

Medicare physician fee schedules: Issues and evidence from South Carolina

by David A. Juba

Three key research questions are identified and analyzed in this article. First is an investigation of whether Medicare already pays physicians using de facto fee schedules. Evidence from South Carolina suggests not. Second is an evaluation of the physician procedures and specialties likely to be affected by

imposition of a Medicare fee schedule. Medical visits are identified as especially susceptible. Third is a report on simulated effects of a charge-based fee schedule on Medicare program payments, physicians' practice revenues, and beneficiaries' liabilities.

Introduction

Recently, the Federal Government, physician organizations, and others have expressed interest in reforming Medicare's customary prevailing reasonable charge approach to paying physicians, known as the CPR reimbursement system. Motivating that interest are perceived problems with the CPR system: that it is inherently inflationary, inconsistent and unfair in payment, and biased in favor of technologically oriented procedures, urban practice locations, and specialists' services.

In this study, one of the important and often-discussed reform options is examined: replacing CPR reimbursement with a fee schedule based on physicians' charges for Medicare services. In particular, three questions are addressed that are likely to surface in the coming debates over Medicare physician payment reform: How different are the CPR and fee schedule approaches to reimbursement; i.e., is CPR already a system of de facto fee schedules? Which physician specialties and classes of procedures will be affected by replacing the CPR system with charge-based fee schedules? What are the likely short-run effects of implementing a prototype fee schedule on Medicare program payments, physicians' practice revenues, and the liabilities of Medicare beneficiaries?

In the next section, the CPR system and recent legislative changes to it are discussed. The following section is a presentation of advantages and disadvantages of a physician fee schedule. An overview of the study's data base is next, followed by analyses pertinent to the three study questions. A discussion of findings and their significance for Medicare physician payment reform concludes the study.

This work is based on a report to the U.S. Congress, Office of Technology Assessment, under Contract No. 533-2880 with the Urban Institute, Washington, D.C. Additional support was provided by Abt Associates Inc. The statements and opinions are the author's and are not necessarily those of the Office of Technology Assessment, the Urban Institute, or Abt Associates Inc.

Reprint requests: David A. Juba, Physician Payment Review Commission, 2120 L Street, NW., Suite 510, Washington, D.C. 20037.

Background

An important reason for interest in physician reimbursement reform is the explosive growth in Medicare program payments over the past decade. From relatively modest beginnings, Medicare Part B supplementary medical insurance, which pays for physician and related services, has become the third largest Federal domestic spending program (Office of Management and Budget, 1985). One reason for that growth is the inflationary bias that, until recently, characterized the CPR reimbursement system. Under Part B, Medicare pays an approved fee per service, defined as the lesser of a physician's bill, his or her customary (median) charge in the preceding year, or the fee that prevailed among like-specialty physicians (the 75th percentile of the local distribution of customary charges for that procedure, subject to limits imposed by the Medicare Economic Index). Periodic increases in physicians' billings automatically generated increases in customary and some prevailing charge profiles, and consequently in Medicare-approved fees, until Congress froze Medicare fees in July 1984.

The freeze was part of a two-pronged attack on Part B cost increases launched by Congress through the Deficit Reduction Act of 1984 (Public Law 98-369). The first prong was the freeze on prevailing and customary charges for the 15-month period July 1984 through September 1985 (later extended to May 1986). A concomitant freeze on physicians' effective billings for Medicare services through a participating provider program was the second prong. Beginning in October 1984, participating physicians signed 1-year agreements to accept the Medicare-approved fee as payment in full for all services.¹ During that interval, participating physicians could increase their Medicare-billed fees. Conversely, nonparticipants (approximately 70 percent of physicians providing Medicare services) were prohibited from increasing their billings, a prohibition which promises to constrain customary charge profiles in later years.

¹The Consolidated Omnibus Budget Reconciliation Act of 1985 (Public Law 99-272) extended the participating provider program through December 1986. It also specified rules for updating prevailing fees through calendar year 1987 and customary fees through 1988.

The freeze was a dramatic, albeit temporary, action, signaling Congress' concern with a Medicare Part B program whose costs were steadily increasing. Besides being a strategy for restraining the rate of cost increases, the freeze provided Congress with time to consider an array of options for more sweeping reform of the payment system. Among these options is replacement of the CPR system with national or regional Medicare physician fee schedules.

Fee schedules

In simple terms, a fee schedule is a list of physician procedures and preestablished maximum payment rates for each. Often, it is derived from an underlying scale of the relative worth, or values, of procedures. Multiplying the relative values (RV's) by a dollar-per-unit conversion factor generates a fee schedule. Discussions of RV scales and fee schedules derived from them can be found elsewhere (Hadley et al., 1983; Office of Technology Assessment, 1986).

Arguments can be made for and against replacing the CPR payment system with a fee schedule. Proponents might argue that a fee schedule is less complicated to administer and update than the CPR system and is less prone to the automatic ratcheting up of approved fees in response to increases in physicians' charges. Also, implementing a fee schedule is less radical and administratively more feasible than some other payment reform options, notably capitated payment systems.

Fee schedules have other advantages to recommend them. For example, the Congressional Budget Office (April 1986) suggested that a fee schedule could serve an important function in the context of a comprehensive approach to physician reimbursement. For example, it could serve as a residual payment system covering populations or services not covered by the primary system. Furthermore, implementing a fee schedule would eliminate the uncertainty characterizing physicians' payments and beneficiaries' liabilities under CPR reimbursement. Finally, updating or otherwise adjusting prices under a fee schedule based on an RV scale might be easier than the current system, for which updates of each physician's customary charge profile are required. For that reason alone, it might be easier for Medicare to selectively adjust out-of-line fees under a fee schedule than under the traditional system.

Opponents might argue that fee schedules suffer from the same problems that plague the CPR system. Both pay on a fee-for-service basis; consequently, both present physicians with financial incentives to provide additional services at the margin. Restraining growth in Medicare outlays through price controls (e.g., through a fee schedule) might be ineffective unless concurrent controls on service volume are imposed. However, such controls might add another layer of regulation to a Part B system that some contend is too complex and interventionist already. Finally, although administering a fee schedule might be simpler than administering alternative physician

reimbursement systems, it need not be simple in absolute terms. At a minimum, constructing and administering a fee schedule would require more and better data than are presently available on physicians' Medicare practices.

In this study, the fiscal effects of replacing Medicare's traditional CPR reimbursement system with a prototype charge-based fee schedule are examined. Alternative fee schedules available for investigation differ along several dimensions. Among the differences are the source of the underlying costs or charges and whether or not allowance is made for regional or specialty differences in payments. It was not feasible to evaluate all possible Medicare fee schedules. Instead, the effects of a single example, a specialty-undifferentiated schedule paying statewide mean Medicare-approved charges for each procedure, are examined in detail in this study.

Data

The primary study data are charges and frequencies for Part-B-covered procedures provided by South Carolina physicians in calendar year 1983. Included are data on each procedure performed by each physician submitting an unmodified Part B claim in the State that year. For analytic convenience, data on services with modified procedure codes, claims from nonphysician providers, and claims from anesthesiologists are excluded from the study because of complexities in their billing arrangements. (Modifier codes indicate that special circumstances characterized a service and its associated fees. Anesthesiologists are paid on the basis of time units, not occasions of service.) Should Medicare decide to implement a charge-based fee schedule, special algorithms and techniques might be required to accommodate these problematic cases. Despite those exclusions, the provider-specific primary data file accounts for 74 percent of all Medicare-approved charges and 72 percent of all services in the State during calendar year 1983.

The generalizability of study findings depends on the representativeness of the Medicare program in South Carolina with respect to others across the country. A priori, it might seem unlikely that South Carolina is representative. South Carolina accounts for only a small fraction of the national Medicare program, less than 1 percent of national aggregate Part-B-approved charges annually. Also, it is one of 16 States, each having but one prevailing charge area within its borders.

Nevertheless, the South Carolina Medicare program is typical in several ways. For instance, physicians in six specialties provide more than one-half of the dollar volume of care in South Carolina; the same specialties account for approximately the same fraction of care in the program nationwide (Table 1). Moreover, the percent distributions of approved fees across specialties are remarkably similar in the two areas. Yet another similarity is that the fraction of assigned allowed fees in South Carolina (58 percent) is

close to the U.S. average (52 percent). Lastly, information on reduction rates confirms the representativeness of South Carolina data. The reduction rate is the percent of claims (or charges) for which the program-determined reasonable fee is less than the physician's billed charge. The Committee on Finance of the U.S. Senate (1983) reported State-specific Medicare claims reduction rates during 1981 ranging from 41 to 93 percent. The reduction rate in South Carolina (86 percent) was very close to the U.S. average (83 percent).

De facto fee schedules?

Over time, growth in physicians' Medicare-billed charges generally has exceeded growth in regional prevailing-charge profiles, the latter being constrained by the Medicare Economic Index. For that reason, some analysts believe the CPR system is already a series of de facto prevailing-charge fee schedules (Burney et al., 1984). But is that the case? Inspection of the fraction of approved charges established at billed, customary, or prevailing levels (Table 2) reveals that approved fees are at the prevailing level for approximately one-half of all services. However, by implication, approved fees are at the physician-specific billed or customary charge as frequently. Therefore, even though prevailing charges are an important determinant of allowed fee levels, they are not universally the primary determinant.

The fraction of approved charges established at specialty-specific statewide prevailing fees varies by type of procedure. Approved charges are at the prevailing level for approximately two-thirds of office and hospital visits. In contrast, prevailing fees are binding on approved charges for only about one-third of the surgery, radiology, and nonvisit medical services.

Because primary care physicians provide most visits, their Medicare-approved fees could be expected to be among those most likely to be at the prevailing level. Inspection of Table 3 substantiates that inference. The prevailing fee is the binding constraint on more than one-half of all approved charges for three specialties—general practice, family practice, and internal medicine—and almost one-half of approved charges for orthopedic surgery. Conversely, statewide prevailing fees are much less frequent determinants of the approved charges of general surgeons, ophthalmologists, and radiologists.

Are prevailing-charge screens de facto Medicare fee schedules? The answer in general is "no." However, the strength of the response varies with the specific services and specialties in question. How soon, if ever, prevailing-charge screens will become de facto fee schedules is unclear. The Congressional Budget Office (April 1986) estimated that, if historical trends continue, 72 percent of all approved fees will be established at the prevailing charge by fiscal year 1991. The accuracy of that estimate will be affected by many factors, including the recent freeze on Medicare physician fees. The long-run effect of the

Table 1
Medicare comparative statistics, by specialty:
South Carolina and United States, 1983

Specialty	Approved charges		Approved charges assigned	
	South Carolina	United States ¹	South Carolina	United States ¹
	Percent distribution		Percent	
Total	100.0	100.0	58.1	51.6
General practice	8.7	6.0	47.5	44.6
Family practice	6.6	3.8	47.5	46.7
Internal medicine	18.1	19.6	38.7	51.2
General surgery	13.2	9.0	73.4	53.8
Orthopedic surgery	5.7	5.6	58.5	46.2
Ophthalmology	9.5	10.4	40.4	44.3
Other	38.1	45.6	—	—

¹U.S. totals are from Burney and Schieber (1985).

Table 2
Percent of Medicare-approved charges, by type
of service and type of charge: South Carolina,
1983

Type of charge	Total ¹	Office visits	Hospital visits	Other medicine	Sur-gery	Radiol-ogy ²
Billed	15.7	12.4	11.4	27.0	15.4	13.0
Customary	38.7	19.7	22.4	34.7	53.4	41.2
Prevailing	43.2	65.2	64.6	37.0	30.3	38.9
Other	2.3	2.8	1.7	1.2	.9	6.9

¹Includes listed services, other visits, and pathology.

²Professional component only.

NOTE: Data are for all services in the South Carolina analysis file, not just the 32 most costly procedures.

freeze in this regard is unknown. What is known is that the freeze and subsequent Medicare rules for establishing charge profiles have disrupted the historical relationship among billed, customary, and prevailing charges for participating as well as nonparticipating physicians.

Anticipated effects of fee schedules

In this section, answers are provided to the question: Which procedures and physician specialties are most likely to be affected by replacing the CPR payment system with the prototype fee schedule? Program payments under a fee schedule set at statewide mean approved charges for each procedure will exceed approved fees (CPR payments) that are below the statewide means and will fall short of approved fees that are above them. Therefore, the greater the variation in approved charges around their means, the greater is the potential disparity between CPR and fee schedule reimbursements.

Because there are thousands of Part-B procedures, an analysis of variation in charges for each is prohibitively complicated. Fortunately, a relatively small number of procedures (32) account for more than 45 percent of all Medicare program payments

Table 3
Percent of Medicare-approved charges, by specialty and type of charge:
South Carolina, 1983

Type of charge	All specialties ¹	General practice	Family practice	Internal medicine	General surgery	Orthopedic surgery	Ophthalmology	Radiology
	Percent							
Billed	15.7	20.7	15.2	17.4	20.8	13.1	12.8	12.9
Customary	38.7	20.5	22.9	28.5	49.7	38.1	72.3	40.4
Prevailing	43.2	56.8	59.0	51.2	28.4	48.1	14.6	39.7
Other	2.3	2.0	2.9	2.9	1.1	.7	.3	7.0

¹Includes physicians in listed specialties and others.

Table 4
Medicare-approved charges, standard deviations, and coefficients of variation, by selected procedure: South Carolina, 1983

Procedure	Approved charges		Standard deviation	Coefficient of variation
	Percent of total	Mean		
Office visits				
Comprehensive: followup	1.03	\$42.48	\$15.47	.364
Comprehensive: initial	0.81	38.11	17.53	.460
Intermediate: followup	1.37	18.23	3.68	.202
Limited: followup	9.57	12.83	2.35	.183
Brief: followup	0.72	11.54	2.74	.238
Hospital visits				
Comprehensive examination	4.56	54.63	13.76	.252
Limited: followup	11.86	16.26	3.40	.209
Brief: followup	0.53	13.99	2.59	.185
Other medical procedures				
Selective angiography	0.67	563.27	46.64	.083
Consultation: initial comprehensive	1.85	63.01	10.91	.173
Consultation: initial complex	0.53	63.01	9.43	.150
Critical care examination: extended	0.65	39.69	10.53	.265
Critical care examination: intermediate	0.73	36.56	7.97	.218
Electrocardiogram	1.56	23.27	3.20	.138
Surgery				
Quadruple bypass	0.65	3,691.17	175.67	.048
Triple bypass	0.92	3,617.33	344.82	.095
Arthroplasty	0.66	2,009.57	257.69	.128
Intraocular lens implantation	7.15	1,335.70	139.51	.104
Femoral fracture	0.89	1,003.70	93.50	.093
Colectomy	0.67	984.54	123.80	.126
Femoral fracture: proximal end	0.52	835.26	55.86	.067
Lens extraction	0.61	794.57	40.62	.051
Transurethral resection of prostate	2.44	792.16	35.72	.045
Cholecystectomy	0.69	702.04	72.98	.104
Upper gastrointestinal endoscopy with biopsy	0.52	229.48	34.54	.150
Upper gastrointestinal endoscopy	0.72	208.59	35.79	.172
Radiology				
Examination, upper gastrointestinal tract	0.51	31.12	3.22	.103
Megavolt treatment: intermediate	0.51	24.10	3.05	.126
Two-view chest X-ray	1.34	13.76	1.44	.105
Single-view chest X-ray	1.01	9.71	.77	.079
Pathology				
Glucose test	0.53	5.59	1.04	.186
Urinalysis	0.70	3.79	.48	.125

NOTE: Only procedures that account for at least 0.5 percent of allowed charges in the State are included in this table.

and more than 50 percent of all Medicare services by physicians in the study State. It is noteworthy that the surgical procedures accounting for much of the program in South Carolina are nearly identical to those accounting for most Medicare-funded surgery nationwide (Burney and Schieber, 1985).

In Table 4 are presented statewide mean approved fees per procedure and the fraction of total approved charges in the State accounted for by each. Also reported are coefficients of variation (CV's), ratios of standard deviations to mean approved fees. (A discussion of the advantages of the CV as an index of variation is in Blalock, 1972.) The greater the CV, the greater is the deviation between physicians' allowed fees and the statewide means, on average. Furthermore, the greater that average deviation, the greater is the potential effect of a mean charge fee schedule on physicians' incomes and their willingness to serve Medicare patients.

Regional distributions of Medicare-approved charges are bounded at the upper end by regional prevailing fees. Consequently, Medicare-approved fees might exhibit less variability than fees paid by other insurers or self-payers. This might be cause for concern if fees of different payers were compared in this analysis, but that is not the case. Also noteworthy is that the magnitudes of the CV's for Medicare-approved charges in South Carolina are in keeping with tradition. In a summary of published research from the 1970's (Juba, 1979), reported CV's for physician services ranged from 0.1 to 0.5. Of the CV's found in the present study, about one-half are less than 0.15, and the remainder equal or exceed that value. They range from .045 for transurethral resection of prostate and .048 for quadruple bypass to 0.46 for an initial comprehensive office visit.

Twelve of the 15 procedures with the greatest variability (CV's equal to or exceeding 0.15) are medical procedures: hospital and office visits, consultations, and critical care examinations. At the other extreme, coefficients of variation for most of the surgery and radiology procedures are below that threshold. At least two possible reasons for those differences exist. First, large CV's might be caused by outliers in the distributions of charges for visits. Second, physicians in many specialties provide visits, and prevailing fees and approved charges vary widely across specialties. Conversely, surgical and nonmedical procedures are often the exclusive province of one or a few specialties, eliminating specialty as an important source of charge variation.

Inspection of the fraction of services with approved fees falling within narrow intervals (10 percent and 25 percent) around their respective statewide and specialty-specific means is informative. Table 5 shows that, with a few exceptions, approved fees are within 10 percent of the statewide mean for more than 80 percent of the listed surgical, radiology, and pathology services. Conversely, approved charges for only one-half or less of most office and hospital visits (services common to many physician specialties) are as tightly distributed. These findings are evidence that

differences in the general spread of the charge distributions, rather than a few outliers, explain the differences between CV's for visits and surgical procedures.

The distributions of fees around statewide specialty-specific means should be tighter than corresponding distributions around the specialty-undifferentiated means. The data in Table 5 confirm that inference. Allowed fees for most hospital and office visits and other medical procedures are within 10 percent of their respective specialty-specific means; with few exceptions, allowed fees for 90 percent or more of those services are within the 25-percent interval.

Medicare fee schedule simulations

Methods

The procedures and specialties most likely to be affected by the prototype Medicare fee schedule were identified in the distribution analysis. It should be emphasized that aggregate Medicare program payments for the given set of physician services in the study State will be unaffected because the prototype fee schedule is budget neutral with respect to the CPR system. However, that neutrality in the aggregate can mask significant differences in the payments to particular physicians, effects investigated in this study.

The methodology behind a simulation of program payments, physicians' revenues, and beneficiary liabilities under the budget-neutral charge-based fee schedule is described in this section. The simulation is based on charge and frequency data for the 313 procedures accounting for more than 90 percent of Medicare payments for physician services in South Carolina in calendar year 1983. For each physician or practice (*i*) in that primary data base computations were made of mean approved fees (approved_{ij}), billed charges (billed_{ij}), and beneficiary deductible (deductible_{ij}) for each procedure (*j*) in the file. Also, for each physician-procedure combination, data are available on total service frequency (F_{ij}) and on the frequency of assigned (F_{aij}) and nonassigned (F_{nij}) services.

Under CPR reimbursement, the Medicare program is liable for 80 percent of the approved fee per service less any outstanding beneficiary deductible payments. Physicians' Medicare revenues per service vary with their willingness to accept assignment; that is, with their willingness to accept the approved charges as payment in full. Maximum practice revenues per procedure are the physicians' approved charges when they accept assignment and their billed charges when they do not.

Under the traditional Medicare reimbursement system, total program payments (PROG_{ij}) for a particular procedure-physician combination during the study year and the maximum Medicare practice revenues (REV_{ij}) the physician can collect during the year are:

Table 5
Percent of services with Medicare-approved charges within selected intervals, by selected procedure: South Carolina, 1983

Procedure	Services with approved charges within 10 percent of:		Services with approved charges within 25 percent of:	
	State mean	Specialty mean	State mean	Specialty mean
	Percent			
Office visits				
Comprehensive: followup	7	33	41	81
Comprehensive: initial	3	66	21	89
Intermediate: followup	41	69	89	97
Limited: followup	12	94	85	98
Brief: followup	10	83	81	95
Hospital visits				
Comprehensive examination	14	68	52	95
Limited: followup	53	87	93	96
Brief: followup	54	55	77	95
Other medical procedures				
Selective angiography	82	88	100	100
Consultation: initial comprehensive	31	77	91	96
Consultation: initial complex	46	72	92	95
Critical care examination: extended	9	63	53	80
Critical care examination: intermediate	37	47	66	84
Electrocardiogram	60	59	95	95
Surgery				
Quadruple bypass	100	—	100	—
Triple bypass	81	—	100	—
Arthroplasty	89	—	96	—
Intraocular lens implantation	83	—	100	—
Femoral fracture	93	—	99	—
Colectomy	73	—	99	—
Femoral fracture: proximal end	100	—	100	—
Lens extraction	100	—	100	—
Transurethral resection of prostate	96	—	100	—
Cholecystectomy	89	—	100	—
Upper gastrointestinal endoscopy with biopsy	63	—	90	—
Upper gastrointestinal endoscopy	48	—	84	—
Radiology				
Examination, upper gastrointestinal tract	82	—	100	—
Megavolt treatment: intermediate	100	—	100	—
Two-view chest X-ray	86	—	100	—
Single-view chest X-ray	94	—	100	—
Pathology				
Glucose test	81	—	95	—
Urinalysis	83	—	96	—

NOTE: Only procedures that account for at least 0.5 percent of allowed charges in the State are included in this table.

$$PROG_{ij} = .8 \cdot F_{ij} (\overline{\text{approved}}_{ij} - \overline{\text{deductible}}_{ij}) \text{ and}$$

$$REV_{ij} = F_{aij} (\overline{\text{approved}}_{ij}) + F_{nij} (\overline{\text{billed}}_{ij}).$$

The implicit maximum beneficiary liability (BEN_{ij}) is the difference between physicians' revenues and program payments:

$$BEN_{ij} = REV_{ij} - PROG_{ij}.$$

Replacing the physician-specific CPR-approved fees in the equations with fee schedule values yields analogous program payments (FSPROG_{ij}), physician revenues (FSREV_{ij}), and beneficiary liabilities

(FSBEN_{ij}) under the prototype fee schedule. (In the simulation, physicians are paid more than the average billed fee if the fee schedule value exceeds their average billed fee.)

Summing payments, revenues, and liabilities over all physicians in a given specialty (or over all procedures in a category) yields statewide totals for the group. For instance, total program payments under the traditional CPR system (PROG_s) and under the fee schedule (FSPROG_s) for all services by

physicians in a particular specialty (s) are:

$$PROG_s = \sum_{i \in S} \sum_j PROG_{ij} \text{ and}$$

$$FSPROG_s = \sum_{i \in S} \sum_j FSPROG_{ij}.$$

The percentage differences in program payments under the two systems are:

$$100 \cdot (FSPROG_s - PROG_s) / PROG_s.$$

Analogous methods yield percentage differences in Medicare practice revenues and beneficiary liabilities.

These simulations are static; they do not allow for shifts in either beneficiary demand or aggregate supplies of physicians' services in response to changes in Medicare market prices. Therefore, results are best viewed as first approximations of the effects of implementing a fee schedule. At the same time, the simulations take account of possible changes in physicians' assignment rates in response to price changes. Researchers have estimated the responsiveness, or elasticity, of assignment rates with respect to approved fees to be in the neighborhood of 1.0 in value; that is, a 1-percent change in allowed fees induces a 1-percent change in assignment rate. (Juba, 1985, contains a review of that literature.) Alternative simulations are based on assumptions that a 1-percent change in approved charges results in no change, a 1/2-percent change, and a 1-percent change in practice assignment rates.²

Effects on Medicare program payments

The effects of the revenue-neutral fee schedule on Medicare program payments for a fixed set of services are reported in Table 6. As expected, total payments across all services and specialties are unaffected. However, rather dramatic differences are seen in the effects on payments to different specialists. The greatest effects are the nearly 12- to 17-percent increases in total program payments to family and general practitioners. The largest reduction is the nearly 8-percent decrease in total program payments for internists' services. Payments for care by the three surgical specialties and by radiologists are unaffected by comparison.

One reason for the relatively large effect on payments to internists is the magnitude of the reductions in payments for their hospital and office visits, which range from 9 to 17 percent. Conversely, the increases in program payments for general and family practitioners' services are attributable to the

²Let " Δ allowed" be the percent difference between allowed fees under the fee schedule and under the CPR reimbursement system. In each simulation, the physician-procedure-specific assignment rate is

$$(1 + (k \cdot \Delta \text{ allowed})) \cdot \text{rate},$$

where k is one of the three elasticity values and "rate" is the assignment rate under baseline (CPR) reimbursement. In all cases, the simulated assignment rate is constrained to be in the $[0,1]$ interval.

large increases in payments for their visits, ranging from 12 to 20 percent.

The Congressional Budget Office (April 1986) reported essentially similar results from simulated implementation of statewide Medicare fee schedules nationwide. Because of differences in reporting styles, it is possible to compare the Congressional Budget Office (CBO) findings with findings from this study only for particular primary care specialties and all specialties combined. In the CBO version, simulated implementation of billed charge-based fee schedules increases Medicare program payments to general and family practitioners by approximately 13 percent. Payments to internists did not grow nearly as fast, by only 1.2 percent. Although the latter statistic is somewhat at variance with the simulated reduction in Medicare payments to internists in South Carolina, the general pattern of findings is consistent across the two studies.

Effects on practice revenues

What effect would the fee schedule have on physicians' Medicare practice revenues assuming no change in assignment patterns? The simulations (Table 7) suggest only modest percentage changes. General and family practitioners realize the greatest gains in revenues: almost 7 percent and 4 percent, respectively. The largest loss is the 2-percent reduction in the Medicare practice revenues of internists. In the CBO study, imposing a statewide fee schedule was found to increase Medicare practice revenues of general and family practitioners by 5.5 and 6.3 percent, respectively. The percentage increase in internists' revenues was much less, 1.0 percent. On balance, the CBO nationwide simulations corroborate the findings from analysis of South Carolina data.

Physicians receiving above average approved fees under the CPR system stand to lose the most under the prototype fee schedule. However, they can minimize those losses by reducing assignment rates and aggressively collecting their full billed charges from Medicare patients. The assumption that a 1-percent reduction in Medicare fees reduces practice assignment rates by 0.5-1.0 percent had different effects on different types of physicians. Allowing assignment rates to vary had little effect on the practice revenues of general practitioners, family practitioners, and ophthalmologists. However, internists could reduce losses in revenues from about 2 percent to about 0.6 percent of their baseline levels by altering their assignment patterns. Radiologists could transform small reductions to small gains in revenues under the same strategy, and general surgeons could almost triple their expected revenue gains (from 0.9 percent to 2.6 percent).

Interpractice variation in effects

Barring changes in assignment behavior, effects on practice revenues are modest in the aggregate. Yet,

Table 6

Percent change in Medicare program payments under statewide mean allowed charge fee schedule, by specialty and procedure category: South Carolina, 1983

Procedure category	All specialties ¹	General practice	Family practice	Internal medicine	General surgery	Orthopedic surgery	Ophthalmology	Radiology
Percent change								
Total ²	0.0	16.5	11.9	-7.5	1.0	-0.6	0.1	-0.2
Office visits	0.0	19.6	16.6	-16.5	1.2	-6.0	(³)	(³)
Hospital visits	0.0	17.4	11.5	-8.8	6.6	(³)	(³)	(³)
Surgery	0.0	(³)	(³)	8.4	0.1	-0.9	0.0	(³)
Radiology	0.0	(³)	(³)	(³)	(³)	(³)	(³)	-0.1
Pathology	0.0	1.3	-1.8	1.8	0.1	-4.5	(³)	(³)

¹ Includes physicians in listed specialties and others.

² Includes other medical services; excludes anesthesia.

³ Less than 5 percent of total allowed charges for specialty.

Table 7

Percent change in physicians' Medicare revenues for all procedures under statewide mean allowed charge fee schedule, by specialty and assignment response (assumed elasticity): South Carolina, 1983

Assumed elasticity	All specialties ¹	General practice	Family practice	Internal medicine	General surgery	Orthopedic surgery	Ophthalmology	Radiology
Percent change								
0.00	0.2	6.9	4.2	-2.2	0.9	0.1	0.8	-0.2
0.50	0.8	7.1	4.3	-1.4	1.8	0.5	0.9	0.2
1.00	1.3	7.1	4.2	-0.6	2.6	0.9	1.0	0.6

¹ Includes physicians in listed specialties and others.

effects on an individual practice might be considerably greater. If many physicians anticipate nontrivial reductions in Medicare revenues under a fee schedule, there might be considerable opposition to its implementation even if others anticipate large increases. The distributions of physicians with respect to changes in Medicare revenues (Table 8) show that simulated reductions almost never exceed 5 percent of current practice revenues. That pattern holds for all the important specialties except internists: 26 percent of them realize simulated reductions in Medicare revenues of 6-25 percent, but simulated losses in excess of 25 percent are rare.

In contrast, simulated gains in the aggregated revenues of general and family practitioners are the result of gains for many and reductions for only a few. Medicare practice revenues under the fee schedule exceed their values under CPR reimbursement by at least 5 percent for more than one-third of those physicians, although in most cases the gains do not exceed 25 percent.

Finally, gainers and losers among other specialties are rather tightly distributed around zero. Simulated Medicare revenues are within 5 percent of baseline values for 75 percent or more of the general surgeons, orthopedic surgeons, ophthalmologists, and radiologists in the study.

At least one caveat needs to be made regarding the generalizability of findings. The study is based on data from a calendar year, a time period covering part of two sequential Medicare fee screen years. Whether or not similar results would be obtained in analyses of

data from one full fee screen year is problematic and beyond the scope of this study.

Effects on beneficiary liabilities

In the fee distribution analyses, it was found that implementing a charge-based fee schedule would be likely to have the greatest effects on Medicare program payments for office and hospital visits, and therefore on payments for the services of primary care providers. However, the expected effects on beneficiaries' liabilities are unclear owing to opposing effects on the two major components of those liabilities (ignoring deductibles), coinsurance and unassigned bill balances. For example, an increase in approved fees because of use of a fee schedule increases the 20-percent coinsurance payment in absolute terms but reduces the difference (balance) between the physician's billed charge and the approved charge.

Simulation results (Table 9) indicate that reductions in balances of bills probably exceed the increases in coinsurance liabilities. That is a plausible explanation for the sharp reduction in beneficiaries' liabilities for services of general and family practitioners, reductions to 10-12 percent below levels under the CPR system. Conversely, the rate of increase in liabilities for care by higher priced (under the CPR system) internists are as sharp as the rates of decrease associated with other primary care physicians. Furthermore, depending on the presumed responsiveness of practice assignment

Table 8

Percent distribution of physicians, by percent change in Medicare revenues under statewide mean allowed charge fee schedule and specialty: South Carolina, 1983

Specialty	Percent change								
	Less than -25	-11 to -25	-6 to -10	-1 to -5	No change	1 to 5	6 to 10	11 to 25	More than 25
	Percent distribution								
All specialties ¹	0.5	5.9	6.5	21.9	23.1	22.3	10.1	7.3	2.5
General practice	0.0	0.4	1.0	1.0	26.0	33.8	18.7	13.7	5.3
Family practice	0.0	1.4	0.0	2.8	20.9	39.4	24.1	9.2	2.1
Internal medicine	1.0	13.3	13.0	43.5	16.4	8.3	3.1	0.9	0.6
General surgery	0.0	0.9	7.9	29.0	16.4	29.4	6.1	8.4	1.9
Orthopedic surgery	0.0	0.0	1.9	33.7	34.6	15.4	4.8	7.7	1.9
Ophthalmology	0.0	1.0	4.9	22.6	41.2	12.8	7.8	7.8	2.0
Radiology	0.0	0.0	7.6	50.6	14.2	15.2	7.6	3.8	0.0

¹Includes physicians in listed specialties and others.

Table 9

Percent change in Medicare beneficiary liabilities for all procedures under statewide mean allowed charge fee schedule, by specialty and assignment response (assumed elasticity): South Carolina, 1983

Assumed elasticity	All specialties ¹	General practice	Family practice	Internal medicine	General surgery	Orthopedic surgery	Ophthalmology	Radiology
	Percent change							
0.00	0.8	-11.5	-10.0	8.9	0.8	1.7	2.7	-0.2
0.50	2.8	-11.1	-9.9	11.5	4.2	3.1	3.2	1.8
1.00	4.6	-11.1	-10.0	13.9	7.3	4.4	3.6	3.7

¹Includes physicians in listed specialties and others.

rates to changes in approved fee levels, implementation of the fee schedule increased beneficiaries' liabilities for the services of surgical specialists by 1-7 percent.

Findings reported by the CBO (April 1986) were not totally consistent with findings from this study. On the one hand, the two studies reported that beneficiary liabilities in total would increase by less than 1.0 percent following implementation of statewide Medicare fee schedules. On the other hand, the two differed with respect to simulated changes in liabilities for care by different specialists, especially internists. CBO estimated an increase in liabilities for internists' services of only 0.2 percent, in contrast to this study's estimate of 8.9 percent.

At least one reason for the discrepancy is the difference in the percentage of internists' charges for which assignment is accepted in South Carolina in contrast to the percentage for the Nation at large. The assignment rate in South Carolina is lower, implying that balances of internists' bills are a more important source of beneficiary liability in South Carolina than elsewhere. This finding emphasizes the importance of physicians' assignment decisions as a factor in the ultimate effect of any payment reform initiative on beneficiary out-of-pocket expenses. By inference, policymakers would do well to maintain the participating provider program or other initiatives to

encourage physicians to accept assignment under this type of physician fee schedule.

Summary and discussion

Physician fee schedules are an important class of alternatives open to policymakers considering reform of the Medicare Part B reimbursement system. Their efforts can be assisted by findings from this study, which provide background information on fee schedules in general and on fee schedules paying statewide mean approved charges per procedure in particular.

Charge-based fee schedules have several advantages over other payment reform options, notably capitation proposals whereby Medicare pays a predetermined amount to a provider in return for future delivery of Medicare services to beneficiaries as needed. First, fee schedules are easily developed and modified, and they preserve the traditional fee-for-service system. Second, they are easily constructed so as to be "budget neutral" in the short run with respect to the traditional CPR system. At the same time, fee schedules are not prone to the automatic passthrough of physician charge increases that plagued the CPR system and contributed so much to Medicare cost inflation in the past. In sum, replacing

the CPR system with a charge-based fee schedule provides policymakers with a mechanism for controlling unit price inflation with minimal short-run disruptions to the medical care delivery system, third-party payers, providers, and beneficiaries.

In the study, a series of important and related questions were addressed. For what procedures would Medicare program payments under a fee schedule differ greatly from their levels under CPR reimbursement? Has the CPR system evolved into a series of fee schedules through the cumulative restraining effects of the Medicare Economic Index on regional prevailing charges? What are the short-run redistributive effects of a fee schedule in program payments, practice revenues, and beneficiary liabilities?

In analysis of intrastate variation in Medicare-approved fees for selected procedures, little variation was discovered in charges for surgery, radiology, and pathology services. In contrast, approved charges for medical procedures, especially visits, varied considerably. Program payments for visits might differ markedly under the fee schedule in comparison with the CPR system. Consequently, some primary care providers might be more sensitive than others to the financial implications of a Medicare average charge fee schedule, in which specialty distinctions in payment are ignored. Complementary analyses showed that the tight distribution of approved fees for nonmedical procedures around their respective statewide means was not the result of binding prevailing fees. By inference, prevailing charges had not yet developed into full-fledged de facto regional fee schedules.

If physicians' responses to a fee schedule are proportional to the anticipated effects on practice revenues, most physicians are not likely to offer strong opposition. Analyses of simulation results revealed that most physicians' Medicare practice revenues are essentially unaffected in the short run by replacing CPR with a fee schedule under which average Medicare charges are paid. The one important exception is the relatively large fraction of internists (almost 15 percent of those in the study) whose Medicare revenues decreased by more than 10 percent. However, the Medicare program might choose to mitigate internists' potential revenue losses and possible adverse consequences for beneficiaries' access to care by upwardly adjusting fee schedule payments for visits, the major source of internists' Medicare revenues.

Additional evidence was provided on the effects of a fee schedule on beneficiaries' access to care. Under plausible assumptions regarding the relationship between assignment rates and approved fees, aggregated beneficiary liabilities under the fee schedule were within a few percentage points of their values under CPR. Estimated changes in those liabilities aggregated over all types of services were always less than 5 percent. However, that low mean value masked considerable variation in effects that were strongly dependent on the provider of the

services in question and on the provider's propensity to mitigate revenue losses by reducing assignment rates. Consequently, there might be a need to protect beneficiary access to care under a fee schedule through regulations or policies that provide an incentive for physicians to maintain or increase their willingness to accept assignment.

The rapid growth of Medicare Part B program outlays prompted a search for policies and reforms to control that growth. In replacing one fee-for-service system (CPR) with another (the fee schedule), only one-half of the cost inflation equation is addressed. A complete cost-containment policy requires complementary initiatives or incentives to monitor the quantity of services provided. However, this requirement does not diminish the usefulness of reform options, such as implementing charge-based fee schedules, that mitigate cost-inflation pressures on the price side. Certainly, each option has its own particular advantages and disadvantages. For example, capitation arrangements are unlikely to require complementary restraints on excess service volume, but they might require policies or regulations to insure that providers do not underserve their Medicare clients. Furthermore, elements of the present study are directly relevant to issues surrounding any Medicare capitation-based reimbursement system. It will always be true that any organization at risk under a capitation system must reimburse physicians for their services. Conceivably, some of those organizations would opt for a fee-for-service approach, possibly one based on a physician fee schedule.

Information on the possible effects of implementing one class of alternatives to the CPR reimbursement system, statewide approved-charge-based fee schedules, is provided in this study. That narrow focus is both a strength and weakness. South Carolina is reasonably representative of other States and is therefore a useful laboratory for analysis. Yet, it is not uniformly representative on every dimension of the Medicare program. In particular, Medicare carriers differ in their recognition of specialty differences for the purpose of defining prevailing fees. The simulation results in South Carolina were, in part, the result of eliminating specialty distinctions in Medicare program payments, especially for visit procedures. Quite possibly, smaller effects would be realized in States where the Medicare carrier does not recognize as many speciality distinctions.

A related issue is now brought into question. If the primary effect of maintaining speciality-specific prevailing fees is to enhance the Medicare practice incomes of selected specialties, then a case can be made for implementing a specialty-undifferentiated fee schedule. Conversely, if there are fundamental differences in the content or quality of care provided by physicians in different specialties, the case for a specialty-undifferentiated schedule is substantially weakened.

The study's findings are most generalizable to States that, like South Carolina, maintain only one

prevailing charge area within their borders. Study results are a less reliable predictor of the effects of implementing a fee schedule in States with multiple fee areas or with speciality differences that are not recognized for reimbursement purposes. These shortcomings aside, through the study, important new data are added to the growing body of information on alternatives to the traditional CPR reimbursement system. The greater that information, the easier it will be for policymakers to distinguish between knowledge and belief as promulgated by proponents of various options during the coming debates on Part B payment reform.

Acknowledgments

The author wishes to thank Christopher Koller for programming assistance.

References

- Blalock, H. M.: *Social Statistics*. New York. McGraw Hill, 1972.
- Burney, I., and Schieber, G.: Medicare physicians' services: The composition of spending and assignment rates. *Health Care Financing Review*. Vol. 7, No. 1. HCFA Pub. No. 03206. Office of Research and Demonstrations, Health Care Financing Administration. Washington. U.S. Government Printing Office, Fall 1985.
- Burney, I., Hickman, P., Paradise, J., and Schieber, G.: Medicare physician payment, participation, and reform. *Health Affairs* 3(4):5-24, Winter 1984.
- Committee on Finance, U.S. Senate: *Background Data on Physician Reimbursement Under Medicare*. Joint Committee No. S. PRT. 98-106. Washington. U.S. Government Printing Office, Oct. 1983.
- Congressional Budget Office: *Physician Reimbursement Under Medicare: Options for Change*. Washington, D.C., Apr. 1986.
- Hadley, J., et al.: Alternative Methods of Developing a Relative Value Scale of Physician Services (Year 1 Report). Working Paper 3075-4. Washington, D.C. The Urban Institute, Feb. 1983.
- Juba, D. A.: Analysis of Issues Relating to Implementing a Medicare Physician Fee Schedule. Working Paper 3481-01. Washington, D.C. The Urban Institute, Nov. 1985.
- Juba, D. A.: Price setting in the market for physicians' services: A review of the literature. *Health Care Grants and Contracts Report*. HCFA Pub. No. 03012. Office of Research, Demonstrations, and Statistics, Health Care Financing Administration. Washington. U.S. Government Printing Office, Sept. 1979.
- Office of Management and Budget: *Budget of the United States Government, Fiscal Year 1985: Special Analysis*. Table A-16. Washington. U.S. Government Printing Office.
- Office of Technology Assessment, U.S. Congress: *Payment for Physician Services: Strategies for Medicare*. Pub. No. OTA-H-294. Washington. U.S. Government Printing Office, Feb. 1986.