FINAL REPORT

The Direct Payment Method for Medicare Managed Care Plans: A Concept Paper

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EXECUTIVE SUMMARY

This concept paper extends and develops an idea for an alternative methodology Medicare might use to determine capitation payments to health plans that participate in the Medicare+Choice program. The Direct Payment Method, first suggested by Greenwald et al. (1998), would shift the basis of payment away from the current approach, which builds on county-based Medicare fee-for-service (FFS) expenditures, to a national model that predicts expenditures for individual Medicare enrollees. Ideally, the Direct Payment Method would use detailed encounter data for Medicare+Choice enrollees, information on the cost of the services they received, and a health-based risk adjuster to predict expenditures for individual enrollees. When combined with a geographic input price adjustment, the resulting payment would be independent of the extreme and highly problematic geographic variations in Medicare's FFS payments per enrollee.

In reality, the detailed encounter data and information on the cost of services used by Medicare+Choice enrollees are unlikely to be available any time in the foreseeable future. Therefore, the goal of this concept paper is to elaborate on the basic idea behind the Direct Payment Method and to consider options for implementing it using existing FFS data. Given the necessity of basing Medicare+Choice payment on FFS data, the concept paper characterizes the main difference between the Direct Payment Method and the current payment methodology as one of explicit vs. implicit adjustment for the many factors that influence geographic variations in payments. The current payment methodology explicitly recognizes payment differences due to variations in enrollees' health risk and geographic areas' input prices. All other sources of variation are implicit in the county-based rates, which are blended with a national average county rate in order to reduce variation.

The Direct Payment Method, as developed in this concept paper, would identify and make explicit adjustments, guided by policy objectives, for as many of the other factors, in addition to health risk and input prices, that can be measured with current data. In particular, the Direct Payment Method is conceptualized as the product of a national base rate, which is simply the national average Medicare expenditure per enrollee in the FFS program, and four explicit adjustment factors for health risk, input prices, geographic factors other than input prices, and enrollee characteristics other than the health and demographic measures already incorporated in the health risk adjuster. This formulation is shown to be the equivalent of a comprehensive model of the determinants of health care expenditures, where the elements of the model are based on either the economic theory of the demand for and supply of medical care or the need-predisposing-enabling theory of medical care use (Chapter II).

The subsequent chapters consider each of the elements of the expanded Direct Payment Method. Chapter III summarizes the current state of risk adjustment in Medicare+Choice, recognizing that the Direct Payment Method would use the same risk adjustment factor as the current payment methodology. Chapter IV addresses a variety of issues in the development of a geographic input price index, including the definition of an "input" from the perspective of a health plan that does

not provide medical care services directly to enrollees but purchases them from independent physicians, hospitals and other medical care providers.

Chapter V reviews issues in the development of the "other geographic" and "other personal characteristics" adjustment factors. The essence of this chapter is that both theory and prior research show that many factors other than health risk and input prices influence medical care use and expenditures. It identifies a number of such factors that could be incorporated into the Direct Payment Method's formula. This chapter also notes that current Medicare administrative data do not include information on most of the additional personal characteristics, such as income, education, marital status, and living arrangement, that prior research has identified as influencing use and expenditures. As an alternative, it suggests using small-area (5-digit zip codes) population characteristics to represent the effects of individuals' personal characteristics. This chapter also addresses the issue of using flexible definitions of medical care markets for different types of services based on distances between enrollees' residential zip codes and the zip codes of various types of medical care providers.

Chapter VI considers empirical estimation and implementation of the Direct Payment Method. It shows that the essential elements of the payment formula, the various adjustment factors and their weights, could be derived from an empirical model that posits expenditures to be a multiplicative function of the risk adjuster, the prices of the relevant inputs, and variables measuring the other geographic and personal characteristics suggested by theory and prior research. The parameters of this statistical function become the weights assigned to the adjustment factor indices, which are essentially the ratios of the values of a set of characteristics for a particular geographic area to the national average values for those characteristics.

This chapter and the final chapter consider the Direct Payment Method in the policy context. At the technical level, policy can decide whether to include or exclude certain specific factors from the payment formula. If a particular factor, such as income, the availability of hospital beds, or the extent of total HMO enrollment in the area, is included, policy can also decide whether to recognize as desirable or allowable all of the variation in the factor, or whether to set floors and/or ceilings that would constrain the effects of a factor on the resulting payment.

More broadly, in going beyond risk and input price adjustment, the analyses required to develop the Direct Payment Method concept would identify the sources of local variation in Medicare expenditures. It would be up to policymakers to decide which of these factors to explicitly incorporate in plan payments. However, the Direct Payment Method would not tell policymakers what is necessarily the "right price" or the "right degree of variation" to invite enough plan participation to produce the desired level of beneficiary access in all geographic areas. In this sense, the Direct Payment Method is not a panacea.

Moreover, the ability to adjust various components of the Direct Payment Method to meet particular policy goals can be viewed as either strength or a weakness. It opens up the payment process to political influence and maneuvering, particularly as compared to the current payment system which does not attribute variation to specific parameters such as physician supply or beneficiaries' incomes. Thus, the Direct Payment Method could either permit more careful decisions about allowable geographic variations or invite politics to interfere with sound policy

decisions. The further development of the Direct Payment Method should be viewed as an alternative to making political judgments that refine the Medicare+Choice system but may not be easily defended. Whether or not having this alternative is worth the required effort will ultimately depend on assessments of how well it might do at correcting problems within the current system.

I. INTRODUCTION AND BACKGROUND

A. THE GOAL OF THE DIRECT PAYMENT METHOD

As the role of private managed care plans in the Medicare program has grown, identifying an appropriate payment methodology has increased in importance. Despite changes enacted in the Balanced Budget Act of 1997 (BBA), the Balanced Budget Refinement Act of 1999 (BBRA) and the Beneficiary Improvement and Protection Act (BIPA) to reform Medicare's method for determining payments to managed care plans, major problems remain. In particular, inadequate risk adjustment and geographic variability in payment rates that lead to variations in access to plans and in the benefits offered are two of the issues that an alternative payment method should address. While some calls for reform— such as that by the co-chairs of the National Bipartisan Commission on the Future of Medicare and the Clinton Administration's Medicare proposal of July 1999— would shift to a system of competitive bidding by plans and away from administered prices, the "Direct Payment Method" examined here offers an alternative approach. Assessing its feasibility and refining its components are important even if a more market-based approach to payment is eventually adopted because the Direct Payment Method may be a better complement to market-based payment than the current county-based payment system.

The basic goal of the method for determining Medicare+Choice (M+C) capitation payments is to establish payment rates that encourage plans to enroll beneficiaries but do not cost Medicare "too much." In other words, the payment level should be just sufficient to encourage the participation of health plans that efficiently manage and provide Medicare-covered services to beneficiaries, but does not cost the Medicare program more than it would pay for the same beneficiaries in the fee-for-service (FFS) program. Recent experience suggests that the current county-based payment methodology has not met this goal adequately.

One important issue that would need to be addressed by a revised payment method is the generally accepted finding that plans have been overpaid, on average, to provide the full range of Medicare-covered services. Since plans are required to offer extra benefits (or return funds to the government) if their payments are in excess of the costs of providing Medicare-covered services, this has not always been viewed as a problem. Both plans and enrollees in those plans have found these extra benefits advantageous. Beneficiaries tend to face lower out-of-pocket costs and health plans find this to be an effective marketing strategy for luring beneficiaries away from the traditional fee for service portion of Medicare.

But this raises a troubling policy question. If the desire is to retain these extra benefits in M+C plans, how should payments account for these benefits--both in determining the average payment level and the distribution of payments across beneficiaries and geographic areas? Although it may seem inequitable to explicitly adopt different benefit packages in M+C and traditional Medicare, accommodating plans' concern about the affordability of continuing these benefits would be an implicit acceptance of benefit differences across these two parts of Medicare.

Many of the problems with the current M+C payment system derive from its basis in fee-for-service utilization and price variation at the county level. Greenwald et al. (1998) suggest that a "direct" model of M+C payments could be developed that would move away (all or in part) from

their current county FFS basis and toward predicting expenditures for each individual. Ideally, predicted expenditures would be derived from complete managed care encounter data and estimates of managed care plans' costs of providing the services captured by the encounter data. Specifically, these authors posit that "…the risk adjuster method would account sufficiently for practice pattern variability," and that the model could be summarized as:

Direct Payment = (Individual's Risk-Based Estimated Expenditure) * (Geographic Price Index).

They recognize, however, that current data are inadequate to implement this method: complete encounter data are not available, HMOs' costs of providing services are unknown, and health care price indexes, especially at the local level, are considered problematic. Moreover, Cutler and Sheiner (1999) show that, after controlling for differences related to "illness" and "regional price," there remains extensive variation in Medicare FFS spending across geographic areas related to demographic and supply factors.

Consequently, this leads us to conclude that the "individual's risk-based estimated expenditure" implied by Greenwald et al. (1998) should be thought of as having two components in the context of currently available data:

- a predominantly clinical risk factor that varies across patients and
- a geographic adjustment factor that captures differences related to other beneficiary- and area-level determinants of spending.

Many of the issues to be considered in this concept paper on the Direct Payment Method of paying Medicare's managed care plans involve making decisions about the appropriate geographic area upon which to base the direct payment method. Specifically, questions related to the development of input price adjusters, allowances for other area-level factors that might be recognized, and defining practical plan payment areas may all lead to different answers about the usefulness of alternative geographic options. As will be seen, a single geographic construct – such as the way the MSA is used as the basis for an input price adjuster in the acute hospital prospective payment system - will not necessarily be desirable for all aspects of the Direct Payment Method. However, this potential complexity should not impose an undue administrative burden and should result in an approach to M+C payments that is more defensible than current methods.

The following sections of this report explore options for implementing the Direct Payment Method within the constraints of available data. Specifically,

- the remainder of this introductory chapter reviews the current M+C payment method, formally presents the Direct Payment Method, and outlines the specific issues that need to be considered in developing an alternative to the current system.

- Chapter II describes a basic model of health care markets that provides the conceptual underpinnings for the Direct Payment Method.

- Chapter III briefly reviews risk adjustment in Medicare managed care.

- Chapter IV considers issues in the development of a more refined geographic input price index.

- Chapter V addresses the issue of other factors that might be incorporated into a geographic index that adjust for variations due to differences in practice patterns and other non-price factors.

- Chapter VI discusses issues related to estimating the parameters of the payment formula or algorithm implied by the Direct Payment Method, focusing specifically on the modeling required to be able to reflect or adjust for other geographic factors.

- Chapter VII addresses issues related to implementation from the perspectives of Centers for Medicare and Medicaid Services (CMS), health plans, providers and beneficiaries.

B. BACKGROUND ON MEDICARE PAYMENTS TO MANAGED CARE PROGRAMS

This section provides a brief review of the history of Medicare's methods for paying managed care plans. This history is divided into two sections: from 1982 (when Medicare's managed care program began) to 1997 (when the Medicare+Choice program was established); and the period since 1997. Greater detail can be found in CMS (1999), Palsbo (1990, 1991, 1992) and, for the most recent changes, www.hcfa.gov/medicare/bipafact.htm..

1. TEFRA Risk Program (1982-1997)

Following a series of demonstrations in the 1980s, the Medicare risk program was created by the Tax Equity and Fiscal Responsibility Act (TEFRA) of 1982. Under TEFRA, capitated payment rates to managed care plans were set using the Average Adjusted Per Capita Cost (AAPCC) methodology. These payments rates, which were developed for each county in the United States, had two basic components: an "…average fee-for-service cost per beneficiary in the county and an average county demographic factor score " (CMS 1999, p.68). The county demographic factor score standardized for variations in expenditures due to age, sex, disability status, institutional status, Medicaid enrollment, and aged/working status, relative to the national Medicare population. These county-specific AAPCC amounts were reported in an annual "county rate book".

The actual Medicare plan payment on behalf of a specific beneficiary was based on that enrollee's individual demographic factor score and a five percent discount based on the assumption that managed care plans are more efficient than Medicare's fee-for-service program. This payment methodology can be represented by the simplified formula:

(1) Payment = [0.95 * (County Per Capita Costs)/(Avg. County Demographic Score)] * Enrollee Demographic Score,

which can be further simplified to

(1a) Payment = (AAPCC County Rate Book) * Enrollee Demographic Score.

The 1997 payment rates became the "base" payment rates under the Medicare+Choice program (that is, they formed the starting point for plan payments under M+C).

As beneficiary enrollment and plan participation in the TEFRA risk program grew, flaws in its payment methodology became increasingly evident and important. The foremost concern about the AAPCC-based payment rates was that they overstated the actual costs faced by Medicare risk plans. Researchers found Medicare was paying considerably more to risk plans than it would have paid if those enrollees had remained in the FFS program (Riley et al. 1996; Dowd et al. 1996; PPRC 1996; Brown et al. 1998).

Another concern about the risk program's payment methodology was the wide variation in payment rates across counties in different parts of the country (Welch 1991). To some extent, this variation reflects differences in area input prices, but even after adjusting for these, the range between the highest and the lowest rates was more than 50 percent (ProPAC 1997). Moreover, payment rates could differ substantially even across counties within the same metropolitan area, raising the issue of whether the county was the appropriate unit for determining risk plan payment rates.

These variations in payments to plans across areas led to inconsistency in the benefit packages available to enrollees across the country.[1] In 1996, the 10 percent of plans with the highest average payment rates (adjusted for input prices) offered an average of $121 per month in extra benefits (in addition to the basic Medicare benefit package) to their enrollees; the 10 percent with the lowest payment rates offered an average of only $48 in extra benefits; while the payments for the high payment rate group were 72 percent higher, their projected costs were only 18 percent higher (ProPAC 1997).

2. Medicare+Choice Program

In 1997, the BBA replaced Medicare's TEFRA Risk Program with the **Medicare+Choice Program** and changed the manner in which plans are paid. A major aim of the new payment method was to break the direct link between county FFS spending and plan payment rates and to reduce the geographic variation in payment rates across counties. As noted above, the 1997 local payment rate (trended forward to the payment year) became the basis for M+C payments in 1998 and beyond. Three key changes made by the BBA can be summarized as follows.

[1] If payments exceeded expected costs (as reported on a plan's adjusted community rate or ACR proposal), then a plan was required to either offer additional benefits actuarially equivalent to the difference, or deposit that amount in a contingency fund. In fact, plans frequently offered additional benefits, and never chose the contingency fund option.

- Under the M+C program, plan payments in a given county are based on the highest of three capitation rates: 1) a "floor" rate (which is trended forward each year and is intended to help plans in counties with exceptionally low rates); 2) a "minimum update" rate, which is 2 percent higher than the prior year's rate; and 3) a "blended rate", which combines the local rate and a national rate. The local rate is the 1997 payment rate, trended forward each year by a national update factor. The national rate is a weighted average of local rates, adjusted for geographic differences in input prices (mainly wages). While the national rate is specifically adjusted for input prices, local rates reflect these and other geographic factors (like practice patterns) that affect utilization and expenditures. The BBA set the blend formula. In 2002, the blended rate is 58 percent of the local rate and 42 percent of the national rate. In 2003 and after, the blended rate will be a 50:50 blend. Most plans, however, receive the floor or minimum update payment rate. Actual payments to plans are then adjusted for the characteristics of individual enrollees (as described in Chapter III).

- To improve the match between plan payment rates and the cost of furnishing Medicare-covered services to enrollees, the BBA also required that by 2000 CMS begin adjusting plan payments by enrollee health status, rather than by only demographic factors. Later legislation (BIPA) stipulated a slow transition to risk-adjusted payments. In 2000 through 2003, the blend of risk-adjusted and demographically-adjusted payments is 10:90. CMS initially implemented an interim risk adjuster that relies on inpatient diagnostic information. As discussed further below, CMS currently is phasing in for payments in 2004 a risk adjuster that uses both inpatient and ambulatory diagnostic information.

- The BBA also removed from local rates a share attributable to Medicare's graduate medical education (GME) payments to hospitals. The GME deductions were fully phased in by 2002. Now, teaching hospitals treating M+C enrollees receive GME payments directly from Medicare.

While the BBA also aimed to expand the managed care program in Medicare by creating opportunities for new types of plans (such as preferred provider organizations and provider-sponsored organizations) to participate in the program, it has suffered a substantial loss of plans and enrollees over the last few years. Several factors have been cited related to the withdrawals, including rising health care costs (particularly regarding prescription drugs); the BBA payment changes; various regulatory requirements of participating in M+C; and a reluctance by some plans to reduce their "extra" benefits or increase their premiums to levels that would allow M+C payments to cover their costs.

Of the roughly 350 plans participating in 1998, 151 withdrew from the program during 1999 through 2001 (about 50 per year). In addition, during this period 165 existing plans reduced their service area by withdrawing from at least one county (about 55 per year). In total, about 1.7 million beneficiaries were affected by these withdrawals and service area reductions. Of that number, approximately 17 percent are in counties with no other participating plans and thus re-entered the FFS program (MedPAC 2000; CMS 2001).

Through BBRA in 1999 and BIPA in 2000, Congress took specific steps to help encourage plans to remain in the M+C program. Key BBRA provisions included: a slowing of the transition to risk-adjusted payments, as mentioned above, which effectively raised average payments slightly in 2001 and 2002; a one-time 5 percent bonus payment to plans entering counties not otherwise served by M+C plans; an 80 percent reduction in the Medicare beneficiary program education assessment (from about $1.50 to $0.30 per member per month); and a shortening of the M+C exclusion period (from 5 to 2 years) for plans that have withdrawn. Key BIPA provisions included: raising the "floor" payment rate (from $415 to $525 in larger metropolitan areas and to $475 in other areas); and increasing (for one year only) the minimum payment increase from 2 percent to 3 percent.

Despite these efforts, effective in 2002 another 22 plans withdrew from M+C and 36 plans reduced their service area, affecting a total of over 500,000 enrollees (CMS 2001). And for plans remaining in the M+C program, substantial variation in payment rates continues to exist, across counties nationwide as well as among counties within a metropolitan area. In the face of these concerns, debate continues over the extent to which Medicare payments to plans should account for geographic variation in utilization and other local conditions, and whether administered price or competitive bidding approaches should be used to set plan payments.

C. THE DIRECT PAYMENT METHOD

Although there is consensus that further revisions of the payment system for Medicare+Choice plans are needed, there is not yet any agreement on what that change should be. One set of strategies focuses on a competitive bidding approach to setting payments for plans, avoiding some of the technical issues raised above by using the market to set payment levels. The competitive approach is the key feature of several proposals for Medicare reform and has been investigated to some extent in the competitive bidding demonstrations that CMS has attempted to conduct. As yet, no successful demonstration of competitive bidding has been undertaken, and that system will also face many potential complications and uncertainties (Nichols 2000). Moreover, if competition results in a concentration of market power in various areas, the prices bid may not yield the types of savings that many anticipate if Medicare is effectively held hostage to plans= leverage in certain locations.

The Direct Payment Method, which is the focus of this report, represents an administered price strategy that has the advantage of building on payment mechanisms that have already been developed by CMS. It also allows for explicit control over the extent of geographic variation in payments. In addition, work on the Direct Payment Method is potentially useful even if Medicare moves toward competitive bidding. For example, the need for an effective risk adjustment mechanism is even more important in a competition-based Medicare program than it is in the current Medicare+Choice program (Guterman 2000). Further, bidding will not be feasible in all parts of the country because of too few beneficiaries or too few plans, and thus an alternative model will be needed for such locations. Finally, the development of a model that produces reliable estimates of how expected payments vary across areas can provide a benchmark for evaluating bids submitted by plans in each area or can be used to establish

acceptable ceilings on bids by plans. This information would make the federal government a much more informed negotiator in any competitive process.

The Direct Payment Method would differ from the current M+C payment system across several key dimensions.

- First, it would move away from payments based on local area-level average adjusted payment to one based on predicting expenditures for individual beneficiaries. To the extent that this approach adjusts for differences in both clinical risk factors and other nonclinical factors that affect expenditures, it could reduce variations in individuals' expected costs relative to the existing payment rates.
- Second, the Direct Payment Method would eliminate the need to base payments on the experience of beneficiaries by county. This can be particularly unstable in counties with relatively few Medicare beneficiaries.[2] Instead, the method for establishing payments and geographic adjustments would shift to a national base, in the sense that predicted payment would be based on the experience of all beneficiaries across the country.
- Third, the Direct Payment Method has the potential to be more refined in terms of allowing geographic variation consistent with policy objectives by taking an explicit range of geographic factors into account.

This report considers a number of the conceptual and practical issues that need to be addressed if the Direct Payment Method is to be developed as an alternative to the current payment method.

1. Defining the Direct Payment Method

Greenwald et al. (1998) described the Direct Payment Method as the product of two components: a risk-adjusted individual expenditure amount and a geographic price index adjuster. For purposes of this concept paper, however, we elaborate on their characterization of the Direct Payment Method as consisting of five elements that combine to establish a payment to a private plan on behalf of a particular individual. This model can be expressed by a formula for the payment (in dollars) a managed care plan would receive on behalf of beneficiary i who resides in area j:

(2) $C_{ij} = NB * RF_i * IF_j * GF_j * ZF_i$, where

- C_{ij} is the capitation payment amount a plan would receive for enrollee *i* in area *j*,
- NB is the national base rate, which is simply the national average Medicare expenditure per beneficiary,
- RF_i is the individual enrollee's risk adjustment factor, which essentially incorporates both health risk and the "enrollee demographic score" described in

[2] The blending of county and national payment rates seeks to achieve a similar objective, but does so in a way that does not make any distinctions among sources of the variation across counties.

the pre-BBA era's AAPCC-based payment methodology represented by equation (1),

- IF_j is the input price adjustment factor for area *j*,
- GF_j is an adjustment factor index for other geographic variables, and
- ZF_i is an adjustment factor index for personal characteristics other than those already included in the risk adjuster.

The primary difference between this formulation and the simpler one specified by Greenwald et al. (1998) is that it includes GF_j, an explicit adjustment index for geographic factors other than input prices, and ZF_i, an adjustment index for personal characteristics other than those incorporated in the risk adjuster.

2. Contrast With the Current M+C Payment System

While payment rates under M+C are the maximum of a floor rate, minimum update rate, or (if budget-neutrality conditions are met) a blended rate, only the blended rate incorporates to any extent a geographic adjustment factor. The basic approach implied by the blended rate within the current payment system (using the 2003 and beyond blend percentages) can be represented as follows:

(3) $C_{ij} = [(.5 * B_j) + (.5 * NB' * IF_j)] * RF_i$, where

- B_j is the "local rate", or county-specific payment rate based on the M+C methodology specified by the 1997 BBA and subsequent legislation,
- NB' is the national weighted average of the area-specific rates, which is similar to NB in equation (2), and
- C_{ij}, IF_j, and RF_i are the same as defined above.

There are three major conceptual differences between the current M+C payment method and the Direct Payment Method.

1. Only the blended payment rate, as represented by equation (3), necessitates the use of a geographic adjuster. In this payment rate the geographic adjuster is simply an input price index, IF_j, which is applied to the national rate.
2. The only explicit individual adjuster to any of the M+C rates (floor, minimum, or blend) is RF_i. The Direct Payment Method, by contrast, adds explicit adjusters for other geographic characteristics and personal characteristics other than those incorporated by the input price index and the risk adjuster.

3. Under the current M+C payment system, the floor rate, the minimum update rate, and the local rate component of the blended rate (B_j in equation (3)) implicitly include the effects of input prices **as well as the effects of all other factors that result in differences in Medicare spending across counties**, whether desirable or not. Only the blended rate was intended to explicitly diminish to some extent differences in M+C payment rates across areas, while recognizing that some of these differences may be attributable to factors beyond the plans' control. Under the Direct Payment Method approach, however, these differences would be accounted for **explicitly**, either as adjustments made at the area level or as predictors of the individual's expected payment. Rather than partially incorporating all existing differences into a base payment rate on an **implicit** basis, under the Direct Payment Method geographic differences would be reflected only to the extent that they are attributable to specific factors (related to the individual enrollee or the area in which he or she resides) that policymakers wish to include in the payment formula.

In the next chapter we develop a conceptual framework that can be used to motivate the elements of the expanded Direct Payment Method formula represented by equation (2) above. The subsequent chapters discuss issues in the development of the relevant adjusters that might be used to convert the national base rate to a beneficiary-specific capitation payment. (We discuss issues pertaining to the risk adjuster only very briefly, since they are the same for both the Direct Payment Method and the current Medicare+Choice payment method. CMS continues to devote considerable resources to refining risk-adjustment in Medicare. Therefore, this concept paper does not address risk-adjustment in a substantive way.) After discussing the components of the Direct Payment Method, we assess issues related to empirical implementation, which is rooted in the estimation of the parameters of a beneficiary-level model to predict beneficiary-specific Medicare payments.

II. CONCEPTUAL FRAMEWORK UNDERLYING THE DIRECT PAYMENT METHOD: THE MARKET FOR MEDICAL CARE

In the preceding section, the Direct Payment Method was described as a simple multiplicative function of five terms, the national base rate, an individual risk adjustment, a geographic input price adjustment factor, an adjustment factor for other geographic variables, and an adjustment factor for personal characteristics other than those already incorporated in the risk adjuster. The purpose of this chapter is to step back from that simple representation to develop a conceptual underpinning for the Direct Payment Method. This framework helps to identify many of the issues that will be addressed more fully in subsequent sections.

We take as our starting point the economics model of the demand for and supply of medical care. This approach recognizes that medical care use and subsequent payments depend both on people's desire to seek care and providers' willingness to supply it. Moreover, potential demand becomes actual service use when the price paid by or on behalf of the patient meets or exceeds the minimum amount of payment the provider will accept to supply the service. In addition, this framework can accommodate the fact that cost to the patient has multiple dimensions, including time and inconvenience, and that the patient's financial cost is typically not the same as the payment received by the provider, because of the presence of third-party insurance plans, specifically Medicare but also supplementary insurance.

Although the model is developed in terms of demand, supply, and services actually received, it is flexible enough to incorporate the notion of need, defined as "demand that is not realized because of barriers to access." To the extent that potential barriers to access are included in the model, then policy may be able to compensate for their effects in determining payment rates. For example, unrealized need can be thought of as the clinical identification of a service that would provide health benefit, but the beneficiary, who perceives the same need, cannot obtain the service, perhaps because it is too hard to get to a provider or the expected cost-sharing is too high relative to the person's income. If these factors —geographic remoteness or low income— are included in the model as geographic factors, then the Direct Payment Method could lead to higher payments for beneficiaries in areas with "high" barriers to care.

In general, the economics model consists of three parts: a demand function, a supply function, and an equilibrium condition, which can be represented by

(4) $Q^D = f(P^D, R, X)$ demand function,

(5) $Q^S = g(P, I, Y)$ supply function, and

(6) $Q^D = Q^S = Q$ equilibrium condition.

The variables R and I correspond to RF and IF, the risk and input price adjustment factors above. The variables X and Y represent other factors that influence demand and supply, respectively. P^D and P are the “prices” that affect demand and supply. Note that P and P^D are conceptually distinct. The former is the payment received by the provider as determined by CMS, while the

latter represents the beneficiary's out-of-pocket financial costs as well as time and inconvenience costs.

Expenditures or total payments for individuals are simply the product $P*Q$, where Q is the equilibrium quantity of services and P, taken from the supply function, represents the payment rates used by Medicare to pay for the services received by beneficiaries. In equilibrium, program costs are $P*Q$, even though $P \neq P^D$. Another implication of this model is that if P and P^D are essentially determined by Medicare, then variations in time costs, inconvenience, amenities, and possibly service quality serve to equilibrate Q^D and Q^S.

This system of equations can be rewritten as a so-called "reduced form" that expresses $P*Q$ as a function of all of the exogenous or independent variables in both the supply and demand models, i.e.,

$$(7) \qquad C = P*Q = h(R, I, P^D, X, Y), \text{ where}$$

C, the capitation rate for person i in area j, would be predicted from the reduced-form expenditure model. Thus, the expanded version of the Direct Payment Method represented by equation (2) can be thought of as a variant of a reduced-form model that takes account of all of the (measurable) factors that affect either the demand for or the supply of care received by Medicare beneficiaries.
How are (7) and (2) related to each other? Equation (7) represents the statistical relationship between Medicare payments and the factors that influence payments. Equation (2) represents the payment formula equivalent, expressed as a national base rate which is then adjusted for variations in individual and area characteristics in order to compute a capitation payment for a specific person living in a particular area.

The link between them is twofold. First, equation (7) potentially identifies all of the observable factors that affect payments. Given the magnitudes of their effects, i.e., the parameter estimates from equation (7), policymakers can decide which factors to include in the formula as explicit adjustment factors and which to ignore, i.e., to leave in the national base rate without any adjustment. Second, the parameter estimates from equation (7) can be used to construct the adjustment factor indices represented by RF_i, IF_j, GF_j, and ZF_i, where the last two terms represent a rearrangement or a subset of the variables X and Y in equation (7). Rather than calling them demand and supply factors, GF and ZF represent other geographic and other individual characteristics.

Characterizing the Direct Payment Method in this way shows that it is not an arbitrarily specified formula, but rather has its foundation in a well-established conceptual framework for understanding the determinants of variations in Medicare expenditures. Furthermore, this framework guides the organization of the following chapters, which consider risk adjustment, input price indices, factors that are potential candidates for the GF and ZF adjusters, and statistical estimation of equation (7), which is needed to construct the weights associated with the various adjustment factors in equation (2).

III. RISK ADJUSTMENT IN MEDICARE MANAGED CARE

Comprehensive risk adjustment is critical in accounting for reasonable variation in medical utilization and costs, and thus in implementing the Direct Payment Method. Compared to the subjects of geographic variation and geographic adjustments to plan payments, however, risk adjustment has advanced considerably further in its research, development, and implementation. Compared to geographic adjustments (particularly non-input price adjustments), the use of risk adjustment elicits consensus among policymakers and stakeholders. While risk and geographic adjustments under a Direct Payment Method are essentially distinct, a Direct Payment Method model could in fact account for interaction between risk and geographic adjustment variables. This is noted in Chapter Six's discussion of the potential parameters of a Direct Payment model.

For the purposes of this concept paper, it is sufficient to assume that the comprehensive risk adjuster already scheduled for use in Medicare+Choice plan payments in 2004 could be used in the Direct Payment Method. Thus, this chapter summarizes the development of risk-adjusted payments under Medicare, reviews the importance of using a comprehensive risk adjuster, and describes the system currently slated for use in M+C payments in 2004 and beyond.

A. INTRODUCING RISK ADJUSTED PAYMENTS TO MEDICARE+CHOICE PLANS

As beneficiary enrollment in Medicare's prior managed care program (the TEFRA risk program) grew, the limitations inherent in a demographics-adjusted payment method became increasingly apparent. In particular, a mounting body of studies found that Medicare was paying substantially more to risk plans than the program would have paid if risk plan enrollees had remained in the traditional FFS program (Riley et al. 1996; Dowd et al. 1996; PPRC 1996; Brown et al. 1998). In response, when the BBA replaced the TEFRA risk program with the M+C program the legislation also mandated that payments to health plans account for enrollee risk (health and demographic status), rather than only demographics.

1. Risk Adjustment Transition Schedule

While the BBA did not impose a specific transition schedule to phase in risk-adjusted payments, it did require that such payments begin by January 2000. CMS proposed a five-year transition schedule: in 2000 a plan's payment amount for an enrollee was based on 10 percent of a risk-adjusted payment rate and 90 percent of demographics-adjusted payment rate. The proposed blend increased to 30:70 in 2001; 55:45 in 2002; 80:20 in 2003; and 100:0 by 2004. BBRA slowed the transition schedule in response to concerns about M+C payment rates and plans discontinuing their participation in the M+C program. BIPA further slowed the transition to its current schedule— 10:90 in 2002 and 2003; 30:70 in 2004; 50:50 in 2005; 75:25 in 2006; and 100 percent risk adjusted in 2007 and beyond.

2. Interim Risk Adjustment Method

The BBA did not mandate use of a particular risk adjustment method. However, CMS had supported research to develop improved risk adjustment methods for roughly a decade. Two

basic types of risk adjusters had been developed— one based on surveys of enrollee health status and the other based on service encounter data. Studies generally concluded that encounter-based systems are better predictors of medical costs, more reliable, and easier to recalibrate than survey-based models (Ingber 1998). As the first step toward risk-adjusted payments (and to meet the BBA's implementation schedule), CMS implemented in 2000 an inpatient encounter-based system— a version of the Principal Inpatient Diagnostic Cost Group (PIP-DCG) model— as an interim risk adjuster.

PIP-DCG classifies patients based on their principal inpatient hospital diagnosis into one of 15 diagnostic cost groups (DCGs). The model also classifies patients based on five demographic characteristics (age; sex; current Medicare status (aged or disabled); original Medicare status (originally aged or originally disabled); and Medicaid enrollment status). New managed care enrollees are grouped into a base DCG, for which payment is determined using only patients' five demographic factors. Since both PIP-DCG and the M+C program's county demographic rates include demographic adjustment factors, CMS adjusts its M+C payment rates so as to not over-adjust for the demographic factors (Ingber 2000)).

3. Limitations of the Interim Risk Adjuster

Implementing only an inpatient-based risk adjuster (rather than an inpatient- and ambulatory-based adjuster) was reasonable given both the BBA implementation schedule and the type of encounter data initially available to CMS for implementing a risk adjustment system. In the long run, an inpatient-based system is not optimal, because it introduces incentives to health plans to hospitalize patients inappropriately in order to maximize payments. While CMS made technical adjustments to the PIP-DCG model to reduce this incentive, such steps also can weaken the risk adjuster's ability to reduce plans' incentives to engage in risk selection (that is, to enroll only healthy individuals and avoid unhealthy ones) (Newhouse et al. 1999).

An inpatient-based system also is simply less able to predict an enrollee's total expenses, because most beneficiaries (about 80 percent) are not hospitalized in any given year. The PIP-DCG model predicts 6.2 percent of variation in individual expenditures, while inpatient- and ambulatory-based models predict nearly 12 percent of such variation. The demographics-only adjustment method, by comparison, predicts just 1.5 percent of variation in individual expenditures (Pope et al. 2000).

Perhaps a more important measure of risk adjuster performance is the ratio of predicted aggregate payments to actual aggregate expenditures. Operationally, plans pay less attention to individual cost prediction and more attention to their total revenues relative to costs. In studies comparing the predictive ratios of alternative risk adjusters across cost quintiles of individuals, inpatient- and ambulatory-based systems clustered fairly closely to 1.0, indicating that group-level predicted payments closely match group-level expenditures. By contrast, inpatient-only models substantially under-predicted the highest-cost quintile group, and over-predicted the lowest-cost quintile. Demographics-only models under-predicted and over-predicted expenditures of the quintiles even more (Pope et al. 2000; Greenwald et al. 1998).

B. INTRODUCING AN INPATIENT- AND AMBULATORY-BASED RISK ADJUSTER (2004 and Beyond)

By 2004, CMS is mandated to replace the inpatient-based risk adjuster with one that will incorporate both inpatient and ambulatory diagnostic information. To facilitate use of such a model, the BBA had authorized a schedule of collecting enrollees' inpatient and ambulatory information from health plans.

1. Data Collection Efforts

CMS began collecting inpatient "encounter" data (which is roughly equivalent to FFS claims data) in October 1997; physician encounter data in October 2000; and hospital outpatient encounter data in January 2001. Policymakers and stakeholders do not view the process of collecting inpatient encounter data as especially burdensome, given the low prevalence of hospitalizations. However the ambulatory encounter data collection process was a much larger task. In the face of continued withdrawal of health plans from M+C and complaints by plans about the operational burden of submitting ambulatory encounter data, CMS suspended the ambulatory encounter data collection effort from May 2001 through June 2002.

Collecting encounter data is the most comprehensive means of obtaining enrollees' diagnostic information, and can allow use of the most powerful and accurate risk adjuster. However, less comprehensive diagnostic information and data collection efforts may still adequately support an impatient- and ambulatory-based risk adjustment system. In March 2002, CMS announced a new, scaled-down data collection process. Plans will have to submit only 5 data elements per data transaction (compared to 50 elements under the prior process), and only diagnoses from a subset of encounters required for determining payment. So that CMS can implement the new risk-adjusted payments in 2004, plans must collect these data on enrollees from July 2002 through June 2003 and begin submitting them to CMS in October 2002 (CMS 2002a).

2. The "Selected Significant Condition" Risk Adjuster

The risk adjuster selected by CMS, the Selected Significant Condition or SSC model, can be implemented using the scaled-down data requirements and is a refinement of Pope and colleagues' (1999) Hierarchical Condition Category model. Like the HCC (and most comprehensive risk models), the SSC model is "site-neutral," meaning that it does not result in higher payments merely because a particular diagnosis is identified in the inpatient rather than ambulatory setting.

CMS considered several alternative inpatient- and ambulatory-based models, which ranged from using 6 disease groups to 86 groups, and explained between 7.4 percent and 11.1 percent of variation in individuals' predicted costs. The SSC model was viewed as the best balance of several considerations— payment accuracy, clinical defensibility, gaming susceptibility, and administrative data burden. It is comprised of about 61 disease groups and explains 10.8 percent of variation in predicted costs (CMS 2002b).

3. Risk Adjustment under a Direct Payment Method

A comprehensive and site-neutral risk adjuster such as the SSC model will improve both payment policy incentives and payment accuracy to M+C plans. Unlike the Direct Payment Method, however, risk-adjusted M+C payments are still predominantly based on county-level expenditures, which may capture area-level variation in risk that is not observed by the risk adjustment system. Under a Direct Payment Method, however, payments would derive from a national base rate rather than (or at least more than) a county base rate. Under such a payment system, the use of a comprehensive risk adjuster would only increase in importance.

IV. GEOGRAPHIC INPUT PRICE INDEX

A. WHAT ARE THE "INPUTS" TO MEDICARE+CHOICE PLANS?

An input price index is generally accepted as essential in setting appropriate payment rates for a nationwide administered pricing system. The key assumption underlying the use of an input price index is that plans in markets with higher input prices should be paid more than plans in markets with low input prices. We know that the variation in these prices can be substantial. For example, in fiscal year 1996, the average hourly wage for hospital employees varied from $15.31 in Jonesboro, Arkansas to $31.16 in Salinas, California. Moreover, in a Direct Payment Method approach, the input price index would be critical, as the payment rates would vary across areas only according to the explicit influence of the variables included in the payment system.

From a health plan's perspective, the "inputs" it purchases to provide care to Medicare beneficiaries may be viewed as the health care services that make up the Medicare benefit package. However, the visits, hospital care, imaging and laboratory services that plans "buy" are intermediate outputs of the medical care production process, not inputs. The basic inputs that providers employ in the production of these outputs are physician time, nurse labor, other labor inputs, space, and capital equipment. How much managed care plans pay for medical care outputs depends on the underlying prices of the true inputs, the production processes that providers use, as well as the market conditions that define the relationships between health plans and medical care providers. If the goal of including a geographic input price index in the payment system is to reflect cost differences that are beyond health plans' and providers' control, then the price index should only reflect variation in prices that providers pay for true inputs.

Health plans face a set of input prices when making choices about how they are going to deliver services to patients. Plans have to decide whether to provide these services themselves by, say, employing physicians or operating their own hospitals and diagnostic centers or by purchasing them as intermediate outputs from independent providers of those services. This decision is driven by the costs of the true inputs underlying the production of health care services as well as plans' and providers' relative market power. Therefore, the index used to adjust Medicare+Choice payments should not be based on what plans pay for services or what inputs are actually used by individual plans or providers because these decisions are endogenous, i.e., they reflect both plans' and providers' responses to market-level input prices. Moreover, actual spending for inputs can be very inefficient, both in terms of quantities and the mix of inputs.

Beyond these conceptual justifications for basing a geographic adjuster on input prices, there are at least three very practical difficulties with trying to construct indices for the prices of the intermediate outputs health plans purchase. First, methods of payment and the units of service vary substantially, so that there are no fixed or readily apparent output prices. For example, health plans may buy hospital care on the basis of discounted hospital charges, a rate proportional to hospital costs, a fixed rate per diem, a fixed rate per case, or on a capitated basis. Second, health plans consider much of this information proprietary and contractually protected. Thus, even if the definitional issues could be addressed, obtaining the relevant information would be extraordinarily difficult. Third, plans have contracts with multiple providers. The

terms of these contracts differ from provider to provider, as does the rate of use of each provider. For example, a plan may agree to a very high price to include a major teaching hospital in its network, but either not use the hospital at all or only use it for cases clearly requiring tertiary care (Gaskin, Escarce, Schulman and Hadley 2002). Thus, one would need to weight the importance of various contracts as well as measure their terms if these prices were to be used to construct an input price index.

B. CURRENT APPROACH

The BBA of 1997 that established the Medicare+Choice Program also established the rules that CMS must follow in setting payments to plans. One of the three possible rates is a blend of national and local rates. Before CMS develops the blended rate, the national rates are adjusted to reflect differences in input prices across counties. This adjustment is based on the hospital wage index used to adjust fee-for-service payments for hospital inpatient services and the geographic practice cost indices (GPCIs) used to adjust the physicians' work, practice expense, and malpractice expense components of the payments for physician services. The hospital wage index is also used in determining prospective payment rates for hospital outpatient, skilled nursing, inpatient rehabilitation, and home health services.

The national rate in the M+C blended rate is a combination of payments for Part A services and payments for Part B services. Following historical data on hospitals costs that has been used in the formulation of the hospital PPS, 70 percent of the Part A payment amount is assumed to be related to labor costs. These Part A labor costs are adjusted by the hospital wage index. Part A non-labor costs are not adjusted for input price differences, implicitly assuming no geographic variation. The Part A component of the national rate is the sum of the adjusted labor costs and the unadjusted non-labor costs.

The input price adjuster for the Part B component is somewhat more complicated. First, Part B costs are divided into its physician and non-physician parts. Based on spending data, two-thirds of Part B costs are associated with physician spending and the remaining one-third with other Part B services, e.g., hospital outpatient. Second, the Part B physician costs are adjusted by the Geographic variations factor from the physician fee schedule (a weighted average of the GPCIs). Third, mirroring the approach used for Part A costs, the BBA divides other Part B costs into labor and non-labor shares and adjusts the labor share by the hospital wage index. The legislation establishes that the labor share is equal to 40 percent of the other Part B costs. Finally, the Part B component of the national rate is the sum of the adjusted physician costs, the adjusted labor share of other costs and the non-labor share of other costs.

C. RECONSIDERING THE CURRENT APPROACH

Several aspects of this current approach have been identified for potential improvement (Thomas 1998). One shortcoming is that it reflects input prices paid only by hospitals and physicians, because these are the only two sets of input price adjusters currently available. As more prospective payment systems are developed and implemented for different services, particularly

skilled nursing facilities and home health agencies, pressure will build to develop separate wage indices for those services, as well. For now, the hospital index is, in fact, used for these other services.

Another potential problem with the current input price adjuster is that its components have been subject to manipulation for purposes of changing the distribution of payments. The primary example of this phenomenon is the requirement that the GPCI applied to the physicians' work component of physician payments be allowed to reflect only one-fourth of the variation indicated by the underlying wage data, i.e., the quarter work GPCI. This compresses payments around the national average, reducing payment for high-cost areas and increasing payment for low-cost areas relative to the full adjustment. The hospital wage index also has been subject to manipulation, as each year hospitals are allowed to apply for reclassification to a market area other than the one in which they are located, so that they may receive payment based on a higher wage index; in fiscal year 2000, over 400 hospitals were reclassified for this purpose, resulting in numerous discrepancies between the wage index and the average hourly wage in the area (Federal Register 2000). The indices can be recalculated to remove these effects.

In the face of these types of criticisms, policymakers may wants to consider alternative approaches to the current Medicare+Choice input price adjuster. In fact, CMS (2001) has produced an alternative index that will be discussed in the following section. However, before looking at that specific index, it is useful to examine the range of questions that must be answered in the development of a Medicare+Choice input price index.

- *What input prices should be captured in the index?* The prices for the basic inputs in the production of health care services should be reflected in the index, especially if the prices are likely to vary across geographic areas. These input prices include those associated with labor, office space, equipment, supplies and, possibly, medical malpractice insurance. Labor inputs would include physicians, nurses, technicians, other support personnel and administrative staff (e.g., secretaries, medical record managers and accountants).

- *What technical structure should be used to compute the index?* In a variety of policy applications related to both output and input price indices, the Laspeyres index is the preferred technical structure. It is used within the Medicare physician fee schedule to create the Geographic variations factor and is the basis of the Consumer Price Index. This index form assumes that input mix remains constant across areas at, say, a national average input mix so that differences in the index capture only differences in input prices. It is desirable because it can be computed by having data on input prices (a minimum requirement for any index that would meet the policy purpose) and a single set of input weights. A more sophisticated index that allowed for substitution in the mix of inputs across areas in response to variation in input prices (e.g., Paasche Index) would require input weights for each geographic area and this is not likely to be feasible in most circumstances.

- *What input quantities, or weights, could be applied within this technical structure?* If data on geographic variation in the basic health care input prices are available, then the Laspeyres index could be computed in a single step with weights being the national shares of Medicare expenditures associated with each of these inputs. However, data that allows policymakers

to compute weights that reflect cost shares for each input across all services are not likely to be available. Fortunately, the Laspeyres structure can accommodate another approach. If we know the share of costs that is related to each input for each Medicare service, we can compute service-specific Laspeyres geographic input price indices. Based on past experience with fee-for-service payments, this is likely to be known for the relevant services. These service-specific indices can be combined into a Medicare+Choice payment adjuster by weighting each index by the share of Medicare expenditures accounted for by that service. The most credible expenditure shares to use in this application, in all likelihood, would reflect spending within the Medicare+Choice program.

- *What geographic areas should be the basis for measuring input price variation?* The choice of a geographic basis for an input price involves a trade-off between the desire for homogeneity of prices within areas and the desire for virtually self-contained and distinct markets. The first criteria would suggest small areas, such as counties or aggregations of zip codes, while the latter might require working with states or groups of state. A reasonable compromise that has been used in previous input price indices (e.g., Welch, et al., 1989) involves the Metropolitan Statistical Area (MSA) and non-MSA areas of states. MSAs are defined to be groups of adjacent counties with close economic ties. These geographic constructs are large enough so that very few workers would reside in one MSA and work in another. However, because MSAs may include high-density core counties, close-in suburbs and a fairly remote suburban ring, there is likely to be a significant gradient in wages and rents. This would introduce unwanted within-area variation in input prices, but policymakers have seemed willing to accept the MSA as a relatively uniform input market.

- *What geographic areas should be the basis for establishing payments to Medicare+Choice plans?* Currently, plans are paid on the basis of the county of residence of the beneficiaries that they enroll. This could continue, even with an MSA-based input price index. The same input price index values could be mapped to each beneficiary's county within the MSA and county-level payment amounts could be computed. To the extent that there was border-crossing to receive care, input price indices from multiple MSAs and non-MSA areas could be combined into different county-level payment indices using, say, the share of beneficiary expenditures occurring in each MSA and non-MSA (above some trivial share). CMS staff have used this latter type of approach in an alternative Medicare+Choice input price index that they developed (CMS 2001).

- *What criteria should be used to assess the data used to measure either the index weights or input price variation?* Ideally, the input price data would measure the market price for each of the basic inputs within each geographic area. Similarly, the data for the weights would allow for computation of expenditure shares within Medicare+Choice services and cost shares for each input by type of service. Inevitably, there is a trade-off between having data that precisely captures the concepts and having data that is available or, at least, easily collected. In a bow to data availability, policymakers have been willing to rely on "proxy" data for which a credible argument can be made about its correlation to the actual price or weight. Although actual and precise data might be desired, the costs of developing such data might be so high relative to the costs of using credible proxies that indices will be computed on a proxy basis.

D. AN ALTERNATIVE TO THE CURRENT INPUT PRICE INDEX

The CMS produced an alternative input price index that addresses perceived shortcomings in the BBA approach (CMS 2001). This index has not yet been adopted for use in Medicare+Choice. The CMS "derived index" is built up from the current set of fee-for-service input price indices (i.e., Hospital Wage Index and elements from the Geographic Practice Cost Indices) as well as three new input price indices. The first two new indices relate to the adjustments required to reflect differences in physician input prices. CMS suggests replacing the quarter work GPCI used in the physician fee schedule that is based on one-quarter of the geographic differences in professional wages (Zuckerman and Welch 1990) with an index based on the full variation in physician wages. In addition, the report proposes making an explicit adjustment for variation in the costs of fringe benefits for physicians and their employees. The third new index would adjust for differences in the administrative input prices facing HMOs.

One of the first steps in developing this alternative geographic input price index for Medicare+Choice was deciding which categories of services would be reflected in the index. Rather than rely on the parameters reflected in the BBA, CMS reviewed data from InterStudy to determine the distribution of Medicare managed care payments by types of service. This resulted in the decision to reflect input price variation in inpatient hospital services, physician and other professional services, hospital outpatient services (including ER care), and administrative costs. There was an explicit decision to assume no geographic variation in costs for pharmacy, durable medical equipment and other services. The weights applied to the input price indices for each of these service categories are as follows:

- inpatient hospital services, 31.9%;
- physician and other professional services, 45.1%;
- hospital outpatient services (including ER care), 5.3%; and
- administrative costs, 10.1%.

The remaining 7.6 percent of Medicare managed care spending relates to the services for which "no variation" is assumed.

In developing the new input price indices and in applying the data from the current set of indices, CMS chose to focus exclusively on relative input costs and removed all of the policy modifications that had been made to the existing indices. CMS correctly argued that these modifications tend to compress index values across geographic areas and create an "implicit subsidy for rural counties." However, recognizing the policy interest in favoring rural areas in payment systems, CMS developed an overall adjustment for its derived index that would explicitly provide a subsidy to rural areas to keep total rural payments at the same level as in the BBA payment system. The justification CMS gives for this adjustment is that maintaining adequate access in rural areas can be viewed as a "public good" and that this would require paying more than would be warranted based solely on input prices.

E. DATA AVAILABILITY AND FEASIBILITY OF NEW DATA COLLECTION

The current input price index used in Medicare+Choice is based on hospital wage data collected through an annual survey of hospitals, professional and non-physician employee wage data derived from the Decennial Census and fair market apartment rents developed by the U.S. Department of Housing and Urban Development. These data sources have been used to adjust Medicare fee-for-service payments for more than a decade and are well accepted. In developing an alternative to the current index, CMS expanded the set of input price information to include physician wage data from the Decennial Census and a compensation index from the Bureau of Labor Statistics. CMS also used data on physicians per capita and the number of office-based physicians from the Area Resource File (ARF) as part of their approach to incorporating the Census data on physician wages.

With the exception of the wage data derived from the hospital survey, all of these input prices are proxies for the actual prices health care providers pay for inputs. Although the practice of using proxies is established, the option of collecting or compiling data on the actual input prices providers pay would be feasible. For example, rental data from the HUD fair market rents could be replaced with actual data on rents for professional office space if questions about the credibility of the HUD data were raised. However, the HUD data have been used because there are no extant sources of data on professional office rents with broad enough geographic coverage to be used in a nationwide input price index. Therefore, CMS would have to develop a special survey to gather the necessary data to replace the fair market rents. Ultimately, the decision to go down the road of replacing the office rent proxy with actual office rent data will depend on the costs of collecting actual data relative to the perceived benefits of removing the proxy measures.

V. ELEMENTS OF THE "OTHER GEOGRAPHIC" AND "OTHER INDIVIDUAL CHARACTERISTICS" ADJUSTMENT FACTORS

Beyond the risk-adjuster and the input price index, what other factors might be considered as part of the model for predicting expected payments? This set of other factors potentially influencing Medicare expenditures per beneficiary can be conceptualized as coming from either of two, somewhat overlapping analytic frameworks. One is economic theory of the demand for and supply of medical care, which identifies variables as those that influence the **demand** for care (such as income, supplementary insurance, education, race, marital status, and inconvenience costs), or the **supply** of care (market characteristics that influence providers' willingness to provide services, given a level of payment), after already accounting for the effects of health on demand and input prices on supply (Grossman 1972; Cutler and Sheiner 1999). The other framework is the **enabling** and **predisposing** domains established by Aday and Andersen (1974) in their work on access to (and use of) medical care. (Their third domain, **need**, fits best as an element of the risk adjuster.)

This chapter begins with a review of past research on the determinants of Medicare spending per beneficiary in order to identify factors other than risk and input prices that have been found to affect Medicare spending. We then move to consideration of the appropriate geographic unit for constructing the adjuster for other geographic factors and of data availability. Since Medicare's administrative data on beneficiary characteristics are very limited, we explore the feasibility of using information on population characteristics at the sub-county level as approximations for individual characteristics. In effect, the adjuster for individual characteristics becomes another geographic adjuster rather than a individual-specific adjuster.

A. PRIOR RESEARCH ON DETERMINANTS OF MEDICARE SPENDING PER BENEFICIARY

Given the emphasis on the relationship between risk adjustment, health measures, and the very modest amount of information available for all beneficiaries on socio-economic characteristics, relatively few studies have gone beyond these basic factors in trying to explain variations in Medicare expenditures per beneficiary. Grana and Stuart (1996/97) were interested primarily in the effect of supplementary insurance on access to care by beneficiaries with arthritis. Using data from the MCBS, they found that both private supplementary insurance as well as dual coverage through Medicaid had statistically significant and positive effects on the use of care. Another significant predisposing characteristic was education, which also had a positive effect on use. Dansky et al (1998) analyzed service use by beneficiaries in rural areas using MCBS data. They identified several personal and market characteristics as having significant effects on either inpatient days, physician visits, or home health visits: Medicaid coverage, the number of people in the household, hospital beds per population, nursing home beds per population, home health aids per population, marital status, and education.

Two studies have used MCBS data to analyze spending for home health care. Hadley et al. (2000) found that Hispanic ethnicity, African-American race, the proportion of for-profit home

health care agencies in the area, and Medicaid spending for long-term-care services were significant determinants of home health care expenditures for a sample of beneficiaries who had been hospitalized. Anderson, Norton, and Kenney (2001) analyzed a more general sample from the MCBS to assess both any use of home health care and home health care expenditures, given any use. They also found that Medicaid spending and the availability of home health agencies, along with race and metropolitan residence, were significant factors.

Another body of research has examined variations across areas in Medicare spending per beneficiary. Cutler and Sheiner (1999) found several supply-side factors (beds per 1000 population, percentages of beds in for-profit and government hospitals, physicians per 100,000 population, and the percentage of physicians who are specialists) to be statistically significant ($p \leq 0.10$) determinants of variations in Medicare spending per beneficiary across 212 hospital referral regions in 1998. Rizzo (1992) analyzed Medicare expenditures per beneficiary across states. Although he was primarily interested in the effects of Medicare hospital and physician payment rates, his model found that the percentage living in metropolitan areas and area level income were both positively related to Medicare expenditures. Baker (1997, 1999) analyzed the relationship between HMO penetration in a county, both total and Medicare-specific, and both levels and changes in Medicare fee-for-service expenditures per beneficiary. In general, he found that greater HMO market penetration was associated with a lower level and slower growth of Medicare FFS expenditures per beneficiary.

Given the limited research on Medicare expenditures per beneficiary that goes beyond the relationship between risk adjustment (health, age, gender, institutional status, and Medicaid coverage) and health care use, the following two sections on potential variables will also be based on consideration of the broader literature on the determinants of medical care use.

B. POTENTIAL CANDIDATES FOR THE INDIVIDUAL CHARACTERISTICS ADJUSTMENT FACTOR

This section identifies individual characteristics that might be considered as adjustment factors in the Direct Payment Method. From a practical perspective Medicare does not currently obtain this information for all beneficiaries, nor is it likely to do so because of the cost and potential privacy implications. Therefore, if these factors are to be incorporated into the Direct Payment Method, they would need to be represented by area-level proxy variables.

As noted in Chapter III, the individual characteristics of age, gender, health, institutional status, and Medicaid coverage would be captured by the risk adjuster. Other potentially relevant individual characteristics are:

- income (as a proxy for supplementary insurance coverage and ability to afford out-of-pocket expenses),
- education,
- marital status,
- living arrangement (alone, with spouse, with someone else, or number of people in the household), and

- type of community (metropolitan or rural).

Drawing on the broader literature on determinants of service use, one should also consider the following individual characteristics as potential candidates for estimating a predictive model:

- race,
- ethnicity, and
- non-English speaker.

The 5-digit residential zip code, which is available for all beneficiaries, can be used to assign population-based estimates of several socio-economic characteristics, primarily from the decennial Census of Population, to individuals. To the extent that a person's individual characteristics are correlated with those of people living in the same small area, then measuring these characteristics at the area level can provide increased accuracy in attempting to predict person-specific payments.

C. POTENTIAL CANDIDATES FOR THE "OTHER" GEOGRAPHIC FACTORS ADJUSTMENT (MEDICAL AND HEALTH CARE MARKET CHARACTERISTICS)

A major rationale for including geographic characteristics other than input prices is that they measure supply-side and market factors that can explain the use of services. As has been demonstrated in many studies of cross-sectional variations in service use, the availability and composition of medical providers affects the quantity and cost of services received. Policy should not necessarily recognize all variations due to supply-side factors as legitimate or desirable. However, incorporating these factors into a method for predicting expected payments reduces the likelihood of obtaining biased estimates of the effects of other variables. It also gives policymakers the opportunity to recognize the effects of supply-side factors and account for them in whatever way is consistent with policy objectives, such as discouraging both overuse and underuse of care.

The 5-digit zip code can also provide a very flexible mechanism for measuring the characteristics of beneficiaries' medical and health care markets. For example, beneficiary 5-digit residential zip codes and hospital 5-digit codes (available from Medicare's hospital provider file) can be used to calculate the distance to the nearest hospital (by applying the Pythagorean theorem to latitudes and longitudes of zip-code centroids) with certain characteristics (for example, hospitals of various sizes, teaching status, or with particular services). This is a more precise measure of potential travel time to expensive hospital-based medical care than county-based measures of beds or physicians per capita. As is well known, variations in county size and cross-county travel patterns make the county a poor approximation of a medical care market. Some interaction or adjustment would need to be made for urban and rural locations, since distances mean different things in different types of locations. Prior research has shown that from a demand perspective proximity is a significant determinant of hospital choice, even in metropolitan areas (McGuirk and Porell 1984).

Zip codes can also be used to construct supply-side measures of provider availability using variable-radius market definitions for different types of providers. For example, the number of hospital beds per capita within 10 miles, the number of physicians and home health workers within 5 miles, and the numbers of long-term care and rehabilitation beds within 20 miles. Empirical analysis would determine the optimal radii for different types of providers. However, the key point is that the definition of the medical care market would be flexible and not constrained by county or state borders.

Using information about the small area (5-digit zip codes) can also help control for potential community health risk factors (Kawachi, Kennedy, and Lochner 1997), as distinct from the effects of proxy measures of individual socio-economic characteristics described above. For example, the degree of income inequality, infant mortality, deaths from violence, and middle-age mortality may all be indicators of community structure that some researchers believe can influence both health needs and service use.

Potential geographic factors for inclusion in a model to predict expected payment per person include:

- physicians per population, by major specialty category (primary care, surgery, other specialties),
- hospital beds per population, by type of hospital (for-profit, public, teaching, other),
- nursing home beds per population,
- home health aids per population,
- percent for-profit nursing home and home health providers,
- HMO market penetration,
- hospital and HMO market concentration (herfindahl index),
- population density,
- measures of climate and air quality, and
- community structure and stability.

D. DATA AVAILABILITY

Summarizing the discussion of the previous two sections, by potentially incorporating adjustments for geographic factors other than input prices and for small-area population characteristics other than the demographic factors included in the risk adjuster, the Direct Payment Method would allow policy to take into account three broad sets of characteristics:

- individual socio-economic characteristics as approximated by variables defined for beneficiaries' 5-digit residential zip code areas;
- community health risk factors, also defined for 5-digit residential zip code areas; and

- medical care market characteristics, using flexible market area definitions either constructed from beneficiary and provider zip-code population centroids or existing political units (counties, MSAs), depending on the particular measure used.[3]

Table 1 presents information about the potential availability of the types of variables discussed above. This information is not exhaustive, but is meant to illustrate a number of possibilities. Information about the "unit of observation" for each variable is also presented.

[3] Although some of the market characteristics would be defined for areas larger than 5-digit zip codes, they would be assigned to people based on their residential zip code. For example, a county-level variable would be associated with all of the 5-digit zip codes within that county.

TABLE 1

POTENTIAL VARIABLES AND SOURCES FOR THE GEOGRAPHIC ADJUSTMENT COMPONENT OF THE DIRECT PAYMENT METHOD

VARIABLE	SOURCE	UNIT OF OBSERVATION
Proxies for Individual Socio-Economic Characteristics		
Income	Decennial Census	5-digit zip code
Poverty Status	Decennial Census	5-digit zip code
Education	Decennial Census	5-digit zip code
Marital Status	Decennial Census	5-digit zip code
Living Arrangement	Decennial Census	5-digit zip code
Race	Decennial Census	5-digit zip code; control for independent effects of neighborhood racial composition as well as proxy for individual's race, which cannot be measured accurately from Medicare enrollment data
Ethnicity (Ancestry)	Decennial Census	5-digit zip code
Foreign-born Status	Decennial Census	5-digit zip code
Non-English Speaker	Decennial Census	5-digit zip code
Community Type		Metro/rural - see population density below
Medical Care Market Characteristics		
Distance to Providers (e.g., nearest hospital, nearest large or teaching hospital)	Provider locations from Medicare provider files or association data (e.g., AHA Annual Survey of Hospitals)	Calculated from beneficiary and provider 5-digit zip codes
Physicians per Population (by specialty)	AMA Physician Masterfile or Medicare Physician Provider File	Use beneficiary and provider 5-digit zip codes to count number of providers within a particular radius of beneficiary's residential zip code.
Hospital Beds per Pop.		Use beneficiary and provider 5-digit zip codes to count number of providers within a particular radius of beneficiary's residential zip code.
Nursing Home Beds per Pop.		Use beneficiary and provider 5-digit zip codes to count number of providers within a particular radius of beneficiary's residential zip code.

VARIABLE	SOURCE	UNIT OF OBSERVATION
Home Health Aids per Pop.		Use beneficiary and provider 5-digit zip codes to count number of providers within a particular radius of beneficiary's residential zip code.
Percent for-profit providers	Association data bases; Medicare provider files (?)	Within a certain radius of beneficiary, or by metro/rural counties.
Hospital and/or Physician Market Concentration	Annual Survey of Hospitals; information on Medical Groups	Herfindahl indices can be computed from Annual Survey of Hospitals for various market definitions; similar data may be available on the presence of large medical groups.
HMO Penetration	InterStudy; Medicare+Choice enrollment data	County of MSA for InterStudy data; for M+C penetration could use percentage of beneficiaries within a particular radius based on residential zip codes
Potential Community Health Risk Factors		
Population Density	Decennial Census	5-digit zip code; could calculate for all zip-codes within a given radius to allow for intra-county variation
Climate		
Air Quality		
Mortality Rates (infant, middle age, violent)	Vital Statistics	5-digit zip code level; proxy for extent of health problems and social instability in local area
Medicaid Expenditures per Beneficiary	CMS	State or smaller areas if available; separate long-term-care spending if possible

VI. ESTIMATING THE EMPIRICAL MODEL UNDERLYING THE DIRECT PAYMENT METHOD

A critical element of the Direct Payment Method formula, equation (2) above is a set of weights that are implicitly incorporated into the adjustment factors, RF_i, IF_j, GF_j and ZF_i. If one thinks of the formula as a parameterization of the reduced-form of the demand for and supply of medical care given by equation (7), then the formula's implicit weights can be seen as corresponding to the coefficients obtained from empirical estimation of the reduced-form model. This chapter addresses a number of issues pertinent to estimation of the reduced-form, starting with the definition of the dependent variable. We then consider the appropriate functional form and several potential statistical problems that might be encountered in estimation. The last section outlines an approach to estimating the function and applying the results to the implementation of the Direct Payment Method.

A. THE DEPENDENT VARIABLE: PAYMENT VS. COST, OR WHAT'S P AND WHAT'S Q.

There can be considerable confusion, as well as disagreement, about whether the capitation rate is a payment or a cost. In spite of the natural and inherently satisfying desire to set the capitation amount equal to the "true" cost of efficiently delivered care, there are neither observable data nor any practical methods for identifying the true cost of efficiently delivered care. All that can be observed are providers' charges for care and the final transactions prices, i.e., how much they are paid. Neither of these observable items need bear any specific relationship to the true cost of care, except in the very special case of a perfectly competitive market with perfect information—conditions that most people agree do not hold in the market for medical services. Furthermore, the cost of efficiently delivered care will vary from market to market as a function of input prices and competitive conditions (Hadley 1991).

Based on these considerations, the discussion of the Direct Payment Method assumes that what is being predicted is Medicare payments for all covered services received by beneficiaries. In other words, we assume that the "Q" is all covered services, since health plans are, with only very minor exceptions, responsible for the full set of all covered services. This also means that extra benefits, such as prescription drugs, are not included in this concept.

The "P" refers to the variety of payment approaches Medicare uses to pay providers in the fee-for-service sector. By defining the dependent variable as total payments, rather than as prices or fees per se, we avoid the problem created by the fact that units of measurement and methods of payment differ substantially for different types of services.

Finally, defining "P*Q" as payments rather than underlying costs is appropriate because actual payments are what influence plans' decisions regarding participation in Medicare+Choice as well as the level of benefits offered. Payments, obviously, also represent Medicare's program costs. Medicare's ultimate policy goal should be to keep program costs reasonable or affordable while attaining desired levels of program participation and benefit levels. The underlying costs of an

efficiently managed plan, even if knowable, are not directly relevant to Medicare's decisions, which should be based on the tradeoff between program costs on the one hand, and beneficiary satisfaction and health, and plan participation and benefit levels on the other hand.

Initially, data on payments must come from Medicare's fee-for-service sector, since complete managed care encounter data are not expected to be available for several years. However, even if encounter data were available, they would still need to be *valued at Medicare prices used in the fee-for-service sector*. As noted in Chapter IV, services that plans buy from health care providers are paid for using a variety of methods, and, in addition, plans are very reluctant to divulge specific contract terms. Services they provide themselves have no explicit prices and would have to be priced using internal accounting data, which are not suitable for this purpose.

As discussed below, however, the method for predicting estimated expenditures per beneficiary may be able to adjust for factors thought to contribute to an overuse (or underuse) of services by fee-for-service beneficiaries. First, spending differences may be driven by utilization rates that may not reflect beneficiary need or efficient practice patterns. Second, consistent with the removal of GME payments from current Medicare+Choice rates, spending for plan enrollees is determined by payment policy provisions, such as GME and disproportionate share hospital payments, which may have little to do with the costs that plans face in providing Medicare benefits to their enrollees. Consequently, it may be desirable to either subtract GME and DSH hospital payments from observed payments per beneficiary (if that can be done in a reasonable way at the individual level) or make an ex-post adjustment based on including measures of the prevalence of teaching hospitals and low-income people (DSH recipients) in the geographic area in the model to predict expected payment per beneficiary.

B. EMPIRICAL/OPERATIONAL ISSUES

After identifying and defining appropriate variables for predicting expected payment per beneficiary, there are numerous empirical and operational issues that must be addressed. These include, for example, specification of the functional form, the unit of observation and the level of aggregation of particular variables, statistical issues (such as multi-collinearity, variable specification and omitted variables, and measurement error), the timing and periodicity of available data, and updating predicted payments based on prior years' data to the current or future payment period.

These are inevitable complexities that would need to be addressed to make the Direct Payment Method a policy reality. In most cases, however, their resolution depends on actual empirical performance with available data and on policy objectives, not just technical statistical issues. Therefore, since this report is a concept paper rather than a detailed technical assessment, we do not attempt to resolve all of these issues here, but only raise them as issues for further consideration.

1. Functional Form

The general representation of the model used to construct capitation payments under the Direct Payment Method was given by equation (7), which is reproduced below.

(7) $P*Q = C = h(R, I, P^D, X, Y)$, where

$P*Q = C$ = payment (for person i in area j, which becomes the capitation rate in the payment formula),
R = risk adjustment score,
I = input prices,
P^D = determinants of the demand price (money, time, inconvenience),
X = other exogenous demand determinants (e.g., income, education), and
Y = other exogenous supply determinants (e.g., provider market structure).

In this general specification, we denote the variables other than risk and input prices as P^D, X and Y to emphasize that the justification for including them in the model comes from the underlying theory of the demand for and supply of medical care. We make two changes in the process of converting this general expression into an empirical specification that can be translated into the formula for the Direct Payment Method. First, we "regroup and rename" the set of variables P^D, X and Y and refer to them as G, geographic factors other than input prices, and Z, individual characteristics other than the risk adjuster. Second, since Medicare administrative data do not contain the kind of information the Z vector connotes, such as education, income, supplementary insurance coverage, and living arrangement, in practice this variable will be represented by a set of area-level proxies measuring characteristics of the population. Ideally, these characteristics would be defined for small geographic areas, like the beneficiary's 5-digit residential zip code, and would refer to characteristics of the elderly population residing in the same zip code. Therefore, in the following notation, Z enters with a j subscript to indicate that it is defined for geographic areas, although it is meant to capture the effects of beneficiaries' personal characteristics.

Recent studies (Herring and Pauly 2001; Gilleskie and Mroz 2000) suggest that a functional form that is **multiplicative in the independent variables, but linear in the parameters** would be a good approximation of equation (7). A multiplicative function is also very amenable to constructing the adjustment factors in the Direct Payment Method formula as weighted indices, where the weights are based on the parameters of the empirically estimated expenditure model. In particular, the empirical version of equation (7) would be expressed as

(8) $(P*Q)_{ij} = C_{ij} = K * R_i^{\alpha} * \Pi I_{jm}^{\beta m} * \Pi G_{jn}^{\gamma n} * \Pi Z_{jo}^{\delta o}$, where

- $(P*Q)_{ij}$ = annual Medicare fee-for-service payments for beneficiary i in area j,

- K = the intercept term,
- R_i = individual risk-adjustment for beneficiary i,
- I_{jm} = a vector of m input prices[4] for area j,
- G_{jn} = a vector of n geographic characteristics for area j,
- Z_{jo} = a vector of o individual characteristics (measured by area proxies), and
- α, β_m, γ_n, and δ_o = parameters to be estimated.

(For estimation purposes, one would take logarithms of the right-hand-side of a multiplicative function to convert it into a form that is a linear function of the parameters, which significantly simplifies empirical estimation.[5])

A key characteristic of this form is that the national average payment per beneficiary, i.e., the national base rate (NB in equation 2), can be expressed as equation (8) evaluated at the national means of each of the independent variables. This enables one to rewrite equation (8) the form suggested by the Direct Payment Method, i.e., a national base rate adjusted by a set of indices.

To illustrate this relationship and to show how the adjustment factor indices would be constructed, the national base rate can be represented by equation (9), using ***bold italic*** script to represent national mean values.

$$(9) \qquad \boldsymbol{NB} = \boldsymbol{C} = K * \boldsymbol{R}^{\alpha} * \Pi \boldsymbol{I}_m^{\beta m} * \Pi \boldsymbol{G}_n^{\gamma n} * \Pi \boldsymbol{Z}_o^{\delta o},$$

where $\boldsymbol{C}$ is simply the national average payment per Medicare beneficiary. If one then multiplies and divides equation (8) by the ratio

$$[\boldsymbol{NB} / (K * \boldsymbol{R}^{\alpha} * \Pi \boldsymbol{I}_m^{\beta m} * \Pi \boldsymbol{G}_n^{\gamma n} * \Pi \boldsymbol{Z}_o^{\delta o})],$$

which is just 1, then equation (8) can be rewritten as the Direct Payment Method payment formula, which determines the capitation payment for beneficiary i living in area j, as the national base rate multiplied by a set of adjustment factor indices unique to the beneficiary's individual and area characteristics, i.e.,

$$(10) \qquad C_{ij} = \boldsymbol{NB} * RF_i * IF_j * GF_j * ZF_j.$$

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[4] Note that the estimation model is specified with input prices as independent variables, rather than an input price index. However, an input price index is created in converting the estimation model into a payment formula.

[5] More complicated mu ltiplicative forms, such as the translog form (Christensen and Greene 1976), could include interactions between all of the independent variables. However, in principle, these could still be reduced to the simple product of multiple indices. Whether the increased complexity is justified would depend on assessing the differences in predicted payments across beneficiaries of different characteristics and across groups of beneficiaries in different locations.

In this formulation, each of the adjustment factor indices would be defined as ratios of the values for person i living in area j to national means for those variables (represented by ***bold italics***).

- $RF_i = (R_i/\boldsymbol{R})^{\alpha}$ = risk adjustment index factor,
- $IF_j = (\Pi I_j/ \Pi \boldsymbol{I})^{\beta m}$ = input price index "adjustment factor" for area j,
- $GF_j = (\Pi G_j/\Pi \boldsymbol{G})^{\gamma n}$ = other geographic variables index "adjustment factor" for area j, and
- $ZF_j = (\Pi Z_i/\Pi \boldsymbol{Z})^{\delta o}$ = other individual variables index "adjustment factor" for person i (based on population characteristics of area j).

Once these factors were determined for each geographic area, which need not coincide with counties but would presumably be tied to beneficiaries' 5-digit zip codes, the resulting formula would be the simple product of the national base rate adjusted by a set of index factors representing the effects of health risk, input prices, other geographic factors, and other individual factors (represented by geographic proxy variables). One desirable characteristic of this formulation is that if policymakers desire capitation payments to be proportional to health risk and/or input prices, i.e., the payment would be twice as large for a person with two times the average health risk or living in an area with two times average input prices, this can be accommodated easily in the estimation process by setting $\alpha = 1$ or imposing the constraint that $\Sigma\beta_m = 1$ Note also that these indices imply that if a beneficiary has average risk and lives in an area with average input prices and average geographic characteristics, then each of the index terms would just equal 1 and the payment for that person would simply be the national average payment.

Equation (8) also allows for the possibility of creating interactions between different types of geographic areas (e.g., large central cities, suburban counties in MSAs, rural counties, census divisions) and both the risk adjuster and the input price index. In effect, if policy makers so desired, the effects of the risk adjuster and/or input prices could be allowed to vary with geography. Whether this would be desirable or not could be assessed by estimating equation (8) with such interactions to determine whether there are systematic or large differences across different types of areas.

2. Statistical Estimation

In this section we raise a number of issues that would need to be considered in estimating equation (7).

a. The Unit of Observation

One of the fundamental motivations behind consideration of the Direct Payment Method is the widespread concern that the county is not an appropriate basis for setting capitation payments,

because of substantial intra-county variation among individuals, instability over time in the components of county-level data used to compute rates, and seemingly anomalous differences between similar or even adjacent areas. Moving to the individual as the unit of observation will eliminate many of these problems, since people with similar personal characteristics will have similar predicted expenditures, except for variations due to differences in input prices and other characteristics of the areas where they live. Note, however, that even with the individual as the unit of observation, the input price index and the components of the other geographic variables adjustment factor and other individual variables adjustment factor would be measured for different geographic areas (5-digit zip code, variable-radius medical care markets, county, and MSA). **For the purpose of estimating equation (8), these area-level measures would be linked to the individual data on payments and health risk.**

Ultimately, however, determination of the most appropriate geographic units for defining the geographic factors in the model is an empirical issue that should be tested and examined in terms of the implications for the stability and plausibility of their effects on predicted expenditures. Alternative approaches to defining geographic units should be assessed in terms of their face validity, predictive power, stability, and variations across areas as well as across individuals.

b. Misspecification

Misspecification refers to omitting relevant variables from the model. In general, the consequence is to bias the estimates of parameters of variables that are correlated with any omitted variables that have a significant effect on expenditures. This can be especially problematic if policy makers choose to base a geographic adjuster in the Direct Payment Method on a limited number of variables, since, in effect, their weights would be biased. Therefore, it is preferable to estimate a fully-specified model, which would reduce misspecification bias. If policy chooses to ignore certain variables, then their values in the predictive formula would be set to their national averages. In effect, those variables would be "folded into" the base rate essentially as constants, since their values would not vary across areas or beneficiaries.

c. Measurement Error

Measurement error will arise primarily from using small-area (5-digit zip code) population characteristics as proxies for unobservable personal characteristics, such as income, education, race, etc. This could lead to bias in the estimates of these variables' parameters. However, the extent of this type of bias would have to be weighed against specification bias, i.e., omitting significant variables from the model. If the measurement error is not systematically related to characteristics of individuals, however, its impact on predicted payment rates may not be substantial. (This and other empirical issues could be tested using data from the MCBS, which measures many of the potentially key socio-economic variables for individuals.)

d. Multicollinearity

Multicollinearity refers to a high level of correlation among variables in the model. Its consequence is to increase the standard errors (and reduce the statistical reliability) of the

estimated parameters. To the extent that the specific values of some parameters are not critical, i.e., the variables are used primarily to increase predictive accuracy, then multicollinearity may not be a severe problem.

e. Timing and Periodicity of Available Data

The risk adjuster and some components of the input price index would be available on an annual basis. Population characteristics used to link to beneficiaries at the zip-code level and some of the wage data in the input price index would only be available from the decennial census. Other geographic modifiers for the supply-side of the model, such as hospital bed availability, physician availability, measures of distance to nearest hospital, HMO penetration, and provider market concentration could be adjusted annually.

Another potentially important issue is re-estimating the underlying model's parameters on a periodic basis to adjust for the effects of changes in technology and in practice patterns. For example, the model's parameters could be re-estimated every five years, with a phased transition from payments based on the prior model over two/three years would both provide stability while recognizing changes in technology, medical practice, and market conditions.

C. SUMMARY: AN ILLUSTRATIVE EXAMPLE OF IMPLEMENTING THE DIRECT PAYMENT METHOD

In this section we provide an illustrative example of the steps that might be taken to construct the formula that the Direct Payment Method would use to establish M+C payment rates for individual beneficiaries.

1. We assume that the risk adjuster and the input price index would be developed separately by CMS.

2. Select a broad set of other variables, such as those listed in Table 1, to capture the effects of geographic and personal characteristics other than risk and input prices.

3. Attach these geographic variables to individual data from the 5% national sample of beneficiaries using flexible definitions of geographic area, e.g.,

    - 5-digit zip code for socio-demographic characteristics
    - variable-radius (from 5 to 20 miles) medical care markets for different types of provider availability (constructed from population centroids of beneficiaries' and providers' zip-codes)

- county or MSA for selected other factors, such as HMO penetration or hospital concentration.

4. Use a multiplicative functional form, such as equation (8) above, with annual payments from FFS per beneficiary as the dependent variable to estimate the parameters of the payment formula.

5. Test the sensitivity of the model's parameters to a variety of assumptions regarding variable specification, geographic definition of market characteristics, and alternative functional forms.

    - Estimate with all variables;
    - Estimate a "policy" model that includes only risk and input price adjustments;
    - Estimate submodels that exclude highly correlated or statistically insignificant variables.

6. Conduct further sensitivity tests be using the parameters to predict expenditures for an independent sample drawn from another year of the 5% sample; can also use the MCBS to estimate parallel models using directly observed individual characteristics in place of area proxies.

7. Once a "fully-specified" model, i.e., with all available relevant variables included, policymakers may choose to limit the amount of variation due to any particular factor by setting upper and lower bounds on the degree of permissible variation in the payment formula. For example, one of the individual characteristics variables in the model might be per capita income of elderly people living in the same zip code. Presumably, this variable would enter with a positive coefficient, suggesting that higher income people are more likely to have supplementary insurance coverage, which leads to higher use and higher Medicare payments. However, policymakers may not wish to recognize all of this variation as desirable and could set both ceiling and floor amounts for this variable in transforming the estimated relationship into the payment formula. In other words, actual values of the variable above the ceiling would be lowered to the ceiling level and actual values below the floor would be increased to the floor level in the formula. Rather than setting floor (or ceiling) on the overall rate for an entire county, as the current method does, policymakers could focus on specific determinants of variations in payments and decide explicitly whether to bound or limit their effects on payment rates.

8. Estimate variations in payment rates that would occur from restricting the amount of permissible variation between upper and lower bounds of particular

geographic variables (such as per capita income or the physician to population ratio), or setting certain variables to their national averages (no variation).

9. Compare to payment rates under the current methodology for particular types of beneficiaries and particular types of areas. Assess whether geographic variation increases or decreases, and whether there are systematic changes in payments to plans in various types of locations.

Once the parameters of the final payment algorithm were determined, its implementation could be developed as a computerized "look-up" table. To calculate the expected payment for a beneficiary enrolling in M+C, one would need to know the value of the beneficiary's risk-adjustment factor, which presumably would be developed independently by CMS, and the beneficiary's 5-digit zip code and other relevant geographic identifiers, such as the county code or MSA code, to coincide with the geographic variables in the payment algorithm. These geographic codes would "import" the relevant values of the geographic variables (from separate geographic files) for that individual into the payment algorithm, which would then compute the M+C capitation payment.

VII. THE DIRECT PAYMENT METHOD IN THE POLICY CONTEXT

A. POLICY CHOICES THAT NEED TO BE MADE

Although the Direct Payment Method described in this paper would establish the approach to setting payments for private plans participating in Medicare, it still leaves open a broad range of policy choices that would have substantial impacts on the specific payment system adopted. In its most restrictive form, for example, this model could limit allowable geographic variation to only that arising from the risk adjuster and the input price index. There is widespread agreement that these two measures need to be applied to any payment system. But even if they are perfectly measured--an unlikely prospect--the geographic variation they would produce would be much lower than the variation in spending that exists on the fee-for service portion of Medicare. Limiting adjustments to these two factors would essentially minimize the geographic variation allowed.

On the other hand, the model could incorporate differences in use of services that arise from differences in practice patterns, individual preferences and other factors. Many personal demand and provider supply determinants help to explain differences in fee-for-service spending.

Thus, a key policy decision is choosing which factors represent appropriate reasons for spending differences and which do not. For example, spending may be greater among high income beneficiaries after adjusting for risk, but it may not be desirable to build such a differential into the payment policy. In fact, just the opposite might be the case. That is, it may be important instead to adjust low income area payments upward recognizing higher unmet needs. The analysis that quantifies the impact of income on spending could be used to make such an adjustment so that enrolling individuals in areas with low incomes could give a "bonus" payment to the private plan. This approach likely would retain more of the variation in spending across areas of the country. Further, other decisions such as how to weight certain variables and what to include in the risk adjuster and input price index could also affect the results either through explicit or implicit policy choices.

Why does payment variation across the country matter? One of the goals of the Balanced Budget Act was to reduce variation in payments across the country, in part to assure that rural areas and low cost urban areas received higher payments. It established the concept of a blend of national and county spending levels (MedPac 1998). The response to the policy, however, has been much less than hoped. Plans have not moved into rural areas; indeed, only the urban floors seem to have had much impact on actual plan behavior (MedPac 2000). Further, one rationale for offering a private plan option in Medicare was that plans could do things that government could not -- such as reducing use of unnecessary services in high cost areas, for example. Since many of the private plans are national in scope and presumably have guidelines for appropriate care, many supporters have argued that they could reduce some of the undesirable geographic variation that occurs because of practice patterns or other factors. In that case, payments should not vary for reasons of practice pattern differences, for example, and the Direct Payment Method might lean to more of a national payment rate.

In practice, however, private plans have not done much to coordinate or manage care. Their emphasis has been on seeking discounts from providers of services. As a result, complaints from plans in high cost areas are that they need high payment levels to be able to attract patients. Thus, plans have argued for a return to payments tied to local fee-for-service spending levels so that they can compete with the fee for service portion of Medicare (AAHP 2001). Under this view, private plans can only survive if they can continue local norms of care delivery. Thus, a key issue is the extent to which payment policy should encourage private plans to change the way that care is delivered in local areas.

The ability to adjust various components of the Direct Payment Method to meet particular policy goals can be viewed as either a strength or a weakness. It opens up the payment process to political influence and maneuvering, particularly as compared to the current payment system which does not attribute variation to specific parameters such as physician supply or beneficiaries' incomes. Thus, the model could be described as either permitting more careful decisions about allowable geographic variations or inviting politics to interfere with sound policy decisions.

B. ISSUES AND IMPLICATIONS FROM OTHER STAKEHOLDER PERSPECTIVES

Any system of administered prices is likely to be subject to considerable criticism: what exactly is the right price for government to pay plans is a question that will be answered quite differently by various stakeholders. Earlier in this paper, we argued that the government's goal is to establish payment rates that encourage plans to participate but do not cost CMS "too much." If the payment system is successful in paying plans approximately what it would cost under fee for service, it is likely that some additional benefits would be offered by plans, but perhaps at a lower level than has historically been the case. These extra benefits are made possible by the efficiencies generated by managed care and by higher than necessary payments as a result of poor risk adjusters. Thus, a successful payment system would likely reduce those benefits made possible when CMS now pays “too much.” But both plans and beneficiaries would prefer payments sufficient to cover additional services at the level available before the BBA changes came into place. One policy choice thus could be to allow some additional plan payments to continue extra services.

While the focus of the Direct Payment Method is on improving relative prices across the country, the basic national level that is established will inevitably influence the debate and, likely, the success of any reformed payment method. That is, it is difficult to distinguish criticisms of the current payment system between the average level of payment and the adjustments made by county. High cost plans complain that they do not receive payments high enough to meet their needs: is this because the overall average is too low or because their county adjustment is too low? This issue needs to be kept in mind in looking at stakeholder concerns. Further, the overall average level can have an impact on how much variation is allowed by area. If the goal is to squeeze these payments as much as possible to generate price competition among plans and savings for the federal government, a major effort to reduce spending levels in high cost areas might keep some of the pressures for lower payments away from lower cost areas.

Even if plans are "overpaid" on average for the full range of Medicare-covered services, the difference is used to provide extra benefits for enrollees. Both beneficiaries and plans find this to their advantage. Beneficiaries have generally faced lower out-of-pocket costs when they are in these plans and health plans use extra benefits as a marketing strategy for luring beneficiaries away from the traditional fee for service portion of Medicare (Cassidy and Gold 2000). The debate about the level of payments is certainly closely related to the question of what benefits to assume. But it may also be important to the Direct Payment Method's approach to variation. For example, the development of a risk adjuster should include spending on prescription drugs if they are to be a part of the covered package.

Since the payments would be assigned on a beneficiary level basis, another policy issue will be the stability of payments over time and how much variation will occur within small areas and across the country. To some extent this is an empirical issue that will depend upon the specifics of the model as described above. But it can also be an explicit goal of the model to assure, for example, that the discontinuities that now exist across counties within an MSA are reduced or that overall variation in payments be kept within certain bounds. Again, this would be accomplished by choosing among the personal and area characteristics to include in the payment formula.

To some extent, it is not difficult to determine stakeholders' likely positions on the refinement of a new payment model, but it is useful to consider each of the four major groups -- plans, beneficiaries, providers of care, and taxpayers -- since there are likely to be conflicts among them over time.

1. Health Plan Issues

In an environment where health plans are free to choose whether to participate in the Medicare program, they must above all believe that they are being treated fairly by the payment system. A number of specific concerns fall under that rubric;

- Is the overall level of payment high enough to attract their participation?
- Is this likely to be a stable and predictable system?
- Does the payment level recognize the diversity in payments needed for patients of different types?
- Are the administrative and regulatory burdens (including data reporting) reasonable?

The payment level faced by plans will depend both on the overall average and the factors that lead to specific rates in various parts of the country. That is, the decision to participate in Milwaukee will depend upon what the impact of the Direct Payment Method is on beneficiaries who will sign up for plans in that city. And although plans are free to charge premiums for provision of extra benefits, in some places, plans have been so concerned about adding premiums or reducing benefits that they have pulled out of areas altogether, fearing that they could not

attract a good mix of beneficiaries. Thus, relatively small differences in payment levels may cause plans to withdraw from or fail to enter a market.

Another issue that needs to be taken into account in considering any new payment system is the extent to which it will provide stable, understandable levels of payment. Any private plan must be concerned about whether they will have a predictable flow of government payments and whether it meets their perceptions about the costs of providing care for individuals in a particular area. The advantage, for example, of area-based payments is that a plan can determine whether it is feasible to operate in a particular location since it will generally understand the payments relative to other areas where it operates. Further, many private plans now argue that to be competitive in an area, their style of practice cannot be that different than what occurs under the less controlled fee-for-service sector. Consequently, the American Association of Health Plans has advocated payments equal to 100% of FFS costs in each payment area (AAHP 2001).

Since plans would be required to take all comers, it is also likely that they will carefully review the risk adjuster to determine whether they believe it fairly captures differences in the costs of providing care to those who are likely to enroll. Even if the overall level seemed adequate, plans may be very reluctant to participate in this program unless they believe that the risk adjuster makes sense. Otherwise, if they draw an enrollee group that differs from the average beneficiary group, they may believe that they would be at considerable financial risk. On the other hand, the Direct Payment model may reduce some of the uncertainty in payment that arises from the current county-level system where outliers can affect payment levels. The issue of stability for plans is thus hard to assess under alternative approaches since a number of factors would come into play.

Finally, plans may question whether there is any acknowledgement in the payment system for the administrative costs they face both from Medicare and from local or state requirements for reporting or marketing, for example (Gold 2001). While this is likely to be largely outside the purview of the Direct Payment Method, plans may feel that it is too narrowly drawn to take this issue and related issues of local area practice differences into account. A potential advantage of a Direct Payment Method, however, is that it could explicitly recognize the high costs of certain types of patients that go beyond basic risk adjusters: income or living environments, for example.

2. Beneficiary Issues

There is likely to be considerable overlap between at least some beneficiaries and health plans in what they wish from the M+C program and what is needed from the payment system. Although perhaps for different reasons, beneficiaries who choose to enroll in private health plans and plans are likely to both want:

- Payment levels sufficient to provide extra benefits and/or lower cost sharing;
- Stability in plans and the providers in those plans over time;
- Payments that effectively compensate plans for higher cost patients.

Beneficiaries' desires in joining managed care plans have been quite clear: they value the extra benefits and generally lower cost sharing that such plans have been able to offer, at least until

recently (Cassidy and Gold 2001). The restricted growth in M+C payments since 1997 has caused plans to cut back on extra benefits, much to the dismay of many beneficiaries. As noted above, one goal of a Direct Payment Method is to achieve payments that efficiently cover the costs of providing Medicare-covered services; if it were successful, the extra benefits would likely be cut further or plans would have to raise the premiums they charge for these extra benefits. Both participating beneficiaries and plans are likely to be unhappy with this outcome. On the other hand, it is important to consider whether setting payments to private plans higher so that they will offer additional benefits is good policy. This has been cited as an explicit goal by some policy makers to compensate for the greater restrictions that beneficiaries face in these plans. It seems likely that for the foreseeable future, such plans will serve only a minority of beneficiaries, both because of the unavailability of offerings in some parts of the country and because of patient preferences. Thus, explicit subsidies to private plans for benefits such as prescription drugs will be limited to only a portion of Medicare beneficiaries. And since studies have indicated that those who remain in traditional Medicare are sicker and more frail than the average beneficiary, why should they be excluded from getting extra benefits? On this issue, beneficiary interests are likely to be split.

Another beneficiary concern is for stability of their health care. If plans withdraw or change premiums on a year to year basis, beneficiaries will be disinclined to choose another private plan option. Again, this is an area where both plans and beneficiaries are likely to be in sync. If payments are held down and/or they change substantially from year to year, beneficiaries will likely suffer. This is likely to also affect satisfaction and hence participation of providers in plans.

Finally, beneficiaries with health problems often currently find that they are not as well served by HMOs and other private plans as are healthier patients. Satisfaction levels are lower for those in poor health, for example (MedPac 2000). And patients who disenroll tend to have health problems (Gold 2001). Will the Direct Payment Method succeed in making patients with health care problems more attractive to plans? In large part this turns on the effectiveness of the risk adjustment factor—a problem that will be present under any payment system. But the presence or absence of other adjustments could also affect whether plans seek out sicker beneficiaries or continue to discourage their participation. Improvements in this area would give sicker beneficiaries better access to alternatives than under the current system where they may feel unwelcome or poorly treated in health plans.

3. Provider Issues

Physicians, hospitals and other providers of care also have concerns about how payments are distributed to private plans. If payment levels, for example, are below costs for the FFS program, plans may seek to squeeze providers with low payments and tighter program controls. Thus, providers have a stake in ensuring that plan payments reflect practice patterns and supply factors for the local area. For example, if there are additional factors that raise the costs of practicing beyond what is captured in an input price index, they would likely favor a Direct Payment approach if it included these other adjustment factors. Further, to the extent that

providers in an area have considerable market power, they may be able to demand higher payments that would not be reflected in a national-level payment system.

Finally, they are also likely to have a considerable stake in whether special payments are built into the payment system and if so, what mechanisms will be in place to assure that they receive reasonable payment levels from plans. Among the most important of these are special payments for graduate medical education and disproportionate share hospitals, for example.

4. Taxpayer Issues

As the payers of a large share of Medicare costs, taxpayers have a strong interest in holding down costs of care. Unless there is an explicit decision to only allow extra benefits in M+C (as a means for avoiding more widespread benefit expansion), taxpayers might find it in their interest to allow "excess" payments to plans. But the issue of fairness both across areas of the country and beneficiaries themselves could raise red flags that would likely make such an approach politically infeasible.

Finally, in addition to the issue of attaining greater efficiency in the delivery of care and perhaps some cost savings, the public interest in a system of private plans providing care under Medicare is to get politics out of the delivery of care and the necessity for the government sector to make detailed payment decisions regarding provider payments, for example. But if the administered payment system turns out to be very detailed and prescriptive, then that goal may not be achieved. That is, if the Direct Payment Method is subject to too much manipulation, it may simply raise the stakes on price setting since it all has to be done in the context of one mechanism. This is an issue of concern to both CMS as an administrative organization and to taxpayers with an interest in "good" government.

C. CONCLUDING COMMENTS

This concept paper has examined issues that would need to be addressed in developing the Direct Payment Method for establishing capitation rates as an alternative to the current Medicare+Choice system. In going beyond risk and input price adjustment, the analyses required to develop the Direct Payment Method concept would identify the sources of local variation in Medicare expenditures. It would be up to policymakers to decide which of these factors to explicitly incorporate in plan payments. However, the Direct Payment Method would not tell policymakers what is necessarily the "right price" or the "right degree of variation" to invite enough plan participation to produce the desired level of beneficiary access in all geographic areas. In this sense, the Direct Payment Method is not a panacea.

The further development of the Direct Payment Method should be viewed as an alternative to making political judgments that refine the Medicare+Choice system but may not be easily defended. Whether or not having this alternative is worth the required effort will ultimately depend on assessments of how well it might do at correcting problems within the current system.

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