An Update on Physician Practice Cost Shares

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The 1988 physicians' practice costs and income survey (PPCIS) collected detailed costs, revenues, and incomes data for a sample of 3,086 physicians. These data are utilized to update the Health Care Financing Administration (HCFA) cost shares used in calculating the medicare economic index (MEI) and the geographic practice cost index (GPCI). Cost shares were calculated for the national sample, for 16 specialty groupings, for urban and rural areas, and for 9 census divisions. Although statistical tests reveal that cost shares differ across specialties and geographic areas, sensitivity analysis shows that these differences are small enough to have trivial effects in computing the MEI and GPCI. These results may inform policymakers on one aspect of the larger issue of whether physician payments should vary by geographic location or specialty.

INTRODUCTION

The Medicare fee schedule, phased in beginning January 1, 1992, restructured payments to physicians according to nationally uniform relative values for physician services and a nationally uniform conversion factor. (Previously, physicians were paid according to a reasonable charge methodology, with the Medicare allowed charge reflecting the lesser of the physician's actual charge, the customary charge, or the locally prevailing charge.) Variation in physician payments is introduced by two parallel indexes: the GPCI which provides geographic variation in fees, and the MEI which is used in calculating annual updates to the fee schedule.

The GPCI is the weighted average of three geographic adjustment factors, constructed for each Medicare payment locality. These adjustment factors represent the cost of malpractice relative to the national average, practice expenses relative to the national average, and one-fourth of the cost of physicians' work relative to the national average. Thus, by law, payments are intended to reflect differences in physician outlays for malpractice premiums, employee wages, office costs, and other practice expenses that vary in price geographically. Payments for physicians' work vary geographically, but reflect one-fourth, rather than all, the geographic variation in cost.

Annual updates to the conversion factor used in establishing the physician fee schedule are based in part on the MEI. This index represents a weighted sum of annual price changes for various inputs needed to produce physicians' services. Promulgated in 1975, the MEI has historically been used to construct one national update applying to all physicians regardless of geographic location or specialty. Under the new payment system, annual updates also depend on changes in actual physician expenditures relative to the

volume performance standards, calculated separately for surgical and non-surgical services. For calendar year 1993, the fee schedule update is 3.1 percent for surgical services and 0.8 percent for non-surgical services.

The use of the GPCI drew criticism both from those who desired a uniform national fee schedule and from those who thought the full variation in the cost of physicians' work should be reflected in the geographic adjustment (*Federal Register*, 1991). The differential fee updates for surgical and non-surgical services have also been criticized, both by those who desire a return to one uniform update and by those who want a more detailed update by specialty. Given this controversy, the question remains: Should physician payments vary by specialty or geographic location?

The data presented in this article inform policymakers on one aspect of this issue: Should physician practice cost shares vary by specialty or geographic location? Cost shares serve as weights in construction of both the GPCI and the MEI; hence, the use of area-specific or specialty-specific cost shares may affect physician payment levels or updates. There are two aspects to determining whether practice cost shares vary sufficiently to support a policy of using a different set of cost shares for any subgroup of physicians. One part of the answer is whether the difference is statistically significant. If the cost shares are not significantly different for a subgroup of physicians, then there is no basis for using a different set of cost shares for that group. Second, although cost shares may be statistically different, the resulting GPCI and MEI values may be trivially different for ratesetting purposes. For the cost shares

to have a meaningful effect on the index values, either the magnitude of the difference in the cost shares must be large, or the geographic variation in prices (for the GPCI) or the rates of inflation (for the MEI) for the physician cost inputs must differ substantially.

First, 1988 physician practice cost shares are presented by region, urban or rural location, and specialty, with associated standard errors. Next, multivariate analysis of variance (MANOVA) is used to simultaneously test for differences in a set of cost shares. As has been found in previous work (Berry, 1981; Zuckerman, Welch, and Pope, 1987), statistically significant differences were found for virtually all cost shares tested. Finally, simulation methods are used to test for potentially important geographic and temporal differences in the levels and trends in costs.

DATA SOURCE

The data source for this analysis is the 1988 Physicians' Practice Costs and Income Survey (PPCIS), sponsored by HCFA. The American Medical Association's (AMA) physician masterfile, a comprehensive file of all physicians practicing in the United States, was used as the sampling frame. A nationally-representative sample of physicians, stratified by specialty, census division, and urban or rural location, was randomly selected from the masterfile. To be eligible for the survey, physicians had to meet the following criteria: (1) currently provide patient care services for at least 20 hours per week; (2) not currently a resident, clinical fellow, or research fellow; (3) not employed by a faculty practice plan, hospital, clinic, or health maintenance organiza-

tion, or by a Federal Government agency in 1988; (4) if in a multipractice arrangement, greater than 80 percent of income from the practice in which the physician was full or part owner, or employed by another physician or group of physicians; (5) have spent at least 20 hours per week in patient care (or services) during 1988; and (6) have been in the same private practice for all of 1988.

The final number of completed cases was 3,505, a response rate of 61 percent. Sampling weights adjust for over- and under-sampling of selected groups of physicians, and differential non-response rates between subgroups. Thus, weighted values provide national projections for eligible physicians who fall into a certain classification. Physician employees have been excluded from this analysis because they were not asked financial questions about their practices, leaving 3,086 cases which responded to the cost questions.

Item response rates for the financial questions were quite high, with 69 percent of the respondents providing all the cost and income information for which they were asked. Only 3 percent of the physicians either responded "don't know" or "refused" for more than 50 percent of the cost and income questions. These missing values were imputed using a regression imputation approach (Dayhoff et al., 1992). Imputed values were used in the cost shares analysis for two reasons. First, use of imputed values allows the inclusion of many observations that would have been deleted otherwise because one or two variables were missing from the survey. Thus, a larger sample size is maintained, which can be especially important in analyses based on specialty or division. Second, the imputation

algorithms were constructed knowing that the resulting data would be used to determine cost shares. That is, the replacement algorithms were not based upon determining a cost variable as a function of other costs or of revenue. Doing so would have reduced the variation in the cost shares, and would have made testing hypotheses concerning cost shares inappropriate. Instead, regressions generally used practice size, specialty, and location as explanatory variables.

The following data preparation and cleaning steps were undertaken before calculation of the cost shares:

- The sample was restricted to self-employed physicians ($N = 3,086$).
- Physicians who did not report a practice size were excluded.
- Physicians reporting practice cost component values (e.g., equipment, office space costs) more than four standard deviations from the arithmetic mean of that component were excluded (no values were more than four standard deviations below the mean). This trim follows the procedure utilized by Zuckerman, Welch, and Pope (1987) in calculating cost shares.
- The imputed values for missing data on practice costs were used.
- The sample weights were used to correct for non-response and the non-randomness of the sample.

Of the 3,086 physicians, 211 were deleted through outlier or missing data trims, resulting in a final sample size of 2,875. By comparison, cost share analysis of the 1983 PPCIS was based on 2,429 physicians, whereas the AMA's Socioeconomic Monitoring System (SMS) for

Table 1

Physician Practice Cost Shares Nationally and by Specialty Based on the 1988 Physicians' Practice Costs and Income Survey (PPCIS)

Specialty	Number	Physician Earnings	Non-Physician Employee Earnings	Office Space Costs	Medical Equipment Costs	Malpractice Costs	Medical Supply Costs	Other Costs
				Percent				
All Physicians	2,875	56.7	17.3	7.6	1.6	5.5	4.1	7.2
		(0.3)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Medical Specialties								
General and Family Practice	374	47.8	22.4	9.6	2.1	4.6	6.3	7.2
		(0.7)	(0.5)	(0.3)	(0.1)	(0.2)	(0.3)	(0.3)
Internal Medicine	329	50.9	20.8	9.0	2.2	3.9	5.2	7.9
		(0.8)	(0.5)	(0.3)	(0.2)	(0.2)	(0.3)	(0.3)
Cardiovascular Disease	117	61.5	15.8	7.2	2.2	4.2	2.6	6.4
		(1.3)	(0.8)	(0.4)	(0.3)	(0.3)	(0.2)	(0.5)
Gastroenterology	127	60.2	16.9	7.4	1.9	3.6	3.5	6.5
		(1.1)	(0.7)	(0.3)	(0.2)	(0.2)	(0.3)	(0.4)
Other Medical Specialties[1]	229	54.2	19.5	·8.4	1.3	3.6	6.0	7.0
		(0.9)	(0.6)	(0.4)	(0.1)	(0.2)	(0.3)	(0.3)
Surgical Specialties								
General Surgery	193	59.0	14.1	7.1	1.3	9.5	2.7	6.4
		(0.9)	(0.6)	(0.3)	(0.1)	(0.4)	(0.2)	(0.3)
Cardiothoracic Surgery	118	65.4	12.6	5.0	1.2	8.7	1.1	6.0
		(1.3)	(0.7)	(0.3)	(0.1)	(0.5)	(0.2)	(0.4)
Orthopedic Surgery	120	53.9	20.3	7.6	1.6	7.2	4.0	5.5
		(1.1)	(0.8)	(0.4)	(0.2)	(0.3)	(0.3)	(0.3)
Ophthalmology	132	53.2	20.7	8.4	3.3	3.3	3.7	7.4
		(1.2)	(0.8)	(0.4)	(0.3)	(0.2)	(0.4)	(0.5)
Urologic Surgery	158	57.8	14.9	7.7	1.9	6.4	4.2	7.1
		(1.0)	(0.6)	(0.3)	(0.2)	(0.3)	(0.2)	(0.4)
Obstetrics and Gynecology	235	51.4	17.8	7.1	1.2	10.8	4.4	7.3
		(0.7)	(0.5)	(0.3)	(0.1)	(0.4)	(0.2)	(0.4)
Other Surgical Specialties[2]	153	53.0	18.2	9.0	1.9	7.1	3.7	7.1
		(1.1)	(0.6)	(0.4)	(0.2)	(0.3)	(0.3)	(0.4)
Other Specialties								
Psychiatry	186	71.5	8.5	8.2	0.3	2.6	0.7	8.2
		(1.0)	(0.9)	(0.4)	(0.1)	(0.1)	(0.1)	(0.4)
Anesthesiology	158	73.1	9.4	1.5	0.3	8.7	0.3	6.7
		(1.2)	(1.0)	(0.2)	(0.1)	(0.4)	(0.1)	(0.4)
Radiology	122	67.8	11.4	3.5	2.9	3.9	3.1	7.4
		(1.9)	(1.1)	(0.4)	(0.6)	(0.2)	(0.4)	(0.5)
Other Specialties[3]	124	69.5	11.4	4.1	1.0	3.8	2.0	8.2
		(1.8)	(1.1)	(0.4)	(0.2)	(0.3)	(0.3)	(0.7)

[1] Other medical specialties consists primarily of pediatrics, allergy, and dermatology.
[2] Other surgical specialties consists primarily of neurosurgery, plastic surgery, and otorhinolaryngology.
[3] Other specialties consists primarily of pathology, emergency medicine, and neurology.

NOTES: Standard errors are in parentheses. Data were trimmed to exclude costs more than 4 standard deviations from the arithmetic mean. Data are for self-employed physicians.

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data are from the 1988 physicians' practice costs and income survey.

1988 based cost estimates on 2,855 responses.

COST SHARES

Cost shares were computed for seven categories of physician expenses: physician earnings, non-physician employee earnings, office space costs, equipment costs, malpractice costs, supply costs, and other costs. Cost shares were calculated at the practice level, unlike the AMA's SMS which asks individual physicians to estimate their own share of practice costs. As mentioned previously, sample weights were used to correct for under- and over-sampling and differences in response rates between subgroups.

Nationally and by Specialty

Table 1 presents cost shares using the national sample, and by specialty. The national cost shares (PPCIS shares) are based on the sample of 2,875 observations which remained after outlier trims. Each of the specialty groups included more than 100 observations, ranging from 117 observations for cardiovascular disease to 374 for general and family practice. Table 2 presents the mean costs and average net earnings values that correspond to these shares.

The national cost share for physician earnings is 56.7 percent. This means that more than one-half of the expenses of a practice is payment to the physicians in the practice. The specialty shares range from 47.8 percent for family practitioners to 73.1 percent for anesthesiologists. These differences in cost shares do not necessarily correspond to differences in incomes. For example, Table 2 indicates that cardiothoracic surgeons have the highest mean physician earnings

($329,903), although 4 specialties have higher physician earnings shares.

Standard errors associated with each cost share are given in parentheses below the share estimate, and reflect the weighting used to produce the means. All standard errors are in percentage terms. For example, the national share of physicians' earnings in total practice costs is 56.7 percent with a 0.3 percent standard error. The standard errors are very small relative to the mean values, implying stable shares within specialties.

Non-physician employee wages account for 17.3 percent of costs on average. By specialty, the share ranges from 22.4 percent for general and family practice to 8.5 percent for psychiatry and 9.4 percent for anesthesiology (Table 1). Here, share differences reflect both the differences in number and type of non-physician employees hired by each specialty. For example, the average psychiatric practice in our sample employs 1.4 non-physician employees per doctor, compared with an average of 3.7 employees for a general and family practice (not shown); the employees in a psychiatric office are predominantly clerical staff, while the general and family practice typically also includes registered nurses, licensed practical nurses, or medical technicians.

Office space shares also show considerable variation around the national share of 7.6 percent. The three lowest office cost shares are for anesthesiology (1.5 percent), radiology (3.5 percent), and other specialties (4.1 percent). The latter group is primarily composed of pathologists and emergency room physicians; hence, the low office cost shares for these groups are easily explained by the hospital-based nature of their work (Table 1).

The national cost share for equipment is 1.6 percent. The two highest cost shares by specialty are 3.3 percent for ophthalmology and 2.9 percent for radiology; these two specialties also have the highest mean equipment costs. The cost distribution for radiologists is bimodal, with 64 of the 122 in our sample reporting no equipment costs (Table 1). Physicians in this specialty seem to incur either very low or very high equipment costs depending on their practice arrangement. Radiologists who own equipment face very high expenses for its purchase. Other radiologists practice in facilities that provide the equipment, thus avoiding the expense themselves.

Table 2
Mean Costs per Physician and Average Net Earnings, by Specialty: 1988

Specialty	Physician Earnings	Non-physician Employee Earnings	Office Space Costs	Medical Equipment Costs	Malpractice Costs	Medical Supply Costs	Other Costs
All Physicians	$163,114	$52,111	$20,187	$4,955	$14,805	$11,457	$20,219
	(1,917)	(867)	(309)	(173)	(261)	(262)	(361)
Medical Specialties							
General and Family	105,339	51,559	19,794	4,926	8,639	14,085	15,218
Practice	(3,207)	(1,931)	(728)	(353)	(316)	(674)	(770)
Internal Medicine	121,320	49,746	19,381	5,204	8,019	12,941	19,182
	(3,586)	(1,749)	(592)	(358)	(306)	(771)	(1,031)
Cardiovascular	237,655	59,919	24,108	7,673	11,911	9,289	23,326
Disease	(16,876)	(5,131)	(1,694)	(988)	(741)	(991)	(2,161)
Gastroenterology	188,497	54,680	21,549	5,956	10,234	10,169	20,040
	(7,893)	(3,649)	(1,094)	(633)	(530)	(917)	(1,454)
Other Medical	137,703	51,646	19,845	3,351	7,669	15,199	18,365
Specialties	(4,975)	(2,572)	(910)	(351)	(326)	(982)	(1,200)
Surgical Specialties							
General Surgery	178,027	41,571	19,227	3,479	24,993	7,062	17,760
	(6,806)	(2,017)	(875)	(315)	(1,010)	(562)	(975)
Cardiothoracic	329,903	60,132	21,258	5,511	33,930	4,743	27,907
Surgery	(19,629)	(4,255)	(1,499)	(757)	(1,558)	(803)	(2,365)
Orthopedic Surgery	261,699	94,992	35,405	7,310	31,704	18,183	25,545
	(12,644)	(4,820)	(2,419)	(707)	(1,405)	(1,252)	(1,674)
Ophthalmology	205,888	82,483	31,053	11,958	10,398	15,874	28,924
	(10,443)	(5,120)	(1,688)	(1,270)	(384)	(2,280)	(2,289)
Urologic Surgery	167,238	43,283	21,601	5,780	16,267	11,708	20,629
	(5,476)	(1,979)	(1,000)	(623)	(685)	(725)	(1,486)
Obstetrics and	179,706	63,392	23,570	4,184	35,735	15,028	25,184
Gynecology	(4,950)	(2,378)	(961)	(347)	(1,278)	(878)	(1,493)
Other Surgical	197,519	68,057	31,185	6,546	22,452	12,459	25,090
Specialties	(9,075)	(4,430)	(1,766)	(661)	(951)	(1,173)	(1,648)
Other Specialties							
Psychiatry	119,641	20,753	13,420	627	3,925	1,090	14,897
	(3,857)	(3,760)	(733)	(114)	(179)	(160)	(1,203)
Anesthesiology	212,951	37,013	4,684	1,060	23,168	838	19,625
	(6,565)	(5,347)	(689)	(322)	(999)	(223)	(1,366)
Radiology	213,017	39,684	12,543	11,555	11,201	10,686	23,392
	(8,431)	(4,091)	(1,612)	(2,585)	(613)	(1,354)	(1,883)
Other Specialties	161,259	33,554	11,135	2,943	8,049	5,687	20,650
	(6,852)	(6,852)	(1,248)	(520)	(597)	(1,090)	(1,930)

NOTES: Cost shares were calculated at the practice level. Mean costs are reported per physician to facilitate comparisons across specialties. Standard errors are in parentheses. Data were trimmed to exclude cost values more than 4 standard deviations from the arithmetic mean. Data are for self-employed physicians.

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data are from the 1988 physicians' practice costs and income survey.

The three largest cost shares for supplies all belong to medical specialties, general and family practice (GFP) being the highest at 6.3 percent, followed by other medical (consisting primarily of pediatrics) at 6.0 percent, and internal medicine at 5.2 percent. Psychiatrists and anesthesiologists have the lowest medical supply cost shares and mean expenses of any specialty (Table 1).

The malpractice cost share is seen to vary substantially by specialty. The medical specialties (the first five specialties listed in the table) all have malpractice shares below the national average of 5.5 percent. Psychiatrists, radiologists, ophthalmologists, and other specialists also have lower than average malpractice shares. Anesthesiologists and the remaining surgical specialties all have high cost shares with the maximum incurred by obstetrics and gynecology at 10.8 percent. This result is consistent with the findings of Rosenbach and Stone (1990) using 1983 and 1986 PPCIS data (Table 1).

The "other costs" share had a national mean of 7.2 percent. Shares range from 5.5 percent for orthopedic surgery to 8.2 percent for psychiatry and other specialties. This category included automobile expenses, continuing education, contracted services (such as legal or accounting), as well as any other expenses not reported elsewhere (Table 1).

Table 2 indicates that the mean physician earning was $157,051 net in 1988. Net income is defined to include total actual gross wages, deferred compensation, bonuses, and fringe benefits. As expected, the surgical specialists tend to have higher net incomes than do medical specialists. However, these high incomes do not appear to be achieved by incurring low expenses. For example, the two highest earning specialties are cardiothoracic surgery ($329,903) and orthopedic surgery ($261,699). These are also among the highest in terms of non-physician earnings, malpractice costs, and medical supply costs.

From Table 1 it is difficult to determine whether the differences in cost shares are large enough to be meaningful. The appropriate statistical technique to simultaneously test for differences in a set of cost shares is MANOVA. This, rather than standard analysis of variance, should be used because the issue is not whether a particular share differs across groups, but whether there are any differences in the entire set of cost shares across groups. MANOVA appropriately accounts for the simultaneous nature of the statistical test.

The small standard errors of the cost shares in previous tables indicate that virtually all share differences are likely to be statistically significant. The pooled MANOVA F-statistic (Wilk's criterion) for all 16 specialties was 30.3, implying that it is extremely unlikely (a less than 1 in 10 thousand chance) that all of the specialty shares came from the same underlying cost distribution. Some specialty shares may be legitimately pooled, however, so we tested for differences in six pairs of specialties: cardiology and gastroenterology, GFP and internal medicine, ophthalmology and orthopedics, anesthesia and radiology, ophthalmology and other surgery, and radiology and other specialties. Of the six pairs tested, only one (cardiology and gastroenterology) could be statistically aggregated at a 5-percent level of significance. Thus, even though, say GFP and internist cost shares differ by only 1 or 2 points, the combined share differences are statistically significant. This

gives an indication of the small share differences required for specialties to be statistically aggregated, given the precision of the shares measured using the PPCIS.

Cost Shares by Geographic Breakdown

Table 3 shows the variation by practice location, not controlling for specialty. The differences are always much less than differences among specialties. Rural practices spend disproportionately more on employees and supplies, leaving the physician with a smaller share. This result is similar to AMA data, which shows rural physicians (American Medical Association, 1989) spending more on non-physician employees than do practices in large metropolitan areas.

As shown in Table 3, the West North Central and New England practices return the least to physicians, but for different reasons (which could be confounded with specialty). New England practices spend proportionately more on office space and malpractice premiums compared with West North Central physicians who tend to spend more on ancillary staff and supplies.

MANOVA tests of statistical significance indicate that urban and rural cost shares cannot be aggregated. The test results in the nine census divisions again indicate that these shares are statistically different and should not be aggregated.

Table 3

Physician Practice Cost Shares, by Location: United States, Urban, Rural, and Census Division

Practice Location	Number	Physician Earnings	Non-Physician Employee Earnings	Office Space Costs	Medical Equipment Costs	Malpractice Costs	Medical Supply Costs	Other Costs
				Percent				
All Physicians	2,875	56.7	17.3	7.6	1.6	5.5	4.1	7.2
		(0.3)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Urban	2,143	57.1	17.0	7.7	1.6	5.5	3.9	7.2
		(1.6)	(1.0)	(0.6)	(0.3)	(0.5)	(0.4)	(0.6)
Rural	732	54.8	19.2	6.7	1.7	5.4	4.8	7.3
		(1.6)	(1.0)	(0.5)	(0.2)	(0.4)	(0.5)	(0.6)
Census Division								
New England	167	54.7	18.7	8.7	1.7	6.1	3.3	6.9
		(1.5)	(1.0)	(0.7)	(0.3)	(0.6)	(0.3)	(0.5)
Middle Atlantic	417	58.2	15.3	7.7	1.7	6.7	3.7	6.7
		(1.6)	(1.0)	(0.5)	(0.3)	(0.5)	(0.4)	(0.5)
East North Central	421	57.3	17.0	7.3	1.5	5.6	4.1	7.2
		(1.6)	(1.0)	(0.5)	(0.3)	(0.4)	(0.4)	(0.6)
West North Central	203	53.4	20.8	7.0	1.6	5.2	4.8	7.2
		(1.6)	(1.1)	(0.5)	(0.2)	(0.4)	(0.4)	(0.6)
South Atlantic	524	57.0	17.4	7.6	1.8	5.1	4.2	6.9
		(1.6)	(0.9)	(0.6)	(0.3)	(0.4)	(0.5)	(0.5)
East South Central	192	56.1	19.2	7.0	1.5	5.0	4.4	6.9
		(1.6)	(1.0)	(0.4)	(0.2)	(0.5)	(0.5)	(0.6)
West South Central	301	57.1	18.1	7.4	1.8	4.2	4.2	7.2
		(1.6)	(1.0)	(0.6)	(0.3)	(0.4)	(0.4)	(0.5)
Mountain	166	56.6	16.2	6.6	1.6	5.8	3.8	9.4
		(1.7)	(1.1)	(0.5)	(0.2)	(0.4)	(0.4)	(0.8)
Pacific	484	56.3	17.4	7.9	1.6	5.2	4.1	7.5
		(1.8)	(1.1)	(0.5)	(0.2)	(0.4)	(0.5)	(0.6)

NOTES: Standard errors are in parentheses. Data were trimmed to exclude outliers more than 4 standard deviations from the mean. Data are for self-employed physicians.

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data are from the 1988 physicians' practice costs and income survey.

Simultaneous tests of the interaction of specialty and location on the cost shares were made to determine whether locational differences remained after controlling for specialty. The results indicate that most of the observed urban-rural differences in cost shares disappear after controlling for specialty. The same is not true for division effects, which are insensitive to specialty. Nevertheless, locational effects that remain are trivial compared with those of specialty.

Comparison of Cost Share Surveys

The AMA's SMS has been a standard benchmark with which to compare the PPCIS cost shares. The SMS asks for practice costs and net incomes in detail similar to the PPCIS, although the PPCIS gathers cost information at the practice level, whereas the SMS asks physicians to report their own share of practice expenses. (In fact, both surveys have shared questions and screening criteria.) Table 4 presents cost shares from both surveys for selected years.

As shown in the table, with the exception of office space costs, the shares are quite similar between the two surveys.

(No standard errors on the shares are available from the AMA for significance testing.) The only major discrepancy concerns office space costs. The PPCIS has reported consistently lower values, although the difference declined between 1983-88. The 1988 PPCIS was modified to explicitly include telephone and utilities in order to be more consistent with the SMS. Although the office space share rose from 5.4 to 7.6 percent between 1983 and 1988, it is still roughly one-third less than the 11.3 percent calculated from the SMS. Other differences in cost shares are quite minor, except for the higher physician share reported by PPCIS, which almost exactly offsets the lower office space share.

One possible explanation for the high SMS figure might be the use of the word mortgage in the framing of the question. It is possible that some small percentage of respondents gave total mortgage figures per self-employed physician rather than annual depreciation, interest, and maintenance costs. PPCIS, in contrast, asks for yearly depreciation and interest costs for tax purposes, avoiding the word mortgage entirely.

Table 4

Comparing Physicians' Practice Costs and Income Survey (PPCIS) with Socioeconomic Monitoring System (SMS) to Determine Physician Practice Cost Shares

Source	Physician Earnings	Non-Physician Employee Earnings	Office Space Costs	Medical Equipment Costs	Malpractice Costs	Medical Supply Costs	Other Costs
				Percent			
PPCIS 1983	58.2	17.9	5.4	2.1	4.4	5.1	6.9
SMS 1983	57.4	14.5	10.4	2.5	3.5	4.6	7.1
SMS 1985	54.9	15.4	11.4	2.6	4.5	4.8	6.5
SMS 1987	54.2	15.7	11.1	2.4	5.6	5.0	6.0
SMS 1988	53.2	16.1	11.3	2.3	5.3	4.8	7.0
PPCIS 1988	56.7	17.3	7.6	1.7	5.5	4.1	7.3

NOTES: The 1988 PPCIS bases cost shares at the practice level. All other shares are reported at the individual level.

SOURCES: AMA Socioeconomic Characteristics of Medical Practice, selected years. 1983; Office of Research and Demonstrations: 1988 physicians' practice costs and income surveys.

Besides the AMA, the Medical Group Management Association also produces annual reports on practice costs, but only for groups. Their estimates of office costs are more similar to the PPCIS than to the SMS. In 1987, building and occupancy costs per full-time employee (FTE) physician were $21,098, with another $3,431 for telephone, or $24,529 altogether (Medical Group Management Association, 1988). As a percent of cash collections (i.e., adjusted gross revenues), these space costs amounted to 8 percent, which is much closer to the 7.6 percent based on PPCIS (using data for both solos and groups together) than the 11.3 percent calculated from SMS data.

SIGNIFICANCE FOR MEI AND GPCI

The statistics previously reported show differences in cost shares calculated by specialty, census division, and urban-rural location. Although these shares are statistically different, it is not clear that these differences are large enough to be meaningful.

Another way to evaluate cost-share differences is to recalculate GPCI and MEI index values using alternative sets of cost shares to determine how much influence each set has on the values. Two factors determine how much the index values are influenced by cost-share differences. One is the magnitude of the differences in the cost shares. The other is how different the rates of inflation (for the MEI) or geographic variation (for the GPCI) are for the inputs whose cost shares differ. For instance, if the rates of inflation were identical for all inputs, then the cost shares would have no effect on the MEI. Similarly, if there were little geographic variation in input prices, large differences in

cost shares would have little effect on the GPCI.

Medicare Economic Index

The Social Security Amendments of 1972 (Public Law 92-603) specify that the growth in Medicare prevailing charges be limited to the increase in an index of physician practice costs and earnings levels. Promulgated in 1975, MEI has been in use ever since, although in recent years Congress has set the MEI update. The historical MEI is based on cost shares derived from previous surveys of physician practice costs. It is limited to one set of cost shares (the national values) with no breakdowns by specialty, region, urban-rural location, and the like.

An alternative MEI (AMEI) is constructed in this article using cost shares from the 1988 PPCIS and MEI line item inflation rates. The forecasted national inflation rate is then compared with MEI to determine the effects on MEI of using updated cost shares. AMEIs are also constructed using cost shares by urban-rural location, census divisions, and specialties to determine whether it is appropriate to use one national set of practice cost shares.

Table 5 presents the historical (i.e., actual) MEI values and AMEI values constructed using MEI inflation proxies and the national PPCIS cost shares. The MEI never exceeds an AMEI based on national cost shares. The difference ranges from 0.1 percent (for 1984 and 1990) to 0.7 percent (for 1987). The 10-year cumulative compound growth is 46.6 percent using MEI cost shares versus 51.3 percent using revised 1988 cost shares. A large portion of the difference between MEI and AMEI comes from the difference in the

Table 5

Medicare Economic Index (MEI), by Specialty: 1982-91

Economic Index	Year										Cumulative Growth
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	
	Percent change										
Historical MEI	8.4	5.0	3.1	3.1	2.4	3.6	3.4	4.0	3.2	2.9	46.6
Alternative MEI	8.7	5.2	3.2	3.4	2.8	4.3	4.0	4.4	3.3	3.1	51.3
PPCIS Specialty Indexes											
General and Family Practice	8.7	5.4	3.5	3.5	3.1	4.3	4.0	4.5	3.6	3.4	53.6
Internal Medicine	8.5	5.2	3.3	3.3	2.8	3.9	3.7	4.3	3.5	3.3	50.4
Cardiovascular Disease	8.4	4.9	3.0	3.0	2.4	3.8	3.4	4.0	3.1	2.9	46.0
Gastroenterology	8.3	4.9	3.1	3.0	2.3	3.5	3.3	4.0	3.2	3.0	45.9
Other Medical Specialties	8.4	5.2	3.3	3.2	2.7	3.7	3.5	4.2	3.4	3.2	49.0
General Surgery	9.2	5.4	3.3	3.8	3.4	5.8	5.2	4.9	3.0	2.9	57.9
Cardiothoracic Surgery	9.0	5.1	3.1	3.5	2.9	5.3	4.7	4.5	2.8	2.8	53.2
Orthopedic Surgery	8.9	5.5	3.4	3.7	3.3	5.2	4.6	4.7	3.3	3.2	56.3
Ophthalmology	8.4	5.1	3.2	3.2	2.6	3.5	3.4	4.1	3.4	3.2	48.0
Urologic Surgery	8.8	5.2	3.2	3.4	2.9	4.6	4.3	4.5	3.2	3.0	52.3
Obstetrics and Gynecology	9.5	5.8	3.6	4.2	4.0	6.6	5.9	5.3	3.2	3.2	64.7
Other Surgical Specialties	9.0	5.4	3.4	3.6	3.2	5.0	4.6	4.7	3.3	3.1	55.5
Psychiatry	8.1	4.3	2.6	2.5	1.6	2.6	2.5	3.4	2.9	2.5	38.2
Anesthesiology	8.8	4.9	3.0	3.2	2.6	5.0	4.5	4.4	2.7	2.6	50.2
Radiology	8.2	4.6	2.9	2.8	2.0	3.4	3.1	3.8	3.0	2.8	43.1
Other Specialties	8.2	4.6	2.8	2.8	1.9	3.2	3.0	3.7	2.9	2.7	42.0

SOURCES: Health Care Financing Administration, Office of Research and Demonstrations: Data are from the 1988 physicians' practice costs and income survey (PPCIS); Office of the Actuary: Data from the Office of National Health Statistics, Division of Health Cost Analysis. 1990 and 1991 forecasts were made by Data Resources, Inc./McGraw-Hill.

weighting of the malpractice insurance component. The MEI weight of 4.0 percent and PPCIS weight of 5.5 percent are not dramatically different; however, when combined with the extremely high rates of malpractice premium inflation for several years, the resulting difference in the MEI is noticeable. For example, in 1987 the difference in malpractice weighting accounts for a 0.6-percentage point difference between the MEI and the AMEI— they vary by 0.7 percentage points. Hence, the years with the most dramatic malpractice inflation (relative to other inflation) are the years with the greatest difference between the MEI and the AMEI. For years where the rates of inflation were projected to be more similar (for example, 1990), the effects of cost-share weights on the resulting MEIs are much less dramatic.

Table 5 also presents AMEI values calculated by 16 specialty groupings. The range of specialty-specific AMEIs appears relatively large. For example, in 1987 the minimum specialty AMEI value is 2.6 percent for psychiatry, although the maximum values, which were for obstetrics and gynecology (6.6 percent) and general surgery (5.8 percent), are more than twice as large. As was seen with other AMEI comparisons, the greatest causes of these differences are: the differences in the malpractice shares of the groups; and the large difference between the malpractice inflation rate and the inflation rate for other inputs, especially during the years 1986-89.

However, differences in the specialty-specific AMEIs persist, even when the inflation rates among the input categories are relatively uniform. For example, in 1984 the three highest input inflation rates are malpractice at 8.9 percent, drugs and supplies at 6.7 percent, and non-physician employment at 5.5 percent (not shown). The specialty-specific AMEIs vary by a full 1 percent, ranging from 2.6 percent for psychiatry to 3.6 percent for obstetrics and gynecology (Table 5). In 1990, the malpractice insurance inflation rate is projected to be only 1.0 percent, but the specialty-specific AMEIs range from 2.7 percent for anesthesiology to 3.6 percent for general and family practice. Thus, the cost shares among specialties differ from each other by a wide enough margin that relatively small variations in input inflation rates can cause differences in the specialty-specific AMEIs of 1.0 percentage point or greater.

Table 6 presents AMEIs calculated using the PPCIS weights for urban-rural location and census division. For comparative purposes, the historical MEI and the AMEI calculated using the national PPCIS cost weights are also presented. The urban and rural AMEIs differ little from the national AMEI. Neither the urban nor the rural annual percentage change ever differs from the national by more than 0.1 percent, and the two never differ from each other by more than 0.1 percent. As a result, the cumulative effects of urban and rural AMEIs differ little from the national AMEI.

The AMEIs calculated by census division show slightly more variation. The largest differences between the divisional AMEI and national AMEIs occur for the Middle Atlantic and the West South Central Divisions during the period 1987-88. For example, in 1988 the Middle Atlantic AMEI was 4.4 percent, 0.4 percentage points above the national AMEI and 0.7 percentage points above the historical MEI. The large differences for these 2 years are caused by the extremely high

Table 6
Medicare Economic Index (MEI), by Geographic Area: 1982-91

Economic Index	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Cumulative Growth
					Percent Change						
Historical MEI	8.4	5.0	3.1	3.1	2.4	3.6	3.4	4.0	3.2	2.9	46.6
Alternative MEI	8.7	5.2	3.2	3.4	2.8	4.3	4.0	4.4	3.3	3.1	51.3
PPCIS Geographic Index											
Urban	8.7	5.2	3.2	3.3	2.8	4.3	4.0	4.3	3.2	3.1	50.9
Rural	8.6	5.3	3.3	3.4	2.9	4.4	4.1	4.4	3.3	3.2	52.0
Census Division:											
New England	8.8	5.3	3.3	3.5	3.0	4.6	4.2	4.4	3.3	3.1	52.9
Middle Atlantic	8.8	5.2	3.2	3.5	2.9	4.7	4.4	4.5	3.1	3.0	52.6
East North Central	8.7	5.2	3.2	3.4	2.8	4.4	4.0	4.4	3.2	3.1	51.3
West North Central	8.6	5.3	3.4	3.4	3.0	4.4	4.0	4.4	3.4	3.2	52.3
South Atlantic	8.6	5.1	3.2	3.3	2.7	4.3	3.9	4.3	3.3	3.1	50.4
East South Central	8.6	5.2	3.3	3.3	2.8	4.2	3.9	4.3	3.3	3.1	50.7
West South Central	8.4	5.1	3.2	3.2	2.6	3.8	3.6	4.2	3.3	3.1	48.6
Mountain	8.7	5.2	3.2	3.4	2.8	4.4	4.1	4.4	3.2	3.1	51.4
Pacific	8.7	5.2	3.3	3.4	2.8	4.2	4.0	4.4	3.3	3.1	51.3

NOTE: PPCIS is physicians' practice costs and income survey.

SOURCES: Health Care Financing Administration, Office of Research and Demonstrations: Data are from the 1988 physicians' practice costs and income survey; Office of the Actuary: Data are from the Office of National Health Statistics, Division of Health Cost Analysis. 1990 and 1991 forecasts were made by Data Resources, Inc./McGraw-Hill.

malpractice inflation rates (42.7 and 36.6 percent, respectively) coupled with the higher malpractice cost share (6.7 percent) for the Middle Atlantic and the lower malpractice cost share (4.2 percent) for the West South Central Division compared with the national average (5.5 percent) (Table 6). As was seen at the national level, small variations in malpractice cost shares for these years can lead to noticeable differences in the AMEIs because of its high inflation during the 1980s.

Geographic Practice Cost Index

The previous analyses have ignored regional and specialty-specific variation in price proxies. However, Congress has mandated that any reform of Medicare physician payment methods recognize justifiable differences in physician practice costs when setting fees for geographic areas. In response to this mandate, the Center for Health Economics Research and the Urban Institute developed the GPCI under a cooperative agreement with HCFA.

The current GPCI was calculated using the 1987 AMA data to compute cost shares. It is limited to one set of cost shares (the national values) with no breakdowns for specialty, region, and the like. The 1988 PPCIS allows GPCIs to be constructed with specialty, urban-rural, and division-specific cost shares to determine if the GPCI can be reasonably limited to a single national set of cost shares. To test the sensitivity of the GPCI to the cost shares used, we first construct an alternative GPCI (AGPCI) using the national PPCIS cost shares, which is compared with the GPCI based on SMS shares. We then construct alternative GPCIs using specialty-specific and area-specific shares.

Because the payment reform law specifies a GPCI which counts only one-fourth of the variation in physician time, we focus on this index. Furthermore, under OBRA 1989 the cost share weights are procedure-specific. The proportion of each service performed by each specialty and the cost share of the specialties is used to determine the procedure-specific adjustment (*Federal Register*, 1991). The AGPCI for a representative procedure using 1988 PPCIS cost weights can be calculated as:

$$\text{AGPCI} = 0.129 + 0.567 * [1 + (\text{IPSWAGE} - 1)/4] + 0.173 * \text{IEMPLOYEE} + 0.076 * \text{IAPTRENT} + 0.055 * \text{IMALP}$$

where

IPSWAGE = the indexed cost of physician time proxy,

IEMPLOYEE = the indexed non-physician employee price proxy,

IAPTRENT = the indexed office space cost proxy, and

IMALP = the indexed malpractice insurance premiums.

The weights on the indexes are the PPCIS cost shares; the constant (0.129) is the cost share of expenses such as equipment and supplies that are assumed not to vary in price by geographic area.

To examine the sensitivity of the GPCI to the 1988 PPCIS cost shares versus the SMS cost shares, the difference AGPCI − GPCI was calculated for each geographic area. Because the GPCI is indexed to have a mean value of 1.0, differences between GPCIs can be interpreted

as percentages. For instance, the Boston metropolitan statistical area (MSA) has a GPCI of 1.064 implying that costs are 6.4 percent above the national average, whereas the AGPCI of 1.046 for the Boston MSA implies that costs are only 4.6 percent above the national average. Hence, for this MSA, the AGPCI calculated with PPCIS weights implies costs that are 1.8 percentage points closer to the national average than does the GPCI. In no geographic area is the difference between the two greater than 2.0 percentage points. For 129 of the 366 geographic areas, the difference has an absolute value less than 0.5 percentage points. Those areas with the greatest differences (−0.017 to −0.020), such as Boston, tend to be areas with extremely high values for the office rental proxy. Because the 1988 AGPCI weights office space at only 7.6 percent of total costs, while the GPCI based on the SMS weights office space at 11.1 percent of total costs, areas with extremely high rents will have lower indexes using the PPCIS weights. However, even in these cases the difference between the two is very small. Given that the SMS and PPCIS cost shares are very similar, this result is not surprising.

Although the SMS and PPCIS cost shares yield GPCIs that are very similar to each other, both are at a highly aggregated, national level. To determine whether it is appropriate to use one national set of weights, the cost shares by urban-rural location and census division were used to calculate alternative sets of GPCIs. For example, the urban cost shares shown in Table 3 were used to calculate an AGPCI for each MSA and the rural cost shares were used to calculate an AGPCI for each rural rest-of-State area. Because Table 3 shows that there is

some variation in cost shares by these geographic locations, these AGPCIs will vary from the GPCIs constructed using the national cost shares. The question of interest is whether these differences will be large enough to warrant the administrative burden of applying alternative sets of cost shares to different areas.

To determine whether the differences between the area-specific AGPCIs and the national AGPCI are meaningful, the absolute value of the difference between each area-specific AGPCI and the 1988 national AGPCI was calculated for each geographic area. The results are reported in Table 7.

The difference between the urban-cost-weighted AGPCI and national AGPCI never exceeds 0.002 for any of the 317 MSAs. The rural AGPCI never differs from the national AGPCI by more than 0.004 for any of the 49 rural areas. Thus, the effects of using the urban-rural cost shares rather than the national shares are trivial.

The absolute differences between the divisional AGPCIs and the 1988 national AGPCI are slightly larger, although the largest mean difference is still only 0.003 (0.3 percentage points). The largest difference for any MSA is 0.011 which occurs for Nassau-Suffolk, New York. Although the cost shares for the Northeast differ little from the national shares, the higher shares for office space and malpractice premiums, coupled with the extremely high indexed costs for these inputs in Nassau-Suffolk, translate to a higher AGPCI using the Northeast-specific cost weights. No other divisional AGPCI differs by more than 0.007 (0.7 percentage points) from the 1988 national AGPCI.

To investigate whether the differences between specialty-specific AGPCIs and the national AGPCI are meaningful,

specialty-specific AGPCIs were calculated for each of the 16 specialty groups using the appropriate specialty-specific PPCIS 1988 cost-share weights. The absolute differences between the specialty-specific AGPCIs and the national AGPCI were than calculated.

Table 8 presents distribution statistics of the differences between each of the 16 specialty-specific AGPCIs and the na-

Table 7

Comparison of Specialty Specific Alternative Geographic Practice Cost Index (GPCIs) to the Alternative GPCI with Physicians Practice Costs and Incomes Survey (PPCIS) Weights

Specialty	Mean Absolute Difference From 1988 PPCIS AGPCI[1]	Percentile of Absolute Difference				
		5	25	50	75	95
General and Family Practice	0.006	0	0.002	0.005	0.007	0.011
Internal Medicine	0.004	0	0.001	0.003	0.005	0.009
Cardiovascular Disease	0.005	0	0.002	0.003	0.005	0.008
Gastroenterology	0.006	0	0.002	0.004	0.007	0.010
Other Medical Specialties	0.005	0	0.002	0.004	0.006	0.009
General Surgery	0.012	0.001	0.005	0.010	0.017	0.023
Cardiothoracic Surgery	0.009	0.001	0.004	0.007	0.011	0.017
Orthopedic Surgery	0.008	0	0.003	0.007	0.011	0.015
Ophthalmology	0.006	0	0.002	0.004	0.007	0.011
Urologic Surgery	0.003	0	0.002	0.003	0.004	0.006
Obstetrics and Gynecology	0.017	0.001	0.006	0.015	0.024	0.032
Other Surgical Specialties	0.009	0.001	0.004	0.007	0.011	0.015
Psychiatry	0.012	0.001	0.004	0.009	0.014	0.021
Anesthesiology	0.012	0.001	0.004	0.008	0.013	0.025
Radiology	0.016	0.001	0.005	0.011	0.016	0.025
Other Specialties	0.014	0.001	0.005	0.010	0.015	0.023

[1]Each line applies 1988 PPCIS specialty-specific cost share weights to the area-specific price proxies.

NOTE: Distribution of differences is population–weighted.

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data are from the 1988 physicians' practice costs and income survey.

Table 8

Comparison of Area-Specific Alternative Geographic Practice Cost Indexes (GPCIs) to the Alternative GPCI with PPCIS Weights

Area	Mean Absolute Difference From 1988 PPCIS AGPCI[1]	Percentiles of Absolute Difference				
		5	25	50	75	95
Urban	0.001	0	0.001	0.001	0.001	0.002
Rural	0.001	0	0	0.001	0.002	0.004
Census Division:						
New England	0.003	0.001	0.002	0.003	0.005	0.006
Middle Atlantic	0.004	0	0.001	0.002	0.002	0.007
East North Central	0.002	0.001	0.001	0.002	0.002	0.003
West North Central	0.003	0.001	0.002	0.002	0.004	0.005
South Atlantic	0.001	0	0.001	0.001	0.002	0.003
East South Central	0.001	0	0	0.001	0.001	0.002
West South Central	0.004	0	0.003	0.004	0.004	0.006
Mountain	0.002	0	0.001	0.002	0.003	0.005
Pacific	0.002	0.001	0.002	0.002	0.003	0.003

[1]Each line applies 1988 PPCIS area-specific cost share weights to the area-specific price proxies.

NOTE: Distribution of differences is population weighted.

SOURCE: Health Care Financing Administration, Office of Research and Demonstrations: Data are from the 1988 physicians' practice costs and income survey.

tional AGPCI. The specialty-specific AGPCIs for the medical specialties are all very similar to the national AGPCI, although differences are greater than those found for divisions. The mean absolute differences range from 0.004 (0.4 percentage points) to 0.006 (0.6 percentage points), and the 95th percentile values never exceed 0.011 (1.1 percentage points).

The specialty-specific AGPCIs for the surgical specialties show somewhat more variation. The mean difference for obstetrics and gynecology is 1.7 points and for general surgery, 1.2 points. The specialties with the 3 highest absolute mean differences are also the 3 specialties with the 3 highest malpractice premium shares. Use of a specialty-specific AGPCI, therefore, would have the effect of evening out somewhat the geographic differences shown in Table 8.

The mean absolute differences for psychiatry (0.012), anesthesiology (0.012), radiology (0.016), and other specialties (0.014) are all relatively high (Table 7). Given that their cost shares all diverge noticeably from the average, it is not surprising that specialty-specific cost shares would affect these specialties more than most others. For psychiatrists, the greatest differentials occur in areas with high malpractice premiums, when weighted by specialty-specific AGPCI cost shares versus higher 1988 PPCIS national malpractice shares. The largest differentials for radiology, anesthesiology, and other specialties tend to occur in areas with very high office rent proxies. New York, Oakland, San Francisco, and San Jose are all areas for which the specialty AGPCIs for these groups have a large absolute difference from the 1988 national AGPCI. Since radiologists, anesthesiologists, and pathologists (RAPs) (and other specialists) have a much lower share of office expenses than the national average, they could benefit from any overestimate of the office space under the current GPCI—but only in high rent areas.

CONCLUSIONS

Both the MEI and the GPCI currently use one set of national cost shares to weight categories of physician practice expenses. An alternative system would use specialty-specific, geographic-specific, or both cost shares as weights.

Our analysis of the 1988 PPCIS indicates that differences clearly exist among key practice cost shares, particularly across specialties. However, the implications of such differences for public policy are generally quite minor. Despite the fact that very few specialty practices can be combined using standard statistical criteria, temporal, or geographic indexes based on specialty-specific or region-specific cost shares vary in only small ways from those computed with a single national index. Thus, the resulting differences in payments that would result are small relative to the cost of implementation. In addition, because physician payments overall would not be increased, given the requirement of budget neutrality, for every winner in a revised payment system there must be an equal loser.

The use of specialty-specific or geographic-specific cost shares would have relatively minor effects on the MEI. An MEI physician–fee–update based on specialty-specific cost weights would have better reflected the rapid growth in malpractice premiums between 1978-88, for example, but in 1991 specialty-specific

MEIs would vary by less than 1 percentage point.

Geographic variation in the cost shares was found to add little to the variation in practice costs for the current GPCI being used in the new Medicare fee schedule. The difference between the urban-rural cost weighted GPCI versus a nationally weighted GPCI never exceeds 0.4 percent, whereas across census divisions the largest difference is Nassau-Suffolk, New York, at 1.1 percent—still a small difference. Using specialty-specific cost weights for the geographic practice cost index produces more variation, but the largest mean cost difference is only 1.7 percent for obstetrics and gynecology where malpractice premiums are very high (and a larger obstetrics malpractice cost share would weight regional premium differences more) (Table 8).

The GPCI used in the new Medicare fee schedule is based on 1987 cost shares from the AMA. With the exception of office space costs, which were much higher in the AMA survey, the cost shares derived from the AMA and the 1988 PPCIS are quite similar. Moreover, in no geographic area is the difference in GPCIs using the alternative cost shares more than 2 percentage points, and in one-third of the 366 areas the difference is less than 0.5 percent.

Moreover, any differences that were found are sensitive to the period under study. High malpractice premium inflation in the early 1980s generated most of the measured differences, producing specialty-weighted or division-weighted indexes slightly higher than a single national index. Yet, in the future, low malpractice premium inflation could produce lower than average adjusted indexes relative to one based on a single set of national cost weights. We conclude, therefore, that minor adjustments in the cost shares designed to improve system equity are more likely to be counterproductive as changes in weights inevitably lag behind swings in inflation. Also, although statistically significant differences exist in specialty and regional cost share differences, we found the absolute magnitudes are small enough to ignore in constructing either temporal or geographic cost indexes when setting payments for physician services.

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