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Physician incentives to improve quality and the delivery of high quality ambulatory medical care

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Abstract

Objective—To determine the prevalence of physician incentives for quality and to test the hypothesis that quality of ambulatory medical care is better by physicians with these incentives.

Study Design—Cross-sectional study using data from the National Ambulatory Medical Care Survey

Method—We examined the association between physician compensation based on quality, physician compensation based on satisfaction, and public reporting of practice measures and twelve measures of high quality ambulatory care.

Results—Overall, 20.8% of visits were to physicians whose compensation was partially based on quality, 17.7% of visits were to physicians whose compensation was partially based on patient satisfaction, and 10.0% of visits were to physicians who publicly reported performance measures. Quality of ambulatory care varied: weight reduction counseling occurred in 12.0% of preventative care visits by obese patients whereas urinalysis was not performed in 93.0% of preventative care visits. In multivariable analyses, there were no statistically significant associations between compensation for quality and delivery of any of the 12 measures, nor between compensation for satisfaction and 11 of the 12 measures; the exception was BMI screening in preventative visits (47.8% vs. 56.2%, adjusted $p=0.004$). There was also no statistically significant association between public reporting and delivery of 11 of 12 measures; the exception was weight reduction counseling for overweight patients (10.0% vs. 25.5%, adjusted $p=0.01$).

Conclusions—We found no consistent association between incentives for quality and 12 measures of high quality ambulatory care.

Introduction

Variation in quality is a problem of the U.S. healthcare system.^{1, 2} Pay-for-performance and public reporting of quality measures are two incentives that health insurers and payers use to promote high quality medical care.^{3–7} Almost half of commercial Health Maintenance Organizations (HMOs) use some form of pay-for-performance according to a 2006 national

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survey.⁶ In addition, the Deficit Reduction Act of 2005 and the Tax Relief and Health Care Act of 2006 required the Centers for Medicare and Medicaid Services (CMS) to establish plans for value-based payments and physician quality reporting mechanisms.^{8, 9} In 2007, CMS instituted a voluntary physician reporting program—the Physician Quality Reporting System (PQRS)—as part of its value-based purchasing (VBP) program.¹⁰ CMS also has an ongoing demonstration project, the Physician Group Practice project, to study the impact of pay-for-performance and other payment models on quality of care.¹¹ The Patient Protection and Affordable Care Act of 2010 has allocated funding for models such as Accountable Care Organizations (ACOs) and the Patient Centered Medical Home which tie compensation to quality.¹²

Despite increasing interest, the impact of pay-for-performance and public reporting on the quality of ambulatory medical care is unclear.^{13–17} A 2006 systematic review of the literature found that there were very few studies that had assessed the effect of pay-for-performance on quality.¹⁸ Of these studies, the impact of pay-for-performance varied: several programs showed improvements in quality and others showed little or none. Even less is known about the effect of physician public reporting of quality measures on ambulatory quality of care.^{19, 20} Furthermore, evaluations of physician-level incentives to improve quality have focused on a small number of health plans or systems, or programs outside the U.S.^{18, 21–34} To our knowledge, no studies have examined the association between physician incentives and quality of ambulatory care on a national level.

Using a nationally representative survey of ambulatory visits in the U.S., we sought to determine the prevalence of physician incentives for quality and to test the hypothesis that quality of ambulatory medical care is better in the context of these physician incentives. We looked specifically at financial incentives that reward higher quality care and financial incentives that reward better patient satisfaction with the hypothesis that these methods of compensation will be associated with higher quality care. We also examined the association between quality and public reporting of quality measures with the assumption that physicians are motivated to improve performance on publicly reported quality measures to maintain or improve their professional reputation and patient volume.

Methods

Study Design

We performed a cross-sectional analysis using data from the 2006 and 2007 National Ambulatory Medical Care Survey (NAMCS). NAMCS is a nationally representative survey administered by the Centers for Disease Control's National Center for Health Statistics (NCHS). NAMCS contains information about patient visits to non-federally-funded, non-hospital-based offices throughout the United States. Physicians in the fields of anesthesiology, radiology, and pathology are excluded from the survey. Physicians who participate in the survey cannot participate again for at least three years.^{35, 36}

NAMCS uses a three stage sampling design. The first stage is based on geographic location, the second stage identifies offices in each geographic location, and the third stage samples visits within each office. The visits sampled take place during a one week period that is randomly assigned for each practice. Between 20 and 100 per cent of the visits that week are sampled depending on the size of the practice. The NCHS weighs each visit so that the data can be used for national estimates. Each visit weight accounts for selection probability, adjusts for non-response, and accounts for other factors so that the national estimates properly reflect the scope of ambulatory visits in the U.S.

The survey collects patient and office demographics, and visit-specific clinical information. The information from each visit is recorded on a standardized survey form by the physician, office staff, or a U.S. Census Bureau Representative. Clinical characteristics include up to 3 reasons for the visit coded using a reason-for-visit (RFV) classification, up to 3 diagnoses coded using the *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)*, and up to 8 drugs coded using the Lexicon Plus classification, a proprietary database of Cerner Multum, Inc. Because this study used publicly-available NAMCS data without respondent identifiers, the Mount Sinai Institutional Review Board exempted it from review.

Study Sample

We limited our sample to visits by non-pregnant patients 18 years of age. Because this study focused on rates of delivery of high quality ambulatory care, we further limited our sample to visits to primary care physicians (i.e. general internists, family practitioners, and gynecologists) and internal medicine subspecialists (e.g. cardiologists, endocrinologists). We excluded visits to surgical specialists and non-medical specialists (e.g. dermatologists, psychiatrists, occupational medicine) because the measures of high-quality care of interest did not pertain to their areas of practice. Finally, we excluded visits in which a physician was not seen.

Study Variables

Physician Incentives—There were 3 physician incentives that were routinely collected as part of the NAMCS physician induction survey³⁶ that we hypothesized would be associated with better quality of care. First, visits were categorized as whether or not the physician's patient-care compensation was at least partially based on quality measures. Second, and similarly, visits were categorized as whether or not the physician's patient-care compensation was at least partially based on patient satisfaction. Of note, the proportion of physician compensation based on quality or satisfaction was reported in quartiles (<25%, 25–50%, 51–75%, and 76–100%). For our study both incentives were categorized as any or none because in the large majority of visits (93.7%), incentives accounted for <25% of compensation. Finally, visits were categorized as whether or not the physician or practice publicly reported quality measures.

Ambulatory Quality of Care—We examined 12 measures of ambulatory quality of care (11 process measures and 1 outcome measure) that were identified using the PQRS measures from CMS (Appendix).³⁷ The PQRS measures include 216 processes and outcomes of care, but the majority of these measures could not be examined because the measure 1) was not related to ambulatory care; 2) could not be analyzed on a per visit basis; 3) was not systematically collected in the NAMCS; or 4) examined a disease or condition where the sample of eligible visits was too small (< 30 visits) for accurate analyses.

Eligible visits for our study included visits to physicians for preventive care; chronic disease care for 5 conditions (diabetes mellitus, heart failure, coronary artery disease, atrial fibrillation, and chronic obstructive pulmonary disease [COPD]); and upper respiratory-tract infections (URIs). Visits were identified using *ICD-9 CM* codes. Preventive care visits were defined as visits to the patient's primary care physician with one of the following: (1) *ICD-9-CM* code V70.0X or V70.9X (or both), (2) general medical examination as a reason for the visit (RFV code 31000), or (3) a preventive or non-illness care code as the NAMCS major reason for visit.

We examined 4 measures of high quality ambulatory care during visits to physicians for preventive care: smoking cessation counseling for smokers, body mass index (BMI)

screening, weight reduction counseling for overweight patients, and urinalysis not performed or ordered. Of note, the urinalysis measure was the only measure that we considered achieved if the test was not performed. For this measure we excluded visits by patients with urinary symptoms, renal disease, diabetes, human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), or hypertension.

We examined 1 measure of high quality diabetes care: blood pressure measurement of less than 130/80 mmHg.

We examined 2 measures of high quality heart failure care: 1) prescription of either angiotensin converting enzyme inhibitor (ACE-I) or angiotension receptor blocker (ARB) therapy, excluding visits by patients with hyperkalemia or angioedema; and 2) prescription of beta-blocker therapy, excluding visits by patients with heart block, bradycardia, chronic obstructive pulmonary disease (COPD), or asthma.

We examined 2 measures of high quality coronary artery disease care: 1) prescription of oral antiplatelet therapy, excluding visits by patients with peptic ulcer disease, gastritis, gastrointestinal bleeding, duodenitis, or renal disease; and 2) prescription of beta-blocker therapy, excluding visits by patients with heart block, bradycardia, COPD, or asthma.

Finally, we examined 3 additional measures of high quality ambulatory care: 1) no prescription of antibiotic therapy during visits by patients for upper respiratory infection, excluding visits by patients with COPD, HIV, AIDS, or cancer; 2) prescription of anticoagulation therapy during visits by patients with atrial fibrillation, excluding visits by patients with peptic ulcer disease, gastritis, gastrointestinal bleeding, duodenitis, cerebral hemorrhage, central nervous system tumors, renal disease, thrombocytopenia, or gait abnormality; and 3) prescription of bronchodilator therapy during visits by patients with COPD. For each measure of high quality care, eligible visits were categorized by whether or not there was documentation that the patient received the recommended ambulatory care.

Other Variables of Interest—All visits were additionally categorized by other patient and physician characteristics. For patient characteristics, we examined the following: age, gender, race/ethnicity, number of chronic conditions, and insurance type (private, Medicare, Medicaid, and other, which included self-pay, worker's compensation, and no fee). For physician and practice characteristics, we examined: practice size (solo or group), practice type (private practice, community health center [CHC], or health maintenance organization [HMO]), physician employment status (owner, employee, or contractor), physician specialty (primary care or medical specialist), region of practice (northeast, midwest, south, or west), and urban or rural practice location.

Statistical Analysis

We performed a visit-level analysis using visit-level sampling weights to account for physician and practice clustering.^{38–41} We describe visit characteristics using standard frequency analyses presenting them as the weighted proportion of visits in our study sample. We used the Chi-squared test to study the bivariate association between physician incentives or public reporting and delivery of each of the 12 quality indicators. We used multivariable logistic regression to assess the independent effect of physician incentives on the delivery of each of the 12 quality indicators, creating independent models for each outcome while controlling for the patient and physician characteristics as outlined above and whether the physician received other incentives for quality or publicly reported quality measures. We also performed logistic regression to determine whether more incentives or specific combinations of incentives had incremental associations with quality.

In order to understand whether the results of our study differed among subgroups of patients, we performed additional sensitivity analyses stratifying patients by insurance type (private insurance, Medicare, and Medicaid) and age (< 65 and ≥ 65).

All analyses took into account the complex survey design and weighted sampling probabilities of the data source for the calculation of nationally representative point and variance estimates. All analyses were performed using Stata statistical software, version 11.0 (Stata Corp., College Station, TX). Because we repeated our analyses for three different physician incentives, we used the Bonferroni correction and used a p-value of 0.01 to signify statistical significance.⁴²

Results

Sociodemographic and Clinical Characteristics

Among 62,170 visits in the 2006 and 2007 NAMCS, 28,287 (46.4%) were by adult, non-pregnant patients to primary care physicians and medical specialists, representing 920 million visits. Overall, 20.8% of visits were to physicians whose compensation was partially based on quality, 17.7% of visits were to physicians whose compensation was partially based on satisfaction, and 10.0% of visits were to physicians who publicly reported performance measures.

There were few differences in patient and physician characteristics in visits to physicians whose compensation was partially based on quality or satisfaction compared with visits to physicians whose compensation was not. (Table 1) Non-Hispanic Black patients were less likely to be seen by a physician whose compensation was partially based on quality (adjusted odds ratio [aOR] 0.62, 95% confidence intervals [CI] 0.46–0.87) or satisfaction (aOR 0.62, 95% CI 0.45–0.86). Visits to practice owners were also less likely to be to a physician whose compensation was partially based on quality (aOR 0.39, 95% CI 0.23–0.66) or satisfaction (aOR 0.40, 95% CI 0.20–0.80). Patient characteristics were also unassociated with visits to physicians who publicly reported quality measures with the exception of the number of comorbidities. In this case, patients seeing physicians who publicly reported quality measures were more likely to have 3 or more chronic conditions than patients seeing physicians who did not report quality measures (aOR 2.62, 95% CI 1.63–4.19).

Quality of Medical Care

Overall, there was wide variation in the quality of ambulatory medical care for adult patients. (Table 2) For example, urinalysis was not performed in 93.0% of preventative care visits (an indicator of high quality) whereas weight reduction counseling occurred in only 12.0%. Appropriate medications for heart failure, coronary artery disease, atrial fibrillation, and COPD were prescribed in 43.5% to 64.9% of visits. Antibiotics for visits for URI's were not prescribed in 45.5% of visits.

Financial Incentives for Quality and Satisfaction

In multivariate analyses, we found no statistically significant associations between quality-based compensation and quality of care. We found that only BMI screening during preventative visits was associated with satisfaction-based compensation (47.8% vs. 56.2%, adjusted p-value=0.004).

Public Reporting of Quality Measures

As with financial incentives, there was no consistent association between public reporting and quality performance. The only performance measure positively associated with public reporting was weight reduction counseling (10.0% vs. 25.5%, adjusted p-value=0.01).

Multiple Incentives for Quality

We found no association between the number of incentives for quality and high quality medical care for any ambulatory care measures we studied. (data not shown)

Discussion

In this analysis of a national sample of ambulatory visits to primary care physicians and internal medicine specialists, we found that approximately 20% of visits were to physicians whose compensation was partially based on quality. Fewer visits were to physicians whose compensation was partially based on patient satisfaction or who publicly reported quality measures. Although prior surveys have found that almost half of commercial HMOs and state Medicaid programs engage in pay-for-performance;^{5, 6, 15-17, 43} we found that a minority of ambulatory visits are to physicians who receive compensation from incentive programs. The lower percentage may not reflect less performance measurement but rather whether financial rewards are directed to an entire practice or an individual physician. In many cases, rewards directed to an entire practice may not be apportioned to individual physicians.

Consistent with prior studies^{1, 2, 41}, we found wide variation in the measured performance of ambulatory medical care. For example, less than a quarter of overweight patients received weight reduction counseling during preventative visits; appropriate medications were prescribed in only 43 to 65% of visits. This variation may reflect the relative ease of performing certain benchmarks of quality (e.g. not performing urinalysis versus counseling overweight patients). We found, however, no consistent association between the financial incentives for quality or public reporting and 12 measures of high quality ambulatory care.

Several prior evaluations of incentive programs have found correlations between financial incentives for quality and improvements in quality but many of these were assessments of single payer's incentive programs or evaluations of small numbers of practices.^{18, 21-34} Other studies, consistent with our results, have not found a relationship between incentives for quality and the delivery of high quality ambulatory care. A 2006 systematic review found that of 6 randomized, controlled studies of physician-level incentives, only 2 showed a positive effect.¹⁸

Several factors may explain our results. First, physicians may not respond to incentives, particularly if the incentives are not substantial enough to significantly affect their incomes or patients' perceptions of quality. This hypothesis was substantiated in interviews with leaders of physician organizations enrolled in one of the country's largest HMO pay-for-performance programs. The majority of those interviewed believed that incentive amounts needed to be greater for the program to be effective.⁴⁴ Second, physicians may not want to cooperate with incentive programs especially if they disagree with the indicators used to measure quality. A 2007 survey found that a majority of general internists felt that quality measures were not accurate and were not accurately adjusted for patient risk factors.⁴⁵

There are some limitations of our study that are worth noting. There are some limitations of our study that are worth noting. First, we were limited to 12 ambulatory quality measures that could be assessed with our dataset. These measures of quality may have little or no relation to measures that were the basis for the incentive programs in which physicians were

enrolled. Thus, we cannot make conclusions about the performance on directly relevant measures but rather can conclude that broadly quality incentives - which may be diverse and different for each physician - were not associated with better performance as measured by a set of highly specific process measures.

We also cannot make generalizations about the association of incentives and reporting with other measures of high quality ambulatory care such as preventative cancer screening and immunizations which could not be evaluated on a per-visit level. In addition, this was a cross-sectional study; thus, we cannot determine whether incentive programs were employed to improve performance in poorly performing practices or implemented regardless of the practices' performance. Also, significant differences in the rates of smoking cessation and weight reduction counseling may partially reflect differences in documentation practice. Finally, we were unable to perform a physician-level analysis because the number of eligible visits at the physician-level was too small to make reasonable performance estimates.

CMS and a number of private payers have invested considerable time and money into the development of public reporting and pay-for-performance programs. Our finding that on a national level financial incentives and public reporting were not associated with quality corroborates other findings from local and regional studies. More research is likely needed to understand whether and how quality incentive programs should be structured and implemented.

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Appendix

Measures of high quality ambulatory care derived from the PQRS

Measure	Eligible Visits					Appropriate Care
	Medical Condition	Exclusions	Age Range, y	No. of patient records	No. of Estimated Patient Visits in Millions	
Preventative Care Measures Group						
Advising smokers and tobacco users to quit	Smoking and GME	None	18	1,097	35	Smoking cessation counseling recorded
Body mass index (BMI) screening	All GMEs	None	18	6,855	264	BMI recorded
Weight reduction counseling during for overweight patients	BMI>25 in patients 18 to 64. BMI>30 in	None	18	2,228	79	Weight reduction counseling recorded

Measure	Eligible Visits					Appropriate Care
	Medical Condition	Exclusions	Age Range, y	No. of patient records	No. of Estimated Patient Visits in Millions	
	patients >65 and GME					
Urinalysis not performed at visit	All GMEs	Urinary symptoms, renal disease, diabetes, HIV/AIDS, hypertension	18	4,125	159	No urinalysis performed
Diabetes Mellitus (DM) Measures Group						
Blood Pressure Management	DM	None	18 to 75	974	28	Blood pressure <140/80
Heart Failure (HF) Measures Group						
Angiotensin converting enzyme inhibitor (ACE-I) or Angiotensin receptor blocker (ARB) therapy	HF	Hyperkalemia and angioedema	18	558	15	ACE-I or ARB reported as current medication
Beta blocker therapy	HF	Heart block, COPD, Asthma	18	441	11	Beta-blocker reported as current medication
Coronary Artery Disease (CAD) Measures Group						
Oral Antiplatelet therapy	CAD	Peptic ulcer disease, GI bleeding, gastritis, duodenitis, renal disease	18	1,590	38	Oral platelet aggregation inhibitors or salicylates reported as current medication
Beta blocker therapy	CAD	Heart block, bradycardia, COPD, Asthma	18	1,462	35	Beta-blocker reported as current medication
Miscellaneous						
No antibiotics for upper respiratory infection	Acute bronchitis, Upper respiratory infection	COPD, HIV/AIDS, cancer	18 to 65	378	16	No antibiotic prescribed
Anticoagulation therapy in patients with Atrial Fibrillation (AF)	Atrial fibrillation	Peptic ulcer disease, GI bleeding, gastritis, duodenitis, cerebral hemorrhage, CNS tumors, thrombocytopenia, gait abnormality, bleeding diathesis, abnormal uterine bleeding	18	529	14	Oral coumarins, heparins, oral thrombin inhibitors, thrombin inhibitors, oral factor Xa inhibitors, oral platelet aggregation inhibitors, or salicylates reported as currently taking
Bronchodilator therapy in patients with Chronic Obstructive Pulmonary Disease (COPD)	COPD	None	18	565	22	Taking adrenergic bronchodilators, bronchodilator combinations, or anticholinergic bronchodilators

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Table 1
Incentives for quality by patient, physician, and practice characteristics, 2006–2007

Characteristic	No. (%) of Estimated Patient Visits in Millions	Compensation for quality, % All Visits*	Adjusted [†] OR of compensation for quality (95% CI)	Compensation for satisfaction, % All Visits*	Adjusted [†] OR of compensation for satisfaction (95% CI)	Practice public reporting, % All Visits*	Adjusted [†] OR of public reporting (95% CI)
All	919	20.8		13.8		10.0	
Sex							
Female	580 (63.1)	20.7	Ref	17.4	Ref	10.4	Ref
Male	340 (37.0)	21.1	0.99 (0.87–1.12)	18.2	1.02 (0.88–1.19)	9.3	0.86 (0.73–1.01)
Age Group							
18–29	114 (12.3)	22.0	Ref	18.8	Ref	9.3	Ref
30–49	269 (29.3)	21.6	0.96 (0.83–1.11)	18.6	1.00 (0.84–1.21)	10.1	1.02 (0.81–1.28)
50–64	84 (9.2)	22.3	0.99 (0.79–1.24)	18.1	0.99 (0.75–1.30)	10.3	0.97 (0.65–1.44)
65–79	365 (39.6)	20.1	0.92 (0.73–1.15)	17.1	0.93 (0.73–1.20)	9.8	0.89 (0.64–1.22)
80	88 (9.6)	18.5	0.84 (0.63–1.13)	15.2	0.80 (0.60–1.09)	11.2	1.01 (0.66–1.54)
Race/Ethnicity							
Non-Hispanic White	661 (71.9)	20.2	Ref	16.7	Ref	10.2	Ref
Non-Hispanic Black	93 (10.3)	15.1	0.63 (0.46–0.87)	12.7	0.62 (0.45–0.86)	8.8	0.93 (0.61–1.43)
Hispanic	108 (11.7)	23.9	1.14 (0.73–1.79)	22.4	1.16 (0.72–1.87)	10.3	1.24 (0.65–2.36)
Other	56 (6.2)	32.4	1.49 (0.95–2.35)	28.3	1.38 (0.76–2.51)	9.4	1.44 (0.89–2.32)
Number of Comorbid Conditions							
0	312 (33.9)	19.3	Ref	16.8	Ref	7.8	Ref
1–3	524 (56.9)	20.8	1.27 (1.06–1.52)	17.2	1.19 (0.97–1.46)	10.2	1.45 (1.11–1.89)
>3	84 (9.1)	26.8	1.82 (1.30–2.55)	24.0	1.85 (1.27–2.70)	17.1	2.62 (1.63–4.19)
Primary Source of Payment							
Private	477 (53.1)	20.8	Ref	16.9	Ref	10.2	Ref
Medicare	243 (27.1)	19.0	0.98 (0.80–1.20)	16.5	1.16 (0.92–1.46)	10.2	0.89 (0.67–1.19)
Medicaid	88 (9.8)	22.9	1.02 (0.71–1.46)	20.9	1.22 (0.81–1.84)	12.8	1.08 (0.73–1.60)
Other	91 (10.1)	22.9	1.18 (0.76–1.85)	20.8	1.24 (0.76–2.02)	7.4	0.66 (0.44–0.99)

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Characteristic	No. (% of Estimated Patient Visits in Millions)	Compensation for quality, % All Visits*	Adjusted [†] OR of compensation for quality (95% CI)	Compensation for satisfaction, % All Visits*	Adjusted [†] OR of compensation for satisfaction (95% CI)	Practice public reporting, % All Visits*	Adjusted [†] OR of public reporting (95% CI)
Practice Size							
Solo	270 (29.4)	22.0	Ref	18.2	Ref	9.3	Ref
Group	647 (70.6)	20.4	0.60 (0.34–1.06)	17.5	0.60 (0.34–1.06)	10.3	0.81 (0.40–1.65)
Practice Type							
Private practice	795 (86.4)	20.9	Ref	16.3	Ref	9.5	Ref
CHC	27 (2.9)	36.0	1.19 (0.51–2.76)	33.5	1.38 (0.54–3.56)	12.1	1.01 (0.48–2.14)
HMO	21 (2.3)	45.8	2.49 (0.83–7.49)	58.6	6.08 (2.24–16.50)	13.5	2.18 (0.45–10.6)
Other	77 (8.4)	8.1	0.28 (0.12–0.66)	14.8	0.87 (0.40–1.90)	13.9	1.70 (0.84–3.46)
Employment Status							
Non-owner	291 (31.7)	30.0	Ref	27.1	Ref	13.6	Ref
Owner	268 (68.3)	16.6	0.39 (0.23–0.66)	13.3	0.40 (0.20–0.80)	8.3	0.58 (0.30–1.12)
Physician Specialty							
Primary Care	708 (77.0)	22.7	Ref	19.4	Ref	10.1	Ref
Medical Specialty	212 (23.0)	14.5	0.70 (0.44–1.11)	12.1	0.66 (0.38–1.12)	9.7	1.07 (0.55–2.10)
Region							
Northeast	165 (17.9)	27.5	Ref	26.7	Ref	14.7	Ref
Midwest	188 (20.4)	23.4	0.97 (0.49–1.91)	12.8	0.48 (0.23–0.98)	16.7	1.18 (0.57–2.43)
South	380 (41.4)	16.1	0.62 (0.29–1.31)	14.5	0.57 (0.25–1.34)	6.8	0.42 (0.20–0.90)
West	187 (20.4)	22.0	0.66 (0.31–1.41)	21.1	0.56 (0.26–1.18)	5.6	0.29 (0.10–0.81)
Location							
Urban	776 (84.3)	21.5	Ref	18.9	Ref	9.5	Ref
Rural	144 (15.7)	17.2	0.91 (0.44–1.85)	10.9	0.63 (0.30–1.32)	12.8	1.35 (0.62–2.96)

Abbreviations: OR – odd ratio, CI – confidence intervals, CHC – community health center, HMO – health maintenance organization.

* Survey weighted percentages based on the population that was sampled.

[†] Adjusted for patient age, gender, race/ethnicity, primary source of payment, and number of comorbid condition, practice size, practice type, physician employment status, physician specialty category, region, urban location, and presence of other incentives for quality.

Table 2

Quality indicator performance by incentives for quality, 2006–2007

Quality Indicator	Overall Performance, %*	Performance, %*		Adjusted† analysis p-value	Performance, %*		Adjusted† analysis p-value	Performance, %*		Adjusted† analysis p-value
		No Compensation for quality	Compensation for quality		No Compensation for satisfaction	Compensation for satisfaction		No Public reporting	Public reporting	
Preventative Care Measures Group										
Advising smokers and tobacco users to quit	25.0	21.8	36.7	0.73	21.3	42.8	0.02	24.1	30.5	0.64
BMI screening	49.5	49.7	48.9	0.02	47.8	56.2	0.004	49.5	49.6	0.85
Weight reduction counseling for overweight patients	12.0	10.0	17.8	0.36	10.5	16.8	0.90	10.0	25.5	0.01
Urinalysis not performed at visit	93.0	93.3	92.2	0.17	92.9	93.2	0.36	93.1	92.3	0.84
Diabetes Mellitus Measures Group										
Blood Pressure Management	45.4	44.7	48.0	0.30	45.3	46.0	0.34	45.7	42.7	0.98
Heart Failure Measures Group										
ACE-inhibitor or ARB therapy	43.5	45.1	38.6	0.09	42.9	46.2	0.08	45.4	31.9	0.24
Beta blocker therapy	57.1	58.7	55.4	0.88	57.6	55.4	0.92	55.3	71.4	0.03
Coronary Artery Disease Measures Group										
Oral Antiplatelet therapy	48.9	50.0	44.5	0.29	50.6	40.0	0.18	49.1	47.8	0.89
Beta blocker therapy	48.8	50.1	43.4	0.33	49.6	44.1	0.78	48.1	53.4	0.48
Miscellaneous										
No antibiotics for upper respiratory infection	45.5	49.3	67.1	0.08	51.3	63.8	0.52	46.0	39.1	0.80
Anticoagulation therapy in patients with Atrial Fibrillation	64.9	63.7	69.5	0.62	64.6	66.5	0.73	46.0	39.1	0.30
Bronchodilator therapy in patients with COPD	59.4	50.3	49.8	0.93	49.8	52.4	0.33	49.7	55.6	0.23

Abbreviations: CHC – community health center; HMO – health maintenance organization.

* Survey weighted percentages based on the population that was sampled.

† Adjusted for patient age, gender, race/ethnicity, primary source of payment, and number of comorbid condition, practice size, physician employment status, physician specialty category, region, urban location, and presence of other incentives for quality.