

Impact of an All-or-Nothing Assignment Requirement under Medicare

by Janet B. Mitchell and Jerry Cromwell

In an effort to raise assignment rates, some policymakers have considered dropping Medicare's case-by-case assignment option. Physicians would have to decide whether to accept all of their patients on assignment, or none of them. In a 1976 national survey, over two-thirds of the physicians stated they would take none of their patients on assignment if forced to choose. Simulation analysis showed that in that event, assignment rates nationwide would fall almost 10 percent. The mean supply of assigned visits would actually increase 11 percent for general practitioners, while decreasing 12-25 percent for general surgeons, internists, and obstetricians/gynecologists.

Introduction

Unlike Medicaid which requires that the physician accept the Medicaid fee as payment-in-full and forego collection from the patient, the Medicare program offers the physician two options. One, he can bill the Medicare patient at his usual fee, just as he would any other patient. The patient is then responsible for obtaining the reimbursement from the Medicare carrier. The patient must pay the deductible (if not previously satisfied), the 20 percent coinsurance on the Medicare allowed charge, plus 100 percent of the physician's fee above the allowed charge. Two, the physician may choose to have the patient's bill "assigned" to him. Under the "assignment of benefits" option, the physician accepts the Medicare prevailing charge as payment in full and is paid directly by the carrier. (The physician must still bill the patient, however, to collect the 20 percent coinsurance and any outstanding deductible.)

The Medicare program allows the physician to decide whether or not to accept assignment on a case-by-case basis. Over one-half of primary care physicians (52.9 percent) exercise this option (Mitchell and Cromwell, 1982); the remainder either accept all of their patients on assignment (18.9 percent) or none of them (28.2 percent). The willingness of a physician to take assignment has clear implications for financial liability of Medicare beneficiaries. For nonassigned

claims, the patient is responsible for the difference between the physician's actual charge and the Medicare allowed charge. Beneficiary data show an average out-of-pocket payment for physicians' services of \$79 in 1975, exclusive of premium contributions (Ferry *et al.*, 1980); liability from unassigned claims accounted for 25 percent. For the very ill, total liability may be considerable.

The steady decline in Medicare assignment rates over the past 10 years, from 60 percent of all claims to 50 percent, means that the elderly are bearing an increasingly larger share of their total medical care bill. Senior citizens, who read in their Medicare, Part B handbook that Medicare will pay 80 percent of physicians' bills, are stunned to discover that Medicare actually reimburses closer to 50 percent. This apparent contradiction in benefits is one of the major complaints made by the elderly about Medicare. (See, for example, Select Committee on Aging report, U.S. House of Representatives, 1980).

In an effort to raise assignment rates, policymakers are considering the introduction of an "all-or-nothing" assignment requirement to the Medicare program. Such a requirement could assume two different forms. In the first, (assumption 1), the physician would have to accept assignment or forego any government reimbursement for his services. Patients would not be able to receive payment directly from the government. Medicaid currently operates under such an "all-or-nothing" participation requirement, as do most national health insurance plans. Under an alternative (and less rigorous) "all-or-nothing" requirement, the case-by-case option would be dropped (assumption 2). Physicians would have to decide

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Reprint requests: Janet B. Mitchell, Center for Health Economics Research, 822 Boylston Street, Suite 104, Chestnut Hill, MA 02167

whether to accept all of their Medicare patients on assignment, or none of them. Patients, however, would retain the ability to collect the allowed Medicare charge from the government (minus the coinsurance).

The basic difference in the two assumptions comes in the ability of nonassigned patients to pay. Under assumption 1 their ability is constrained to their own out-of-pocket demand; under the second assumption, nonassigned demand remains buoyed up by continued government payment, albeit indirect. Faced with either of these scenarios, the physician would have to make a dichotomous decision which could have potentially severe implications. This he would have to do under uncertainty, both in terms of Medicare private demand of currently assigned patients and ability to collect from such patients.

Both versions of an "all or nothing" requirement have been considered by policymakers.¹ The Medicaid option (assumption 1) has actually been introduced in Congress, but lawmakers have feared that such a measure would result in widespread defection by physicians from the Medicare program. A 1977 *Medical Economics* survey found that 31 percent of the physicians reported they would drop out of the Medicare program if assignment was made mandatory, and 29 percent stated they would reduce their Medicare caseloads (Rosenberg, 1977).² Given the current dependence of many physicians on Medicare patients, these estimates are probably biased upwards. For example, internists, on average, devote 29 percent of their office practice to elderly patients (NCHS, 1978a); only those with strong private demand could probably afford to give up the Medicare subsidy.

The less drastic, and presumably more politically feasible, non-case option (assumption 2) has been discussed in congressional hearings, notably by Nelson Cruikshank, president of the National Council of Senior Citizens. Our theoretical and empirical analysis of the "all or nothing" requirement is based on this non-case option.³

¹Other means for increasing assignment include tax incentives, use of more recent charge data for reasonable charge determination, and simplified billing procedures for assigned patients. The latter approach, proposed by Senator Talmadge, includes an added financial incentive of a dollar per assigned claim.

²These percentages are based only on physicians who are currently treating Medicare patients, and thus differ somewhat from those reported in *Medical Economics*.

³Mr. Cruikshank has expressed the fear that this option could lead to a two-tiered form of medicine, similar to what now exists under the Medicaid program. We examine this empirically later.

Theoretical Analysis of the All or Nothing Choice

The Decision Rule

In deciding whether to accept all Medicare patients on assignment, the physician must weigh the relative incomes under the "all" or "nothing" choices. Because eliminating the case-by-case assignment option restricts the physician's ability to price discriminate, either of these two choices will result in some net revenue loss. We illustrate this algebraically, as follows:

$$(1) TR_{m+n} = [R \cdot V_m \cdot AR + P_n \cdot V_n (1 - AR)] \cdot (m + n)$$

where TR_{m+n} = total Medicare revenues;
 R = Medicare allowed fee;
 V_m, V_n = visits per assigned, nonassigned patient;
 AR = assignment rate;
 P_n = average physician nonassigned fee;
 m, n = number of assigned, nonassigned patients.

The physician's decision rule is to maximize TR_{m+n} for $AR = 0$ or 1 , or more accurately (because the physician is assumed to be already maximizing total revenues at his current assignment rate), to minimize net losses (NL), as follows:

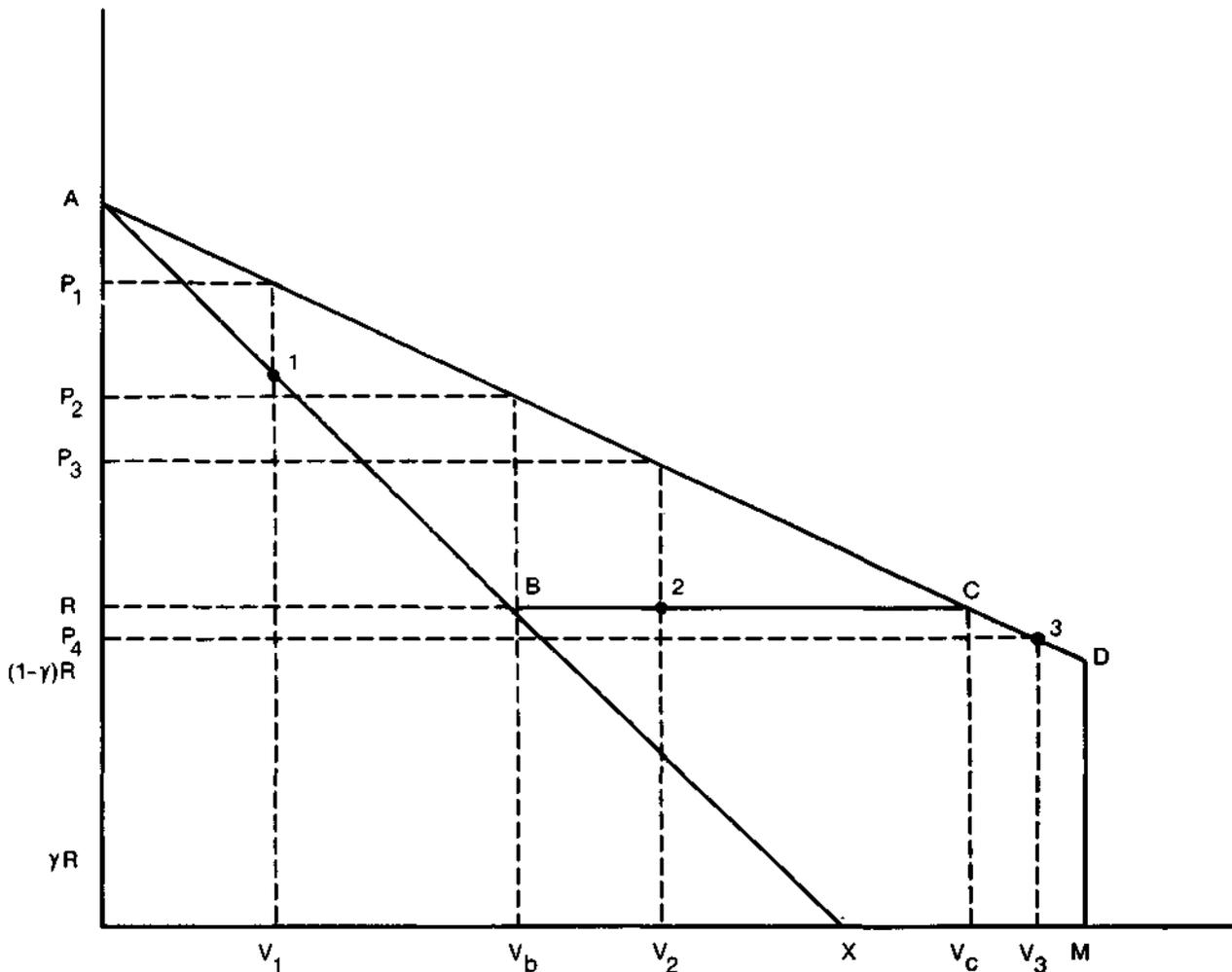
$$(2a) NL(AR=1) \begin{matrix} \geq \\ < \end{matrix} NL(AR=0).$$

When expected losses under the "all" option exceed those under the "none" option, the physician will choose to take no patients on assignment. On the other hand, when losses under the "none" option are higher, the physician will take all patients on assignment, other things being equal.

Let us examine the decision graphically in Figure 1. For the majority of physicians who currently accept assignment on a case-by-case basis, either choice will entail some amount of loss. Consider physician 2 who provides V_b nonassigned visits at price P_2 and $V_2 - V_b$ assigned visits. Under the "all" option, he must forego revenues equal to the rectangle $(P_2 - R) \cdot V_b$. If, on the other hand, the physician chooses the "none" option, he will face a downward sloping marginal revenue curve (AX) for all his Medicare patients and must lower his fee to P_3 . (For now,

FIGURE 1

Graphical Analysis of the "All or Nothing" Decision Rule



we make the critical assumption of no price discrimination.) This results in a loss of revenue from nonassigned patients who had been willing to pay P_2 , equal to $(P_3 - P_2) \cdot V_b$. Offsetting this loss, however, is a gain in revenue from previously assigned patients who are willing to pay more than the allowed Medicare charge, equal to $(P_3 - R) \cdot (V_2 - V_b)$. Substituting these expressions in for (2a), we have:

$$(2b) (P_2 - R) \cdot V_b \geq (P_3 - P_2) \cdot V_b - (P_3 - R) \cdot (V_2 - V_b).$$

Rearranging, we have:

$$(2c) 0 \geq (R - P_3) \cdot V_2$$

As P_3 should always be greater than R under less than 100 percent assignment, the right-hand term is clearly negative—implying a smaller loss associated with the "none" option. This suggests that the physician at point 2 will always choose the "none" option.

Under what circumstances will a physician opt to take all patients on assignment? Equation (2c) implies that the physician will choose the "all" option only when P_3 falls below R (when the right-hand term turns positive). (Where P_3 equals R , the physician will be indifferent, other things being equal). This makes sense when we compare total revenues for any physician accepting assignment along the horizontal portion of the marginal revenue curve, BC. Under the "all" option, total revenues will be $R \cdot V_2$, say, while under the "none" option they will always be greater, say, $P_3 \cdot V_2$. For Medicare patients who were assigned along BC, the physician can always get a least $\$R$, and usually more, by not taking them on assignment, while certainly being able to charge more than $\$R$ for previously nonassigned patients. *Only* when the physician begins seeing Medicare patients too poor to pay even the coinsurance, γR , does he seriously consider the "all" option.

It thus becomes apparent that the physician's decision will depend on the price elasticity of demand and on the size of his assigned caseload. The more price inelastic the demand for care, the more the physician will have to lower his usual fee to maintain a given Medicare caseload under the "none" option. This has the effect of moving P_3 further away from P_2 and closer to R . Similarly, the larger his assigned caseload, the more he must lower his fee for all patients. In either case, the "all" option will not be attractive except at those output levels where the physician must reduce his fee below R (after point C). At this point, patients are no longer willing to pay the full coinsurance. Physician 3, for example, would have to lower his usual fee to P_4 , producing a net loss under the "none" option.

Some physicians do not currently exercise the case-by-case option under Medicare, and have effectively already chosen the "all" or "none" position that minimizes their losses. Consider, for example, the physician at point 1 who is providing V_1 nonassigned visits. Because he is currently accepting no patients on assignment, his net loss under the "none" option would be zero. If this physician elects to take all patients on assignment, he would not be able to bill for the difference between P_1 and R , resulting in a loss of net revenue equal to the area $(R - P_1) \cdot V_1$. Since this amount clearly is negative, we would expect physician 1 to choose the "none" option. Similarly, we would expect a physician taking his entire Medicare caseload on assignment to choose the "all" option (not shown in Fig. 1).

The Impact of Collection Costs

So far, the collection of the physician's fee—either from the patient or the government—has been presumed costless. With no collection costs and a perfect collection rate, we observe the "ideal" demand (ACDM) and marginal revenue (ABX) curves shown in Figure 1. In fact, however, the physician may experience difficulties or delays in collection. Consider trying to collect from patients first. The patient may be tardy in paying, requiring repeated prodding from the physician. The *net* fee (NP) the physician receives can be written as

$$NP = k(g,P) \cdot P - g$$

where $k(g,P)$ = collection rate, g = collection cost per visit, and P = the physician's gross fee. The collection rate, k , is assumed to depend positively on g and inversely on P ; the more money physicians spend on collection, the higher the collection rate. Conversely, for a given collection effort, the higher the physician's fee, the lower the collection rate is expected to be.

Positive patient collection costs unambiguously lead to earlier, more extensive Medicare assignment, as the physician's demand and marginal revenue curves are shifted (and rotated) inwards. What impact do patient collection costs have on the all or nothing decision? In part, the impact is indirect through the assignment decision. Physicians with higher patient collection costs will have higher assigned caseloads to begin with and hence are more likely to choose the "all" option. However, the impact is also direct. When shifted inward, the marginal revenue curve kinks at a lower level of Medicare output than in the absence of collection costs.

Collecting from Medicare directly is generally not costless either. Assuming a constant unit cost associated with collecting from Medicare for assigned bills, the physician's net fee is reduced by a constant amount. Thus, Medicare collection costs will put off the point at which the marginal revenue curve kinks, and at which the physician would choose the "all" option. Thus, physicians will still opt to take no patients on assignment at much higher levels of Medicare output than they would in the absence of Medicare collection costs.

Impact of a Medicare Fee Increase

Theory predicts that an increase in the Medicare allowed fee, R , will raise assignment rates—an impact documented empirically as well (Mitchell and Cromwell, 1982). Do higher Medicare reimbursement levels have an independent impact on the all or none decision? As discussed earlier, the probability of a physician choosing the "all" option is affected only by shifts in the downward-sloping portion of the assigned marginal revenue curve (CD in Figure 1). Because of the coinsurance, an increase in the Medicare fee effectively raises the out-of-pocket burden for assigned patients, and assigned patients will demand fewer visits at this price.⁴ This means that the second kink in the physician's marginal revenue curve (C) occurs at a lower level of total output than before the fee increase. For physicians to the right of this kink, a larger proportion of their assigned patients are now unwilling to pay the full coinsurance. Some physicians previously on the horizontal portion of their assigned marginal revenue curve will now find themselves on the downward-sloping portion (CD), assuming Medicare output remains constant. These latter physicians will now choose the "all" option.

⁴Say, for example, the Medicare allowed charge was \$8, and the assigned patient paid \$1.60 coinsurance ($0.2 \times \8). If the Medicare fee is increased to \$10, the assigned patient must now pay \$2 for the same visit ($0.2 \times \10).

Joint Medicare-Medicaid Patients

In instances of joint Medicare-Medicaid eligibility, assignment is mandatory, but the physician is reimbursed the full reasonable charge rather than the lower Medicaid fee. (Mandatory means only that the physician must accept assignment in order to bill Medicaid for the deductible and coinsurance.) The pool of joint Medicare-Medicaid patients will lengthen the horizontal portion of the physician's marginal revenue curve (BC in Figure 1), as marginal revenue equals R for all patients. (The Medicare carrier pays $(1-\gamma)R$, while the State Medicaid program is responsible for γR .) Unlike other assigned patients, these joint eligibles face no out-of-pocket price for care, and assigned demand will be perfectly inelastic. Thus, when these joint patients constitute a larger share of the physician's Medicare caseload, assignment rates will also be higher. What about the all or nothing decision? Referring back to Figure 1, we can see that where BC is longer, C kinks at a greater level of Medicare output, thereby putting off the critical decision point. This would lead to the somewhat paradoxical conclusion that the physician is less likely to choose the "all" option. In fact, however, he does not face the same choice with his joint Medicare-Medicaid eligibles, as with the "pure" Medicare patients. Under the "none" option, this physician must either drop the joint patients from his caseload or forego his right to bill Medicaid for the copayments. Presumably, these patients would be willing or able to pay the physician only a small fraction of his usual fee (less than γR), if anything at all. As shown earlier, it is at this point, (when the physician begins seeing Medicare patients too poor to pay even the coinsurance) that he begins to consider choosing the "all" option.

Because there are no out-of-pocket payments, the physician will not incur any collection costs from the patient. He will still incur any expenses associated with billing Medicare directly, as well as from the State Medicaid program which is responsible for paying γR . Collection costs associated with Medicaid are identical in impact to those of Medicare: they lower the physician's marginal revenue from assigned patients and discourage entry into the assignment market. The magnitude of the effect of Medicaid collection costs may be considerably larger, however. Physicians have consistently cited the Medicaid program as having more onerous administrative requirements than Medicare (Sloan, Cromwell, and Mitchell, 1978). Given relatively higher collection costs associated with Medicaid, physicians may either refuse to treat joint-eligibles or may simply decline to bill the State agency for γR . The latter response implies that the physician would be located to the right of C (or the downward sloping portion of his assigned marginal revenue curve). In this instance, the physician would be more willing to accept the "all" option.

The Medicare Market under Price Discrimination

The preceding analyses have assumed that the physician does not price discriminate. What happens if we now assume that he is a perfect price-discriminator? The marginal revenue curve becomes the demand curve and the physician is able to extract from each patient exactly what he/she is willing to pay, without having to lower his fee to previous patients. The physician would move down his demand curve and derive marginal revenue greater than or equal to R at each visit level. After some point (point C in our earlier analyses), patients are willing to pay only some fraction of the coinsurance out of pocket, and marginal revenue falls below R . The physician continues to move down along his demand curve, deriving marginal revenue such that $(1-\gamma)R \leq MR < R$. The perfect price-discriminator will never choose the "all" option; any deviation from his revenue-maximizing position along the demand curve will result in loss. This is true even for those physicians to the right of C (which we showed earlier to be the critical threshold for the "all" decision), because they need never lower their usual fee to all patients under the "none" option as would non-price-discriminators.

The assumption of perfect price-discrimination is a particularly strong one. More realistically, the physician can only imperfectly assess each patient's ability and willingness to pay. Under less-than-perfect price-discrimination, we can imagine the old marginal revenue curve rotating out towards the demand curve, thereby putting off the point where marginal revenue falls below R and where the physician enters the assignment market. As long as the physician can price discriminate to some extent, no matter how imperfectly, he will never choose the "all" option. Even physicians to the right of C (though they may have to lower the fee charged their marginal patient below R) can continue to exact higher fees ($\geq R$) from their remaining patients.

Other Demand and Supply Factors

Until now we have ignored non-Medicare demand for physicians' services and analyzed only demand by the elderly. The model is easily extended, however, to incorporate private, non-elderly demand. Increases in private demand are similar to those in the demand for non-assigned Medicare services; both bid the physician's time away from the assignment market. Outward demand shifts, by putting off the point at which the horizontal portion of the assigned marginal revenue curve turns downward-sloping, also reduce the probability that the physician will choose the "all" option.

Supply variables influencing the all or none decision include billing and collection costs associated with Medicare assignment and practice costs, including an imputed wage to the physician's time. Factors raising the costs of practice will discourage assignment and the "all" option.

Data Sources

Physician Survey

The primary data base for this analysis is the 1976 physician survey conducted by the National Opinion Research Center (NORC) for the Health Care Financing Administration (HCFA). (Within HCFA, it is known as the 1975 survey because cost and income data refer to the previous calendar year. All other data, such as fees and visits, refer to the actual year in which they were obtained.) This survey included two independent samples, one national in scope, the other consisting of two regions (East South Central and Mid-Atlantic). With the appropriate weighting algorithm, the two samples can be combined into one nationally representative sample. All physicians were in office-based, private practice in the five primary care specialties: general practice, general surgery, internal medicine, obstetrics-gynecology (OB-GYN), and pediatrics.

An extensive questionnaire was administered to all physicians, usually by telephone. The primary focus was to collect data on practice costs and income for use in the Medicare Economic Index, but information was also collected on work effort, size and type of practice, fees, and Medicare/Medicaid participation. All information was based on physician self-reports. Measurement error might be present if physicians refused to participate in the survey, or if they reported inaccurate or incomplete information. These types of errors are known as non-response bias and field bias, respectively. Physician response rates were over 70 percent, and an earlier analysis of this same survey found no evidence of measurement error (see Sloan, Cromwell, and Mitchell, 1978, pp. 14-21).

Secondary Data Sources

A number of additional data sources were merged with the physician surveys for these analyses. Biographic information on individual survey physicians was obtained from the *AMA Masterfile*, including such data as physician age, board-certification, and medical school. Variables describing the physician's county, such as demographic characteristics, were drawn from the Area Resource File and the *AMA's Physician Distribution and Medical Licensure in the U.S., 1976*.

Data on Medicare program characteristics, such as claims denial and investigation rates and the carrier rate of reduction, were obtained from a HCFA report by Muller and Otelsberg (1979). Medicare prevailing charges were available from HCFA's *Medicare Directory of Prevailing Charges, 1976*. Medicaid program characteristics, were obtained from the Medicare-Medicaid Management Institute reports entitled *Data on the Medicaid Program: Eligibility, Services, Expenditures, 1977* and from the *1977 County and City Data Book*.

Sample Description

The total unweighted sample size was 1,726 general practitioners, internists, obstetrician-gynecologists, and general surgeons. Pediatricians were excluded from the analysis because they almost never treat Medicare patients.

Over one-fifth of the physicians in this sample (27.7 percent) reported that they never accepted any of their Medicare patients on assignment, and almost another fifth (21.1 percent) stated that they always did. The remainder (51.2 percent) takes assignment on a case-by-case basis. Besides questions on Medicare assignment rates, caseloads, and how often he tried to collect the deductible and coinsurance from his assigned patients, each physician was asked the following question:

"If you had to make a choice between accepting all of your Medicare patients on assignment, or none of your Medicare patients on assignment, which would you choose?"

This question formed the basis for our analysis of the all or nothing decision. The analysis consisted of three components: (1) descriptive statistics illustrating the all or none decision as a function of physician characteristics, geographic location, and willingness to accept assignment; (2) econometric analysis of the decision; and (3) simulation of the impact of the all or nothing requirement on assignment rates and assigned workloads.

Descriptive Analysis of the All or Nothing Decision

Specialty and Current Assignment Status

When asked which they would choose if forced to take all of their Medicare patients on assignment or none of them, over two-thirds of the surveyed physicians (68.5 percent) responded that they would choose the "none" option (Table 1). Internists desert the assignment market in disproportionate numbers. Only one of every five internists said he would take all patients on assignment compared with two out of

TABLE 1
All or None Choice by Specialty'
(percent distribution)

	All	None
General Practice	31.3%	68.7%
General Surgery	40.9	59.1
Internal Medicine	20.4	79.6
Obstetrics-Gynecology	38.8	61.2
Total	31.5	68.5

¹Percents sum to 100 percent by row.

five general surgeons and OB-GYNs. This is not completely surprising given the higher assignment rates of surgical specialists which will encourage them to choose the "all" option.

We see this more clearly in Table 2 which presents the all or none decision as a function of whether the physician never, always, or sometimes (that is, on a case-by-case basis) takes assignment. The overwhelming majority of physicians who never take assignment choose the "none" option, as predicted by theory. Over three-fourths of the physicians currently accepting all patients on assignment will continue to do so if forced to choose. Theory does not explain the relatively large number of physicians who report that they would stop taking assignment (22.4 percent) even though their current assignment rate is 100 percent. It is possible that the absolute size of their assigned caseloads is quite low, thus minimizing the net loss associated with the "none" option. Alternatively, a distaste for government regulation may lead these physicians to make a (financially) irrational choice. The fact that the survey was federally sponsored may also have led physicians to respond negatively to this hypothetical question; actual behavior could be very different.

TABLE 2
All or None Choice as a Function of
Current Assignment Status'
(percent distribution)

	All	None
Physician Accepts Assignment (%)		
Always (21.1%)	77.6%	22.4%
Sometimes (51.2)	26.8	73.2
Never (27.7)	5.2	94.8

¹Percents sum to 100 percent by row.

The largest group of physicians (and the most interesting one for policy purposes) are those who currently accept assignment on a case-by-case, or sometimes, basis. Most of the impact of an all or nothing requirement on assignment rates and assigned work-

loads will be felt through this "swing group". Which option do they choose? We see from Table 2 that the large majority (73.2 percent) state they would not take any patients on assignment. Internists in the "swing group" choose the "none" option at a higher than average rate, 82 percent compared with 67 and 65 percent of general surgeons and OB-GYNs, respectively.

Physician Credentials

The concern has been voiced in congressional testimony⁸ and elsewhere that two levels of medical care may be created as the result of an all or nothing requirement—similar to what now exists under Medicaid. Because of its low fees, the Medicaid program appears to constitute a secondary market served by less-well-trained physicians (Mitchell and Cromwell, 1980.) Will competition for elderly patients who are better able to pay encourage only less-qualified physicians to choose the "all" option? Table 3 suggests not. Based on such variables as board-certification, foreign versus U.S. medical school training, or faculty status, there are no differences in credentials of physicians choosing either of the options. Physicians aged 60 and over are somewhat disproportionately located in the "all" group, partially because of low private demand for their services. Older physicians also are more likely to have assigned patients of longstanding and for whom they may be reluctant to suddenly terminate the assignment of benefits.

Although credentials are equal between the "all" and "none" groups, the unequal distribution of specialists suggests that access to internists' services may be limited for assigned patients under an all or nothing requirement. Only one out of six physicians choosing the "all" option is an internist compared with one internist out of three physicians choosing the "none" option. Yet internists are a major source of care for Medicare patients (second only to GPs) and provide 19.3 percent of all office visits to the elderly (NCHS, 1978b). By contrast, surgical specialists who are overrepresented in the "all" group, are a less important source of medical care for the elderly (particularly OB-GYNs).

Geographic Location

Table 4 presents the geographic location of physicians choosing the all and none options. Physicians in non-metropolitan areas are more willing to choose the "all" option than are their city colleagues. This is consistent with what we know about higher assignment rates in non-Standard Metropolitan Statistical Areas (SMSAs), and probably reflects the relatively

⁸See, for example, testimony by Nelson Cruikshank to the Select Committee on Aging, U.S. House of Representatives (1980).

TABLE 3
Characteristics of Physicians Choosing All Vs. None

	All	None
Specialty ¹		
General Practice	40.0	40.4
General Surgery	24.6	16.3
Internal Medicine	16.4	29.5
Obstetrics-Gynecology	19.1	13.8
Board-Certification	38.9	37.3
Foreign Medical Graduate	11.5	11.6
Medical School Faculty	9.8	10.1
60 years and older	28.4	23.7

¹Specialty columns sum to 100 percent.

TABLE 4
Geographic Location of Physicians Choosing All Vs. None (percentage distribution)¹

	All	None
SMSA	28.9	71.1
Non-SMSA	38.8	61.2
North East	39.0	61.0
North Central	27.3	72.8
South	27.3	72.7
West	32.4	67.6

¹Rows sum to 100 percent.

low demand in these areas. The elderly in rural areas, for example, are apt to be poorer and to have more limited complementary insurance coverage. Thus, non-SMSA physicians probably are already accepting all of their Medicare patients on assignment, or if taking assignment on a case-by-case basis, they may be on the downward-sloping portion of their assigned marginal revenue curves.

Table 4 also shows large regional differences in the all or none decision. Physicians in the North East are far more likely to choose the "all" option than are physicians in other regions, a finding consistent with the generally high assignment rates in the North East. A surprising finding is the relatively high number of Western physicians opting to take all patients on assignment, compared with those in the South and North Central parts of the country. Previous to this study, work had shown that Western physicians were actually less willing to accept assignment, and almost never had 100 percent assignment (Mitchell and Cromwell, 1982). Demand factors not held constant here may partially explain this anomaly.

Political Attitudes

Previous work has shown that political attitudes influence the assignment decision above and beyond traditional economic variables (Mitchell and Cromwell, 1982). Not surprisingly, we also observe a strong association between these attitudes and the all or nothing decision. Each physician was asked whether he agreed or disagreed with two different statements displayed in Table 5.⁶ Physicians choosing the "all" option were more likely to strongly agree that health care is a right, as measured by responses to the first statement ("it is the responsibility of society . . ."). The majority of all physicians agreed that there are too many controls on the medical profession but the "all group" was somewhat less likely to strongly agree.

Collection Rates

Theory predicts that where collection rates and net fees are lower, physicians will be more likely to choose the "all" option. Based on our survey instrument, we have a direct measure of the physician's collection ratio, $k(g,P)$. Each physician was asked what percentage of patient billings his practice was able to collect during the preceding year. Although the question refers to total billings, it is probably a reasonably good measure of Medicare billings as well. Physicians in the "all" group apparently did have more difficulty in collecting patient billings than did physicians in the "none" group (Table 6). Only 10.8 percent of physicians choosing the "all" option reported collection rates exceeding 95 percent, compared with twice as many of physicians declining assignment (22.4 percent).

Under assignment, the Medicare carrier reimburses the physician directly for only 80 percent of the allowed charge, $(1-\gamma)R$. The physician is then responsible for billing the patient for the deductible (if not previously satisfied) and for the coinsurance (γR) . Each survey physician was asked in what percentage of cases he tried to collect these copayments from the patient. Given some positive collection costs, the extent to which physicians pursue copayments will reflect the expected probability of receiving them. Thus, we would expect physicians choosing the "all" option to be less likely to try to collect the copayments (and hence to be on the downward-sloping portion of their MR curves).

⁶These two questions were asked in the national survey only. The unweighted sample size on which these responses are based was 889.

TABLE 5

**Political Attitudes of Physicians Choosing All vs. None
(percent distribution)¹**

	Strongly Agree	Agree Somewhat	Disagree Somewhat	Strongly Disagree
"It is the responsibility of society, through its government, to provide everyone with the best available medical care, whether he can afford it or not."				
All	24.5%	28.3%	20.7%	26.6%
None	17.5	23.7	22.6	36.3
"There are too many controls on the medical profession that interfere with taking care of patients."				
All	55.5	25.2	13.2	6.1
None	66.3	16.9	14.2	2.6

¹Rows sum to 100 percent.

TABLE 6

**Percent of Patient Billings Collected as a Function of
the All or Nothing Decision
(percent distribution)¹**

Percent of Bills Collected	All	None
96-100%	10.8%	22.4%
90-95%	34.9	43.7
80-89%	38.7	24.2
Less than 80%	15.6	9.7

¹Columns sum to 100 percent.

Table 7 suggests that this may be the case. Physicians have been grouped first by their all or none choice, and then by their current assignment status, that is, whether they accept 100 percent of their patients on assignment or whether they do so on a case-by-case basis. Physicians who never take assignment were not asked the copayment questions (as they would naturally bill their patients for the full fees) and are excluded from the table. Physicians choosing the "all" option appear somewhat less likely to pursue collection of the deductible and coinsurance. They less frequently report that they always go after the copayments; between 40.4 and 53.6 percent of the "all" group report that they always try to collect the coinsurance compared with 42.6-61.0 percent of the "none" group. The more striking difference is between physicians currently exercising the case-by-case option and those always taking assignment. The latter are much more likely to try to collect both coinsurance and deductible, probably because assigned patients constitute a much larger proportion of their total caseloads.

Earlier, we saw that a small but substantial number of physicians who currently accept *all* of their patients on assignment stated they would not take any if forced to choose. This is the group in the last column of Table 7. These physicians appear especially aggressive in collecting the copayments; they are more likely than physicians in any of the other three groups to always go after the deductible and coinsurance. Almost two-thirds (61.0 percent) of these physicians, for example, state they *always* try to collect the coinsurance compared with one-half or less of physicians in the other groups.

Swing Group Physicians.

Swing group physicians currently take some, but not all, patients on assignment. Their all or none decision will depend solely on whether they are located on the horizontal or downward-sloping portions of their assigned marginal revenue curves.

Table 8 examines this group of physicians (51.2 percent of our total sample) in more detail. Differences shown earlier between all and none physicians as a whole (see Table 3 and 4) are somewhat magnified for the swing group. As expected, surgical specialists are overrepresented, and internists underrepresented, in the "all" group, but there are also more general practitioners. Because they include relatively more GPs, swing physicians choosing the "all" option are less likely to be board-certified and somewhat less likely to be foreign trained. Most noteworthy, they tend to be older (36 percent are 60 years and over vs. 24 percent) and to be located in non-metropolitan areas (31 percent vs. 25 percent). Again, these may be specialty effects, at least in part. We will be able to test this directly in the econometric analysis.

Theory predicts that swing physicians with larger assigned caseloads are more likely to be on the

TABLE 7

**Collection of Medicare Copayments
(percent distribution)¹**

	All		None	
	Case-by-Case	100%	Case-by-Case	100%
Deductible				
Never Collect	40.8%	45.0%	40.5%	35.9%
Sometimes Collect	22.4	13.1	15.9	15.4
Always Collect	36.8	41.9	43.6	48.7
Coinsurance				
Never Collect	37.8	36.2	45.5	33.9
Sometimes Collect	21.8	10.2	11.9	5.1
Always Collect	40.4	53.6	42.6	61.0

¹Columns sum to 100 percent within each type of copayment.

TABLE 8

**Characteristics and Medicare Workloads of
Swing Group Physicians**

	All	None
Specialty (%)¹		
General Practice	43.5%	39.3%
General Surgery	23.2	16.9
Obstetrics-Gynecology	12.9	8.9
Internal Medicine	20.4	34.8
Board-Certification (%)	36.8	41.5
Foreign Medical Graduate (%)	10.3	12.0
60 years and Older (%)	36.4	23.6
Practices in Non-SMSA (%)	31.1	25.1
Medicare Assignment Rate (%)	41.5	22.9
Assigned Visits	23.4	11.5
Total Medicare Visits	54.9	49.7

¹Specialty distribution percentages sum to 100 percent by column.

downward-sloping portion of their assigned MR curves and hence to choose the "all" option. Table 8 bears this out: assignment rates and assigned case-loads in the "all" group are almost double those for the "none" group. This is true even though total Medicare output is only slightly higher for physicians selecting the "all" option. They provide 55 visits per week to Medicare patients on average, compared with 50 for physicians choosing the "none" option.

It might appear that the net gain in assigned visits would be considerable from the swing group physicians under an all or nothing requirement. The "all" group would more than double its average assigned caseload (from 23.4 to 54.9 assigned visits for a net gain of 31.5 visits), while the "none" group would

give up only 11.5 assigned visits. These figures are deceiving, however, because physicians opting for no assignment constitute the vast majority of all swing group physicians. We examine this in detail later when we simulate the impact of an all or nothing requirement on assignment rates and assigned workloads for all physicians.

Econometric Analysis of the All or Nothing Decision

Empirical Specification

A structural equation for the all or nothing requirement under Medicare can be specified as follows:

$$A/N = f(AR; MPC; BSF; CRR; CC; Y; INSUR; MDCRED; MDAGE; PRACC; MDPOP; POLIT)$$

- where
- A/N = all or nothing decision;
 - AR = physician's assignment rate;
 - MPC = Medicare prevailing charge;
 - BSF = Blue Shield fee;
 - CRR = carrier rate of reduction;
 - CC = collection costs;
 - Y = per capita income;
 - INSUR = health insurance coverage;
 - MDCRED = vector of physician credentials;
 - MDAGE = physician age;
 - PRACC = physician practice costs;
 - MDPOP = physician-population ratio;
 - POLIT = physician political attitudes.

Variable definitions and means are presented in Table 9. All monetary variables are adjusted for geographic cost-of-living differences (IOM, 1976).

TABLE 9

Variable Means and Definitions—All or Nothing Analysis

Variable	Definition	Mean
A/N	whether the physician chooses to accept all patients on assignment (A/N = 1) or none (A/N = 0)	0.31
AR	assignment rate (percent of all claims accepted on assignment)	35.35
MPC	Medicare prevailing charge for a follow-up office visit	10.45
BSF	Blue Shield fee for follow-up office visit	8.62
CRR	carrier rate of reduction	0.73
PTCOLL	physician is able to collect more than 95% of patient billings	0.19
DENY	proportion of all assigned claims that are denied	0.06
INVEST	proportion of all assigned claims that are investigated	0.07
CLAIMSP	State Medicaid program has fiscal agent for claims processing	0.56
Y	per capita income (in thousands)	5.35
OVER65	proportion of persons aged 65 and over	0.10
SSI	SSI recipients as proportion of all elderly	0.24
GS	physician is general surgeon	0.19
OB	physician is obstetrician-gynecologist	0.15
IM	physician is internist	0.25
BOARD	physician is board-certified	0.38
FMG	foreign medical graduate	0.12
FAC	physician is medical school faculty member	0.10
MDAGE	physician's age	52.80
MDAGESQ	physician's age squared	2894.75
PRACY	physician has nonpractice income of \$10,000 +	0.14
RESTRICT	physician has restricted his practice for health reasons	0.13
WAGE	wage rate for nonphysician personnel	3.75
MDPOP	physician-population ratio	1.21

Dependent Variable: The dependent variable is specified as a dichotomous variable (A/N) in which "one" signifies that the physician chooses the "all" option, and "zero," the "none" option.

Independent Variables—Assignment Rates: The physician's assignment rate (AR) is the percentage of Medicare patients' bills taken on assignment. Higher assignment rates increase the probability that the physician will elect to take all patients on assignment. AR is an endogenous recursive variable, as it is determined by the other demand and supply variables (D,S) in the equation below.



We include these other variables in order to measure their marginal contribution to the all or nothing decision, above and beyond their influence on the assignment rate itself. In order to better assess the indirect impact of certain variables, such as Medicare fees, we will also estimate an assignment rate equation. This equation specification is virtually identical to the all or nothing equation, but with AR now on the left-hand side.

Fee Schedules: Two variables are included to measure the influence of relative fee schedules: the Medicare prevailing charge for a follow-up office visit (MPC) and Blue Shield's maximum allowed payment for the same procedure (BSF).⁷ The Medicare prevailing charge is defined for the physician's reasonable charge locality and was obtained from the 1976 *Medicare Directory of Prevailing Charges*. The Blue Shield fee was constructed from physician self-reported survey data and is defined for the physician's Blue Shield plan area. Because these responses may reflect an area's specialty mix, individual physician responses were weighted by national proportions of physicians in each of the four specialties. The "all" decision is hypothesized to be positively related with the Medicare prevailing charge, and negatively with the Blue Shield fee schedule.

⁷As seen in Table 9, the Medicare prevailing charge is higher than the Blue Shield fee, rather than smaller as expected. In part, this may be because prevailing charges were obtained from secondary data and the Blue Shield fees from physician self-reports. In addition, the prevailing charge is the *maximum* allowed charge and thus may exceed the average allowed charge under Medicare.

Some physicians are reimbursed at less than the prevailing charge (if their customary charge, as determined by Medicare, is lower), and in these instances MPC will not capture the relative generosity of Medicare carriers. In order to capture this, we also included the carrier rate of reduction (CRR), that is, the percent of times the Medicare payment is lower than the physicians' charge. This variable, although defined for a fairly large area (carrier-wide), does provide a partial measure of the physicians' net fee. The higher the carrier rate of reduction, the less likely the physician will choose the "all" option.

Collection Costs: Three kinds of collection costs are included: costs associated with collecting payment from the patient, from the Medicare carrier, and (in the case of joint eligibles) from the State Medicaid agency. Though we do not have a measure of the actual cost associated with collecting from patients (g , in our theory), we do have a measure of $k(g,P)$, the physician's collection ratio. Each physician was asked what percentage of patient billings he collected during the preceding year: 96-100 percent, 90-95, 80-89, or less than 80 percent. We specified PTCOLL as a dummy variable set equal to one if physicians were able to collect more than 95 percent of billings, and zero otherwise. Where collection rates are lower, thus reducing net fees, physicians are hypothesized to be more willing to choose the "all" option.

Two measures of the administrative burden associated with Medicare assignment were available by Part B carriers for assigned claims in 1976: (1) claims investigation rates (INVEST); and (2) denial rates (DENY). Physicians are hypothesized to be more willing to select the "all" option when these costs are lower, other things being equal.

Additional collection costs may be incurred for joint Medicare-Medicaid beneficiaries, because the physician must bill the State Medicaid program for the deductible and coinsurance. In States where the Medicaid program has an outside fiscal agent responsible for claims processing (CLAIMSP), payment delays will be shorter, encouraging the physician to treat joint patients and to bill for the coinsurance. In these instances, the physician's mandatory assigned caseload will be larger and he will be more willing to choose the "all" option. CLAIMSP is hypothesized to be positively related to the "all" decision.

Ability to Pay: Two variables measure ability to pay: income and health insurance coverage. Income (Y) is defined as per capita income in the physician's county and is hypothesized to shift the fee-setting demand curve outwards, thus discouraging the choice of 100 percent assignment.

Both Medicare and Medicaid provide health insurance coverage for the elderly. Medicare coverage is defined as the proportion of persons age 65 years and over in the physician's county (OVER65), and raises demand for both assigned and nonassigned services. The net effect on the probability of choosing the "all" option is clearly negative. In communities with a disproportionately larger elderly population, the downward sloping portion of the demand curve shifts outward, allowing the physician to draw upon a larger pool of nonassigned patients before entering the assignment market. The horizontal (assigned) portion of the curve also lengthens, putting off the point where patients are no longer willing to pay the full coinsurance.

The physician is hypothesized to be more willing to choose the "all" option in those areas where he faces a larger pool of joint Medicare-Medicaid beneficiaries. No data on Medicaid enrollments for the elderly are published below the State level, but data on the percentage of the elderly population receiving Supplemental Security Income (SSI) payments (and who are categorically eligible for Medicaid) are available by county from the *City and County Data Book*. The SSI variable is defined as the ratio of SSI recipients to all elderly.

Physician Credentials: Four variables measuring the physician's credentials will influence the "all" decision: specialty, board-certification, foreign medical graduate status, and whether he is a faculty member of a medical school. Specialists face a higher demand for their services in the fee-setting market, and are less likely to take all patients on assignment than are general practitioners. Offsetting this demand effect is a collection effect, that is, the apparent willingness of physicians with large bills to take assignment in order to guarantee payment. We know from previous work, however, that the latter effect dominates. Thus, internists (IM) are hypothesized to be less willing than GPs to choose the "all" option, and general surgeons (GS) and obstetrician-gynecologists (OB) are hypothesized to be more willing.

Board-certified physicians, U.S. medical school graduates, and medical school faculty are generally considered to be of higher technical quality, and hence face a greater private demand for their services. As a result, they are hypothesized to be less likely to choose the "all" option. (Offsetting this demand effect for medical school faculty, however, is the greater likelihood of their practicing part-time in hospital outpatient departments (OPDs). Because assignment is mandatory in these instances, faculty may choose to take all patients on assignment.) The variables BOARD, FMG, and FAC all assume the value one if the physician is board-certified, if he is an FMG, or if he is a member of a medical school faculty.

Physician Age: More experienced physicians may be less willing to choose 100 percent assignment, because of their higher implicit wage. As physicians age, however, demand for their services may fall in the private market. In this instance, the probability of an "all" choice will be higher. Because we expect the relationship to be U-shaped, physician age will be specified both in linear and squared form. If the wage effect dominates through late middle-age with the demand effect becoming more important in later years, we would expect the MDAGE and MDAGESQ variables to be negative and positive, respectively.

Practice Costs: Practice costs include the cost of the physician's time and the wage rate for nonphysician personnel. Physicians with non-practice incomes over \$10,000 (PRACY), and physicians who report that health problems have restricted their practice (RESTRICT) are hypothesized to value their leisure time more highly, and thus be less willing to take all their Medicare claims on assignment.

When wage levels are high, physicians will be less willing to take the "all" option. The WAGE variable is defined as a county index of hourly wage rates of nonphysician personnel.

Physician-Population Ratio: The MDPOP variable is defined as the number of office-based physicians per 1,000 county population. As this ratio rises, competition among physicians for private patients increases and private demand shifts in, encouraging assignment. Thus, MDPOP is hypothesized to be positively related to the "all" decision. A negative (or zero) coefficient, however, could be interpreted as evidence that physicians can protect their workloads by inducing demand for non-assigned services.

Political Attitudes: In order to examine noneconomic factors that may influence the all or nothing decision, we included two variables measuring physician political attitudes: whether the physician strongly agreed or strongly disagreed with the statement that "it is the responsibility of society, through its government, to provide everyone with the best available medical care, whether he can afford it or not". Because regional sample physicians were not asked the political attitude questions, the regression equations were estimated for the national sample alone. Neither attitudinal variable was significant in the all or nothing equation, and are not presented.

Estimation Methods

With a qualitative, zero-one, dependent variable (none = 0, all = 1), ordinary least squares (OLS) are inefficient because of the concentration of values at the two extremes. Multivariate probit analysis is preferred because it constrains the predicted values of the dependent variable to the unit (0,1) interval (Goldberger, 1964). In the probit model, the conditional expectation is given by

$$E(y_i/\hat{l}_i) = \text{Prob}(y_i = 1/\hat{l}_i) = F(\hat{l}_i),$$

where y_i = zero or one, depending on whether the physician chooses all or none

\hat{l}_i = predicted value of index ($\sum \beta_i X_i$)

$F(\cdot)$ = cumulative normal distribution

The conditional probability of the physician choosing the "all" option (that is $y_i = 1$) can be determined by looking up values of l_i in a cumulative normal distribution table.

We also want to estimate an assignment rate equation, in order to better see the *indirect* effect of certain demand and supply variables on the all or nothing decision (via AR). From descriptive results presented earlier, we know that AR is not normally distributed but shows concentrations at upper and lower bounds, that is, some physicians take all patients on assignment (AR = 100) and some take none (AR = 0). In this instance, the two-limit probit (2LP) is generally the preferred technique (Rosett and Nelson, 1975). However, because two-limit probit is a costly computation technique and because the AR equation is of secondary importance for this analysis, we have chosen to estimate it using OLS. Furthermore, in assignment work conducted earlier, 2LP results did not vary substantially from those done with OLS (Mitchell and Cromwell, 1982).

Econometric Results

Three regression equations are shown in Table 10. Equation (3) presents OLS estimates of the percent of Medicare patients taken on assignment, and eq. (5) explains the all or nothing decision using probit analysis. The OLS regression results (eq. 4) are included for comparative purposes with the probit equation; where there are differences, greater reliance should be placed on the probit results. By comparing eqs. (3) and (5), we can see that some variables, while highly significant predictors of assignment rates, have no marginal impact on the all or nothing decision, when AR is held constant. Because assignment levels are the single most important determinant of the all or none choice, these variables (for example the Medicare prevailing, physician specialty, etc.) do exert an indirect effect.

These indirect effects are shown more clearly in Table 11; they were calculated by substituting eq. (3) into eq. (5). Partial elasticities represent the direct short-run impact of the independent variable on the all or nothing decision (eq. 5). Total elasticities capture both direct and indirect impacts. Marginal effects, rather than elasticities, were calculated for discrete, dummy variables; they simply give the absolute change in the probability of an "all" decision associated with positive values of the discrete independent variable. Thus, being an FMG lowers the

TABLE 10
Regression Results for All or Nothing Analysis

Independent Variable	Dependent Variable		
	AR	A/N	A/N
	OLS (3)	OLS (4)	Probit (5)
AR	—	0.61***	0.02***
MPC	2.63***	-0.01	-0.01
BSF	-0.55	0.01	-0.003
CRR	-141.36***	-0.38*	-1.92*
PTCOLL	-11.23***	-0.07**	-0.37**
DENY	-23.94	-0.20	0.14
INVEST	-181.42***	0.30	2.51
CLAIMSP	2.70	0.01	-0.0002
Y	-5.93***	0.005	-0.001
OVER65	-323.06***	-0.79	0.04
SSI	19.71**	0.27**	1.54**
GS	10.17***	0.04	0.14
OB	10.16***	0.02	0.08
IM	-7.45**	-0.03	-0.14
BOARD	1.43	-0.02	0.01
FMG	9.42***	-0.07**	-0.40**
FAC	-0.99	0.01	-0.003
MDAGE	-1.41*	-0.01	-0.0005
MDAGESQ	0.02**	0.0001	0.00001
PRACY	-8.54***	0.05*	0.14
RESTRICT	-10.63***	0.01	0.005
WAGE	-10.12***	-0.13***	-0.59***
MDPOP	-1.43	-0.01	-0.05
CONSTANT	257.44	1.01**	2.07
	R ² (c) = 0.18	R ² (c) = 0.34	
	F(22,1698) = 18.2***	F(23,1601) = 36.7***	

***Significant at 1-percent level.

**Significant at 5-percent level.

*Significant at 10-percent level.

probability by 6.79 percentage points, other things being equal, relative to U.S. medical graduates (around a mean of 31 percent).

As expected, assignment rates have a powerful impact on the all or nothing decision. Physicians who have higher assigned caseloads to start with are significantly more likely to choose the "all" option. The estimated elasticity associated with the AR variable is 0.80, suggesting that the physician's decision is highly responsive to his current participation in the Medicare market. Physicians who accept one-half of their patients on assignment are twice as likely to choose the "all" option as are physicians who take only one out of five patients on assignment.

Relative fee schedules do not appear to directly influence the all or nothing decision; both the MPC and BSF variables are insignificant. Higher Medicare prevailing charges do indirectly encourage physicians to choose the "all" option, however, by raising assignment rates. The estimated total elasticity im-

plies that a 10-percent increase in the Medicare prevailing charge will increase the probability of a physician choosing the "all" option by 6 percent.

The Medicare prevailing charge is only a partial measure of carrier generosity; the physician's net fee is also determined by how frequently the allowed charge is less than his usual charge, or the carrier rate of reduction. Physician willingness to choose the "all" option appears to be highly sensitive to this rate; the CRR variable is negative and quite elastic, -1.63. The probability of physicians choosing "all" in areas with a carrier rate of reduction one standard deviation (S.D.) above the mean (CRR=0.79) is 23 percent lower than in areas where the carrier rate of reduction is one S.D. below the mean (0.68). This is the *direct* impact only; high carrier rates of reduction further lower the probability of physicians selecting the "all" option by depressing assignment rates in the first instance (see eq. 3). As seen in Table 11, the total impact is quite large: -3.61.

TABLE 11

Impact of Selected Explanatory Variables on the All or Nothing Decision

Independent Variable	Indirect Effect	Direct Effect	Total Effect	Partial Elasticity	Total Elasticity
AR	—	0.02	0.02	0.80	0.80
MPC	0.05	- 0.01 ¹	0.04	- 0.10	0.60
CRR	- 2.83	- 1.92	- 4.75	- 1.63	- 3.61
PTCOLL	- 0.22	- 0.37	- 0.59	- 11.52 ²	- 16.78 ²
INVEST	- 3.63	2.51 ¹	- 1.12	0.21	- 0.09
SSI	0.39	1.54	1.93	0.40	0.57
FMG	0.19	- 0.40	- 0.21	- 12.03 ²	- 6.79 ²
WAGE	- 0.20	- 0.59	- 0.79	- 2.47	- 3.24

¹This effect was not significant.

²Actually a marginal effect, rather than an elasticity.

Theory predicts that positive patient collection costs will increase the likelihood of choosing the "all" option, not only by encouraging assignment but also by lowering the physician's net price (through an inward shift in his demand and marginal revenue curves). The regression results bear this out; even holding AR constant, high collection ratios (implying low patient collection costs) lower the physician's willingness to select the "all" option. The estimated marginal effect for PTCOLL implies that the probability of an "all" choice is about 11.5 percentage points lower for physicians who are able to collect more than 95 percent of their billings than for physicians with lower collection ratios. This probability is lowered even further when the long run effect (through assignment levels) is included: almost 17 percentage points in all. Three other collection costs variables also had been included but were not significant in eq. (5): the financial burden associated with Medicare assignment (DENY, INVEST), and with Medicaid (CLAIMSP). Higher claims investigation rates do depress assignment levels, however, thus exerting an indirect (negative) effect on the all or nothing decision, but the associated elasticity for the INVEST variable is quite low.

As expected, physicians are significantly more likely to take assignment *and* to choose the "all" option when the pool of joint Medicare-Medicaid patients is larger. Here, the all or none choice has a somewhat different meaning: Accept assignment or lose the privilege of any Medicaid reimbursement for jointly eligible patients. A 10-percent increase in the Medicaid-eligible elderly population (SSI) raises the probability of an "all" choice by 4 percent (around a mean of 31 percent). This impact increases by half, to 6 percent, when the indirect effect of SSI on assignment rates is included.

The other two community demand variables were insignificant in the all or nothing equation, but had the expected impact on assignment rates. Higher incomes (Y) and larger Medicare populations (OVER65) exert a net depressing effect on assignment

levels (through outward shifts in demand), and thereby indirectly reduce the likelihood of an "all" choice.

Four variables were included to measure physician credentials: specialty, board-certification, faculty status, and medical training. None of the specialty variables were significant predictors of the all or nothing decision. All of their impact comes through assignment levels. As expected, foreign medical graduates are more likely to accept assignment (eq. 3), but surprisingly are less likely to choose the "all" option, once assignment levels are held constant (eq. 5). The *net* estimated marginal effect for the FMG variable is still negative, but somewhat smaller, when both direct and indirect impacts are included (6.8 versus 12.0 percentage points). The remaining credential variables (BOARD, FAC) were not significant.

It had been hypothesized that where practice costs (including the cost of the physician's own time) were higher, physicians would be less willing to treat low marginal revenue (for example, assigned) patients. In fact, physicians with higher time-prices are no less likely to choose the "all" option, the impact of time-price variables (MDAGE, MDAGESQ, PRACY, RESTRICT) coming indirectly through assignment rates. Younger physicians, physicians with large non-practice incomes, and those with health problems all have lower assignment rates, as predicted. High wage levels for nonphysician personnel not only depress assignment levels (eq. 3), but also have a direct effect on the all or nothing decision (eq. 5). The WAGE variable is negative and highly elastic, - 3.24 overall.

Finally, the physician-population ratio appears to have no impact on the all or none decision, either directly or indirectly through assignment rates. As increased competition for private patients was hypothesized to encourage assignment, the zero MDPOP coefficients could be interpreted as evidence that physicians are able to protect their non-assigned workloads through inducement.

Simulation Analysis of the All or Nothing Decision

Simulation Methods

In the preceding sections, we have described the characteristics of physicians choosing the "all" versus "none" options and analyzed the factors influencing their decision. Although we know that the majority of physicians would take none of their Medicare patients on assignment if forced to choose, we have not estimated the impact of this decision. Access to assigned services will depend not only on the physician's choice but also on his current Medicare caseload. If, for example, physicians choosing the "all" option have higher Medicare caseloads to start with, the net effect of an all or nothing requirement on total assigned visits may be positive. Because of data limitations, we must assume that the physician's Medicare caseload remains constant, regardless of which option he selects.

Using physician responses to the all-or-nothing decision, we can simulate the impact of such a requirement on the average assignment rates in the United States and the total number of Medicare assigned visits.⁸ Let

$$(6) AR_i = MED_{ai}/MED_i$$

be the assignment rate for the *i*-th sample physician, where AR_i = assignment rate, MED_{ai} = Medicare assigned patients, and MED_i = total Medicare visits, assigned or otherwise. The assignment rate for the U.S. can be written as a weighted average of the assignment rates for each physician, that is,

$$(7) AR_{US} = \frac{\sum MED_i}{MED_{US}} \cdot AR_i = \frac{\sum MED_{ai}}{MED_{US}}$$

Assuming the *i*-th physician's share of total Medicare patients in the U.S. is unaffected by his all or none decision (that is, $MED_i/MED_{US} = K$), changes in the U.S. assignment rate can be simulated by plugging in responses to the all-or-nothing question into eq. (7). Similarly, changes in the aggregate supply of assigned visits can be derived using $\sum MED_{ai}$ in eq. (7).

⁸Total visits are the sum of six visit categories included in the survey: office visits, inpatient visits, operations, emergency room and clinic visits, nursing home visits, and house calls.

Simulation Results

The average assignment rate in our sample of physicians was 34.9 percent.⁹ Substituting in the all or nothing responses, we obtain a new assignment rate of 31.5 percent. Thus, the introduction of an all or nothing requirement does result in a net decline in assignment rates, but the reduction is fairly modest, -9.7 percent. From this estimate alone, however, we cannot determine the extent to which access to assigned services would actually be constrained, or whether certain types of services or parts of the country would be affected more than others.

Determining the change in the supply of assigned visits is similar to that done for assignment rates. For policy purposes, however, we are interested in knowing which group of physicians is primarily responsible for any change in assigned visits. Table 12 presents total Medicare caseloads, and assigned caseloads before and after the all or nothing decision for six physician groups. These groups are defined by: (1) whether the physician currently never, sometimes, or always takes assignment, and (2) whether he chooses the "all" or "none" option. Groups 2 and 5 correspond to the two swing groups described earlier: physicians who accept assignment on a case-by-case basis but who now must choose one or the other. Table 12 also presents the total weekly supply of assigned visits for physicians in our sample, before and after the all or nothing choice. The final column provides the gain (or loss) in aggregate supply after the all or none decision for each physician group.

Based on these findings, the total weekly supply of assigned visits would fall by 1,333 visits or 5.8 percent. If we inflate our sample to physicians nationally and multiply by average weeks worked, this implies an annual loss of 5.4 million assigned visits.¹⁰ Though a reduction in assigned visits of almost 6 percent may seem fairly small, the absolute number of visits (and patients) affected is quite large. For every previously assigned visit a physician now declines to accept, the out-of-pocket liability to the patient is increased by some (indeterminate) amount.

Earlier, we had suggested that the net change in assigned caseloads would be determined largely by swing group physicians; the remaining physicians

⁹This assignment rate is considerably lower than the 50 percent rate nationwide reported by HCFA (Ferry *et al.*, 1980). This is primarily because of the fact that our assignment measure is unweighted by physician charges. We know, for example, that physicians with higher average charges per beneficiary (such as surgeons) are more likely to accept assignment.

¹⁰In 1975, the elderly made 68.7 million office visits to the four specialties included in our sample (NCHS, 1978b). The vast majority of these visits were undoubtedly covered by Medicare.

TABLE 12

Impact of All or Nothing Decision on Assigned Visits Per Week: Simulation Results

Prior Assignment Status	Choice	Group	Σ Weights	Old Assigned Caseload/MD	Total Medicare Caseload/MD	New Assigned Caseload/MD	Σ Old Assigned Caseloads	Σ New Assigned Caseloads	Gain (loss)
Never	} All	1	19.4	0.0	40.0	40.0	0	776	776
Sometimes		2	184.5	23.4	54.9	54.9	4,313	10,131	5,818
Always		3	218.5	49.7	49.7	49.7	10,866	10,866	no Δ
.....									
Never	} None	4	336.4	0.0	42.0	0.0	0	0	no Δ
Sometimes		5	498.2	11.5	49.7	0.0	5,738	0	(5,738)
Always		6	63.5	34.5	34.5	0.0	2,189	0	(2,189)
Total			1320.5	—	—	—	23,106	21,773	(1,333)

who always or never took assignment were hypothesized to choose the "all" and "none" options, respectively. In fact, the gain in assigned visits yielded by swing group physicians choosing the "all" option (group 2) is almost perfectly offset by the loss in assigned visits occasioned by those choosing "none" (group 5). Although there are more than twice as many physicians in group 5 as in group 2, the smaller assigned caseloads in group 5 soften the impact of the "none" decision. It is group 6 that is primarily responsible for the net decline in assigned visits: the theoretically anomalous group of physicians who had accepted all of their patients on assignment but stated they would not take any if forced to choose. This group, although only 4.8 percent of the sample, provided 9.5 of the assigned visits before the all or none choice. Compared with those in group 3, these physicians are more likely to be surgeons, to be board-certified, and to be foreign-trained. Attitudinal differences are particularly marked; physicians in group 6 are twice as likely to strongly disagree that medical care is a right, 40 percent compared with 23 percent of physicians in group 3.

We know that surgical specialists are more likely to choose the "all" option, largely as a result of their higher assignment rates. Does this mean that access to surgical services will be enhanced relative to medical services for assigned patients? Table 13 suggests not. Assignment rates fall for all specialties following the introduction of an "all or nothing" requirement, but much less so for general practitioners; absolute levels remain high (as expected) for general surgeons and OB-GYNs. Changes in assigned caseloads, on the other hand, show a surprisingly wide range. The mean supply of assigned visits actually increases 11.3 percent for general practitioners, and decreases for all other specialties. It thus becomes readily apparent that, if not for this positive response by GPs, the total reduction in assigned visits would be much larger than the 5.8 percent shown in Table 12.

Will an all or nothing requirement restrict access to assigned services in some parts of the country more than others? Table 14 presents assignment rates and assigned caseloads by census region and urban/rural location. With the exception of the North Central region where almost all rural physicians chose the "none" option, rural areas generally show smaller reductions in the supply of assigned visits, and nationwide have a modest increase, 3.4 percent. Western physicians in both urban and rural areas exhibit a phenomenal increase in assigned visits, 44.7 percent more than in the absence of an all or nothing requirement. This percent change is somewhat misleading, however, as it is due in large part to their already low assigned caseloads. Western physicians would still average fewer assigned visits per week than physicians in other regions.

Conclusions and Policy Implications

In an effort to raise assignment rates, some policymakers have considered introducing an "all or nothing" assignment requirement to the Medicare program. The case-by-case option would be dropped, and physicians would have to decide whether to accept all of their Medicare patients on assignment, or none of them. Others have been concerned, however, that physicians might desert the program in droves, leaving only less-qualified practitioners to treat patients on assignment.

Over two-thirds of physicians surveyed in fact responded that they would take none of their patients on assignment if forced to choose. While a two-tiered system of medical care would not necessarily emerge, our simulations show that introducing an all or nothing requirement would actually have the opposite effect from what was intended: assignment rates nationwide would fall almost 10 percent. The total supply of *assigned visits* would also decline, by almost 6 percent. While this percent reduction may seem fairly small, the absolute number of visits (and patients) affected is quite large: approximately 5.4 million assigned visits would be lost per year. For every previously assigned visit the physician would now decline to accept, the out-of-pocket liability to the patient would increase by some (indeterminate) amount.

The single most important factor influencing the "all or none" decision was the physician's current assignment rate. The higher the physician's assigned caseload, the more likely he was to choose the "all" option. Thus, policy levers encouraging assignment, such as higher Medicare fees and lower rates of reduction, would also lead more physicians to choose the "all" option. It does not appear that two levels of medical care would be created as has happened in the Medicaid program because there were no differences in credentials between physicians choosing either the "all" or the "none" options. Nevertheless, access to some specialist services may be limited for assigned patients; only one of five internists stated he would take all patients on assignment compared with two out of five general surgeons and OB-GYNs. This is of particular concern because internists are a major source of care for Medicare patients, second only to GPs.

For policy purposes, we also want to know whether certain types of services or parts of the country would be affected more than others. The mean supply of assigned visits actually would increase 11 percent for general practitioners, and decrease 12-25 percent for all other specialties. Thus, access to specialized medical and surgical services would be reduced considerably for patients seeking physicians who will accept assignment. In part because of such differences in specialty mix, assigned patients in non-

TABLE 13
Simulation Results by Specialty

Specialty	Old Assignment Rate (%)	New Assignment Rate (%)	Percent Change	Old Assigned Caseload/MD ¹	New Assigned Caseload/MD ¹	Percent Change
General Practice	32.5	31.3	- 3.7	17.7	19.7	+ 11.3
General Surgery	46.1	40.9	- 11.3	26.2	22.5	- 14.1
Internal Medicine	23.9	20.4	- 14.6	14.8	13.0	- 12.2
OB-GYN	45.3	38.8	- 14.3	8.5	6.4	- 24.7
All	34.9	31.5	- 9.7	17.5	16.5	- 5.8

¹Visits per week.

TABLE 14
Simulation Results by Geographic Location

Location	Old Assignment Rate (%)	New Assignment Rate (%)	Percent Change	Old Assigned Caseload/MD ¹	New Assigned Caseload/MD ¹	Percent Change
North East	47.1	39.1	- 17.0	20.0	17.5	- 12.5
Urban	47.2	38.5	- 18.4	19.8	17.1	- 13.6
Rural	46.5	42.9	- 7.7	21.3	20.3	- 4.7
North Central	30.5	27.3	- 10.5	13.5	13.1	- 3.0
Urban	32.2	29.5	- 8.4	14.1	14.3	+ 1.4
Rural	13.6	5.0	- 63.2	4.0	0.4	- 90.0
South	33.5	27.4	- 18.2	22.1	19.8	- 10.4
Urban	19.3	13.0	- 32.6	8.9	4.3	- 51.7
Rural	47.4	41.2	- 13.1	34.8	34.6	- 0.6
West	23.9	32.0	+ 33.9	7.6	11.0	+ 44.7
Urban	27.5	30.2	+ 9.8	8.6	10.2	+ 18.6
Rural	7.6	40.0	+ 426.3	3.0	14.8	+ 79.7
All Urban	33.0	29.1	- 11.8	13.8	12.2	- 11.6
All Rural	39.3	38.4	- 2.3	26.2	27.1	+ 3.4

¹Visits per week.

metropolitan areas and in the West would be better off, because the supply of assigned visits in these areas would increase following the introduction of an "all or nothing" requirement.

Based on our simulations, dropping the case-by-case option of Medicare assignment would not achieve the desired policy results. So long as non-assigned elderly demand remains buoyed up by continued government payment (albeit indirect), the majority of physicians will eschew the "all" option. An alternative, and more rigorous version of the "all of nothing" requirement could take advantage of the government's monopsonistic purchasing power to induce more physicians to accept assignment. In this Medicaid-type option, the physician would have to take assignment or forego any government reimbursement for his services, either directly or indirectly, because patients would not be able to collect directly

from Medicare. Probably few physicians would be able to afford to give up the Medicare subsidy totally, despite threatening defection from the program.

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