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Untapped Potential – Using the HRS-Medicare Linked Files to Study the Changing Nursing Home Population

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Abstract

Background—Nursing home (NH) care in the United States now includes many short term admissions to skilled nursing facilities (SNFs) for post-acute care.

Objective—To demonstrate the potential of the Health and Retirement Study (HRS) linked to administrative data to study this group.

Research Design—Descriptive retrospective panel study

Subjects—HRS respondents between 2002–10 linked to administrative data from the Centers for Medicare and Medicaid Services (CMS).

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Conflicts of interest: This manuscript and the Health and Retirement Study are each (separately) sponsored by the National Institute on Aging (NIA). Dr. Lima has been paid 100 contract hours by NIA over the past 18 months to consult on matters pertaining to NIA's current arrangements and future options for the acquisition and distribution of CMS datafiles, particularly as they pertain to NIA sponsored surveys linked to CMS files, including the Health and Retirement Study. Ms. Ogarek has no conflicts of interest. Dr. Mor has three financial interests that are broadly related to policy issues related to the quality of nursing home care. He is the Chair of the Independent Quality Committee at HCR ManorCare and is compensated for the service. HCR is a provider of short-term, post-hospital services and long-term care. The company has a network of more than 500 nursing and rehabilitation centers, assisted living facilities, outpatient rehabilitations clinics, and hospice and home health care agencies. Dr. Mor is also a paid consultant to NaviHealth, Inc, and chair of their Scientific Advisory Board. NaviHealth is whole owned by Cardinal Health. The company offers post-acute care (PAC) management and services to more than 1.5 million beneficiaries in all regions of the country through its partnerships with health plans and health systems. Dr. Mor is also a former Director of PointRight, Inc. While he no longer provides any services or holds any positions at PointRight, he still has a small amount of equity in the company. PointRight is a provide company based in Cambridge, MA. It provides predictive analytics solutions to thousands of post-acute providers, long-term care providers, hospitals, payers, and insurance organizations.

Measures—NH use was defined in three ways: by survey responses, Medicare SNF claims, and mandatory NH assessments.

Results—8.5% of observation periods (i.e., time between two consecutive survey dates or two years prior to initial survey) reported by the survey and 26.0% reported by administrative data indicated some NH use. There was 98% agreement between survey responses and administrative data when there was no indication of a NH observation in the administrative data. However, there was only 33% agreement between survey responses and administrative data when a NH stay *was* indicated in the administrative data. NH stays associated with SNF care were responsible for the discrepancy – they were not consistently captured by the HRS survey. Rates of agreement were highest when a proxy respondent was used, and lowest among respondents who rated themselves in excellent overall health. Rates of agreement were higher later in the decade than earlier.

Conclusions—The HRS-Medicare linked files enhance the ability of the HRS to examine the growing use of NH for post-acute care as well as offer a more comprehensive view of who uses NHs.

Keywords

nursing home; skilled nursing; Health and Retirement Study; Medicare

Introduction

The landscape of nursing home (NH) care in the United States has shifted dramatically in the last decade. NHs are no longer simply an institutional setting for the long-term care of frail older persons. They are increasingly composed of individuals receiving skilled nursing care following an acute care episode in the hospital. Despite declining NH occupancy rates and lengths of stay overall, NH admissions have grown due to the large numbers of these post-acute admissions, primarily paid for by Medicare's skilled nursing facility benefit (SNF).¹

The SNF benefit allows for Medicare coverage of up to 100 days of rehabilitative skilled nursing care following a three-day hospital stay, provided certain other conditions are met.² Using data from *Long-term Care: Facts on Care in the United States (LTCfocus.org)*³, we estimate that the proportion of NH days in the United States that were paid for by the SNF benefit rose from 11.5% in 2000 to 17.6% in 2010. In addition, 82% of the approximately 3.6 million NH admissions in 2015 were the result of a direct transfer from a hospital. [Calculated from LTCFocus.org].

This growing heterogeneity of NH residents made up of both traditionally long-term and post-acute residents adds complexity to the study of NH care. This complexity not only pertains to the determinants and consequences of NH use, but also to the definition of a NH stay itself. Researchers must understand how the public perceives the concepts of NH stays in relation to post-acute rehabilitation stints, particularly in their responses to survey questions. The ability to evaluate both the demand and supply side factors that influence individuals' choice of NH care is increasingly important as health care policy emphasizes the role of informed consumers' preferences.^{4,5}

The Health and Retirement Study (HRS) is uniquely situated to examine these topics, particularly now that it has been linked to Medicare claims and assessment data from the Centers for Medicare and Medicaid Services (CMS). One of the largest and longest running national surveys of the elderly population, the survey has collected information on a representative sample of Americans over the age of 50 for more than two decades.⁶ It gathers data on a wide range of topics including the physical and mental health status, insurance coverage, financial status, family support systems, labor market status, and retirement planning of older Americans. Individuals are surveyed every two years until death. Despite the richness of the survey, there have been no questions specifically related to post-acute care services and those pertaining to time spent in a NH likely do not sufficiently capture its use for short term rehabilitation and recuperation, given the specific wording of the questions.

The HRS, however, has been linked to CMS administrative data since 2011. In 2014, linked NH assessment data through 2010 were added. This has opened up a new avenue to examine the changing role of NHs in ways that neither the HRS survey nor CMS administrative data alone can capture.

Only a few published studies have taken advantage of the linked files to study NH use to date. None of the most recently published articles using the HRS to study NH admissions or use defined NH stays using the linked files, relying solely on survey responses.^{7–10} The goals of this report, therefore, are to demonstrate the potential of the HRS-linked Medicare files to study the full scope of NH utilization among the elderly Medicare population and to better understand the relationship of survey response to administratively-defined NH stays in the HRS.

Methods

Data Source and Study Population

This study uses 2002–2010 survey data from the HRS linked with 2000–2010 Medicare enrollment, SNF claims, and the Minimum Data Set (MDS) NH assessment data from CMS. The use of these linked data were approved by both CMS and the University of Michigan under the terms of dual Data Use Agreements. The Institutional Review Board of Brown University approved the study.

The HRS survey—The HRS is sponsored by the National Institute on Aging (grant number NIA U01AG009740) and is conducted by the University of Michigan⁶. Begun in 1992, a new birth cohort is added every six years to ensure that the survey continually represents those 50 and older. Although individuals must be living at home when they enter a survey cohort, they can subsequently enter a care facility and continue to participate in the study. Since its inception, over 38,000 individuals have participated in one or more waves. More than 80% of those eligible have given their permission to link their survey data with their administrative data from CMS. This study uses the tracker file and core surveys and relies on the RAND public use version, an easy to use longitudinal datafile based on the HRS data.¹¹

CMS data—The enrollment file contains Medicare, Medicaid, and Part D eligibility and enrollment status, monthly enrollment status in Medicare health maintenance organizations (HMOs), birth and death dates, and limited sociodemographic information for all Medicare beneficiaries. SNF claims contain final action, fee-for-service claims data submitted by SNF providers. MDS data are federally mandatory clinical assessments of all NH admissions to Medicare and/or Medicaid certified NHs, repeated at least quarterly and whenever there is a change in a resident's status.

Sample

Because MDS data were only available in the HRS-Medicare linked files thru 2010 at the time these analyses were conducted, we examined NH use between 2000 and 2010. We used 2002–2010 survey data, excluding exit surveys for those that died between waves. Between 2002 and 2010, 29,219 respondents had at least one survey. Of those, 16,799 were Medicare eligible and gave their permission to be linked to CMS data. We dropped 75 respondents whose HRS IDs overlapped, and an additional six whose CMS-reported and HRS-reported gender did not match. Of the remaining 16,718 respondents, 2,712 were dropped due to incomplete Medicare coverage. The final sample included 14,006 respondents with 44,259 survey observations. While the MDS are available for all NH respondents regardless of payer source, Medicare claims are only available for fee-for-service (FFS) Medicare recipients. Therefore, when incorporating SNF claims into the results an additional 11,375 observations were dropped since the enrollment file indicated that the respondent was enrolled in an HMO at some point during the look back period, for a final FFS sample of 32,834 observations across 11,428 individuals.

Variables

Whether or not a person was in a NH at any time since the last survey wave, or else in the two years prior to their first survey, was identified in three ways. Using the survey, a person was considered to have used a NH during the look back period if they were living in a NH at the time of the survey or answered affirmatively to the following question: *[Since Respondent's last interview wave month & year/in the last two years] have you been a patient overnight in a nursing home, convalescent home, or other long-term health care facility?* We also created separate flags of NH use based upon service dates within the SNF claims and MDS files for the same time periods.

Differences in reporting were examined across several characteristics including gender, race (non-Hispanic White, non-Hispanic Black, Hispanic, Other), marital status (never married, married, divorced/separated, widowed), education (less than high school, high school, some college, college or more), dual-eligibility (i.e., Medicare and Medicaid) status, age group, self-reported health, year of survey, and whether or not the respondent relied on a proxy. All items were taken from the HRS survey except for dual-eligibility status, which came from the CMS enrollment file.

Analyses

We report rates of NH use by survey response and CMS administrative data. We then describe levels of agreement overall and by several characteristics. No survey weights were

used in the analyses because we are not presenting population estimates or conducting multivariate analyses. We are looking strictly at within person/observation reporting agreement.

Results

Eight and a half percent of all observation periods as reported by the survey and 26% as reflected in administrative data revealed at least some NH use between 2000 and 2010 (see Table 1). Among the FFS sample, we can further see that the majority of NH episodes (represented by the presence of an MDS assessment during the lookback period) were covered by the SNF benefit at some point during the stay (approximated by a SNF claim in the same time period).

Table 2 looks at the within-observation agreement between survey responses and administrative data. Among all eligible Medicare beneficiaries, in 98% of observations without an MDS assessment in the administrative data, survey respondents also stated that they had not been in a NH during that time period. Alternatively, only one-third (32.7%) of observations with an MDS assessment reflecting NH use were also captured by survey responses. The same is true for FFS-only beneficiaries.

Table 3 examines the rate of survey agreement when administrative data indicates a NH stay by several respondent characteristics. Compared to the overall rate agreement of 33% found in Table 2, rates of agreement ranged from a high of 74% among proxy respondents to a low of 19% among those who reported being in excellent health.

Rates of agreement do show improvement over time (see Figure 1). Between 2002 and 2010, the proportion of all HRS respondents reporting no NH stay in the survey despite the presence of an administrative record declined by 50%, from 18.9% of all observations in 2002 to 9.5% in 2010.

Discussion

By merging survey responses with CMS administrative data, the HRS was able to enhance its value as a research tool for studying NH care. Among HRS respondents whose survey responses were matched to data between 2000 and 2010, the number of study periods in which NH care was captured increased by two-thirds. The missed NH care episodes appear to be largely attributable to post-acute care episodes as indicated by payment under the SNF benefit. The wording of survey questions likely underestimates short term rehabilitative NH use. Our findings in Table 3 showing lower concordance between survey and administrative data among respondents who rated themselves in excellent health and higher concordance for proxy versus self-respondents give credence to this perspective.

We are limited in that we can only comment on the population of HRS respondents who agreed to allow their responses to be matched to administrative data and who were actually matched. We also cannot fully capture information on the small number of individuals who may have stayed at a NH that was not Medicare or Medicaid certified since these facilities are not mandated to complete MDS assessments. Further, it might be noted that SNF claims

do not capture post-acute care episodes for individuals insured through a Medicare HMO. However, our findings show that a large number of HRS respondents who are HMO members also had administrative signs of having used a NH as evidenced by an MDS record. Since there is a very high correspondence between having an MDS and a SNF claim among FFS respondents (94% of observations with a SNF claim in our study also had an MDS assessment, not shown), this makes it possible to study NH use without having to drop the increasingly large number of individuals who are HMO members. Finally, administrative data were only available through 2010 at the time of our analyses. The HRS-Medicare linked files will become even more valuable as more administrative data are able to be linked.

The added ability by the HRS to capture post-acute NH use through linkage to administrative data is important given that one-fifth of all FFS Medicare beneficiaries were discharged from a hospital to a skilled nursing facility in 2015.¹² Better understanding the role that accumulating post-acute care episodes have in increasing individuals' risk of becoming a permanent NH resident is very important, particularly better understanding which factors might attenuate that risk. To our knowledge, there are no other data sources that combine the breadth and depth of information that the HRS-Medicare linked files do to examine this and related topics.

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Figure 1. Among FFS Medicare Beneficiaries, NH Use Agreement by Mode of Definition Over Time

FFS=fee-for-service; NH=nursing home; HRS=Health and Retirement Study; CMS=Centers for Medicare and Medicaid Services

Table 1Rates of NH Use Since the Last Survey^a by Mode of Definition

	%
<i>Observation-level (all Medicare eligible n=44,259)</i>	
NH use by survey response	8.5%
NH use by MDS assessment	26.0%
<i>Observation-level (FFS Medicare n=32,834)</i>	
NH use by survey response	8.7%
NH use by SNF claim	24.2%
NH use by MDS assessment	26.0%
NH use by SNF claim or MDS assessment	27.9%

^a or in the past two years if the information was taken from the first survey entry for a study respondent.

NH=nursing home; MDS=Minimum Data Set; SNF=skilled nursing facility; **FFS=fee-for-service**

Table 2

Within-Observation Rates of NH Use Reporting Agreement

HRS Survey Response: In NH					
Yes	No	Missing	n	%	n
<i>Among all eligible Medicare beneficiaries (FFS and HMO)</i>					
Had MDS assessment					
Yes	2984	32.7%	6127	67.1%	24
No	480	1.3%	34602	98.5%	41
<i>Among all eligible FFS Medicare beneficiaries only</i>					
Had SNF claim					
Yes	1974	30.9%	4404	68.8%	19
No	663	2.5%	25744	97.4%	30
Had MDS assessment					
Yes	2257	33.3%	4500	66.4%	18
No	380	1.5%	25648	98.4%	31
Had SNF claim or MDS assessment					
Yes	2285	31.9%	4864	67.9%	19
No	352	1.4%	25284	98.5%	30

NH=nursing home; FFS=fee-for-service; HMO=health maintenance organization; MDS=Minimum Data Set; SNF=skilled nursing facility.

Table 3

Survey NH use Among FFS Medicare Beneficiaries with NH Stays According to CMS Administrative Data by Resident Characteristics

	NH Use (HRS survey response)			
	Yes	No		
	(Agrees with CMS)	(Disagrees with CMS)	Total	Proportion Agree
Gender				
Male	670	1653	2323	28.8%
Female	1615	3210	4825	33.5%
Race				
Non-Hispanic White	1872	3976	5848	32.0%
Non-Hispanic Black	293	601	894	32.8%
Hispanic	105	266	371	28.3%
Other	16	20	36	44.4%
Marital Status				
Never married	123	215	338	36.4%
Married	610	2143	2753	22.2%
Divorced/Separated	183	437	620	29.5%
Widowed	1369	2068	3437	39.8%
Education				
Less than high school	861	1484	2345	36.7%
High school	787	1810	2597	30.3%
Some college	379	844	1223	31.0%
College graduate	258	725	983	26.2%
Dual Eligible				
Yes	812	744	1556	52.2%
No	1473	4120	5593	26.3%
Age group				
<65	51	182	233	21.9%
67–74	381	1485	1866	20.4%
75–84	805	2114	2919	27.6%
85+	1048	1082	2130	49.2%
Self-reported health				
Excellent	57	242	299	19.1%
Very Good	238	937	1175	20.3%
Good	558	1544	2102	26.5%
Fair	705	1411	2116	33.3%
Poor	718	723	1441	49.8%
Year of Survey				
2002	506	1428	1934	26.2%

	NH Use (HRS survey response)			
	Yes	No		
	(Agrees with CMS)	(Disagrees with CMS)	Total	Proportion Agree
2004	494	1361	1855	26.6%
2006	539	1072	1611	33.5%
2008	485	748	1233	39.3%
2010	698	682	1380	50.6%
Proxy Respondent				
Yes	1005	358	1363	73.7%
No	1281	4507	5788	22.1%

NH=nursing home; FFS=fee-for-service; CMS=Centers for Medicare and Medicaid Services; **HRS=Health and Retirement Study**