

Pricing strategies for capitated delivery systems

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This article discusses alternative methods for establishing a fairer pricing mechanism for Medicare recipients who enroll in health maintenance organizations and other competitive medical plans. The current method, based upon the adjusted average per capita cost, is inadequate because it fails to adjust

premium levels for differences in health status; it establishes undesirable incentives that may lead to underservice, and it is tied to costs in the fee-for-service system. Alternative methods would incorporate health status, have Medicare share the risk with HMO's, and base payment on HMO experience.

Introduction

With the implementation of the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA), opportunity for membership in a health maintenance organization (HMO) or other competitive medical plan (CMP) will become increasingly available to most people who are 65 years of age or over.¹ Given the growing emphasis on prospective payment systems such as capitation and diagnostic-related groups (DRG's), the task of setting prices for units of medical service is a critical one.

Although price setting may be useful to the Medicare program as a means of controlling increases in medical care costs, it places a burden on the reimbursement system. Payments to providers must be equitably distributed and appropriate and sufficient provider incentives established. HMO capitation payments must be priced fairly so as to give medical plans adequate resource levels to cover reasonable costs, but to prevent unnecessary overpayment.

In these respects, the current reimbursement system is not working well. Evidence to date indicates that the Medicare program stands to lose considerable amounts of money because, unlike hospitals under the DRG payment system, HMO's must volunteer to participate under TEFRA. HMO's that would not be better off by participating may decline or withdraw, leaving the Government to bear the risk of loss.

In the payment mechanism established under TEFRA, the Health Care Financing Administration (HCFA) seems to have found an effective incentive for widespread HMO participation. By the middle of 1986, 1 1/2 years after the regulations were issued, about 40 percent of the 480 HMO's in the country had signed or applied for Medicare risk contracts (HCFA, 1986). Being a new program, however, total penetration of HMO's into the Medicare market was still low, with about 667 thousand (between 2 and 3 percent) of the elderly enrolled in risk contracts. These numbers serve to emphasize that growth in the near future may be rapid; there is now an opportunity

to study some alternative pricing strategies that may help the Medicare program benefit from utilizing capitated delivery systems.

Use patterns in an elderly population

In pricing HMO capitation payments for Medicare enrollees, it is important to confront some prominent characteristics of medical care use among the elderly. The well-known fact that, on average, medical care costs increase significantly with age does not, by itself, represent a particular problem for constructing a Medicare reimbursement system. However, the distribution of costs that accompany the aging process does have implications for price setting. Higher-than-average costs for the elderly result, primarily, from a relatively large number of people with high-cost illnesses rather than from an overall increase in the costs of a typical Medicare beneficiary.

There are three major contributions to the relatively high prevalence of high-cost individuals among the elderly. The first has to do with the natural fact that mortality rates are relatively high among the elderly, and that, on average, the elderly have extremely high medical care costs during the last year of life. Lubitz and Prihoda (1984) found that, in 1978, the 5.9 percent of the elderly Medicare population who died accounted for 28 percent of total Medicare expenditures.

The second contribution relates specifically to the prominence of chronic illness and repeated hospitalizations. Anderson and Steinberg (1984) found that a majority of Medicare hospital costs were associated with repeated hospitalizations over an extended period of time. In fact, they showed that during the period 1974-77, one-eighth of Medicare beneficiaries were hospitalized three or more times, accounting for 60 percent of Medicare's hospital expenditures during that 4-year period.

A third contribution is the association of high medical costs with functional impairments. Gruenberg and Tompkins (1985b) found that two out of five Medicare recipients who were hospitalized at least three times during a 3-year period (1975, 1976, and 1977) had some limitations in mobility, and nearly one-eighth were homebound. For many of these people, limitations in mobility are also likely to restrict their access to medical care.

¹CMP refers to an organization, other than a federally qualified HMO, that is approved to enroll Medicare beneficiaries under TEFRA. In this article, the term HMO will be used generally to refer to both HMO's and CMP's.

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Implications for pricing

The patterns previously described indicate that a substantial minority of the elderly population are near death, have some chronic illness leading to repeated hospitalizations, or have disabilities that restrict their mobility. The fact that such a large part of Medicare expenditures are spent in this way must be taken into account in designing an adequate pricing system. Payment levels should be modified to reflect enrollee health status, and some mechanism for reducing the risk to providers of caring for these very high-cost members needs to be introduced.

In order to have a major effect on Medicare's overall budget, it is necessary to have many Medicare recipients enroll in HMO's, including a significant proportion of the heavy users. But, under the current payment system, HMO's are better off financially if they exclude the heavy users. It would be better if HMO's were financially indifferent to individuals' health status or, perhaps, if payments for the chronically ill were relatively generous.

HMO's, for the most part, have had experience primarily with nonelderly populations, in which there are only very small proportions of frail and terminally ill people. With representative elderly groups, HMO's must carefully develop strategies for handling the frequent occurrences of expensive terminal and chronic cases. Budget constraints will pressure plans to limit services for these cases so that cash flow and service levels for the majority of members will not be threatened. It would be hazardous to allow any HMO's to face them with insufficient funds. Such cases could not only jeopardize the financial outlook of the HMO's, but could add to the chances for underservice to Medicare members.

Experiments with the social/health maintenance organization (S/HMO) concept have been favorable. The S/HMO received higher payments from Medicare for nursing-home certifiable members living in the community. This has enabled the elderly in poor health and with chronic limiting conditions to join prepaid managed plans that offer enhanced benefits.

Insurers in the private sector typically confront the threat of adverse selection by offering multiple coverage options (with differential premiums) and using experience-rating techniques that follow changes over time in the expected cost of large defined groups. But with Medicare, prices are set by directly including the experience of a larger (and different) population. Medicare may benefit from borrowing techniques proven effective in the private sector. However, the S/HMO and Federal Employee Health Benefits Program experiences suggest that, in a competitive environment, health plans with benefit packages that are specially designed to attract those in poor health may not be chosen by people at lower risk. People who are well are often interested in plans with more limited benefits and lower premiums.

These findings suggest that there may be limitations in what pricing alone can do to assure a balanced case-mix in HMO's serving the elderly. More

comprehensive initiatives (including wider attempts to inform consumers about their options), as well as some constraints on marketing, private premiums, and benefit design, may be necessary. Given the current Medicare reimbursement system, HMO's offering more limited benefits will win in the competition against plans designed especially to enroll a representative mix of elderly.

Medicare HMO reimbursement system

Description

The reimbursement system currently used by HCFA is based upon the adjusted average per capita cost (AAPCC) of Medicare recipients who remain in fee-for-service. The AAPCC is calculated by a multiplication of the following three factors: (1) a projected national per capita cost, (2) a county price adjustment, and (3) an enrollee-mix adjustment (Kunkell and Powell, 1981).²

HMO's choosing to enter into risk contracts with HCFA are paid capitation amounts based, in part, on both the AAPCC and an amount called the adjusted community rate (ACR). The ACR is an estimate of what an HMO would charge as a premium to provide its non-Medicare enrollees with the Medicare benefit package, adjusted to take into account the higher use experience of the elderly. HMO capitation payments from HCFA are limited to 95 percent of the combined Part A and Part B AAPCC's; however, any amount exceeding the ACR must be returned to HCFA or used either to subsidize Medicare enrollees' private premiums or to expand their benefits. Payments are in the form of full capitation, that is, a fixed payment for all services in the Medicare benefit package, and there are no arrangements for retrospective adjustments.

Problem of biased selection

Given the concentration of use among a minority of the population and the frequent occurrence of extended periods of high use, a primary concern has to be the potential for biased selection. Currently, HMO's receive capitation amounts based on the total elderly population, which includes a certain prevalence of high-cost individuals. The risk for HMO's and HCFA, therefore, has to do with the actual proportions that are enrolled.

A major shortcoming of the AAPCC formula has to do with its inability to adjust capitation levels for differences in health status among enrolled groups (Thomas et al., 1983). Variables now used to adjust for class differences are age, sex, welfare status, and institutional status.³ All but 1 percent of the variance

²The AAPCC is calculated separately for Medicare Parts A and B.

³Medicare entitlement status is also used to distinguish rates. End stage renal disease patients and nonelderly disabled each have separate AAPCC rate books, and these subpopulations are not dealt with explicitly here.

in Medicare costs is attributable to differences occurring within the risk cells (Gruenberg, 1982). Unlike the random variations in annual medical costs that may occur for an enrolled group, systematic bias in health status could lead to losses that are magnified as the size of the HMO increases.⁴ Furthermore, because the problem stems from differences in relative health status, it may persist for a number of years.

Studies by Eggers (1980), Eggers and Prihoda (1982), and Jackson-Beeck and Kleinman (1983), show that some pre-TEFRA Medicare HMO's have enrolled a population that was apparently healthier, on the basis of prior levels of medical care use, than their counterparts in fee-for-service. These results suggest that HMO's may be significantly overpaid under the existing AAPCC formula. Moreover, early results of a U.S. General Accounting Office (GAO) study (1986) indicate that favorable selection has continued in the post-TEFRA period.

It should be noted, however, that the findings of favorable selection were for group and staff model HMO's and that new enrollees were less likely than typical area residents to have a usual source of care. Further expansion of capitated plans into the Medicare program will probably include independent practice association (IPA) and network models that may tend to enroll their current patients because patients want to remain with their own physicians (Luft, 1982). This could result in favorable or unfavorable selection, depending on the health status of the patients. Alternatively, individuals may choose to not enroll based on advice given by their physicians (Berenson, 1986). This, too, could result in favorable or unfavorable selection.

Incentives to HMO participation

For better or worse, the financial incentives established by any reimbursement system will affect the behavior of providers, including their participation, marketing strategies, and service delivery. Therefore, a key aspect of any reimbursement system has to do with the types and strengths of incentives that arise.

One objective of the Medicare program, since its inception, has been to furnish beneficiaries with access to mainstream providers in the community. Broad HMO participation in Medicare would give patients more opportunity for choice, or, perhaps, in some circumstances improved access to care. The decisions by providers to participate will be contingent on a reasonable expectation of avoiding financial losses. Whereas much of the concern with the DRG system has to do with which hospitals will benefit and which will be harmed, with a voluntary capitation system it is HCFA that is at highest risk of losing.

Furthermore, the decision not to participate will be at cross-purposes with attempts to address major inadequacies in the delivery of health services to the

⁴The notion of losses to Medicare refers to paying more for enrollees because they have joined an HMO. Some of this HMO surplus must be used to directly benefit Medicare enrollees.

elderly (Besdine, Levkoff, and Wetle, 1984). The hiring of, or contracting with, experts and specialists in chronic and high-cost illnesses (who are best able to provide care to enrolled groups with higher than average costs) is unlikely to occur without an adequate adjustment for health status in the AAPCC formula. The participation of these experts and specialists could increase HMO risk by attracting more frail high-cost members.

This could contribute to individuals' uneven access to capitated systems. Administrative safeguards have been enacted as part of the TEFRA regulations to help prevent this, including open enrollment requirements and prohibitions against imposing explicit health status-screening enrollment criteria. Yet, discouragement of enrollment by individuals with higher than average expected cost may still occur through carefully designed marketing and benefit structures (Luft, 1982).

Another aspect of the current reimbursement system that may need modification is the fully prospective nature of the payments. Although it is believed that fee-for-service has been characterized by waste, it may be that full capitation will err in the opposite direction. Strong incentives to cut back on services (in part, because providers are being forced to bear the full marginal costs of treatment) may result in standards of care that are below what clinicians or economists would describe as optimal (Ellis and McGuire, 1986; Schlesinger, 1986). This may be especially true with even the prospect of revenue shortfalls. So far, HMO's have, for the most part, had to compete with fee-for-service providers, and there is no evidence to date that quality of care in HMO's is poorer. However, in an environment of increasing competition between HMO's, it is not clear how advisable it is to rely on systems that cause all treatment costs to have a direct impact on the provider organization's bottom line.

Fee-for-service price standard

Legislated guidelines expressed in TEFRA state that HMO's are to be paid according to what enrollees would have cost Medicare had they not chosen to join an HMO. Hence, in the AAPCC formula, fee-for-service data is used to estimate expected costs for individuals who enroll.

There are some important reasons why we have to move away from this fee-for-service standard. First, the evidence cited earlier concerning favorable selection indicates that HMO joiners do not represent the fee-for-service standard. Errors of this type would become more serious as HMO penetration increases; the costs of the elderly in fee-for-service compared with HMO's would continue to diverge, and this would tend to amplify the error in Medicare HMO premiums. Second, the county fee-for-service cost estimates will become less accurate and less stable, to varying degrees, with sizable HMO penetration rates (Beebe, 1982). Third, it would be desirable to abandon such a standard as a matter of policy when

the level of competition faced by Medicare HMO participants has been largely with other HMO's and not with fee-for-service providers. In some areas, such as Minneapolis, this may already be occurring. Biased selection is apt to vary in type and degree across counties and among differing types of prepaid plans, making a simple pricing rule, such as paying 95 percent of the AAPCC, uneven in its effect.

Refining the reimbursement system

Several alternatives have been developed and proposed that would improve the accuracy of cost projections or help to lessen the effects of errors. It is worthwhile exploring these options because they could potentially refine, or make incremental improvements in, the current AAPCC formula; in addition, they represent techniques that may be transferable to other types of reimbursement systems that the Government may eventually choose to replace the AAPCC.

The refinement options can be grouped into two broad categories that reflect the nature of the modification. The first category has to do specifically with enrollee classification systems, i.e., the establishment of actuarial categories that differentiate enrollees for revenue purposes. A number of variables have been proposed that are related to health status and the variance in expected cost. The second category of refinement has to do with the nature of the payment system itself. Although the current approach is to transfer full risk to HMO's by full capitation, there are reasons to consider other arrangements.

Statistical performance of models

Interpretation of statistical results for alternative models presupposes an understanding of what the goals of setting prices ought to be. Projecting the expected medical costs of individuals is a task that involves considerable error. The ability of the various models to do this is commonly thought to be reflected in the measure of explained variance (R-square) obtained for the model, and this turns out to be quite small for every model (at most about 10 percent). However, paying HMO's fairly entails a correct average price for the entire group, not for each individual. Assuming that there was no systematic biased selection, for any of these models to perform well would require only that groups were large enough to create stable averages. In principle, this might not be a serious problem because HMO's could use their entire membership base to protect against cost overruns in any one year.

When enrolled groups are not representative of the local elderly population, then the relative abilities of the models to project accurate prices become consequential. Performance will depend on the explanatory power of particular variables included in the model, which is perhaps not conveyed well by any one statistic. Ash et al. (1986) developed a goodness-

of-fit measure, which they called the grouped R-square; this measure quantifies the variance in future costs that is explained by a model's classification system as a whole. Another measure (the predictive ratio) used by them and others (Beebe, Lubitz, and Eggers, 1985) was the ratio of predicted to actual costs for various biased subgroups. Norms and properties have not been established, but it is clear that there is a need for tools such as these.

Health status classification models

Thomas et al. (1983) proposed four criteria for evaluating alternative classification models: predictability, reliability, invulnerability to provider manipulation, and administrative simplicity. There is considerable controversy over which of these properties is more critical. For instance, there are differences of opinion as to whether the variables used should be restricted to those that now reside in Medicare administrative files or include those identified after an individual is enrolled. To a certain extent, the controversy stems from lack of knowledge about the ultimate utility of different variables and how the relative health status of HMO member populations may change over time.

Many variables have been proposed as representing potential improvements to the current AAPCC formula, including the relative mortality rate observed for an HMO (Cookson, 1983; Tolley and Manton, 1984). A useful summary of many others can be found in Lubitz, Beebe, and Riley (1985). Some authors have suggested using prior medical care use as an indicator of future use (Trapnell, McKusick, and Genuardi, 1982). Beebe et al. (1985) proposed a prior-use model that uses information readily available in Medicare files; this model is currently being tested in a demonstration program. One criticism of this model has been that although this prior-use model provides an administratively simple method, the reliance on aggregate prior use measures (that do not differentiate self-limited from chronic conditions) could lead to provider manipulation through selective marketing.

In an attempt to address this and other perceived deficiencies in simple prior-use models, another health status measure, based upon diagnostic information associated with prior hospital episodes, has been proposed for the AAPCC formula. Limiting use information to that related to specified conditions helps to provide a more direct measure of health, especially as it relates to chronicity and expected future costs. An analysis of Medicare data indicated that a clinically derived dichotomous diagnostic category was able to statistically identify those individuals who would have significantly higher total medical costs for the next year (Anderson and Gertman, 1983). Drawing upon this work, Ash et al. (1986) proposed a set of marker diagnoses, which were chosen, in part, on an empirical basis (i.e., as related to high future costs) and, in part, on a clinical evaluation of these diagnoses' ability to reflect serious

Table 1

Reimbursement ratios and percent of Medicare costs, by diagnostic-risk group

Diagnostic-risk group 1979	1979 percent of population	1980 reimbursement ratio	1980 percent of Medicare costs
Low risk ¹	91.2	0.83	76.2
Medium risk ²	5.6	2.22	12.5
High risk ³	3.2	3.49	11.3

¹ Low-risk group includes the nonhospitalized and those hospitalized for nonmarker diagnoses.

² Medium-risk group includes, for example, stroke, ischemic heart disease, rheumatoid arthritis and osteoarthritis, and intestinal obstruction.

³ High-risk group includes, for example, diabetes mellitus, chronic obstructive pulmonary disease, heart failure, and cancer.

SOURCE: (Ash et al., 1986).

conditions with relatively small opportunities for provider discretion in treatment (Anderson and Steinberg, 1984 and 1985). This model includes risk factors by age, sex, and three categories of diagnostic cost groups, of which two signify higher-than-average expected costs next year. It is hoped that this type of information could be obtained for individuals through validated self-reporting, while in an HMO or prior to being eligible for Medicare.

In Table 1, the three diagnostic cost groups proposed in Ash et al. (1986) are shown. The low-risk group was comprised of beneficiaries who were either not hospitalized or were hospitalized for nonmarker principal diagnoses in 1979. More than 91 percent of the elderly population were in this group, which had a reimbursement ratio in 1980 of 0.83 and accounted for more than 76 percent of Medicare expenditures that year. The medium-risk group included beneficiaries who were hospitalized in 1979 with a principal diagnosis associated with rather high expected costs the next year. The 5.6 percent of the elderly population in this group had a reimbursement ratio of 2.22 and accounted for 12.5 percent of 1980 expenditures. The third and highest cost group was made up of 3.2 percent of the population, had a reimbursement ratio of 3.49, and used 11.3 percent of Medicare expenditures in 1980.

Possible methods have been devised for developing payment formulas that depend, in part, on mobility limitations, as well as activities of daily living and instrumental activities of daily living scales of functional limitations (Thomas et al., 1986). A modified application of the AAPCC formula, incorporating disability level as measured by eligibility for publicly supported nursing home payments, is being tested in the S/HMO demonstration. In Table 2, the risk cells proposed by Gruenberg and Tompkins (1986) for a combined diagnostic and disability AAPCC formula are shown. It can be seen that the approximately 24 percent of the elderly who were classified as disabled accounted for more than 37 percent of Medicare costs in 1980 and that the

Table 2

Reimbursement ratios and percent of Medicare costs, by disability level and diagnostic-risk group

Diagnostic-risk group 1979	1979 percent of population	1980 reimbursement ratio	1980 percent of Medicare costs
Nondisabled			
Low risk ¹	72.0	0.76	54.6
Medium risk ²	2.8	1.46	4.1
High risk ³	1.8	2.15	3.9
Disabled			
Low risk	17.0	1.33	22.6
Medium risk	4.0	1.93	7.7
High risk	2.7	2.63	7.1

¹ Low-risk group includes the nonhospitalized and those hospitalized for nonmarker diagnoses.

² Medium-risk group includes, for example, stroke, ischemic heart disease, rheumatoid arthritis and osteoarthritis, and intestinal obstruction.

³ High-risk group includes, for example, diabetes mellitus, chronic obstructive pulmonary disease, heart failure, and cancer.

SOURCE: (Gruenberg and Tompkins, 1986).

disabled had consistently higher reimbursement ratios than others in comparable diagnostic cost groups.

A combination of diagnoses and disability level in the AAPCC formula would help to address the problem raised earlier concerning sufficient access to medical care and adequate quality of care for the frail elderly. The establishment of separate rate-cells for individuals who are functionally limited would also provide a basis for an interface with the long-term care system (Gruenberg and Tompkins, 1986). However, accurate information about functional level is not currently available to HCFA, and a means of obtaining it would have to be developed.

Changing the payment system

Paying less

One of the simplest proposals for changing the payment system is to pay a smaller percentage of the AAPCC to HMO's. HCFA could try to overcome the financial effects of favorable selection into HMO's by reducing capitation levels across the board. But there are problems associated with this response. For one, paying less to HMO's could do even more harm to HMO's with unfavorable selection. Another problem is that paying less could exacerbate provider incentives to favorably select and to undertreat enrollees (Gruenberg and Tompkins, 1985a).

Partial capitation

Other options for modifying the current AAPCC approach include proposals to alter the manner in which HMO's are reimbursed and to introduce some amount of risk-sharing between HCFA and HMO's.

These might be labeled partial capitation systems because they involve combinations of prospective and retrospective reimbursements. For-profit and not-for-profit health insurers, as well as several public payers, have implemented various payment systems that involve the sharing of risk with providers. Being willing to maintain some of the risk for medical costs has significant advantages for the payer from both a policy and financial standpoint.

Potential benefits to HCFA of moving to a system of partial capitation are manifold (Wallack, 1985; Tompkins and Gruenberg, 1986). First among these, HCFA would stand to keep a greater percentage of the savings generated by HMO's. As it is now, achieving lower hospital use rates (relative to providers in fee-for-service) produces surpluses that are controlled by the plans themselves. In addition, this type of approach could have an effect similar to that of improved classification systems: Losses to HCFA or to HMO's that result from biased selection could be reduced substantially. A second benefit of partial capitation over full capitation is that the limitations on risk may help to foster the development of more HMO's and more participation among smaller and rural plans. Third, certain versions of partial capitation, such as Part B capitation, would offer a solution to the problem of establishing a workable system for physician reimbursement. A fourth benefit is that because HCFA would maintain risk, it would be able to remain a more active participant in the organizational and treatment policies that affect Medicare beneficiaries. This may include decisions about which providers are eligible for referrals, what their reimbursement rates are, how payments are structured, and so on. A fifth reason to implement partial capitation is that it offers a better opportunity to balance conflicting provider incentives: To control costs and to provide adequate quality of care to enrollees.

In full capitation, HCFA gives up the benefits of being a huge risk pool and transfers risk to much smaller budgeted plans. HCFA must face trade-offs by having plans manage the risk. Partial capitation would permit HCFA to limit the risk to plans so as to reap the benefits described above. However, the flexibility of this approach could be used to establish incentives that are too strong or too weak.

Some partial capitation models deal directly with the aggregate cost experience of HMO's; others introduce risk-sharing on an individual enrollee basis. An example of the former would be for HCFA to enter into aggregate risk-sharing arrangements with HMO's. Such a model would constrain the savings or losses to HMO's, according to some specified risk corridor or formula. A variation on this would be to capitate physician groups for the provision of Medicare Part B services and for the management of care under Part A, and to let HCFA pay institutional providers directly (Wallack and Donovan, 1985). In this Part B capitation model, risk-sharing would be specified for Medicare Part A costs only.

Part B capitation may offer HCFA the opportunity for rapid conversion to Medicare prepayment because Part B capitation would enable many provider groups who could not qualify financially as a CMP to participate. However, these efforts need to be carefully designed and monitored. Using risk-sharing under Part A to leverage providers represents a flexible but powerful tool that could create potentially strong incentives to reduce specialty-physician and hospital services.

There are a number of alternative models that incorporate the concept of partial capitation with risk-sharing defined on an individual enrollee basis. Ellis and McGuire (1986) proposed a general payment model in which providers are paid a reduced amount prospectively and are responsible for a certain fraction of all treatment costs. If their model were applied in this context, HCFA would pay a reduced capitation and a proportion of all costs on a retrospective basis. An alternative approach was suggested by Cookson (1983), who argued for the use of an individual stop-loss approach for Part A costs only, with a low outlier threshold (about \$5,000). HMO's would continue to have responsibility for a proportion (e.g., 25 percent) of those costs in excess of the threshold, in order to maintain incentives for cost-effectiveness. Tompkins and Gruenberg (1986) have elaborated on this latter type of model by suggesting that the HMO deductible be defined over a multiyear period. Expanding the time horizon would permit the establishment of a moderately higher outlier threshold that, more typically, would be exceeded by repeatedly hospitalized, chronically ill individuals.

These types of models would have the general effect of reducing the differences in expected net profit between healthy and sick enrollees because retrospective reimbursements would be focused on the latter. This, in a sense, would improve the predictive ratio of a reimbursement system and would help to lessen the financial consequences of biased selection. In this respect, partial capitation may be seen as a practical forerunner of, or a complement to, health status formula adjustments. Actually, partial capitation has some of the features of a capitation adjustment based on actual HMO use. Although some have objected to allowing any provider influence on reimbursement rates (McClure, 1984), it may be viewed as a practical and prudent method of addressing serious potential problems with enrolling Medicare beneficiaries in capitated plans. Partial capitation introduces a degree of experience rating to the rate-setting process, the actual amount depending on the chosen values of model parameters. This has long been the main approach in the private sector for setting prices; with market mechanisms to be gradually introduced by Medicare, competitive pressures may be used as an additional check on provider behavior.

The estimated savings to the Medicare program that could accrue under a partial capitation payment system are shown in Table 3. The assumptions made in this table are that HCFA serves as the reinsurer

Table 3
Estimated Medicare savings under partial
capitation, by payment model

Payment model	Medicare savings	
	HMO hospital costs = 80 percent of fee-for-service average	HMO hospital costs = 60 percent of fee-for-service average
Individual stop-loss	\$950 million	\$1.9 billion
Part B capitation	\$1.4 billion	\$3.3 billion

NOTE: In this table, it is assumed that per capita Medicare costs are \$2,000 for Part A and \$1,000 for Part B; Medicare enrollment is 20 percent (about 4.75 million people). Medicare costs for this population would be \$14.25 billion.

under each payment model; the individual stop-loss is set so that the reinsurance premium represents 50 percent of total expected costs; risk-sharing under Part B capitation specifies that the first 5 percent of acute hospital savings accrue to the plan, with the rest being returned to HCFA; per capita Medicare costs are \$2,000 for Part A and \$1,000 for Part B; and total Medicare enrollment is 20 percent (about 4.75 million people). With these assumptions, it can be seen that given a 20 percent reduction in Part A costs in the HMO, savings to HCFA are \$950 million for the individual stop-loss model and \$1.4 billion under Part B capitation. Similarly, assuming that HMO hospital costs are 40 percent below the fee-for-service average, savings to HCFA are about \$1.9 billion for individual stop-loss and \$3.3 billion for Part B capitation.

Developing alternative pricing strategies

A major impetus behind virtually all of the potential refinements in the reimbursement system has been the need to establish an effective means for adjusting base premiums for individuals or groups according to differences in expected costs. Methods like these are likely to be an integral part of any successful Medicare HMO reimbursement system, even if the current AAPCC methodology is replaced with other pricing strategies that make greater use of competition and market mechanisms.

Formulating a total reimbursement system requires that three types of choices be made. First, the basis of payment by which premium levels will be set must be chosen. The AAPCC is based on fee-for-service costs, but in the future it will make more sense to use capitation costs. Second, a mechanism for determining the price must be chosen. The options are for HMO prices to be payer determined, jointly payer-provider determined, or provider determined. Opportunities for the Medicare program to benefit from these mechanisms will vary, by geographic area,

according to key factors such as the local market structure and Medicare's market share and influence. These factors will determine HCFA's relative bargaining strength, and will affect its willingness to rely on provider input for the setting of prices. Third, a program must be chosen to implement the reimbursement system. A payer-determined price would most probably be implemented through a formula. A payer-provider price would most probably be implemented by competitive bidding and direct negotiation. But in provider-determined price, it would be necessary for consumers to become price sensitive and shop among competing providers. Implementation of a voucher system would represent the kind of approach necessary to achieve this.

A formula approach

The current reimbursement system represents a formula method for establishing HMO capitation prices. Part of the motivation for developing alternative pricing strategies is to replace the use of fee-for-service costs as the basis of HMO premiums; one alternative is to use a capitation formula based on HMO costs. Because HMO costs are used in order to have a payer dictate prices, formulas severely limit the influence of providers and market dynamics in the determination of prices. Consequently, formulas generally have the distinct advantage of being easier to administer than other kinds of pricing models. However, a formula approach may work only if prices are potentially generous, or if Medicare has a substantial market share among relevant providers.

Competitive bidding

If a number of providers in an area are potentially interested in participating with Medicare, HCFA could opt for a competitive bidding process (McCombs, 1985). Having local plans submit bids would let competition between HMO's play a role in determining the price for the services contained in the Medicare benefit package. But care must be taken to avoid some potential pitfalls, including directly excluding valuable providers (Lave, 1984; McCombs, 1985).

Negotiation

In a locality or situation where HCFA must deal with very few providers, a possible method of establishing prices would be to negotiate individually with each HMO. This approach would put providers in a strong position to influence capitation levels. It can have particular advantages, including tailoring prices to take account of enrollee characteristics as well as special features of the provider and of the area. Wherever this approach may be implemented, negotiation or budget review methods would be complex and relatively expensive to administer.

Vouchers

If several separate entities wish to participate with Medicare, HCFA may be in a position to permit competing providers to determine their own rates. To implement such a system, beneficiaries may be given a fixed dollar amount to spend on medical care coverage, in place of their current entitlement to a fixed package of benefits (Luft, 1984; Friedman, Latour, and Hughes, 1984). This earmarked voucher could be redeemed at any participating plan that has openings for new enrollees. Beneficiaries shopping for the best value would take into account differences in providers' asking prices. Market forces stemming from cost-conscious consumers and multiple providers would presumably keep prices close to actual costs. There are a number of issues and potential drawbacks with a voucher system, including possible market segmentation (Luft, 1984).

In principle, the harnessing of competitive forces would reduce the problem of inaccuracies in the forecasting of expected costs. The fact will remain, however, that definite and perceptible differences will exist in the expected costs of individuals. One way or another, these differences must be reflected in the value of the voucher or in the relative prices associated with risk cells. If the value of the voucher is not allowed to vary, serious inequities could result: Either patients with chronic health problems might be treated poorly or, depending on patient selection, some insurers might inappropriately profit and others might suffer substantial losses. Determining relative prices will thus continue to require some form of uniform classification system across all HMO's.

Conclusions and recommendations

The current TEFRA program is run on a voluntary basis. HMO's decide whether or not to participate and when to withdraw, and Medicare beneficiaries make the determination whether or not to join a participating HMO. In the TEFRA capitation program, a key issue is whether the Government will win or lose. If the Government becomes a financial loser under the current system, additional HMO Medicare enrollment growth could translate into Medicare's loss. A consequence might be that Medicare will try to reduce HMO capitation payments from 95 percent of the community costs to 90 percent, 85 percent, or some lower rate. Such reduction would intensify the pressures to favorably select and to underserve enrollees. Ultimately, this scenario would result in the demise of the program.

Changes in the current reimbursement system seem to be necessary. The new system should, first, protect HCFA and providers against losses because of biased selection, and, second, carefully control and balance the perceived conflicting provider incentives to reduce costs and to provide adequate levels of service. We believe that the most desirable system will incorporate health status adjustments and partial capitation.

A major policy question is whether to test, in a demonstration program, the most promising alternative systems or to incorporate them into the current program and monitor the results. The importance of gauging effects because of provider response to any new system point to a demonstration, as does the lack of consensus concerning which of the proposed health status and partial capitation approaches are most desirable. However, the usual demonstration approach, where provider groups are free to choose whether to participate, would not allow one to address the major policy questions concerning provider response. This is because HMO's that would agree to participate in a demonstration program for AAPCC refinements, when the current reimbursement system is available as an alternative, would not be representative of HMO's as a whole. That is, HMO's that are prospering under the existing reimbursement formula would find their net incomes reduced under the alternative proposed. Moreover, the Medicare program might not want to continue operating under the current payment formula while awaiting the results of a demonstration.

We therefore recommend that HCFA consider modifying the current payment approach and implement alternative approaches that incorporate combinations of actuarially equivalent partial and full capitation, with and without health status adjustments. This would be a type of natural experiment, with HMO's being assigned randomly to a payment model. The experiment should include a careful evaluation during a 3-to 5-year period, and should contain a strong research component aimed at refining health status categories and testing implementation strategies.

The following models are recommended for testing and comparison:

- A health status model incorporating diagnostic categories associated with recent hospitalization.
- A health status model incorporating functional status and disability.
- A partial capitation model using an individual stop-loss with a low outlier threshold.
- A partial capitation model using Part B capitation.
- A partial capitation model using Part B capitation and incorporating a health status adjustment.
- The current reimbursement system (for comparison purposes).

HCFA should also continue work on other possible risk adjusters for capitation.

HCFA should initiate a significant demonstration program with a variety of options to set the base capitation rate. This would allow HMO payments to be more in line with HMO costs, rather than with costs in the fee-for-service. Here we see geographic areas taking on different payment arrangements. HCFA could choose to test a payment formula in certain areas that adjusts capitation levels according to demographic, health status, or utilization information about enrollees. In other demonstrations, Medicare payment levels could be determined by negotiation or bidding within a metropolitan area or

State. Arizona, because of its experience with the AHCCCS program, is one possible candidate.

Another approach that should be tested is to let providers determine their own rates. One alternative would be to link a voucher-like payment to the average costs of HMO's in an area. This would be administered like the Government Federal Employees Health Benefits Program, in which the Government voucher would equal a percentage of the highest cost plans. An experiment like this should be conducted in a place where premium differentials between HMO's and fee-for-service insurers are becoming pronounced, i.e., where HMO's have achieved high penetration rates and are primarily competing with each other. Another alternative would be to link a voucher-like payment to the prevailing employer premium. This strategy might be implemented by having large employers receive the Medicare capitation rate based on the experience of their own retirees. The employers, in turn, would negotiate rates with HMO's.

Many options now exist that offer hope for improvement in the Medicare HMO reimbursement system. Now is the time to test many alternative models that are judged to be consistent with the goals of Medicare. We have much to learn: The problem is to try to identify fair and efficient capitation payment systems. Then we must learn how providers and beneficiaries respond to these different systems; although a system might look good on paper, it might not work in practice. Only through demonstration can we be sure that the system that is finally selected will be the best for all.

References

- Anderson, G., and Steinberg, E.: Hospital readmissions in the Medicare population. *New Engl J Med* 311(21):1349-1353, Nov. 1984.
- Anderson, G., and Steinberg, E.: Predicting hospital readmissions in the Medicare population. *Inquiry* 22:251-258, Fall 1985.
- Anderson, J., and Gertman, P.: Prediction of Subsequent Year Reimbursement Using the Medicare File. Unpublished paper. Health Policy Center, Brandeis University, 1983.
- Ash, A., Porell, F., Gruenberg, L., Sawitz, E., and Beiser, A.: An Analysis of Alternative AAPCC Models Using Data From the Medicare History File. Unpublished paper. Health Policy Center, Brandeis University, 1986.
- Beebe, J.: An Examination of the Geographic Factor Used in the AAPCC. Office of Research and Demonstrations, Health Care Financing Administration. Prepared for the workgroup on the AAPCC. Baltimore, Md. Apr. 1982.
- Beebe, J., Lubitz, J., and Eggers, P.: Using prior utilization information to determine payments for Medicare enrollees in HMO's. *Health Care Financing Review*. Vol. 6, No. 3. HCFA Pub. No. 03198. Office of Research and Demonstrations, Health Care Financing Administration. Washington. U.S. Government Printing Office, May 1985.
- Berenson, R.: Capitation and conflict of interest. *Health Affairs* 5(1):141-146, Spring 1986.
- Besdine, R., Levkoff, S., and Wetle, T.: Health and illness behaviors in elder veterans. In T. Wetle and J.W. Rowe, eds., *Older Veterans: Linking VA and Community Resources*. Harvard University Press, 1984.
- Cookson, J.: *Final Report: Review of AAPCC Methodology for Implementing Prospective Contracts with HMO's*. Prepared for the Health Care Financing Administration. Contract No. 500-38-0018. Milliman and Robertson, Inc., Aug. 1983.
- Eggers, P.: Risk differential between Medicare beneficiaries enrolled and not enrolled in an HMO. *Health Care Financing Review*. Vol.1, No.3. HCFA Pub. No. 03027. Office of Research and Demonstrations, Health Care Financing Administration. Washington. U.S. Government Printing Office, Winter 1980.
- Eggers, P., and Prihoda, R.: Pre-enrollment reimbursement patterns of Medicare beneficiaries enrolled in "at-risk" HMOs. *Health Care Financing Review*. Vol. 4, No. 1. HCFA Pub. No. 03146. Office of Research and Demonstrations, Health Care Financing Administration. Washington. U.S. Government Printing Office, Sept. 1982.
- Ellis, R., and McGuire, T.: Prospective Payment in Markets for Health Services: Price Setting in the AAPCC. Unpublished paper. Health Policy Center, Brandeis University, 1985.
- Ellis, R., and McGuire, T.: Provider behavior under prospective reimbursement: Cost-sharing and supply. *J Health Economics* 5(2):129-152, June 1986.
- Friedman, B., LaTour, S., and Hughes, E.: A Medicare Voucher System: What Can it Offer? In *Proceedings of the Conference on the Future of Medicare*. Subcommittee on Health, Committee on Ways and Means, U.S. House of Representatives. U.S. Government Printing Office, 1984.
- Gruenberg, L.: The AAPCC—A Preliminary Examination of the Issues. Unpublished paper. Health Policy Center, Brandeis University, 1982.
- Gruenberg, L., and Tompkins, C.: An Analysis of Risk-sharing and Reinsurance in Medicare HMO's. Paper presented at the 38th Annual Scientific Meeting of the Gerontological Society of America, 1985a.
- Gruenberg, L., and Tompkins, C.: Repeated Hospitalization and Chronic Conditions: Their Contribution to Health Care Costs Among the Elderly. Paper presented at the 38th Annual Scientific Meeting of the Gerontological Society of America, 1985b.
- Gruenberg, L., and Tompkins, C.: Including Disability Status in the AAPCC. Unpublished paper. Health Policy Center, Brandeis University, 1986.
- Health Care Financing Administration: Office of Prepayment Operations, Prepayment Administration Branch. Unpublished data. June 30, 1986.
- Jackson-Beeck, M., and Kleinman, J.: Evidence for self-selection among health maintenance organization enrollees. *JAMA* 250 (20), 2826-2829, June 15, 1983.
- Kunkel, S.M., and Powell, C.K.: The adjusted average per capita cost under risk contracts with providers of health care. *Society of Actuaries Transactions* 33:221-230, 1981.
- Lave, J.: Competitive bidding and public insurance programs. *J Health Economics* 3(2):195-201, 1984.
- Lubitz, J., Beebe, J., and Riley, G.: Improving the Medicare HMO Payment Formula to Deal with Biased Selection. In *Advances in Health Economics and Health Services Research*. Vol. 6. JAI Press, 1985.

- Lubitz, J., and Prihoda, R.: Use and costs of Medicare services in the last years of life. *Health Care Financing Review*. Vol.5, No. 3. HCFA Pub. No. 03169. Office of Research and Demonstrations, Health Care Financing Administration. Washington. U.S. Government Printing Office, Spring 1984.
- Luft, H.: *Health Maintenance Organizations, Dimensions of Performance*. New York. John Wiley & Sons, 1981.
- Luft, H.: Health maintenance organizations and the rationing of medical care. *Milbank Memorial Fund Quarterly* 60(2):79-86, 1982.
- Luft, H.: A Medicare Voucher System: Issues and Concerns. In *Proceedings of the Conference on the Future of Medicare*. Subcommittee on Health, Committee on Ways and Means, U.S. House of Representatives. U.S. Government Printing Office, 1984.
- McClure, W.: On the research status of risk-adjusted capitation rates. *Inquiry* 21:205-213, Fall 1984.
- McCombs, J.: Setting Capitation Payments for Medicare HMO Enrollees: The Role of Competitive Bidding. Paper presented at the Western Economic Association Meeting. San Francisco, July 1985.
- Schlesinger, M.: Chronic care in prepaid settings. *Milbank Memorial Fund Quarterly* 64(2):189-215, 1986.
- Thomas, J., Berki, S., Lichtenstein, R., and Wyszewianski, L.: A health status measure for adjusting the HMO capitation rates of Medicare beneficiaries. *Med Care* 24(3):259-75, Mar. 1986.
- Thomas, J., Lichtenstein, R., Wyszewianski, L. and Berki, S.: Increasing Medicare enrollment in HMO's: The need for capitation rates adjusted for health status. *Inquiry* 20:227-39, 1983.
- Tolley, H., and Manton, K.: Assessing health care costs in the elderly. *Society of Actuaries Transactions* 36:579-598, 1984.
- Tompkins, C., and Gruenberg, L.: An Analysis of Alternative Partial Capitation Models for the AAPCC. Unpublished paper. Health Policy Center, Brandeis University, 1986.
- Trapnell, G., McKusick, D., and Genuardi, J.: *An Evaluation of the Adjusted Average Per Capita Cost (AAPCC) Used in Reimbursing Risk-basis HMO's Under Medicare*. Contract No. HCFA-80-ORDS-87. Prepared for Health Care Financing Administration. Actuarial Research Corporation, 1982.
- U.S. General Accounting Office: *Report to the Congress: Medicare Issues Raised by Florida Health Maintenance Organizations*. GAO/HRD-86-97. Washington. U.S. Government Printing Office, July 1986.
- Wallack, S.: Capitating Physician Services Under Medicare. Testimony to the Senate Committee on Finance's Subcommittee on Health. Dec. 6, 1985.
- Wallack, S., and Donovan, E.: Capitating Physician Services Under Medicare. Unpublished paper. Health Policy Center, Brandeis University, 1985.
- Wood, J. C., Lucksinger, T. S., and Epstein, J. D.: Medicare's new HMO/CMP risk contracts: Whose Armageddon? Whose opportunity? *Health Law Outlook Alert* 4(1):1-27, Jan. 11, 1985.