67%
51.63%
25.27%

■ FFS ■ Non-SNP MA ■ CO ■ FIDE ■ C-SNP
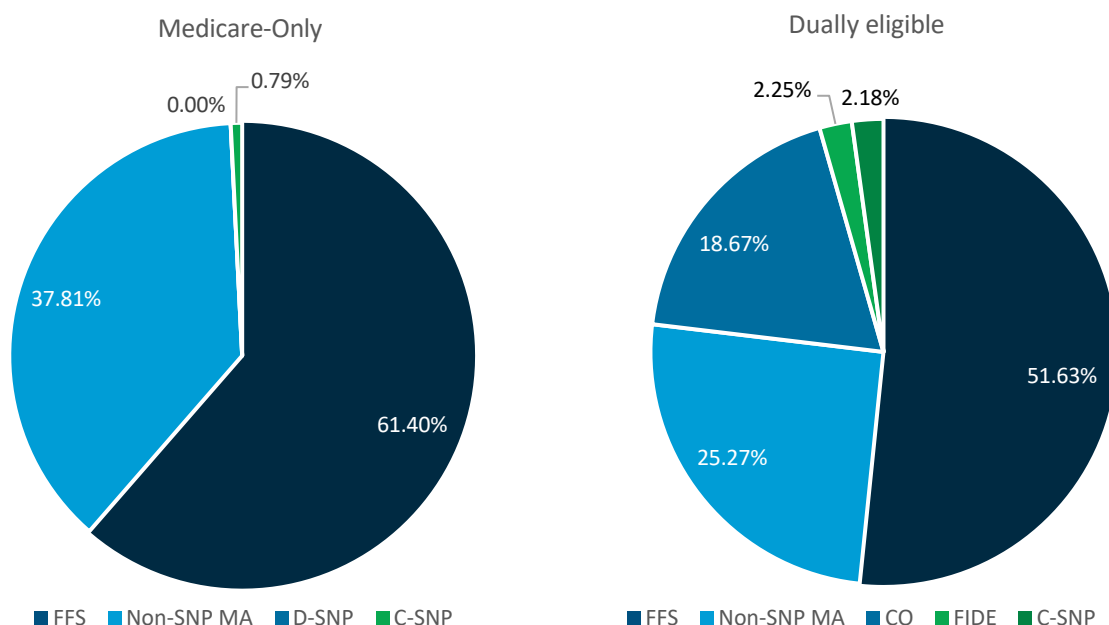
Note. Percentage of sampled persons enrolled in different types of Medicare plans among pooled sample 2015–2019, by Medicare-only and dual-eligible status. FFS = fee-for-service Medicare; SNP = Special Needs Plan; MA = Medicare Advantage; non-SNP MA = any other MA plan that is not SNP; D-SNP = Dual-Eligible SNP, including Fully Integrated Dual-Eligible (FIDE) SNP and Coordination-Only (CO) plans; C-SNP = Chronic Conditions SNP. All percentages were weighted.

Enrollee Characteristics

Exhibit 1-D presents the characteristics of Medicare enrollees across different Medicare models and plan types. Enrollees in Medicare Advantage (MA) non–Special Needs Plans (non-SNPs) were largely similar to those in Medicare fee-for-service (FFS) plans, whereas enrollees in Dual-Eligible Special Needs Plans (D-SNPs) and Chronic Condition Special Needs Plans (C-SNPs) exhibited notable differences. Enrollees in non-SNP MA plans had demographic compositions and health care needs comparable to those in FFS, with slightly lower rates for health conditions and ADL and IADL needs. However, non-SNP MA enrollees were less likely to have private long-term care insurance than were FFS enrollees. Among dually eligible beneficiaries (not shown here), however, enrollees in non-SNP MA plans had significantly lower prevalence of health conditions such as diabetes, osteoporosis, arthritis, and heart disease than do enrollees in SNPs.

D-SNPs, which serve individuals dually enrolled in Medicare and Medicaid, had enrollees with higher health burdens and functional impairments, as reflected by greater needs in activities of daily living (ADL) and instrumental activities of daily living (IADL). Compared with other

Medicare plan types, D-SNP enrollees were younger, more likely to be female, and less likely to have a high school education or to be married. Racial and ethnic minorities were overrepresented in D-SNPs, with 21.2% identifying as Black and 49.2% belonging to other racial or ethnic groups (Hispanic, Asian, American Indian or Alaska Native, or Hawaiian or Pacific Islander).

Enrollees in C-SNPs which are designed for individuals with chronic conditions, had the highest prevalence of health conditions such as hypertension, diabetes, heart disease, osteoporosis, and arthritis. Enrollees in C-SNPs exhibited higher levels of functional impairments than did those in FFS and non-SNP MA plans, although to a lesser degree than D-SNP enrollees. Similar to D-SNPs, C-SNPs had overrepresentation of racial and ethnic minorities, with 23.3% of enrollees' identifying as Black and 34.6% belonging to other racial or ethnic groups. C-SNP enrollees also had lower levels of educational attainment than did FFS and non-SNP MA plans, with fewer enrollees holding a high school degree or higher.

Exhibit 1-D. Characteristics of Community-Living Medicare Enrollees, by Plan Type

Characteristics	Fee-for-service (N = 16,758)		Non-SNP MA (N = 10,308)		D-SNP (N = 1,018)		C-SNP (N = 340)		Total (N = 28,424)	
	N	%	N	%	N	%	N	%	N	%
Health insurance										
Dually eligible	2,186	10.7	1,256	9.8	1,018	100.0	148	35.1	4,608	13.4
Private LTCI	4,260	24.4	2,128	18.4	128	8.9	42	10.1	6,558	21.6
Demographics										
Female	9,553	54.6	6,003	56.0	704	64.0	215	58.4	16,475	55.4
Age Category										
65–74 years	5,188	48.8	3,256	50.0	357	54.1	105	46.5	8,906	49.4
75–84 years	7,069	36.3	4,520	36.3	437	35.2	193	46.2	12,219	36.4
85+ years	4,501	14.9	2,532	13.8	224	10.6	42	7.3	7,299	14.3
Race, Ethnicity, Education, Employment, Marital Status										
White, non-Hispanic	12,468	81.9	6,878	77.0	219	29.6	95	42.1	19,660	78.1
Black, non-Hispanic	2,854	6.6	2,303	8.9	494	21.2	170	23.3	5,821	8.0
Other[a]	1,436	11.6	1,127	14.1	305	49.2	75	34.6	2,943	13.9
High school or above	9,471	61.3	5,133	54.3	180	19.5	88	39.2	14,872	57.3
Employed	1,903	15.5	1,174	15.8	18	2.6	25	15.2	3,120	15.2
Married or has a partner	8,213	56.9	4,929	54.8	211	28.6	123	48.8	13,476	55.2
Household size										
1	5,879	30.7	3,281	28.6	421	41.2	101	28.5	9,682	30.3

Characteristics	Fee-for-service (N = 16,758)		Non-SNP MA (N = 10,308)		D-SNP (N = 1,018)		C-SNP (N = 340)		Total (N = 28,424)	
	N	%	N	%	N	%	N	%	N	%
2	8,123	53.6	4,930	52.4	295	29.4	139	49.0	13,487	52.4
3+	2,756	15.7	2,097	19.0	302	29.5	100	22.5	5,255	17.4
Health conditions										
Heart attack	669	3.7	389	3.4	58	4.9	21	4.8	1,137	3.6
Heart disease	4,049	20.6	2,097	18.1	285	23.2	111	32.1	6,542	19.9
Hypertension	12,083	67.8	7,447	67.3	858	78.8	291	84.7	20,679	68.1
Arthritis	11,285	64.1	6,822	61.4	803	78.0	265	81.5	19,175	63.8
Osteoporosis	4,944	27.9	2,887	26.6	370	37.3	124	39.9	8,325	27.8
Diabetes	4,615	26.6	2,951	26.1	463	42.3	245	68.1	8,274	27.3
Lung disease	3,437	19.3	2,008	19.1	328	32.5	94	26.8	5,867	19.7
Stroke	593	3.1	343	2.7	53	3.6	13	2.9	1,002	3.0
Cancer	1,596	9.8	822	8.1	52	5.1	13	5.7	2,483	9.0
NHATS dementia diagnosis 65+										
1 Probable dementia	1,544	6.1	914	6.0	180	12.9	52	9.4	2,690	6.3
2 Possible dementia	1,630	7.5	972	7.3	162	13.3	70	15.6	2,834	7.7
3 No dementia	13,584	86.4	8,422	86.7	676	73.8	218	74.9	22,900	86.0
Functional Impairment										
# of ADLs										
0	10,310	66.9	6,674	70.2	424	41.3	157	50.4	17,565	67.1
1	2,552	14.1	1,522	13.3	163	17.3	74	22.0	4,311	14.0
2	1,291	6.7	719	5.9	123	13.8	45	11.9	2,178	6.7
3+	2,605	12.3	1,393	10.5	308	27.6	64	15.6	4,370	12.2
# of IADLs										
0	4,817	31.4	3,234	35.4	161	16.4	69	19.9	8,281	32.2
1	3,122	20.3	1,898	19.0	155	15.9	54	18.3	5,229	19.7
2	2,377	14.7	1,489	14.8	132	13.1	60	20.9	4,058	14.8
3+	6,442	33.5	3,687	30.8	570	54.6	157	40.9	10,856	33.3

Note. Sample included person-year observations from NHATS respondents from 2015 to 2019. SNP = Special Needs Plan; MA = Medicare Advantage; non-SNP MA = any other MA plan that is not SNP; D-SNP = Dual-Eligible SNP; C-SNP = Chronic Conditions SNP; LTCI-Long-term care insurance. Unweighted counts and weighted percentages reported.

[a] Includes enrollees who identify as Hispanic, American Indian and Alaska Native, Asian, and Hawaiian and Pacific Islander.

Health Care Service Use Patterns

There were several differences in service use patterns across the different Medicare plans (Exhibit 1-E). Testing for similar distribution of characteristics among groups, using Pearson chi-squared tests for factor variables, differences for all health care service use variables were statistically significant at 1% level. Compared with enrollees in FFS and D-SNPs, enrollees in non-SNP MA had lower health care service use across all types of care. Differences observed for nursing home use and home health use were consistent with several studies that have shown lower post-acute care utilization among MA enrollees than among enrollees in FFS Medicare.[28,29,30] For inpatient hospitalizations, previous studies have reported mixed findings. Although few studies found *no* differences between MA and FFS in terms of the share of MA enrollees and traditional Medicare beneficiaries with at least one hospital stay,[31,32] other studies have reported lower likelihood of hospitalizations among MA enrollees.[33,34]

D-SNP enrollees are dually eligible for Medicare and Medicaid, which implies that they are more likely to have higher health care needs and functional impairments than those enrolled in FFS and other MA plans. In a comparison of service use patterns of D-SNP enrollees with these patterns in other Medicare plans, the differences become evident. Enrollees in D-SNPs are more likely to use post-acute care, including Medicare home health services and nursing home care (skilled nursing facility or inpatient rehabilitation facility). The differences in utilization are especially large for the proportion of enrollees with any ED visit and any inpatient stay. Among enrollees in D-SNPs, 47.8% had any ED visit compared with 30.1% among FFS and 27.2% among non-SNP MA plan enrollees. Similarly, 17.0% of FFS enrollees and 13.8% of non-SNP enrollees had any inpatient stay, which is substantially lower than the 27.2% among D-SNP enrollees.

As Exhibit 1-C has shown, enrollees in C-SNPs are substantially more likely to have chronic conditions such as hypertension, diabetes, osteoporosis, and arthritis. Accordingly, their health care utilization would likely differ from those enrolled in other Medicare plans. For example, C-SNP enrollees are more likely to have any ED visit but less likely to have a long stay in a nursing home than are FFS and non-SNP MA enrollees. However, it is important to note that C-SNPs may provide specialized services only for a specific chronic condition in addition to traditional Medicare services which could result in similar service use patterns for some health care services. For example, among C-SNP enrollees, service use patterns for post-acute care, including any home health visit and any nursing home use, is comparable with those among FFS enrollees.

Exhibit 1-E. Health Care Service Use Patterns Among Community-Living Older Adults, by Medicare Plan Type

Health care utilization	Fee-for-service (*N* = 16,758)		Non-SNP MA (*N* = 10,308)		D-SNP (*N* = 1,018)		C-SNP (*N* = 340)		Total (*N* = 28,424)	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%
Acute care										
Any outpatient visit	12,460	71.7	6,573	61.8	742	69.3	216	58.3	19,991	68.0
Any inpatient stay	3,254	17.0	1,660	13.8	279	27.2	64	15.8	5,257	16.1
Any ED visit	5,813	30.1	3,284	27.2	512	47.8	142	34.6	9,751	29.7
Post-acute care										
Any home health	2,510	11.6	1,095	7.7	193	17.5	49	10.3	3,847	10.4
Any SNF use	1,098	5.1	592	4.2	71	6.2	18	4.7	1,779	4.8
Long-term care										
Long-stay nursing home	1,541	6.9	500	3.1	97	7.2	11	1.8	2,148	5.5

Note. Sample included person-year observations from NHATS respondents from 2015-2019. SNP = Special Needs Plan; MA = Medicare Advantage; non-SNP MA = any other MA plan that is not SNP.
D-SNP = Dual-Eligible SNP; C-SNP = Chronic Conditions SNP; SNF: Skilled Nursing Facility. Unweighted counts and weighted percentages reported. Differences between all health care services across plans are significant at the 5% level. For definitions of health care utilization variables, see Appendix B.

Exhibit 1-F presents odds ratios (ORs) and confidence intervals (CIs) from multivariate logistic regressions of health care service use variables in Medicare plan types, controlling for individual demographic, health, and functional ability characteristics. After adjusting for differences in enrollee characteristics, enrollees in all Medicare managed care plan types are less likely than FFS enrollees or equally likely to use health care services. For three healthcare service use variables—any Medicare covered home health visit, any outpatient visit, and long-stay nursing home admission—enrollees in non-SNP MA, D-SNP, and C-SNP had statistically significant lower likelihood of service use than did FFS enrollees. Descriptive statistics suggested substantially higher likelihood of service use for D-SNP and C-SNP enrollees, but regression results indicate that, after controlling for the differences in the enrollee populations, D-SNP and C-SNP enrollees are generally equally or less likely to use the health care services studied compared with FFS enrollees. For example, descriptive statistics suggested that D-SNP enrollees were more likely to have an ED visit, an inpatient hospital stay, or a home health visit. However, controlling for differences in enrollee characteristics, we do not see significant differences in the likelihood of ED visits and inpatient stays between D-SNP and FFS enrollees. After accounting for individual differences, D-SNP enrollees were also significantly less likely than FFS

enrollees to use home health (OR = 0.650), nursing home care (OR = 0.559), or outpatient visits (OR = 0.629).

Exhibit 1-F. Healthcare Service Use Among Community-Living Older Adults, Controlling for Health and Functional Ability

Plan Type	Any outpatient visit		Any inpatient stay		Any ED visit	
	Odds ratio	CI	Odds ratio	CI	Odds ratio	CI
Non-SNP MA	0.650***	0.584–0.724	0.816***	0.739–0.900	0.881***	0.809–0.959
D-SNP	0.629***	0.456–0.866	1.115	0.842–1.476	1.113	0.849–1.460
C-SNP	0.442***	0.280–0.698	0.661**	0.444–0.984	0.807	0.570–1.144
Observations	28,424		28,424		28,424	

Plan Type	Any home health visit		Any SNF use		Long-stay nursing home admission	
	Odds ratio	CI	Odds ratio	CI	Odds ratio	CI
Non-SNP MA	0.650***	0.573–0.738	0.893	0.759–1.051	0.450***	0.352–0.576
D-SNP	0.666**	0.486–0.914	0.559***	0.361–0.865	0.389***	0.211–0.717
C-SNP	0.471***	0.286–0.776	0.623	0.283–1.372	0.141***	0.051–0.393
Observations	28,424		28,424		28,424	

Note. Sample included person-year observations from NHATS respondents from 2015 to 2019. Odds ratios (ORs) were adjusted by sample person characteristics, health conditions, and functional ability. All plans were compared with fee-for-service (FFS) Medicare. SNP = Special Needs Plan; MA = Medicare Advantage; non-SNP MA = all other MA plans that are not SNPs. D-SNP = Dual-Eligible SNP; C-SNP = Chronic Conditions SNP; SNF: Skilled Nursing Facility. CI=95% Confidence interval. * p<0.05, ** p<.01, *** p<.001.

Discussion and Policy Implications

This is the first study to use CMS Special Needs Plan reports linked with survey data to systematically analyze enrollment trends, enrollee characteristics, and health care service use patterns across different types of Medicare managed care plans. Our findings provide insights into differences in populations enrolled in acute and long-term care and needs of Medicare enrollees in different managed care plans, as well as related policy implications.

Enrollment in MA plans increased between 2015 and 2019, with most of the increase attributed to enrollment in D-SNPs. The proportion of enrollees in non-SNP plans among all MA enrollees declined from 84.9% in 2015 to 77.4% in 2019. In contrast, the share of those enrolled in D-SNPs increased from 10.7% in 2015 to 15.2% in 2019 and the share of C-SNPs increased from 2.9% of MA enrollees in 2015 to 5.1% in 2019. Increased enrollment in D-SNPs suggests a need

to understand whether and to what extent D-SNPs increase care overall and across types of D-SNPs (FIDE-SNPs, HIDE-SNPs and CO) and in turn the impact on health outcomes of dually eligible beneficiaries.

In terms of demographic and health characteristics, enrollees in non-SNP MA plans were mostly similar to those in Medicare FFS. Studies that examined data prior to 2014 found evidence of gross favorable selection (prior to risk adjustment) in Medicare Advantage plans where MA enrollees has lower prevalence of health conditions and lower health expenditures compared with FFS enrollees.[35,36] However, our findings are consistent with recent studies that report similar demographic composition and prevalence of chronic conditions between FFS and non-SNP MA plans.[37] But enrollees in non-SNP MA plans were less likely to have private long-term care insurance.

Enrollees in D-SNPs and C-SNPs differed from those in FFS and non-SNP MA plans. Because D-SNPs serve individuals dually eligible for Medicare and Medicaid, enrollees were more likely to have health conditions and functional impairments than were enrollees in other Medicare plan types. In addition, compared with enrollees in other plan types, D-SNP enrollees were more likely to be female and less likely to have a high school degree or above, or to be married. Individuals from other race groups (who identified as Hispanic, Asian, American Indian or Alaska Native, and Hawaiian or Pacific Islander) were overrepresented in D-SNPs (49.2%) and C-SNPs (34.6%), compared with other plan types. Individuals in C-SNPs, which are targeted those with chronic conditions, had the highest rates of hypertension, diabetes, heart disease, osteoporosis, and arthritis.

Accounting for differences in health and functional ability across plan types, likelihood of service use was lower than or comparable to FFS for all types of services across all MA plans—D-SNPs, C-SNPs and non-SNP. Although unadjusted comparisons suggested a higher likelihood of service use among D-SNP and C-SNP, accounting for differences in the characteristics of enrollees in the different plan types, results showed that likelihood of service use was lower among MA enrollees compared with FFS enrollees. Descriptive statistics suggested that D-SNP enrollees were more likely to have an ED visit, an inpatient hospital stay, or a home health visit. But after controlling for differences in enrollee characteristics, there were no significant differences in the likelihood of ED visits and inpatient stays between D-SNP and FFS enrollees, and D-SNP enrollees were significantly less likely than FFS enrollees to use home health visits or nursing home care, or to have an outpatient visit.

These findings can have several possible explanations. The finding of generally lower utilization in Medicare Advantage may indicate favorable selection, where among beneficiaries with similar characteristics those with lower likelihood of services based on factors not controlled in

the regression analysis may select into MA plans. Service utilization may be lower across MA plans due to higher efficiency of care. For example, MA plans have reported lower elective hip and knee replacements and outpatient surgeries or procedures.[30] Finally, lower service utilization could be related to MA plan incentives to control costs and minimize spending, which can result in strategies that restrict service utilization. These strategies may involve strict utilization management practices, like restrictive provider networks, requiring pre-authorization for services, and promoting the use of more affordable or lower-value services. Understanding the reasons for the observed utilization patterns is necessary to examine whether older adults are able to receive the care they need.

Focus Area 2. Predictors of Nursing Home Placement

Historical Background and Context

Because the prevalence of chronic medical conditions and functional disabilities increase at older ages, understanding the demand for medical care and LTSS among older adults is an important policy concern. Population aging began in the U.S. in the late 19th century but accelerated after World War II because of medical care advances that extended life expectancy at older ages. By the late 1970s, policymakers were already looking to plan ahead for what they anticipated would be a surge in demand for medical care and LTSS when the large "baby boom" birth cohort reached age 65, beginning in 2011. Medicaid's coverage of nursing home care was particularly worrisome to policymakers because despite strict means-tested income and asset requirements for Medicaid coverage, seniors who did not meet these criteria at admission could eventually "spend-down" to Medicaid eligibility if they stayed long enough to exhaust their personal financial resources. However, over several decades of research, we have learned that population aging **per se** does not drive utilization of long-stay nursing home care.

In 1981, the Office of Policy Analysis in the Health Care Financing Administration (now called the Centers for Medicare & Medicaid Services) published a report projecting that if age/sex adjusted rates of nursing home residency remained constant, population aging would result in 1.95 million nursing home residents (91% aged 65 and older) in 2000 and 2.95 million nursing home residents (93% aged 65 and older) in 2030.[38] Early on, these projections appeared to underestimate growth in long-stay nursing home use. The daily census of elderly nursing home residents reached its zenith in 1985.[39] In that year, 2.1 million older Americans resided in nursing homes on any given day according to the 1985 National Nursing Home Survey (about 7. 5% of older Americans). After 1985, however, nursing home use began to decline and has continued to decline since. As of 2022, despite the growth in numbers of older Americans, the percentage of elderly residing in nursing homes (about 2.2–2.3) is less than half what it was in 1977, and the absolute number of nursing home residents was about the same (1.3 million).[40]

Christine Bishop (1999)[41] was one of the first scholars to identify and analyze reasons behind the decline in elderly nursing home residency that first became apparent in the 1995 National Nursing Home Survey. The decline in long-stay nursing home use is now attributed in large part to the emergence of a private market for other types of congregate eldercare facilities ("assisted living" broadly defined). These settings are less institutional (more 'homelike," less "hospital-like") than nursing homes and typically offer more private accommodations. Because they are not staffed and equipped to provide the level of nursing care that some chronically ill

and disabled elders require, care in assisted living costs less than nursing home care. According to the most recent National Post-Acute and Long-Term Care Survey,[42] there are 800,000 residents in assisted living facilities compared to 1.3 million nursing home residents.

These facilities cater primarily to private payers. Nearly two thirds of nursing home residents (63%) have Medicaid as a payer source; only 24% pay privately (mostly out of pocket); the remainder receive short-term, post-acute Medicare coverage.[43] In contrast, only 18% of assisted living residents have Medicaid as a payer source. Although most state Medicaid programs will cover the service component of assisted living costs, Medicaid is prohibited under federal law from paying the "room and board" costs, whereas Medicaid does cover these costs in nursing homes. State Medicaid programs that use 1915 (c) waivers to fund HCBS have the flexibility to set the income eligibility threshold at the maximum permissible level of 300% of the SSI benefit level and allow HCBS recipients to exempt from copayment requirements a generous "community living" allowance that might be enough for many of them to get Medicaid coverage for services while using their protected income to cover their housing, food, and utility costs at home or in assisted living facilities. Johnson and Lindner (2016)[44] measured the adequacy of the income allowances granted to older Medicaid HCBS enrollees and their spouses. Their study measured household expenditures made by older adults living in the community and compared them to the Medicaid HCBS income allowances provided by the state in which they reside to see how much they would have to reduce their spending if they enrolled in Medicaid HCBS and did not allow their expenses to exceed those income allowances. The results show that 48% of low- and moderate-income households headed by an adult aged 65 or older spend more than their state's Medicaid HCBS income allowances, and 29% spend at least 50% more than the allowances. Single adults are more likely than couples to spend more than they would be allocated by Medicaid HCBS because spousal income allowances are generally much larger than the maintenance needs allowances provided to Medicaid HCBS enrollees. These findings suggest that Medicaid financial eligibility rules discourage the use of HCBS as an alternative to nursing home care by not allowing HCBS enrollees to retain enough income to cover their community living expenses.

Although some private-pay assisted living residents eventually exhaust their resources and move to nursing homes so they can access Medicaid coverage, this nevertheless results in shorter, less costly Medicaid nursing home stays. An analysis of private-pay affordability of paid LTSS found that assisted living is the LTSS setting that is most readily affordable on a private-pay basis, even for low-income elderly with little wealth apart from home equity, whereas nursing home care is the least affordable.[45] Home care is more affordable than nursing home care but less so than assisted living because disabled elderly who want to remain in their own homes cannot cash out their home equity to help pay for care as they can in assisted living.

Historically, most older Americans in need of LTSS have been able to continue living in private homes and to avoid paying privately for LTSS by relying greatly on receiving care at home from informal caregivers (primarily close relatives such as spouses and adult children, but also from more distant relatives and from friends and neighbors). Four decades ago, there was considerable concern that factors such as increased participation by women in the paid labor force would make family caregiving less available, resulting in unpaid help being replaced by paid care in nursing homes for which Medicaid would pay a large share of the costs. These fears have not been realized. A recent study based on NHATS data found that even though family caregivers face challenges, informal caregiving networks have remained largely stable.[46]

However, the decline in long-stay nursing home use evident since the late 1990s has been attributed in part to expansion of both Medicaid-covered home care (including but not limited to personal care aide services) and growth in private-pay use of home care aide services. Although the impact of the former was found to have been somewhat greater than that of the latter, the effects of both have been modest.[47]

Although Medicaid has greatly expanded funding for HCBS, the use of, and spending on, HCBS as a proportion of total Medicaid LTSS use and spending is much lower for older adults than for other subpopulations of LTSS users who are much more likely to qualify financially for Medicaid.[48] This is because many seniors whose disabilities are severe enough to qualify for nursing home coverage cannot meet Medicaid financial eligibility criteria for HCBS while residing in the community. To gain financial eligibility for Medicaid, they must become long-stay nursing home residents as private payers and spend down their personal financial resources. Here again, Medicaid's strict financial eligibility requirements—which, since the late 1980s, have not kept pace with inflation, especially with respect to allowable asset limits—serve to explain why so few functionally disabled elderly report receiving assistance through Medicaid to access paid HCBS.

When older Americans with disabilities living in the community report receiving paid LTSS, private (mostly out-of-pocket) funds are the predominant payer source. An analysis of National Long-term Care Survey (NLTCS) data[49] found that among survey respondents who reported using paid HCBS, nearly two thirds cited private (mostly out-of-pocket) payments as the sole payment source; that percentage would have been higher had Medicare-funded short-term HHA coverage been excluded from the total. Medicaid was the sole payment source by only 6.1% of NLTCS respondents' use of paid HCBS. Although small percentages of NLTCS respondents who used paid HCBS reported using a combination of personal resources and public funds (Medicare and/or Medicaid) or a combination of Medicare and Medicaid funding, the majority did not report Medicaid as either a sole or partial payment source. Our analyses of

NHATS found similar patterns: Among survey respondents who received paid HCBS, out-of-pocket payments were, compared to Medicaid, much more frequently reported.

The Current Study

In this study we examine individual and caregiver characteristics that currently predict nursing home placement. We use linked NHATS, NSOC and MDS data for two years 2015 and 2017. We define nursing home placement as 30 days or more of consecutive nursing home stay.

Previous literature about factors associated with LTSS use have primarily focused on nursing home admissions, and have usually accounted for a narrow subset of individual or caregiver factors.[50,51,52,53] Furthermore, many studies examine nursing home admissions or entry for a specific cohort or population groups such as individuals with dementia or individuals residing in a particular state or community.[54,55,56] A few studies examine a comprehensive set of factors associated with nursing home admissions but rely on old data.[57] Existing studies, thus, have not accounted for changes in health care delivery and payment settings during recent years such as the growth of MA plans including SNPs.

Our study makes two main contributions to the literature about factors associated with LTSS use and settings. First, we use recent data, from 2015 to 2019, from the National Health and Aging Trends Study (NHATS) linked with CMS data which allows us to accurately measure healthcare service utilization. Second, this unique dataset combines survey responses with data from claims and nursing home episodes, which allows us to investigate individual, caregiver, and health insurance characteristics associated with nursing home admissions.

Methods

Data and Study Sample

We use the 2015–2019 NHATS linked with Minimum Data Set (MDS) for our nursing home outcome variables. The MDS is a standardized assessment tool for evaluating the health status and care needs of residents in nursing homes. MDS assessments are completed every 3 months (or more often) on nearly all residents of nursing homes in the United States. It includes both SNF stays and long-term nursing home stays. Lastly, we use NHATS-linked Medicare data for the sample person's Medicare plan type (also used as independent variables). To measure caregiver characteristics, we used information from the NSOC data.

Full dataset. To examine overall trends in nursing home and residential care, we use pooled person-year data for all NHATS respondents. The full dataset included 32,446 observations for 8,334 individuals.

Study sample. We use a pooled person-year sample and account for multiple observations of the same individuals by clustering standard errors at the individual level. For each person, we use their and their caregiver's characteristics at baseline year for independent variables and use the individual's LTC service utilization in the next 2 years for dependent variables. For example, for a sample in 2017 NHATS data, we will use the person's baseline 2017 NHATS data to construct the independent variable, use that person's 2018 and 2019 NHATS data to construct the residential care outcome variables, and use the individual's 2017, 2018, and 2019 MDS data to construct the nursing home outcome variables. We then exclude all observations of individuals who (1) died between 2015 and 2019, (2) did not have a record in the Medicare Beneficiary Summary File (MBSF), and/or (3) did not have an unpaid caregiver in the NSOC file or had missing key caregiver characteristics in the baseline year. Then, for the nursing home model, we exclude observations of individuals who live in a nursing home (according to the derived residential variable) in the baseline year. We further excluded observations that had missing information for key individual and caregiver characteristics. Our final analytical sample included 2,549 observations for 1,267 individuals. A schematic of our analysis sample is pictured in Appendix Exhibit B-1.

Outcome or Dependent Variables

The outcome variable of our analysis is long-term nursing home admission. It is a binary variable indicating whether the sampled person had a long-term nursing home stay lasting more than 30 days within the 2 years from the survey year.

Because our study focuses on long-term nursing home use for custodial care, we would like to be able to exclude post-acute nursing home stays intended for rehabilitative purposes. MDS data do not, however, distinguish between different types of nursing home stays. Therefore, in alignment with prior literature, we define "long-term nursing home stays" (for custodial care) using the 30-day threshold. Although Medicare does cover rehabilitation services for up to 100 days in a nursing home subsequent to an acute hospitalization, with a notable copayment required after the 20th day, the empirical reality is that the overwhelming majority of such stays are of a duration less than 30 days.[58,59] We also experimented with defining long-term nursing home stay using a 100-day threshold. However, this approach only identified a very small portion of the sample. To mitigate the challenge posed by rare outcomes, we opted to use the 30-day threshold definition instead.

Predictor variables

We use Anderson's health care utilization model as a guide to select the independent variables to be included in the regression analysis.[60] The model posits that the health services used by an individual are a function of the predisposing and enabling characteristics of that individual and

their need for medical care. In this case, the predisposing variables include those that describe the propensity of an individual to use LTC, such as age, gender, race, and ethnicity. The enabling variables include resources for the use of LTC, such as wealth, health insurance coverage, the availability of informal LTC, and county-level health system infrastructure. In addition, characteristics of primary caregivers are enabling variables for LTC use. We define "primary caregiver" using information about the number of hours of care provided, whether the caregiver lives with the respondent, and the relationship to the respondent. "Health care need" refers to health status and LTC need, in this case functional and cognitive impairment measured by the presence of chronic conditions and number of ADL and IADL needs.

Exhibit 2-A. Predictor Variables Used in the Analysis of Long-Term Care Placement

Predisposing characteristics	Enabling characteristics
• Age categories (SP)	• Age categories (PC)
• Sex (SP)	• Sex (PC)
• Race/ethnicity (SP)	• Race/ethnicity (PC)
• Education (SP)	• Education (PC)
• Employment status (SP)	• Employment status (PC)
• Self-reported health status (SP)	• Number of members in household (SP)
• Chronic conditions (SP)	• Long-term care insurance (SP)
• Number of difficulties with ADLs and IADLs (SP)	• Total income (SP)
• Dual eligibility (SP)	• Home ownership (SP)
	• Social isolation (SP)
	• Relationship with SP (PC)
	• Physical, mental and financial burden of caregiver (PC)
	• Whether there are other unpaid caregivers (SP)
	• Whether there are other paid caregivers (SP)
	• Number of hours of services provided in the previous month (PC)

Note. The table shows independent variables used in the analyses, classified into predisposing and based on enabling characteristics. SP = sample person; PC = primary caregiver.

Statistical Analysis

Prediction Model

We employ a predictive model to identify baseline characteristics of the sampled individuals and their primary caregivers that correlate with the long-term care placement outcomes in the next 2 years. Specifically, we use the stepwise variable selection within logistic regression approach and use a *p* value threshold of 0.2 for variable inclusion. Specifically, we include only variables with a *p* value of 0.2 or less during the iterative process of stepwise selection. This process begins with all the independent variables described above and proceeds to automatically retain those with a p-value of 0.2 or less through stepwise selection. We mandated that the variable of primary interest—Medicare type—remain in the model throughout irrespective of the p-value. Below is our model specification:

$$\text{Equation 1: } YY_{iiii+2} = \alpha\alpha XX_{iiii} + \omega\omega\omega\omega_{ccii} + \tau\tau YYYYYYYY_{ii} + \varepsilon\varepsilon_{hii}$$

where

- YY_{iiii+2} is the outcome for individual i in the following 2 years,

- XX_{iiii} represents the characteristics of individual *i* in baseline year *t* (e.g., age, sex, ADLs),

- $\omega\omega_{ccii}$ represents the characteristics of caregiver *c* in baseline year *t* (e.g., relationship to *i* sex, number of hours),

- $YYYYYYYY_{ii}$ is year fixed effects, and

- $\varepsilon\varepsilon_{hii}$ is the error term.

Findings

Overall Trends in Nursing Home Placement

Exhibit 2-B presents the overall trends in the nursing home residents between 2015 and 2019 for the full dataset of all NHATS respondents. The full dataset includes 32,446 person-year observations on residential setting in each survey wave for 8,334 NHATS respondents in each survey wave. During the period between 2015 and 2019, about 2.5% of respondents reported living in a nursing home.

Exhibit 2-B. Trends in Nursing Home Residents, 2015-2019

	Nursing home		Total number of respondents
Year(s)	*N*	Weighted %	*N*
2015–2019	1,485	2.5	32,446
2015	403	2.5	8,334

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| Year(s) | Nursing home | | Total number of respondents |
	N	Weighted %	N
2016	352	2.6	7,276
2017	291	2.5	6,312
2018	232	2.4	5,547
2019	207	2.6	4,977

Note. The numbers are based on data from NHATS survey and include respondents who answered only the facility questionnaire. The numbers also include respondents who reported being in a nursing home in NHATS Round 1 and Round 5. The table shows unweighted counts and weighted percentages calculated using NHATS analytic weights to account for NHATS sample design.

As a result of advocacy efforts and federal and state policies focused on avoiding unnecessary institutionalization and increasing access to HCBS, the number of older adults receiving LTSS in nursing homes has been declining over the past three decades from 4.5% in 1990 to less than 2% in 2023.[61,62] Consistent with these findings, we see that nursing home use declined between 2015 and 2019. Our findings suggest that the proportion of the older adults living in a nursing home stabilized at about 2.5% during the study period.

Characteristics of Beneficiaries, Full Study Sample and Individuals with Nursing Home Placement

Exhibit 2-C shows characteristics of community-dwelling individuals and their primary caregivers for the study sample (*N* = 2,549) overall and by the type of long-term care setting during a 2-year follow-up period. Among this cohort, 340 (13.3%) had a long-stay nursing home admission during the 2-year follow-up period.

There were several differences in sample characteristics of respondents within the full-study sample who had a nursing home admission. About 40% of the study sample was enrolled in MA plans. However, the proportion was comparatively lower among those admitted to a nursing home (28.7%), which suggests that individuals with greater LTSS needs are less likely to select into MA plans. Respondents admitted to long-stay nursing home care were more likely to have one or more chronic health conditions and require assistance with greater number of ADLs and IADLs. In addition, caregiving dynamics at baseline differed across settings. Specifically, a spouse was the primary caregiver for 37.8% of the full-study sample, but a significantly lower proportion of respondents admitted to nursing home (16.0%) reported a spouse as primary caregiver at the baseline. These respondents were more likely to have children or another family member serving as primary caregivers.

Exhibit 2-C. Characteristics of Community-Living Older Adults Receiving Help With Self-Care From Family or Unpaid Caregivers, Overall and Among Individuals with Nursing Home Placement

Characteristics	Full study sample (*N* = 2,549) (%)	Nursing home placement (*N* = 340) (%)
Medicare Advantage	40.3	28.7
Medicare Advantage non-SNP	33.5	23.5
Medicare Advantage SNP	7.0	6.8
Dually eligible	17.1	32.7
Private LTC insurance	21.8	18.1
Female	58.3	65.9
Age		
65–74	33.2	14.0
75–84	41.6	40.6
85+	25.1	45.4
Race/Ethnicity		
White, non-Hispanic	69.2	63.5
Black, non-Hispanic	21.7	29.9
Other (including Hispanic)	9.0	6.7
Education		
Less than high school	50.2	61.5
High school degree or above	49.8	38.5
Employed	9.9	2.0
Income quintiles		
1	19.2	30.8
2	20.9	28.8
3	21.0	21.1
4	18.6	12.2
5	20.4	7.1
Own home	73.0	53.9
Married or having a partner	51.3	31.0
Number of members in household		
1	26.6	37.5
2	51.0	36.1
3+	22.5	26.4

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Characteristics	Full study sample (N = 2,549) (%)	Nursing home placement (N = 340) (%)
Number of ADLs		
0	59.4	30.6
1	16.3	17.9
2	8.2	12.6
3+	16.2	38.9
Number of unmet ADLs		
0	66.7	47.8
1	18.0	25.8
2	8.0	14.9
3+	7.3	11.4
Number of IADLs		
1	10.8	6.1
2	11.9	7.8
3+	77.3	86.2
Number of unmet IADLs		
0	92.4	86.8
1	6.0	9.6
2+	1.6	3.5
NHATS dementia diagnosis		
1 Probable dementia	10.1	25.5
2 Possible dementia	10.5	17.7
3 No dementia	79.4	56.8
Health and health conditions		
Good or excellent self-rated health	72.6	51.5
Heart attack	5.1	7.2
Heart disease	23.6	31.0
Hypertension	73.3	81.4
Arthritis	66.8	73.8
Osteoporosis	28.3	34.9
Diabetes	30.2	39.3
Lung disease	20.9	24.0
Stroke	4.3	8.0
Cancer	10.3	10.2
Caregiver characteristics		

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Characteristics	Full study sample (N = 2,549) (%)	Nursing home placement (N = 340) (%)
Age		
<35	2.7	3.0
35–54	18.7	17.7
55–64	18.2	23.8
65+	38.9	27.4
Missing	21.5	28.1
Female	63.2	61.8
Education		
Less than high school or high school graduate	29.6	25.0
Some college and bachelor's degree or above	44.4	38.6
Education missing	26.0	36.4
Relationship to care recipient		
Spouse	37.8	16.0
Children	36.8	48.0
Other	25.5	36.0
Hours of caregiving		
7 hours or less a month	8.5	7.6
> 7–30 hours a month	28.2	29.4
> 30–90 hours a month	29.3	29.1
90+ hours a month	34.0	33.8
Other unpaid caregiver	48.6	64.7
Other paid caregiver	14.5	31.4

Note. [a] Not reported because the unweighted cell size was less than 11. Full sample includes NHATS respondents living in the community in any of the baseline year (2015–2017) with at least one unpaid caregiver in the Other Person file. Nursing home admission is determined on the basis of a 2-year follow-up from the Minimum Data Set.

Predictors of Nursing Home Placement

Exhibit 2-D presents estimates from the final selected models predicting nursing home admission. Insurance status played a significant role: enrollment in Medicare Advantage was associated with reduced likelihood of nursing home admission (OR = 0.594 for non-SNP MA enrollment and OR=0.534 for MA SNP enrollment), while dual eligibility for Medicare and Medicaid was associated with increased odds of nursing home placement (OR = 1.785). Consistent with previous research, health status and functional limitations were important predictors of nursing home admission. Specifically, persons with three or more IADLs limitations

(OR = 1.565) and those who ever had a stroke (OR=1.557) had higher odds of nursing home placement while those with self-rated good health had lower odds of placement (OR = 0.680). Individuals experiencing social isolation were 43% more likely to be placed in nursing homes compared to those not experiencing isolation.

Demographic factors showed that older age was a strong risk factor (75–84 years: OR = 1.902; 85+ years: OR = 2.287). Individuals who owned their home (OR = 0.578) had lower likelihood of nursing home admission, and living in larger households is marginally protective (OR = 0.731 for two members). Black respondents and those identifying as Other race had significantly lower odds of nursing home placement compared with White respondents.

Caregiver characteristics emerged as important determinants of long-term care placement in a nursing home. Respondents whose primary caregiver was not a family member, had increased risk of long-stay nursing home admission (OR = 1.677). Financial difficulties in caregiving (OR = 1.553) were associated with increased odds of nursing home placement. Having other paid caregivers was also a strong predictor of nursing home placement, which typically reflects more advanced caregiving needs. However, caregiving intensity (hours of caregiving) and caregiver physical or mental health burden, as measured by experiencing physical or mental difficulties, did not predict long-stay nursing home admissions.

Exhibit 2-D. Predictors of Long-Term Care Placement Within 2 Years for Community-Living Older Adults Receiving Help With Self-Care From Family or Unpaid Caregivers

Variables	Long-stay nursing home admission	
N	2,549	
	Odds ratio	CI
Medicare Advantage Non-SNP	0.607***	0.453 - 0.813
Medicare Advantage SNP	0.534**	0.314 - 0.909
Dual eligible	1.785***	1.289 - 2.473
Number of IADLs		
2	0.827	0.452 - 1.510
3+	1.565*	0.981 - 2.498
Self-rated health good overall	0.680***	0.514 - 0.898
Social isolation	1.437**	1.012 - 2.041
Diabetes	1.264	0.952 - 1.679
Stroke	1.557**	1.064 - 2.280
Heart disease	0.750**	0.564 - 0.996

Variables	Long-stay nursing home admission	
N	2,549	
	Odds ratio	CI
Age		
75–84	1.902***	1.247 - 2.901
85+	2.287***	1.473 - 3.552
Number of members in household		
2	0.731*	0.526 - 1.016
3+	0.759	0.540 - 1.066
Own home	0.578***	0.436 - 0.765
Race and ethnicity		
Black	0.618***	0.433 - 0.883
Other	0.362***	0.183 - 0.713
High school degree or higher	1.266	0.952 - 1.684
Caregiver characteristics		
Relationship to sample person		
Children	1.325	0.880 - 1.995
Other	1.677**	1.085 - 2.593
Gender		
Female	0.800	0.607 - 1.055
Financially difficult helping the sampled person	1.553**	1.107 - 2.180
Physically difficult helping the sampled person	1.273	0.906 - 1.789
Having other paid helper	1.428***	1.091 - 1.868

Note. The sample included NHATS respondents living in the community at baseline (2015–2017) with at least one caregiver in the NSOC file. "Long-stay nursing home admission" is defined as having any 30+ days of stay in a nursing home within the 2-year follow-up from the interview year, identified from the Minimum Dataset. All individual and caregiver characteristics were obtained from the baseline survey.
CI = 95% confidence interval. * $p<0.05$, ** $p<.01$, *** $p<.001$

Sensitivity Analyses

There are two main issues for estimating nursing home placement using the NSOC sample which may affect the results from the main analysis. First, the NSOC data contains only a subset of caregivers from the household roster, because not all caregivers responded to the detailed NSOC questionnaire. And second, because the NSOC was fielded biennially, our analysis was

limited to two waves of linked NHATS-NSOC data (2015 and 2017). To test the sensitivity of our main findings, we estimate the stepwise regression model predicting long-stay nursing home admission for a sample of community-living NHATS respondents who had at least one unpaid caregiver in the OP file. Using the same sample restrictions as our main analysis, the analytic sample for the sensitivity analysis included 12,675 observations for 6,162 individuals.

The sensitivity analysis (Exhibit 2-E) revealed patterns that are largely consistent with the main analysis but with more predictors identified due to a larger sample size. Exhibit 2-E presents estimates from the final selected models predicting nursing home admission. Insurance plan type was an important predictor of long-stay nursing home admission with individuals enrolled in MA plans having lower odds of nursing home admission (OR = 0.538). In addition, dual eligibility was associated with higher odds of nursing home placement.

Individuals with greater ADL needs were more likely to be admitted to a nursing home. But controlling for ADL and IADL needs, the presence of any of the eight chronic conditions was not significantly associated with nursing home placement. Older individuals, particularly those ages 75–84 and 85+, had higher odds of placement in nursing home compared with younger individuals ages 65 to 74. Household composition also played a role; a greater number of household members was associated with a lower likelihood of nursing home placement. However, after controlling for socioeconomic factors such as dual eligibility, home ownership, education, and employment status, there was no evidence that income categories significantly predicted nursing home placement.

Caregiver characteristics emerged as important determinants of long-term care placement in a nursing home. Compared with individuals whose spouses were the primary caregivers, those cared for by children or other family members were more likely to experience long-stay nursing home admissions. In addition, individuals with female primary caregivers were less likely to enter nursing home settings (OR = 0.828) than were those who had male primary caregivers. Compared with individuals not receiving paid home help at baseline, those receiving paid care—often indicative of higher care needs—were 1.2 times as likely to transition to nursing home (OR = 1.245). Despite these findings, the relationship between the number of caregiving hours and nursing home placement remains unclear because of substantial missing data on caregiving hours in the OP file.

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Exhibit 2-E. Predictors of Long-Term Care Placement Within 2 Years for Community-Living Older Adults Receiving Help With Self-Care From Family or Unpaid Caregivers, NSOC Sample

Variables	Long-stay nursing home admission	
N	**12,675**	
	Odds ratio	**CI**
Medicare Advantage	0.538***	0.427–0.678
Dually eligible	1.403**	1.047–1.878
Number of ADLs (Reference: No ADL)		
1	1.360**	1.054–1.755
2	1.422**	1.048–1.930
3+	1.760***	1.348–2.297
Number of IADLs (Reference: No IADL)		
1	1.366	0.927–2.012
2	1.649**	1.116–2.436
3+	2.230***	1.525–3.261
Self-rated health good overall	0.705***	0.573–0.867
Social Isolation	1.356**	1.017–2.033
Diabetes	1.345**	1.072–1.687
Dementia diagnosis (Reference: Probable dementia)		
Possible dementia	0.896	0.664–1.207
No dementia	0.588***	0.452–0.764
Age		
75–84	1.789***	1.298–2.466
85+	2.262***	1.606–3.185
Number of members in household		
2	0.787**	0.609–1.018
3+	0.755**	0.563–1.012
Employed	0.535*	0.281–1.019
Income quintiles (Reference: Lowest income quintile, quintile 1)		
2	1.106	0.817–1.497
3	1.160	0.808–1.664
4	0.923	0.603–1.414
5	0.602**	0.366–0.990

Variables	Long-stay nursing home admission	
N	12,675	
	Odds ratio	CI
Own home	0.688***	0.539–0.879
Race and ethnicity		
Black	0.849	0.639–1.128
Other	0.421***	0.271–0.654
Caregiver characteristics		
Relationship to sample person		
Children	1.399**	1.042–1.877
Other	2.395**	1.054–5.445
Gender		
Female	0.839*	0.688–1.024
Missing	1.143	0.754–1.731
Education		
High school degree or higher	1.270*	0.982–1.622
Education missing	0.919	0.457–2.203
Having other paid helper	1.538***	1.236–1.913

Note. The sample included NHATS respondents living in the community at baseline (2015–2017) with at least one unpaid caregiver in the Other Person file. "Long-stay nursing home admission" is defined as having any 30+ days of stay in a nursing home within the 2-year follow-up from the interview year, identified from the Minimum Dataset. All individual and caregiver characteristics were obtained from the baseline survey.

CI = 95% confidence interval. * p<0.05, ** p<.01, *** p<.001.

Discussion and Policy Implications

Health insurance type predicted nursing home admission. Compared with FFS enrollees, individuals enrolled in MA plans, both non-SNP and SNPs, had significantly lower odds of nursing home admission, after controlling for demographic characteristics, health status, and functional needs. In addition, dual eligibility was associated with higher odds of nursing home placement. MA plans are permitted to offer supplemental benefits not covered by traditional Medicare. Supplemental benefits historically included services such as dental, vision, and hearing care, but recently they have become more expansive. In 2019, MA plans began covering additional health-related benefits for people with chronic conditions and LTSS needs. In 2020, plans started offering Special Supplemental Benefits for the Chronically Ill, which

include benefits to address health-related social needs among enrollees with chronic conditions. Whether or to what extent MA supplemental benefits designed specifically to meet the needs of older people with chronic conditions and LTSS can play a role in preventing or deferring long-stay nursing home use is a subject for future research.

Social isolation was associated with increased risk for nursing home placement. Studies examining social isolation as a predictor of long-term nursing home placement are limited and have defined long-stay nursing home placement based on point-in-time measures.[63] Using the 30-day measures for long-stay admission, we find that individuals who experience social isolation had significantly higher odds of nursing home placement within a 2-year follow-up period. Prior research has shown that social isolation is also correlated with poor health outcomes including functional limitations, cognitive decline and chronic conditions including diabetes and cardiovascular disease.[64,65,66] With increasing concern about social isolation in the wake of the COVID-19 pandemic, expanding policies and programs that improve social connectedness can improve outcomes of older adults and potentially reduce avoidable Medicare and Medicaid spending. Assisted living facilities typically try to foster a sense of community among residents and provide opportunities for socialization with peers that are less available to older adults living in private homes alone or with relatives. However, access to assisted living is limited for older adults who qualify financially for Medicaid HCBS coverage.

Caregiver characteristics were important determinants of long-term nursing home placement. Individuals whose primary caregiver at baseline was not a family member had lower odds of nursing home placement compared to those whose primary caregiver was a family member. Compared with individuals not receiving paid home help at baseline, those receiving paid care—often indicative of higher care needs—were 1.2 times as likely to transition to a nursing home. In addition, the caregiver's financial burden measured by whether a caregiver experience financial difficulties in providing care was associated with increased odds of nursing home placement. These findings highlight the importance of caregiver support policies to help lower the likelihood of nursing home placement among older adults. For example, our findings suggest that state Medicaid programs that provide a "consumer-directed" or "self-directed" care option and allow individuals to hire and pay family members as caregivers may be effective at helping older adults avoid nursing home placement.

Respondents admitted to a nursing home differed from the full study sample in economic characteristics, health care needs, and caregiver dynamics. Although 40% of individuals in the full-study sample were enrolled in MA plans, the proportion was lower among those admitted to nursing home (28.7%). This finding, consistent with findings in previous studies examining nursing home utilization by FFS and MA beneficiaries, suggests that individuals with lower LTSS

needs may be more likely to select MA plans. For 37.8% of the full study sample the spouse was the primary caregiver, but the proportion was significantly lower for respondents admitted to nursing home (16.0%).

Limitations

As both studies in this project suffer from limitations primarily related to data availability and quality, in this section we describe the limitations of our analysis across both focus areas.

1. **Sample size limitations**. The size of the study sample limited our ability to examine all outcome measures needed to assess the relationship between Medicare plan types and service use patterns. For example, we could not measure service use outcomes at the intensive margin, such as number of visits and number of inpatient stays among enrollees who had at least one visit. In addition, small cell size for health care utilization measures within plan type separately for Medicare-only and dually eligible beneficiaries precluded subgroup analysis that could inform understanding of differences in service use patterns across the groups. Small cell size for outcome measures also limited the types of longitudinal analysis we could conduct. To increase sample size and ensure robust estimation, the analysis used a pooled sample from the survey waves. A potential way to mitigate these issues would be to use additional years of NHATS data. At the time of this study, 2019 was the most recent year of data available and data prior to 2015 would not have been relevant to the analysis of enrollment in SNPs, which have seen a rapid growth in enrollment during recent years.

2. **Limitations of findings based on NSOC**. We constructed caregiver variables using information from the NSOC. However, NSOC does not include responses from all unpaid caregivers reported in the NHATS Other Person (OP) file. For example, in 2015, 2,204 unpaid caregivers completed NSOC. However, it only covered 19.6% (N = 1,194) of all unpaid primary caregivers identified in the OP file (N = 6,092). NSOC response rates explain most of the mismatch between sample sizes. NSOC had a 68.1% unweighted first-stage response rate, because the NHATS respondent refused to provide contact information for the caregiver.[67] Among eligible caregivers for whom the respondent did not refuse to provide information, the second-stage response rate was 59.7%. These differences may limit the generalizability of findings from our analysis. To mitigate the issue, we conducted sensitivity analysis with the NHATS-OP sample to compare with our main results, and found no contradictory estimates using the two samples. However, more predictors were identified in the NHATS OP file and certain chronic conditions were identified as significant predictors in the NSOC analysis. These are likely due to the differences between the respondent and

caregiver characteristics and may limit the generalizability of findings from the NSOC analysis.

3. **Lack of imputation methodology for total assets**. NHATS Technical Paper 15[68] describes the method to calculate imputed total income but not total assets. The imputation methodology for total income variable cannot be easily adapted for imputing total assets, and developing an imputation method was beyond the scope of this project. We did not include a measure of total assets in our analysis. Instead, we included an indicator for home ownership, an important asset that is an important predictor of long-term care placement.

4. **Limited LTSS measures**. Although states began transitioning from reporting Medicaid data from the Medicaid Analytic Extract format prior to the Transformed Medicaid Statistical Information System (T-MSIS) in 2012, most states had transitioned by 2016. The quality of T-MSIS data during the transition period (2012–2016) was poor, especially for home- and community-based services (HCBS) data elements, which changed substantially between the Medicaid Analytic Extract and T-MSIS.[69,70] As we could not measure HCBS utilization consistently for the study sample and the resulting limited sample size for the remaining years, our analysis did not examine HCBS use patterns.

5. **Lack of causal relationship.** Our study focuses on associations and predictive relationships of individual, health insurance, and caregiver characteristics with healthcare service utilization. However, a key limitation of this study is the inability to establish causal relationships between Medicare plan type and healthcare utilization patterns, and long-term nursing home placement.

Strengths and Limitations of NHATS-CMS-Linked Data

This project used the NHATS data linked with Medicare FFS claims, MA encounter data, and T-MSIS data to examine acute care and LTSS use patterns, and factors affecting the type and intensity of acute and LTSS use among older adults. Our work revealed the strengths and limitations of this linked dataset for studying health care needs and health care utilization patterns for older adult Medicare beneficiaries across Medicare and Medicaid plans. First, the NHATS-CMS-linked dataset is a valuable resource for examining health care utilization patterns because it provides both claims-based and self-reported measures of health conditions, allowing cross-validation for accurate measurement. Second, the link helps fill data gaps for information that may be difficult to obtain through the survey. For example, the linked data includes the Outcome and Assessment Information Set dataset. These data help measure functional ability for individuals in institutional settings that NHATS does not collect in the

facility questionnaire, potentially due to limited ability of respondents to provide the information. Finally, the availability of provider-format Medicare Beneficiary Summary File (MBSF) allows for linkage with external Medicare plan data to identify plan types. In this study, we linked relevant variables from CMS SNP data with the NHATS-CMS-linked dataset to identify non-SNP MA plans and SNPs.

Although the NHATS-CMS-linked data provide a rich data source for analysis of health care service utilization, there are sample size limitations for analyzing the relationship between caregiver characteristics and long-term care placement. Specifically, as outlined in the "Limitations" section, for rare outcomes or outcomes experienced by a small proportion of the respondents, such as nursing home admissions and residential care admission, cell sizes for NSOC variables can be small. This limitation is magnified for studies that would like to examine differences by Medicare and Medicaid plan types. Furthermore, unlike the National Long-Term Care Survey, NSOC does not identify a primary caregiver. Instead, interviews are attempted with all eligible helpers for whom contact information has been obtained. The aim of the design is to yield a caregiver sample that is representative of all eligible caregivers to older adults and allows insights into the way in which caregiving responsibilities are distributed. This approach provides an opportunity to study impacts of caregiver networks and other caregiver dynamics that have been understudied.[71] However, comparing primary caregivers identified from the OP file and linking them to NSOC revealed that less than 20% could be matched. This discrepancy suggests that the NSOC may not include a large proportion of primary caregivers for NHATS respondents as listed in the NHATS OP file. The sampling weights developed by the NHATS team, which are adjusted to account for nonresponse to NHATS and NSOC can alleviate concerns about representativeness of the NSOC sample. An examination of the differences between primary caregivers identified from the OP file and NSOC was beyond the scope of this study, but such analysis may provide insights into the differences between the caregiver samples across the two data sources. The resulting lower overall sample size and cell sizes within nursing home admissions and admission in the NSOC limited our ability to comprehensively analyze association of caregiver characteristics with long-term care placement.

Future Research

This project presents several avenues for future research. Our study examined the characteristics of enrollees and healthcare utilization patterns in Medicare FFS and MA plans between 2015 and 2019. But enrollment in plans with higher level of integration—FIDE SNPs and HIDE SNPs—has been increasing rapidly in recent years. Future research should examine

how enrollment in these integrated plans alters the composition of enrollees and healthcare utilization patterns across all Medicare plan types. In addition, more research is needed to understand whether a higher level of integration between Medicare and Medicaid is associated with improved health outcomes. Further research is also needed for causal identification of the reasons driving the differences in care across Medicare plans.

Medicaid is the largest payer of LTSS, and several state Medicaid plans have implemented managed care coverage for long-term services and supports, and other non-Medicare covered services, either by encouraging voluntary enrollment or mandating enrollment for certain groups. States most often mandate the enrollment of Medicaid-eligible older adults in Managed Long-Term Services and Supports (MLTSS) plans. According to the ADvancing States Medicaid Integration Tracker, as of June through July 2024, 24 states had or were actively developing Medicaid LTSS plans for older adults.[72] While our findings suggest differences in care utilization between FFS and managed care plans in Medicare, future studies can examine the impact of Medicaid managed care on healthcare utilization.

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[Note that the following is a note, not a reference. I'm having trouble adding a comment, so I just red highlighted it.]

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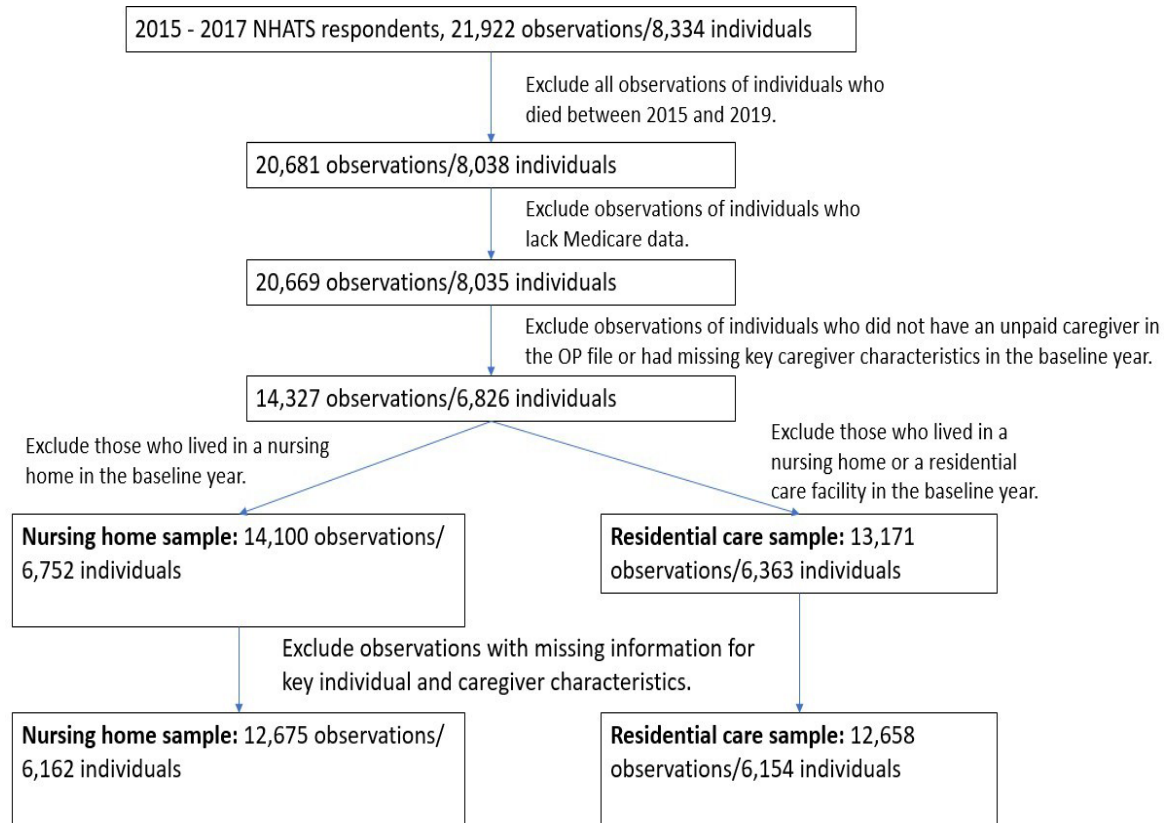
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Appendix A. Sample Selection

Exhibit A-1. Sample Selection

2015 - 2017 NHATS respondents, 21,922 observations/8,334 individuals

Exclude all observations of individuals who died between 2015 and 2019.

20,681 observations/8,038 individuals

Exclude observations of individuals who lack Medicare data.

20,669 observations/8,035 individuals

Exclude observations of individuals who did not have an unpaid caregiver in the OP file or had missing key caregiver characteristics in the baseline year.

14,327 observations/6,826 individuals

Exclude those who lived in a nursing home in the baseline year.

Exclude those who lived in a nursing home or a residential care facility in the baseline year.

Nursing home sample: 14,100 observations/ 6,752 individuals

Residential care sample: 13,171 observations/6,363 individuals

Exclude observations with missing information for key individual and caregiver characteristics.

Nursing home sample: 12,675 observations/ 6,162 individuals

Residential care sample: 12,658 observations/6,154 individuals

Note. NHATS=National Health and Aging Trends Study; OP=Other Person

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Appendix B. Variable Definitions

Variables	Definitions
Focus Area 1	
Outcomes	
Acute and post-acute care: • Any inpatient visit • Any outpatient visit • Any ED visit • Any Medicare covered home health use • Any Medicare covered skilled nursing facility use	• Binary, indicating whether the sampled person had any utilization of each type of care in each study year. Data used: • FFS enrollees: Used person-level Medicare MBSF Cost and Use segment to identify utilization. • MA enrollees: used Part C encounter data to identify utilization with relevant claim type code and revenue center codes. • Dual eligible enrollees: used the Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF) files to identify utilization covered by Medicaid.
Any nursing home admission	• Binary, indicating whether the sampled person had any nursing home admission in each study year • Defined by their start and end date of their stay Data used: Minimum Data Set (MDS)
Any long-stay nursing home admission	• Binary, indicating whether the sampled person had any nursing home admission that lasted more than 30 days in each study year • Defined by their start and end date of their stay, and length of stay is defined using cumulative days in facility, per the MDS 3.0 Quality Measures User's Manual Data used: Minimum Data Set (MDS)
Independent Variables	
MA SNP types	• Categorical: C-SNP, CO-SNP, FIDE-SNP, and I-SNP. Data used: CMS SNP comprehensive reports from January of each study year, linked with MBSF, by contract number and plan ID.
Individual characteristics	• See Sampled person characteristics under Focus Area 2
Focus Area 2	
Outcomes	
Any long-stay nursing home admission	• Binary, indicating whether the sampled person had any nursing home admission that lasted more than 30 days within two years from the NHATS interview.

Variables	Definitions
	• Defined by their start and end date of their stay, and length of stay is defined using cumulative days in facility, per the MDS 3.0 Quality Measures User's Manual Data used: Minimum Data Set (MDS)
Any residential care admission	• Binary, indicating whether the sampled person had any residential admission within two years from the NHATS interview Data used: NHATS residential setting variable
Independent Variables	
Sampled person characteristics	
Age	Age groups: 65-74, 75-84, 85+. NHATS SP file 2015.
Sex	Female, Male. NHATS SP file 2015.
Race/Ethnicity	Non-Hispanic White, non-Hispanic Black, Other (including Hispanic). NHATS SP file 2015.
Education	Binary indicating whether the SP has a high school degree or above. NHATS SP file 2015.
Employment	Binary, indicating whether the SP was employed for pay. NHATS SP file 2015.
Self-reported health status	Binary, indicating whether SP rated their health as good to excellent. NHATS SP file 2015.
Social isolation	We measure social isolation based on the approach by Cudjoe et al. (2018)
Chronic conditions	A series of binary variables indicating whether the person has ever been told by a doctor that he/she has any chronic conditions: heart attack, heart disease, high blood pressure, arthritis, osteoporosis, diabetes, stroke, cancer. NHATS SP file 2015.
Dementia classifications	Categorical, indicating whether the SP was classified as having probable, dementia, possible dementia, or no dementia. The classification is based on an algorithm developed by NHATS researchers using information including self-reported diagnosis, diagnosis instrument scores, and responses to cognitive tests. The classification algorithm can be found: Dementia Classification with Programming Statements https://www.nhats.org/researcher/nhats/methods-documentation. NHATS SP file 2015.
Number of ADLs	Count of reported difficulties with moving inside the house, getting out of bed, eating, bathing, using toilet, and dressing. Difficulty was defined if SP indicated they did not do this activity last month or did with difficulty. NHATS SP file 2015.
Number of IADLs	Count of reported difficulties with making hot meals, doing laundry, shopping, banking, and managing medication. Difficulty was defined if

Variables	Definitions
	SP indicated they did not do this activity last month or did with difficulty. NHATS SP file 2015.
Dual eligibility	Binary, indicating whether the SP is enrolled in Medicaid. Medicare MBSF 2015.
Household size	Number of people in the household: 1, 2, 3 and more. NHATS SP file 2015.
Long-term care insurance	Binary, indicating whether the SP has private long-term care insurance coverage. NHATS SP file 2015.
Total income	Continuous, indicating the SP's total annual income. If missing, we used one set of imputation provided by NHATS. NHATS SP file 2015.
Home ownership	Binary, indicating whether the SP own their home vs. rent. NHATS SP file 2015.
Whether there are other unpaid caregivers	Binary, indicating whether the SP had other unpaid helpers than their primary caregivers. This is defined as 1 if the SP had more than one unpaid helper in the OP file. NHATS OP file 2015.
Whether there are other paid caregivers	Binary, indicating whether the SP had other paid helpers than their primary caregivers. This is defined as 1 if the SP had more than one paid helper in the OP file. NHATS OP file 2015.
Primary caregiver characteristics	If an SP only has one unpaid caregiver, then this person is considered their primary caregiver. If they had multiple, we considered the number of hours of helping, whether living with SP, and relationship with SP.
Age	Categorical: <35, 35-54, 55-64, 65+. NHATS OP file 2015.
Sex	Male, female. NHATS OP file 2015.
Education	Binary indicating whether the PC has a high school degree or above. NHATS OP file 2015.
Employment	Binary, indicating whether the PC was employed for pay. NHATS OP file 2015.
Relationship to SP	Categorical: spouse, children, other person . NHATS OP file 2015.

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