

ORIGINAL RESEARCH

Variation in Specialty Outpatient Care Patterns in the Medicare Population

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BACKGROUND: Multiple payment reform efforts are under way to improve the value of care delivered to Medicare beneficiaries, yet few directly address the interface between primary and specialty care.

OBJECTIVE: To describe regional variation in outpatient visits for individual specialties and the association between specialty physician-specific payments and patient-reported satisfaction with care and health status.

DESIGN: Retrospective cross-sectional study.

PATIENTS: A 20 % random sample of Medicare fee-for-service beneficiaries in 2012.

MAIN MEASURES: Regions were grouped into quartiles of specialist index, defined as the observed/expected regional likelihood of having an outpatient visit to a specialist, for ten common specialties, adjusting for age, sex, and race. Outcomes were per capita specialty-specific physician payments and Medicare Current Beneficiary Survey responses.

KEY RESULTS: The proportion of beneficiaries seeing a specialist varied the most for endocrinology and gastroenterology (3.7- and 3.9-fold difference between the highest and lowest quartiles, respectively) and least for orthopedics and urology (1.5- and 1.7-fold difference, respectively). Multiple analyses suggested that this variation was not explained by prevalence of disease. Average specialty-specific payments were strongly associated with the likelihood of visiting a specialist. Differences in per capita payments from lowest (Q1) to highest quartiles (Q4) were greatest for cardiology (\$89, \$135, \$172, \$251) and dermatology (\$46, \$64, \$82, \$124). Satisfaction with overall care (median [interquartile range] across specialties: Q1, 93.3 % [92.6–93.7 %]; Q4, 93.1 % [92.9–93.2 %]) and self-reported health status (Q1, 37.1 % [36.9–37.7 %]; Q4, 38.2 % [37.2–38.4 %]) was similar across quartiles. Satisfaction with access to specialty care was consistently lower in the lowest quartile of specialty index (Q1, 89.7 % [89.2–91.1 %]; Q4, 94.5 % [94.4–94.8 %]).

CONCLUSIONS: Substantial regional variability in outpatient specialist visits is associated with greater payments with limited benefits in terms of patient-reported satisfaction with care or reported health status. Reducing outpatient physician visits may represent an important opportunity to improve the efficiency of care.

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INTRODUCTION

Multiple payment and delivery reform measures are being evaluated in efforts to improve the organization and delivery of care for Medicare beneficiaries, with particular attention recently to outpatient settings.^{1,2} The Department of Health and Human Services has set a goal of transitioning 50 % of Medicare payments to alternative payment models by the end of 2018. Beginning in 2019, physicians will receive bonuses for participating in alternative payment models.^{3,4} Models currently being tested include accountable care organizations (ACOs) and medical homes that promote accountability for general primary care populations, and specialty-focused models that promote accountability for specific populations or episodes of care managed principally by specialists.^{5–7} Much of the care in outpatient settings, however, is delivered through collaborations between primary and specialty care in which specialists function as co-managers or cognitive consultants.⁸ A better understanding of the variation in patterns of care in these clinical situations is needed in order to identify opportunities and priorities for payment and delivery reforms that promote shared accountability.

There has been a dramatic increase in specialist referrals in recent years,⁹ and a corresponding narrowing of services delivered by specialists.¹⁰ Studies of the interface between primary and specialty care have documented poor communication and a lack of standardized processes,^{11,12} limited acceptable metrics for measuring performance,¹³ and a high prevalence of bypassing primary care by patients and specialists, with adverse effects on coordination.^{9,14,15}

Few studies have examined variation in primary and specialist care for specific conditions or specialties in outpatient settings. Evaluation and management services in specialties that typically function in roles of shared care and cognitive consultation for common conditions in older patients are potentially at greatest risk for inconsistent patterns of care, given a lack of guidelines or evidence base for the need and intensity of primary care or specialty visits.^{16–18} Although standards exist for documenting and billing the types of encounters, physicians and patients generally have discretion as to how

frequently and with whom such services occur, and beliefs differ widely among physicians in specific clinical situations.¹⁸ The Choosing Wisely campaign, in which professional societies identified potentially low-value services, focused primarily on tests and procedures. Only one recommendation has addressed the need for physician visits,¹⁹ though office visits are a major component of annual spending.¹⁸ Similarly, none of the 254 quality measures used by the Centers for Medicare & Medicaid Services (CMS) for the Physician Quality Reporting System address potential overuse of office visits.²⁰

The objectives of this study were to (1) measure regional variations in the likelihood of beneficiary outpatient office visits for ten specialties commonly providing shared care and cognitive consults for Medicare beneficiaries; (2) assess whether such variations are associated with differences in population health status; and (3) determine the associations between increased specialist use and per capita specialty-specific physician payments and patient-reported satisfaction with care and health status.

METHODS

Data and Study Cohort

We used a 20 % national random sample of Medicare fee-for-service beneficiaries in 2012. We obtained demographic data from the beneficiary summary file and claims data from the carrier file, which includes Part B claims submitted by physicians. We included beneficiaries who were 65 years or older at the beginning of 2012 and had full Part A and Part B eligibility during the entire year of 2012. We excluded beneficiaries who had missing race or sex data (0.3 % of the population), were enrolled in a Medicare Advantage plan at any point during 2012, or had any claims for which Medicare was a secondary payer. We used the 2012 Medicare Current Beneficiary Survey (MCBS) for the patient-reported analyses and applied the same exclusions. The MCBS is a continuous multipurpose survey with initial response rates of over 80 % in the first round and 95 % in subsequent rounds.²¹ The survey has been used extensively in the health services literature^{22,23} with procedures to minimize the impact of nonresponse bias.²⁴

Methodological Overview

We conducted multiple analyses to address the three objectives of the study. We chose ten specialties that, in our judgment, commonly treat Medicare beneficiaries for conditions that may be directly managed by primary care physicians. We did not include nurse practitioners or physician assistants who may act in a primary care or specialist role. We used hospital referral regions as the regional unit of analysis, a commonly used unit for measuring variation in care patterns.²²

To assess regional variation in the likelihood of seeing a specialist, we calculated a specialist index for each specialty, a measure we defined as the ratio of observed to expected proportion of the population with an outpatient evaluation and management visit to the specialist of interest after adjusting for age, sex, and race.

We then conducted several analyses to further assess whether variation was associated with differences in patterns of care or underlying health status. We purposely avoided the use of claims-based comorbidity algorithms which are sensitive to coding and practice patterns, particularly rates of physician visits.^{25–28} First, we measured the number of visits for high-volume conditions within each specialty and compared relative increases among specialists and primary care physicians to determine whether increased specialist visits corresponded to an increase in primary care visits, as would be expected with an overall increase in the prevalence of disease. We present regional variation in specialist use for comparison with known prevalence of commonly treated diseases or risk factors. Finally, we measured the correlation among specialties and assessed the strength of correlation among specialties commonly managing related conditions.

To accomplish the third aim, we determined the regional association between specialty-specific per capita physician payments for all beneficiaries in each region, using a conservative measure of Part B services directly billed by the specialist. To assess associations between specialist use and beneficiary-reported health status and satisfaction with care, we measured regional responses to these questions using the MCBS.

Outcomes

We identified outpatient office visits as claims from the carrier file with a procedure code between 99201 and 99215. We used the associated specialty code to assign visits to specialists and the line diagnosis code to assign reasons for visits. We tabulated average Medicare payments for any service billed by physicians within each specialty for all beneficiaries in a region. We standardized payments to remove the effects of regional price differences.²⁹ These payments did not include facility payments or other payments not billed directly by physicians (see [Appendix](#) available online for further details).

For patient-reported outcomes, we separately analyzed responses to three questions from the MCBS. Beneficiaries were asked to indicate their satisfaction with the overall quality of care received within the past year and satisfaction with the availability of care by specialists. In both cases, we combined responses of “very satisfied” and “satisfied.” Beneficiaries were also asked to indicate their general health relative to others the same age. For this question, we combined responses of “excellent” and “very good.”

Statistical Analysis

For each specialty, including primary care, we divided 306 hospital referral regions into quartiles of the risk-adjusted likelihood that a beneficiary would have an outpatient visit to that specialist (hereafter termed *specialist index*). We determined this index based on the ratio of the observed to expected proportion of beneficiaries in a region visiting the specialist. The expected proportion for each region was generated as the average likelihood of seeing a specialist for all beneficiaries in the region, as determined by a multivariable logistic model adjusting for beneficiary age, sex, and race (white vs. nonwhite), with the probability of seeing a specialist as the dependent variable.

For each specialty, we present the overall proportion of beneficiaries in each quartile who visited each specialist. We present the number of visits for common diagnoses and the corresponding number of visits to primary care physicians for the same diagnoses. To measure the association between specialties, we calculated the Pearson correlation coefficients for regional-level comparisons between all specialties.

We present the average amount of specialty-specific Medicare payments per beneficiary for the lowest and highest quartiles. MCBS response frequencies by quartile were weighted using cross-sectional survey weights.³⁰

We used SAS Enterprise Guide version 5.1 for all analyses. The study was conducted in accordance with the CMS privacy policy.

RESULTS

Variation in Likelihood of Visiting a Specialist

Figure 1 shows the proportion of beneficiaries with an outpatient visit to each specialist for the lowest and highest quartiles of hospital referral regions, ranked by specialist index. Ratios between the highest and lowest quartiles were greatest for endocrinology (3.7) and gastroenterology (3.9) and lowest for orthopedics (1.5) and urology (1.7). The ratio for primary care was 1.3 (57.7% vs. 76.7%). Appendix Table 1 (available online) lists the logistic regression results for each specialty.

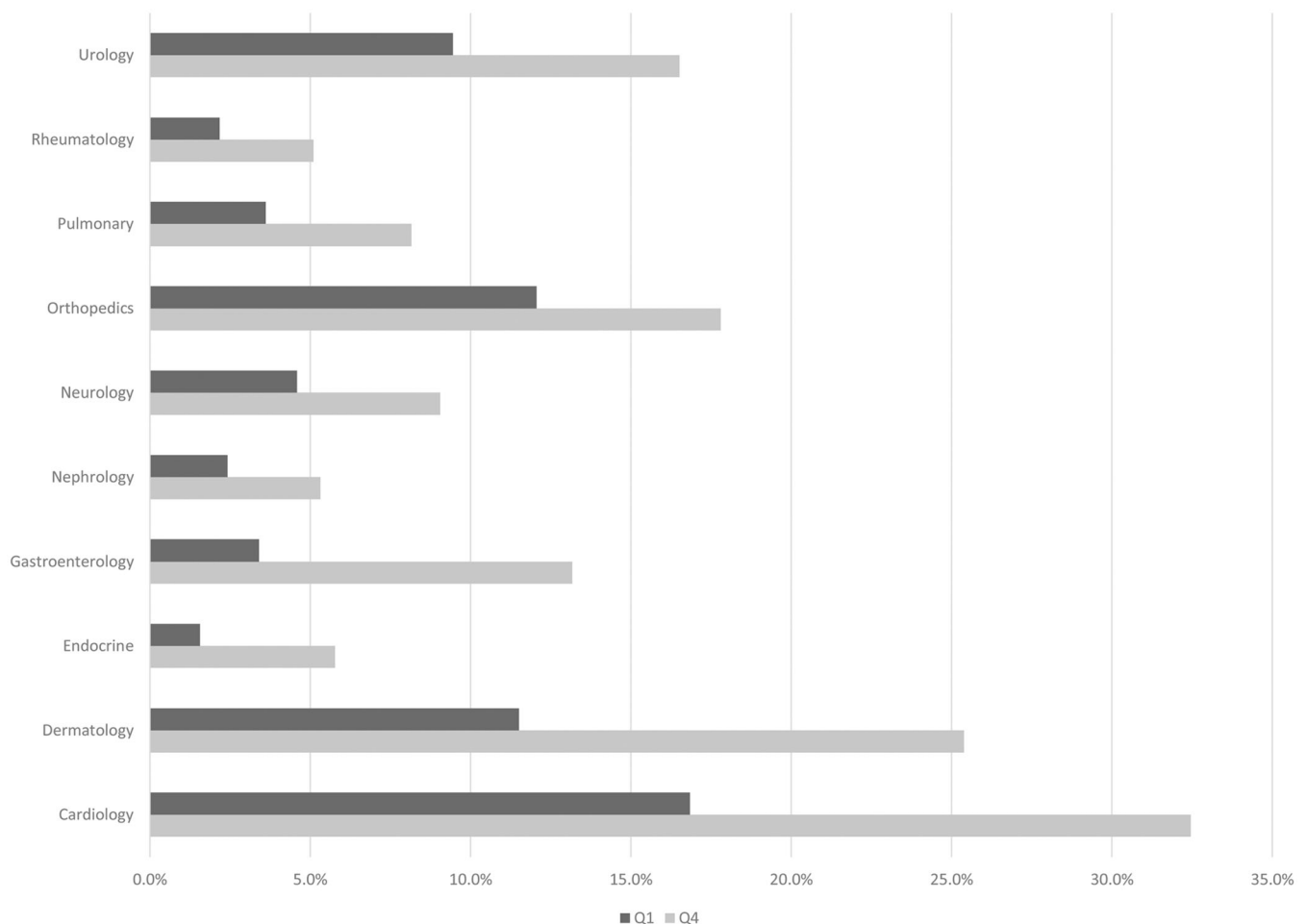


Figure 1 Proportion of beneficiaries with a visit to a specialist, 2012. Figure compares highest and lowest quartiles of hospital referral regions, separately ranked for each specialty. Rankings are based on the age-, sex-, and race-adjusted likelihood of visiting a specialist.

Table 1 Total and Diagnosis-Specific Outpatient Visits per 100 Beneficiaries by Specialty, 2012

Specialty and diagnosis	Specialty care*			Primary care*		
	Quartile 1	Quartile 4	Ratio	Quartile 1	Quartile 4	Ratio
Cardiology	35.5	96.8	2.7	245.5	311.5	1.3
Hypertension	2.8	11.3	4.1	36.4	58.0	1.6
Cardiac dysrhythmias	8.2	20.8	2.5	10.7	10.4	1.0
Ischemic heart disease	9.2	21.4	2.3	4.7	7.0	1.5
Dermatology	19.4	49.9	2.6	255.7	320.7	1.3
Benign skin neoplasms	0.9	4.6	4.9	0.1	0.1	0.8
History of malignancy	2.1	4.6	2.2	0.2	0.1	0.8
Contact and other dermatoses	7.5	17.7	2.4	1.9	1.8	0.9
Endocrine	3.3	14.3	4.4	247.7	312.6	1.3
Hypothyroidism	0.3	1.4	4.3	3.7	5.0	1.3
Diabetes	1.7	7.9	4.6	23.1	26.8	1.2
Gastroenterology	5.2	24.0	4.6	237.5	321.7	1.4
Functional digestive disorders	0.3	1.8	5.4	1.1	1.4	1.3
Digestive/abdominal symptoms	1.6	6.0	3.8	5.8	6.7	1.2
Esophageal disorders	0.6	3.4	5.5	2.0	3.1	1.5
Nephrology	5.4	14.1	2.6	259.1	312.4	1.2
Hypertension	0.4	1.3	3.4	43.5	57.3	1.3
Chronic kidney disease	3.3	8.5	2.6	1.8	2.1	1.2
Neurology	8.8	20.7	2.4	252.0	319.4	1.3
Cerebral degeneration	0.6	1.8	2.9	0.7	0.7	1.0
Parkinson's	1.4	2.2	1.6	0.4	0.5	1.1
Orthopedics	22.8	40.5	1.8	257.6	319.3	1.2
Dorsopathies	1.2	3.3	2.7	6.4	6.9	1.1
Osteoarthroses/other joint	10.2	17.6	1.7	9.2	9.5	1.0
Pulmonary	7.7	21.3	2.8	256.2	324.1	1.3
Asthma/chronic obstructive pulmonary disease	2.3	6.3	2.7	6.1	6.8	1.1
Sleep disorders	0.8	1.8	2.1	0.7	0.5	0.7
Rheumatology	5.9	15.6	2.6	269.7	317.6	1.2
Osteoarthritis	0.7	2.8	4.1	4.1	4.8	1.2
Rheumatoid arthritis	2.5	3.9	1.6	1.1	0.8	0.7
Urology	17.9	36.7	2.1	248.3	324.0	1.3
Urinary symptoms/disorders	4.9	10.3	2.1	6.1	5.9	1.0
Prostate cancer	3.0	5.5	1.8	0.4	0.5	1.2
Benign prostatic hyperplasia	3.1	7.6	2.5	0.8	1.0	1.2

COPD chronic obstructive pulmonary disease

* *Quartiles of hospital referral regions were ranked separately for each specialty after adjusting for age, sex, and race*

Beneficiary age and sex were similarly distributed across quartiles for all specialties (Appendix Table 2, available online). Except for nephrology, regions with a higher specialist index had a greater proportion of nonwhite beneficiaries. For seven specialties, the highest-quartile region had a greater percentage of beneficiaries eligible for Medicaid.

Contribution of Health Status

Table 1 shows the number of visits per 100 beneficiaries for high-volume conditions in the highest and lowest specialist index quartiles to both the respective specialty and primary care physicians. In most cases, increased visits to specialists for specific conditions identified by the primary diagnosis

Table 2 Pearson Correlation Coefficients for the Specialist Index Across Specialties

Specialty	Primary care	Cardiology	Dermatology	Endocrinology	Gastroenterology
Cardiology	0.41				
Dermatology	0.45	0.45			
Endocrinology	0.35	0.49	0.57		
Gastroenterology	0.48	0.71	0.67	0.64	
Nephrology	0.33	0.32	0.20	0.26	0.34
Neurology	0.43	0.56	0.62	0.53	0.74
Orthopedics	0.47	0.42	0.65	0.46	0.56
Pulmonary	0.41	0.60	0.47	0.45	0.59
Urology	0.50	0.65	0.50	0.51	0.66
Rheumatology	0.39	0.39	0.44	0.52	0.48
	Nephrology	Neurology	Orthopedics	Pulmonary	Urology
Cardiology					
Dermatology					
Endocrinology					
Gastroenterology					
Nephrology					
Neurology	0.29				
Orthopedics	0.14	0.49			
Pulmonary	0.34	0.56	0.40		
Urology	0.34	0.56	0.60	0.56	
Rheumatology	0.19	0.45	0.35	0.43	0.43

code were associated with a much smaller increase in primary care visits for the same condition, which was generally comparable to the overall increase in primary care visits, suggesting no specific increase in condition-specific prevalence of disease. Conditions demonstrating the greatest relative increase for specialists are commonly managed by primary care, which may be most susceptible to differences in practice norms for shared care. For example, hypertension, diabetes, digestive/abdominal symptoms, esophageal disorders, and osteoarthritis all increased greater than threefold for their respective specialties, yet were most commonly listed as primary diagnoses for primary care visits. Benign neoplasms were an exception in that they increased significantly and are more commonly managed by dermatology.

Appendix Table 2 (available online) presents full data of the regional distribution for all ten specialties and primary care. Notable regional patterns included high specialist indices for all specialties in the Mid-Atlantic and South Atlantic regions and low indices for the East North Central, West North Central, and Mountain regions.

The specialist index was moderately correlated across regions among specialties, with a median Pearson correlation coefficient of 0.47 (interquartile range, 0.39–0.56; Table 2). Specialties that predominantly manage conditions with shared underlying risk factors, such as cardiology, endocrinology, and nephrology, were no more strongly associated than other specialty pairs. Gastroenterology and urology had strong associations with other specialties.

Payments and Patient-Reported Outcomes

Figure 2 shows the average per capita specialty-specific Medicare payments by quartile of specialist index (Appendix Table 3 available online for full data). Payments were 1.5- to 5.0-fold higher across the ten specialties. Absolute differences in payments between the highest and lowest quartiles were greatest for cardiology (\$162) and dermatology (\$78).

Figure 3 shows patient-reported measures of satisfaction with care and health status.

Satisfaction with overall care (median [interquartile range] across specialties: Q1, 93.3 % [92.6–93.7 %]; Q4, 93.1 % [92.9–93.2 %]) and self-reported health status (Q1, 37.1 %

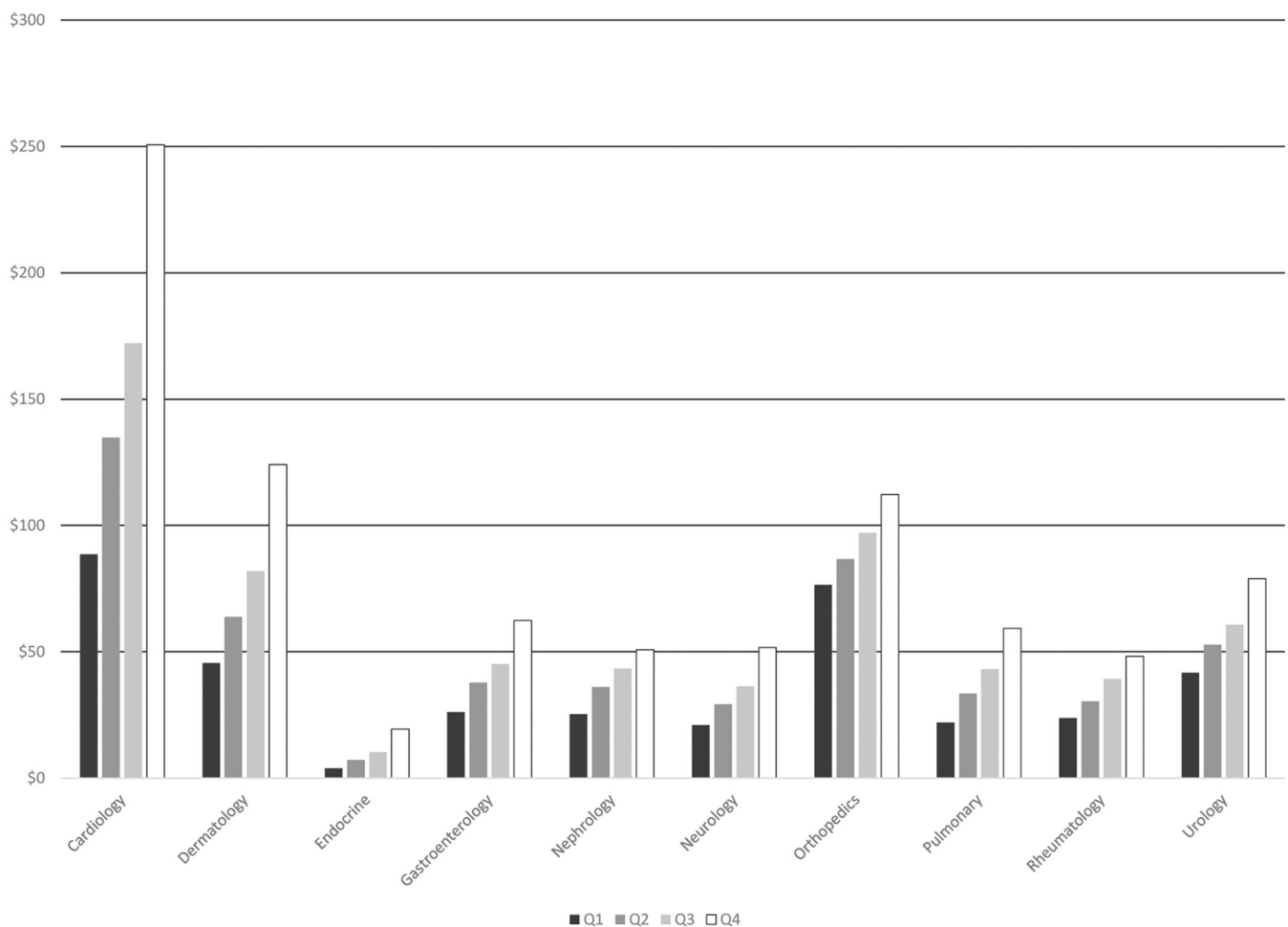


Figure 2 Payments per capita billed by specialty physicians by quartile specialist index, 2012. Each bar represents average annual Medicare payments per beneficiary to physicians in the indicated specialty. Figure compares highest and lowest quartiles of hospital referral regions, ranked separately for each specialty, based on the likelihood of visiting a specialist.

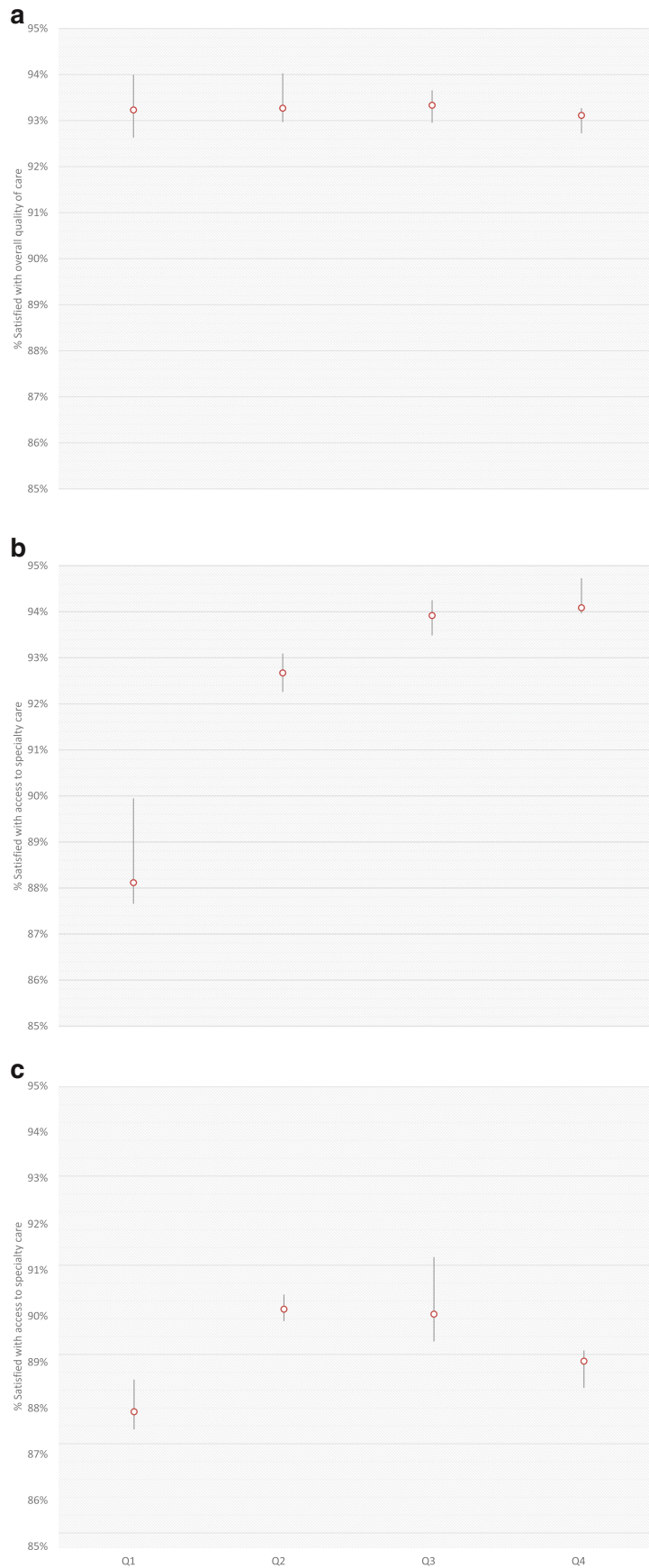


Figure 3 Association between specialist use and patient-reported outcomes, 2012. For each quartile of regional specialist index, the median (circle) and interquartile range (line) is displayed for the ten specialties.

[36.9–37.7 %]; Q4, 38.2 % [37.2–38.4 %]) was similar across quartiles. Satisfaction with access to specialty care was consistently lower in the lowest quartile of specialty index (Q1, 89.7 % [89.2–91.1 %]; Q4, 94.5 % [94.4–94.8 %]). A similar relationship existed for primary care (Appendix Table 3, available online).

DISCUSSION

Our findings demonstrate high regional variability in the likelihood of seeing a specialist for common illnesses that are typically managed by primary care physicians and specialists. Multiple analyses suggest that this variation was not due to differences in beneficiary health status. An increased use of specialists was associated with a considerable increase in cost, without a corresponding increase in beneficiary overall satisfaction with care or perceived health status. The lowest quartile of specialist use was consistently associated with modestly lower satisfaction with access to specialists, though overall satisfaction was high and similar across the three highest quartiles. Our results suggest that substantial opportunity exists to improve the efficiency of the health care system by reducing the variation in outpatient management of common illnesses.

Regional variation has been documented in the global delivery of most aspects of care,³¹ although the extent to which differences in underlying health status contribute to the variation is controversial.³² We focused on a specific aspect of care susceptible to variation based on physician or patient preference due to a multitude of factors, including payment incentives and a lack of evidence or guidelines for best practices. Our study provides evidence through several analyses that variation in population health status does not explain these differences. Regions with higher specialty indices did not have comparable increases in primary care visits for the same conditions, and were not strongly correlated among specialties with similar underlying risk factors. Regions with high specialist indices differed from regions with high reported prevalence of diseases and risk factors such as obesity, diabetes, and arthritis, as measured by the Centers for Disease Control and Prevention, which are generally greatest in the East and West South Central regions.^{33–35} Furthermore, the differences were large and were poorly explained by age, sex, and race, which are among the strongest risk factors for most diseases.

Previous research has demonstrated that patient preferences for specialty care are similar across regions, and that variation is largely explained by physician supply and practice norms, although practice norms were limited to timing of visits for hypertension.³⁶ A strength of our study is that we disaggregated specialties that were moderately correlated with one another, providing a more granular characterization of variations in delivery patterns and allowing for comparison to known disease-specific prevalence. As has been demonstrated with inpatient episodes, opportunities to promote efficiency are likely specialty- and condition-specific.³⁷

The magnitude of variation in payments was substantial. Although many specialty professional organizations have identified potentially low-value services through the Choosing Wisely campaign, a recent study found that the difference between the 95th- and 5th-percentile regions in payments per beneficiary for these services was only \$38.³⁸ The per-beneficiary payments billed by cardiologists in the highest quartile of regional use was \$162 greater than that in the lowest quartile, and most specialties had comparable or greater variation in payments than the set of Choosing Wisely services. Because we measured only payments billed by physicians, this variation is likely conservative, in that services ordered but not billed by physicians, including facility payments, would likely similarly increase.

Innovative approaches to improving the interface between primary and specialty care, such as teleconferencing and e-consults, have demonstrated promise but have typically relied on grants for funding.^{39–41} Few new payment mechanisms provide incentives for more efficient use of evaluation and management services delivered by primary care physicians and specialists. Several initiatives support primary care physicians for non-reimbursable services, including patient-centered medical home initiatives and the recently implemented chronic care management fees, but they offer little incentive for reducing unnecessary primary care visits and offer no incentive for specialists to reduce visits or provide non-reimbursable care. The use of other potentially cost-effective delivery models, including telehealth and nurse or pharmacist chronic care management, is typically not reimbursed under existing payment system.

ACOs may offer the greatest potential for encouraging coordinated and efficient care, because their participating providers can include both primary care physicians and specialists. Despite suggestions that management of specialist referrals may be an important path to savings,^{18,42} engagement with specialists has been limited.⁴³ Significant barriers exist in that the majority of specialty care is provided by physicians that are not part of the ACO.⁴⁴ For specialists participating in ACOs, revenue generated through the ACO typically accounts for a small percentage of total revenue,⁴⁵ potentially limiting their desire to develop innovative models of care financed through possible shared savings.

Several steps could be taken to improve the efficiency of care. As an immediate action, ACOs can examine their own visit patterns using these data as benchmarks to identify opportunities for more efficient care. In addition, primary care and specialty professional societies could further develop standards for appropriate condition-specific provision of care. Developing standards for the appropriate quantity of primary and specialty care may have a greater impact than identifying specific services, as was done through the Choosing Wisely campaign. Finally, CMS and other payers could begin testing novel payment models that reflect the roles of managing providers yet allow innovative approaches, while taking care to ensure preserved or improved disease-specific outcomes.

Recent legislation requires CMS to test physician-directed payment models that support better care and greater efficiency.⁴ Our data highlight the importance of considering opportunities to test models that support efficient use of physician evaluation and management services.

There are several limitations to this study. First, it is possible that some variation may be explained by residual differences in the prevalence of disease after adjusting for risk. Second, it is likely that in many cases, multiple diagnoses are addressed during office visits, particularly in primary care, thus underestimating the number of condition-specific visits delivered. Third, as this is an observational study, we cannot establish a causal relationship between specialty use and outcomes, particularly for patient-reported outcomes that were not specialty-specific. Fourth, we focused on ten specialties with high volume in the Medicare population, among which we expected that shared care and cognitive consultation was commonly provided, recognizing that other specialists perform these roles and these specialties occasionally function in other roles. Fifth, we did not assess whether variation in use was associated with other outcomes, such as hospitalizations. Sixth, it is possible that some comparable services are performed by providers not included in the study, such as nurse practitioners and physician assistants, which could explain a portion of the regional variability. Seventh, our study is limited to the Medicare fee-for-service population. Finally, because of the broad range of conditions and specialties included, our summary assessment of analyses to address variance in underlying health status relied on clinical judgment, as has been done in other papers.⁴⁶ We have provided full data in the appendix (available online) so that readers may consider other interpretations.

In conclusion, wide variation is found in patterns of care for common chronic conditions in which a specialist provides shared care or cognitive consultation, suggesting an opportunity for novel payment models and other efforts to improve value through emphasizing the interaction between specialists and primary care physicians.

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Compliance with Ethical Standards:

Disclaimer: Dr. Clough was employed by the Centers for Medicare & Medicaid Services during the time in which the study was conducted. The views expressed in this manuscript are those of the authors, and do not necessarily represent the policy or views of the Centers for Medicare & Medicaid Services.

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

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