ANALYSIS OF 2011 PHYSICIAN FEEDBACK PROGRAM INDIVIDUAL REPORTS*

I. INTRODUCTION AND SUMMARY OF FINDINGS

On December 17, 2012, the Centers for Medicare & Medicaid Services (CMS) made confidential quality and resource use reports (QRURs) available to 94,585 physicians affiliated with medical group practices of 25 or more eligible professionals (EPs), including physicians and other medical staff such as nurse practitioners and physician assistants. These group practices are in nine states: California, Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, and Wisconsin. Each report provided information on the quality of care and resource use for traditional Medicare fee-for-service (FFS) beneficiaries the physician treated in calendar year 2011.

This report presents findings from a descriptive analysis of QRUR recipients' performance measures and participation. The summary findings are broken down by physician specialties as well as by attributed level of care and disease categories in order to better understand physician participation in and performance on these measures.

A. Overview of the 2011 QRURs

The QRURs contained performance on Physician Quality Reporting System (PQRS) measures for physicians who participated in the 2011 program. They also contain performance information on 28 quality indicators for preventive care, medication management, and eight separate condition categories, such as chronic obstructive pulmonary disease (COPD) and cancer. CMS calculates rates for these measures using 2010 and 2011 Medicare administrative claims. Of these 28 measures, 14 measures will be available as part of the Administrative Claims reporting mechanism available for groups of physicians and individual EPs in 2013.

Physician resource use is measured using payment-standardized and risk-adjusted total Parts A and B per capita costs for beneficiaries treated by the physician. Payment standardization and risk adjustment are incorporated into the measures to account for differences in costs among physicians that result from circumstances beyond the physician's control. CMS included five measures of cost in the QRURs: total per capita costs for all beneficiaries attributed to the physician and total per capita costs for attributed beneficiaries with one of four chronic conditions (diabetes, heart failure, COPD, or coronary artery disease [CAD]). For the cost measures, we attribute beneficiaries to physicians based on each physician's degree of involvement with the beneficiary. The three categories of attribution are directed, influenced, and contributed, which are based on the percentage of each beneficiary's evaluation and management services or total professional costs.

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B. Key Findings for 2011 QRURs

A key conclusion from the reports is that among high-risk Medicare beneficiaries, obtaining care from a primary care physician during the year is associated with lower costs, but having one physician who is more involved in the beneficiary's care is associated with the lowest costs, on average. Other key findings include the following:

1. Quality

- The top five specialties in terms of the number of physicians for whom QRURs were prepared are internal medicine, family practice, emergency medicine, anesthesiology, and diagnostic radiology.
- Among the 10 PQRS measures with more than 3,000 physicians reporting for a case size of 20 or more in the nine states, 5 measures had more than 25 percent of physicians significantly different from the mean:
    - Health Information Technology: Adoption/Use of Electronic Health Records (48.2 percent)
    - Preventive Care and Screening: Colorectal Cancer Screening (39.7 percent)
    - Preventive Care and Screening: Pneumonia Vaccination for Patients 65 Years and Older (32.6 percent)
    - Preventive Care and Screening: Tobacco Use Screening and Cessation Intervention (29.3 percent)
    - Preventive Care and Screening: Influenza Immunization for Patients >= 50 Years Old (26.0 percent)
- Ninety-eight percent of the 128 PQRS measures reported by QRUR recipients with a case size of at least 20 for which we calculated reliability had an average reliability score above 0.70, and 85 percent of the reported PQRS measures had a reliability score greater than 0.90.
- The administrative claims-based quality measure for which the most beneficiaries attributed to a QRUR recipient received the indicated treatment was HbA1c Testing for Beneficiaries 75 Years of Age or Younger with Diabetes, with an 87.5 percent compliance rate. The measure for which the fewest attributed beneficiaries received the indicated treatment was Osteoporosis Management in Women 67 Years or Older Who Had a Fracture, with a 19.0 percent compliance rate.
- On average, performance rates for the following five claims-based quality measures that will be available in 2013 in the Administrative Claims reporting mechanism were less than 50 percent, meaning that the majority of Medicare beneficiaries are not obtaining the indicated treatment:
    - Use of Spirometry Testing to Diagnose COPD
    - Osteoporosis Management in Women 67 Years or Older Who Had a Fracture
    - Continuation Phase Treatment for Antidepressant Treatment for Depression
    - Percentage of Patients Receiving Follow-Up Within Seven Days After Hospitalization for Mental Illness

- Lipid Profile for Beneficiaries Who Started Lipid-Lowering Medications

- None of the 14 measures that will be available in 2013 in the Administrative Claims reporting mechanism had performance rates significantly different from the mean for 25 percent or more of physicians in the nine states.

2. Costs

- Across the nine states included in the 2011 QRURs, the average of the total per capita cost among physicians was $18,735.
- The costs attributed to physicians for patients whose care they directed were adjusted upward 21 percent on average, reflecting lower risk. Similarly, the costs attributed to physicians for patients whose care they influenced were adjusted upward 29 percent on average. However, the costs attributed to physicians for patients to whom they contributed care were adjusted downward 19 percent on average. This negative adjustment reflects a higher risk population.
- Overall, hospital-based services (inpatient and emergency outpatient) accounted for over 50 percent of total per capita cost. This finding holds true within each of the broad specialty categories examined (primary care, medical specialist, surgeons, emergency medicine, and other physicians).
- On average, physicians' total per capita costs for beneficiaries with heart failure were highest ($34,545), followed by COPD ($32,946), CAD ($25,906), and diabetes ($25,016).
- Across the nine states, the average reliability of the total per capita cost measure, with at least 20 cases, was 0.85 for physicians who directed care, 0.78 for physicians who influenced care, and 0.97 for physicians who contributed to care. Regarding physicians' per capita costs among the four chronic conditions, with at least 20 cases, average reliabilities were 0.93 (COPD measure), 0.94 (heart failure measure) 0.95 (CAD and diabetes measures).
- The percentages of physicians with per capita costs significantly different from each attribution level's means are between 13 percent (for directed care) and 68 percent (for all beneficiaries treated), followed closely by contributed care with 67 percent.

II. DESCRIPTION AND COMPOSITION OF THE INDIVIDUAL PHYSICIANS FOR WHOM CMS PREPARED A 2011 QRUR

To qualify for a PY2011 Individual Physician QRUR, a physician had to meet the following criteria:

- Submit at least one claim in 2011 for a full-year Medicare FFS beneficiary (for example, a beneficiary enrolled in both Medicare Parts A and B for the full year and not enrolled in managed care at any time during the year)
- Submit the majority of their 2011 claims in one of nine states: California, Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, or Wisconsin
- Be affiliated with a medical group practice comprising at least 25 eligible professionals, where affiliation means the physician billed under a given tax identification number[1]
- Be a medical doctor (M.D.) or doctor of osteopathic medicine (D.O.)

A breakdown of the 94,585 physicians across the nine states for whom a 2011 QRUR was prepared is presented in Table II.1. These physicians provided services for 1,595,008 Medicare beneficiaries. More than one-third of the physicians practiced in California. The top five states with physicians receiving reports were California (35 percent of all reports), Illinois (15 percent), Michigan (13 percent), Minnesota (12 percent), and Wisconsin (10 percent).

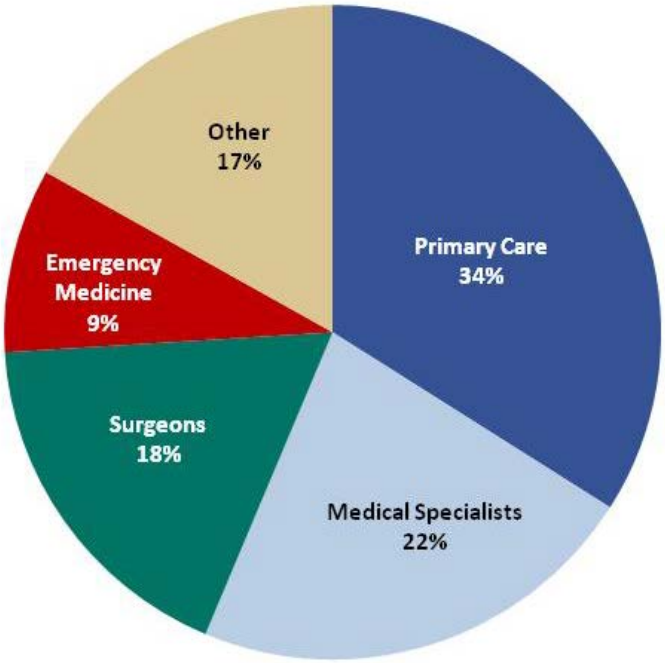
Table II.1. Geographic Breakdown of Physicians Receiving a 2011 QRUR

State	Number of Groups with 25 or More EPs	Number of Physicians with a Report Prepared	Percentage of Total Physicians with a Report Prepared
Overall	**2,332**	**94,585**	**100.0%**
California	650	32,754	34.6%
Illinois	437	13,737	14.5%
Iowa	103	3,537	3.7%
Kansas	93	2,503	2.6%
Michigan	342	12,174	12.9%
Minnesota	210	10,957	11.6%
Missouri	267	7,397	7.8%
Nebraska	54	1,691	1.8%
Wisconsin	176	9,835	10.4%

To understand the types of physicians receiving the reports, CMS divided physicians into five broad specialty categories (Figure II.1). As expected, primary care physicians received the most reports. For a breakdown of all specialties that these five broad categories comprise, see Appendix Table A.1.

[1] An eligible professional is someone who is a physician, a practitioner (including physician assistant, nurse practitioner, clinical nurse specialist, certified registered nurse anesthetist, certified nurse-midwife, clinical social worker, clinical psychologist, or registered dietician/nutritional professional), a physical or occupational therapist or qualified speech-language pathologist, or a qualified audiologist.

Figure II.1. Breakdown of PY2011 QRUR Reports by Broad Physician Category



CMS stratified physicians by medical specialty based on the plurality of the two-digit CMS specialty codes on all 2011 professional claims for which the physician was listed as the "performing provider." The top five specialties with the most PY2011 QRURs prepared—internal medicine, family practice, emergency medicine, anesthesiology, and diagnostic radiology—represented 54 percent of all 94,585 reports (Table II.2). For more details on specialty participation, see Appendix Tables A.1 and A.2.

Table II.2. Top Five Specialties for Which 2011 QRURs Were Prepared

Top Five Specialties with the MOST Reports Distributed	Percentage of Total QRURs Prepared	Number of Physicians	Average Number of Beneficiaries Treated
1. Internal Medicine	17.4%	16,452	215
2. Family Practice	15.5%	14,632	168
3. Emergency Medicine	9.1%	8,560	315
4. Anesthesiology	6.5%	6,136	167
5. Diagnostic Radiology	5.8%	5,483	1,336

QRUR recipients filed claims for an average of 307 beneficiaries. The 10 specialties with the highest average number of beneficiaries for whom a physician filed at least one 2011 claim and the 10 with the lowest average number of beneficiaries for whom a physician filed at least one 2011 claim are presented in Table II.3.

Table II.3. Specialties with the MOST Beneficiaries Attributed per Physician and Specialties with the FEWEST Beneficiaries Attributed per Physician

Specialties with the MOST Beneficiaries Attributed per Physician	# of Physicians	Average # of Beneficiaries Attributed	Specialties with the FEWEST Beneficiaries Attributed per Physician	# of Physicians	Average # of Beneficiaries Attributed
1. Diagnostic Radiology	5,483	1,336	1. Pediatric Medicine	1,587	26
2. Cardiac Electrophysiology	148	925	2. Maxillofacial Surgery	59	40
3. Cardiology	3,908	918	3. Addiction Medicine	22	41
4. Nuclear Medicine	150	702	4. Obstetrics/Gynecology	4,041	47
5. Peripheral Vascular Disease	12	650	5. Hospice and Palliative Care	74	60
6. Interventional Radiology	240	626	6. Preventive Medicine	155	66
7. Pathology	1,664	562	7. Plastic/Reconstructive Surgery	428	81
8. Vascular Surgery	400	498	8. Allergy/Immunology	341	85
9. Ophthalmology	1,756	398	9. Psychiatry	3,418	90
10. Dermatology	1,163	385	10. Osteopathic Manipulative Therapy	52	115

Note: Only specialties with > 10 physicians receiving reports are shown above.

III. QUALITY OF CARE

CMS provided physicians with the following two sets of quality-of-care measures for Medicare beneficiaries in the 2011 QRURs:

1. PQRS measures self-selected and submitted by physicians.
2. Measures calculated by CMS that rely solely on Medicare administrative claims.

A. PQRS Measures

The PQRS allows physicians to select and submit data on the measures most pertinent to the care they provide to Medicare beneficiaries. In the nine states, 30 percent of physicians participated in PQRS.

1. Measures

For the 2011 QRURs, PQRS measures were reported for all incentive-eligible physicians who successfully reported via claims, registry, or electronic health records. The 198 PQRS measures available for reporting in 2011 address various aspects of care, such as prevention, chronic and acute care management, procedure-related care, and care coordination. The 2011 measure list and specifications can be found at http://www. cms. gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/PQRS/2011-Physician-Quality-Reporting-System-Items/CMS1254515. html.

The most frequently reported PQRS measure by QRUR recipients was "Health Information Technology: Adoption/Use of Electronic Health Records," reported by 10,017 QRUR physicians (35.3 percent of PQRS participants; Table III.1). Of the 198 measures available for reporting, there were 139 (70 percent) for which at least 10 physicians reported, and 141 (71 percent) were reported by physicians with at least 20 eligible cases.

For details on PQRS performance rates for physicians in the nine states, see Appendix Table A.3. For more information about the PQRS program, including national performance rates, see the 2011 PQRS Experience Report at http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/PQRS/.

Table III.1. Top Five Most Frequently Reported PQRS Measures

PQRS Measure	Number of Physicians	Percentage of Total PQRS Participants	Mean Performance (Standard Deviation)	10th Percentile	90th Percentile
1. Health Information Technology: Adoption/Use of Electronic Health Records*	10,017	35.3	99 (8.2)	100%	100%
2. DM: Hemoglobin A1c Poor Control	7,539	26.6	25 (27)	0%	67%
3. DM: High Blood Pressure Control	7,470	26.3	76 (24)	50%	100%
4. DM: Low-Density Lipoprotein (LDL-C) Control	7,295	25.7	57 (27)	6%	91%
5. (CAP): Assessment of Oxygen Saturation	5,786	20.4	94 (19)	88%	100%

*This is a structural measure that can only be reported if a physician has adopted or is using an electronic health record. Therefore, the only possible performance rates for this measure are zero percent or 100 percent.

2. Statistical Significance

For each of the PQRS quality measures, we determined the percentage of physicians who were significantly different from the mean using two criteria: (1) The physician has a *p* value of less than 0.05 for assessing the statistical significance of the difference between the physician's score and the mean score among all physicians with at least one case upon which to base the measure. (2) The physician's score was at least one standard deviation from the mean among physicians reporting at least one case for the measure. Table III.2 presents the 10 PQRS measures for which more than 3,000 physicians had a case size of 20 or more patients. For these measures, we report the percentage of physicians who were significantly different from the mean of all physicians reporting the measure. For five measures, more than 25 percent of physicians were significantly different from the mean. See Appendix Table A.3 for more information on the statistical significance of PQRS measures.

Table III.2. PQRS Measures for Which More Than 3,000 Physicians Reported 20 or More Cases

PQRS Measure	Number of Physicians	Percentage of Physicians Significantly Different from Mean ($p < .05$) and at Least One Standard Deviation from Mean	Mean Performance (Standard Deviation)
1. Health Information Technology: Adoption/Use of Electronic Health Records	9,073	48.2	99.2 (8.2)
2. Preventive Care and Screening: Influenza Immunization for Patients >= 50 Years Old	4,857	26.0	43.4 (23.9)
3. Documentation of Current Medications in the Medical Record	4,534	16.8	83.9 (24.6)
4. Preventive Care and Screening: Pneumonia Vaccination for Patients >= 65 Years Old	4,473	32.6	55.0 (28.7)
5. Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention	4,032	29.3	70.2 (33.1)
6. 12-Lead Electrocardiogram (ECG) Performed for Nontraumatic Chest Pain	3,662	3.6	97.2 (8.3)

Table III.2 *(Continued)*

PQRS Measure	Number of Physicians	Percentage of Physicians Significantly Different from Mean ($p < .05$) and at Least One Standard Deviation from Mean	Mean Performance (Standard Deviation)
7. Preventive Care and Screening: Colorectal Cancer Screening	3,449	39.7	44.3 (30.2)
8. Diabetes Mellitus: Hemoglobin A1c Poor Control in Diabetes Mellitus	3,357	6.0	24.9 (27.1)
9. Diabetes Mellitus: Low-Density Lipoprotein (LDL-C) Control in Diabetes Mellitus	3,198	9.8	57.1 (27.2)
10. Diabetes Mellitus: High Blood Pressure Control in Diabetes Mellitus	3,191	5.4	75.7 (23.5)

3. Reliability

Reliability measures the extent to which the performance of one physician (or group of physicians) can be confidently distinguished from another. Potential reliability values range from zero to one, where one (highest possible reliability) signifies that all variation in the measure's performance rates is the result of differences in performance across physicians. Of the 128 PQRS measures for physicians with a case size of at least 20 for which we reported average reliability scores, 125 (98 percent) measures reported average reliability scores above 0.70. A total of 109 (85 percent) of the measures reported reliabilities greater than 0.90 (see Appendix Table A.3).

B. Administrative Claims-Based Quality Reporting

For all physicians, CMS calculated quality measures using administrative claims to provide feedback to physicians who did not participate in the PQRS. Performance rates for these measures are patient-centric and therefore reflect care furnished by all physicians to patients attributed to QRUR recipients, not just the care delivered by the report recipient. This approach provides physicians a broader view of the care received by their patients and encourages shared accountability in coordinating care. 2011 performance in the nine states indicates there is room for improvement, as average performance was below 50 percent on 5 of the 17 measures (counting submeasures) that will be available in 2013 in the Administrative Claims reporting mechanism.

1. Measures

The 2011 QRURs reported performance on up to 28 administrative claims-based quality measures. These measures focused on clinical care of prevalent chronic diseases among Medicare beneficiaries and medication management, and were assessed at the individual physician level. Of the 28 measures, 26 were endorsed by the National Quality Forum and the remaining 2 were developed and are maintained by the National Committee for Quality Assurance (NCQA). All 28 measures are computed solely from Medicare administrative claims. The performance year was January 1 through December 31, 2011; for measures requiring a look-back period, claims were available back to January 1, 2010. Specifications for claims-based measures can be found at https://www.cms.gov/physicianfeedbackprogram. A subset of these

measures (14 measures with several submeasures, for a total of 17 measures) is part of the Administrative Claims reporting mechanism available in 2013 for groups and EPs.

2. Attribution

For determining claims-based quality measure performance rates, CMS attributed a beneficiary to any physician who submitted at least one 2011 Part B claim for that beneficiary, such as an Evaluation and Management (E&M) visit, a radiology, or a lab test claim. Beneficiaries could therefore be attributed to multiple physicians.

3. Performance Results on Administrative Claims-Based Measures

The 14 administrative claims-based measures to be included in the 2013 Administrative Claims reporting mechanism are shown in Table III.3. Among measures for which higher percentages reflect better performance, the average performance rate for beneficiaries covered by the QRURs was highest for "HbA1c Testing for Beneficiaries 75 Years or Younger with Diabetes", at 85 percent. Among the three measures for which lower percentages reflect better performance, average performance was best for the measure of patients receiving at least two different drugs to be avoided, at five percent.

Performance rates and other statistics for the 28 Administrative Claims-based measures, including those that will not be used in the 2013 Administrative Claims-based reporting mechanism, are reported in Appendix Table A.4.

4. Statistical Significance

For only 3 of the 14 measures were at least 10 percent of physicians (among those with a case size of at least 20) statistically different from the mean (with a *p*-value less than 0.05) and at least one standard deviation from the mean. The three measures were "Dilated Eye Exam for Beneficiaries 75 Years or Younger with Diabetes" (12.5 percent), "Breast Cancer Screening for Women 69 Years or Older" (13.8 percent), and "Lack of Monthly INR Monitoring for Beneficiaries on Warfarin" (12.8 percent). For two measures, no physicians had scores statistically different from the mean and at least one standard deviation from the mean. The measures were "Antidepressant Treatment for Depression: Acute Phase Treatment (at least 12 weeks)" and "Continuation Phase Treatment (at least 6 months)."

Table III.3. Performance Results on Administrative Claims-Based Quality Measures (20 or More Cases)

Clinical Condition and Measure	Mean Performance Rate	Number of Physicians	Average Case Size in Denominator	Percentage of Physicians Significantly Different from Mean ($p < .05$) and at Least One Standard Deviation From Mean
COPD				
Use of Spirometry Testing to Diagnose COPD	32.1	33,855	70.2	8.0
Bone, Joint, and Muscle Disorders				
Osteoporosis Management in Women ≥ 67 Who Had a Fracture	17.4	5,167	38.5	0.5
Diabetes				
Dilated Eye Exam for Beneficiaries ≤ 75 with Diabetes	73.0	56,861	93.1	12.5
HbA1c Testing for Beneficiaries ≤ 75 with Diabetes	85.8	56,861	93.1	2.4
Urine Protein Screening for Beneficiaries ≤ 75 with Diabetes	76.4	56,861	93.1	9.2
Lipid Profile for Beneficiaries ≤ 75 with Diabetes	78.7	56,861	93.1	6.2
Heart Conditions				
Adherence to Statin Therapy for Beneficiaries with Coronary Artery Disease	63.3	15,034	53.7	1.1
Lipid Profile for Beneficiaries with Ischemic Vascular Disease	73.0	50,665	109.7	7.5
Mental Health				
Antidepressant Treatment for Depression				
1. Acute Phase Treatment (at least 12 weeks)	52.8	821	28.0	0.0
2. Continuation Phase Treatment (at least 6 months)	36.0	821	28.0	0.0
Follow-Up After Hospitalization for Mental Illness				
1. Percentage of Patients Receiving Follow-Up Within 30 Days	57.6	10,189	47.5	4.7
2. Percentage of Patients Receiving Follow-Up Within 7 Days	31.2	10,189	47.5	0.9
Prevention				
Breast Cancer Screening for Women ≤ 69	63.3	59,541	84.3	13.8
Medication Management				
Lipid Profile for Beneficiaries Who Started Lipid-Lowering Medications	40.3	47,916	76.6	5.7
NOTE: For the measures shown below, lower percentages reflect better performance				
Drugs to Be Avoided for Beneficiaries ≥ 65				
1. Patients Who Receive at Least One Drug to Be Avoided	24.7	68,777	185.0	7.9
2. Patients Who Receive at Least Two Different Drugs to Be Avoided	5.0	68,777	185.0	2.9
Lack of Monthly INR Monitoring for Beneficiaries on Warfarin	50.6	27,821	60.2	12.8

5. Reliability

Because future reports will be at the physician group level rather than at the individual level, we examined reliabilities (not shown) at the physician group level (defining a group as all physicians billing under a unique Tax Identification Number) for the measures in Table III.3. At the group level, all of these measures except one had average reliability greater than 0.5. The measure that had the lowest reliability, "Antidepressant Treatment for Depression," involves the fewest physicians; out of the 94,585 physicians who received reports, only 821 had 20 or more cases for this measure. These findings are noteworthy since a group-level analysis increases case sizes, which will increase the reliability of a measure. More information on reliability scores for the administrative claims-based quality measures can be found in Appendix Table A.4.

IV. COST OF CARE

CMS calculated risk-adjusted and payment standardized annual per capita cost in order to provide a comprehensive measure of beneficiary treatment costs. 2011 results in the nine states indicate that the beneficiaries who received the most dispersed care (that is, those who were treated by a higher number of different physicians during the year) were also the highest cost beneficiaries.

A. Measures

CMS provided the five following measures of cost in the QRURs:

- Total per capita costs for all beneficiaries attributed to the physician (which included all 2011 Medicare FFS Parts A and B payments except those for hospice services)
- Total per capita costs for beneficiaries attributed to the physician who had one or more of the following four chronic conditions:
    - Diabetes
    - Heart Failure
    - COPD
    - CAD

B. Payment Standardization

In calculating per capita costs, CMS standardized Medicare payments to providers across all service types in order to ensure fair cost comparisons among physicians. Geographic variation in Medicare payments to providers can reflect factors unrelated to the care provided to beneficiaries. Payment standardization was applied to:

- Eliminate adjustments made to national-allowed amounts to reflect differences in regional labor costs and practice expenses (measured by hospital wage indices and geographic practice cost indices)
- Substitute a national amount in the case of services paid on the basis of state fee schedules
- Eliminate payments to providers that support larger Medicare program goals, such as payments to hospitals for graduate medical education, indirect medical education, and for serving a large population of poor and uninsured (that is, disproportionate share payments)
- Maintain differences that exist in actual allowed amounts resulting from:
    - The choice of setting in which a service is provided
    - The choice about who provides the service
    - The choice as to whether to provide multiple services in the same encounter
    - Differences in provider experience with regard to outlier cases

More information about how CMS standardized payments for the 2011 QRURs can be found at http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeedbackProgram/Downloads/PY2011-QRUR-Methods.pdf.

C. Attribution

CMS separated all beneficiaries for whom a physician submitted at least one Part B Medicare claim in 2011 into three categories, based on the physician's degree of involvement with the beneficiary:

- **The physician *directed* the beneficiary's care.** For these beneficiaries, the physician billed for 35 percent or more of the patient's office or other outpatient evaluation and management (E&M) visits.
- **The physician *influenced* the beneficiary's care.** For these beneficiaries, the physician billed for fewer than 35 percent of the patient's outpatient E&M visits but for 20 percent or more of the patient's total professional costs.
- **The physician *contributed to* the beneficiary's care.** For these beneficiaries, the physician billed for fewer than 35 percent of the patient's outpatient E&M visits *and* for less than 20 percent of the patient's total professional costs.

The number of directed, influenced, and contributed beneficiaries attributed to an individual physician is equal to his or her total number of attributed beneficiaries. However, a single beneficiary can be attributed to multiple physicians. For example, a beneficiary may have up to two physicians who direct his or her care, up to five physicians who influence the care, and multiple physicians who contribute to his or her care. Table IV.1 presents the average number of attributed beneficiaries by attribution level of care. The average number of attributed beneficiaries among physicians who influenced beneficiaries' care was 23, whereas the average number of attributed beneficiaries among physicians who directed their care was 43.

Table IV.1. Average Number of Attributed Beneficiaries by Attribution Level of Care

Attribution Level	Average Number of Attributed Beneficiaries	Standard Deviation
Directed	43	62
Influenced	23	48
Contributed	270	524

For a more detailed attribution breakdown by level of care, see Appendix Table A.2.

D. Risk Adjustment

Following payment standardization, total per capita costs were risk adjusted to account for differences in patient demographics, socioeconomic factors, and prior health conditions, recognizing that physiologic differences among beneficiaries can affect their medical costs regardless of the care provided. These risk factors were incorporated into a single beneficiary-risk score based on the CMS Hierarchical Condition Categories (HCC) model that assigns ICD-9 diagnosis codes (each with similar disease characteristics) to 70 clinical conditions to capture medical condition risk. Beneficiary prior-year HCC risk scores (for CY2010) also incorporated

patient age, general reason for Medicare eligibility (aged or disabled), and Medicaid eligibility. The risk-adjustment model additionally included the beneficiary's prior year end-stage renal disease (ESRD) status. More information about how CMS risk adjusted per capita costs can be found in the September 2011 document describing the methodologies used in the 2010 QRURs, which can be accessed at http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeedbackProgram/Downloads/PY2011-QRUR-Methods.pdf.

Based on the population of beneficiaries included in the PY2011 QRURs, 95 percent of physicians' total per capita costs were adjusted between 15 percent downward and 14 percent downward. A downward risk adjustment lowers the physician's observed costs to account for a higher risk population, ensuring a fair comparison to the cost of caring for lower risk populations. An upward adjustment has the opposite interpretation.

Directed and influenced care beneficiaries' risk adjusted per capita costs were, on average, adjusted upward (21 percent and 29 percent, respectively), whereas contributed care beneficiaries, on average, had their costs adjusted downward by 19 percent for all physicians. This negative adjustment reflects a higher risk population, often including beneficiaries with multiple comorbidities.

Considering condition-specific risk adjustment, diabetes and coronary artery disease had the greatest negative adjustments at −13.5 percent and −13.0 percent, respectively. COPD and heart failure also had negative average risk adjustments at −8.6 percent and −9.8 percent, respectively.

E. Performance Results on Cost Measures

Across the nine states included in the PY2011 QRURs, the average total per capita cost among physicians was $18,735; however, this varied widely across the different level of care categories. The highest per capita costs were associated with beneficiaries to whom the physician contributed care.

1. Physicians with Directed Care Beneficiaries (Mean = $10,044)

On average, physicians who directed beneficiaries' care billed for approximately 89 percent of the total E&M services provided by all physicians treating those beneficiaries.

2. Physicians with Influenced Care Beneficiaries (Mean = $8,618)

On average, surgeons had the highest per capita costs for influenced care at $16,228 — 82 percent higher than the next most expensive specialty group ("other physicians") at $8,908 (Appendix Table B.7).

3. Physicians with Contributed Care Beneficiaries (Mean = $19,921)

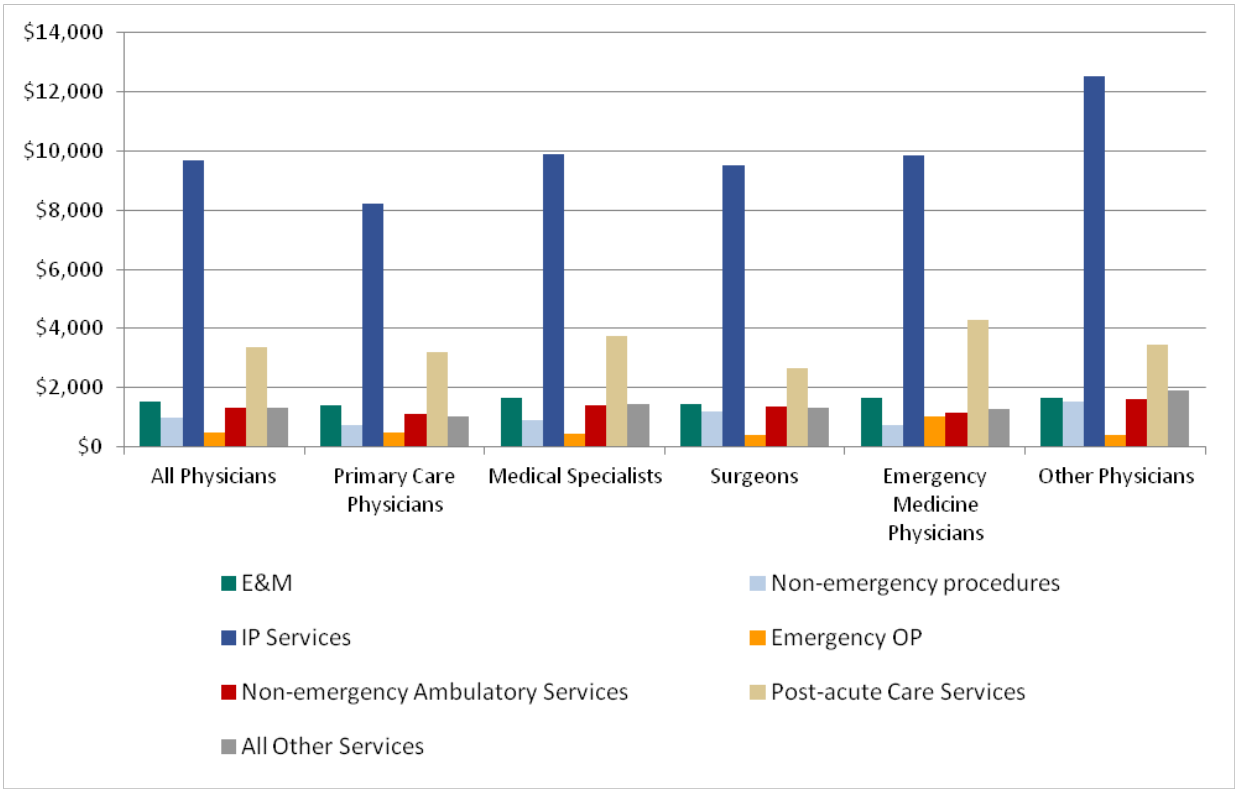
Contributed care beneficiaries tended to have the highest cost care; on average, physician total per capita costs for contributed care patients were 98 percent higher relative to per capita costs for directed care patients and 131 percent higher relative to influenced care patients.

For more details on total per capita cost performance, see Appendix Table B.7.

4. Per Capita Costs by Type of Service and Broad Specialty Category

CMS divided per capita costs into seven categories of services. Figure IV.1 shows average costs for these seven categories, stratified by broad physician specialty categories. Inpatient (IP) hospital services made up the plurality of costs across all physicians' patients (52 percent of costs on average) with a mean value of $9,705. IP services also displayed the highest dispersion in per capita costs, with a standard deviation of $6,291. The smallest average costs and variation was for emergency outpatient (OP) costs, with a mean of $496 and a standard deviation of $518. Overall, hospital-based services (IP and emergency OP) accounted for over 50 percent of total per capita costs.

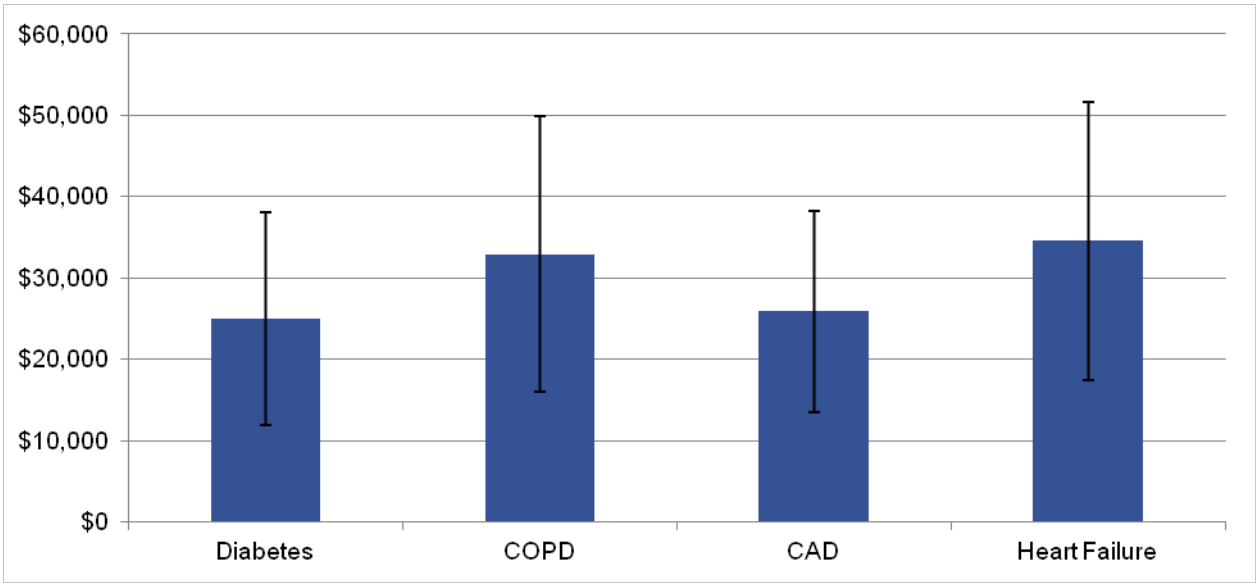
Figure IV.1. Total per Capita Costs, by Selected Types of Service and Broad Specialty Category



5. Chronic Conditions

On average, total per capita costs for beneficiaries with heart failure were highest ($34,545), followed by COPD ($32,946), CAD ($25,906), and diabetes ($25,016). Average payment-standardized and risk-adjusted per capita costs are presented in Figure IV.2 for each condition. Error bars represent one standard deviation around the mean per capita cost for each condition. For more details on per capita costs by chronic condition and physician specialty see Appendix Table B.8.

Figure IV.2. Total per Capita Costs by Chronic Condition



Note: Error bars represent one standard deviation from the mean.

6. Total per Capita Costs for Physicians among the Nine States

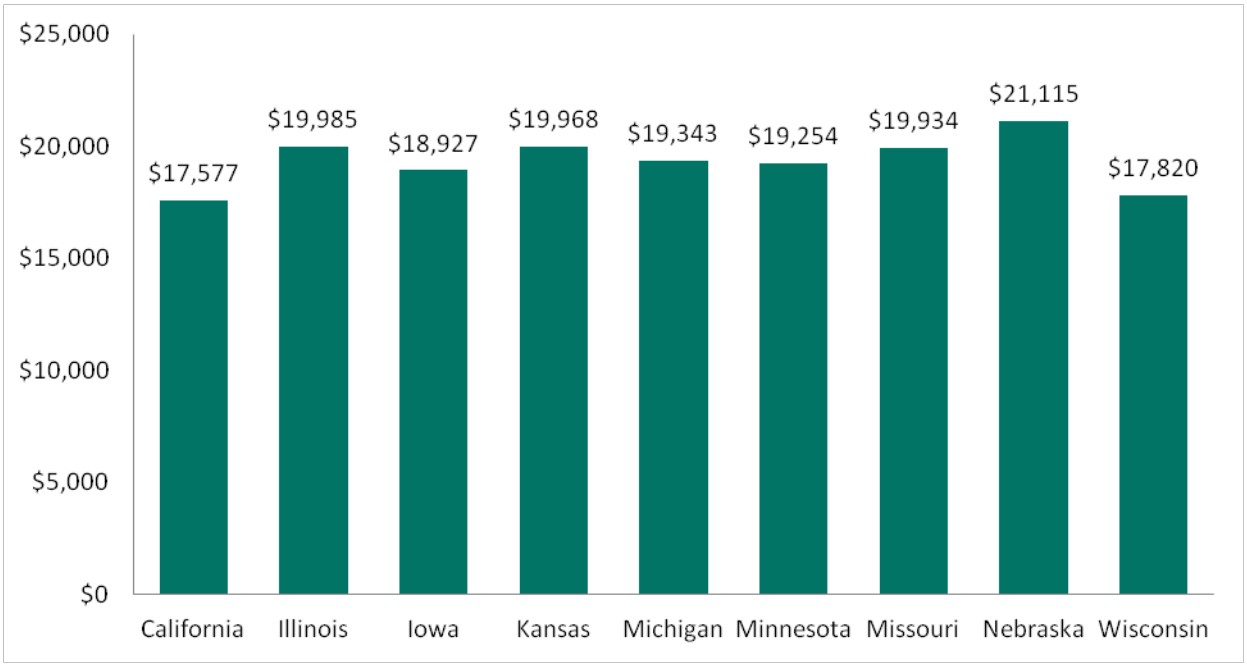
We averaged the physician per capita costs for each of the nine states, and found little variation across the states. Physicians in two states had below-average per capita costs for attributed beneficiaries compared to the average for physicians in all nine states, $18,735. As depicted in Figure IV.3, California physicians averaged the lowest costs per capita at $17,577, which is 6.4 percent below the nine-state physician average. Nebraska physicians averaged the highest total per capita costs at $21,115, nearly 12 percent greater than the nine-state average. We also examined beneficiary-level costs (risk-adjusted and payment standardized) by state and the findings were similar to the physician-level results reported here.

There is variation across states, however, in the percentage of beneficiaries that were included in the per capita cost calculation out of all Medicare beneficiaries in the state.[2] In Minnesota and California 37 and 42 percent of the beneficiaries were in the per capita cost calculation, respectively. At the high end, Illinois, Iowa, and Kansas had 66 percent of the beneficiaries included in the calculation. Appendix Table B.9 presents the percentages across the nine states.

[2] Data on the number of Medicare beneficiaries by state from the Kaiser Family Foundation's State Health Facts Medicare Enrollment analysis. <http://www.statehealthfacts.org/comparecat.jsp?cat=6&rgn=6&rgn=1>. Accessed March 25, 2013.

This variation may in part reflect the inverse relationship between and the percentage of beneficiaries included in the cost calculation and Medicare Advantage (MA) penetration.[3] States with lower MA penetration (for example, Illinois, Iowa, Kansas, and Nebraska) have a higher percentage of beneficiaries in the per capita cost calculations. Conversely, those states with high MA penetration, such as California and Minnesota, have a smaller percentage of beneficiaries in the calculations. This suggests that the differences in MA penetration may be related to variation in the per capita costs across states.

Figure IV.3. Total Payment Standardized and Risk Adjusted per Capita Costs for Physicians by State



F. Reliability

As described previously, reliability is defined as the extent to which variation in a measure's performance rate is due to meaningful variation in the quality or cost of care provided by the physicians (or group of physicians), rather than random variation due to the sample of cases observed. Reliability ranges from zero to one, where one indicates perfect reliability of a measure.

Across the nine states, the average reliability of the total per capita cost measure, with at least 20 cases, was 0.97 overall, 0.85 for physicians who directed care, 0.78 for physicians who influenced care, and 0.97 for physicians who contributed to care (Table IV.2).

[3] Data on MA penetration at the state level from the Kaiser Family Foundation's State Health Care Facts 2012 MA penetration analysis. <http://www.statehealthfacts.org/comparetable.jsp?cat=6&ind=329>. Accessed March 25, 2013.

Table IV.2. Reliability of Payment-Standardized and Risk-Adjusted Total per Capita Costs by Attribution Level of Care

Attribution Level	Number of Beneficiaries	Average Reliability	Average Reliability with 20+ Cases
Directed	53,290	0.64	0.85
Influenced	74,661	0.42	0.78
Contributed	92,892	0.91	0.97

Among the four chronic condition per capita costs, average reliability ranged from 0.79 (COPD patients) to 0.87 (diabetes patients) when no case minimum was specified (Table IV.4). Although it was already greater than 0.70, a value commonly regarded as the threshold for high reliability, for a one-case minimum restriction, average reliability increased by 9 percent to 15 percent when using a minimum of 20 cases. As shown in Table IV.3, the average reliability of each condition-specific per capita cost measure is well above 0.70.

Table IV.3. Reliability of Payment Standardized and Risk-Adjusted per Capita Costs by Chronic Condition

Patient Type	Number of Beneficiaries	Average Reliability with 1+ cases	Average Reliability with 20+ Cases
Diabetes	87,790	0.87	0.95
CAD	86,532	0.86	0.95
COPD	82,332	0.79	0.93
Heart failure	84,718	0.83	0.94

For more details on the reliability of per capita cost measures, see Appendix Tables B.1 through B.5 and B.10 through B.12.

G. Statistical Significance

Tables IV.4 and IV.5 present the percentage of physicians (among those with a case size of 20 or more) with per capita costs that are statistically significantly different from mean values. Statistical significance is identified in terms of *p* values that are below 0.05 (using a two-tailed test). In Table IV.4, these statistics are organized by level of care. For example, the average *p* value for physicians among "all treated" beneficiaries was 0.13, as reported in the last column.

The percentages of physicians with per capita costs significantly different from the attribution level's means are between 13 percent (directed care beneficiaries) and 68 percent (all treated beneficiaries), followed closely by contributed care beneficiaries, at 67 percent. These statistics are greatly influenced by the average case size of attributed beneficiaries; the average number of contributed beneficiaries attributed to physicians (270) is substantially higher than the average number of directed care beneficiaries (43). For each level of care, more than 50 percent of physicians were below the attribution-level mean total per capita costs.

Table IV.4. Statistical Significance of Payment-Standardized and Risk-Adjusted Total per Capita Costs by Attribution Level of Care

Level of Care	Number of Physicians (1+ Cases)	Average Number of Beneficiaries Attributed to the Physician (1+ Cases)	Total per Capita Cost (20+ Cases Only)		Statistical Significance (20+ Cases Only)	
			Mean	Standard Deviation	Percent of Physicians Statistically Different from Mean (p<.05)	Average p Value
All treated	94,585	307	$18,851	$7,183	68	0.13
Directed	53,290	43	$9,424	$3,931	13	0.44
Influenced	74,661	23	$10,134	$9,552	27	0.38
Contributed	92,892	270	$19,902	$6,726	67	0.14

Note: Statistical tests are two tailed.

In Table IV.5, information about per capita cost statistical significance is reported for the four chronic conditions of diabetes, CAD, COPD, and heart failure. The percentages of physicians (among those with a case size of 20 or more) with per capita costs that are significantly different from condition means are between 46 percent (COPD) and 56 percent (CAD). For each chronic condition except COPD, more than 50 percent of physicians (among those with a case size of 20 or more) were below the condition-specific mean total per capita costs.

Table IV.5. Statistical Significance of Payment Standardized and Risk Adjusted Total per Capita Costs by Chronic Condition

Chronic Condition	Number of Physicians (1+ Cases)	Average Number of Beneficiaries Attributed to the Physician (1+ Cases)	Total per Capita Cost (20+ Cases Only)		Statistical Significance (20+ Cases Only)	
			Mean	Standard Deviation	Percent of Physicians Statistically Different from Mean (p<.05)	Average p Value
Diabetes	87,790	106	$24,994	8,354	55	0. 9
CAD	86,532	128	$26,018	8,541	56	0.18
COPD	82,332	49	$33,459	9,640	46	0.23
Heart failure	84,718	73	$35,082	10,483	50	0.21

Note: Statistical tests are two tailed.

For more details on statistical significance of total per capita cost performance, see Appendix Tables B.13 through B.15.

H. Analysis of High-Risk Beneficiaries

Tables IV.6 and IV.7 summarize results from an analysis of risk-adjusted per capita costs for high-risk beneficiaries, defined as those with a hierarchical condition category (HCC) risk score in the top 20th or 25th percentiles among all beneficiaries in the sample. We calculated costs by level of care and level of engagement with a primary care physician (PCP). Two levels of engagement were defined based on a minimum threshold for the number of E&M visits to any PCP during 2011, either one or two E&M visits.

When applying a one-visit threshold to define a PCP's level of engagement with the beneficiary, beneficiaries with high-risk scores (the top 20 percent) incurred per capita costs between $9,194 (directed or influenced by a PCP) and $14,319 (contributed only) (Table IV.6).

Table IV.6. Total per Capita Costs for Beneficiaries: One-E&M Visit Definition

	Beneficiaries in Top 20 Percent of Risk Scores		Beneficiaries in Top 25 Percent of Risk Scores	
Groups by Level of Care and Engagement	Total per Capita Cost	Number of Beneficiaries	Total per Capita Cost	Number of Beneficiaries
A. Beneficiaries with a PCP (regardless of level of care)	$10,479	931,918	$10,457	1,174,609
B. Beneficiaries without a PCP (regardless of level of care)	$11,839	450,112	$11,831	551,809
C. Beneficiaries who are "contributed only" (regardless of PCP engagement)	$14,319	296,465	$14,443	356,270
D. Beneficiaries "directed" or "influenced" (regardless of PCP engagement)	$9,960	1,085,565	$9,931	1,370,148
E. Beneficiaries "directed" or "influenced" by a PCP	$9,194	547,982	$9,126	703,132
F. Beneficiaries "directed" or "influenced" by a physician other than a PCP	$10,010	794,906	$10,019	1,002,200

When applying a two-E&M visit threshold, beneficiaries with high risk scores (the top 20 percent) incurred per capita costs between $9,251 (directed or influenced by a PCP) and $14,319 (contributed only) (Table IV.7).

Table IV.7. Total per Capita Costs for Beneficiaries: Two-E&M Visit Definition

	Beneficiaries in Top 20 Percent of Risk Scores		Beneficiaries in Top 25 Percent of Risk Scores	
Groups by Level of Care and Engagement	Total per Capita Cost	Number of Beneficiaries	Total per Capita Cost	Number of Beneficiaries
A. Beneficiaries with a PCP (regardless of level of care)	$10,491	796,077	$10,498	999,918
B. Beneficiaries without a PCP (regardless of level of care)	$11,517	585,953	$11,462	726,500
C. Beneficiaries who are "contributed only" (regardless of PCP engagement)	$14,319	296,465	$14,443	356,270
D. Beneficiaries "directed" or "influenced" (regardless of PCP engagement)	$9,960	1,085,565	$9,931	1,370,148
E. Beneficiaries "directed" or "influenced" by a PCP	$9,251	512,076	$9,207	655,205
F. Beneficiaries "directed" or "influenced" by someone other than a PCP	$9,980	812,027	$9,979	1,024,971

The definition of engagement with a PCP (one versus two E&M visits) had little effect on the costs for a group of beneficiaries with a given level of care. For example, beneficiaries in the top 20 percent of risk scores who had a PCP under the less restrictive one visit definition had average costs of $10,479 (Group A in Table IV.6). Under the stricter two-visit definition of having a PCP, per capita costs were $10,491 (Group A in Table IV.7), a difference of less than $15. The largest difference for both risk groups with respect to PCP level of engagement was for those without a PCP (Group B), with a difference of about 3 percent ($322 for those in the top 20 percent of HCC risk scores and $370 for those in the top 25 percent).

Overall, beneficiaries whose care was directed or influenced by a physician of any specialty had lower per capita costs compared to other beneficiaries for both risk categories (top 20th and 25th percentiles) with the very lowest costs being for beneficiaries whose care was directed or influenced by a PCP. In general, beneficiaries who saw a PCP at least once (or twice) during the calendar year had lower costs than those who did not see a PCP at all during this same time frame. The highest per capita costs were among those to whose care physicians only contributed. A key conclusion is that having a physician who is more involved in one's care (that is, who directed or influenced the care) is associated with the lowest costs, on average, among high-risk beneficiaries of roughly comparable risk. Visiting a PCP during the year, regardless of the physician's level of engagement, is also associated with lower costs on average for high-risk beneficiaries.

APPENDIX A TABLES

QUALITY MEASURES

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APPENDIX A TABLES

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Table A.1. Number of Physicians who Received a QRUR by State and Specialty

Two-Digit CMS Specialty	Overall	California	Illinois	Iowa	Kansas	Michigan	Minnesota	Missouri	Nebraska	Wisconsin
Overall	94,585	32,754	13,737	3,537	2,503	12,174	10,957	7,397	1,691	9,835
Primary Care	**32,113**	**11,130**	**4,355**	**1,342**	**829**	**4,071**	**4,055**	**2,234**	**505**	**3,592**
01 = General practice	497	196	47	21	17	113	20	37	4	42
08 = Family practice	14,632	4,029	1,839	904	491	1,760	2,338	981	294	1,996
11 = Internal medicine	16,452	6,773	2,388	410	317	2,093	1,616	1,167	198	1,490
38 = Geriatric medicine	377	83	65	3	4	87	48	34	9	44
84 = Preventive medicine	155	49	16	4	0	18	33	15	0	20
Medical Specialists	**21,149**	**6,595**	**3,105**	**803**	**605**	**2,791**	**2,691**	**1,860**	**472**	**2,227**
03 = Allergy/immunology	341	115	42	21	13	24	41	19	7	59
06 = Cardiology	3,908	994	680	184	164	593	447	385	121	340
07 = Dermatology	1,163	530	121	29	17	84	158	68	9	147
09 = Interventional Pain Management	155	35	25	4	3	14	24	21	1	28
10 = Gastroenterology	1,661	521	255	58	40	163	243	151	45	185
12 = Osteopathic manipulative therapy	52	20	3	3	1	16	4	2	1	2
13 = Neurology	2,270	765	342	77	45	288	308	205	33	207
17 = Hospice and Palliative Care	74	4	12	2	4	9	17	3	4	19
21 = Cardiac Electrophysiology	148	6	20	8	2	23	33	17	6	33
25 = Physical medicine and rehabilitation	909	220	144	29	17	131	141	64	21	142
26 = Psychiatry	3,418	1,293	330	125	105	456	420	281	94	314
27 = Geriatric Psychiatry	24	13	1	0	2	1	0	2	4	1
29 = Pulmonary disease	1,351	393	229	60	37	198	137	120	30	147
39 = Nephrology	998	288	177	39	26	152	122	76	15	103
44 = Infectious disease	778	222	151	30	14	135	80	62	21	63
46 = Endocrinology	871	269	129	29	26	101	122	82	20	93
66 = Rheumatology	668	231	117	29	14	66	68	55	9	79
79 = Addiction medicine	22	8	3	1	1	1	3	1	0	4
81 = Critical care (intensivists)	461	114	58	13	11	77	57	93	1	37
82 = Hematology	147	60	22	3	1	22	15	7	3	14
83 = Hematology/oncology	1,295	379	202	49	48	166	186	93	15	157
86 = Neuropsychiatry	14	3	1	0	0	7	1	0	1	1
90 = Medical oncology	421	112	41	10	14	64	64	53	11	52
Surgeons	**16,746**	**5,379**	**2,552**	**695**	**455**	**2,133**	**2,017**	**1,363**	**327**	**1,825**

Table A.1 *(Continued)*

Two-Digit CMS Specialty	Overall	California	Illinois	Iowa	Kansas	Michigan	Minnesota	Missouri	Nebraska	Wisconsin
02 = General surgery	2,844	883	345	123	93	370	381	247	48	354
04 = Otolaryngology	1,162	407	150	53	35	109	139	108	36	125
14 = Neurosurgery	668	222	114	22	14	85	66	61	14	70
16 = Obstetrics/gynecology	4,041	1,151	648	127	96	624	510	335	81	469
18 = Ophthalmology	1,756	718	239	74	34	216	163	119	23	170
20 = Orthopedic surgery	2,862	905	435	142	93	295	391	230	58	313
24 = Plastic and reconstructive surgery	428	156	66	16	12	48	42	33	7	48
28 = Colorectal surgery (formerly proctology)	146	28	26	7	2	24	34	12	5	8
33 = Thoracic surgery	294	90	45	12	5	43	32	33	7	27
34 = Urology	1,365	465	293	50	37	182	131	67	16	124
40 = Hand surgery	158	35	29	14	4	13	27	14	2	20
76 = Peripheral vascular disease	12	2	4	0	0	0	2	0	0	4
77 = Vascular surgery	400	148	56	18	5	57	37	42	10	27
78 = Cardiac surgery	294	76	56	18	16	38	28	24	6	32
85 = Maxillofacial surgery	59	6	5	8	0	7	16	5	4	8
91 = Surgical oncology	119	44	22	6	5	6	2	18	6	10
98 = Gynecologist/oncologist	138	43	19	5	4	16	16	15	4	16
Emergency Medicine Physicians	**8,560**	**3,632**	**1,384**	**217**	**185**	**1,153**	**617**	**664**	**100**	**608**
93 = Emergency medicine	8,560	3,632	1,384	217	185	1,153	617	664	100	608
Other Physicians	**16,017**	**6,018**	**2,341**	**480**	**429**	**2,026**	**1,577**	**1,276**	**287**	**1,583**
05 = Anesthesiology	6,136	2,417	986	206	176	643	476	561	137	534
22 = Pathology	1,664	560	257	43	33	228	208	120	54	161
23 = Sports Medicine	47	0	10	1	3	6	11	4	0	12
30 = Diagnostic radiology	5,483	2,139	675	133	149	788	577	395	45	582
36 = Nuclear medicine	150	84	13	5	0	25	6	9	1	7
37 = Pediatric medicine	1,587	447	278	58	36	237	210	119	26	176
70 = Multispecialty clinic or group practice	1	0	0	0	1	0	0	0	0	0
72 = Pain management	113	21	22	7	8	22	5	11	5	12
92 = Radiation oncology	596	224	66	21	22	61	65	49	14	74
94 = Interventional radiology	240	126	34	6	1	16	19	8	5	25

Table A.2. Beneficiary Attribution by Specialty: Out of QRUR Recipients at the Specified Level of Care

Two-Digit CMS Specialty	Touched			Directed			Influenced			Contributed		
	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)
Overall	307.2	19.1	21.5	42.9	89.0	89.1	22.8	40.3	86.1	269.8	17.8	21.2
	548.7	21.3	14.6	61.8	11.7	12.8	47.7	37.4	14.9	524.3	19.4	12.2
Primary Care	**192.9**	**29.6**	**25.4**	**64.1**	**91.4**	**90.7**	**12.8**	**47.1**	**84.0**	**141.9**	**24.5**	**22.6**
	213.7	**24.6**	**16.0**	**75.2**	**10.6**	**12.1**	**19.7**	**35.6**	**15.7**	**176.1**	**21.0**	**12.6**
01 = General practice	192.9	26.4	27.2	63.2	90.2	89.7	16.2	41.4	86.0	146.4	24.5	27.2
	227.5	26.4	17.0	82.4	12.5	14.6	24.5	37.9	15.5	198.3	23.9	14.1
08 = Family practice	167.6	35.9	29.3	57.2	91.4	90.7	12.0	54.1	83.7	113.5	30.6	26.1
	175.0	22.6	15.4	63.0	9.9	11.3	16.6	32.3	15.3	141.8	19.6	12.1
11 = Internal medicine	215.2	24.3	22.0	73.2	91.4	90.8	13.3	40.4	84.1	167.0	19.2	19.5
	239.8	25.0	15.8	87.0	11.3	12.9	21.2	37.3	16.1	197.2	20.7	12.1
38 = Geriatric medicine	251.0	21.0	23.5	63.6	90.8	90.7	26.1	38.8	85.7	184.2	17.3	20.6
	200.6	18.9	12.8	78.6	10.2	10.5	43.6	35.8	15.4	148.2	16.3	10.5
84 = Preventive medicine	66.0	34.0	23.2	13.3	91.3	90.4	5.6	68.6	85.5	58.1	35.1	24.6
	266.1	23.8	17.7	23.1	12.2	14.9	8.1	38.0	18.4	263.7	25.0	19.2
Medical Specialists	**343.6**	**18.2**	**20.1**	**35.6**	**88.1**	**88.6**	**31.8**	**48.7**	**87.1**	**296.1**	**18.4**	**19.6**
	511.9	**16.7**	**13.8**	**51.8**	**11.0**	**11.4**	**53.6**	**35.7**	**13.6**	**462.8**	**16.6**	**12.1**
03 = Allergy/immunology	85.1	27.5	22.6	10.9	87.5	87.9	11.6	78.4	88.2	69.6	30.5	22.5
	90.6	14.9	13.5	13.6	12.0	12.7	13.2	23.9	12.5	73.5	14.3	11.7
06 = Cardiology	917.8	15.8	16.4	60.4	88.2	88.9	64.2	53.0	88.7	808.3	14.9	16.6
	807.5	13.2	11.4	71.0	9.3	9.4	83.4	27.6	10.2	744.2	12.2	9.6
07 = Dermatology	385.0	31.0	27.0	49.5	83.9	85.4	63.7	75.0	85.5	296.1	35.0	26.1
	504.2	15.0	13.6	64.8	11.3	11.9	87.1	24.6	11.7	432.9	15.5	12.1
09 = Interventional Pain Management	253.1	21.7	24.8	21.8	88.4	89.5	32.9	65.8	90.3	209.7	22.7	23.4
	175.5	14.4	12.5	27.3	11.3	11.9	43.6	30.0	13.2	135.7	13.7	9.9
10 = Gastroenterology	260.3	15.3	21.4	14.0	85.3	86.7	36.0	34.2	91.4	219.5	17.6	21.0
	221.5	12.8	11.1	19.5	13.1	13.5	35.3	28.8	9.2	186.5	13.8	10.4
12 = Osteopathic manipulative therapy	115.1	33.3	30.9	22.8	95.0	94.3	7.3	58.9	82.3	92.3	28.7	25.8
	190.2	22.4	17.1	25.8	8.8	11.6	8.7	38.9	18.4	186.9	20.4	11.8
13 = Neurology	211.4	24.6	19.7	26.4	87.3	87.4	17.6	59.9	86.2	178.5	25.4	19.5
	221.3	16.2	11.9	35.1	11.4	12.1	23.7	31.1	13.9	183.7	16.1	10.3

Table A.2 *(Continued)*

Two-Digit CMS Specialty	Touched			Directed			Influenced			Contributed		
	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)
17 = Hospice and Palliative Care	60.4	6.2	8.5	23.4	90.5	87.7	6.2	45.4	84.9	52.0	5.8	8.8
	84.3	12.5	8.5	46.6	15.8	25.0	8.9	44.2	20.0	63.2	9.9	6.5
21 = Cardiac Electrophysiology	925.3	9.1	13.5	25.2	85.7	86.9	71.5	48.5	91.0	835.4	9.4	14.0
	1,001.2	7.8	7.8	28.4	11.3	13.3	54.3	22.5	6.0	966.7	7.9	7.4
25 = Physical medicine and rehabilitation	198.9	18.3	18.2	17.0	87.5	88.2	15.9	53.6	88.7	175.0	19.2	17.9
	206.0	15.0	11.6	23.6	12.9	13.2	20.1	33.4	12.6	189.0	15.9	10.9
26 = Psychiatry	90.0	3.8	27.8	10.4	89.7	90.6	18.6	6.0	88.6	74.9	3.1	26.5
	113.4	11.5	18.3	17.5	14.1	13.6	24.7	19.0	15.0	96.5	9.6	16.3
27 = Geriatric Psychiatry	188.4	3.8	19.7	7.9	84.5	85.7	16.6	13.3	91.3	171.7	3.5	21.5
	134.9	5.1	10.7	9.5	12.2	11.1	16.2	20.2	8.2	121.1	4.7	10.7
29 = Pulmonary disease	324.5	15.9	14.5	29.0	87.4	87.6	14.5	59.1	86.5	289.2	16.2	15.3
	279.3	12.5	9.8	49.3	10.5	10.9	19.6	31.0	13.1	244.2	11.6	8.9
39 = Nephrology	263.8	18.0	18.0	27.0	88.2	87.9	26.6	36.8	83.9	221.9	17.7	15.9
	252.1	13.7	11.7	39.3	10.4	11.6	29.6	30.4	15.2	224.5	12.3	9.1
44 = Infectious disease	155.9	14.4	12.5	15.8	90.1	89.9	5.2	51.6	82.8	143.3	12.3	11.6
	163.6	15.7	10.8	29.4	12.0	13.0	9.1	38.7	19.4	150.6	12.2	8.2
46 = Endocrinology	219.5	28.9	19.3	32.2	88.2	87.8	12.0	76.3	83.3	182.6	30.7	19.7
	235.9	15.5	11.4	41.0	9.9	10.6	14.7	25.5	15.6	200.7	16.0	10.4
66 = Rheumatology	248.7	33.0	24.1	47.8	89.6	89.9	24.9	77.6	85.8	184.9	34.0	23.2
	239.9	14.9	12.2	52.7	8.9	9.4	32.9	23.0	13.3	182.1	15.1	10.9
79 = Addiction medicine	41.0	13.2	19.1	13.2	90.4	90.7	5.2	12.8	83.9	32.7	12.0	15.2
	40.4	17.6	12.4	15.5	15.1	15.0	6.1	27.4	17.5	31.0	15.3	8.7
81 = Critical care (intensivists)	120.9	4.6	10.4	15.5	86.2	86.0	6.5	25.6	86.8	114.9	4.5	11.9
	245.5	9.8	8.9	37.4	15.1	17.0	13.5	35.8	18.3	239.4	9.7	9.4
82 = Hematology	147.6	28.1	15.6	26.2	92.9	92.4	8.9	68.2	85.2	121.8	27.3	15.6
	274.3	17.1	8.0	31.4	8.7	9.4	11.1	32.7	16.9	255.9	16.1	7.8
83 = Hematology/oncology	199.1	32.5	20.5	43.3	92.6	92.5	16.8	74.8	83.2	151.6	31.7	19.1
	197.2	16.2	12.8	46.7	8.0	8.3	23.2	26.0	16.4	144.5	14.4	10.1
86 = Neuropsychiatry	135.4	9.3	20.6	12.0	91.7	91.5	12.6	20.5	92.0	122.1	11.2	23.5
	144.9	13.8	11.6	6.4	6.5	6.8	11.3	35.3	9.1	134.9	16.7	13.0
90 = Medical oncology	222.4	31.3	18.5	39.0	93.5	93.2	19.2	66.7	79.0	177.3	31.0	17.4
	531.4	16.8	12.1	46.9	7.1	8.1	67.5	29.7	17.4	468.7	16.4	9.9
Surgeons	**189.7**	**23.6**	**24.5**	**21.2**	**86.6**	**87.5**	**36.5**	**59.5**	**91.7**	**146.0**	**26.4**	**23.4**
	263.8	**16.2**	**13.4**	**33.0**	**12.6**	**13.7**	**61.2**	**32.1**	**10.6**	**204.9**	**17.0**	**12.1**

Table A.2 *(Continued)*

Two-Digit CMS Specialty	Touched			Directed			Influenced			Contributed		
	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)
02 = General surgery	140.1	18.3	22.0	12.4	85.1	86.7	25.3	54.1	93.3	111.0	20.7	20.2
	155.2	14.2	12.4	20.2	13.7	14.9	27.3	30.1	8.1	131.0	15.0	10.9
04 = Otolaryngology	213.3	29.6	23.8	25.8	86.6	87.1	23.1	78.7	89.0	175.3	33.8	24.4
	205.2	14.3	12.0	29.7	10.0	10.5	22.5	20.2	9.8	167.6	15.4	10.9
14 = Neurosurgery	124.8	25.5	21.8	9.7	87.8	87.7	21.5	65.4	94.9	99.3	29.3	18.6
	104.0	14.2	11.3	11.2	12.3	13.8	19.4	26.6	7.3	81.8	14.9	10.0
16 = Obstetrics/gynecology	47.4	21.6	21.5	5.9	86.2	86.0	5.7	52.6	89.4	40.5	23.8	23.0
	77.1	16.0	13.5	9.4	15.6	17.5	9.9	36.4	15.3	66.8	16.5	13.0
18 = Ophthalmology	397.8	16.2	30.1	32.2	85.5	87.7	107.0	34.8	89.4	285.8	17.7	29.0
	433.2	15.7	14.1	51.7	12.8	13.2	135.6	32.7	11.0	301.3	17.4	11.8
20 = Orthopedic surgery	222.4	30.7	28.5	29.0	87.7	89.0	44.0	72.0	94.3	161.3	34.6	25.5
	194.9	15.5	13.4	28.6	9.3	10.2	42.3	24.8	7.0	139.2	15.5	11.9
24 = Plastic and reconstructive surgery	81.1	25.9	27.1	9.6	87.9	89.0	19.2	64.9	91.3	57.8	29.5	22.8
	85.0	14.1	12.9	14.8	12.6	13.7	21.4	26.9	9.4	58.9	14.4	11.2
28 = Colorectal surgery (formerly proctology)	183.2	20.2	25.2	11.7	85.9	88.3	35.9	56.9	94.1	140.7	22.8	22.5
	126.2	11.0	11.9	10.2	11.4	9.9	26.1	22.6	4.1	95.9	10.7	9.7
33 = Thoracic surgery	142.5	15.6	22.3	7.6	85.1	86.4	28.8	52.1	96.5	114.7	19.0	17.3
	187.7	12.5	11.9	13.8	16.0	17.2	25.1	27.8	4.7	175.6	13.5	9.1
34 = Urology	368.6	32.6	27.0	55.5	87.9	88.8	53.9	72.7	90.2	278.9	35.3	25.6
	317.1	16.9	13.4	53.8	9.3	9.7	45.3	24.7	9.1	239.4	16.8	11.9
40 = Hand surgery	213.3	30.6	28.4	23.0	87.3	89.5	33.5	78.8	93.3	164.0	33.8	26.2
	164.7	14.3	11.4	19.8	7.5	6.6	21.8	18.1	5.2	132.3	12.0	10.4
76 = Peripheral vascular disease	649.7	11.1	12.2	26.5	83.8	82.3	37.4	53.8	88.8	590.2	11.9	14.5
	584.3	6.8	4.5	18.7	13.4	16.2	43.8	37.2	6.1	531.4	8.1	5.1
77 = Vascular surgery	498.0	18.3	17.5	20.8	86.7	87.7	46.6	60.4	91.2	448.7	19.5	16.4
	590.3	13.5	10.6	21.5	11.1	12.4	59.0	26.7	9.0	552.5	14.6	8.1
78 = Cardiac surgery	134.7	12.9	24.4	8.8	82.6	83.9	38.6	45.6	96.2	96.8	17.2	18.7
	176.8	10.1	11.1	21.2	17.7	20.2	32.8	24.2	6.0	160.6	13.0	10.8
85 = Maxillofacial surgery	40.3	17.1	18.8	4.6	90.4	91.4	6.1	53.6	90.2	34.1	20.2	18.9
	66.2	13.7	11.4	6.4	13.8	11.3	8.1	37.4	12.3	58.2	14.7	15.0
91 = Surgical oncology	126.4	25.7	20.8	8.7	86.0	87.2	14.3	76.8	92.3	111.7	29.3	19.1
	162.0	15.3	11.6	11.8	14.6	13.8	12.7	25.8	8.5	154.2	15.1	7.3
98 = Gynecologist/oncologist	122.4	33.0	24.8	19.8	90.9	91.5	17.0	80.6	92.1	90.8	36.5	23.7

Table A.2 *(Continued)*

Two-Digit CMS Specialty	Touched			Directed			Influenced			Contributed		
	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)	Average Number of Beneficiaries Attributed (Standard Deviation)	Average Percent of Total E&M Visits (Standard Deviation)	Average Percent of Total Part B Charges (Standard Deviation)
	107.0	13.9	11.4	22.0	10.1	11.6	12.9	21.7	10.3	81.0	14.2	10.5
Emergency Medicine Physicians	**315.0**	**2.5**	**18.5**	**16.9**	**86.4**	**85.1**	**11.2**	**4.7**	**84.6**	**302.7**	**2.6**	**21.0**
	226.5	**9.0**	**10.2**	**41.6**	**15.1**	**17.8**	**10.2**	**17.5**	**12.6**	**219.8**	**9.5**	**9.8**
93 = Emergency medicine	315.0	2.5	18.5	16.9	86.4	85.1	11.2	4.7	84.6	302.7	2.6	21.0
	226.5	9.0	10.2	41.6	15.1	17.8	10.2	17.5	12.6	219.8	9.5	9.8
Other Physicians	**607.1**	**3.4**	**14.0**	**10.9**	**87.1**	**87.2**	**22.8**	**9.5**	**83.0**	**597.2**	**3.2**	**18.2**
	1,052.6	**11.4**	**12.5**	**22.8**	**16.2**	**18.4**	**69.6**	**25.2**	**18.7**	**1,020.1**	**10.7**	**12.4**
05 = Anesthesiology	167.3	1.3	15.6	13.0	87.7	86.2	4.0	8.1	79.1	165.3	1.4	22.2
	145.1	6.1	10.7	23.6	15.3	21.1	10.3	23.2	26.4	143.0	6.0	10.4
22 = Pathology	562.5	0.2	9.8	21.9	87.4	89.8	21.3	0.6	80.9	548.2	0.2	14.5
	1,780.2	2.8	8.9	39.9	18.7	16.4	161.5	6.5	19.1	1,655.5	2.5	10.0
23 = Sports Medicine	173.5	30.9	22.7	26.2	89.4	90.1	21.6	81.2	88.0	131.0	33.2	21.3
	138.0	11.5	9.6	25.4	7.0	6.7	19.7	16.3	14.0	102.6	9.7	7.8
30 = Diagnostic radiology	1,335.7	0.2	11.6	2.6	86.4	88.6	33.4	1.7	84.8	1,306.4	0.2	15.2
	1,145.4	2.1	11.6	3.2	18.9	19.4	55.1	8.9	13.1	1,125.3	2.1	11.9
36 = Nuclear medicine	702.5	0.4	11.8	26.8	88.3	89.7	21.7	4.1	83.5	683.2	0.3	15.2
	782.7	2.2	10.0	49.4	11.9	10.6	39.3	17.0	15.9	774.4	1.8	10.8
37 = Pediatric medicine	25.7	18.0	15.9	10.8	88.9	88.7	5.8	42.6	80.4	22.8	15.5	16.6
	92.3	24.8	18.8	27.5	16.7	18.0	9.6	40.1	21.6	84.2	22.6	18.3
70 = Multispecialty clinic or group practice	458.0	43.5	35.6	70.0	94.9	95.5	58.0	80.4	95.0	330.0	44.5	30.4
72 = Pain management	251.4	22.6	25.3	25.3	89.8	91.3	45.3	68.1	90.6	193.0	23.5	24.6
	174.1	15.9	15.9	35.4	11.9	11.1	65.0	31.6	11.5	129.5	15.4	12.9
92 = Radiation oncology	175.3	19.1	23.0	7.1	84.1	84.4	29.0	68.2	89.2	147.4	23.0	20.8
	384.3	14.7	14.3	8.1	15.7	17.6	28.3	30.2	12.2	377.6	16.0	11.4
94 = Interventional radiology	626.5	2.3	13.4	6.7	84.4	88.1	23.0	13.8	84.9	606.9	2.3	14.8
	878.5	6.5	10.6	22.7	19.9	18.7	31.0	24.2	14.7	863.6	6.7	10.7

Table A.3. Individual and Group Combined—PQRS Measure Performance

PQRS Measures		Performance Statistics								
		Number of Physicians Who Reported (20+ Cases)	Mean Rate	10th Percentile	90th Percentile	Standard Deviation	Percent of Physicians Statistically Different From Mean (5% Level; 20+ Cases)	Percent of Physicians Significantly Different from Mean (5% Level) and at Least One Standard Deviation From Mean (Case Size 20+)	Coefficient of Variation	Average Reliability (Case Size 20+)
Diabetes Mellitus (DM) Measures Group										
1	Diabetes Mellitus: Hemoglobin A1c Poor Control in Diabetes Mellitus	3,357	24.9	0	67	27.1	53.0	6.0	109.1	0.901
2	Diabetes Mellitus: Low Density Lipoprotein (LDL-C) Control in Diabetes Mellitus	3,198	57.1	6	91	27.2	36.1	9.8	47.6	0.854
3	Diabetes Mellitus: High Blood Pressure Control in Diabetes Mellitus	3,191	75.7	50	100	23.5	33.8	5.4	31.1	0.825
117	Diabetes Mellitus: Dilated Eye Exam in Diabetic Patient	574	36.5	0	100	44.1	86.7	21.7	120.8	0.995
119	Diabetes Mellitus: Urine Screening for Microalbumin or Medical Attention for Nephropathy in Diabetic Patients	1,699	80.3	50	100	22.3	48.1	7.7	27.8	0.897
126	Diabetes Mellitus: Diabetic Foot and Ankle Care, Peripheral Neuropathy - Neurological Evaluation	21	87.7	41	100	28.5	100.0	50.0	32.5	0.998
127	Diabetes Mellitus: Diabetic Foot and Ankle Care, Ulcer Prevention - Evaluation of Footwear	39	9.7	0	50	28.7	100.0	0.0	296.3	0.998
163	Diabetes Mellitus: Foot Exam	366	55.5	0	100	42.4	78.5	11.0	76.3	0.987
Chronic Kidney Disease (CKD) Measures Group										
121	Chronic Kidney Disease (CKD): Laboratory Testing (Calcium, Phosphorus, Intact Parathyroid Hormone (iPTH) and Lipid Profile)	45	29.4	0	100	36.0	77.3	36.4	122.3	0.978
122	Chronic Kidney Disease (CKD): Blood Pressure Management	209	46.2	0	100	34.5	49.7	13.1	74.6	0.940
123	Chronic Kidney Disease (CKD): Plan of Care - Elevated Hemoglobin for Patients Receiving Erythropoiesis-Stimulating Agents (ESA)	10	98.5	100	100	5.0			5.1	1.000
153	Chronic Kidney Disease (CKD): Referral for Arteriovenous (AV) Fistula	8	28.3	0	100	39.7	71.4	0.0	140.2	0.966
Preventive Care Measures Group										
39	Screening or Therapy for Osteoporosis for Women Aged 65 Years and Older	1,785	57.4	13	100	29.2	70.9	23.5	50.8	0.969
48	Urinary Incontinence: Assessment of Presence or Absence of Urinary Incontinence in Women Aged 65 Years and Older	455	45.1	0	100	45.4	95.7	11.4	100.6	0.996
110	Preventive Care and Screening: Influenza Immunization for Patients >=50 Years Old	4,857	43.4	12	75	23.9	69.0	26.0	55.0	0.963
111	Preventive Care and Screening: Pneumonia Vaccination for Patients 65 Years and Older	4,473	55.0	11	93	28.8	77.9	32.6	52.3	0.975
112	Preventive Care and Screening: Screening Mammography	2,687	50.3	6	88	28.6	58.8	26.3	56.8	0.939
113	Preventive Care and Screening: Colorectal Cancer Screening	3,449	44.3	4	83	30.2	78.9	39.7	68.2	0.971
128	Preventive Care and Screening: Body Mass Index (BMI) Screening and Follow-Up	2,343	45.4	10	98	27.9	63.0	22.0	61.4	0.979
173	Preventive Care and Screening: Unhealthy Alcohol Use - Screening	315	76.6	0	100	37.6	85.7	6.1	49.0	0.996
226	Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention	4,032	70.2	18	100	33.1	85.1	29.3	47.2	0.985

Table A.3 *(Continued)*

PQRS Measures		Performance Statistics								
		Number of Physicians Who Reported (20+ Cases)	Mean Rate	10th Percentile	90th Percentile	Standard Deviation	Percent of Physicians Statistically Different From Mean (5% Level; 20+ Cases)	Percent of Physicians Significantly Different from Mean (5% Level) and at Least One Standard Deviation From Mean (Case Size 20+)	Coefficient of Variation	Average Reliability (Case Size 20+)
Coronary Artery Bypass Graft (CABG) Measures Group										
43	Coronary Artery Bypass Graft (CABG): Use of Internal Mammary Artery (IMA) in Patients with Isolated CABG Surgery	65	97.3	99.5	100	14.4	33.3	25.0	14.8	0.937
44	Coronary Artery Bypass Graft (CABG): Preoperative Beta-Blocker in Patients with Isolated CABG Surgery	53	94.6	89	100	17.2	15.4	15.4	18.1	0.968
164	Coronary Artery Bypass Graft (CABG): Prolonged Intubation (Ventilation)									
165	Coronary Artery Bypass Graft (CABG): Deep Sternal Wound Infection Rate	3	0.0	0	0	0.0				
166	Coronary Artery Bypass Graft (CABG): Stroke/Cerebrovascular Accident (CVA)									
167	Coronary Artery Bypass Graft (CABG): Postoperative Renal Insufficiency									
168	Coronary Artery Bypass Graft (CABG): Surgical Re-exploration									
169	Coronary Artery Bypass Graft (CABG): Antiplatelet Medications at Discharge	3	100.0	100	100	0.0			0.0	
170	Coronary Artery Bypass Graft (CABG): Beta-Blockers Administered at Discharge									
171	Coronary Artery Bypass Graft (CABG): Lipid Management and Counseling									
Rheumatoid Arthritis (RA) Measures Group										
108	Rheumatoid Arthritis (RA): Disease Modifying Anti-Rheumatic Drug (DMARD)Therapy	36	90.1	66	100	19.6	63.2	31.6	21.7	0.985
176	Rheumatoid Arthritis (RA): Tuberculosis Screening	6	70.1	0	100	42.8	50.0	0.0	61.1	0.990
177	Rheumatoid Arthritis (RA): Periodic Assessment of Disease Activity	11	94.1	99	100	24.2	100.0	0.0	25.8	1.000
178	Rheumatoid Arthritis (RA): Functional Status Assessment	6	87.0	67	100	30.4	50.0	0.0	34.9	0.992
179	Rheumatoid Arthritis (RA): Assessment and Classification of Disease Prognosis	6	87.5	64	100	29.4	50.0	0.0	33.6	0.894
180	Rheumatoid Arthritis (RA): Glucocorticoid Management	5	90.9	89	100	27.5	0.0	0.0	30.3	0.980
Perioperative Care Measures Group										
20	Perioperative Care: Timing of Antibiotic Prophylaxis - Ordering Physician	228	93.8	84	100	20.3	42.3	15.4	21.6	0.993
21	Perioperative Care: Selection of Prophylactic Antibiotic - First OR Second Generation Cephalosporin	311	95.7	90	100	15.1	20.4	13.0	15.8	0.975
22	Perioperative Care: Discontinuation of Prophylactic Antibiotics (Non-Cardiac Procedures)	267	96.1	100	100	16.8	55.6	50.0	17.4	0.992
23	Perioperative Care: Venous Thromboembolism (VTE) Prophylaxis (When Indicated in ALL Patients)	298	94.8	99	100	20.2	29.2	16.7	21.3	0.994
Back Pain Measures Group										
148	Back Pain: Initial Visit									
149	Back Pain: Physical Exam									

Table A.3 *(Continued)*

PQRS Measures		Performance Statistics								
		Number of Physicians Who Reported (20+ Cases)	Mean Rate	10th Percentile	90th Percentile	Standard Deviation	Percent of Physicians Statistically Different From Mean (5% Level; 20+ Cases)	Percent of Physicians Significantly Different from Mean (5% Level) and at Least One Standard Deviation From Mean (Case Size 20+)	Coefficient of Variation	Average Reliability (Case Size 20+)
150	Back Pain: Advice for Normal Activities									
151	Back Pain: Advice Against Bed Rest									
Hepatitis C Measures Group										
84	Hepatitis C: Ribonucleic Acid (RNA) Testing Before Initiating Treatment	0	100.0	100	100	0.0			0.0	
85	Hepatitis C: HCV Genotype Testing Prior to Treatment	0	100.0	100	100	0.0			0.0	
86	Hepatitis C: Antiviral Treatment Prescribed	4	22.5	0	100	37.5	50.0	0.0	167.1	0.989
87	Hepatitis C: HCV Ribonucleic Acid (RNA) Testing at Week 12 of Treatment	1	87.9	67	100	30.8			35.0	1.000
89	Hepatitis C: Counseling Regarding Risk of Alcohol Consumption	4	24.2	0	100	41.0			169.6	1.000
90	Hepatitis C: Counseling Regarding Use of Contraception Prior to Antiviral Therapy	0	100.0	100	100	0.0			0.0	
183	Hepatitis C: Hepatitis A Vaccination in Patients with HCV	6	47.9	0	100	42.6	75.0	25.0	88.8	0.975
184	Hepatitis C: Hepatitis B Vaccination in Patients with HCV	5	57.4	0	100	38.9	50.0	25.0	67.6	0.953
Coronary Artery Disease (CAD) Measures Group										
6	Coronary Artery Disease (CAD): Oral Antiplatelet Therapy Prescribed for Patients with CAD	1,526	81.1	33	100	28.7	68.4	11.6	35.4	0.978
7	Coronary Artery Disease (CAD): Beta-Blocker Therapy for CAD Patients with Prior Myocardial Infarction (MI)	278	83.6	50	100	24.2	48.8	7.7	28.9	0.948
196	Coronary Artery Disease (CAD): Symptom and Activity Assessment	153	72.8	14	99	33.5	92.1	18.6	46.0	0.993
197	Coronary Artery Disease (CAD): Drug Therapy for Lowering LDL-Cholesterol	525	84.7	60	100	19.9	59.8	8.4	23.4	0.926
Ischemic Vascular Disease (IVD) Measures Group										
201	Ischemic Vascular Disease (IVD): Blood Pressure Management Control	1,165	78.8	56	100	19.7	38.3	7.9	25.1	0.877
202	Ischemic Vascular Disease (IVD): Complete Lipid Profile	301	42.1	0	94	40.4	92.5	34.0	96.0	0.984
203	Ischemic Vascular Disease (IVD): Low Density Lipoprotein (LDL-C) Control	1,049	49.1	0	78	28.7	53.4	7.2	58.4	0.948
204	Ischemic Vascular Disease (IVD): Use of Aspirin or Another Antithrombotic	955	75.1	32	100	26.2	59.8	8.2	34.9	0.930
Community-Acquired Pneumonia (CAP) Measures Group										
56	Community-Acquired Pneumonia (CAP): Vital Signs	2,009	93.5	89	100	21.6	25.8	8.9	23.1	0.988
57	Community-Acquired Pneumonia (CAP): Assessment of Oxygen Saturation	2,077	94.2	88	100	18.9	20.1	11.5	20.0	0.981
58	Community-Acquired Pneumonia (CAP): Assessment of Mental Status	2,060	97.9	97	100	10.3	7.3	7.0	10.5	0.956
59	Community-Acquired Pneumonia (CAP): Empiric Antibiotic	1,711	92.2	80	100	22.2	22.6	4.9	24.1	0.979
Asthma Measures Group										
53	Asthma: Pharmacologic Therapy	0	81.4	0	100	34.6			42.5	
64	Asthma: Asthma Assessment	0	14.3	0	100	34.8			243.6	

Table A.3 *(Continued)*

PQRS	Measures	Performance Statistics: Number of Physicians Who Reported (20+ Cases)	Mean Rate	10th Percentile	90th Percentile	Standard Deviation	Percent of Physicians Statistically Different From Mean (5% Level; 20+ Cases)	Percent of Physicians Significantly Different from Mean (5% Level) and at Least One Standard Deviation From Mean (Case Size 20+)	Coefficient of Variation	Average Reliability (Case Size 20+)
231	Asthma: Tobacco Use: Screening- Ambulatory Care Setting	0	100.0	100	100	0.0			0.0	
232	Asthma: Tobacco Use: Intervention- Ambulatory Care Setting	0	83.3	50	100	28.9			34.6	
Heart Failure (HF) Measures Group										
5	Heart Failure: Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction (LVSD)	156	93.3	78	100	15.0	31.0	21.2	16.1	0.876
8	Heart Failure: Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction (LVSD)	179	96.0	88	100	8.7	6.7	2.9	9.1	0.718
198	Heart Failure: Left Ventricular Function (LVF) Assessment	178	82.5	44	99	26.8	88.2	8.1	32.5	0.986
199	Heart Failure: Patient Education	152	50.3	5	100	36.4	76.4	47.2	72.5	0.988
200	Heart Failure: Warfarin Therapy Patients with Atrial Fibrillation	143	53.6	0	100	38.8	65.3	33.7	72.4	0.977
HIV/AIDS Measures Group										
159	HIV/AIDS: CD4+ Cell Count or CD4+ Percentage	15	93.1	75	100	8.9	15.4	0.0	9.6	0.647
160	HIV/AIDS: Pneumocystis Jiroveci Pneumonia (PCP) Prophylaxis	0	74.2	33	100	27.6			37.2	
161	HIV/AIDS: Adolescent and Adult Patients with HIV/AIDS Who Are Prescribed Potent Antiretroviral Therapy	1	100.0	100	100	0.0			0.0	
162	HIV/AIDS: HIV RNA Control After Six Months of Potent Antiretroviral Therapy	1	85.8	41.5	100	25.3	100.0	0.0	29.6	0.989
205	HIV/AIDS: Sexually Transmitted Disease Screening for Chlamydia and Gonorrhea	12	96.0	90	100	3.5	11.1	0.0	3.7	0.482
206	HIV/AIDS: Screening for High Risk Sexual Behaviors	1	95.0	88	100	6.0	0.0	0.0	6.3	
207	HIV/AIDS: Screening for Injection Drug Use	1	87.6	63	100	14.7	100.0	0.0	16.8	0.946
208	HIV/AIDS: Sexually Transmitted Disease Screening for Syphilis	12	95.8	94	98	2.8	0.0	0.0	3.0	
Other (Non-Group) Measures										
9	Major Depressive Disorder (MDD): Antidepressant Medication During Acute Phase for Patients with MDD	88	35.0	0	100	33.1	64.6	8.5	94.4	0.922
10	Stroke and Stroke Rehabilitation: Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) Reports	546	71.6	25	100	30.6	66.1	22.2	42.7	0.956
12	Primary Open Angle Glaucoma (POAG): Optic Nerve Evaluation	251	94.9	88	100	16.5	59.4	20.3	17.4	0.978
14	Age-Related Macular Degeneration (AMD): Dilated Macular Examination	283	76.4	0	100	40.2	89.8	13.6	52.6	0.998
18	Diabetic Retinopathy: Documentation of Presence or Absence of Macular Edema and Level of Severity of Retinopathy	152	80.8	0	100	38.1	85.7	7.1	47.2	0.999
19	Diabetic Retinopathy: Communication with the Physician Managing On-going Diabetes Care	99	92.8	75	100	21.8	78.6	71.4	23.5	0.992
24	Osteoporosis: Communication with the Physician Managing On-going Care Post- Fracture of Hip, Spine, or Distal Radius for Men and Women Aged 50 Years and Older	20	51.2	0	100	46.1	100.0	25.0	90.0	0.993
28	Aspirin at Arrival for Acute Myocardial Infarction (AMI)	24	87.7	50	100	25.2	28.6	7.1	28.7	0.876

Table A.3 *(Continued)*

PQRS	Measures	Performance Statistics: Number of Physicians Who Reported (20+ Cases)	Mean Rate	10th Percentile	90th Percentile	Standard Deviation	Percent of Physicians Statistically Different From Mean (5% Level; 20+ Cases)	Percent of Physicians Significantly Different from Mean (5% Level) and at Least One Standard Deviation From Mean (Case Size 20+)	Coefficient of Variation	Average Reliability (Case Size 20+)
30	Perioperative Care: Timely Administration of Prophylactic Parenteral Antibiotics	2,740	94.3	86	100	12.2	37.3	9.7	12.9	0.939
31	Stroke and Stroke Rehabilitation: Deep Vein Thrombosis Prophylaxis (DVT) for Ischemic Stroke or Intracranial Hemorrhage	28	84.1	0	100	32.6	60.0	20.0	38.8	0.991
32	Stroke and Stroke Rehabilitation: Discharged on Antiplatelet Therapy	38	89.2	47	100	27.2	47.1	11.8	30.5	0.977
33	Stroke and Stroke Rehabilitation: Anticoagulant Therapy Prescribed for Atrial Fibrillation at Discharge	0	89.0	50	100	27.1			30.5	
35	Stroke and Stroke Rehabilitation: Screening for Dysphagia	11	94.4	96	100	19.5	50.0	0.0	20.7	0.985
36	Stroke and Stroke Rehabilitation: Consideration of Rehabilitation Services	23	74.0	9	100	33.8	77.8	22.2	45.7	0.973
40	Osteoporosis: Management Following Fracture of Hip, Spine or Distal Radius for Men and Women Aged 50 Years and Older	71	57.2	0	100	37.3	66.1	12.9	65.2	0.948
41	Osteoporosis: Pharmacologic Therapy for Men and Women Aged 50 Years and Older	102	67.9	0	100	31.7	43.3	8.9	46.7	0.883
45	Perioperative Care: Discontinuation of Prophylactic Antibiotics (Cardiac Procedures)	105	99.8	100	100	0.8	0.0	0.0	0.8	0.937
46	Medication Reconciliation: Reconciliation After Discharge from an Inpatient Facility	166	94.8	80	100	9.5	13.9	10.9	10.1	0.805
47	Advance Care Plan	2,066	46.9	0	100	36.5	84.2	34.0	77.9	0.990
49	Urinary Incontinence: Characterization of Urinary Incontinence in Women Aged 65 Years and Older	94	77.4	0	100	40.1	75.0	0.0	51.9	0.999
50	Urinary Incontinence: Plan of Care for Urinary Incontinence in Women Aged 65 Years and Older	94	71.7	0	100	43.4	57.1	7.1	60.5	0.997
51	Chronic Obstructive Pulmonary Disease (COPD): Spirometry Evaluation	106	86.2	39	100	27.3	76.8	32.1	31.6	0.989
52	Chronic Obstructive Pulmonary Disease (COPD): Bronchodilator Therapy	72	99.5	100	100	4.5	0.0	0.0	4.5	0.985
54	12-Lead Electrocardiogram (ECG) Performed for Non-Traumatic Chest Pain	3,662	97.2	93	100	8.3	6.5	3.6	8.6	0.794
55	12-Lead Electrocardiogram (ECG) Performed for Syncope	1,046	97.9	94	100	8.1	5.0	5.0	8.2	0.878
65	Treatment for Children with Upper Respiratory Infection (URI): Avoidance of Inappropriate Use	0	100.0	100	100					
66	Appropriate Testing for Children with Pharyngitis									
67	Myelodysplastic Syndrome (MDS) and Acute Leukemias: Baseline Cytogenetic Testing Performed on Bone Marrow	5	97.9	94	100	6.5	75.0	75.0	6.7	0.568
68	Myelodysplastic Syndrome (MDS): Documentation of Iron Stores in Patients Receiving Erythropoietin Therapy	0	94.4	86	100	19.7			20.9	
69	Multiple Myeloma: Treatment with Bisphosphonates	6	87.5	50	100	25.2	100.0	100.0	28.8	0.905
70	Chronic Lymphocytic Leukemia (CLL): Baseline Flow Cytometry	25	90.6	67	100	23.5	30.0	0.0	25.9	0.934
71	Breast Cancer: Hormonal Therapy for Stage IC-IIIC Estrogen Receptor/ Progesterone Receptor (ER/PR) Positive Breast Cancer	84	73.5	0	100	42.9	92.3	15.4	58.3	0.998
72	Colon Cancer: Chemotherapy for Stage III Colon Cancer Patients	3	79.7	0	100	39.6			49.7	1.000

Table A.3 *(Continued)*

PQRS	Measures	Performance Statistics								
		Number of Physicians Who Reported (20+ Cases)	Mean Rate	10th Percentile	90th Percentile	Standard Deviation	Percent of Physicians Statistically Different From Mean (5% Level; 20+ Cases)	Percent of Physicians Significantly Different from Mean (5% Level) and at Least One Standard Deviation From Mean (Case Size 20+)	Coefficient of Variation	Average Reliability (Case Size 20+)
76	Prevention of Catheter-Related Bloodstream Infections (CRBSI): Central Venous Catheter (CVC) Insertion Protocol	324	82.3	0	100	35.1	70.6	24.4	42.6	0.992
79	End Stage Renal Disease (ESRD): Influenza Immunization in Patients with ESRD	9	83.1	57	100	19.7	0.0	0.0	23.7	0.933
81	End Stage Renal Disease (ESRD): Plan of Care for Inadequate Hemodialysis in ESRD Patients									
82	End Stage Renal Disease (ESRD): Plan of Care for Inadequate Peritoneal Dialysis									
83	Hepatitis C: Testing for Chronic Hepatitis C - Confirmation of Hepatitis C Viremia	0	45.4	0	100	51.0			112.5	
91	Acute Otitis Externa (AOE): Topical Therapy	6	82.2	0	100	33.1	100.0	100.0	40.3	0.971
92	Acute Otitis Externa (AOE): Pain Assessment	6	94.3	75	100	18.9	100.0	100.0	20.0	0.893
93	Acute Otitis Externa (AOE): Systemic Antimicrobial Therapy - Avoidance of Inappropriate Use	6	80.9	0	100	34.9	66.7	0.0	43.1	0.968
94	Otitis Media with Effusion (OME): Diagnostic Evaluation - Assessment of Tympanic Membrane Mobility									
99	Breast Cancer Resection Pathology Reporting: pT Category (Primary Tumor) and pN Category (Regional Lymph Nodes) with Histologic Grade	17	98.6	100	100	8.5	0.0	0.0	8.6	0.953
100	Colorectal Cancer Resection Pathology Reporting: pT Category (Primary Tumor) and pN Category (Regional Lymph Nodes) with Histologic Grade	1	98.8	100	100	8.1			8.2	1.000
102	Prostate Cancer: Avoidance of Overuse of Bone Scan for Staging Low-Risk Prostate Cancer Patients	1	84.4	0	100	33.9			40.1	1.000
104	Prostate Cancer: Adjuvant Hormonal Therapy for High-Risk Prostate Cancer Patients	2	89.6	67	100	20.6			23.0	1.000
105	Prostate Cancer: Three-Dimensional (3D) Radiotherapy	15	100.0	100	100	0.0			0.0	
106	Major Depressive Disorder (MDD): Diagnostic Evaluation	29	39.2	0	100	43.4	90.9	0.0	110.8	0.994
107	Major Depressive Disorder (MDD): Suicide Risk Assessment	35	29.9	0	100	43.3	100.0	44.4	144.7	0.996
109	Osteoarthritis (OA): Function and Pain Assessment	27	72.7	0	100	40.4	100.0	23.1	55.7	0.998
116	Antibiotic Treatment for Adults with Acute Bronchitis: Avoidance of Inappropriate Use	0	80.0	0	100	36.8			46.0	
118	Coronary Artery Disease (CAD): Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Patients with CAD and Diabetes and/or Left Ventricular Systolic Dysfunction (LVSD)	256	84.5	62	100	18.0	51.4	13.1	21.4	0.943
124	Health Information Technology (HIT): Adoption/Use of Electronic Health Records (EHR)	9,073	99.2	100	100	8.2	64.0	48.2	8.3	0.999
130	Documentation of Current Medications in the Medical Record	4,534	83.9	47	100	24.6	86.7	16.8	29.4	0.992
131	Pain Assessment Prior to Initiation of Patient Therapy and Follow-Up	2	99.1	100	100	5.0			5.1	1.000
134	Screening for Clinical Depression and Follow-Up Plan	3	78.5	20	100	31.4			40.1	1.000
135	Chronic Kidney Disease (CKD): Influenza Immunization	2	69.6	29	100	32.4	50.0	50.0	46.6	0.883

Table A.3 *(Continued)*

PQRS	Measures	Performance Statistics: Number of Physicians Who Reported (20+ Cases)	Mean Rate	10th Percentile	90th Percentile	Standard Deviation	Percent of Physicians Statistically Different From Mean (5% Level; 20+ Cases)	Percent of Physicians Significantly Different from Mean (5% Level) and at Least One Standard Deviation From Mean (Case Size 20+)	Coefficient of Variation	Average Reliability (Case Size 20+)
137	Melanoma: Continuity of Care - Recall System	40	92.5	82	100	23.5	57.1	14.3	25.4	0.987
138	Melanoma: Coordination of Care	4	88.7	34.5	100	29.3	0.0	0.0	33.0	0.983
140	Age-Related Macular Degeneration (AMD): Counseling on Antioxidant Supplement	180	68.2	0	100	43.3	77.8	13.0	63.5	0.997
141	Primary Open-Angle Glaucoma (POAG): Reduction of Intraocular Pressure (IOP) by 15% OR Documentation of a Plan of Care	68	92.3	84	100	23.6	58.3	25.0	25.6	0.993
142	Osteoarthritis (OA): Assessment for Use of Anti-Inflammatory or Analgesic Over-the-Counter (OTC) Medications	17	69.8	12	100	36.1	90.9	54.5	51.7	0.978
143	Oncology: Medical and Radiation - Pain Intensity Quantified	5	99.0	95	100	2.2	0.0	0.0	2.3	0.967
144	Oncology: Medical and Radiation - Plan of Care for Pain	5	94.0	91	98	2.7	0.0	0.0	2.9	
145	Radiology: Exposure Time Reported for Procedures Using Fluoroscopy	1,157	64.3	0	100	37.6	81.8	20.4	58.5	0.985
146	"Radiology: Inappropriate Use of "Probably Benign" Assessment Category in Mammography Screening"	962	3.2	0	2	16.0	64.7	10.5	499.1	0.999
147	Nuclear Medicine: Correlation with Existing Imaging Studies for All Patients Undergoing Bone Scintigraphy	252	64.2	0	100	36.0	69.9	17.2	56.0	0.966
154	Falls: Risk Assessment	50	65.2	0	100	40.4	80.8	23.1	61.9	0.990
155	Falls: Plan of Care	49	47.6	0	100	41.2	74.2	32.3	86.4	0.985
156	Oncology: Radiation Dose Limits to Normal Tissues	2	98.2	100	100	8.5	0.0	0.0	8.7	
157	Thoracic Surgery: Recording of Clinical Stage for Lung Cancer and Esophageal Cancer Resection	2	100.0	100	100	0.0			0.0	
158	Carotid Endarterectomy: Use of Patch During Conventional Carotid Endarterectomy	9	98.3	100	100	8.8	50.0	50.0	9.0	0.930
172	Hemodialysis Vascular Access Decision-Making by Surgeon to Maximize Placement of Autogenous Arterial Venous (AV) Fistula	5	93.9	85	100	21.1			22.4	1.000
175	Pediatric End Stage Renal Disease (ESRD): Influenza Immunization									
181	Elder Maltreatment Screen and Follow-Up Plan									
182	Functional Outcome Assessment in Chiropractic Care									
185	Endoscopy & Polyp Surveillance: Colonoscopy Interval for Patients with a History of Adenomatous Polyps - Avoidance of Inappropriate Use	88	99.0	96	100	4.6	0.0	0.0	4.6	0.894
186	Wound Care: Use of Compression System in Patients with Venous Ulcers	3	87.9	0	100	32.2	100.0	0.0	36.6	0.985
187	Stroke and Stroke Rehabilitation: Thrombolytic Therapy									
188	Referral for Otologic Evaluation for Patients with Congenital or Traumatic Deformity of the Ear									
189	Referral for Otologic Evaluation for Patients with a History of Active Drainage From the Ear Within the Previous 90 Days									
190	Referral for Otologic Evaluation for Patients with a History of Sudden or Rapidly Progressive Hearing Loss									

Table A.3 *(Continued)*

PQRS	Measures	Performance Statistics								
		Number of Physicians Who Reported (20+ Cases)	Mean Rate	10th Percentile	90th Percentile	Standard Deviation	Percent of Physicians Statistically Different From Mean (5% Level; 20+ Cases)	Percent of Physicians Significantly Different from Mean (5% Level) and at Least One Standard Deviation From Mean (Case Size 20+)	Coefficient of Variation	Average Reliability (Case Size 20+)
191	Cataracts: 20/40 or Better Visual Acuity Within 90 Days Following Cataract Surgery	1	96.0	96	96					
192	Cataracts: Complications within 30 Days Following Cataract Surgery Requiring Additional Surgical Procedures	1	2.0	2	2					
193	Perioperative Temperature Management	1,328	90.7	74	100	15.6	54.5	15.3	17.2	0.941
194	Oncology: Cancer Stage Documented	64	54.9	0	100	48.8	100.0	0.0	88.9	0.998
195	Radiology: Stenosis Measurement in Carotid Imaging Studies	858	66.2	6	100	35.7	77.9	22.1	53.9	0.978
209	Functional Communication Measure - Spoken Language Comprehension									
210	Functional Communication Measure - Attention									
211	Functional Communication Measure - Memory									
212	Functional Communication Measure - Motor Speech									
213	Functional Communication Measure - Reading									
214	Functional Communication Measure - Spoken Language Expression									
215	Functional Communication Measure - Writing									
216	Functional Communication Measure - Swallowing									
217	Functional Deficit: Change in Risk-Adjusted Functional Status for Patients with Knee Impairments									
218	Functional Deficit: Change in Risk-Adjusted Functional Status for Patients with Hip Impairments									
219	Functional Deficit: Change in Risk-Adjusted Functional Status for Patients with Lower Leg, Foot or Ankle Impairments	0	50.0	50	50					
220	Functional Deficit: Change in Risk-Adjusted Functional Status for Patients with Lumbar Spine Impairments	0	100.0	100	100					
221	Functional Deficit: Change in Risk-Adjusted Functional Status for Patients with Shoulder Impairments	0	0.0	0	0					
222	Functional Deficit: Change in Risk-Adjusted Functional Status for Patients with Elbow, Wrist or Hand Impairments									
223	Functional Deficit: Change in Risk-Adjusted Functional Status for Patients with Neck, Cranium, Mandible, Thoracic Spine, Ribs, or Other General Orthopedic Impairments	0	100.0	100	100					
224	Melanoma: Overutilization of Imaging Studies in Stage 0-IA Melanoma	27	93.2	71	100	17.8	60.0	50.0	19.0	0.969
225	Radiology: Reminder System for Mammograms	448	66.8	0	100	44.4	96.9	54.3	66.5	0.999
227	Heart Failure: Weight Measurement									
228	Heart Failure (HF): Left Ventricular Function (LVF) Testing	4	97.8	92.5	100	5.8	0.0	0.0	6.0	0.733
229	Diabetes Mellitus: Hemoglobin A1c Testing									
230	Diabetes Mellitus: Lipid Profile									
233	Thoracic Surgery: Recording of Performance Status Prior to Lung or Esophageal Cancer Resection									

Table A.3 *(Continued)*

PQRS Measures		Performance Statistics								
		Number of Physicians Who Reported (20+ Cases)	Mean Rate	10th Percentile	90th Percentile	Standard Deviation	Percent of Physicians Statistically Different From Mean (5% Level; 20+ Cases)	Percent of Physicians Significantly Different from Mean (5% Level) and at Least One Standard Deviation From Mean (Case Size 20+)	Coefficient of Variation	Average Reliability (Case Size 20+)
234	Thoracic Surgery: Pulmonary Function Tests Before Major Anatomic Lung Resection (Pneumonectomy, Lobectomy, or Formal Segmentectomy)									
235	Hypertension (HTN): Plan of Care	142	81.7	29	100	28.8	81.4	20.6	35.2	0.988
236	Hypertension (HTN): Blood Pressure Control									
237	Hypertension (HTN): Blood Pressure Measurement	4	0.0	0	0	0.0				
238	Drugs to be Avoided in the Elderly	54	0.0	0	0	0.0				
239	Weight Assessment and Counseling for Children and Adolescents									
240	Childhood Immunization Status									

Table A.4. Summary Descriptive and Statistical Analyses for the 2011 QRUR Claims=Based Quality Measures

Clinical Condition and Measure	Statistical Analysis (Case Size 20+)							
	Number of Physicians	Average Case Size in Denominator	Mean	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	Average p Value	Percent of Physicians With Reliability Above 0.7	Average Measure Reliability
Chronic Obstructive Pulmonary Disease (COPD)								
Pharmacotherapy Management of COPD Exacerbation								
1. Dispensed Systemic Corticosteroid Within 14 Days of Event	10,061	45.4	74.6	30.6	0.3	0.319	43.7	0.682
2. Dispensed Bronchodilator Within 30 Days of Event	10,061	45.4	77.5	26.3	0.5	0.346	42.9	0.672
Use of Spirometry Testing to Diagnose COPD*	33,855	70.2	32.1	31.0	8.0	0.316	50.4	0.704
Bone, Joint, and Muscle Disorders								
Osteoporosis Screening for Chronic Steroid Use	2,400	30.5	61.6	14.5	0.6	0.423	1.7	0.454
Osteoporosis Management in Women ≥ 67 Who Had a Fracture*	5,167	38.5	17.4	16.1	0.5	0.417	3.3	0.412
Disease-Modifying Antirheumatic Drug Therapy for Rheumatoid Arthritis	2,870	36.3	81.0	29.5	1.4	0.333	47.7	0.703
Cancer								
Breast Cancer Surveillance for Women with a History of Breast Cancer	342	27.5	88.2	47.9	0.0	0.268	63.7	0.773
PSA Monitoring for Men with Prostate Cancer	59	36.9	97.1	19.4	0.0	0.285	86.4	0.870
Diabetes								
Dilated Eye Exam for Beneficiaries ≤ 75 with Diabetes*	56,861	93.1	73.0	41.0	12.5	0.261	93.8	0.862
HbA1c Testing for Beneficiaries ≤ 75 with Diabetes*	56,861	93.1	85.8	32.7	2.4	0.308	54.5	0.707
Urine Protein Screening for Beneficiaries ≤ 75 with Diabetes*	56,861	93.1	76.4	34.7	9.2	0.293	68.4	0.767
Lipid Profile for Beneficiaries ≤ 75 with Diabetes*	56,861	93.1	78.7	38.6	6.2	0.273	75.0	0.788
Gynecology								
Endometrial Sampling or Hysteroscopy with Biopsy Before Endometrial Ablation Procedure*	0							
Heart Conditions								
Adherence to Statin Therapy for Beneficiaries with Coronary Artery Disease*	15,034	53.7	63.3	11.8	1.1	0.437	0.5	0.296
Persistence of Beta-Blocker Treatment After Heart Attack	9	23.9	68.8	11.1	0.0	0.459	0.0	0.206
Lipid Profile for Beneficiaries with Ischemic Vascular Disease*	50,665	109.7	73.0	31.4	7.5	0.313	51.9	0.704
Human Immunodeficiency Virus (HIV)								
Monitoring for Disease Activity for Beneficiaries with HIV	2,403	35.8	37.5	55.4	20.6	0.183	100.0	0.872
Mental Health								
Antidepressant Treatment for Depression								
1. Acute Phase Treatment (at least 12 weeks)*	821	28.0	52.8	7.3	0.0	0.462	0.1	0.237
2. Continuation Phase Treatment (at least 6 months)*	821	28.0	36.0	9.5	0.0	0.441	0.1	0.314
Follow-Up After Hospitalization for Mental Illness								
1. Percentage of Patients Receiving Follow-Up Within 30 Days*	10,189	47.5	57.6	35.6	4.7	0.287	68.8	0.754

Table A.4 *(Continued)*

Clinical Condition and Measure	Statistical Analysis (Case Size 20+)							
	Number of Physicians	Average Case Size in Denominator	Mean	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	Average p Value	Percent of Physicians With Reliability Above 0.7	Average Measure Reliability
2. Percentage of Patients Receiving Follow-Up Within 7 Days*	10,189	47.5	31.2	29.3	0.9	0.323	40.5	0.672
Prevention								
Breast Cancer Screening for Women ≤ 69*	59,541	84.3	63.3	41.1	13.8	0.258	81.6	0.801
Medication Management								
Viral Load Testing for Beneficiaries with Antiviral Therapy for Hepatitis C	1	23.0	95.7	0.0	0.0	0.426	100.0	0.813
Lipid Profile for Beneficiaries Who Started Lipid-Lowering Medications*	47,916	76.6	40.3	15.8	5.7	0.411	9.8	0.436
Annual Monitoring for Beneficiaries on Persistent Medications								
1. Angiotensin Converting Enzyme (ACE) Inhibitors or Angiotensin Receptor Blockers (ARB)[A, D]	42,253	75.5	93.9	15.9	2.3	0.417	38.3	0.611
2. Digoxin	1,990	34.1	94.4	3.7	1.3	0.547	25.8	0.483
3. Diuretics	37,060	67.6	94.3	13.8	1.9	0.434	35.8	0.590
4. Anticonvulsants	217	34.8	80.8	54.2	0.5	0.209	96.3	0.845
5. Total Rate (sum of 4 previous numerators divided by sum of 4 previous denominators)	55,045	115.7	94.0	27.2	2.6	0.344	62.7	0.748
Anticoagulation Treatment ≥ 3 Months After Deep Vein Thrombosis	1,141	29.1	37.4	30.2	0.8	0.307	26.1	0.657
Anticoagulation Treatment ≥ 3 Months After Pulmonary Embolism	250	27.8	31.8	36.8	0.4	0.293	16.8	0.583
International Normalized Ratio (INR) Testing for Beneficiaries Taking Warfarin and Interacting Anti-Infective Medications	4,860	36.3	8.9	6.1	0.6	0.498	5.6	0.139
NOTE: *For the measures shown below, lower percentages reflect better performance*								
Drugs to Be Avoided for Beneficiaries ≥ 65								
1. Patients Who Receive at Least One Drug to Be Avoided*	68,777	185.0	24.7	34.2	7.9	0.297	52.8	0.693
2. Patients Who Receive at Least Two Different Drugs to Be Avoided*	68,777	185.0	5.0	25.5	2.9	0.358	44.0	0.636
Potentially Harmful Drug-Disease Interactions for Beneficiaries ≥ 65								
1. Prescription for Tricyclic Antidepressants, Antipsychotics, or Sleep Agents for Patients with a History of Falls	20,280	51.7	21.5	14.1	1.2	0.426	2.6	0.348
2. Prescription for Tricyclic Antidepressants or Anticholinergic Agents for Patients with Dementia	23,588	59.2	31.4	17.3	2.3	0.396	8.3	0.452
3. Prescription for Nonaspirin NSAIDs or Cox-2 Selective NSAIDs for Patients with Chronic Renal Failure	5,997	39.2	11.3	15.5	3.3	0.401	20.6	0.554
4. Total Rate (sum of 3 previous numerators divided by sum of 3 previous denominators)	41,236	81.6	24.4	17.9	3.5	0.399	10.3	0.446
Lack of Monthly INR Monitoring for Beneficiaries on Warfarin*	27,821	60.2	50.6	35.1	12.8	0.279	44.8	0.699

*Measure used for the PQRS Administrative Claims Reporting Mechanism in 2013.

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APPENDIX B TABLES

COST MEASURES

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APPENDIX B TABLES

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Table B.1. Reliability of Overall Payment Standardized and Risk Adjusted per Capita Cost for Touched Patients for Eligible Physicians

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
Overall*	78,450	369.3	78,444	78,272	0.905	0.973
Primary Care						
01 = General Practice	391	243.5	391	391	0.884	0.975
08 = Family practice	12,539	194.7	12,539	12,472	0.861	0.942
11 = Internal medicine	13,285	265.4	13,285	13,285	0.914	0.988
38 = Geriatric medicine	348	271.3	348	348	0.950	0.981
84 = Preventive medicine	66	147.5	66	66	0.702	0.945
Medical Specialists						
03 = Allergy/immunology	250	114.0	250	247	0.778	0.916
06 = Cardiology	3,573	1,003.2	3,573	3,569	0.948	0.988
07 = Dermatology	940	475.4	937	917	0.799	0.934
09 = Interventional Pain Management	143	273.9	143	143	0.927	0.971
10 = Gastroenterology	1,439	299.8	1,439	1,439	0.940	0.989
12 = Osteopathic manipulative therapy	42	140.4	42	41	0.876	0.932
13 = Neurology	1,897	251.8	1,897	1,897	0.932	0.987
17 = Hospice and Palliative Care	57	75.6	57	57	0.950	0.972
21 = Cardiac Electrophysiology	144	950.8	144	144	0.968	0.982
25 = Physical medicine and rehabilitation	739	243.3	739	739	0.929	0.990
26 = Psychiatry	2,454	122.9	2,454	2,454	0.873	0.975
27 = Geriatric Psychiatry	23	196.6	23	23	0.940	0.976
29 = Pulmonary disease	1,245	351.6	1,245	1,245	0.954	0.985
39 = Nephrology	859	305.5	859	859	0.970	0.995
44 = Infectious disease	647	186.1	647	647	0.956	0.993
46 = Endocrinology	748	254.7	748	748	0.955	0.992
66 = Rheumatology	590	280.8	590	589	0.907	0.964
79 = Addiction medicine	12	69.9	12	12	0.873	0.981
81 = Critical care (intensivists)	332	166.5	332	332	0.936	0.996
82 = Hematology	123	174.9	123	123	0.962	0.992
83 = Hematology/oncology	1,096	234.3	1,096	1,096	0.945	0.992
86 = Neuropsychiatry	10	185.7	10	10	0.905	0.971
90 = Medical oncology	374	249.7	374	374	0.932	0.983
Surgeons						
02 = General surgery	2,398	165.1	2,398	2,398	0.928	0.984
04 = Otolaryngology	935	264.1	935	935	0.874	0.977

Table B.1 *(Continued)*

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
14 = Neurosurgery	574	144.3	574	574	0.958	0.992
16 = Obstetrics/gynecology	2,493	72.4	2,493	2,439	0.712	0.879
18 = Ophthalmology	1,401	497.3	1,401	1,384	0.833	0.955
20 = Orthopedic surgery	2,435	260.5	2,435	2,435	0.905	0.978
24 = Plastic and reconstructive surgery	333	102.5	333	333	0.854	0.951
28 = Colorectal surgery (formerly proctology)	131	203.6	131	131	0.884	0.945
33 = Thoracic surgery	254	164.0	254	254	0.948	0.989
34 = Urology	1,139	440.9	1,139	1,139	0.897	0.984
40 = Hand surgery	145	232.2	145	145	0.859	0.921
76 = Peripheral vascular disease	12	649.7	12	12	0.953	0.953
77 = Vascular surgery	326	609.8	326	326	0.958	0.996
78 = Cardiac surgery	258	152.7	258	258	0.963	0.991
85 = Maxillofacial surgery	33	66.9	33	33	0.778	0.942
91 = Surgical oncology	96	155.6	96	96	0.909	0.985
98 = Gynecologist/oncologist	120	139.6	120	120	0.899	0.953
Emergency Medicine Physicians						
93 = Emergency medicine	7,633	352.2	7,633	7,633	0.948	0.984
Other Physicians						
05 = Anesthesiology	5,557	184.0	5,557	5,557	0.954	0.983
22 = Pathology	1,370	681.6	1,370	1,370	0.942	0.992
23 = Sports Medicine	44	185.2	42	38	0.801	0.850
30 = Diagnostic radiology	5,188	1,411.1	5,188	5,187	0.972	0.989
36 = Nuclear medicine	117	898.3	117	117	0.926	0.989
37 = Pediatric medicine	253	144.1	253	253	0.832	0.993
70 = Multispecialty clinic or group practice**	1	458.0				
72 = Pain management	106	267.7	106	106	0.941	0.971
92 = Radiation oncology	521	199.6	521	521	0.931	0.980
94 = Interventional radiology	211	711.2	211	211	0.944	0.980

*This row excludes specialties without a valid reliability measure.

**A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, (3) or the number of physicians was one.

Table B.2. Reliability of Overall Payment Standardized and Risk Adjusted per Capita Cost for Diabetes Patients for Eligible Physicians

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
Overall*	64,985	140.4	64,961	64,531	0.866	0.950
Primary Care						
01 = General Practice	314	93.6	314	312	0.822	0.929
08 = Family practice	9,829	64.4	9,829	9,623	0.785	0.885
11 = Internal medicine	11,659	97.5	11,659	11,659	0.901	0.970
38 = Geriatric medicine	316	99.4	316	316	0.914	0.954
84 = Preventive medicine	28	75.5	28	28	0.529	0.919
Medical Specialists						
03 = Allergy/immunology	121	38.8	121	119	0.674	0.859
06 = Cardiology	3,446	367.3	3,446	3,445	0.930	0.974
07 = Dermatology	825	117.1	811	679	0.708	0.810
09 = Interventional Pain Management	131	84.5	131	131	0.902	0.936
10 = Gastroenterology	1,298	98.3	1,298	1,298	0.915	0.969
12 = Osteopathic manipulative therapy	23	66.7	23	20	0.650	0.852
13 = Neurology	1,521	88.5	1,521	1,521	0.905	0.975
17 = Hospice and Palliative Care	21	49.1	21	21	0.900	0.968
21 = Cardiac Electrophysiology	134	345.5	134	134	0.953	0.979
25 = Physical medicine and rehabilitation	615	90.5	615	615	0.908	0.976
26 = Psychiatry	1,299	53.9	1,299	1,299	0.833	0.963
27 = Geriatric Psychiatry	18	73.5	18	18	0.851	0.945
29 = Pulmonary disease	1,152	131.5	1,152	1,152	0.935	0.971
39 = Nephrology	828	169.3	828	828	0.952	0.990
44 = Infectious disease	537	92.0	537	537	0.936	0.983
46 = Endocrinology	684	152.4	684	684	0.913	0.969
66 = Rheumatology	486	79.2	486	486	0.919	0.971
79 = Addiction medicine	5	25.8	5	5	0.656	0.875
81 = Critical care (intensivists)	280	69.7	280	280	0.945	0.991
82 = Hematology	82	62.7	82	82	0.967	0.995
83 = Hematology/oncology	869	80.8	869	869	0.945	0.983
86 = Neuropsychiatry	6	104.0	6	6	0.831	0.977
90 = Medical oncology	292	79.6	292	292	0.910	0.965
Surgeons						
02 = General surgery	1,865	64.2	1,865	1,865	0.901	0.963
04 = Otolaryngology	794	76.9	794	794	0.884	0.956

Table B.2 *(Continued)*

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
14 = Neurosurgery	424	50.6	424	424	0.928	0.973
16 = Obstetrics/gynecology	552	36.7	552	543	0.588	0.868
18 = Ophthalmology	1,239	178.7	1,239	1,229	0.802	0.931
20 = Orthopedic surgery	2,103	78.6	2,103	2,102	0.855	0.932
24 = Plastic and reconstructive surgery	171	45.8	171	171	0.886	0.975
28 = Colorectal surgery (formerly proctology)	117	56.1	117	117	0.790	0.865
33 = Thoracic surgery	199	70.9	199	199	0.937	0.978
34 = Urology	1,073	137.2	1,073	1,072	0.886	0.951
40 = Hand surgery	133	60.1	124	76	0.672	0.703
76 = Peripheral vascular disease	11	258.8	11	11	0.922	0.935
77 = Vascular surgery	306	256.1	306	306	0.953	0.996
78 = Cardiac surgery	205	63.6	205	205	0.962	0.990
85 = Maxillofacial surgery	6	46.2	6	6	0.549	0.862
91 = Surgical oncology	69	52.1	69	69	0.838	0.930
98 = Gynecologist/oncologist	80	47.0	80	80	0.788	0.888
Emergency Medicine Physicians						
93 = Emergency medicine	7,057	136.0	7,057	7,048	0.897	0.961
Other Physicians						
05 = Anesthesiology	4,762	65.3	4,762	4,760	0.901	0.949
22 = Pathology	1,239	211.6	1,239	1,239	0.925	0.984
23 = Sports Medicine	30	66.0	30	29	0.706	0.855
30 = Diagnostic radiology	4,850	476.7	4,850	4,847	0.941	0.979
36 = Nuclear medicine	107	312.6	107	107	0.942	0.994
37 = Pediatric medicine	135	73.4	135	135	0.800	0.988
70 = Multispecialty clinic or group practice**	1	117.0				
72 = Pain management	92	90.7	92	92	0.860	0.920
92 = Radiation oncology	366	72.4	366	366	0.909	0.972
94 = Interventional radiology	180	281.3	180	180	0.936	0.983

*This row excludes specialties without a valid reliability measure.

**A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, (3) or the number of physicians was one.

Table B.3. Reliability of Overall Payment Standardized and Risk Adjusted per Capita Cost for CAD Patients for Eligible Physicians

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
Overall*	64,576	169.2	64,521	64,028	0.860	0.946
Primary Care						
01 = General Practice	315	106.8	315	315	0.897	0.975
08 = Family practice	9,508	69.6	9,508	9,301	0.776	0.881
11 = Internal medicine	11,583	110.7	11,583	11,582	0.894	0.966
38 = Geriatric medicine	317	118.0	317	317	0.915	0.951
84 = Preventive medicine	36	73.5	36	35	0.576	0.905
Medical Specialists						
03 = Allergy/immunology	120	44.0	120	119	0.704	0.882
06 = Cardiology	3,503	563.0	3,503	3,503	0.952	0.987
07 = Dermatology	853	152.8	800	617	0.680	0.768
09 = Interventional Pain Management	134	95.1	134	132	0.872	0.907
10 = Gastroenterology	1,308	108.4	1,308	1,308	0.894	0.951
12 = Osteopathic manipulative therapy	22	80.5	22	22	0.707	0.899
13 = Neurology	1,569	102.3	1,569	1,569	0.884	0.961
17 = Hospice and Palliative Care	26	48.7	26	26	0.891	0.957
21 = Cardiac Electrophysiology	140	560.9	140	140	0.957	0.981
25 = Physical medicine and rehabilitation	614	105.4	614	614	0.915	0.978
26 = Psychiatry	922	58.4	922	922	0.816	0.967
27 = Geriatric Psychiatry	19	88.9	19	19	0.878	0.932
29 = Pulmonary disease	1,162	163.6	1,162	1,162	0.935	0.971
39 = Nephrology	821	157.5	821	819	0.931	0.975
44 = Infectious disease	531	96.0	531	531	0.948	0.988
46 = Endocrinology	641	107.9	641	641	0.918	0.968
66 = Rheumatology	498	90.6	498	492	0.813	0.897
79 = Addiction medicine	5	29.4	5	5	0.460	0.788
81 = Critical care (intensivists)	284	80.5	284	284	0.922	0.980
82 = Hematology	86	73.2	86	86	0.911	0.969
83 = Hematology/oncology	899	91.5	899	899	0.896	0.957
86 = Neuropsychiatry	5	112.0	5	5	0.829	0.986
90 = Medical oncology	307	88.9	307	307	0.906	0.959
Surgeons						
02 = General surgery	1,863	71.0	1,863	1,863	0.900	0.963
04 = Otolaryngology	819	94.5	819	819	0.852	0.934

Table B.3 *(Continued)*

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
14 = Neurosurgery	443	58.5	443	443	0.925	0.971
16 = Obstetrics/gynecology	492	40.0	492	468	0.520	0.835
18 = Ophthalmology	1,250	174.2	1,250	1,227	0.801	0.913
20 = Orthopedic surgery	2,108	93.0	2,108	2,104	0.865	0.932
24 = Plastic and reconstructive surgery	175	50.8	175	175	0.858	0.961
28 = Colorectal surgery (formerly proctology)	117	69.1	116	105	0.757	0.834
33 = Thoracic surgery	220	89.6	220	220	0.936	0.980
34 = Urology	1,084	179.2	1,084	1,084	0.903	0.961
40 = Hand surgery	135	69.3	135	114	0.764	0.793
76 = Peripheral vascular disease	12	359.3	12	12	0.899	0.899
77 = Vascular surgery	311	326.3	311	311	0.932	0.988
78 = Cardiac surgery	227	89.2	227	227	0.947	0.980
85 = Maxillofacial surgery	8	46.1	8	8	0.715	0.940
91 = Surgical oncology	66	58.7	66	66	0.862	0.957
98 = Gynecologist/oncologist	67	46.8	67	67	0.757	0.890
Emergency Medicine Physicians						
93 = Emergency medicine	7,064	157.8	7,064	7,059	0.899	0.963
Other Physicians						
05 = Anesthesiology	4,852	73.9	4,852	4,850	0.892	0.941
22 = Pathology	1,246	246.7	1,246	1,246	0.922	0.984
23 = Sports Medicine	29	68.6	29	29	0.705	0.860
30 = Diagnostic radiology	4,862	552.7	4,862	4,862	0.953	0.986
36 = Nuclear medicine	107	396.1	107	107	0.891	0.987
37 = Pediatric medicine	126	86.4	126	126	0.788	0.989
70 = Multispecialty clinic or group practice**	1	137.0				
72 = Pain management	93	101.6	93	93	0.884	0.929
92 = Radiation oncology	389	80.8	389	389	0.864	0.942
94 = Interventional radiology	182	308.3	182	182	0.904	0.972

*This row excludes specialties without a valid reliability measure.

**A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, (3) or the number of physicians was one.

Table B.4. Reliability of Overall Payment Standardized and Risk Adjusted per Capita Cost for COPD Patients for Eligible Physicians

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
Overall*	42,819	86.3	42,792	42,306	0.787	0.928
Primary Care						
01 = General Practice	199	62.7	199	199	0.746	0.929
08 = Family practice	4,494	41.2	4,494	4,445	0.654	0.861
11 = Internal medicine	7,855	56.8	7,855	7,855	0.830	0.945
38 = Geriatric medicine	216	58.3	216	216	0.843	0.940
84 = Preventive medicine	8	58.5	8	7	0.387	0.902
Medical Specialists						
03 = Allergy/immunology	50	39.5	50	50	0.588	0.874
06 = Cardiology	3,247	167.0	3,247	3,247	0.912	0.958
07 = Dermatology	493	53.1	477	267	0.522	0.706
09 = Interventional Pain Management	96	49.5	96	95	0.764	0.861
10 = Gastroenterology	879	51.2	879	879	0.820	0.919
12 = Osteopathic manipulative therapy	10	59.5	10	10	0.568	0.901
13 = Neurology	837	51.6	837	837	0.876	0.973
17 = Hospice and Palliative Care	11	36.8	11	11	0.814	0.946
21 = Cardiac Electrophysiology	126	156.5	126	126	0.933	0.974
25 = Physical medicine and rehabilitation	336	54.3	336	336	0.899	0.982
26 = Psychiatry	600	45.3	600	600	0.749	0.954
27 = Geriatric Psychiatry	12	43.2	12	12	0.751	0.907
29 = Pulmonary disease	1,097	127.8	1,097	1,097	0.914	0.961
39 = Nephrology	578	60.3	578	577	0.871	0.943
44 = Infectious disease	336	60.1	336	336	0.900	0.979
46 = Endocrinology	350	46.5	350	350	0.797	0.937
66 = Rheumatology	307	44.1	307	304	0.701	0.854
79 = Addiction medicine**	1	25.0	1	1	0.480	0.803
81 = Critical care (intensivists)	198	55.6	198	198	0.908	0.972
82 = Hematology	29	49.1	29	29	0.878	0.980
83 = Hematology/oncology	541	50.3	541	541	0.852	0.957
86 = Neuropsychiatry	4	63.8	4	4	0.730	0.972
90 = Medical oncology	156	50.6	156	156	0.761	0.925
Surgeons						
02 = General surgery	857	43.2	857	857	0.861	0.966
04 = Otolaryngology	492	45.1	492	491	0.738	0.880
14 = Neurosurgery	167	33.7	167	167	0.779	0.924

Table B.4 *(Continued)*

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
16 = Obstetrics/gynecology	69	33.0	69	69	0.485	0.898
18 = Ophthalmology	894	59.1	893	717	0.634	0.792
20 = Orthopedic surgery	1,212	39.5	1,212	1,211	0.740	0.879
24 = Plastic and reconstructive surgery	50	31.2	50	50	0.795	0.962
28 = Colorectal surgery (formerly proctology)	51	32.0	51	51	0.697	0.857
33 = Thoracic surgery	130	51.0	130	130	0.888	0.964
34 = Urology	823	57.8	823	819	0.787	0.884
40 = Hand surgery	46	30.6	37	6	0.436	0.599
76 = Peripheral vascular disease	10	106.9	10	10	0.805	0.879
77 = Vascular surgery	278	118.4	278	278	0.881	0.959
78 = Cardiac surgery	111	43.8	111	111	0.904	0.973
85 = Maxillofacial surgery	2	32.5	2	2	0.611	0.928
91 = Surgical oncology	18	34.1	18	18	0.668	0.882
98 = Gynecologist/oncologist	17	26.9	17	17	0.587	0.854
Emergency Medicine Physicians						
93 = Emergency medicine	6,266	75.8	6,266	6,264	0.850	0.937
Other Physicians						
05 = Anesthesiology	2,182	40.2	2,182	2,182	0.800	0.923
22 = Pathology	971	93.5	971	971	0.876	0.965
23 = Sports Medicine	13	35.5	13	11	0.527	0.786
30 = Diagnostic radiology	4,527	234.1	4,527	4,524	0.911	0.969
36 = Nuclear medicine	102	127.5	102	102	0.824	0.937
37 = Pediatric medicine	65	55.8	65	65	0.831	0.988
70 = Multispecialty clinic or group practice**	1	43.0				
72 = Pain management	73	49.9	73	72	0.761	0.879
92 = Radiation oncology	181	54.5	181	181	0.839	0.957
94 = Interventional radiology	145	164.5	145	145	0.870	0.971

*This row excludes specialties without a valid reliability measure.

**A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, (3) or the number of physicians was one.

Table B.5. Reliability of Overall Payment Standardized and Risk Adjusted per Capita Cost for Heart Failure Patients for Eligible Physicians

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
Overall*	53,049	111.5	53,048	52,864	0.827	0.939
Primary Care						
01 = General Practice	228	76.9	228	228	0.821	0.955
08 = Family practice	6,403	46.7	6,403	6,300	0.697	0.862
11 = Internal medicine	10,017	73.7	10,017	10,017	0.862	0.953
38 = Geriatric medicine	295	82.8	295	295	0.890	0.943
84 = Preventive medicine	14	73.6	14	14	0.477	0.920
Medical Specialists						
03 = Allergy/immunology	39	32.9	39	39	0.596	0.876
06 = Cardiology	3,436	314.4	3,436	3,431	0.922	0.969
07 = Dermatology	689	72.3	689	662	0.737	0.860
09 = Interventional Pain Management	110	53.4	110	104	0.774	0.845
10 = Gastroenterology	1,121	61.4	1,121	1,120	0.855	0.932
12 = Osteopathic manipulative therapy	11	82.7	11	11	0.619	0.929
13 = Neurology	1,218	61.8	1,218	1,218	0.831	0.944
17 = Hospice and Palliative Care	18	41.4	18	18	0.902	0.968
21 = Cardiac Electrophysiology	137	394.3	137	137	0.946	0.975
25 = Physical medicine and rehabilitation	489	68.1	489	489	0.874	0.963
26 = Psychiatry	501	52.4	501	501	0.746	0.963
27 = Geriatric Psychiatry	17	57.1	17	17	0.783	0.889
29 = Pulmonary disease	1,120	109.9	1,120	1,120	0.921	0.961
39 = Nephrology	790	126.8	790	788	0.915	0.972
44 = Infectious disease	479	75.2	479	479	0.898	0.966
46 = Endocrinology	511	68.3	511	511	0.879	0.965
66 = Rheumatology	409	50.6	409	409	0.862	0.945
79 = Addiction medicine	1	32.0	1	1	0.425	0.839
81 = Critical care (intensivists)	249	58.9	249	249	0.900	0.970
82 = Hematology	57	49.9	57	57	0.893	0.974
83 = Hematology/oncology	700	57.3	700	700	0.897	0.966
86 = Neuropsychiatry	5	71.8	5	5	0.887	0.991
90 = Medical oncology	198	58.0	198	198	0.928	0.981
Surgeons						
02 = General surgery	1,294	48.6	1,294	1,294	0.888	0.968
04 = Otolaryngology	608	53.0	608	608	0.786	0.898

Table B.5 *(Continued)*

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
14 = Neurosurgery	247	35.3	247	247	0.867	0.957
16 = Obstetrics/gynecology	120	35.5	120	120	0.627	0.940
18 = Ophthalmology	1,104	89.0	1,104	1,101	0.795	0.909
20 = Orthopedic surgery	1,638	48.2	1,638	1,633	0.781	0.889
24 = Plastic and reconstructive surgery	89	37.3	89	89	0.863	0.975
28 = Colorectal surgery (formerly proctology)	73	37.7	73	71	0.725	0.838
33 = Thoracic surgery	158	59.0	158	158	0.924	0.978
34 = Urology	983	80.7	983	971	0.824	0.895
40 = Hand surgery	87	35.0	87	80	0.730	0.811
76 = Peripheral vascular disease	11	185.5	11	10	0.864	0.876
77 = Vascular surgery	296	185.6	296	296	0.912	0.973
78 = Cardiac surgery	172	57.5	172	172	0.945	0.984
85 = Maxillofacial surgery	1	37.0	1	1	0.587	0.868
91 = Surgical oncology	29	41.4	29	29	0.699	0.892
98 = Gynecologist/oncologist	30	35.0	30	30	0.693	0.893
Emergency Medicine Physicians						
93 = Emergency medicine	6,747	104.2	6,747	6,742	0.879	0.952
Other Physicians						
05 = Anesthesiology	3,593	45.2	3,593	3,593	0.852	0.931
22 = Pathology	1,124	126.1	1,124	1,124	0.900	0.971
23 = Sports Medicine	19	39.9	19	19	0.685	0.876
30 = Diagnostic radiology	4,720	320.6	4,720	4,717	0.936	0.979
36 = Nuclear medicine	106	203.2	106	105	0.806	0.942
37 = Pediatric medicine	91	63.2	91	91	0.823	0.990
70 = Multispecialty clinic or group practice**	1	48.0				
72 = Pain management	79	52.1	79	78	0.806	0.899
92 = Radiation oncology	197	61.7	197	197	0.732	0.890
94 = Interventional radiology	170	198.7	170	170	0.919	0.983

*This row excludes specialties without a valid reliability measure.

**A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, (3) or the number of physicians was one.

Table B.6. Total per Capita Costs Across All Nine States

	Mean (Dollars)	Standard Deviation
Total Per Capita Costs	18,735	10,390
Diabetes	25,016	13,062
Coronary Artery Disease	25,906	12,361
Chronic Obstructive Pulmonary Disease	32,946	16,897
Heart Failure	34,545	17,148

Table B.7. Descriptive Analysis of Payment Standardized and Risk Adjusted per Capita Costs by Attribution Level, Physician Specialty Stratification

		Touched			Directed			Influenced			Contributed		
Two-Digit CMS Specialty	State	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation
Overall	All	307.2	18,735	10,390	42.9	10,044	10,704	22.8	8,618	11,215	269.8	19,921	10,337
Primary Care	**All**	**192.9**	**16,161**	**9,428**	**64.1**	**8,440**	**8,097**	**12.8**	**5,777**	**7,510**	**141.9**	**18,102**	**9,432**
01 = General practice	All	192.9	15,818	8,944	63.2	8,260	13,620	16.2	5,580	7,366	146.4	17,477	8,747
08 = Family practice	All	167.6	13,316	6,706	57.2	7,771	5,918	12.0	4,096	5,266	113.5	15,489	7,202
11 = Internal medicine	All	215.2	18,678	10,728	73.2	9,263	9,971	13.3	7,464	8,928	167.0	20,430	10,543
38 = Geriatric medicine	All	251.0	18,528	7,413	63.6	9,222	5,290	26.1	6,330	7,222	184.2	20,629	7,424
84 = Preventive medicine	All	66.0	12,913	10,350	13.3	7,112	8,499	5.6	4,487	7,201	58.1	14,306	10,971
Medical Specialists	**All**	**343.6**	**19,466**	**10,531**	**35.6**	**11,094**	**10,370**	**31.8**	**8,864**	**11,124**	**296.1**	**20,761**	**10,587**
03 = Allergy/immunology	All	85.1	13,933	7,196	10.9	7,472	6,409	11.6	6,367	6,081	69.6	15,499	7,706
06 = Cardiology	All	917.8	19,749	5,720	60.4	10,799	6,668	64.2	9,159	7,350	808.3	20,701	5,759
07 = Dermatology	All	385.0	10,554	4,874	49.5	5,661	5,259	63.7	4,224	3,530	296.1	12,375	6,140
09 = Interventional Pain Management	All	253.1	17,395	6,197	21.8	11,303	9,934	32.9	8,082	4,157	209.7	19,009	5,873
10 = Gastroenterology	All	260.3	18,589	10,200	14.0	10,474	9,681	36.0	5,793	5,830	219.5	20,059	10,039
12 = Osteopathic manipulative therapy	All	115.1	14,685	7,554	22.8	7,759	3,349	7.3	4,872	5,113	92.3	16,538	7,097
13 = Neurology	All	211.4	20,246	11,022	26.4	10,381	9,731	17.6	8,094	10,838	178.5	21,542	10,568
17 = Hospice and Palliative Care	All	60.4	28,991	7,866	23.4	12,421	11,012	6.2	6,045	6,076	52.0	29,533	7,455
21 = Cardiac Electrophysiology	All	925.3	19,484	5,017	25.2	11,845	8,131	71.5	17,135	7,580	835.4	19,756	5,014
25 = Physical medicine and rehabilitation	All	198.9	24,060	13,128	17.0	12,220	14,271	15.9	14,476	18,914	175.0	25,606	13,103
26 = Psychiatry	All	90.0	18,513	11,867	10.4	11,887	14,751	18.6	7,080	9,790	74.9	20,437	11,867
27 = Geriatric Psychiatry	All	188.4	23,448	8,293	7.9	9,913	6,564	16.6	8,672	9,270	171.7	24,367	7,942
29 = Pulmonary disease	All	324.5	22,356	6,749	29.0	11,055	9,602	14.5	10,272	13,242	289.2	23,153	6,594
39 = Nephrology	All	263.8	16,518	7,586	27.0	8,742	7,510	26.6	8,762	4,170	221.9	18,183	10,932
44 = Infectious disease	All	155.9	25,776	10,870	15.8	15,940	17,118	5.2	10,329	10,113	143.3	26,819	10,504
46 = Endocrinology	All	219.5	16,094	13,438	32.2	7,066	5,478	12.0	4,223	4,677	182.6	17,137	13,906
66 = Rheumatology	All	248.7	14,462	6,359	47.8	8,645	6,087	24.9	6,766	5,188	184.9	15,545	6,366
79 = Addiction medicine	All	41.0	19,525	13,110	13.2	6,157	3,675	5.2	8,209	11,664	32.7	21,834	12,100
81 = Critical care (intensivists)	All	120.9	32,696	17,958	15.5	15,076	17,857	6.5	24,521	30,878	114.9	33,222	18,639
82 = Hematology	All	147.6	23,955	12,359	26.2	15,291	9,030	8.9	14,141	15,795	121.8	25,153	12,375
83 = Hematology/oncology	All	199.1	21,256	11,307	43.3	18,528	13,611	16.8	15,696	18,442	151.6	21,957	11,121
86 = Neuropsychiatry	All	135.4	20,817	9,316	12.0	15,725	6,710	12.6	9,187	11,965	122.1	21,438	9,066
90 = Medical oncology	All	222.4	21,832	8,095	39.0	18,744	13,549	19.2	15,495	12,640	177.3	22,654	8,078
Surgeons	**All**	**189.7**	**17,929**	**10,865**	**21.2**	**11,509**	**12,928**	**36.5**	**16,228**	**14,329**	**146.0**	**18,625**	**11,024**

Table B. 7 *(Continued)*

Two-Digit CMS Specialty	State	Touched			Directed			Influenced			Contributed		
		Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation
02 = General surgery	All	140.1	22,626	11,281	12.4	13,607	17,268	25.3	18,259	13,280	111.0	23,799	11,502
04 = Otolaryngology	All	213.3	14,399	9,055	25.8	8,040	9,623	23.1	8,732	8,667	175.3	15,730	10,944
14 = Neurosurgery	All	124.8	27,798	16,580	9.7	18,879	17,121	21.5	37,016	15,994	99.3	26,693	16,744
16 = Obstetrics/gynecology	All	47.4	13,939	8,158	5.9	8,434	11,217	5.7	9,627	7,891	40.5	14,896	8,844
18 = Ophthalmology	All	397.8	11,446	5,378	32.2	7,164	7,924	107.0	6,529	6,181	285.8	12,753	5,052
20 = Orthopedic surgery	All	222.4	18,774	8,989	29.0	13,720	7,994	44.0	22,040	11,675	161.3	18,593	9,097
24 = Plastic and reconstructive surgery	All	81.1	18,686	7,989	9.6	12,166	13,290	19.2	15,903	10,556	57.8	20,398	9,553
28 = Colorectal surgery (formerly proctology)	All	183.2	18,435	5,025	11.7	12,364	9,739	35.9	16,863	9,393	140.7	19,442	4,400
33 = Thoracic surgery	All	142.5	33,252	13,049	7.6	20,380	28,689	28.8	42,999	23,412	114.7	30,918	12,100
34 = Urology	All	368.6	15,932	7,822	55.5	10,356	6,864	53.9	10,308	5,733	278.9	17,403	9,408
40 = Hand surgery	All	213.3	14,508	4,625	23.0	9,945	4,457	33.5	10,629	4,019	164.0	15,684	5,044
76 = Peripheral vascular disease	All	649.7	18,062	3,269	26.5	9,607	3,077	37.4	8,193	7,257	590.2	18,655	3,238
77 = Vascular surgery	All	498.0	20,155	11,221	20.8	13,038	9,104	46.6	18,383	12,243	448.7	20,489	11,436
78 = Cardiac surgery	All	134.7	38,007	14,059	8.8	25,408	34,412	38.6	50,171	17,687	96.8	34,270	15,592
85 = Maxillofacial surgery	All	40.3	19,296	9,293	4.6	7,607	7,835	6.1	13,537	11,289	34.1	20,360	9,910
91 = Surgical oncology	All	126.4	22,211	11,443	8.7	12,553	11,397	14.3	24,314	14,018	111.7	22,545	11,468
98 = Gynecologist/oncologist	All	122.4	19,494	7,153	19.8	17,545	15,870	17.0	22,112	10,383	90.8	19,878	7,152
Emergency Medicine Physicians	**All**	**315.0**	**20,041**	**6,933**	**16.9**	**7,220**	**11,626**	**11.2**	**3,182**	**3,291**	**302.7**	**20,449**	**6,666**
93 = Emergency medicine	All	315.0	20,041	6,933	16.9	7,220	11,626	11.2	3,182	3,291	302.7	20,449	6,666
Other Physicians	**All**	**607.1**	**23,074**	**11,372**	**10.9**	**12,410**	**18,609**	**22.8**	**8,908**	**12,534**	**597.2**	**23,452**	**11,486**
05 = Anesthesiology	All	167.3	26,268	9,727	13.0	11,472	8,751	4.0	14,651	17,765	165.3	26,448	9,810
22 = Pathology	All	562.5	22,501	10,691	21.9	14,880	32,588	21.3	7,396	8,921	548.2	22,754	10,744
23 = Sports Medicine	All	173.5	13,973	4,798	26.2	9,182	5,136	21.6	8,068	6,983	131.0	15,465	4,900
30 = Diagnostic radiology	All	1,335.7	20,634	6,216	2.6	14,381	17,545	33.4	4,434	5,766	1,306.4	20,941	6,236
36 = Nuclear medicine	All	702.5	19,835	8,087	26.8	9,677	5,077	21.7	6,320	13,332	683.2	20,357	8,044
37 = Pediatric medicine	All	25.7	19,943	23,649	10.8	11,389	24,743	5.8	7,703	11,026	22.8	21,244	24,500
70 = Multispecialty clinic or group practice	All	458.0	15,155		70.0	8,909		58.0	8,578		330.0	16,916	
72 = Pain management	All	251.4	19,106	6,845	25.3	11,434	8,695	45.3	7,969	4,190	193.0	20,090	6,425
92 = Radiation oncology	All	175.3	25,355	9,671	7.1	13,118	18,691	29.0	25,571	11,884	147.4	25,633	11,898
94 = Interventional radiology	All	626.5	21,853	5,770	6.7	20,059	27,684	23.0	11,775	8,341	606.9	22,660	6,230

Table B.8. Descriptive Analysis of Payment Standardized and Risk Adjusted per Capita Costs by Chronic Condition, Physician Specialty Stratification

		Diabetes			COPD			CAD			Heart Failure		
Two-Digit CMS Specialty	State	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation
Overall	All	105.9	25,016	13,062	48.8	32,946	16,897	128.3	25,906	12,361	72.8	34,545	17,148
Primary Care	**All**	**63.3**	**22,059**	**12,110**	**28.1**	**29,418**	**15,449**	**70.5**	**22,993**	**11,498**	**41.0**	**30,953**	**15,570**
01 = General practice	All	67.6	21,046	10,879	32.9	27,701	14,944	76.5	22,999	16,892	43.7	30,405	18,573
08 = Family practice	All	48.5	18,687	9,707	19.9	25,154	13,684	51.4	19,550	9,405	27.2	26,448	13,134
11 = Internal medicine	All	76.3	25,101	13,274	35.3	33,306	15,964	87.0	26,067	12,148	52.9	34,998	16,387
38 = Geriatric medicine	All	86.7	25,713	9,706	38.5	33,340	14,023	103.5	26,287	9,328	68.8	35,117	13,813
84 = Preventive medicine	All	21.4	16,221	11,630	9.0	22,957	15,201	25.7	18,082	12,096	15.5	22,634	14,924
Medical Specialists	**All**	**124.9**	**26,132**	**13,671**	**57.5**	**34,189**	**17,557**	**169.3**	**26,925**	**12,714**	**96.3**	**35,896**	**17,122**
03 = Allergy/immunology	All	21.1	20,085	12,559	12.6	26,676	16,409	22.8	20,018	11,089	10.8	27,378	15,289
06 = Cardiology	All	335.8	26,090	7,380	148.5	34,295	11,214	521.0	26,072	9,227	285.8	35,318	11,075
07 = Dermatology	All	95.1	14,937	5,586	31.7	20,726	8,417	129.6	15,818	5,037	52.4	22,247	12,831
09 = Interventional Pain Management	All	75.5	24,170	9,300	35.8	29,716	10,434	86.9	24,466	7,825	42.5	32,345	10,278
10 = Gastroenterology	All	82.6	24,825	12,264	34.5	33,207	13,380	93.0	25,726	9,697	47.6	35,749	13,054
12 = Osteopathic manipulative therapy	All	35.0	20,634	9,230	17.7	24,162	14,022	40.7	20,825	9,667	24.1	28,228	14,300
13 = Neurology	All	65.7	27,538	14,801	26.6	35,861	21,789	78.5	28,402	12,663	40.2	37,596	16,367
17 = Hospice and Palliative Care	All	20.7	38,455	15,085	11.7	48,487	16,788	23.6	37,748	10,950	17.1	51,382	19,579
21 = Cardiac Electrophysiology	All	315.9	26,340	8,195	136.2	34,879	13,775	531.1	26,042	8,400	365.7	35,040	11,986
25 = Physical medicine and rehabilitation	All	68.7	31,932	15,898	28.5	41,823	28,890	80.5	33,551	16,577	45.0	43,319	20,632
26 = Psychiatry	All	27.8	26,086	16,963	15.2	33,959	21,273	23.8	27,330	16,603	14.8	36,114	22,916
27 = Geriatric Psychiatry	All	57.5	30,420	9,537	26.9	35,151	12,109	75.6	31,719	8,250	44.3	38,951	11,832
29 = Pulmonary disease	All	116.0	29,715	9,254	108.8	36,818	13,528	145.8	30,498	9,503	95.7	41,177	13,207
39 = Nephrology	All	148.5	22,394	9,428	43.3	30,988	8,205	140.5	23,354	6,341	108.4	32,119	9,085
44 = Infectious disease	All	70.1	34,009	11,199	33.3	47,201	17,911	72.2	36,420	13,992	52.9	46,459	13,100
46 = Endocrinology	All	126.4	20,983	11,295	25.5	29,216	14,580	87.2	22,224	12,065	46.4	30,605	17,024
66 = Rheumatology	All	62.3	20,524	14,776	26.4	25,880	11,557	72.7	20,797	8,070	35.8	28,600	16,861
79 = Addiction medicine	All	11.9	23,382	10,881	7.7	28,226	13,056	13.0	26,740	9,985	7.1	32,721	12,036
81 = Critical care (intensivists)	All	53.9	41,441	19,282	35.1	51,686	19,753	62.2	41,279	14,118	41.6	53,108	17,637
82 = Hematology	All	40.4	31,393	30,189	16.1	39,787	23,705	48.9	31,653	12,036	25.9	39,622	20,578
83 = Hematology/oncology	All	61.9	27,173	16,137	28.4	33,886	17,167	72.1	27,647	10,264	38.1	35,214	18,490
86 = Neuropsychiatry	All	51.8	28,718	18,035	22.9	33,427	20,971	47.1	25,149	15,423	32.3	45,448	34,196
90 = Medical oncology	All	61.2	27,729	11,885	25.7	34,691	13,299	71.5	29,624	17,490	34.0	35,609	25,147

Table B.8 *(Continued)*

Two-Digit CMS Specialty	State	Diabetes			COPD			CAD			Heart Failure		
		Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation	Average Number of Beneficiaries	Mean (Dollars)	Standard Deviation
Surgeons	**All**	**61.8**	**23,908**	**14,630**	**24.0**	**30,600**	**18,373**	**73.2**	**24,458**	**13,621**	**35.6**	**32,753**	**20,711**
02 = General surgery	All	47.9	28,959	13,925	20.3	37,728	20,617	53.0	29,824	13,695	28.9	39,098	22,244
04 = Otolaryngology	All	60.2	20,049	13,131	27.3	26,007	13,292	76.6	19,923	10,228	35.8	27,207	13,365
14 = Neurosurgery	All	37.7	34,784	19,303	15.8	40,377	18,012	44.4	35,053	18,065	19.9	44,220	22,961
16 = Obstetrics/gynecology	All	11.7	19,608	13,739	4.8	24,854	21,387	11.7	19,187	12,344	6.0	27,071	25,444
18 = Ophthalmology	All	135.5	15,560	7,801	39.2	21,528	8,948	139.0	16,731	7,001	66.7	23,072	11,109
20 = Orthopedic surgery	All	64.0	24,569	10,973	24.0	30,235	12,833	76.7	25,339	10,110	34.2	33,212	13,232
24 = Plastic and reconstructive surgery	All	25.0	25,569	17,554	10.0	34,261	22,289	28.0	27,060	14,796	14.7	37,349	29,584
28 = Colorectal surgery (formerly proctology)	All	47.6	25,448	7,458	17.8	31,782	12,365	58.4	24,618	6,652	25.2	35,452	11,787
33 = Thoracic surgery	All	53.7	42,137	17,147	29.5	48,253	20,369	72.1	42,553	17,535	38.4	53,861	25,153
34 = Urology	All	118.7	21,436	9,510	43.3	27,895	11,079	158.0	22,109	10,036	67.3	29,445	10,543
40 = Hand surgery	All	54.8	19,592	6,667	17.3	24,667	7,942	63.7	20,379	6,346	25.7	27,842	10,082
76 = Peripheral vascular disease	All	238.8	25,206	5,670	90.2	29,775	7,825	359.3	24,719	4,498	171.4	34,964	7,458
77 = Vascular surgery	All	204.0	26,694	18,265	95.0	33,940	11,973	271.5	26,372	12,145	152.5	35,631	12,159
78 = Cardiac surgery	All	48.6	47,589	24,575	23.1	54,563	25,796	72.9	48,006	17,710	38.9	60,519	29,230
85 = Maxillofacial surgery	All	11.7	23,901	12,993	5.2	31,165	20,093	13.2	24,632	14,145	6.6	31,650	15,718
91 = Surgical oncology	All	36.4	26,954	11,270	12.5	33,984	19,941	39.3	28,651	15,460	18.2	32,964	15,091
98 = Gynecologist/oncologist	All	32.3	25,162	9,798	9.7	29,103	15,950	28.8	25,005	9,430	15.1	31,019	13,896
Emergency Medicine Physicians	**All**	**115.8**	**26,660**	**8,695**	**60.3**	**35,840**	**11,621**	**134.7**	**27,695**	**8,901**	**86.4**	**37,110**	**11,754**
93 = Emergency medicine	All	115.8	26,660	8,695	60.3	35,840	11,621	134.7	27,695	8,901	86.4	37,110	11,754
Other Physicians	**All**	**207.7**	**29,777**	**12,725**	**96.4**	**38,990**	**17,670**	**243.7**	**30,935**	**11,996**	**134.5**	**40,260**	**16,959**
05 = Anesthesiology	All	54.6	32,886	11,325	21.5	42,768	17,021	62.5	33,938	10,615	32.0	43,779	15,153
22 = Pathology	All	167.7	28,670	14,202	64.9	37,702	16,881	197.4	30,062	14,119	95.7	38,842	16,233
23 = Sports Medicine	All	46.5	18,854	8,324	17.0	24,343	10,958	47.5	20,037	7,796	22.4	28,363	13,378
30 = Diagnostic radiology	All	428.4	27,079	8,318	200.1	35,834	14,616	499.1	28,432	9,619	281.6	38,044	14,237
36 = Nuclear medicine	All	236.9	26,935	16,490	103.2	33,332	9,699	297.5	27,797	15,346	156.9	35,625	9,868
37 = Pediatric medicine	All	18.0	27,007	29,162	13.3	37,685	42,826	23.9	28,310	26,418	12.7	35,406	40,657
70 = Multispecialty clinic or group practice	All	117.0	21,681		43.0	26,052		137.0	21,776		48.0	25,490	
72 = Pain management	All	77.5	25,039	8,259	35.7	31,746	12,037	88.3	25,680	8,608	39.5	34,238	12,413
92 = Radiation oncology	All	50.0	32,328	17,840	23.7	38,191	20,259	58.2	31,602	11,857	28.0	37,117	14,145
94 = Interventional radiology	All	218.4	28,852	10,159	109.6	39,414	14,102	241.5	29,765	8,483	147.6	40,597	15,437

Table B.9. Percentage of Beneficiaries in the Nine States Whose Costs Contribute to Physicians' Total Standardized and Risk-Adjusted Per Capita Costs

State	QRUR Beneficiaries[a]	Total Number of Medicare Beneficiaries[b]	Number of Beneficiaries in the Per Capita Cost Calculation	Percentage of QRUR Beneficiaries in Cost Calculation	Percentage of Total Medicare Beneficiaries in Cost Calculation
California	2,679,837	4,806,469	2,018,116	75.3	42.0
Illinois	1,550,312	1,854,402	1,226,476	79.1	66.1
Iowa	437,391	519,726	343,411	78.5	66.1
Kansas	368,461	435,802	285,895	77.6	65.6
Michigan	1,312,343	1,669,386	967,479	73.7	58.0
Minnesota	472,178	791,566	296,315	62.8	37.4
Missouri	747,232	1,009,613	579,560	77.6	57.4
Nebraska	235,688	280,441	181,216	76.9	64.6
Wisconsin	627,847	918,344	475,093	75.7	51.7

a QRUR beneficiaries are those for whom a physician in the CMS provided physician finder file submitted a carrier claim. The beneficiary counts are calculated prior to attribution and exclusions.

b Total Medicare beneficiaries consists of all Medicare beneficiaries residing in the given state in 2011. Source: Kaiser Family Foundation "statehealthfacts.org" <http://www.statehealthfacts.org/comparemaptable.jsp?ind=290&cat=6> Accessed March 25, 2013.

Table B.10. Reliability of Overall Payment Standardized and Risk Adjusted per Capita Cost for Directed Patients for Eligible Physicians

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
Overall*	25,671	82.2	25,111	22,343	0.642	0.852
Primary Care						
01 = General Practice	163	110.2	163	163	0.809	0.968
08 = Family practice	7,750	84.5	7,523	5,978	0.605	0.789
11 = Internal medicine	6,040	114.4	6,040	6,025	0.744	0.937
38 = Geriatric medicine	172	93.9	171	151	0.646	0.837
84 = Preventive medicine	16	51.0	16	15	0.426	0.872
Medical Specialists						
03 = Allergy/immunology	40	36.7	7		0.122	0.349
06 = Cardiology	2,275	87.7	2,273	2,137	0.713	0.863
07 = Dermatology	643	75.4	543	292	0.505	0.674
09 = Interventional Pain Management	46	49.6	46	46	0.691	0.928
10 = Gastroenterology	275	41.7	275	265	0.572	0.862
12 = Osteopathic manipulative therapy	15	50.4	4		0.197	0.416
13 = Neurology	771	53.3	771	771	0.697	0.910
17 = Hospice and Palliative Care	6	74.5	6	6	0.737	0.917
21 = Cardiac Electrophysiology	55	49.8	55	55	0.678	0.907
25 = Physical medicine and rehabilitation	206	41.2	206	206	0.764	0.949
26 = Psychiatry	97	40.7	97	97	0.589	0.927
27 = Geriatric Psychiatry	1	34.0	1	1	0.368	0.754
29 = Pulmonary disease	449	60.8	449	449	0.761	0.934
39 = Nephrology	348	54.6	348	347	0.771	0.925
44 = Infectious disease	111	51.1	111	111	0.862	0.983
46 = Endocrinology	362	58.6	289	135	0.421	0.634
66 = Rheumatology	376	72.7	365	245	0.573	0.747
79 = Addiction medicine	2	40.5			0.097	0.246
81 = Critical care (intensivists)	19	73.6	19	19	0.665	0.961
82 = Hematology	54	49.6	54	54	0.830	0.958
83 = Hematology/oncology	705	66.3	705	705	0.876	0.976
86 = Neuropsychiatry**	0				0.515	
90 = Medical oncology	213	62.7	213	213	0.884	0.974
Surgeons						
02 = General surgery	355	42.9	355	355	0.756	0.960

Table B.10 *(Continued)*

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
04 = Otolaryngology	457	45.9	457	359	0.592	0.791
14 = Neurosurgery	68	33.9	68	68	0.759	0.957
16 = Obstetrics/gynecology	146	34.8	124	46	0.207	0.631
18 = Ophthalmology	521	69.5	521	500	0.569	0.859
20 = Orthopedic surgery	1,305	46.3	1,302	1,058	0.626	0.788
24 = Plastic and reconstructive surgery	38	40.5	38	38	0.633	0.932
28 = Colorectal surgery (formerly proctology)	26	28.0	26	24	0.550	0.798
33 = Thoracic surgery	14	40.4	14	14	0.868	0.992
34 = Urology	835	75.8	834	797	0.725	0.859
40 = Hand surgery	64	37.4	9		0.241	0.352
76 = Peripheral vascular disease**	7	32.7				
77 = Vascular surgery	137	40.3	137	134	0.743	0.907
78 = Cardiac surgery	13	55.5	13	13	0.872	0.993
85 = Maxillofacial surgery	1	35.0	1	1	0.207	0.817
91 = Surgical oncology	10	32.7	10	10	0.618	0.916
98 = Gynecologist/oncologist	43	41.7	43	43	0.829	0.970
Emergency Medicine Physicians						
93 = Emergency medicine	186	72.6	186	183	0.473	0.891
Other Physicians						
05 = Anesthesiology	87	41.9	87	84	0.501	0.863
22 = Pathology	4	80.8	4	4	0.872	0.994
23 = Sports Medicine	22	45.3	13	7	0.376	0.583
30 = Diagnostic radiology**	3	21.7	3	3	0.607	0.917
36 = Nuclear medicine**	2	75.5				
37 = Pediatric medicine	49	72.4	49	49	0.663	0.983
70 = Multispecialty clinic or group practice**	1	70.0				
72 = Pain management	36	54.6	36	36	0.669	0.909
92 = Radiation oncology	29	30.5	29	29	0.758	0.963
94 = Interventional radiology	2	101.0	2	2	0.770	0.999

Table B.11. Reliability of Overall Payment Standardized and Risk Adjusted per Capita Cost for Influenced Patients for Eligible Physicians

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
Overall*	22,345	61.0	18,423	15,734	0.483	0.782
Primary Care						
01 = General Practice	91	45.7	87	52	0.405	0.739
08 = Family practice	2,079	37.8	754	207	0.182	0.462
11 = Internal medicine	2,342	43.7	2,342	2,120	0.493	0.838
38 = Geriatric medicine	113	62.3	113	102	0.582	0.860
84 = Preventive medicine**	4	31.3				
Medical Specialists						
03 = Allergy/immunology	43	34.6	5	1	0.121	0.316
06 = Cardiology	2,377	91.8	2,376	2,257	0.729	0.878
07 = Dermatology	630	98.7	133	23	0.224	0.337
09 = Interventional Pain Management	66	61.3	26	3	0.272	0.459
10 = Gastroenterology	890	54.8	812	428	0.526	0.682
12 = Osteopathic manipulative therapy**	4	31.3				
13 = Neurology	500	44.2	500	500	0.622	0.890
17 = Hospice and Palliative Care	3	25.7	1		0.194	0.434
21 = Cardiac Electrophysiology	114	86.0	114	114	0.869	0.938
25 = Physical medicine and rehabilitation	192	40.6	192	192	0.813	0.966
26 = Psychiatry	861	45.4	861	856	0.562	0.863
27 = Geriatric Psychiatry	6	34.2	6	6	0.674	0.891
29 = Pulmonary disease	248	42.0	248	248	0.742	0.949
39 = Nephrology	392	48.3	388	385	0.766	0.961
44 = Infectious disease	21	37.4	21	21	0.406	0.879
46 = Endocrinology	135	34.7	8		0.127	0.304
66 = Rheumatology	213	54.9	176	92	0.369	0.656
79 = Addiction medicine**	1	25.0				
81 = Critical care (intensivists)	11	52.4	11	11	0.754	0.989
82 = Hematology	16	29.1	16	16	0.770	0.974
83 = Hematology/oncology	277	45.1	277	277	0.838	0.988
86 = Neuropsychiatry**	3	29.0				
90 = Medical oncology	83	54.3	83	83	0.792	0.973
Surgeons						
02 = General surgery	1,161	44.5	1,161	1,161	0.794	0.924

Table B.11 *(Continued)*

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
04 = Otolaryngology	444	39.7	444	433	0.677	0.845
14 = Neurosurgery	260	37.7	260	260	0.862	0.962
16 = Obstetrics/gynecology	128	38.9	82	19	0.140	0.563
18 = Ophthalmology	1,068	155.7	1,053	911	0.625	0.826
20 = Orthopedic surgery	1,718	61.0	1,718	1,718	0.831	0.934
24 = Plastic and reconstructive surgery	134	39.8	134	134	0.721	0.907
28 = Colorectal surgery (formerly proctology)	96	47.5	96	96	0.800	0.882
33 = Thoracic surgery	138	46.6	138	138	0.936	0.986
34 = Urology	909	68.7	907	814	0.703	0.823
40 = Hand surgery	110	41.1	1		0.220	0.263
76 = Peripheral vascular disease	6	64.3	6	6	0.716	0.892
77 = Vascular surgery	216	70.1	216	216	0.885	0.969
78 = Cardiac surgery	176	54.3	176	176	0.926	0.979
85 = Maxillofacial surgery	3	33.7	3	2	0.257	0.701
91 = Surgical oncology	25	33.5	25	25	0.790	0.938
98 = Gynecologist/oncologist	40	32.7	40	39	0.694	0.863
Emergency Medicine Physicians						
93 = Emergency medicine**	1,127	29.9				
Other Physicians						
05 = Anesthesiology	112	41.7	112	112	0.382	0.942
22 = Pathology	129	156.0	129	93	0.340	0.799
23 = Sports Medicine	17	41.9	17	17	0.588	0.828
30 = Diagnostic radiology	2,135	67.0	1,694	926	0.430	0.654
36 = Nuclear medicine	33	70.1	33	33	0.706	0.968
37 = Pediatric medicine	24	34.4	24	22	0.400	0.858
70 = Multispecialty clinic or group practice**	1	58.0				
72 = Pain management	43	90.2	27	14	0.353	0.610
92 = Radiation oncology	305	44.3	305	305	0.841	0.954
94 = Interventional radiology	72	53.1	72	70	0.712	0.892

*This row excludes specialties without a valid reliability measure.

**A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, (3) or the number of physicians was one.

Table B.12. Reliability of Overall Payment Standardized and Risk Adjusted per Capita Cost for Contributed Patients for Eligible Physicians

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
Overall*	77,088	323.9	77,087	76,994	0.911	0.972
Primary Care						
01 = General Practice	384	183.2	384	384	0.885	0.968
08 = Family practice	12,174	131.7	12,174	12,137	0.868	0.936
11 = Internal medicine	13,091	202.7	13,091	13,091	0.923	0.986
38 = Geriatric medicine	343	200.8	343	343	0.949	0.979
84 = Preventive medicine	54	150.2	54	54	0.729	0.960
Medical Specialists						
03 = Allergy/immunology	241	93.1	241	241	0.798	0.922
06 = Cardiology	3,562	883.7	3,562	3,560	0.948	0.988
07 = Dermatology	933	354.7	933	927	0.851	0.956
09 = Interventional Pain Management	142	222.6	142	142	0.930	0.962
10 = Gastroenterology	1,425	252.0	1,425	1,425	0.944	0.989
12 = Osteopathic manipulative therapy	36	126.8	36	36	0.841	0.922
13 = Neurology	1,868	212.7	1,868	1,868	0.934	0.986
17 = Hospice and Palliative Care	57	64.7	57	57	0.943	0.967
21 = Cardiac Electrophysiology	144	858.4	144	144	0.967	0.980
25 = Physical medicine and rehabilitation	730	214.4	730	730	0.931	0.990
26 = Psychiatry	2,319	104.8	2,319	2,319	0.883	0.976
27 = Geriatric Psychiatry	23	179.1	23	23	0.935	0.971
29 = Pulmonary disease	1,241	313.4	1,241	1,241	0.955	0.984
39 = Nephrology	850	255.9	850	850	0.982	0.997
44 = Infectious disease	637	171.7	637	637	0.959	0.993
46 = Endocrinology	737	213.9	737	737	0.956	0.992
66 = Rheumatology	585	209.1	585	585	0.905	0.963
79 = Addiction medicine	12	53.2	12	12	0.868	0.974
81 = Critical care (intensivists)	330	157.4	330	330	0.944	0.997
82 = Hematology	120	145.4	120	120	0.961	0.992
83 = Hematology/oncology	1,084	175.7	1,084	1,084	0.950	0.990
86 = Neuropsychiatry	10	167.2	10	10	0.890	0.961
90 = Medical oncology	372	195.8	372	372	0.938	0.977
Surgeons						
02 = General surgery	2,349	130.8	2,349	2,349	0.932	0.982
04 = Otolaryngology	923	215.3	923	923	0.900	0.985

Table B.12 *(Continued)*

Two-Digit CMS Specialty	Number of Eligible Physicians (20 + Cases)	Average Number of Attributed Beneficiaries	Number of Eligible Physicians with Reliability Exceeding: (20+ Cases) 0.50	0.70	Average Reliability	Average Reliability with 20+ Cases
14 = Neurosurgery	569	114.1	569	569	0.965	0.991
16 = Obstetrics/gynecology	2,294	63.5	2,294	2,274	0.727	0.887
18 = Ophthalmology	1,391	350.5	1,391	1,374	0.836	0.949
20 = Orthopedic surgery	2,404	187.7	2,404	2,404	0.910	0.976
24 = Plastic and reconstructive surgery	307	75.8	307	307	0.876	0.962
28 = Colorectal surgery (formerly proctology)	130	155.3	130	127	0.856	0.915
33 = Thoracic surgery	241	135.0	241	241	0.952	0.987
34 = Urology	1,131	328.7	1,131	1,131	0.924	0.989
40 = Hand surgery	145	175.1	145	145	0.889	0.934
76 = Peripheral vascular disease	12	590.2	12	12	0.951	0.951
77 = Vascular surgery	325	540.2	325	325	0.954	0.996
78 = Cardiac surgery	245	112.7	245	245	0.968	0.992
85 = Maxillofacial surgery	28	61.9	28	28	0.742	0.916
91 = Surgical oncology	95	133.0	95	95	0.927	0.983
98 = Gynecologist/oncologist	118	103.2	118	118	0.901	0.949
Emergency Medicine Physicians						
93 = Emergency medicine	7,584	340.5	7,584	7,580	0.939	0.981
Other Physicians						
05 = Anesthesiology	5,547	181.5	5,547	5,547	0.956	0.983
22 = Pathology	1,366	665.0	1,366	1,366	0.944	0.993
23 = Sports Medicine	42	142.5	42	38	0.817	0.870
30 = Diagnostic radiology	5,166	1,385.3	5,166	5,166	0.966	0.987
36 = Nuclear medicine	115	888.8	115	115	0.925	0.990
37 = Pediatric medicine	232	128.7	232	232	0.850	0.994
70 = Multispecialty clinic or group practice**	1	330.0				
72 = Pain management	106	205.5	106	106	0.927	0.962
92 = Radiation oncology	508	168.2	508	508	0.950	0.984
94 = Interventional radiology	210	689.5	210	210	0.946	0.983

*This row excludes specialties without a valid reliability measure.

**A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, (3) or the number of physicians was one.

Table B.13. Statistical Significance of Payment Standardized and Risk Adjusted Overall per Capita Cost

Two-Digit CMS Specialty	Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Total per Capita Cost ($) (Case Size 20+)								Statistical Significance (Case Size 20+)		Average Reliability (Case Size 20+)
			Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Mean	Standard Deviation	Min	Median	Max	Coefficient of Variation	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	
Overall	94,585	307.2	78,450	369.3	18,851	7,183	1,969	18,242	83,699	38.1	68.1	9.9	0.973
Primary Care													
01 = General Practice	497	192.9	391	243.5	15,474	6,568	4,302	13,226	38,817	42.4	79.0	14.3	0.975
08 = Family practice	14,632	167.6	12,539	194.7	13,512	5,063	1,969	12,181	58,125	37.5	47.4	10.6	0.942
11 = Internal medicine	16,452	215.2	13,285	265.4	19,097	7,598	2,898	18,069	60,578	39.8	89.8	10.5	0.988
38 = Geriatric medicine	377	251.0	348	271.3	18,852	6,716	6,329	17,206	38,030	35.6	81.6	25.0	0.981
84 = Preventive medicine	155	66.0	66	147.5	13,159	5,598	3,813	11,676	28,406	42.5	39.4	9.1	0.945
Medical Specialists													
03 = Allergy/immunology	341	85.1	250	114.0	13,844	3,736	7,387	13,073	31,685	27.0	27.6	5.2	0.916
06 = Cardiology	3,908	917.8	3,573	1,003.2	19,660	4,095	6,567	19,460	50,634	20.8	82.0	13.4	0.988
07 = Dermatology	1,163	385.0	940	475.4	11,025	2,189	6,023	10,681	25,787	19.9	27.9	3.8	0.934
09 = Interventional Pain Management	155	253.1	143	273.9	18,092	5,582	5,403	16,256	43,427	30.9	67.1	16.1	0.971
10 = Gastroenterology	1,661	260.3	1,439	299.8	18,233	4,329	7,668	17,844	37,813	23.7	70.3	1.8	0.989
12 = Osteopathic manipulative therapy	52	115.1	42	140.4	15,928	7,135	8,039	12,701	32,859	44.8	52.4	21.4	0.932
13 = Neurology	2,270	211.4	1,897	251.8	20,369	7,463	6,532	18,960	72,731	36.6	74.1	8.8	0.987
17 = Hospice and Palliative Care	74	60.4	57	75.6	28,510	7,302	8,521	29,643	44,301	25.6	70.2	19.3	0.972
21 = Cardiac Electrophysiology	148	925.3	144	950.8	19,287	4,274	11,332	18,629	33,426	22.2	89.6	22.9	0.982
25 = Physical medicine and rehabilitation	909	198.9	739	243.3	25,756	11,583	3,733	22,884	83,699	45.0	91.7	21.0	0.990
26 = Psychiatry	3,418	90.0	2,454	122.9	19,008	8,759	2,867	17,598	51,663	46.1	79.4	15.2	0.975
27 = Geriatric Psychiatry	24	188.4	23	196.6	22,151	5,453	13,302	21,762	33,863	24.6	65.2	21.7	0.976
29 = Pulmonary disease	1,351	324.5	1,245	351.6	22,435	5,805	7,791	22,056	50,759	25.9	81.3	22.2	0.985
39 = Nephrology	998	263.8	859	305.5	16,537	3,753	5,218	16,248	35,487	22.7	83.7	3.4	0.995
44 = Infectious disease	778	155.9	647	186.1	26,032	6,434	6,391	26,469	47,511	24.7	79.4	9.9	0.993

Table B.13 *(Continued)*

Two-Digit CMS Specialty	Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Total per Capita Cost ($) (Case Size 20+)								Statistical Significance (Case Size 20+)		Average Reliability (Case Size 20+)
			Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Mean	Standard Deviation	Min	Median	Max	Coefficient of Variation	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	
46 = Endocrinology	871	219.5	748	254.7	15,166	4,706	6,190	14,087	40,706	31.0	72.1	1.3	0.992
66 = Rheumatology	668	248.7	590	280.8	14,151	3,371	3,999	13,639	32,855	23.8	51.4	4.7	0.964
79 = Addiction medicine	22	41.0	12	69.9	18,985	6,174	11,794	17,996	34,265	32.5	41.7	8.3	0.981
81 = Critical care (intensivists)	461	120.9	332	166.5	32,256	8,888	12,481	32,440	67,901	27.6	82.5	4.5	0.996
82 = Hematology	147	147.6	123	174.9	22,765	6,360	10,259	21,781	48,641	27.9	82.1	3.3	0.992
83 = Hematology/oncology	1,295	199.1	1,096	234.3	20,993	5,820	9,025	20,150	55,302	27.7	76.2	4.9	0.992
86 = Neuropsychiatry	14	135.4	10	185.7	21,693	8,248	7,061	25,078	29,882	38.0	90.0	20.0	0.971
90 = Medical oncology	421	222.4	374	249.7	22,381	7,093	9,325	20,576	60,510	31.7	79.9	21.4	0.983
Surgeons													
02 = General surgery	2,844	140.1	2,398	165.1	22,079	6,999	5,693	20,573	53,824	31.7	73.4	9.2	0.984
04 = Otolaryngology	1,162	213.3	935	264.1	13,935	3,633	4,845	13,346	47,870	26.1	49.6	1.8	0.977
14 = Neurosurgery	668	124.8	574	144.3	25,973	7,111	5,303	24,858	67,370	27.4	71.3	3.0	0.992
16 = Obstetrics/gynecology	4,041	47.4	2,493	72.4	13,127	3,424	4,437	12,552	35,568	26.1	15.2	2.0	0.879
18 = Ophthalmology	1,756	397.8	1,401	497.3	11,790	2,404	5,318	11,454	27,602	20.4	38.4	3.6	0.955
20 = Orthopedic surgery	2,862	222.4	2,435	260.5	18,605	5,225	5,923	17,570	53,199	28.1	59.8	5.5	0.978
24 = Plastic and reconstructive surgery	428	81.1	333	102.5	18,891	6,086	8,679	17,809	57,338	32.2	57.4	10.5	0.951
28 = Colorectal surgery (formerly proctology)	146	183.2	131	203.6	18,921	4,046	9,685	18,918	28,930	21.4	64.9	22.9	0.945
33 = Thoracic surgery	294	142.5	254	164.0	32,383	10,057	6,086	31,604	61,250	31.1	81.9	19.7	0.989
34 = Urology	1,365	368.6	1,139	440.9	15,672	3,571	6,202	15,067	38,614	22.8	64.2	3.2	0.984
40 = Hand surgery	158	213.3	145	232.2	14,390	2,049	9,113	14,168	23,041	14.2	22.8	3.4	0.921
76 = Peripheral vascular disease	12	649.7	12	649.7	18,062	3,269	14,034	18,268	25,235	18.1	50.0	33.3	0.953
77 = Vascular surgery	400	498.0	326	609.8	19,433	3,977	11,370	19,045	46,966	20.5	78.2	1.2	0.996
78 = Cardiac surgery	294	134.7	258	152.7	36,912	10,065	12,170	36,322	67,536	27.3	78.3	16.7	0.991
85 = Maxillofacial surgery	59	40.3	33	66.9	18,382	6,209	8,830	16,411	31,465	33.8	57.6	9.1	0.942

Table B.13 *(Continued)*

Two-Digit CMS Specialty	Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Total per Capita Cost ($) (Case Size 20+)								Statistical Significance (Case Size 20+)		Average Reliability (Case Size 20+)
			Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Mean	Standard Deviation	Min	Median	Max	Coefficient of Variation	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	
91 = Surgical oncology	119	126.4	96	155.6	21,842	7,158	11,044	20,271	50,178	32.8	75.0	6.3	*0.985*
98 = Gynecologist/oncologist	138	122.4	120	139.6	19,851	5,407	8,460	18,645	38,186	27.2	65.0	14.2	0.953
Emergency Medicine Physicians													
93 = Emergency medicine	8,560	315.0	7,633	352.2	20,040	3,233	3,912	20,345	56,271	16.1	59.8	5.6	0.984
Other Physicians													
05 = Anesthesiology	6,136	167.3	5,557	184.0	26,046	6,106	7,535	25,731	58,724	23.4	69.7	11.1	0.983
22 = Pathology	1,664	562.5	1,370	681.6	22,470	6,888	7,796	21,728	66,960	30.7	80.9	10.4	0.992
23 = Sports Medicine	47	173.5	44	185.2	14,564	4,318	9,381	13,816	34,088	29.6	36.4	9.1	0.850
30 = Diagnostic radiology	5,483	1,335.7	5,188	1,411.1	20,540	4,799	6,024	20,806	45,509	23.4	84.1	18.8	0.989
36 = Nuclear medicine	150	702.5	117	898.3	19,840	3,581	9,061	20,106	29,117	18.0	71.8	4.3	0.989
37 = Pediatric medicine	1,587	25.7	253	144.1	16,853	7,324	5,591	14,734	55,721	43.5	78.3	0.4	0.993
70 = Multispecialty clinic or group practice* [i]	1	458.0	1	458.0	15,155		15,155	15,155	15,155				
72 = Pain management	113	251.4	106	267.7	19,098	6,008	12,820	16,862	41,740	31.5	71.7	12.3	0.971
92 = Radiation oncology	596	175.3	521	199.6	24,825	6,676	6,240	23,918	54,601	26.9	73.9	14.2	0.980
94 = Interventional radiology	240	626.5	211	711.2	22,148	5,220	10,424	22,090	44,213	23.6	81.0	24.2	0.980

*Number of eligible physicians is too few.

[i] A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, (3) or the number of physicians was one.

Table B.14. Statistical Significance of Overall Payment Standardized and Risk Adjusted per Capita Cost by Category of Attribution (Case Size 20+)

Two-Digit CMS Specialty	Directed					
	Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	Average p Value	Average Reliability
Overall	25,671	82.2	13.1	1.8	0.441	0.852
Primary Care						
01 = General Practice	163	110.2	6.7	0.6	0.514	0.968
08 = Family practice	7,750	84.5	6.9	1.9	0.514	0.789
11 = Internal medicine	6,040	114.4	11.2	0.7	0.423	0.937
38 = Geriatric medicine	172	93.9	12.2	2.9	0.401	0.837
84 = Preventive medicine	16	51.0	31.3	18.8	0.347	0.872
Medical Specialists						
03 = Allergy/immunology	40	36.7	7.5	7.5	0.612	0.349
06 = Cardiology	2,275	87.7	19.8	3.1	0.365	0.863
07 = Dermatology	643	75.4	2.5	1.4	0.636	0.674
09 = Interventional Pain Management	46	49.6	13.0	2.2	0.434	0.928
10 = Gastroenterology	275	41.7	12.7	2.2	0.418	0.862
12 = Osteopathic manipulative therapy	15	50.4	0.0	0.0	0.603	0.416
13 = Neurology	771	53.3	12.8	1.2	0.377	0.910
17 = Hospice and Palliative Care	6	74.5	50.0	0.0	0.162	0.917
21 = Cardiac Electrophysiology	55	49.8	18.2	0.0	0.391	0.907
25 = Physical medicine and rehabilitation	206	41.2	13.1	0.5	0.380	0.949
26 = Psychiatry	97	40.7	29.9	0.0	0.238	0.927
27 = Geriatric Psychiatry	1	34.0	0.0	0.0	0.687	0.754
29 = Pulmonary disease	449	60.8	17.6	0.7	0.371	0.934
39 = Nephrology	348	54.6	21.6	0.3	0.342	0.925
44 = Infectious disease	111	51.1	75.7	0.0	0.098	0.983
46 = Endocrinology	362	58.6	4.7	1.4	0.534	0.634
66 = Rheumatology	376	72.7	8.2	2.4	0.489	0.747
79 = Addiction medicine	2	40.5	0.0	0.0	0.598	0.246
81 = Critical care (intensivists)	19	73.6	68.4	0.0	0.175	0.961
82 = Hematology	54	49.6	63.0	9.3	0.148	0.958
83 = Hematology/oncology	705	66.3	53.2	1.4	0.189	0.976
86 = Neuropsychiatry* [i]	0					
90 = Medical oncology	213	62.7	57.7	2.3	0.167	0.974
Surgeons						
02 = General surgery	355	42.9	19.7	0.3	0.337	0.960
04 = Otolaryngology	457	45.9	3.7	0.0	0.540	0.791
14 = Neurosurgery	68	33.9	29.4	1.5	0.335	0.957
16 = Obstetrics/gynecology	146	34.8	6.8	1.4	0.538	0.631
18 = Ophthalmology	521	69.5	8.8	2.7	0.513	0.859
20 = Orthopedic surgery	1,305	46.3	14.4	6.1	0.414	0.788
24 = Plastic and reconstructive surgery	38	40.5	21.1	2.6	0.348	0.932
28 = Colorectal surgery (formerly proctology)	26	28.0	3.8	0.0	0.443	0.798
33 = Thoracic surgery	14	40.4	78.6	0.0	0.131	0.992
34 = Urology	835	75.8	11.3	2.4	0.433	0.859
40 = Hand surgery	64	37.4	1.6	1.6	0.647	0.352
76 = Peripheral vascular disease [i]	7	32.7	0.0	0.0	0.715	
77 = Vascular surgery	137	40.3	26.3	1.5	0.329	0.907
78 = Cardiac surgery	13	55.5	100.0	0.0	0.002	0.993
85 = Maxillofacial surgery	1	35.0	0.0	0.0	0.318	0.817
91 = Surgical oncology	10	32.7	40.0	10.0	0.185	0.916
98 = Gynecologist/oncologist	43	41.7	53.5	0.0	0.160	0.970
Emergency Medicine Physicians						
93 = Emergency medicine	186	72.6	16.7	3.2	0.453	0.891
Other Physicians						
05 = Anesthesiology	87	41.9	10.3	2.3	0.443	0.863
22 = Pathology	4	80.8	100.0	0.0	0.015	0.994
23 = Sports Medicine	22	45.3	0.0	0.0	0.528	0.583
30 = Diagnostic radiology	3	21.7	0.0	0.0	0.129	0.917
36 = Nuclear medicine [i]	2	75.5	0.0	0.0	0.425	
37 = Pediatric medicine	49	72.4	24.5	0.0	0.272	0.983
70 = Multispecialty clinic or group practice* [i]	1	70.0				
72 = Pain management	36	54.6	2.8	0.0	0.493	0.909
92 = Radiation oncology	29	30.5	24.1	0.0	0.268	0.963
94 = Interventional radiology	2	101.0	100.0	0.0	0.000	0.999

*Number of eligible physicians is too few.

[i] A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, or (3) the number of physicians was one.

Table B.14 *(Continued)*

Two-Digit CMS Specialty	Influenced					
	Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	Average p Value	Average Reliability
Overall	22,345	61.0	26.5	8.3	0.380	0.782
Primary Care						
01 = General Practice	91	45.7	19.8	14.3	0.444	0.739
08 = Family practice	2,079	37.8	14.2	11.1	0.553	0.462
11 = Internal medicine	2,342	43.7	20.0	6.1	0.292	0.838
38 = Geriatric medicine	113	62.3	29.2	5.3	0.334	0.860
84 = Preventive medicine	4	31.3	0.0	0.0	0.457	
Medical Specialists						
03 = Allergy/immunology	43	34.6	7.0	7.0	0.616	0.316
06 = Cardiology	2,377	91.8	42.9	14.3	0.210	0.878
07 = Dermatology	630	98.7	11.6	9.0	0.604	0.337
09 = Interventional Pain Management	66	61.3	9.1	6.1	0.526	0.459
10 = Gastroenterology	890	54.8	1.9	1.5	0.666	0.682
12 = Osteopathic manipulative therapy	4	31.3	0.0	0.0	0.751	
13 = Neurology	500	44.2	8.0	2.2	0.452	0.890
17 = Hospice and Palliative Care	3	25.7	0.0	0.0	0.580	0.434
21 = Cardiac Electrophysiology	114	86.0	62.3	17.5	0.161	0.938
25 = Physical medicine and rehabilitation	192	40.6	61.5	4.7	0.110	0.966
26 = Psychiatry	861	45.4	23.2	10.2	0.241	0.863
27 = Geriatric Psychiatry	6	34.2	50.0	16.7	0.154	0.891
29 = Pulmonary disease	248	42.0	23.4	1.2	0.316	0.949
39 = Nephrology	392	48.3	64.8	7.4	0.126	0.961
44 = Infectious disease	21	37.4	66.7	33.3	0.145	0.879
46 = Endocrinology	135	34.7	0.7	0.7	0.731	0.304
66 = Rheumatology	213	54.9	34.3	28.2	0.327	0.656
79 = Addiction medicine	1	25.0	0.0	0.0	0.708	
81 = Critical care (intensivists)	11	52.4	90.9	0.0	0.035	0.989
82 = Hematology	16	29.1	93.8	0.0	0.021	0.974
83 = Hematology/oncology	277	45.1	58.5	0.7	0.182	0.988
86 = Neuropsychiatry* [i]	3	29.0	33.3	33.3	0.195	
90 = Medical oncology	83	54.3	67.5	12.0	0.112	0.973
Surgeons						
02 = General surgery	1,161	44.5	41.0	2.9	0.252	0.924
04 = Otolaryngology	444	39.7	15.8	8.6	0.382	0.845
14 = Neurosurgery	260	37.7	53.5	8.1	0.168	0.962
16 = Obstetrics/gynecology	128	38.9	22.7	13.3	0.381	0.563
18 = Ophthalmology	1,068	155.7	18.3	3.7	0.379	0.826
20 = Orthopedic surgery	1,718	61.0	51.5	17.4	0.204	0.934
24 = Plastic and reconstructive surgery	134	39.8	51.5	9.0	0.151	0.907
28 = Colorectal surgery (formerly proctology)	96	47.5	40.6	14.6	0.225	0.882
33 = Thoracic surgery	138	46.6	86.2	14.5	0.060	0.986
34 = Urology	909	68.7	16.4	7.4	0.375	0.823
40 = Hand surgery	110	41.1	5.5	5.5	0.521	0.263
76 = Peripheral vascular disease [i]	6	64.3	50.0	16.7	0.328	0.892
77 = Vascular surgery	216	70.1	59.3	5.6	0.180	0.969
78 = Cardiac surgery	176	54.3	69.3	10.8	0.155	0.979
85 = Maxillofacial surgery	3	33.7	66.7	66.7	0.292	0.701
91 = Surgical oncology	25	33.5	80.0	20.0	0.113	0.938
98 = Gynecologist/oncologist	40	32.7	15.0	2.5	0.435	0.863
Emergency Medicine Physicians						
93 = Emergency medicine	1,127	29.9	2.8	2.8	0.815	
Other Physicians						
05 = Anesthesiology	112	41.7	43.8	0.0	0.165	0.942
22 = Pathology	129	156.0	25.6	0.8	0.393	0.799
23 = Sports Medicine	17	41.9	17.6	11.8	0.444	0.828
30 = Diagnostic radiology	2,135	67.0	6.2	5.0	0.580	0.654
36 = Nuclear medicine [i]	33	70.1	18.2	0.0	0.427	0.968
37 = Pediatric medicine	24	34.4	16.7	8.3	0.336	0.858
70 = Multispecialty clinic or group practice* [i]	1	58.0				
72 = Pain management	43	90.2	11.6	0.0	0.488	0.610
92 = Radiation oncology	305	44.3	50.8	12.1	0.206	0.954
94 = Interventional radiology	72	53.1	55.6	26.4	0.158	0.892

*Number of eligible physicians is too few.

[i] A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, or (3) the number of physicians was one.

Table B.14 *(Continued)*

Two-Digit CMS Specialty	Contributed					
	Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	Average p Value	Average Reliability
Overall	77,088	323.9	67.2	9.2	0.136	0.972
Primary Care						
01 = General Practice	384	183.2	74.2	12.5	0.098	0.968
08 = Family practice	12,174	131.7	48.3	10.6	0.213	0.936
11 = Internal medicine	13,091	202.7	84.7	8.5	0.060	0.986
38 = Geriatric medicine	343	200.8	80.8	26.5	0.088	0.979
84 = Preventive medicine	54	150.2	42.6	5.6	0.237	0.960
Medical Specialists						
03 = Allergy/immunology	241	93.1	32.8	2.9	0.282	0.922
06 = Cardiology	3,562	883.7	80.4	12.9	0.082	0.988
07 = Dermatology	933	354.7	29.4	2.5	0.303	0.956
09 = Interventional Pain Management	142	222.6	65.5	18.3	0.151	0.962
10 = Gastroenterology	1,425	252.0	71.2	1.4	0.119	0.989
12 = Osteopathic manipulative therapy	36	126.8	52.8	22.2	0.196	0.922
13 = Neurology	1,868	212.7	73.9	9.2	0.108	0.986
17 = Hospice and Palliative Care	57	64.7	75.4	19.3	0.114	0.967
21 = Cardiac Electrophysiology	144	858.4	86.1	25.7	0.061	0.980
25 = Physical medicine and rehabilitation	730	214.4	90.7	20.1	0.029	0.990
26 = Psychiatry	2,319	104.8	78.4	13.3	0.083	0.976
27 = Geriatric Psychiatry	23	179.1	69.6	21.7	0.141	0.971
29 = Pulmonary disease	1,241	313.4	80.2	21.1	0.078	0.984
39 = Nephrology	850	255.9	81.3	1.4	0.079	0.997
44 = Infectious disease	637	171.7	78.8	7.8	0.083	0.993
46 = Endocrinology	737	213.9	71.6	1.1	0.107	0.992
66 = Rheumatology	585	209.1	48.7	4.4	0.210	0.963
79 = Addiction medicine	12	53.2	50.0	0.0	0.169	0.974
81 = Critical care (intensivists)	330	157.4	81.2	3.0	0.078	0.997
82 = Hematology	120	145.4	78.3	5.0	0.105	0.992
83 = Hematology/oncology	1,084	175.7	75.3	5.4	0.110	0.990
86 = Neuropsychiatry* [i]	10	167.2	100.0	10.0	0.006	0.961
90 = Medical oncology	372	195.8	78.2	24.5	0.088	0.977
Surgeons						
02 = General surgery	2,349	130.8	71.5	8.6	0.111	0.982
04 = Otolaryngology	923	215.3	53.3	1.3	0.198	0.985
14 = Neurosurgery	569	114.1	72.2	2.6	0.104	0.991
16 = Obstetrics/gynecology	2,294	63.5	18.8	1.6	0.362	0.887
18 = Ophthalmology	1,391	350.5	37.6	4.0	0.280	0.949
20 = Orthopedic surgery	2,404	187.7	56.9	4.7	0.184	0.976
24 = Plastic and reconstructive surgery	307	75.8	61.9	4.6	0.153	0.962
28 = Colorectal surgery (formerly proctology)	130	155.3	60.0	27.7	0.175	0.915
33 = Thoracic surgery	241	135.0	74.3	15.8	0.092	0.987
34 = Urology	1,131	328.7	63.2	1.8	0.151	0.989
40 = Hand surgery	145	175.1	26.2	3.4	0.326	0.934
76 = Peripheral vascular disease [i]	12	590.2	50.0	33.3	0.128	0.951
77 = Vascular surgery	325	540.2	77.2	0.9	0.086	0.996
78 = Cardiac surgery	245	112.7	80.0	9.8	0.085	0.992
85 = Maxillofacial surgery	28	61.9	60.7	10.7	0.162	0.916
91 = Surgical oncology	95	133.0	73.7	5.3	0.129	0.983
98 = Gynecologist/oncologist	118	103.2	62.7	18.6	0.158	0.949
Emergency Medicine Physicians						
93 = Emergency medicine	7,584	340.5	58.4	5.5	0.173	0.981
Other Physicians						
05 = Anesthesiology	5,547	181.5	69.7	10.5	0.124	0.983
22 = Pathology	1,366	665.0	80.3	10.1	0.078	0.993
23 = Sports Medicine	42	142.5	35.7	11.9	0.278	0.870
30 = Diagnostic radiology	5,166	1,385.3	84.5	18.1	0.064	0.987
36 = Nuclear medicine [i]	115	888.8	69.6	3.5	0.126	0.990
37 = Pediatric medicine	232	128.7	78.4	0.0	0.088	0.994
70 = Multispecialty clinic or group practice* [i]	1	330.0				
72 = Pain management	106	205.5	65.1	15.1	0.158	0.962
92 = Radiation oncology	508	168.2	74.2	11.2	0.106	0.984
94 = Interventional radiology	210	689.5	80.5	19.0	0.098	0.983

*Number of eligible physicians is too few.

[i] A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, or (3) the number of physicians was one.

Table B.15. Statistical Significance of Overall Payment Standardized and Risk Adjusted per Capita Cost by Chronic Conditions

	Diabetes					
Two-Digit CMS Specialty	Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	Average p Value	Average Reliability
Overall	64,985	140.4	55.3	9.2	0.189	0.950
Primary Care						
01 = General Practice	314	93.6	55.7	14.0	0.155	0.929
08 = Family practice	9,829	64.4	29.8	9.4	0.305	0.885
11 = Internal medicine	11,659	97.5	76.8	11.0	0.089	0.970
38 = Geriatric medicine	316	99.4	70.6	24.7	0.117	0.954
84 = Preventive medicine	28	75.5	50.0	32.1	0.222	0.919
Medical Specialists						
03 = Allergy/immunology	121	38.8	19.0	5.0	0.381	0.859
06 = Cardiology	3,446	367.3	69.5	12.1	0.128	0.974
07 = Dermatology	825	117.1	14.7	6.7	0.421	0.810
09 = Interventional Pain Management	131	84.5	47.3	11.5	0.197	0.936
10 = Gastroenterology	1,298	98.3	52.3	3.5	0.196	0.969
12 = Osteopathic manipulative therapy	23	66.7	52.2	34.8	0.187	0.852
13 = Neurology	1,521	88.5	61.5	5.8	0.157	0.975
17 = Hospice and Palliative Care	21	49.1	52.4	23.8	0.176	0.968
21 = Cardiac Electrophysiology	134	345.5	79.9	13.4	0.075	0.979
25 = Physical medicine and rehabilitation	615	90.5	82.9	19.7	0.072	0.976
26 = Psychiatry	1,299	53.9	65.3	7.9	0.136	0.963
27 = Geriatric Psychiatry	18	73.5	66.7	27.8	0.099	0.945
29 = Pulmonary disease	1,152	131.5	69.6	18.8	0.126	0.971
39 = Nephrology	828	169.3	73.9	4.0	0.111	0.990
44 = Infectious disease	537	92.0	70.4	10.6	0.123	0.983
46 = Endocrinology	684	152.4	63.2	8.3	0.147	0.969
66 = Rheumatology	486	79.2	33.1	1.0	0.285	0.971
79 = Addiction medicine	5	25.8	20.0	0.0	0.190	0.875
81 = Critical care (intensivists)	280	69.7	69.6	3.6	0.125	0.991
82 = Hematology	82	62.7	52.4	0.0	0.174	0.995
83 = Hematology/oncology	869	80.8	58.6	1.3	0.165	0.983
86 = Neuropsychiatry	6	104.0	100.0	0.0	0.010	0.977
90 = Medical oncology	292	79.6	63.0	12.3	0.149	0.965
Surgeons						
02 = General surgery	1,865	64.2	58.8	8.1	0.173	0.963
04 = Otolaryngology	794	76.9	30.2	1.4	0.315	0.956
14 = Neurosurgery	424	50.6	56.8	1.9	0.162	0.973
16 = Obstetrics/gynecology	552	36.7	10.7	1.1	0.399	0.868
18 = Ophthalmology	1,239	178.7	20.5	2.2	0.373	0.931
20 = Orthopedic surgery	2,103	78.6	36.6	4.8	0.265	0.932
24 = Plastic and reconstructive surgery	171	45.8	56.7	2.3	0.199	0.975
28 = Colorectal surgery (formerly proctology)	117	56.1	41.0	29.1	0.261	0.865
33 = Thoracic surgery	199	70.9	69.8	17.1	0.115	0.978
34 = Urology	1,073	137.2	46.0	4.1	0.229	0.951
40 = Hand surgery	133	60.1	11.3	6.0	0.405	0.703
76 = Peripheral vascular disease	11	258.8	54.5	27.3	0.216	0.935
77 = Vascular surgery	306	256.1	68.3	0.3	0.141	0.996
78 = Cardiac surgery	205	63.6	67.3	2.0	0.138	0.990
85 = Maxillofacial surgery	6	46.2	33.3	16.7	0.302	0.862
91 = Surgical oncology	69	52.1	55.1	14.5	0.141	0.930
98 = Gynecologist/oncologist	80	47.0	46.3	11.3	0.235	0.888
Emergency Medicine Physicians						
93 = Emergency medicine	7,057	136.0	47.2	5.6	0.228	0.961
Other Physicians						
05 = Anesthesiology	4,762	65.3	53.7	13.1	0.195	0.949
22 = Pathology	1,239	211.6	60.3	4.0	0.161	0.984
23 = Sports Medicine	30	66.0	26.7	6.7	0.383	0.855
30 = Diagnostic radiology	4,850	476.7	73.9	15.4	0.106	0.979
36 = Nuclear medicine	107	312.6	58.9	0.0	0.145	0.994
37 = Pediatric medicine	135	73.4	69.6	0.0	0.134	0.988
70 = Multispecialty clinic or group practice* [i]	1	117.0				
72 = Pain management	92	90.7	60.9	16.3	0.141	0.920
92 = Radiation oncology	366	72.4	51.1	2.2	0.176	0.972
94 = Interventional radiology	180	281.3	67.8	6.1	0.150	0.983

*Number of eligible physicians is too few.

[i] A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, or (3) the number of physicians was one.

Table B.15 *(Continued)*

Two-Digit CMS Specialty	CAD					
	Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	Average p Value	Average Reliability (Case Size 20+)
Overall	64,576	169.2	56.3	10.8	0.184	0.946
Primary Care						
01 = General Practice	315	106.8	60.6	3.2	0.153	0.975
08 = Family practice	9,508	69.6	32.5	10.8	0.289	0.881
11 = Internal medicine	11,583	110.7	77.0	15.7	0.088	0.966
38 = Geriatric medicine	317	118.0	67.2	24.6	0.133	0.951
84 = Preventive medicine	36	73.5	44.4	19.4	0.282	0.905
Medical Specialists						
03 = Allergy/immunology	120	44.0	20.8	4.2	0.355	0.882
06 = Cardiology	3,503	563.0	73.5	7.8	0.111	0.987
07 = Dermatology	853	152.8	14.4	7.3	0.414	0.768
09 = Interventional Pain Management	134	95.1	45.5	20.1	0.215	0.907
10 = Gastroenterology	1,308	108.4	52.7	8.6	0.196	0.951
12 = Osteopathic manipulative therapy	22	80.5	54.5	36.4	0.145	0.899
13 = Neurology	1,569	102.3	61.7	10.8	0.153	0.961
17 = Hospice and Palliative Care	26	48.7	65.4	34.6	0.178	0.957
21 = Cardiac Electrophysiology	140	560.9	85.0	12.9	0.060	0.981
25 = Physical medicine and rehabilitation	614	105.4	85.3	18.7	0.062	0.978
26 = Psychiatry	922	58.4	64.4	7.3	0.147	0.967
27 = Geriatric Psychiatry	19	88.9	57.9	36.8	0.198	0.932
29 = Pulmonary disease	1,162	163.6	70.3	17.4	0.114	0.971
39 = Nephrology	821	157.5	71.3	17.8	0.118	0.975
44 = Infectious disease	531	96.0	68.2	7.7	0.127	0.988
46 = Endocrinology	641	107.9	58.5	7.2	0.163	0.968
66 = Rheumatology	498	90.6	28.9	8.2	0.315	0.897
79 = Addiction medicine	5	29.4	40.0	40.0	0.199	0.788
81 = Critical care (intensivists)	284	80.5	71.1	17.3	0.112	0.980
82 = Hematology	86	73.2	64.0	7.0	0.159	0.969
83 = Hematology/oncology	899	91.5	58.1	9.7	0.168	0.957
86 = Neuropsychiatry	5	112.0	60.0	0.0	0.064	0.986
90 = Medical oncology	307	88.9	70.7	2.6	0.122	0.959
Surgeons						
02 = General surgery	1,863	71.0	60.5	8.9	0.165	0.963
04 = Otolaryngology	819	94.5	24.2	2.7	0.329	0.934
14 = Neurosurgery	443	58.5	53.0	2.7	0.192	0.971
16 = Obstetrics/gynecology	492	40.0	12.6	1.4	0.410	0.835
18 = Ophthalmology	1,250	174.2	19.8	3.1	0.375	0.913
20 = Orthopedic surgery	2,108	93.0	38.3	6.3	0.269	0.932
24 = Plastic and reconstructive surgery	175	50.8	56.6	7.4	0.176	0.961
28 = Colorectal surgery (formerly proctology)	117	69.1	34.2	18.8	0.246	0.834
33 = Thoracic surgery	220	89.6	70.5	18.6	0.123	0.980
34 = Urology	1,084	179.2	47.8	3.4	0.218	0.961
40 = Hand surgery	135	69.3	13.3	3.0	0.406	0.793
76 = Peripheral vascular disease	12	359.3	58.3	33.3	0.113	0.899
77 = Vascular surgery	311	326.3	69.5	1.9	0.138	0.988
78 = Cardiac surgery	227	89.2	68.3	18.9	0.153	0.980
85 = Maxillofacial surgery	8	46.1	37.5	0.0	0.213	0.940
91 = Surgical oncology	66	58.7	59.1	3.0	0.162	0.957
98 = Gynecologist/oncologist	67	46.8	44.8	11.9	0.191	0.890
Emergency Medicine Physicians						
93 = Emergency medicine	7,064	157.8	49.2	5.6	0.216	0.963
Other Physicians						
05 = Anesthesiology	4,852	73.9	53.1	17.4	0.195	0.941
22 = Pathology	1,246	246.7	64.8	5.8	0.149	0.984
23 = Sports Medicine	29	68.6	20.7	6.9	0.363	0.860
30 = Diagnostic radiology	4,862	552.7	73.9	12.3	0.106	0.986
36 = Nuclear medicine	107	396.1	61.7	0.0	0.150	0.987
37 = Pediatric medicine	126	86.4	65.1	0.0	0.096	0.989
70 = Multispecialty clinic or group practice* [i]	1	137.0				
72 = Pain management	93	101.6	68.8	14.0	0.126	0.929
92 = Radiation oncology	389	80.8	48.6	8.5	0.228	0.942
94 = Interventional radiology	182	308.3	70.9	14.3	0.133	0.972

*Number of eligible physicians is too few.

[i] A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, or (3) the number of physicians was one.

Table B.15 *(Continued)*

Two-Digit CMS Specialty	COPD					
	Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	Average p Value	Average Reliability (Case Size 20+)
Overall	42,819	86	45.6	8.1	0.234	0.928
Primary Care						
01 = General Practice	199	63	53.3	9.5	0.198	0.929
08 = Family practice	4,494	41	28.2	10.2	0.323	0.861
11 = Internal medicine	7,855	57	59.5	11.5	0.160	0.945
38 = Geriatric medicine	216	58	52.8	13.0	0.190	0.940
84 = Preventive medicine	8	59	50.0	12.5	0.234	0.902
Medical Specialists						
03 = Allergy/immunology	50	40	30.0	6.0	0.267	0.874
06 = Cardiology	3,247	167	52.9	8.0	0.197	0.958
07 = Dermatology	493	53	8.1	6.1	0.454	0.706
09 = Interventional Pain Management	96	50	32.3	15.6	0.248	0.861
10 = Gastroenterology	879	51	38.9	7.4	0.263	0.919
12 = Osteopathic manipulative therapy	10	60	70.0	60.0	0.149	0.901
13 = Neurology	837	52	50.4	1.9	0.201	0.973
17 = Hospice and Palliative Care	11	37	72.7	27.3	0.267	0.946
21 = Cardiac Electrophysiology	126	156	67.5	5.6	0.122	0.974
25 = Physical medicine and rehabilitation	336	54	75.0	2.1	0.094	0.982
26 = Psychiatry	600	45	57.3	5.8	0.186	0.954
27 = Geriatric Psychiatry	12	43	50.0	41.7	0.179	0.907
29 = Pulmonary disease	1,097	128	62.3	11.9	0.155	0.961
39 = Nephrology	578	60	51.7	14.9	0.203	0.943
44 = Infectious disease	336	60	60.7	2.1	0.141	0.979
46 = Endocrinology	350	47	44.6	11.7	0.211	0.937
66 = Rheumatology	307	44	16.0	4.9	0.357	0.854
79 = Addiction medicine	1	25	100.0	100.0	0.021	0.803
81 = Critical care (intensivists)	198	56	70.2	17.7	0.137	0.972
82 = Hematology	29	49	48.3	0.0	0.228	0.980
83 = Hematology/oncology	541	50	45.8	1.8	0.230	0.957
86 = Neuropsychiatry	4	64	50.0	0.0	0.249	0.972
90 = Medical oncology	156	51	34.6	7.1	0.269	0.925
Surgeons						
02 = General surgery	857	43	46.6	3.2	0.212	0.966
04 = Otolaryngology	492	45	17.5	3.3	0.380	0.880
14 = Neurosurgery	167	34	34.1	4.2	0.300	0.924
16 = Obstetrics/gynecology	69	33	15.9	1.4	0.454	0.898
18 = Ophthalmology	894	59	8.7	3.2	0.471	0.792
20 = Orthopedic surgery	1,212	40	19.8	6.1	0.354	0.879
24 = Plastic and reconstructive surgery	50	31	50.0	0.0	0.226	0.962
28 = Colorectal surgery (formerly proctology)	51	32	31.4	9.8	0.309	0.857
33 = Thoracic surgery	130	51	56.2	9.2	0.183	0.964
34 = Urology	823	58	29.2	7.2	0.297	0.884
40 = Hand surgery	46	31	8.7	6.5	0.413	0.599
76 = Peripheral vascular disease	10	107	30.0	20.0	0.349	0.879
77 = Vascular surgery	278	118	58.3	6.5	0.165	0.959
78 = Cardiac surgery	111	44	60.4	5.4	0.164	0.973
85 = Maxillofacial surgery	2	33	50.0	0.0	0.051	0.928
91 = Surgical oncology	18	34	33.3	0.0	0.341	0.882
98 = Gynecologist/oncologist	17	27	5.9	0.0	0.454	0.854
Emergency Medicine Physicians						
93 = Emergency medicine	6,266	76	36.0	5.6	0.278	0.937
Other Physicians						
05 = Anesthesiology	2,182	40	44.6	10.1	0.242	0.923
22 = Pathology	971	94	47.1	5.9	0.226	0.965
23 = Sports Medicine	13	36	30.8	23.1	0.310	0.786
30 = Diagnostic radiology	4,527	234	62.4	7.7	0.158	0.969
36 = Nuclear medicine	102	128	40.2	4.9	0.222	0.937
37 = Pediatric medicine	65	56	47.7	0.0	0.233	0.988
70 = Multispecialty clinic or group practice* [i]	1	43				
72 = Pain management	73	50	37.0	13.7	0.247	0.879
92 = Radiation oncology	181	55	36.5	0.0	0.290	0.957
94 = Interventional radiology	145	164	59.3	7.6	0.163	0.971

*Number of eligible physicians is too few.

[i] A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, or (3) the number of physicians was one.

Table B.15 *(Continued)*

Two-Digit CMS Specialty	Heart Failure					
	Number of Eligible Physicians	Average Number of Beneficiaries Attributed to the Physician	Percent of Physicians Statistically Different from Mean (p<.05)	Percent of Physicians Significantly Different from Mean (p<.05) and at Least One Standard Deviation From Mean	Average p Value	Average Reliability (Case Size 20+)
Overall	53,049	111.5	49.8	9.6	0.213	0.939
Primary Care						
01 = General Practice	228	76.9	55.3	5.7	0.201	0.955
08 = Family practice	6,403	46.7	29.3	11.7	0.310	0.862
11 = Internal medicine	10,017	73.7	66.3	11.9	0.131	0.953
38 = Geriatric medicine	295	82.8	57.3	18.0	0.192	0.943
84 = Preventive medicine	14	73.6	57.1	14.3	0.202	0.920
Medical Specialists						
03 = Allergy/immunology	39	32.9	17.9	10.3	0.332	0.876
06 = Cardiology	3,436	314.4	64.7	12.3	0.143	0.969
07 = Dermatology	689	72.3	12.5	2.0	0.428	0.860
09 = Interventional Pain Management	110	53.4	33.6	20.0	0.283	0.845
10 = Gastroenterology	1,121	61.4	44.7	10.0	0.233	0.932
12 = Osteopathic manipulative therapy	11	82.7	72.7	45.5	0.120	0.929
13 = Neurology	1,218	61.8	51.5	8.2	0.205	0.944
17 = Hospice and Palliative Care	18	41.4	83.3	22.2	0.061	0.968
21 = Cardiac Electrophysiology	137	394.3	77.4	10.9	0.091	0.975
25 = Physical medicine and rehabilitation	489	68.1	76.7	17.6	0.088	0.963
26 = Psychiatry	501	52.4	61.1	5.6	0.132	0.963
27 = Geriatric Psychiatry	17	57.1	35.3	29.4	0.277	0.889
29 = Pulmonary disease	1,120	109.9	63.6	16.2	0.152	0.961
39 = Nephrology	790	126.8	65.1	13.3	0.143	0.972
44 = Infectious disease	479	75.2	59.1	13.8	0.181	0.966
46 = Endocrinology	511	68.3	53.4	7.6	0.192	0.965
66 = Rheumatology	409	50.6	25.7	2.2	0.320	0.945
79 = Addiction medicine	1	32.0	100.0	100.0	0.017	0.839
81 = Critical care (intensivists)	249	58.9	65.9	16.5	0.157	0.970
82 = Hematology	57	49.9	49.1	1.8	0.200	0.974
83 = Hematology/oncology	700	57.3	42.9	1.7	0.249	0.966
86 = Neuropsychiatry	5	71.8	80.0	0.0	0.178	0.991
90 = Medical oncology	198	58.0	41.9	1.0	0.252	0.981
Surgeons						
02 = General surgery	1,294	48.6	52.5	3.0	0.196	0.968
04 = Otolaryngology	608	53.0	20.6	3.9	0.353	0.898
14 = Neurosurgery	247	35.3	41.3	0.8	0.241	0.957
16 = Obstetrics/gynecology	120	35.5	15.0	0.8	0.374	0.940
18 = Ophthalmology	1,104	89.0	12.0	2.0	0.424	0.909
20 = Orthopedic surgery	1,638	48.2	27.3	8.1	0.323	0.889
24 = Plastic and reconstructive surgery	89	37.3	52.8	0.0	0.210	0.975
28 = Colorectal surgery (formerly proctology)	73	37.7	35.6	13.7	0.275	0.838
33 = Thoracic surgery	158	59.0	61.4	9.5	0.173	0.978
34 = Urology	983	80.7	37.5	10.5	0.265	0.895
40 = Hand surgery	87	35.0	8.0	4.6	0.395	0.811
76 = Peripheral vascular disease	11	185.5	54.5	36.4	0.192	0.876
77 = Vascular surgery	296	185.6	63.2	3.7	0.135	0.973
78 = Cardiac surgery	172	57.5	64.0	5.8	0.132	0.984
85 = Maxillofacial surgery	1	37.0	100.0	0.0	0.014	0.868
91 = Surgical oncology	29	41.4	41.4	10.3	0.187	0.892
98 = Gynecologist/oncologist	30	35.0	20.0	0.0	0.438	0.893
Emergency Medicine Physicians						
93 = Emergency medicine	6,747	104.2	39.8	5.2	0.254	0.952
Other Physicians						
05 = Anesthesiology	3,593	45.2	45.7	13.3	0.228	0.931
22 = Pathology	1,124	126.1	53.6	7.5	0.198	0.971
23 = Sports Medicine	19	39.9	31.6	5.3	0.352	0.876
30 = Diagnostic radiology	4,720	320.6	67.9	9.5	0.130	0.979
36 = Nuclear medicine	106	203.2	54.7	10.4	0.185	0.942
37 = Pediatric medicine	91	63.2	51.6	0.0	0.221	0.990
70 = Multispecialty clinic or group practice* [i]	1	48.0				
72 = Pain management	79	52.1	51.9	16.5	0.174	0.899
92 = Radiation oncology	197	61.7	26.4	6.1	0.337	0.890
94 = Interventional radiology	170	198.7	67.1	3.5	0.126	0.983

*Number of eligible physicians is too few.

[i] A reliability measure for the specialty could not be estimated because the maximization procedure to estimate the between variance: (1) was not positive definite, (2) did not converge, or (3) the number of physicians was one.