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Integrated Medicare and Medicaid Managed Care and Rehospitalization of Dual Eligibles

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Abstract

Objectives—Healthcare expenditures for dually eligible individuals covered by both Medicare and Medicaid constitute a disproportionate share of spending for the 2 programs. Fragmentation, inefficiency, and low-quality care have been long standing issues for this population. The objective of this study was to conduct an early evaluation of an innovative program that coordinates benefits for elderly dual eligibles.

Study Design—Longitudinal cohort study.

Methods—Comparable sources of administrative claims from 2007 to 2009 were used to examine differences in 30-day rehospitalization between dual eligibles in Massachusetts participating in Senior Care Options (SCO), an integrated managed care program, and dual eligibles in Medicare fee-for-service. Multivariable logistic regression models with county and time fixed effects were used for estimation.

Results—We found no statistically significant effect of SCO on rehospitalization, an area where coordinated care would be expected to make a substantial difference.

Conclusions—Our results suggest that coordinating the financing and delivery of services through an integrated managed program may not sufficiently address the problems of inefficiency and fragmentation in care for hospitalized dual eligible enrollees.

Over 9 million dually eligible beneficiaries (duals) are covered by both Medicare and Medicaid.[1] Duals present a special challenge for policy makers in that compared with other

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Medicare beneficiaries, they have a higher prevalence of chronic disease and mental illness and are generally in poorer health.[2] Duals account for a disproportionate share of both Medicare and Medicaid spending: although they represent only 20% of the Medicare population, they account for 31% of Medicare expenditures.[1] Similarly, duals make up 15% of the Medicaid population, but account for 39% of Medicaid spending.[3]

Despite high costs and a greater need for comprehensive health services, duals are frequently exposed to fragmented and inefficient care of low quality.[4–7] Duals are heavily reliant on Medicare physician and hospital services and depend on Medicaid to meet their long-term care needs. However, no clear accountability for needed care, inadequate administrative coordination between Medicare and Medicaid, and a lack of smooth transitions between services are issues that plague this group.[4–7] The current financial scheme for duals creates incentives to shift costs between Medicare and Medicaid, often hindering efforts to improve the quality of care and potentially limiting access to providers.[4,8,9]

As part of the Affordable Care Act, CMS initiated demonstration projects to improve care and reduce costs for duals. CMS is partnering with states to examine the impact of financial and administration alignment of Medicare and Medicaid services through these projects. In 2011, CMS awarded planning grants to 15 states to develop dual demonstrations; the number of states receiving these awards expanded to 26 in 2012. As of July 2014, CMS had finalized memoranda of understanding (MOUs) for 13 demonstrations in 12 states.[10] The proposed programs vary in the structure of financial aliment of services (eg, capitated vs fee-for-service [FFS] models) and the populations covered. For example, New York proposed a capitated model for duals with disabilities who require long-term care, while Massachusetts launched a demonstration for nonelderly duals aged 21 through 65 years. Details of all 13 demonstrations can be found elsewhere.[11] Despite the number of states pursuing these programs, little evidence exists to support their effectiveness.

Take-Away Points

CMS is partnering with states to examine the impact of financial and administration alignment of Medicare and Medicaid services by integrating the benefits of both programs under a single entity. Although 26 states are pursuing these programs, and 13 memoranda of understanding have been finalized with CMS, little evidence exists to support their effectiveness. We examined the effect of Senior Care Options (SCO)— an early demonstration for dual eligibles in Massachusetts—on rehospitalization.

- SCO did not have a statistically significant effect on rehospitalization, an area where coordinated care would be expected to make a substantial difference.
- Coordinating the financing and delivery of services through an integrated managed program may not be sufficient to address the problems of inefficiency and fragmentation in care for hospitalized dual eligibles.

Several programs have tested the feasibility of coordinating Medicare and Medicaid benefits, including the national demonstration of the Program of All-Inclusive Care for the

Elderly (PACE),[12–14] as well as several state initiatives such as Minnesota Senior Health Options (MSHO) and the Wisconsin Partnership Program (WPP).[15–17] These programs vary in the details of their delivery systems and targeted populations, but share a common goal of improving access to providers and enhancing the coordination of medical services. Studies evaluating the effectiveness of these programs have produced inconsistent results. Although participation in PACE has been associated with decreased use of acute care services and lower mortality rates,[12–14,18] evaluations of state demonstrations did not find similar improvements in utilization and outcomes.[16,17,19]

In this study, we evaluated Senior Care Options (SCO)—a CMS dual demonstration in Massachusetts— to examine the benefits of integrated managed care under a single entity. Massachusetts was among the first states to obtain a CMS waiver to combine Medicare and Medicaid benefits for duals. The early experiences of duals in SCO may provide insights for states implementing similar demonstrations. We focused on rehospitalization as our outcome, given the frequency and cost of these events in addition to the risks they pose for patients.[20] Readmission has been associated with gaps in care following hospital discharge,[20] a common problem for duals.[4–7] A report from CMS in 2011 indicated that 1 in 4 hospitalizations of duals—accounting for 20% of inpatient spending for this population—is potentially avoidable.[21] Better integration of Medicare and Medicaid benefits for duals may enhance coordination of care, thereby reducing readmissions. Integrating payments under a single insurer receiving capitated payments for duals has the potential to create greater accountability for patients before, during, and after hospital discharge, by incentivizing the responsible organization to limit costs associated with rehospitalization.

Senior Care Options

In 2004, Massachusetts started SCO as a voluntary demonstration for duals. SCO is an integrated Medicare and Medicaid managed care program that offers the full collection of healthcare and social services for low-income elderly duals. SCO is one of the first CMS initiatives of its kind that expands beyond the PACE model. It differs from existing integrated managed care programs in the scope of benefits offered and eligibility requirements. The program promotes care coordination through the use of an interdisciplinary team with geriatric expertise and a focus on extensive primary and preventive care. The state contracts with qualified managed care plans on a capitated basis to provide the complete benefit package. SCO enrollment is available to individuals who are at least 65 years of age, eligible for MassHealth Standard (ie, Medicaid), live in a SCO service area, and do not have end-stage renal disease (ESRD). The program is available to duals who are community dwelling or nursing home residents. SCO enrollees are free to choose from physicians in its network, which covers fairly broad geographic locations relative to its predecessors.

METHODS

Data and Population

We used Medicare administrative claims and comparable sources of data from a commercial health plan participating in SCO for years 2007 through 2009. The commercial plan is

available in 7 counties (Bristol, Essex, Middlesex, Norfolk, Plymouth, Suffolk, and Worcester) and provides coverage for approximately half of the duals participating in SCO. It provided event-level hospital claims as well as SCO enrollment status. Patient characteristics for both FFS and SCO beneficiaries were derived from Medicare enrollment records. Medicare enrollment files also provided information on dual eligibility of Medicare beneficiaries, including SCO enrollees, on a monthly basis.

The study population included duals in Massachusetts who were hospitalized at least once during the study period. SCO beneficiaries represented our case group and comparable duals in Medicare FFS residing in SCO service areas served as the control group. Dual status was required for SCO enrollment,[22] but was verified from the Medicare enrollment file for FFS beneficiaries. Duals aged under 65 years and those with ESRD were excluded to maintain consistency with SCO enrollment requirements. Study participants were further limited to those with continuous dual status who maintained the same insurance coverage (SCO or FFS) throughout the study period to account for continuing effects of insurance status.[23] Outliers with hospital length of stay above the 99th percentile (≥32 days) were also excluded. The final analytic file included 1090 SCO beneficiaries and 22,106 FFS enrollees associated with 59,143 hospitalizations.

Variables

Our primary outcome measure was all-cause 30-day rehospitalization (yes/no). A rehospitalization also served as the baseline for risk of another readmission. SCO participation (yes/no) was the determinant of interest. Explanatory variables included patient demographic characteristics such as age (65–75, 76–85, and ≥86 years), gender, and race; other independent variables included disability status prior to Medicare enrollment, length of stay measured in days,[24] and an indicator of whether the index stay itself was a 30-day rehospitalization following a prior admission. We also included indicators for levels of the Charlson comorbidity index,[25,26] the 5 most common principal diagnoses, the 5 most common major procedures, county of residence, and the quarter and year of admission.

Analytic Approach

Primary analysis—We used multivariate logistic regression models with county and time fixed effects to estimate the association between SCO enrollment and 30-day rehospitalization. County fixed effects controlled for time-invariant, region-specific differences influencing outcomes, while indicators for the year and quarter of admission adjusted for seasonal variation in hospitalization rates and year specific trends. There is the possibility that changes in outcomes might have been due to systematic differences across counties rather than program effects (eg, the availability of healthcare resources). As an example, eastern Massachusetts includes highly urbanized areas in and around Boston that are much different than more rural counties in other parts of the state. The identification strategy relies on within-county variation over time, removing the unobserved and potentially confounded cross-sectional heterogeneity between counties. Thus, our regression predicts the likelihood of rehospitalization among SCO and FFS enrollees who reside within the same county and are hospitalized in the same quarter and year.

Sensitivity analyses—Multiple sensitivity analyses were conducted to validate the findings of our primary analysis. First, a differential mortality risk between SCO enrollees and FFS beneficiaries could bias the estimated changes in rehospitalization associated with SCO participation. Therefore, we repeated our primary analysis with a sample that excluded patients who died within 30 days of baseline hospital discharge. Second, we hypothesized that the effect of integrated managed care may differ for clinical conditions with a high risk of rehospitalization. Therefore, we limited the sample to index hospitalizations associated with 2 conditions with high rates of rehospitalization: congestive heart failure (CHF) and chronic obstructive pulmonary disease (COPD).[20] Third, the possibility of selective marketing and enrollment was examined.

SCO is offered by risk-based private insurers with an incentive to reduce healthcare expenditures. If SCO contractors targeted enrollment in specific counties based on favorable patient case mix, our estimates could be biased. To address this possibility, we derived estimates based on an expanded sample that included all counties in Massachusetts (eg, non-SCO service areas) and compared the results with those from our primary analysis. Fourth, we estimated an alternate model using a difference-in-differences specification to mitigate bias arising from time-invariant confounders. This was done by comparing differences in the likelihood of rehospitalization for a subset of 208 individuals who first joined SCO in 2008 with those of 19,568 concurrent FFS beneficiaries in 2007 (pre-SCO) and 2009 (post SCO). Lastly, estimates from our primary analysis could be biased if there are differences in overall hospitalization rates between SCO and FFS duals. Therefore, we examined the association between SCO participation and hospitalization in any given quarter adjusting for age and gender in addition to market influences and temporal trends.

RESULTS

All analyses were performed using SAS version 9.2 (SAS Institute, Cary, North Carolina) and Stata MP version 12 (StataCorp, College Station, Texas). Results are reported with 95% robust confidence intervals (CIs) adjusted for clustering at the level of the county.

Table 1 presents characteristics of SCO and FFS beneficiaries. The mean age was similar for both groups, but there was a higher percentage of enrollees 85 years or older among FFS beneficiaries. Additionally, SCO enrollees had larger proportions of racial minorities and female beneficiaries. The mean Charlson comorbidity index was comparable for both groups, although there were small differences in the distributions of scores. No apparent differences between SCO and FFS enrollees were observed in other variables reflective of patient case mix, as indicated by mean hospital length of stay and disability status before Medicare entitlement. However, SCO enrollees had a much higher prevalence of diabetes and were also more likely to have hypertension. SCO participants also had higher unadjusted rehospitalization rates (Table 2). The proportion of index hospitalizations that were 30-day readmissions from prior stays was small in magnitude for both SCO and FFS beneficiaries, but the unadjusted difference between the 2 groups was statistically significant. Similarly, the percent of patients who died within 30 days of discharge differed between SCO and FFS beneficiaries, but the magnitude of difference was small.

The results from our primary analysis indicated no statistically significant association between SCO enrollment and 30-day rehospitalization (adjusted odds ratio [AOR], 1.13; 95% CI, 0.98–1.32) (Figure). The estimate from our sensitivity analysis that excluded patients who died within 30 days of discharge was identical to the result of our primary analysis (AOR, 1.13; 95% CI, 0.98–1.32). However, estimated odds ratios from our sensitivity analysis limited to duals with CHF and COPD varied by condition. For duals with CHF, the likelihood of 30-day rehospitalization was not significantly different between SCO enrollees and FFS duals (AOR, 1.12; 95% CI, 0.89–1.41), but SCO enrollees with COPD had higher odds of readmission within 30 days than did their dually eligible FFS counterparts (AOR, 1.32; 95% CI, 1.13–1.53).

Consistent with our primary analysis, the results from our sensitivity analysis that included duals in all Massachusetts' counties showed no statistically significant association between SCO participation and rehospitalization (AOR, 1.13; 95% CI, 0.96–1.33). Likewise, the result of our sensitivity analysis that used a difference-in-differences approach was also similar to the estimate from our primary analysis (AOR, 1.13; 95% CI, 0.74–1.73). Lastly, the overall odds of hospitalization were not statistically different between SCO enrollees and FFS beneficiaries (AOR, 0.99; 95% CI, 0.89–1.09). A table with all estimates from each regression model can be found in the eAppendix (available at www.ajmc.com).

DISCUSSION

Coordination of care through a single entity has the potential to decrease rehospitalization rates for duals by removing perverse incentives from multiple payer sources and reducing fragmentation. Given that rehospitalization can be indicative of poor quality of care, including gaps in care following discharge,[27–30] we hypothesized that enrollment in an integrated Medicare-Medicaid managed care plan would be associated with a lower likelihood of 30-day rehospitalization. However, we did not find evidence suggesting that integrating financing and service delivery for duals reduced their risk of readmission. Similarly, the results of our sensitivity analysis examining duals with conditions that are more prone to rehospitalization (COPD and CHF) did not find benefits associated with SCO enrollment. Estimates from our other sensitivity analyses support these results. Our findings are consistent with the results of 2 earlier evaluations. For example, participation in MSHO and WPP was not associated with changes in the use of acute care services in previous studies.[16,31]

There are 2 potential explanations that may have led to our null finding. First, integrated managed care enrollment by itself may not be not sufficient to improve postdischarge care coordination and reduce rehospitalizations among duals. In order to produce a sizable effect, more substantial changes in the structure of care may have been needed to respond to the complex needs of duals. Pooling Medicare and Medicaid payments under the umbrella of managed care, while extending case management to all enrollees, may not be sufficient to effectively integrate post hospital care. Closer coordination with hospital medical and discharge staff may be necessary to effectively break the cycle of readmissions. Similarly, initiating and sustaining care management that directs efforts toward triaging those at

highest risk may also have been challenging. This type of program is difficult to implement for people with complex healthcare needs who may have multiple chronic illnesses.

Another possibility is selective participation in SCO due to voluntary enrollment. Although Medicare beneficiaries who participate in managed care tend to be relatively healthier than those in traditional FFS,[23,32] this may not be the case for the dual population. We observed that, relative to FFS beneficiaries, SCO participants had a higher prevalence of some chronic diseases. This may indicate that the integration of benefits is attractive to duals with greater healthcare needs that require closer management. Although we used several analytic strategies to adjust for differences between SCO and FFS beneficiaries, certain unmeasured comorbidities could have influenced our results. If sicker patients selectively enroll in SCO, this may partly explain the absence of program effects in our results. Given this concern, other state demonstrations have used passive enrollment to guard against limited and selective participation.[10]

Implications

Our study has important implications for policies targeting the care of duals. The use of event-level data enabled us to compare hospitalizations of duals in a private managed care plan with those associated with duals in traditional FFS. Given the difficulty of acquiring claims-level data for duals after enrollment in managed care, our study offers valuable insight into the benefits of integrated care on inpatient utilization. Additionally, we examined the CMS dual demonstration that most closely resembles the structure of current CMS financial alignment initiatives, such as a capitated risk-based model. Among the 12 states that have finalized MOUs with CMS, 10 are using capitated models.[11]

Limitations

Our study has limitations to consider. First, we did not have data covering time periods prior to the initial implementation of SCO. Second, because the program was voluntary, unobserved differences between SCO enrollees and FFS beneficiaries may have led to residual confounding. For example, we did not have detailed measures of cognitive and functional status, nor did we have information on social support or use of long-term care facilities. Third, our study was limited to 1 state and the results may not generalize broadly to demonstrations in other regions that cover different dual populations. Lastly, since our evaluation was relatively early in the implementation of SCO and before the current policy emphasis on reducing rehospitalizations, it may be that SCO did not have targeting mechanisms in place that are increasingly common as providers seek to control costs associated with readmissions.[33]

CONCULSIONS

Given the complex healthcare needs of duals and the disproportionate share of Medicare and Medicaid spending directed toward this population, policy makers have sought new strategies to better allocate services for individuals participating in both programs. Although there is a lack of compelling evidence to support integrated managed care as a potential solution to providing more efficient care of better quality to duals, CMS and state

administrators continue to move ahead with new programs based on this approach. Currently, 26 states are actively working with CMS to develop dual demonstration programs; 13 MOUs have been finalized. The majority of these programs use capitated riskbased managed care models, similar to SCO.[10,11] The rationale for states' demonstration projects was to provide better care to the dual population by improving the coordination of medical services with close management. However, our study raises questions as to whether coordinating the financing and delivery of services through an integrated managed program adequately addresses inefficiency and fragmentation in care for duals. Programs seeking to improve care for duals may need to consider not only the structure of benefits, but also the specific interventions used by plans and the characteristics of duals who are likely to enroll so that participation can be appropriately gauged and services tailored accordingly.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

1. Jacobson, G.; Neuman, T.; Damico, A. [Accessed March, 2014] Medicare's role for dual eligible beneficiaries. Kaiser Family Foundation website. https://kaiserfamily-foundation.files.wordpress.com/2013/01/8138-02.pdf. Published April 2012
2. [Accessed August 2014] Report to the congress; new approaches in Medicare. Medicare Payment Advisory Commission website. http://qio.ipro.org/wp-content/uploads/2012/12/june04_entire_report.pdf. Published June 2004
3. Young, K.; Garfield, R.; Musumeci, M.; Clemans-Cope, L.; Lawton, E. [Accessed July 2014] Medicaid's role for dual eligible beneficiaries. Kaiser Family Foundation website. https://kaiserfamilyfoundation.files.wordpress.com/2013/08/7846-04-medicaids-role-for-dual-eligible-beneficiaries.pdf. Published August 2013
4. Grabowski D. Medicare and Medicaid: conflicting incentives for long-term care. Milbank Q. 2007; 85(4):579–610. [PubMed: 18070331]
5. Merrell K, Colby D, Hogan C. Medicare beneficiaries covered by Medicaid buy-in agreements. Health Aff (Millwood). 1997; 16(1):175–184. [PubMed: 9018955]
6. Walsh EG, Clark WD. Managed care and dually eligible beneficiaries: challenges in coordination. Health Care Financ Rev. 2002; 24(1):63–82. [PubMed: 12545599]
7. Komisar HL, Feder J, Kasper JD. Unmet long-term care needs: an analysis of Medicare-Medicaid dual eligibles. Inquiry. 2005; 42(2):171–182. [PubMed: 16196314]
8. Unruh MA, Grabowski DC, Trivedi AN, Mor V. Medicaid bed-hold policies and hospitalization of long-stay nursing home residents. Health Serv Res. 2013; 48(5):1617–1633. [PubMed: 23521571]
9. Grabowski DC, Feng Z, Intrator O, Mor V. Medicaid bed-hold policy and Medicare skilled nursing facility rehospitalizations. Health Serv Res. 2010; 45(6 pt 2):1963–1980. [PubMed: 20403059]
10. [Accessed February, 2014] Financial alignment initiative. CMS website. http://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/FinancialAlignmentInitiative/FinancialModelstoSupportStatesEffortsinCareCoordination.html. Updated September 14, 2015
11. Musumeci, M. [Accessed August 2014] Financial and administrative alignment demonstrations for dual eligible beneficiaries compared: states with memoranda of understanding approved by CMS.

Kaiser Family Foundation website. http://kaiserfamilyfoundation.files.wordpress.com/2014/07/8426-06-financial-alignment-demonstrations-fordual-eligible-beneficiaries-compared.pdf. Published July 2014

12. Eng C, Pedulla J, Eleazer GP, McCann R, Fox N. Program of All-inclusive Care for the Elderly (PACE): An innovative model of integrated geriatric care and financing. J Am Geriatr Soc. 1997; 45(2):223–232. [PubMed: 9033525]
13. Kane RL. Setting the PACE in chronic care. Contemp Gerontol. 1999; 6(2):47–50.
14. Chatterji, P.; Burstein, NR.; Kidder, D.; White, A. [Accessed August 2014] Evaluation of the program of all-inclusive care for the elderly (PACE) demonstration: the impact of PACE on participant outcomes. CMS website. https://www.cms.gov/Medicare/Demonstration-Projects/DemoProjectsEvalRpts/downloads/pace_outcomes.pdf. Published July 1998
15. Kane, RL.; Homyak, P.; Rudolph, N. [Accessed July 2014] Multi state evaluation of dual eligibles demonstration: final report. CMS website. https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Reports/downloads/Kane2_2004_1.pdf. Published July 2004
16. Kane RL, Homyak P, Bershadsky B, Flood S. The effects of a variant of the program for all inclusive care of the elderly on hospital utilization and outcomes. J Am Geriatr Soc. 2006; 54(2): 276–283. [PubMed: 16460379]
17. Kane RL, Homyak P, Bershadsky B, Lum T, Flood S, Zhang H. The quality of care under a managed-care program for dual eligibles. Gerontologist. 2005; 45(4):496–504. [PubMed: 16051912]
18. Beauchamp, J.; Cheh, V.; Schmitz, R.; Kemper, P.; Hall, J. [Accessed December 2013] The effect of the Program of All-Inclusive Care for the Elderly (PACE) on quality. CMS website. http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Reports/downloads/Beauchamp_2008.pdf. Published February 12, 2008
19. Kane, R.; Homyak, P. [Accessed July 2014] Multi state evaluation of dual eligibles demonstration: Minnesota senior health options evaluation focusing on utilization, cost, and quality of care. CMS website. https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Reports/downloads/kane2003_1.pdf. Published 2002. Revised August 2003
20. Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-service program. N Engl J Med. 2009; 360(14):1418–1428. [PubMed: 19339721]
21. Segal, M. [Accessed July 2014] Dual eligible beneficiaries and potentially avoidable hospitalizations. CMS website. https://www.cms.gov/Research-Statistics-Dataand-Systems/Statistics-Trends-and-Reports/Insight-Briefs/downloads/PAHInsightBrief.pdf. Published September 2011
22. Senior Care Options overview. [Accessed September, 2015] Mass Resources website. http://www.mass.gov/eohhs/consumer/insurance/senior-care-options/scooverview.html
23. Morgan RO, Virnig BA, DeVito CA, Persily NA. The Medicare-HMO revolving door—the healthy go in and the sick go out. N Engl J Med. 1997; 337(3):169–175. [PubMed: 9219704]
24. Unruh MA, Trivedi AN, Grabowski DC, Mor V. Does reducing length of stay increase rehospitalization of Medicare fee-for-service beneficiaries discharged to skilled nursing facilities? J Am Geriatr Soc. 2013; 61(9):1443–1448. [PubMed: 23926902]
25. Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. J Chronic Dis. 1987; 40(5):373–383. [PubMed: 3558716]
26. Deyo RA, Cherkin DC, Ciol MA. Adapting a clinical comorbidity index for use with *ICD-9-CM* administrative databases. J Clin Epidemiol. 1992; 45(6):613–619. [PubMed: 1607900]
27. Ashton CM, Wray NP. A conceptual framework for the study of early readmission as an indicator of quality of care. Soc Sci Med. 1996; 43(11):1533–1541. [PubMed: 8961397]
28. Ashton CM, Kuykendall DH, Johnson ML, Wray NP, Wu L. The association between the quality of inpatient care and early readmission. Ann Intern Med. 1995; 122(6):415–421. [PubMed: 7856989]

29. Ashton CM, Del Junco DJ, Souchek J, Wray NP, Mansyur CL. The association between the quality of inpatient care and early readmission: a meta-analysis of the evidence. Med Care. 1997; 35(10): 1044–1059. [PubMed: 9338530]

30. [Accessed July 2014] Report to Congress: promoting greater efficiency in Medicare. Medicare Payment Advisory Committee website. http://www.caretransitions.org/documents/MedPAC%20report.pdf. Published 2007

31. Kane R, Homyak P, Bershadsky B, Flood S, Zhang H. Patterns of utilization for the Minnesota senior health options program. J Am Geriatr Soc. 2004; 52(12):2039–2044. [PubMed: 15571539]

32. Hellinger FJ, Wong HS. Selection bias in HMOs: a review of the evidence. Med Care Res Rev. 2000; 57(4):405–439. [PubMed: 11105511]

33. Coleman EA, Smith JD, Frank JC, Min SJ, Parry C, Kramer AM. Preparing patients and caregivers to participate in care delivered across settings: the Care Transitions Intervention. J Am Geriatr Soc. 2004; 52(11):1817–1825. [PubMed: 15507057]

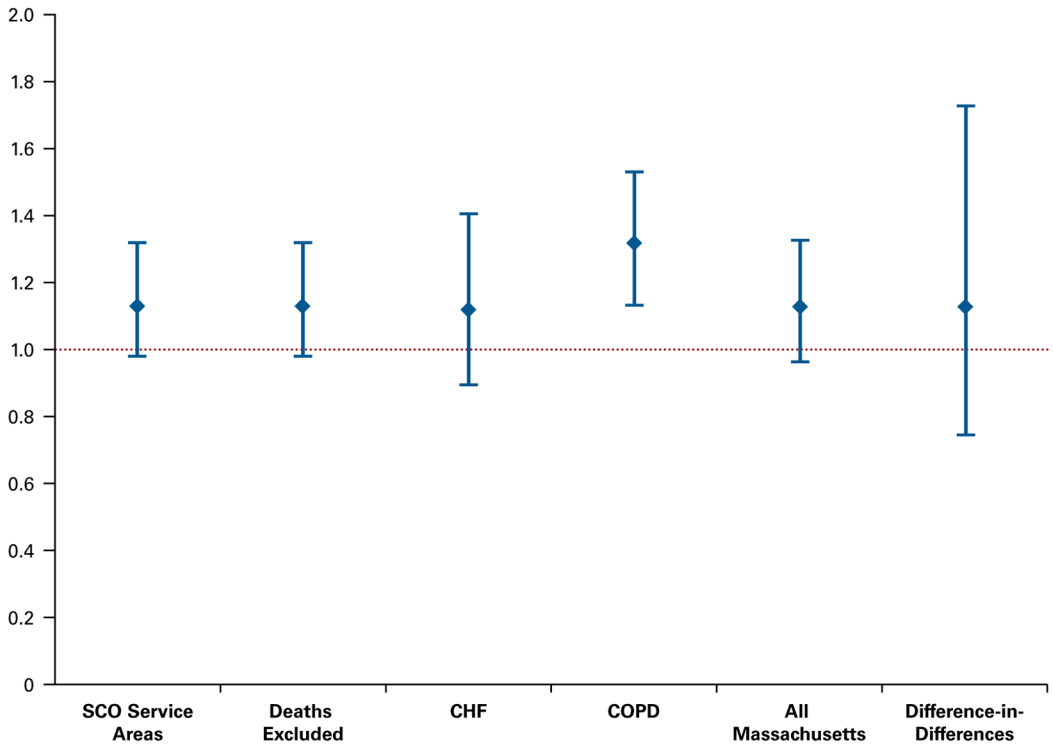

Figure.

Adjusted Associations (odds ratios) Between Enrollment in Senior Care Options and 30-Day Rehospitalization

CHF indicates congestive heart failure; COPD, chronic obstructive pulmonary disease; SCO, Senior Care Options.

Table 1

Baseline Characteristics of Senior Care Options and Medicare Fee-for-Service Beneficiaries

	Total (N = 23,196)				
	SCO Dual Eligibles N = 1090 (4.7%)		FFS Dual Eligibles N = 22,106 (95.3%)		*P*
Age (mean/SD)	77.5	7.3	77.7	8.1	.47
Age distribution, years (%)					
65–75	44.0		44.3		.85
76–85	39.6		37.4		.13
≥86	16.1		18.6		.03
Male (%)	26.1		28.5		.08
White (%)	59.8		76.2		<.001
Black (%)	20.9		8.1		<.001
Other (%)	19.2		15.7		<.01
Charlson comorbidity index (mean/SD)	1.4	1.3	1.4	1.4	.61
Charlson distribution (%)					
0	24.2		27.9		<.01
1	38.2		32.8		<.001
2	21.7		21.4		.78
3	9.7		10.8		.28
≥4	6.1		7.1		.24
Chronic disease prevalence (%)					
Diabetes	37.5		29.8		<.001
Hypertension	60.8		57.1		.02
COPD	8.3		9.7		.13
Congestive heart failure	15.0		15.6		.65
Medicare entitlement before age 65 (%)	32.5	–	35.1	–	.09
Length of stay for the index hospitalization (mean/SD)	4.6	3.9	4.6	4.0	.61
Index stay itself was a 30-day rehospitalization from a prior stay (%)	0.9		0.3		<.01
Death within 30 days of discharge (%)[a]	0.0		0.4		<.001

COPD indicates chronic obstructive pulmonary disease; FFS, fee-for-service; SCO, Senior Care Options.

[a]Based on all hospitalizations.

Patient characteristics were derived from baseline hospitalizations.

Table 2

Unadjusted Rehospitalization Rates Stratified by Senior Care Options Service Areas, All of Massachusetts, and Specific Clinical Conditions

	Senior Care Options Enrollees	Fee-for-Service Beneficiaries
Senior Care Options service areas	22.1%	19.8%
All of Massachusetts	22.1%	19.7%
Chronic obstructive pulmonary disease	27.8%	21.9%
Congestive heart failure	26.5%	24.1%