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Influence of Peer Physicians on Intensity of End-of-Life Care for Cancer Decedents

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Abstract

Background: The intensity of end-of-life care varies substantially both within and between areas. Differing practice patterns of individual physicians are likely influenced by their peers.

Objective: To assess whether intensity of end-of-life care previously provided by a physician's peers influences patterns of care at the end of life for that physician's patients.

Research Design: Observational study

Subjects: 185,947 fee-for-service Medicare enrollees with cancer who died during 2006–2010 who were treated by 26,383 physicians.

Measures: Spending in the last month of life, >1 ER visits, >1 hospitalization, ICU admission in the last month of life, chemotherapy within 2 weeks of death, no/late hospice, terminal hospitalization.

Results: Mean (standard deviation) spending in the last month of life was \$16,237 (\$17,124). For each additional \$1000 of spending for a peer physician's patients in the prior year, spending for the ego physician's patients was \$83 higher ($P<.001$). Among physicians with peers both in and out of their practice, more of the peer effect was explained by physicians outside of the practice (\$72 increase for each \$1000 increase by peer physicians' patients, $P<.001$) than peer physicians in the practice (\$27 for each \$1000 increase by within-practice peer physicians' patients, $P=.01$). Results were similar across the other measures of end-of-life care intensity.

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Conclusions: Physician's peers exert influence on the intensity of care delivered to that physician's patients at the end of life. Physician education efforts led by influential providers and provider organizations may have potential to improve the delivery of high-value end-of-life care.

Keywords

end-of-life care; physician networks; Medicare

Substantial geographic variation exists in the intensity of care delivered to individuals at the end of life that is not associated with improved outcomes.¹⁻³ Such variation has been documented for individuals with numerous chronic illnesses, including cancer.⁴ Prior work has found that physicians' beliefs and practice styles are associated with area-level differences in care intensity.⁵⁻⁷ A recent study documented that physicians' beliefs and practice styles and area-level availability of services but not patients' beliefs were key factors explaining geographic variations in expenditures at the end of life for individuals diagnosed with advanced-stage lung or colorectal cancer.⁸

Social influence is likely a key mechanism driving the adoption of new ideas and behaviors.⁹ In medicine, the social context within which physicians practice is likely to influence the practice patterns of individual physicians. Specifically, physicians are embedded within practices, which, in turn, are embedded within larger health systems and communities. These physicians actively share clinical information via both formal and informal interactions that occur as they care for patients, and these interactions are likely to be an important conduit for the diffusion of practice styles and new advances in care. Previously, using the methods of social networks analysis, we found that shared patients identified through Medicare administrative data can be used to identify information sharing connections among physicians, and these methods can identify professional networks within specific geographic areas.¹⁰⁻¹² In recent work, we demonstrated that the structure of an individual physician's professional network is associated with care delivered by physicians in that network.¹³ For example, physicians whose patients are more dispersed in the network generally have higher spending on care. Work by others suggests that a physician's propensity to adopt novel imaging technologies in caring for cancer patients is influenced by early adoption of these technologies by other physicians with whom they are connected.¹⁴

In this paper, we sought to use network methods to understand variation in end of life care delivered to patients. Specifically, we examined whether the intensity of end-of-life care previously provided by a physician's peers was likely to influence the subsequent care provided by that physician. We studied the care of individuals with cancer who died and identified the principal physician responsible for their care at the end of life; we also identified other peer physicians with whom that physician was connected through shared patients. We then examined whether the intensity of end of life care previously provided by a physician's peers influenced the patterns of care at the end of life for that physician's patients. Because evidence suggests variation in intensity of end-of-life care varies both across and within practices,¹⁵ we also examined if network effects differed for peer physicians practicing within or outside of a physician's practice.

Methods

Data and subjects

We used Medicare data for 2005–2010 from the inpatient, outpatient, and carrier files for all individuals 65 living in 51 hospital referral regions in the U.S., the maximum that CMS would allow. These regions were randomly sampled with probability proportional to their size; in addition, we also included the Boston hospital referral region because of our familiarity with it. We restricted the cohort to all patients who died during 2006–2010 who were continuously enrolled in parts A and B of fee-for-service Medicare as of three months before death. Among the decedents, we identified individuals with cancer based on at least two face-to-face outpatient physician visits (evaluation and management codes 99201–99215, 99241–99245) with an International Classification of Disease, 9th edition (ICD-9) diagnosis code for cancer (140–209 except 173) or one inpatient admission with a primary ICD-9 diagnosis of cancer in the last six months of life.

Assignment of patients to physicians

Similar to prior work,^{15,16} we assigned each patient to a principal physician based on face-to-face office visits during the last six months of life. We used the specialty code on the claims to categorize specialty of the physicians and assigned patients to physicians based on the likelihood that physician specialty was caring for the patient's cancer, with preferential assignment to an oncologist, followed by surgical specialists involved in cancer treatment (e.g., urologists for prostate cancer), followed by primary care physicians, and finally other medical specialists who also provide primary care. If patients saw more than one physician within a specialty, we selected the one with the most visits or (if a tie) with the greatest total charges. In total, 91% of the decedents were assigned to a principal physician (see Supplemental Digital Content 1: Assignment of Physicians).

Identification of peer physicians

We used Medicare encounter data for all patients enrolled in fee-for-service Medicare in the 51 hospital referral regions to define networks of physicians based on shared patients.^{11,17} We excluded claims for non-direct patient care specialties or specialties where individual physicians are not selected (e.g., anesthesia) and for laboratory and other services not requiring a physician visit. We identified all evaluation and management services for inpatient and outpatient care and for procedures with a relative value unit (RVU) value 2.0 (to capture surgical procedures that may be reimbursed via bundled fees). We constructed physician networks among physicians who saw <30 Medicare patients with any diagnoses during a year for each year by identifying pairs of physicians who shared patients with each other within an episode of care (measured using Optum's Episode Treatment Group software).^{13,18–20} Focusing on visits within an episode of care²¹ allows us to avoid identifying relationships that were unlikely to reflect true information sharing, for example, between an orthopedist and an ophthalmologist treating a patient with cataracts and knee pain.

To identify other physicians who might have the largest impact on care practices for cancer patients at the end of life, we next limited this larger set of connected physicians to

physicians with patients in our cancer decedent cohort. Physicians with patients in our decedent cohort had connections with a median (interquartile range) of 7 (4–16) other physicians with patients in the decedent cohort.

Measures of intensity of end-of-life care

We studied 7 claims-based measures of intensity of care at the end of life.^{22–25} For each patient, we characterized (1) Medicare spending in the last 30 days of life, (2) more than one emergency room visits in the last 30 days of life, (3) ICU stay in the last 30 days of life, (4) more than one hospital stay in the last 30 days of life, (5) chemotherapy use in the last 14 days of life, (6) death in the hospital, and (7) no hospice or hospice enrollment within 3 days of death. These measures were initially developed based on literature reviews and focus groups with patients, families, and clinicians,²² and several measures (frequent ER visits, hospitalizations, ICU stays, chemotherapy near death, and none/late hospice referrals) have been endorsed by the National Quality Forum and the Quality Oncology Practice Initiative.^{26,27} For Medicare spending, we summed Medicare expenditures (including patient cost sharing) for the 30-day period before death from claims irrespective of whether they were directly related to the cancer diagnosis. We included expenditures for inpatient, post-acute skilled nursing facility, outpatient, home health and hospice care, physician/supplier fees; and durable medical equipment.⁸ All measures were attributed to the patient's principal physician.

Control variables

For each patient, we characterized age at death, race/ethnicity, cancer type (lung, colorectal, other gastrointestinal, breast, hematologic, other), and year of death (to account for differences in spending and care intensity over time). We used hierarchical condition category (HCC) scores from the year before death for case mix adjustment.²⁸ Variables are categorized as in Table 1.

Analyses

Analyses used a two-step approach. First, we used patient-level models to estimate adjusted physician rates of each EOL measure. Next, for each outcome, we used physician-level models to regress the ego physician's outcome in year t based on care for the peers' patients' in year $t-1$.

Step 1: Measures of Peers' EOL Care Patterns—We used patient-level models to construct measures of EOL care among a physician's peers in the prior period for each of the 7 measures studied. Because physicians may see patients of varying levels of complexity, we accounted for patient case-mix in these measures. We regressed the end-of-life outcome from each patient on the patient's characteristics and included a physician-year fixed-effect for the patient's attributed physician in the year they died. The estimated fixed-effects for each physician-year represent the physicians' expected value of the outcome (e.g., spending in the last month of life) under the assumption that a standardized set of patients was seen by all physicians in each year. For some outcomes it was necessary to approximate the estimation of the fixed-effect model with a procedure that estimated the model in steps. Because the sole purpose of this analysis was to obtain physician-by-year case-mix adjusted

values of the outcome variable and not to obtain optimally precise or within-range predictions, we used linear models for all outcomes. Additional details are in Supplemental Digital Content 2: Statistical Models.

To construct our measure of peer practice patterns for each particular outcome that we assess in year t , we calculated the average of each physician's peer physicians' same outcome variable in the previous year $t-1$ weighted proportional to the number of patients they treated in year $t-1$. The resulting weighted averages represent the prior year "exposure" of each ego physician to peer influence. Separate variables were computed over all peers of the ego physician, as well as after restricting to only those working in the same practice (defined by its tax identification number or TIN), and only those working in a different practice. Additional indicator variables were specified to indicate whether an ego physician only had external peer physicians (e.g., was the only physician in their practice) or whether all of their peers were in their own practice for each year in the data set.

Step 2: Physician-level peer-effect models—For the physician-level models, we restricted the cohort to decedents cared for by ego physicians in 2007–2010 who had at least 1 peer physician in the prior year. The core statistical model regressed the ego physician's outcome (mean spending in the last month of life across patients or proportion of patients for each binary indicator) in year t on one or more of the peer variables as defined above (all peers, same TIN, different TIN) evaluated in year $t-1$. The unit of analysis was the physician year. Because there was variation in the number of patients seen by the ego physician, we weighted the regression by the number of patients of the ego physician in year t . The physician-year observations with higher weights also tended to be those with the most peer physicians. Such weighting also had the desirable effect of minimizing the impact of measurement error due to the uncertainty in the estimates of the patient case-mix adjusted ego physician and weighted average peer physician variables. Random effects for hospital referral region, TIN (practices), and physician were included to account for statistical dependence arising from the clustering of TINs in HRRs, the cross-classification of physicians and TINs, and observations within physicians across years. The physician effects were largely nested within TINs but cross-classification arose whenever a physician moved practice or practiced in more than one setting, which was rare. Because observations made on the same physician in consecutive years were naturally expected to be more highly correlated than those further apart in time, we first estimated models in which the vector of repeated observations on each physician followed an unstructured covariance matrix. However, because the estimated variances were similar across years, there was no obvious pattern in the correlations, and the correlations were small in magnitude, we simplified the model by including a random effect for physician that allowed for an exchangeable correlation structure. The simplified model yielded virtually identical results. The only predictors other than the peer effects (which as described above already account for case mix) were physician age, gender, and specialty; their inclusions served to distinguish physician homophily effects manifesting through these variables, if any, from physician peer effects.

We log transformed the spending variable at the physician level; the other variables were binary, such that the physician-level outcomes were essentially proportions. Because

outcomes were generally located far from 0 or 1, it sufficed to use linear regression models with no transformation of the outcome. The regression coefficient of the peer variable is interpreted as the expected change in the ego physician's outcome resulting from a change in the value of the peer variable. Peer EOL spending was scaled to reflect differences in spending for ego physicians' patients for each \$1000 increase in peer spending. Peer variables on a 0–1 scale (e.g., proportions) were scaled to reflect ego physicians' differences associated with a 10 percentage-point increase in the peer variable.

Results

We identified 185,947 patients with cancer who died during 2006–2010 in the 51 hospital referral regions that we studied who were assigned to 26,383 physicians. Characteristics of the patients and physicians are included in Table 1. Briefly, patients died at a mean age of 77.9 years (SD 7.6 years), 52.1% were male, and approximately one quarter had lung cancer. The doctors in the network had a mean age of 49.2 years (SD=10.6), of whom 77.3% were male, and 10.7% were oncologists. Although relatively few physicians were oncologists, most patients (87%) were attributed to oncologists. The 19,984 ego physicians in 2007–2010 who had at least 1 peer physician in the prior year cared for 138,446 patients; patient and physician characteristics were similar to the full cohort. Physicians cared for patients in 4,669 to 5,322 practices depending on the year; approximately 22% of practices had more than one physician in our cohort in a given year. The oncologists cared for patients in 525 to 538 practices depending on the year; about 44% of which had more than one physician in our cohort in a year.

Table 2 shows the unadjusted measures of intensity of care in the last month of life. Among physicians with patients in 2007–2010 and peer(s) in the prior year, the mean (standard deviation) per-patient spending for their patients in the last 30 days of life was \$16,237 (\$17,124). Overall, about one fifth of patients had more than one emergency visit, about one quarter had an intensive care unit admission, and about 14% had more than one hospitalization in the last month of life. The proportion who had infused chemotherapy in the last 14 days of life was 5.7%; about one quarter died in the hospital, and about one half either did not enroll in hospice or enrolled within 3 days of death.

Table 3 shows the association of measures of end-of-life care intensity for peer physicians' patients in the prior year with measures for the ego physician's patients in the current year. Overall, for each additional \$1000 of spending for a peer physician's patients in the prior year, spending for the ego physician's patients was \$83 higher. When we conducted stratified analyses to assess the extent to which this effect was driven by peer physicians inside of the practice (with whom they likely share face-to-face interactions as well as clinical staff and billing resources) versus outside of the practice, we found that among physicians with peers both in and out of the practice, more of the peer effect was explained by peer physicians outside of the practice (\$72 increase for each \$1000 increase by peer physicians' patients) than peer physicians in the practice (\$27 for each \$1000 increase by within-practice peer physicians' patients). The increase was largest for ego physicians who only had connected peer physicians outside of the practice (\$101 for each \$1000 increase by

peer physicians outside of the practice). Results were generally consistent across the other measures. Results were robust to sensitivity analyses (Supplemental Digital Content 3–5).

Discussion

We found that the intensity of care at the end of life delivered to a physician's cancer patients is associated with the intensity of end-of-life care delivered by that physician's peers in the prior year. This association was not just a practice effect, but was evident, and seemingly stronger, for peer physicians who were outside of a physician's practice than inside of the practice. Moreover, the association persisted even after adjustment for the physician's own care patterns in the prior year. Although the size of the effect that we observed was modest, this finding underscores the power of physician peers to shape care delivery.

Other work has highlighted the influence of physicians' beliefs in explaining area-level variations in health-care spending.^{5,7} A recent study assessing factors contributing to geographic variations in care at the end of life for cancer patients found that area-level availability of services and physicians' beliefs and practice styles, but not patient sociodemographic or clinical factors or patients' beliefs, were key factors in explaining these variations.⁸ Although physicians are increasingly identified as a driver of unwarranted variations in care, there has been relatively little evidence about the influence of physicians on each other.

Network analyses that rely on administrative data to identify connections between physicians have provided an opportunity to assess the role of physicians' peers in influencing care. A recent study assessed the influence of peer physicians in adoption of advanced imaging tests for women with newly-diagnosed breast cancer. The authors identified early adoption of advanced imaging in the perioperative setting in a baseline period, and found that among surgeons who were not early adopters, those whose peer groups ordered more of these imaging tests in the baseline period were more likely to use these tests in a follow up period.¹⁴ Our findings demonstrate that such influence is not limited to the adoption of novel imaging procedures, but also for the intensity of a variety of existing care delivered at the end of life, including use of emergency care, hospitalization, intensive care, and hospice.

As noted, we observed peer influence from both peers within a practice and those outside of a practice. Although one might expect that peers in a practice could exert more influence, it is possible that physicians may not share patients as closely with other physicians in their practice, and may in fact be influenced by physicians outside of their practice, especially peers considered opinion leaders. Future research is needed to understand if factors such as distance, specialty of peer physician, or type of practice contributed to the influence of peers outside of an ego physician's practice.

Changing physician behavior is challenging. Despite this, current attempts to control health care spending growth and improve the value of health care delivered to patients have focused on physicians and provider organizations. For example, the American Board of Internal

Medicine's Choosing Wisely campaign relies on influential physician-led organizations to identify low value care and publicize such low-value care among members and other providers. In addition, accountable care organizations and other alternative payment models that are increasingly being offered by payers put decisions about care delivery in the hands of providers, who must then determine how to provide high quality care at lower costs. These initiatives also rely on social interactions among physicians to influence physicians' practice patterns. Determining the best strategies for leveraging such influence will be important to improving the delivery of high-value care.

Our study has several limitations. We studied care for older individuals enrolled in fee-for-service Medicare who were cared for in 2006–2010, and thus our findings may not generalize to younger patients and those who died more recently. Use of Medicare data also provides an incomplete understanding of the entirety of a physician's network, especially if physicians have differing referral patterns for privately-insured or Medicaid patients. In addition, we studied patients with cancer who died, but cannot be certain that these patients died of their cancers. For some patients, high-intensity care would likely be very appropriate. To address differences in case mix across physicians, we adjusted for patient sociodemographic and clinical characteristics, including cancer type and comorbidity as measured by hierarchical condition categories, and we adjusted for physician specialty, since many of our physicians were not oncologists (although most patients were assigned to oncologists). Due to the complexity of the statistical analysis, we used some judicious approximations to obtain estimates that closely approximate the exact values that could only be obtained by developing statistical estimation methods not available in standard software. However, because we weighted the regression models in step 2 of our estimation procedure by the number of patients a physician treated in that year and these same physicians are likely to have more peer physicians, the approximations should be accurate. Finally, we relied on administrative data to identify influential peers rather than physician report of other physicians who they view as opinion leaders or influential colleagues. However, prior work has demonstrated the validity of patient sharing in administrative data to predict relationships between physicians.¹⁰

In conclusion, our findings suggest that a physician's peers exert powerful influence on the intensity of care delivered to that physician's Medicare patients with cancer at the end of life. Such influence suggests that physician education efforts led by influential providers and provider organizations may have potential to improve the delivery of high-value care.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Physician demographics for 26,383 physicians caring for 185,947 patients with cancer who died during 2006–2010

Patient and physician characteristics	All Doctors and Patients	Patients Treated in 2007–2010 by Ego Doctors with at least 1 Peer in Prior Year*
<i>Patient characteristics</i>		
N patients	185,947	138,446
Patient age, mean (SD)	77.9 (7.6)	77.9 (7.6)
Patient sex (N, %)		
Male	96,875 (52.1)	72,479 (52.4)
Female	89,072 (47.9)	65,967 (47.6)
Race/ethnicity (N, %)		
White	161,661 (86.9)	120,756 (87.2)
Black	16,115 (8.7)	11,777 (8.5)
Other	8,171 (4.4)	5,913 (4.3)
Cancer type (N, %)		
Lung	46,829 (25.1)	35,159 (25.4)
Colorectal	16,851 (9.1)	12,436 (9.0)
Other gastrointestinal	16,743 (9.0)	12,519 (9.0)
Breast	11,132 (6.0)	8,592 (6.2)
Hematologic	5,589 (3.0)	3,977 (2.9)
Other	88,803 (47.8)	65,763 (47.5)
Hierarchical Condition Category Score (N,%)		
0–3	44,959 (24.2)	31,748 (22.9)
3–4	39,914 (21.5)	29,404 (21.2)
4–5	36,682 (19.7)	27,851 (20.1)
5–6	27,059 (14.6)	20,833 (15.0)
6+	37,333 (20.1)	28,610 (20.7)
Year of death (N, %)		
2006	39,505 (21.3)	
2007	37,795 (20.3)	35,900 (25.9)
2008	37,443 (20.1)	35,032 (25.3)
2009	35,710 (19.2)	33,775 (24.4)
2010	35,494 (19.1)	33,739 (24.4)
<i>Physician characteristics[†]</i>		
N physicians	26,383	19,984
Mean # patients per doctor	7.0	6.9
Median # patients per doctor (interquartile range)	2 (1–4)	2 (1–4)
Range of # patients per doctor	1 to 422	1 to 321
Physician age, mean (SD)	49.2 (10.9)	49.2 (10.6)
Physician sex (N, %)		
Male	20,379 (77.2)	15,755 (78.8)

Patient and physician characteristics	All Doctors and Patients	Patients Treated in 2007–2010 by Ego Doctors with at least 1 Peer in Prior Year [*]
Female	5,601 (21.2)	3,918 (19.6)
Missing	406 (1.5)	311 (1.6)
Physician specialty (N, %)		
Oncologist	2,659 (10.1)	2,146 (10.7)
Primary care physician	16,955 (64.3)	12,756 (63.8)
Other	6,772 (25.6)	5,082 (25.4)

^{*} Patients are counted only once.

[†] Oncologists only comprised 10–11% of physicians but were the principal physician for >60% of patients. The median (interquartile [IQ] range) physicians per patient varied substantially by specialty. For example, among the 19,984 physicians treated in 2007–2010 with at least 1 peer physician in the prior year, oncologists had a median of 27 Medicare cancer patients who died (IQ range 1–64), primary care physicians a median of 2 (IQ range 1–3), and other specialists a median of 1 (IQ range 1–2).

Table 2.**Unadjusted Physician-Level End-of-Life Measures**

Measure	All Patients of All Physicians 185,947 patients of 26,383 physicians	Patients Treated in 2007–2010 by Ego Doctors with at least 1 Peer in Prior Year* 138,446 patients of 19,984 physicians
Spending in the last 30 days of life, mean (SD)	\$16,027 (\$17,001)	\$16,237 (\$17,124)
More than 1 emergency department visit in the last 30 days of life, %	19.6%	19.8%
ICU admission in the last 30 days of life, %	28.3%	28.8%
More than 1 hospital admission in the last 30 days of life, %	14.2%	14.1%
Chemotherapy in the last 14 days of life, %	5.6%	5.7%
Terminal hospitalization, %	27.3%	26.9%
No hospice or hospice within 3 days of death, %	53.3%	52.6%

* Patients are counted only once.

Table 3:

Association of measures of end-of-life care intensity and 95% confidence intervals for peer physicians' patients in the prior year with measures for the ego physician's patients in the current year, N=36,723 ego physician years

	Overall effect of peer physicians on end-of-life measures N= all 36,723 ego physician years	Analyses stratified by whether ego physician has connected peer physicians in and/or out of the practice				
		Ego has peer physicians in and out of practice (15,207 ego physician years)			Ego has peer physicians outside of practice only (N=21,091 ego physician years)	Ego has peer physicians only in practice (N=1,048 ego physician years)
	Overall effect	Overall effect	Effect of peers outside of practice	Effect of peers in practice	Effect of peers outside of practice	Effect of peers in practice
For each \$1000 increase in spending for peers' patients in prior year...						
Increase in spending in last 30 days of life	\$83 (\$50, \$115)[‡]	\$106 (\$44, \$168)[‡]	\$72 (\$35, 110)[‡]	\$27 (\$6, \$48)[*]	\$101 (\$50, \$142)[‡]	\$28 (-\$95, \$152)
For each 10 percentage point increase in outcome of peer physicians in prior year, percentage point increase in...						
>1 ER visit in last 30 days of life	.84 (.50, 1.17)[‡]	1.35 (.72, 1.98)[‡]	.54 (.16, .91)[‡]	.34 (.13, .55)[‡]	.78 (.36, 1.20)[‡]	.80 (-.32, 1.92)
ICU stay in last 30 days of life	1.11 (.78, 1.43)[‡]	1.21 (.58, 1.83)[‡]	.60 (.22, .98)[‡]	.36 (.15, .57)[‡]	1.32 (.93, 1.71)[‡]	.60 (-.58, 1.78)
>1 hospital stay in last 30 days of life	.49 (.14, .83)[‡]	.65 (.01, 1.28)[*]	-.05 (-.41, .32)	.40 (.19, .61)[‡]	.63 (.19, 1.06)[‡]	.01 (-1.27, 1.29)
Chemotherapy in last 14 days of life	-.04 (-.29, .22)	-.19 (-.70, .31)	.19 (-.19, .56)	-.03 (-.24, .18)	.16 (-.12, .44)	.62 (-.49, 1.74)
Death in hospital	.45 (.12, .78)[‡]	1.23 (.60, 1.86)[‡]	.71 (.34, 1.09)[‡]	.10 (-.10, .30)	.40 (-.01, .81)	.05 (-1.14, 1.25)
No or late hospice	.93 (.62, 1.24)[‡]	2.11 (1.53, 2.69)[‡]	1.04 (.68, 1.40)[‡]	.27 (.05, .48)[*]	.85 (.47, 1.23)[‡]	.80 (-.24, 1.83)

Model includes all doctors with outcome observations weighted by each doctor's number of patients and regression adjustment for year of death, age, sex, physician specialty, and number of patients. Bolded values are statistically significant at the 0.05 level.

^{*} P<.05;

[‡] P<.01,

^{‡‡} P<.001