Use of Chronic Care Management Codes for Medicare Beneficiaries: a Missed Opportunity?

Rebekah L. Gardner, MD[1,2], Rouba Youssef, PhD[2], Blake Morphis, BS[2], Alyssa DaCunha, MPH[2], Kimberly Pelland, MPH[2], and Emily Cooper, MPH[2]

[1]Department of Medicine, Alpert Medical School of Brown University, Providence, RI, USA; [2]Healthcentric Advisors, Providence, RI, USA.

BACKGROUND: Physicians spend significant time outside of regular office visits caring for complex patients, and this work is often uncompensated. In 2015, the Centers for Medicare & Medicaid Services (CMS) introduced a billing code for care coordination between office visits for beneficiaries with multiple chronic conditions.
OBJECTIVE: Characterize use of the Chronic Care Management (CCM) code in New England in 2015.
DESIGN: Retrospective observational analysis.
PARTICIPANTS: All Medicare fee-for-service beneficiaries in New England continuously enrolled in Parts A and B in 2015.
INTERVENTION: None.
MAIN MEASURES: The primary outcome was the number of beneficiaries with a CCM claim per 1000 eligible beneficiaries. Secondary outcomes included the total number of CCM claims, total reimbursement, mean number of claims per beneficiary, and beneficiary characteristics independently associated with receiving CCM services.
KEY RESULTS: Of the more than two million Medicare fee-for-service beneficiaries in New England, almost 1.7 million were potentially eligible for CCM services. Among eligible beneficiaries, 10,951 (0.65%) had a CCM claim in 2015. Massachusetts had the highest penetration of CCM use (9.40 claims per 1000 eligible beneficiaries); Vermont had the lowest (0.54 claims per 1000 eligible beneficiaries). Mean reimbursement per physician was $1745.98. Age, race/ethnicity, dual-eligible status, income, number of chronic conditions, and state of residence were associated with receiving CCM services in an adjusted model.
CONCLUSIONS: The CCM code is likely underutilized in New England; the program may therefore not be achieving its intended goal of encouraging consistent, team-based chronic care management for Medicare's most complex beneficiaries. Or practices may be foregoing reimbursement for care coordination that they are already providing. Recently implemented revisions may improve uptake of CCM services; it will be important to compare our results with future utilization.

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INTRODUCTION

Physicians and their staff spend significant time outside of regular office visits caring for complex patients.[1–3] This work is critically important for coordinating care and is expected and valued by patients,[4,5] but it is time-consuming[6,7] and historically has not been compensated through traditional Evaluation and Management (E/M) codes.

In 2015, the Centers for Medicare & Medicaid Services (CMS) introduced a billing code that allowed physicians to bill for care coordination between office visits for beneficiaries with two or more chronic conditions. The chronic care management (CCM) services code requires at least 20 min of clinical staff time directed by a physician each month, with reimbursement of about $40 per beneficiary per month.[8,9] Medicare estimates that only half a million Medicare beneficiaries received CCM services[10] in 2015, the first year the CCM code was available. Physicians reported that they found it difficult to implement the infrastructure, health information technology, and documentation requirements needed to use the code efficiently and successfully.[10,11]

In response to this feedback, CMS modified the original CCM code requirements in 2017 to ease their use (e.g., allowing faxing of care plans in addition to electronic transmission) and added codes for more complex patients.[12] However, use of the CCM code has not been well described, making it challenging to assess progress in response to the recent changes. This study aims to fill this important gap by characterizing use of the CCM code for Medicare fee-for-service (FFS) beneficiaries in New England in 2015. These results can inform future revisions to the CCM code and implementation of similar codes to better support management of complex, chronically ill patients by easing reimbursement for care coordination services.

METHODS

Participants and Setting

The study population includes all Medicare FFS beneficiaries in New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) who were continuously enrolled in Parts A and B in 2015. Beneficiaries who died in 2015 are included up until their date of death if they died after January 31, 2015.

Data Sources

We used the following data sources: Medicare FFS Part A and Part B claims data (2013–2015), Medicare enrollment data (2015), and US Census Bureau data for ZIP Code tabulation areas (2014). Healthcentric Advisors, the New England Medicare Quality Innovation Network-Quality Improvement Organization, has access to Medicare claims data under a CMS data use agreement that allows use of these data to evaluate improvement in care quality. Institutional Review Board review is not required in these circumstances, per Healthcentric Advisors' policy.

CCM Code Goals and Requirements

CMS has outlined several goals for the CCM program.[13] For patients, objectives include improved health outcomes, better care coordination including use of a comprehensive care plan, higher satisfaction, and a team to provide support between office visits. For physicians, CMS aims to recognize the time, effort, and costs for care coordination; to support patient adherence and decrease unplanned utilization; and to help physicians sustain their practices and expand their panels.

Beneficiaries are potentially eligible for the CCM code (99490) if they have two or more chronic conditions that are expected to last at least 12 months or until death and if these conditions place them "at significant risk of death, acute exacerbation/decompensation, or functional decline".[8] The 2015 CCM requirements stated that services must be initiated during a comprehensive E/M visit, an Annual Wellness Visit, or an Initial Preventive Physical Examination. Physicians or their staff must develop and follow a patient-centered care plan and provide regular follow-up by a designated member of the care team. Additionally, CMS requires physicians to have a certified electronic health record (EHR) to bill the CCM code. Only one physician can bill a CCM code for a beneficiary each month.

Creation of the Eligible Population

To compare beneficiaries who received CCM services with those who did not, we created a population of beneficiaries potentially eligible to receive CCM services using the following approach:

First, to account for the office visit required to initiate CCM services in 2015, we limited the pool of beneficiaries to those with an outpatient claim from January 1, 2014, to June 30, 2015, and with at least one of the following types of E/M codes: office or other outpatient services, preventive medicine services, Annual Wellness Visit, and Initial Preventive Physical Exam (see Online Appendix Table 1 for a list of the included codes). We chose the 2014–2015 timeframe because initiating CCM services requires an outpatient visit within the prior year.

Second, we created a pool of beneficiaries with two or more chronic conditions, based on Medicare FFS Part A and Part B claims data for January 1, 2013, to June 30, 2015. CMS does not specify which chronic conditions qualify beneficiaries for use of CCM services. We chose diagnoses based on those provided as examples in the CMS factsheet on the CCM codes,[8] included in the Chronic Conditions Data Warehouse diagnoses,[14] identified by the Multiple Chronic Conditions Working Group,[15] and/or included in a publication about multiple chronic conditions among Medicare beneficiaries.[16]

Using these references, we selected the following chronic conditions for inclusion in this study: acute myocardial infarction, Alzheimer's disease and related dementias, anemia, arthritis (osteoarthritis and rheumatoid arthritis), asthma, atrial fibrillation, autism spectrum disorders, benign prostatic hypertrophy, cancer (breast, colorectal, prostate, lung, and endometrial), cataracts, chronic kidney disease, chronic obstructive pulmonary disease (COPD), depression, diabetes, glaucoma, heart failure, chronic viral hepatitis, hip or pelvic fracture, HIV, hyperlipidemia, hypertension, hypothyroidism, ischemic heart disease, osteoporosis, schizophrenia, stroke or transient ischemic attack, and substance use disorder.

Most ICD-9 and ICD-10 codes were available through the Chronic Conditions Data Warehouse.[14] For those that were not, we looked to published studies on similar populations[17–28] and mapped equivalent diagnoses between ICD-9 and ICD-10 (Online Appendix Table 2). When creating the eligible population, we looked at all Part A and Part B claims for each beneficiary from January 1, 2013, to June 30, 2015, and included all conditions that matched the diagnosis codes in Online Appendix Table 2. We also performed a sensitivity analysis in which we removed Part B claims that were associated with services provided at walk-in retail health clinics, urgent care facilities, or emergency departments (place of service codes 17, 20, and 23, respectively), as well as those associated with radiology or laboratory studies. We performed this sensitivity analysis because diagnosis codes associated with claims for diagnostic tests and episodic care (such as that provided in urgent care centers and emergency departments) may less reliably predict the true prevalence of certain diagnoses among our population.

We included beneficiaries who met the criteria for both the required office visit and the two chronic conditions, regardless of age. We did not attempt to limit the population to beneficiaries seen in practices with certified EHRs. We then divided the eligible population into beneficiaries who had a CCM code in the claims file for 2015 and those who did not.

Data Analysis

We conducted a retrospective observational analysis. Our primary outcome was the number of beneficiaries with a CCM claim per 1000 eligible beneficiaries in each New England state in 2015. Secondary outcomes included the total number of CCM claims in each state in 2015, the total reimbursement for those claims, the mean number of CCM claims billed per beneficiary, the number of physicians billing CCM services, and the mean reimbursement per physician, among physicians billing CCM services.

In a bivariate analysis, we compared characteristics of eligible beneficiaries who had a CCM claim with those who did not, using chi-square tests. Using logistic regression, we identified variables associated with a beneficiary having any CCM claim. We adjusted for beneficiary-level measures in the regression model including beneficiary age (categorized into 0–18 years, 19–64 years, and > 64 years), sex, race/ethnicity (Asian, Black, Hispanic, White, and other), whether the beneficiary was dually eligible for Medicare and Medicaid, the number of chronic conditions from Online Appendix Table 2 captured in the 2013–2015 claims data (0–3, 4–6, and > 6), and state of residence. We used 2014 US Census Bureau estimates to identify the median household income for each beneficiary's ZIP Code tabulation area of residence. After examining the distribution of median household income across New England, we stratified the ZIP Code-level median income variable into three levels: low income (< $47,700), middle income ($47,700 to $71,550), and high income (>$71,550). We also adjusted for the presence of specific diagnoses that were commonly submitted with CCM claims (diabetes, ischemic heart disease, heart failure, and COPD).

Role of the Funding Source

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RESULTS

Of the more than two million Medicare FFS beneficiaries in New England in 2015, almost 1.7 million were eligible for CCM services according to the criteria used for this study (Table 1). Among eligible beneficiaries, 10,951 (0.65%) had any CCM claim in 2015, translating to a New England-wide rate of 5.09 beneficiaries with CCM claims per 1000 eligible beneficiaries in 2015 (Table 1). We noted considerable variation across the New England states in use of CCM services: Massachusetts had the highest penetration of CCM use (9.40 claims per 1000 eligible beneficiaries), and Vermont had the lowest (0.54 claims per 1000 eligible beneficiaries).

The six New England states saw a total of 42,362 CCM claims in 2015. Among beneficiaries with a CCM claim, the mean number of claims per beneficiary was 3.52 (SD 2.60) (Table 2). Maine had the highest number of mean claims per beneficiary at 6.21 (SD 2.78) and New Hampshire had the lowest (2.43 [SD 1.97]). The total reimbursement for CCM claims in New England was $1,354,882 in 2015, with more than half going to Massachusetts ($853,863). Mean reimbursement per physician, among physicians billing for CCM services, was $1745.98 in 2015. This also varied by state, with Vermont averaging $242.48 per physician and Massachusetts averaging $2954.54 (Table 2). Overall, 776 physicians in New England billed for CCM services in 2015, ranging from a total of 37 physicians in Vermont to 289 in Massachusetts.

Bivariate analyses revealed that, compared to those who did not have a CCM claim, greater proportions of the 10,951 eligible beneficiaries with CCM claims were 65 years or older (90.1 vs 80.8% without a CCM claim, $p < 0.0001$), were White (94.1 vs 90.3% without a CCM claim, $p < 0.0001$), and had more than six chronic conditions (65.3 vs 46.6% without a CCM claim, $p < 0.0001$) (Table 3).

Compared to those with a CCM claim, greater proportions of beneficiaries without a CCM claim were Black (4.1 vs 2.5% with a CCM claim, $p < 0.0001$) and were dually eligible for Medicare and Medicaid (24.3 vs 17.4% with a CCM claim, $p < 0.0001$) (Table 3). There were no differences between the groups with regard to gender (57.3% of those with a CCM claim were women vs 57.0% without a claim, $p = 0.54$).

In the adjusted model, age, race/ethnicity, dual-eligible status, income, number of chronic conditions, presence of selected diagnoses, and state of residence remained significantly associated with receiving CCM services (Fig. 1). Older age (AOR 1.71, 95% CI 1.59 to 1.83; 65 years or older compared with younger than 65) and the presence of COPD (AOR 1.05, 95% CI 1.00 to 1.10; compared with no COPD) or ischemic heart disease (AOR 1.06, 95% CI 1.01 to 1.11; compared with no ischemic heart disease) were associated with higher odds of having a CCM claim. Dual-eligible status (AOR 0.75, 95% CI 0.71 to 0.79; compared with not dually eligible), fewer chronic conditions (AOR 0.59, 95% CI 0.57 to 0.62; 4 to 6 chronic conditions compared to more than 6), and being Black, Asian, or Hispanic (AOR 0.51, 95% CI 0.46 to 0.58; AOR 0.32, 95% CI 0.23 to 0.45; AOR 0.47, 95% CI 0.37 to 0.59; respectively, compared with White) were associated with lower odds of having a CCM claim. Beneficiaries residing in ZIP Codes with both the lowest median annual household income (< $47,700) and the highest median annual household income (> $71,550) had lower odds of receiving CCM services compared to those in the middle-income group (AOR 0.77, 95% CI 0.73 to 0.81; AOR 0.41, 95% CI 0.39 to 0.43; respectively). Living in Massachusetts was also positively associated with receiving CCM services in the adjusted model. A sensitivity analysis that removed claims with certain place of service codes, as well as radiology and laboratory claims, produced results similar to those of the primary analysis.

Table 1 Medicare Fee-for-Service Beneficiaries with a CCM Claim in 2015, by State

State	Total beneficiaries	Number of eligible beneficiaries	Number of eligible beneficiaries with CCM claims	Number of beneficiaries with CCM claims per 1000 beneficiaries	Number of beneficiaries with CCM claims per 1000 eligible beneficiaries
All New England	2,153,230	1,691,803	10,951	5.09	6.47
Connecticut	467,811	374,990	2314	4.95	6.17
Maine	236,559	175,444	713	3.01	4.06
Massachusetts	954,867	770,432	7244	7.59	9.40
New Hampshire	242,448	183,498	215	0.89	1.17
Rhode Island	131,202	99,187	417	3.18	4.20
Vermont	120,343	88,252	48	0.40	0.54

CCM, chronic care management

DISCUSSION

We found that few Medicare beneficiaries in New England received CCM services in 2015, despite a large population of patients who were likely eligible. We also noted disparities in receipt of CCM services among different beneficiary populations, as well as variation in uptake across the six New England states, even after controlling for patient characteristics. These findings suggest that the CCM code, as currently implemented, is underutilized by physicians. Patients with complex chronic conditions may be missing out on high-quality, team-based care in between office visits, and practices may be foregoing reimbursement for care coordination that they are already providing.

Physicians and their practices may be eschewing use of the CCM code for a variety of reasons, including lack of awareness that reimbursement for chronic disease management in between office visits is available.[29] Among those aware of the code, the most widely reported barrier is that the infrastructure, health information technology, and documentation requirements are overly burdensome.[10,30–32] Practices face many other competing initiatives[33] in their practice environment and may not have the time or resources to explore implementation of CCM billing. Practices may have too few Medicare patients to make implementation worthwhile. A study estimated that a practice would need to enroll at least 131 Medicare patients to recoup its costs if it hired a full-time registered nurse to provide CCM services.[34] For the average primary care physician in the USA, 131 Medicare patients represent more than a quarter of the Medicare patients in their panel,[34] which may not be a realistic target.

We found variation in use of the CCM code across the different New England states. Overall, physicians in the Southern New England states billed more CCM claims than the Northern New England states, even when accounting for differences in the eligible populations. Our findings may echo regional utilization patterns, with Southern New England states routinely demonstrating higher utilization of healthcare services than Northern New England states.[35–37] They may also reflect regional differences in technology, staffing, or membership in larger healthcare systems. Notably, Massachusetts has experienced substantial healthcare industry consolidation,[38] which may facilitate delivery of CCM services due to improved infrastructure.

Our work confirms preliminary CMS analyses that showed that older patients and those with more chronic conditions were more likely to receive CCM services.[10] These patients tend to visit their physician more frequently and to require more intensive care coordination from the practice between visits. Given differences in healthcare utilization between men and women,[39–41] it was interesting to note that gender was not associated with receiving CCM services in this analysis. Race/ethnicity, however, was associated with receipt of CCM services. In analyses controlled for patient characteristics, White beneficiaries were more likely to have a CCM claim than Black, Asian, or Hispanic

Table 2 CCM Claims and Reimbursement in 2015, by State

State	Total number of CCM claims	Mean (SD) number of claims per beneficiary	Median number of claims per beneficiary	Range of number of claims per beneficiary	Total reimbursement for CCM claims ($)	Total number of physician billing CCM services	Mean reimbursement per physician ($)
All New England	42,362	3.52 (2.60)	3	1–22	1,354,882	776	1745.98
Connecticut	9275	3.64 (2.75)	3	1–22	301,438	185	1629.39
Maine	4984	6.21 (2.78)	7	1–12	129,512	64	2023.63
Massachusetts	25,897	3.28 (2.40)	3	1–17	853,863	289	2954.54
New Hampshire	643	2.43 (1.97)	2	1–11	20,149	132	152.65
Rhode Island	1277	2.81 (1.82)	2	1–8	40,948	69	593.46
Vermont	286	4.61 (3.97)	3	1–13	8972	37	242.48

CCM, chronic care management; SD, standard deviation

Table 3 Characteristics of Eligible Medicare Fee-for-Service Beneficiaries in 2015, by Presence of a CCM Claim ($N = 1,691,803$)

Characteristic	With a CCM claim *n* (%)	Without a CCM claim *n* (%)	*p* value
Eligible beneficiaries	10,951 (0.65)	1,680,852 (99.35)	$p < 0.0001$
Age			$p < 0.0001$
0–18 years	0 (0)	53 (0)	
19–64 years	1088 (9.94)	323,670 (19.26)	
> 64 years	9863 (90.06)	1,357,038 (80.80)	
Female	6274 (57.29)	958,123 (57.00)	$p = 0.54$
Race/ethnicity			$p < 0.0001$
Asian	37 (0.34)	16,915 (1.01)	
Black	275 (2.51)	68,376 (4.07)	
Hispanic	76 (0.69)	26,545 (1.58)	
White	10,309 (94.14)	1,518,256 (90.33)	
Other	117 (1.07)	22,565 (1.34)	
Dually eligible for Medicare and Medicaid	1900 (17.35)	407,770 (24.26)	$p < 0.0001$
Median household income*			$p < 0.0001$
< $47,700	2040 (18.63)	359,866 (21.41)	
$47,700 to $71,550	5530 (50.50)	617,241 (36.72)	
> $71,550	3381 (30.87)	703,745 (41.87)	
Number of chronic conditions†			$p < 0.0001$
0–3	438 (4.00)	225,209 (13.40)	
4–6	3365 (30.73)	672,664 (40.02)	
> 6	7148 (65.27)	789,297 (46.58)	
Presence of selected diagnoses			
COPD	3184 (29.07)	387,868 (23.08)	$p < 0.0001$
Diabetes	3938 (35.96)	522,848 (31.11)	$p < 0.0001$
Heart failure	2197 (20.06)	237,805 (14.15)	$p < 0.0001$
Ischemic heart disease	3960 (36.16)	445,085 (26.48)	$p < 0.0001$

Chi-square tests were used to calculate p values. Beneficiaries were considered eligible for CCM services in this analysis if they had two or more pre-specified chronic conditions and a qualifying office visit. CCM, chronic care management; COPD, chronic obstructive pulmonary disease

**Income data represent median household income for the beneficiary's ZIP Code tabulation area of residence (from 2014 US Census Bureau data)*

†Chronic conditions consisted of the following diagnoses: acute myocardial infarction, Alzheimer's disease and related dementias, anemia, arthritis (osteoarthritis and rheumatoid arthritis), asthma, atrial fibrillation, autism spectrum disorders, benign prostatic hypertrophy, cancer (breast, colorectal, prostate, lung, and endometrial), cataracts, chronic kidney disease, chronic obstructive pulmonary disease (COPD), depression, diabetes, glaucoma, heart failure, chronic viral hepatitis, hip or pelvic fracture, HIV, hyperlipidemia, hypertension, hypothyroidism, ischemic heart disease, osteoporosis, schizophrenia, stroke or transient ischemic attack, and substance use disorder

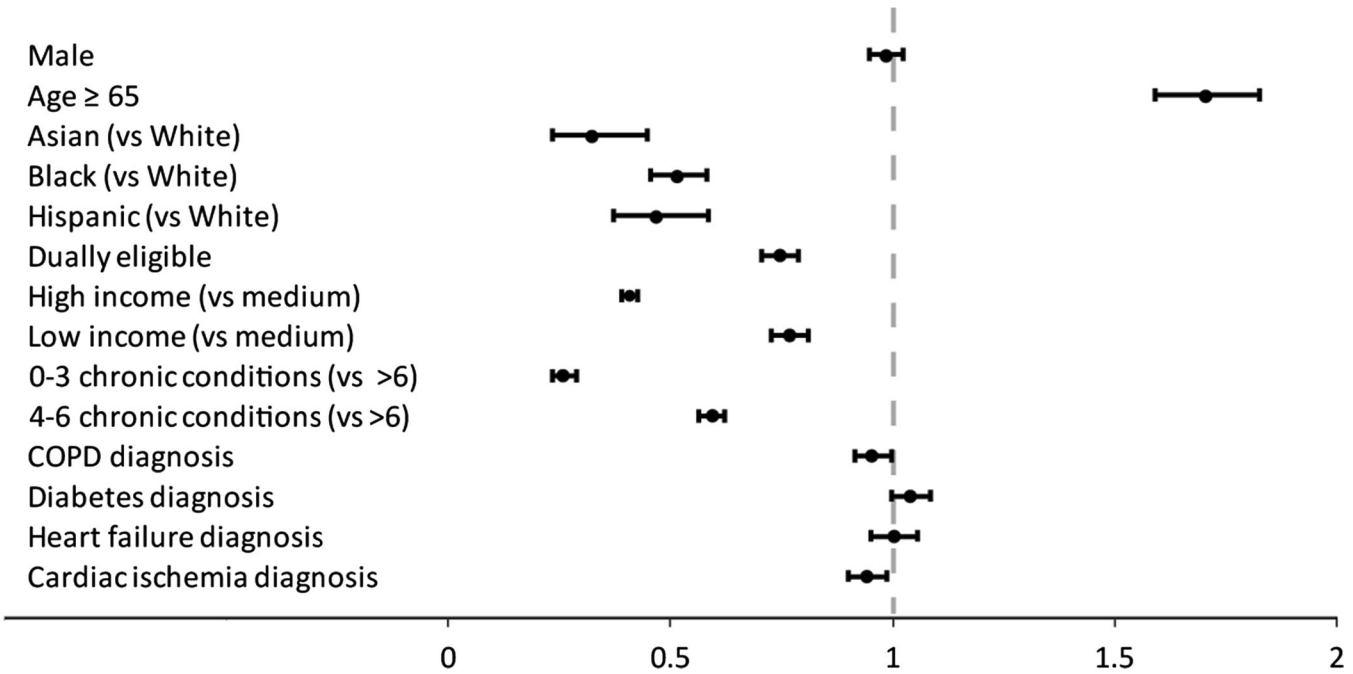

Figure 1 Forest plot of the fully adjusted logistic regression model assessing the odds of receiving CCM services among different Medicare fee-for-service populations. Model is adjusted for age, sex, race/ethnicity, whether dually eligible for Medicare and Medicaid, median household income for the beneficiary's ZIP Code tabulation area of residence (from 2014 US Census Bureau data), number of chronic conditions, presence of selected diagnoses, and state of residence. CCM chronic care management, COPD chronic obstructive pulmonary disease.

beneficiaries. This disparity may be present because non-White patients are more likely to be cared for by practices with fewer resources;[42,43] implementation requirements may be particularly challenging in these settings. Or it may reflect differences in healthcare access or use overall among patients of different races and ethnicities.[44] Despite having higher healthcare utilization generally,[45] beneficiaries dually eligible for Medicare and Medicaid in this study were also less likely to receive CCM services. It is not yet clear if making these codes easier to implement by revising the requirements will increase their use for non-White beneficiaries and dually eligible beneficiaries.

The study's strengths include the large sample size and the ability to capture every CCM claim in the region in 2015. Limitations include the potential lack of generalizability to other regions of the country with different practice patterns. Additionally, we may have overestimated the population of eligible beneficiaries because we likely included patients whose physicians cannot bill the CCM code (e.g., because they do not have a certified EHR or participate in payment models that preclude use of these codes). However, beneficiaries with multiple chronic conditions often see many different physicians throughout the year,[46] and any one of those could potentially have billed for CCM services. Conversely, we may have underestimated the eligible population because we did not include all possible diagnoses that may have prompted use of the CCM code in practice. We attempted to mitigate this limitation by including a wide array of diagnoses. Last, we are only able to control for variables present in claims data. Specifically, we are not able to include physician or practice characteristics in the model; a qualitative study found that practice size and ownership characteristics may affect the ability to provide and bill for CCM services.[47]

In summary, use of the CCM code in New England was low in 2015, and the CCM program was likely underutilized by physicians and beneficiaries, perhaps due to lack of awareness or perceived or true implementation barriers. The program, as originally conceived and implemented in 2015, is apparently not achieving its intended goal of encouraging consistent, team-based chronic care management for Medicare's most complex beneficiaries. There was variation in uptake across the six states, which suggests opportunities to learn from physicians and practices that successfully provide and bill for CCM services.[11,47] Additionally, certain Medicare beneficiary populations were less likely to have CCM claims than others, which should prompt efforts to support wider use of these services, particularly in practices with limited resources. Recently implemented revisions to the program may improve uptake of CCM services; it will be important to compare our results with future utilization to see if these changes are having their intended effect of reimbursing practices for the important care they provide to patients with multiple chronic conditions in between office visits.

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Corresponding Author: *Rebekah L. Gardner, MD; Department of Medicine, Alpert Medical School of Brown University, Providence, RI, USA (e-mail: Rebekah_Gardner@Brown.edu).*

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Compliance with Ethical Standards:

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

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