FACTORS PREDICTING TRANSITIONS FROM MEDICARE-ONLY TO MEDICARE-MEDICAID ENROLLEE STATUS

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ABSTRACT

Objective. To gain a better understanding of the factors associated with Medicaid enrollment among Medicare beneficiaries as well as the factors associated with nursing home entry, a significant predictor of dual eligibility for Medicare and Medicaid coverage.

Key Outcomes. We estimate the probability of transitioning to dual eligibility for Medicare and Medicaid coverage among Medicare-only beneficiaries, as well as the probability of entry to nursing home care not financed by the Medicare skilled nursing facility (SNF) benefit.

Data. We used the 2009 Medicare Master Beneficiary Summary File (MBSF) to identify all fee-for-service Medicare-Medicaid enrollees (MMEs) age 22 and older. For comparison purposes, we also used the Medicare 5 percent sample to develop a group of Medicare-only beneficiaries who did not transition to MME status during 2009. Data on prior service utilization and chronic conditions were obtained by linking these data to 2008 and 2009 Medicare inpatient, outpatient, and hospice claims files, 2008 and 2009 Chronic Conditions Warehouse Timeline files, the 2009 MBSF Chronic Conditions segment, and the 2008 MBSF Cost and Utilization segment.

Methodology. Factors predicting transition to MME status and non-SNF nursing home entry--a frequent precursor of MME entry--were identified by estimating separate multivariate logistic regression models, by age group--beneficiaries under age 65 and those 65 and older.

Results. Emergency room (ER) visits, inpatient stays, and nursing home utilization are all positively predictive of transition to MME status. Residence in a nursing home increases the likelihood of transition to MME status in the next month by 2-14 times, depending on the age group and whether the care is covered by the Medicare SNF benefit. Among beneficiaries admitted to inpatient care from the ER who also had both SNF and non-SNF nursing home care during the prior six months, approximately 27 per thousand beneficiaries under age 65 are expected to transition to MME in the next month; the corresponding figure for beneficiaries age 65 and older is 11 per thousand. Residence in a SNF increased the likelihood someone would enter non-SNF nursing home care by 10-30 times depending on the age group. Beneficiaries with a dementia-related condition were also more likely to enter non-SNF nursing home care relative to those without this type of chronic condition.

Conclusions/Implications. Because ER visits leading to inpatient stays and nursing home stays are significant factors for the transition from Medicare-only to MME status, care coordination programs and other similar initiatives that avoid or interrupt this chain of events would likely reduce MME entry transitions. Beneficiaries with dementia-related conditions are particularly vulnerable to entering long-term institutional care, so initiatives that avoid or interrupt this chain of events for such individuals might have an especially large effect on MME transitions.

ACRONYMS

The following acronyms are mentioned in this report and/or appendix.

CCW	Chronic Conditions Warehouse
CMS	Centers for Medicare and Medicaid Services
DME	Durable Medical Equipment
ER	Emergency Room
ESRD	End-Stage Renal Disease
LTC	Long-Term Care
MBSF	Master Beneficiary Summary File
MME	Medicare-Medicaid Enrollee
SNF	Skilled Nursing Facility

INTRODUCTION

Medicare-Medicaid enrollees (MMEs) are older adults and individuals with disabilities who qualify for both Medicare and Medicaid coverage.[1] They are among the most vulnerable people served by Medicare and Medicaid, with half of MMEs having incomes below the federal poverty line, compared to about 8 percent of Medicare beneficiaries who are not dually eligible (CMS 2011). They are also among the costliest users of health care (MedPAC 2011), with average Medicare spending nearly double that of other Medicare beneficiaries (Jacobson et al. 2012).

The purpose of this report is to gain a better understanding of the factors associated with Medicaid enrollment among Medicare beneficiaries as well as the factors associated with nursing home entry, which we find to be a significant predictor of MME status. Understanding these factors may shed light on policy interventions designed to prevent at least some types of impoverishment that would precipitate Medicaid eligibility, ensure that the needs of beneficiaries are adequately met, and support the sustainability of long-term care (LTC) systems.

Background

MMEs must meet the eligibility requirements of both Medicare and Medicaid. At a high level, Medicare beneficiaries become eligible for Medicaid through one of three ways: having low income and few resources, incurring high medical expenses, or requiring institutional level of care (for a more complete description, see the companion study by Borck et al. (2013)).[2] The transition from Medicare-only to MME status is of particular policy interest as it may represent a transition to impoverishment or a transition based on a need for more resource-intensive LTC services.[3] Of particular policy concern are transitions that occur after an individual has become dependent upon institutional care and impoverished when those outcomes could have been prevented by early access to community-based services and supports.

States and the Medicare program have little information at their disposal to design coverage in a way that will limit the number of Medicare beneficiaries becoming impoverished or unnecessarily reliant on institutional care, and thereby qualifying for Medicaid (Woodcock et al. 2011). The available literature suggests several characteristics that may be associated with the transition from Medicare-only enrollment

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[1] These beneficiaries are also commonly called dual eligible.

[2] See Borck et al. (2013) or Kaiser Family Foundation (2010) for additional information about Medicaid-eligibility for individuals who are aged or have a disability.

[3] Transitions from Medicaid-only coverage to MME status typically occur when someone turns 65 or when a younger Medicaid enrollee who has qualified for disability insurance satisfies the two-year waiting period required to be eligible for Medicare.

to MME status, but many of these provide limited information to policymakers on how to target interventions to reduce unnecessary transitions to MME status. The likelihood of transitioning to MME status increases with age or as health declines, as measured by self-reported health status, the number of co-morbidities, and functional limitations (Pezzin and Kasper 2002, Shin and Moon 2005). Other characteristics linked to becoming MMEs include being female, having low educational attainment, living in the west or in rural areas, and residing in a LTC facility (Stuart and Singhal 2006).

Recent studies of Medicare beneficiaries who transitioned to MME status offer more detailed insights about the population of the new MMEs. Borck et al. (2013) find that nationally, only about 2 percent of Medicare-only beneficiaries became dually eligible for Medicare and Medicaid in 2009, but this transition rate varied considerably by age group and across states. Nationally, most new MMEs live in the community, but transitions to MME status are much more common among those residing in nursing homes (Borck et al. 2013). A study based on beneficiaries living in Maryland finds patterns that are consistent with what is seen at the national level. About half of those transitioning from Medicare-only to MME status in Maryland became eligible due to establishing eligibility for Supplemental Security Income benefits or because they had too few resources to cover institutional care (Johnson, Folkemer, and Stockwell 2012). About 31 percent of new MMEs in Maryland used nursing facility services in the year prior to transition and almost half (48 percent) used inpatient services. The Maryland study also indicated that about 80 percent of the new MMEs in that state had Medicare claims for chronic conditions in the year prior to their transition and more than 60 percent had two or more chronic conditions, with an average of three co-occurring conditions per beneficiary (Stockwell, Trippe, and Folkemer 2012).

Compared to the Maryland-based studies, which compare the characteristics of those who recently transitioned from Medicare-only to MME status to those who recently transitioned from Medicaid-only to MME status, this study focuses on predictive characteristics by comparing Medicare-only individuals who transitioned to MME status to Medicare-only individuals who did not. This type of ex-ante comparison can highlight patient characteristics and patterns of prior service utilization to give policymakers insights into the populations of Medicare beneficiaries who might be more likely to transition to MME status, and also potentially identify interventions that could either delay the transition or hasten it. Among these predictors, the link between nursing home care and transition to MME status has been documented (Woodcock et al. 2011), but other patterns may also exist. One possibility, for example, is that high costs related to emergency rooms (ERs) and inpatient hospitalizations may result in medical spending that causes an individual to become eligible for Medicaid.

Given our finding in this report that nursing home use is a significant predictor of MME status, relevant predictors for nursing home entry are also potentially informative. For example, previous research suggests that dementia and the number of prescription drugs are significant predictors of institutionalization (Bharucha et al. 2004). Other characteristics include dependencies in three or more activities of daily living, cognitive impairment, and prior nursing home use (Gaugler et al. 2007).

These possible causes for transition from Medicare-only to MME status raise important questions for policymakers:

- To what extent do service utilization patterns and beneficiary characteristics predict whether a Medicare beneficiary will become Medicaid eligible?

- Given the likely influence of nursing home use on becoming Medicaid eligible, what service utilization patterns predict entry into (non-skilled nursing facility) nursing home care?

- To what extent is the presence of certain chronic conditions associated with becoming dually eligible and entering a nursing home?

DATA AND METHODOLOGY

We combined data from multiple sources to examine beneficiary characteristics and service utilization patterns that predict transitions from Medicare-only eligibility to MME status on a monthly basis. We also examined beneficiary characteristics and service utilization patterns that predict entry into nursing home care not covered by the Medicare skilled nursing facility (SNF) benefit during 2009, in which case beneficiaries either pay for the care with private insurance, Medicaid, or out of pocket.

We used the 2009 Medicare Master Beneficiary Summary File (MBSF) to identify all individuals age 22 and older who were ever enrolled as MMEs in 2009.[4] We used the Medicare 5 percent sample in the MBSF to provide a group of Medicare beneficiaries who never were MMEs during the year and to estimate the size of the population of Medicare-only beneficiaries in 2009. The MBSF includes summary demographic information about all Medicare beneficiaries, including date of birth, date of death, state of residence, monthly Medicare managed care enrollment, monthly Medicaid-eligibility status, Medicaid benefits, and original reason for Medicare eligibility (disability, aged, or end-stage renal disease [ESRD]). To assess service utilization, we excluded beneficiaries covered by a comprehensive Medicare or Medicaid managed care plan during 2009 as well as beneficiaries not continuously eligible for Medicare during the six months prior to a potential transition, because Medicare and Medicaid claims data required to assess service utilization are not generally available for these beneficiaries. We also excluded beneficiaries who became eligible for Medicare on the basis of ESRD, because these enrollees have unique pathways to Medicare eligibility.[5]

After identifying our sample of enrollees, we linked MBSF data with other data sources to obtain additional information about the service utilization and demographic characteristics of these beneficiaries.

- **Chronic Conditions Warehouse (CCW) Timeline Files, 2008 and 2009**. These files, maintained by Centers for Medicare and Medicaid Services (CMS), contain person-level residence status for all Medicare beneficiaries for each day during a year. These files were used to compute nursing home stays (including Medicare-financed SNF stays and other nursing home stays).

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[4] We wanted to focus the study on adults to eliminate some of the complexities associated with the differences in Medicaid-eligibility rules between children and adults. Some Medicaid-eligibility policies consider beneficiaries under the age of 21 as children. To establish a sample that would be uniformly treated as adults across all categories of Medicaid beneficiaries, we selected age 22 as the cut off for this study.

[5] Inclusion of the ESRD subgroup would have required obtaining information from additional data sources and it was not clear that the benefits of including this group would outweigh the additional costs of analyzing them. Nevertheless, the exclusion of this group suggests further research work will be necessary to understand whether this group has more or less similar rates of transitions into Medicare-Medicaid enrollment or long-term nursing home care.

- **Medicare Inpatient, Outpatient, and Hospice Claims Files, 2008 and 2009**. These files enabled us to compute inpatient stays, ER visits, and hospice use.

- **MBSF Chronic Conditions Segment, 2009**. This file contains CCW flags identifying 27 chronic conditions, including Alzheimer's, related disorders, dementia, and depression.

- **MBSF Cost and Utilization Segment, 2008**. This file enabled us to control for aggregated 2008 Medicare Part B services and durable medical equipment (DME) claims.

We used the data to estimate a multivariate logistic model for the likelihood that a beneficiary would become dually eligible, conditional on being Medicare-only in the prior month, as a function of prior service utilization and chronic conditions. To do this, we constructed a sample of pooled person-month observations that, for any given month from February to December, was representative of beneficiaries who were Medicare-only in the prior month.[6] This approach resulted in a dataset consisting of 16,807,633 person-month observations based on 1,767,388 individuals.[7] To control for underlying month-to-month variation in transition rates, we include an indicator variable for each month. Because the population of Medicare beneficiaries under age 65 differs substantially from those age 65 and above (beneficiaries under age 65 typically qualify for Medicare via a disability versus those who age in at 65), we estimate separate models for these two broad age groups.

Table 1 presents summary statistics for the variables in the regression model. In any given month, 5 per thousand Medicare-only beneficiaries under age 65 become eligible for Medicaid. This rate is much higher than the corresponding rate of 1 per thousand for Medicare-only beneficiaries age 65 and over. Our main measures of service utilization include an indicator of whether a beneficiary had an ER visit resulting in an inpatient admission in the past six months, an indicator of whether a beneficiary had a SNF stay in the past six months, and an indicator of a nursing home stay not financed by Medicare in the past six months. On average, 6 per thousand Medicare-only beneficiaries under age 65 had a SNF stay in the past six months and 3 per thousand had a non-SNF nursing home stay. The corresponding rates for beneficiaries 65 and over are 23 and 10 per thousand, respectively. To account for chronic conditions

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[6] Analyzing January 2009 transitions would have required 2008 MBSF data to determine eligibility status in December 2008. Assuming that January transitions were not likely to substantially differ from transitions in other months, we sought to avoid bringing in the 2008 MBSF data and any associated linking issues.

[7] In our regression analyses, we weight observations from the Medicare 5 percent sample by 20 to account for sampling and to obtain estimates that reflect population rates.

In the dataset, we observe any given individual for up to 11 months (February to December), which means that we have multiple observations for a single individual. Because these multiple observations of the same individual are not independent, our standard error estimates, which are based on the assumption of independence, are biased downward. However, because of the very large sample sizes for this analysis, this bias is small and unlikely to be consequential for interpreting the results.

we include an indicator variable for Alzheimer's, related disorders, or dementia; an indicator variable for depression; and an indicator variable for any of the other (that is, physical) chronic conditions. On average, 170 per thousand beneficiaries under 65 and 90 per thousand beneficiaries 65 and over, have depression. Other individual level controls are number of planned inpatient stays, number of outpatient ER visits, and number of weeks of home health use, all measured within the past six months. We also include 2008 DME and Part B physician payments to control for health status. To account for observed and unobserved state-level characteristics, we included state fixed effects in our regression models.[8]

TABLE 1. Summary Statistics for Variables Included in Models, by Age Group				
Variable	Age Under 65		Age 65 and Above	
	Mean	S.D.	Mean	S.D.
Transitioned from Medicare-only to MME Status	0.005	0.072	0.001	0.035
Number of Planned Inpatient Stays	0.042	0.237	0.045	0.235
Number of Outpatient ER Visits	0.189	0.816	0.131	0.473
Number of Weeks of Home Health Use	0.260	2.062	0.462	2.613
ER Visit Resulting in Inpatient Stay	0.047	0.213	0.056	0.230
SNF Stay	0.006	0.076	0.023	0.150
Other Nursing Home Stay	0.003	0.056	0.010	0.098
ER Visit Resulting in Inpatient Stay, and SNF Stay	0.003	0.056	0.013	0.113
ER Visit Resulting in Inpatient Stay, and Other NH Stay	0.001	0.027	0.002	0.049
SNF and Other Nursing Home Stay	0.001	0.028	0.004	0.060
ER Visit Resulting in Inpatient Stay, SNF Stay, and Other Nursing Home Stay	0.000	0.020	0.002	0.045
Alzheimer's, Related Disorder, or Dementia	0.018	0.132	0.086	0.280
Depression	0.170	0.376	0.087	0.281
Number of Other Physical Chronic Conditions	1.709	2.126	3.154	2.491
Any Hospice	0.001	0.038	0.005	0.070
Total 2008 DME Payments	252	1,349	203	809
Total 2008 Part B Physician Payments	268	436	434	470
Age	53	9	75	8
Female	0.432	0.495	0.550	0.498
Number of Person-Month Observations	2,480,450		14,327,183	
Number of Unique Beneficiaries	312,858		1,454,530	
SOURCE: Mathematica analysis of 2008 and 2009 MBSF, CCW Timeline, and Medicare Claims Files. **NOTE**: Service utilization is measured within the prior six months, unless described otherwise. Statistics are weighted to be representative of the population.				

We then estimated a multivariate logistic model, using the same set of predictors, for the likelihood that a beneficiary would enter nursing home care that was financed by private insurance, Medicaid, or out of pocket. For this analysis, in addition to excluding

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[8] We also estimated models where we included variables for specific state characteristics instead of state fixed effects, to determine whether any were predictive. These variables included the percent of the population age 65 and over; an indicator for medically needy programs; an indicator for poverty-related expansions; and an indicator for expanded Medicaid-eligibility for individuals needing institutional levels of care. Results were mixed, however. For example, we found that older Medicare beneficiaries who lived in states with a medically need program were more likely to become dually eligible but younger beneficiaries in the same states were less likely to do so. It is possible that these indicators may reflect other state characteristics not captured in our models, but that are correlated with them. Without data to utilize year-to-year variation in these indicators, it is difficult to disentangle these correlations.

those already in MME status in a previous month, we also removed person-month observations where a beneficiary was already in a non-SNF nursing home. This restriction reduced the sample size to 16,459,350 person-month observations for 1,730,765 individuals across both age groups.

For all the regression analyses, to make the results meaningful we use the estimates (coefficients and odds ratios from the estimated regression models as presented in the Appendix) to infer predicted transition rates for the sample. We then compare predicted transition rates across different patterns of service utilization, to understand the impact of a particular service utilization pattern on the likelihood of becoming dually eligible.

RESULTS

Transitions to Dual Eligibility and Service Utilization

The analysis indicates that the likelihood that Medicare beneficiaries transition to MME status is associated with the types of services they use, particularly nursing home care (Table 2). For example, among younger Medicare-only beneficiaries with no service utilization--"no ER visit leading to an inpatient admission, no SNF stay, and no non-SNF stay in the past six months"--only 4.9 per thousand (or 0.49 percent) transitioned to MME status. The transition rate increases slightly to 7.1 per thousand when beneficiaries have an "ER visit resulting in an inpatient stay." Thus, an "ER visit resulting in an inpatient stay" is associated with a 2.2 per thousand (7.1 minus 4.9) increase in the chance of transitioning to MME status relative to the base transition rate associated with no service utilization.

TABLE 2. Predicted Rates of Transition from Medicare-Only to Medicare-Medicaid Enrollment for Various Pathways, by Age Group				
Service Utilization in Past Six Months	**Age Under 65**		**Age 65 and Above**	
	Transition Rate[1]	**Difference from Base[2]**	**Transition Rate[1]**	**Difference from Base[2]**
No ER Visit Resulting in Inpatient Stay, SNF Stay, or Other Nursing Home Stay	4.9	---	0.8	---
ER Visit Resulting in Inpatient Stay Only	7.1	2.2*	1.6	0.8*
SNF Stay Only	12.3	7.5*	3.9	3.1*
ER Visit Resulting in Inpatient Stay, and SNF Stay	16.5	11.6*	5.4	4.7*
ER Visit Resulting in Inpatient Stay, and Other Nursing Home Stay	16.5	11.7*	7.6	6.8*
Other Nursing Home Stay Only	16.7	11.8*	7.5	6.7*
SNF and Other Nursing Home Stay	26.1	21.2*	9.3	8.5*
ER Visit Resulting in Inpatient Stay, SNF Stay, and Other Nursing Home Stay	27.2	22.3*	10.8	10.0*
SOURCE: Mathematica analysis of 2008 and 2009 MBSF, CCW Timeline, and Medicare Claims Files. **NOTES**: 2,480,450 person-month observations for the under 65 model. 14,327,183 person-month observations for the 65 and above model. Observations are weighted to be representative of the population. 1. Rates are per 1,000. 2. Base is no SNF, other Nursing Home, or ER visit resulting in Inpatient stay. * Statistically different from base rate at the 1% level.				

Regardless of the age group, a nursing home stay of any kind is associated with increases in the rate of transition to MME status whether or not that stay is preceded by the use of acute care services. Among beneficiaries under 65, a nursing home stay is associated with increases in transition rates ranging from 7.5 per thousand among those who only have a SNF stay to 22.3 per thousand among those who have an "ER visit resulting in an inpatient stay, a SNF stay, and a non-SNF nursing home stay." Similarly, among older beneficiaries, a SNF stay is associated with a 3.1 per thousand

increase while an "ER visit resulting in an inpatient stay, a SNF stay, and a non-SNF nursing home stay" is associated with a 10 per thousand increase.

The service combination that is associated with the highest probability of transitioning to MME status is when a beneficiary has an "ER visit resulting in an inpatient stay, a SNF stay, and a non-SNF nursing home stay" all within the past six months: 27.2 per thousand for under 65 and 10.8 per thousand for 65 and above. This combination likely captures the pathway where a beneficiary first suffers an acute medical episode for which they enter the ER and then end up being admitted for an inpatient stay; the beneficiary is then discharged to a Medicare-financed SNF stay for subacute care or rehabilitation, followed by ongoing nursing home care after the Medicare benefit runs out. The data do not tell us if the beneficiary spent down to meet Medicaid resource criteria because of this adverse sequence of events, or would have had sufficiently low resources irrespective of the events, but presumably some do.

Notably, the magnitude of the transition rates, both in levels as well as differences relative to the base rate of no service utilization, are substantially higher among the under 65 than the 65 and above, which is consistent with what Borck et al. (2013) find in their descriptive study of the transitions to MME status.[9] For example, the pathway "ER visit resulting in an inpatient stay, a SNF stay, and a non-SNF nursing home stay" described earlier is associated with a transition rate of 27.2 per thousand among the under 65, which is more than twice the transition rate of 10.8 per thousand for the same pathway among the 65 and above. Moreover, the respective differences relative to the base rate are 22.3 and 10 per thousand, respectively--again a more substantial transition rate among the under 65.[10]

We also find that the other predictor variables are associated with an increased probability of transitioning to MME status (estimates are found in the Appendix, Table A1). We find that a planned inpatient stay is associated with a 4 percent and 2 percent higher odds of entering MME status for the under 65 and the 65 and above, respectively. An outpatient ER visit is associated with a 7 percent and 9 percent higher odds, respectively, of transitioning to MME status, perhaps reflective of a more severe medical episode. A week of home health use is associated with less than a 1 percent increase, though this is not trivial for a long duration of home health use. The model we estimated also included chronic condition indicators, which we will address in a later section.

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[9] Borck et al. (2012) find that enrollees under age 65 have higher transition rates than those age 65 and above (as well as account for a disproportionate share of new MMEs).

[10] Note that while the service utilization patterns studied here are for the most part more prevalent among older than younger beneficiaries (Table 1), it still remains the case that, conditional on experiencing these events, the likelihood of transitioning is higher among younger beneficiaries than older beneficiaries.

Nursing Home Entry and Service Utilization

The results in the previous section highlight that a nursing home stay, particularly a non-SNF stay, is strongly predictive of transition to MME status. The analysis indicates that acute care services and SNF use are associated with having a non-SNF nursing home stay (Table 3). For those under 65 with "no prior ER visit resulting in an inpatient admission or SNF care," the rate of entering a non-Medicare-financed nursing home stay is 0.3 per thousand among those under age 65. The corresponding rate among those age 65 and above is 0.5 per thousand. Having an "ER visit resulting in an inpatient admission" leads to a 0.5 per thousand and 0.7 per thousand increase in this rate, respectively. Having a prior "SNF stay" substantially increases the likelihood of having a non-SNF stay, by 5 per thousand for beneficiaries under 65, and 5.5 per thousand for older beneficiaries. Among those under age 65, having both a prior "ER visit resulting in an inpatient admission and SNF stay" within the past six months is associated with an 8.3 per thousand higher rate of entering a non-SNF nursing home. The same pattern of service utilization among those age 65 and above is associated with a 9.4 per thousand increase. These rates likely reflect a significant acute event that requires discharge to a SNF following an inpatient stay.

TABLE 3. Predicted Rates of Nursing Home Entry for Various Pathways, by Age Group				
Service Utilization in Past Six Months	**Age Under 65**		**Age 65 and Above**	
	Transition Rate[1]	**Difference from Base[2]**	**Transition Rate[1]**	**Difference from Base[2]**
No ER Visit Resulting in Inpatient Stay, or SNF Stay	0.3	---	0.5	---
ER Visit Resulting in Inpatient Stay Only	0.7	0.5*	1.1	0.7*
SNF Stay Only	5.3	5.0*	6.0	5.5*
ER Visit Resulting in Inpatient Stay, and SNF Stay	8.6	8.3*	9.9	9.4*
SOURCE: Mathematica analysis of 2008 and 2009 MBSF, CCW Timeline, and Medicare Claims Files. **NOTES**: 2,466,398 person-month observations for the under 65 model. 13,992,952 person-month observations for the 65 and above model. Observations are weighted to be representative of the population. 1. Rates are per 1,000. 2. Base is no SNF, other Nursing Home, or ER visit resulting in Inpatient stay. * Statistically different from base rate at the 1% level.				

Other predictor variables also are associated with a non-SNF nursing home stay. Each planned inpatient stay increases the odds of entering a nursing home by 33 percent and 23 percent, respectively, for the under 65 and the 65 and above (estimates are found in the Appendix, Table A2). Each outpatient ER visit increases the odds of nursing home entry by 5 percent and 12 percent, respectively. Conversely, the amount of home health care is negatively correlated with nursing home entry (odds ratio=0.98 and 0.96 for the under 65 and the 65 and above, respectively), which is consistent with home health care as a potential substitute for nursing home care.

Chronic Conditions

In addition to service utilization, chronic conditions were also associated with the rate of transition to MME status, as well as non-SNF nursing home entry. Younger beneficiaries with Alzheimer's, dementia, and related disorders have 1.8 times the odds of becoming an MME than those without, whereas older beneficiaries with dementia have nearly three times the odds of becoming an MME than those without (estimates are found in the Appendix, Table A1).[11] Depression is also a significant factor (odds of 1.5-1.7, depending on the age group). The number of physical chronic conditions is also associated with higher odds of becoming an MME--on average, an 18 percent and 12 percent increase in the odds per condition, for younger and older beneficiaries, respectively.

Chronic conditions are also strong predictors of nursing home entry. Younger and older beneficiaries with dementia are about four times more likely to enter a nursing home than those without dementia (estimates are found in the Appendix, Table A2). The corresponding odds for depression are about 1.7-1.8. Each physical condition is associated with a 12-16 percent higher odds, depending on the age group.

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[11] Note that these odds ratios mask the fact that because the underlying transition rate is much higher among younger beneficiaries, the magnitude of the difference in the MME transition rate due to dementia is actually higher among younger beneficiaries than older beneficiaries.

CONCLUSIONS

This analysis identified nursing home use (SNF or other nursing home) as an important predictor of MME status, particularly among younger Medicare beneficiaries. Additionally, having both a Medicare-financed SNF stay and a non-SNF stay is an even stronger predictor of MME status. Chronic conditions, particularly related to Alzheimer's or dementia, were also strong predictors. SNF stays, Alzheimer's or dementia, and depression were strongly predictive of entry into nursing home care not covered by the Medicare SNF benefit, the type of care that predicts the transition to dual enrollment in Medicare and Medicaid.

Study Limitations

Some limitations of this study should be noted in considering our results. First, our analysis was restricted to those not in managed care, and understanding how transition rates differ for those in managed care may be informative and policy relevant. Second, our results are informative of factors that predict MME status and nursing home entry, but do not necessarily cause these transitions. Third, while we analyze general service utilization, we do not look at specific diagnoses or procedures that may be informative of more targeted policy prescriptions.

We also did not address state characteristics in this paper. When estimating models where we included variables for specific state characteristics instead of state fixed effects, we found mixed and contradictory results. One possibility is that the indicators we included may reflect other characteristics that are not captured in the models, but with which they are correlated. Without variation over time, it is difficult to disentangle these effects. Thus, future work is needed to fully understand how characteristics of Medicaid programs and state LTC systems influence transitions to dual eligibility and nursing home care.

Policy Implications

This analysis identified nursing home use and ER visits leading to an inpatient stay as significant predictors of the transition from Medicare-only eligibility to MME status. Moreover, these predictors were particularly strong among younger Medicare beneficiaries (under 65) compared to older (65 and above) beneficiaries. To the extent that nursing home admissions causally affect the transition to Medicaid coverage, then policies and programs that limit admissions to nursing home care or shorten nursing home stays may reduce the rate of transition to MME status among individuals at increased risk for becoming Medicaid eligible. For example, interventions that help people at risk for becoming dually eligible avoid undesirable events such as acute

emergencies that lead to an inpatient admission and entry into nursing home care would likely reduce entry into dual eligibility. Such interventions might need to focus on minimizing preventable emergencies (such as those due falls and other types of injuries).

The results also indicate that dementia disorders and depression play important roles in predicting the transition to MME status and entry into nursing home care. Services and care coordination programs may need to be tailored to meet the needs of beneficiaries with these particular conditions. Beneficiaries and their loved ones frequently need assistance in learning how to cope with these conditions.

Many policymakers and other stakeholders advocating for an improved LTC system have focused on nursing home diversion and transition programs. To the extent that these programs reduce nursing home stays, they may also reduce the likelihood of becoming dually eligible. Whether such initiatives and other care innovations are effective at reducing entry into dual eligibility remains to be seen; being able to effectively identify people at risk for long-term nursing home stays appears to be a fruitful first step.

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APPENDIX A

The following tables contain the set of coefficient estimates and odds ratios from the regression models. To get predicted rates for Table 2 and Table 3, we retained the estimated coefficients. Then for "No ER Visit Resulting in IP Stay, SNF Stay, or Other NH Stay", we computed the predicted transition rate by setting the indicator variables for "ER Visit Resulting in IP stay", "SNF stay", "Other Nursing Home Stay", and their interactions to 0. For "ER Visit Resulting in IP Stay Only", we set the indicator variable for "ER Visit Resulting in IP Stay" to 1, and kept all other indicator variables and interactions to 0, and computed the predicted transition rate. We followed a similar procedure for the remaining rates.

TABLE A1. Estimates from Model Predicting the Transition from Medicare-Only to Medicare-Medicaid Enrollment, by Age Group				
Variable	Age Under 65		Age 65 and Above	
	OR	Coef	OR	Coef
Number of Planned Inpatient Stays	1.04***	0.03***	1.02**	0.02**
Number of Outpatient ER Visits	1.07***	0.06***	1.09***	0.09***
Number of Weeks of Home Health Use	1.01***	0.01***	1.00***	0.00***
ER Visit Resulting in Inpatient Stay	1.47***	0.38***	2.04***	0.71***
SNF Stay	2.57***	0.95***	4.93***	1.60***
Other Nursing Home Stay	3.52***	1.26***	9.60***	2.26***
ER Visit Resulting in Inpatient Stay, and SNF Stay	0.92*	-0.08*	0.69***	-0.37***
ER Visit Resulting in Inpatient Stay, and Other Nursing Home Stay	0.68***	-0.39***	0.49***	-0.71***
SNF and Other Nursing Home Stay	0.62***	-0.48***	0.25***	-1.39***
ER Visit Resulting in Inpatient Stay, SNF Stay, and Other Nursing Home Stay	1.15	0.14	1.70***	0.53***
Alzheimer's, Related Disorder, or Dementia	1.76***	0.57***	3.05***	1.12***
Depression	1.72***	0.54***	1.47***	0.38***
Number of Other Physical Chronic Conditions	1.18***	0.17***	1.12***	0.11***
Any Hospice	1.63***	0.49***	1.12***	0.12***
Total 2008 DME Payments	1.00	0.00	1.00***	0.00***
Total 2008 DME Payments Squared	1.00	0.00	1.00***	0.00***
Total 2008 Part B Physician Payments	1.00***	0.00***	1.00***	0.00***
Total 2008 Part B Physician Payments Squared	1.00***	0.00***	1.00***	0.00***
Age	1.00	0.00	0.94***	-0.06***
Age Squared	1.00***	0.00***	1.00***	0.00***
Female	1.04***	0.04***	1.26***	0.23***
March	0.84***	-0.18***	0.77***	-0.26***
April	0.72***	-0.33***	0.69***	-0.37***
May	0.63***	-0.46***	0.65***	-0.43***
June	0.60***	-0.51***	0.62***	-0.49***
July	0.64***	-0.45***	0.69***	-0.37***
August	0.56***	-0.58***	0.63***	-0.46***
September	0.52***	-0.65***	0.55***	-0.60***
October	0.74***	-0.30***	0.91***	-0.10***
November	0.53***	-0.64***	0.61***	-0.50***
December	0.49***	-0.72***	0.65***	-0.43***
Alaska	1.38***	0.32***	1.63***	0.49***
Alabama	0.53***	-0.63***	0.74***	-0.30***
Arkansas	0.97	-0.03	1.21***	0.19***

Variable	Age Under 65		Age 65 and Above	
	OR	Coef	OR	Coef
Arizona	1.21**	0.19**	0.99	-0.01
California	1.13*	0.12*	1.42***	0.35***
Colorado	0.74***	-0.30***	0.79***	-0.23***
Connecticut	1.47***	0.38***	1.59***	0.46***
District of Columbia	3.66***	1.30***	2.39***	0.87***
Delaware	0.77**	-0.27**	0.74***	-0.30***
Florida	1.21**	0.19**	1.22***	0.20***
Georgia	0.95	-0.05	1.23***	0.21***
Hawaii	1.35***	0.30***	1.37***	0.31***
Iowa	1.05	0.05	0.71***	-0.35***
Idaho	0.80**	-0.22**	0.87**	-0.14**
Illinois	1.17**	0.16**	1.05	0.05
Indiana	1.25**	0.22**	1.21***	0.19***
Kansas	0.85**	-0.17**	0.80***	-0.22***
Kentucky	0.80**	-0.23**	1.17***	0.16***
Louisiana	0.75***	-0.29***	1.19***	0.17***
Massachusetts	1.79***	0.58***	1.38***	0.32***
Maryland	0.87*	-0.14*	0.79***	-0.24***
Maine	1.39***	0.33***	2.40***	0.88***
Michigan	1.14*	0.13*	1.10*	0.09*
Minnesota	1.33***	0.28***	0.77***	-0.26***
Missouri	1.37***	0.31***	0.95	-0.05
Mississippi	0.73***	-0.32***	1.18***	0.17***
Montana	0.93	-0.08	0.92	-0.08
North Carolina	0.72***	-0.33***	1.12**	0.11**
North Dakota	1.17*	0.15*	0.97	-0.03
Nebraska	0.84*	-0.17*	0.82***	-0.20***
New Hampshire	1.31***	0.27***	1.13**	0.12**
New Jersey	0.51***	-0.67***	0.95	-0.06
New Mexico	1.00	0.00	1.17**	0.16**
Nevada	0.91	-0.10	0.96	-0.04
New York	0.91	-0.10	1.91***	0.65***
Ohio	1.37***	0.31***	1.04	0.04
Oklahoma	0.89	-0.12	0.91*	-0.10*
Oregon	0.93	-0.08	1.05	0.04
Pennsylvania	0.88*	-0.13*	0.95	-0.06
Rhode Island	0.96	-0.05	1.14**	0.13**
South Carolina	0.74***	-0.31***	0.86**	-0.16**
South Dakota	0.83*	-0.19*	0.93	-0.08
Tennessee	0.83**	-0.19**	1.01	0.01
Texas	0.64***	-0.44***	1.04	0.04
Utah	0.81**	-0.21**	0.65***	-0.43***
Virginia	0.76***	-0.27***	0.89**	-0.12**
Vermont	1.61***	0.48***	1.54***	0.43***
Washington	1.23**	0.21**	1.13**	0.12**
Wisconsin	1.22**	0.20**	1.18***	0.17***
West Virginia	0.86*	-0.15*	1.28***	0.24***
Number of Observations	2,480,450		14,327,183	

SOURCE: Mathematica analysis of 2008 and 2009 MBSF, CCW Timeline, and Medicare Claims Files.
NOTE: Service utilization is measured within the prior 6 months, unless described otherwise. Statistics are weighted to be representative of the population. Wyoming is the omitted (reference) state.

*** Indicates statistical significance at the 0.1% level
** indicates statistical significance at the 1% level
* indicates statistical significance at the 5% level.

TABLE A2. Estimates from Model Predicting Nursing Home Entry, by Age Group				
Variable	**Age Under 65**		**Age 65 and Above**	
	OR	**Coef**	**OR**	**Coef**
Number of Planned Inpatient Stays	1.33***	0.28***	1.23***	0.21***
Number of Outpatient ER Visits	1.05***	0.05***	1.12***	0.11***
Number of Weeks of Home Health Use	0.98***	-0.02***	0.96***	-0.04***
ER Visit Resulting in Inpatient Stay	2.81***	1.03***	2.44***	0.89***
SNF Stay	21.25***	3.06***	13.12***	2.57***
ER Visit Resulting in Inpatient Stay, and SNF Stay	0.58***	-0.54***	0.69***	-0.37***
Alzheimer's, Related Disorder, or Dementia	4.12***	1.42***	4.14***	1.42***
Depression	1.71***	0.53***	1.79***	0.58***
Number of Other Physical Chronic Conditions	1.16***	0.15***	1.12***	0.11***
Any Hospice	6.82***	1.92***	2.51***	0.92***
Total 2008 DME Payments	1.00***	0.00***	1.00***	0.00***
Total 2008 DME Payments Squared	1.00	0.00	1.00***	0.00***
Total 2008 Part B Physician Payments	1.00***	0.00***	1.00***	0.00***
Total 2008 Part B Physician Payments Squared	1.00***	0.00***	1.00***	0.00***
Age	1.13***	0.12***	1.24***	0.21***
Age Squared	1.00***	0.00***	1.00***	0.00***
Female	1.13***	0.12***	0.98***	-0.02***
March	0.88**	-0.13**	1.02*	0.02*
April	1.17***	0.15***	1.00	0.00
May	0.84***	-0.18***	0.92***	-0.08***
June	0.81***	-0.21***	0.97***	-0.04***
July	0.74***	-0.30***	1.00	0.00
August	0.90**	-0.11**	0.96***	-0.04***
September	0.67***	-0.40***	0.93***	-0.07***
October	0.88**	-0.13**	1.12***	0.11***
November	0.76***	-0.28***	0.93***	-0.08***
December	0.86**	-0.15**	1.11***	0.10***
Alaska	0.45	-0.81	0.37***	-0.98***
Alabama	0.95	-0.06	0.65***	-0.43***
Arkansas	1.88	0.63	1.02	0.02
Arizona	1.53	0.43	0.78***	-0.25***
California	3.21**	1.17**	0.74***	-0.30***
Colorado	3.90**	1.36**	1.04	0.04
Connecticut	6.16***	1.82***	1.02	0.02
District of Columbia	5.52***	1.71***	1.16*	0.15*
Delaware	0.71	-0.34	0.91	-0.09
Florida	1.80	0.59	0.70***	-0.36***
Georgia	1.98	0.68	0.78***	-0.25***
Hawaii	2.39*	0.87*	0.48***	-0.74***
Iowa	3.39**	1.22**	1.78***	0.58***
Idaho	4.33**	1.47**	0.77***	-0.27***
Illinois	2.76**	1.02**	0.95	-0.05
Indiana	2.94**	1.08**	1.19***	0.18***
Kansas	1.95	0.67	1.19***	0.17***
Kentucky	1.43	0.36	0.93	-0.08
Louisiana	1.85	0.61	1.18**	0.16**
Massachusetts	5.80***	1.76***	0.99	-0.01
Maryland	3.25**	1.18**	0.83***	-0.19***
Maine	4.88***	1.58***	0.85**	-0.16**
Michigan	1.91	0.65	0.68***	-0.39***
Minnesota	4.74***	1.56***	1.31***	0.27***
Missouri	3.15**	1.15**	1.14**	0.13**
Mississippi	0.96	-0.04	0.48***	-0.75***
Montana	5.21***	1.65***	1.01	0.01
North Carolina	1.30	0.27	0.80***	-0.23***

Variable	Age Under 65		Age 65 and Above	
TABLE A2 (*continued*)				
	OR	Coef	OR	Coef
North Dakota	5.58***	1.72***	1.07	0.07
Nebraska	3.32**	1.20**	1.62***	0.48***
New Hampshire	5.61***	1.72***	1.02	0.02
New Jersey	3.32**	1.20**	0.93	-0.07
New Mexico	1.09	0.08	0.70***	-0.35***
Nevada	4.33**	1.47**	0.93	-0.07
New York	3.75**	1.32**	0.84***	-0.17***
Ohio	4.01**	1.39**	1.05	0.05
Oklahoma	1.62	0.48	1.29***	0.26***
Oregon	3.16**	1.15**	0.76***	-0.27***
Pennsylvania	3.25**	1.18**	0.96	-0.05
Rhode Island	4.03**	1.39**	1.95***	0.67***
South Carolina	1.48	0.39	0.59***	-0.53***
South Dakota	0.55	-0.61	1.59***	0.46***
Tennessee	1.68	0.52	0.88**	-0.13**
Texas	1.86	0.62	1.08	0.08
Utah	7.14***	1.97***	1.11*	0.10*
Virginia	3.06**	1.12**	0.82***	-0.20***
Vermont	4.11**	1.41**	1.03	0.03
Washington	3.70**	1.31**	0.88**	-0.13**
Wisconsin	5.06***	1.62***	1.05	0.05
West Virginia	0.62	-0.48	0.61***	-0.49***
Number of Observations	2,466,398		13,992,952	

SOURCE: Mathematica analysis of 2008 and 2009 MBSF, CCW Timeline, and Medicare Claims Files.
NOTE: Service utilization is measured within the prior 6 months, unless described otherwise. Statistics are weighted to be representative of the population. Wyoming is the omitted (reference) state.

*** Indicates statistical significance at the 0.1% level
** indicates statistical significance at the 1% level
* indicates statistical significance at the 5% level

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HTML	http://aspe.hhs.gov/daltcp/reports/2014/3MCPlans.shtml
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Effect of PACE on Costs, Nursing Home Admissions, and Mortality: 2006-2011
Executive Summary	http://aspe.hhs.gov/daltcp/reports/2014/PACEeffectes.shtml
HTML	http://aspe.hhs.gov/daltcp/reports/2014/PACEeffect.shtml
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Effectiveness of Alternative Ways of Implementing Care Management Components in Medicare D-SNPs: The Brand New Day Study
Executive Summary	http://aspe.hhs.gov/daltcp/reports/2014/OrthoV2s.shtml
HTML	http://aspe.hhs.gov/daltcp/reports/2014/OrthoV2.shtml
PDF	http://aspe.hhs.gov/daltcp/reports/2014/OrthoV2.pdf

Effectiveness of Alternative Ways of Implementing Care Management Components in Medicare D-SNPs: The Care Wisconsin and Gateway Study
Executive Summary	http://aspe.hhs.gov/daltcp/reports/2014/OrthoV1es.shtml
HTML	http://aspe.hhs.gov/daltcp/reports/2014/OrthoV1.shtml
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Evaluating PACE: A Review of the Literature
Executive Summary	http://aspe.hhs.gov/daltcp/reports/2014/PACELitReves.shtml
HTML	http://aspe.hhs.gov/daltcp/reports/2014/PACELitRev.shtml
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    HTML   http://aspe.hhs.gov/daltcp/reports/2014/MMTransV2.shtml
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