Lessons for States in Inpatient Ratesetting Under the Boren Amendment

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Encouraged by a 1990 Supreme Court decision, Medicaid providers have challenged State inpatient ratesetting methodologies under the Boren Amendment. Procedurally, State assurances to the U.S. Department of Health and Human Services (DHHS) that payment rates meet the Amendment's requirements must be supported by findings based on a reasonably principled analysis. Substantively, rates may fall within a zone of reasonableness, but courts have differed in interpreting and applying the Amendment's terms. Although some courts have found special studies and written findings unnecessary, States that undertake economic analyses to support their findings are more likely to withstand judicial scrutiny. Several applicable economic analyses are proposed.

INTRODUCTION

Recently, Federal courts have become increasingly involved in setting State inpatient ratesetting policy through the Boren Amendment, a provision of the Medicaid law requiring States to provide assurances that their inpatient rates meet certain specified standards of adequacy. Although initially focusing on the procedural adequacy of State ratesetting processes, the courts have recently become more willing to rule on the substantive adequacy of specific rates and ratesetting methodologies. In this article, we summarize the results of Boren Amendment cases that have been decided by the courts and suggest strategies for States to satisfy the requirements of the amendment.

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BACKGROUND

When Medicaid was established in 1965, States were required to reimburse hospitals for their "reasonable costs" of providing inpatient services using the Medicare program's retrospective reimbursement methodology. There has since been a general recognition that retrospective cost-based payment is inherently inflationary and does not encourage cost-effective provision of services. Consequently, amendments to the Social Security Act were passed in 1968 and 1972 that allowed States to obtain waivers from the Health Care Financing Administration (HCFA) to conduct demonstrations applying alternative payment methodologies in their Medicaid programs.

In 1981, based in part on the results of the demonstrations, Congress passed the Boren Amendment (section 2173 of the Omnibus Reconciliation Act of 1981, 42 U.S.C. section 1396a[a][13][a]) (section 1902[a][13][A] of the Social Security Act) to reduce Medicaid expenditures and their rate of increase by providing States

greater flexibility in developing their own Medicaid inpatient ratesetting systems. However, in granting the States flexibility to develop their own payment systems and reduce costs, Congress insisted that rates be adequate to meet the needs of providers and recipients. Under the amendment, the State Medicaid plan must provide:

> "[F]or payment . . . of the hospital, nursing home, and intermediate care facility services approved under the plan through the use of rates (determined in accordance with *methods and standards developed by the State* and which, in the case of hospitals, take into account the situation of hospitals which serve a *disproportionate number of low income patients . . .*) which the State *finds, and makes assurances satisfactory to the Secretary, are reasonable and adequate to meet the costs which must be incurred by efficiently and economically operated facilities* in order to provide care and services in conformity with applicable State and Federal laws, regulations, and quality and safety standards and to ensure that individuals eligible for medical assistance have *reasonable access* (taking into account geographic location and reasonable travel time) to inpatient hospital services of *adequate quality* . . . ." (Emphasis added to identify the terms that have been most important in litigation.)

Thus, the Boren amendment includes three basic requirements. The State plan must provide assurances that it pays at rates that:

- Are reasonable and adequate to meet the costs that must be incurred by efficiently and economically operated facilities.
- Are reasonable and adequate to ensure that Medicaid recipients will have reasonable access to inpatient hospital services of adequate quality.
- Take into account the situation of hospitals that serve a disproportionate number of low-income patients with special needs.

If the State provides adequate assurances, supported by findings, that its Medicaid plan or plan amendments meet these requirements (and other applicable requirements), the Secretary of Health and Human Services must approve it (*State of New York by Perales v. Sullivan*, 894 F.2d 20 [2nd Cir. 1990]). Once approved, the State plan is subject to continual scrutiny to ensure continued compliance.

Because HCFA's regulations at 42 C.F.R. 447 implementing the Boren Amendment do not define or clarify its key terms, and the courts are poorly qualified to apply the amendment's specialized terms of health care economics, the state of the law on what constitutes acceptable payment rates or an acceptable payment methodology is currently highly uncertain. There have been several court opinions on both ratesetting procedure and policy issues but no firm judicial consensus on what the amendment requires. The one legal issue that is certain at this time is that hospitals have a right to sue State Medicaid programs for violations of the Boren Amendment.

In *Wilder v. Virginia Hospital Association* (110 S.Ct. 2510 [1990]) the Supreme Court decided 5-4 that health care providers are "the intended beneficiaries of the

Boren Amendment," in that the law is designed and phrased in terms benefiting providers. Consequently, providers may bring a legal action to enforce their rights under it. Significantly, the Court found that "[t]he right is not merely a procedural one that rates be accompanied by findings and assurances (however perfunctory) of reasonableness and adequacy; rather the Act provides a substantive right to reasonable and adequate rates as well." (The dissent in *Wilder* argued that, if providers could sue States, the courts would contradict the intent of Congress to give States flexibility to develop methods and standards of ratesetting subject to the review of the Secretary of Health and Human Services.) As a result of *Wilder*, hospitals and nursing homes have been encouraged to bring Boren Amendment actions against their States, and the courts are increasingly in the business of setting, or at least voiding, State Medicaid policy.

PROCEDURAL ISSUES

Boren Amendment suits almost invariably challenge both the procedure by which State payment rates are set as well as the substantive reasonableness and adequacy of the rates themselves. The two procedural issues that arise most frequently are whether the State's findings and assurances are satisfactory and whether the State has an adequate ratesetting appeals process (and if so, whether the provider has taken advantage of that process).

State Findings and Assurances

Under the Boren Amendment, States must make findings at least every year and whenever they modify their Medicaid plans, assuring that the requirements of the amendment have been met (*Pinnacle Nursing Home v. Axelrod*, 928 F.2d 1306, at 1314 [2nd Cir. 1991]; also see 42 C.F.R. sections 447.253 and 447.255). The 2nd Circuit Court of Appeals, citing *Wilder*, stated that "[i]n light of the abundant evidence demonstrating that Congress intended that the procedural requirements be followed, the State's argument that 'findings' are not mandatory is fatally flawed." The 10th Circuit Court of Appeals found that the State is "free to create its own method for arriving at the required findings," and the procedural requirement is satisfied if the State has submitted assurances to HCFA based on "a bona fide finding process" (*AMISUB (PSL) v. Colorado Department of Social Services*, 879 F.2d 789, at 797 [10th Cir. 1989]). Generally, the administrative burden of making such findings is not an adequate excuse for not making them.

The State's findings must address the three substantive requirements of the Boren Amendment mentioned previously. One central issue in the courts has been whether there was an adequate factual basis, supported by objective evidence, for a State's findings and assurances to the Secretary that its rates are adequate (*Lapeer County Medical Care Facility v. State of Michigan*, 765 F.Supp. 1291 [W.D. Mich. 1991]; *Coalition of Michigan Nursing Homes*, 537 F.Supp. 451, at 459 [D.D.Mich. 1982]; *California Hospital Association v. Schweiker*, 559 F. Supp. 110, at 117 [C.D.Cal. 1982], *aff'd* 705 F.2d 466 [9th Cir. 1983]).

A few courts have ruled that the process does not require any special studies or written findings (*Colorado Health Care Association v. Colorado Department of*

Social Services, 842 F.2d 1158, at 1168 [10th Cir. 1988]; *Mary Washington Hospital v. Fisher*, 635 F.Supp. 891, at 897 [E.D.Va 1985]; *Folden v. Washington State Department of Social and Health Services*, 744 F.Supp. 1507, 1532 [W.D.Wash. 1990]). The 10th Circuit Court of Appeals concluded that it is sufficient that the State has considered, on the basis of some reasonably principled analysis, whether its payment rates meet the substantive requirements of the Boren Amendment (*Colorado Health Care Association*, 842 F.2d 1158, at 1168). However, it is unclear in the absence of such studies or written findings how a State would be able to defend itself in court against alleged substantive violations of the amendment.

The 3rd Circuit Court of Appeals, disturbed that no special studies, findings, or investigations were conducted by Pennsylvania, concluded that "[w]ithout knowledge of hospital costs, [the State] could not have known what an efficient and economical hospital operation would entail, let alone what payment rates would be reasonable and adequate to meet the hospital's costs and assure reasonable access to hospital care" (*Temple University v. White*, 941 F.2d 201, at 210 [3rd Cir. 1991]). Other courts have also found that the lack of special studies to support findings creates difficulties (*Kansas Health Care Association v. Kansas DSRS*, 754 F.Supp. 1502 [D.Kan. 1990]; *Lapeer County Medical Care Facility v. State of Michigan*, 765 F.Supp. 1291, at 1299; *Rye Psychiatric Hospital Center v. Surles*, 678 F.Supp. 82, at 86 [S.D.N.Y. 1991]). Overall, it appears that courts are placing great emphasis on whether State assurances are supported by adequate findings.

State Administrative Procedures

HCFA requires that States have internal procedures for appealing ratesetting determinations. The regulations require that "[t]he Medicaid agency [of the State] must provide an appeals or exception procedure that allows individual providers an opportunity to submit additional evidence and receive prompt administrative review, with respect to such issues as the agency determines appropriate, of payment rates" (42 C.F.R. section 447.253[c]). States vary substantially as to the specific procedures that they have adopted.

A few courts have ruled on whether State procedures are adequate, whether providers have adequately exhausted their State administrative remedies in the context of the Boren Amendment[1], or whether the State appeals process is adequate to redress specific alleged violations of the Boren Amendment. Generally, the courts have applied a standard of reasonableness and appear comfortable in determining whether a specific State procedure, be it an appeals process or an assurance process, was adequate in a particular application.

SUBSTANTIVE ISSUES

Even when a State's findings and assurances and administrative appeals processes are found procedurally acceptable under the Boren Amendment, the courts have further examined whether the rates themselves are substantively adequate.

[1] In *St. Michael Hospital v. Thompson*, 725 F.Supp. 1038 (W.D.Wis. 1989), the district court abstained from ruling on a Boren Amendment case based on an application of the *Burford* doctrine, which requires that where timely and adequate State court review is available, a Federal court must decline to interfere with State administrative agency orders or proceedings for which there are difficult questions of State law bearing on substantial policy questions or where Federal review would disrupt State efforts to establish a coherent policy.

The primary focus has been whether the rates are adequate to meet the needs of efficiently and economically operated providers. However, a few courts have also addressed the access, quality, and disproportionate share provisions of the amendment.

The 4th Circuit Court of Appeals specified that the Boren Amendment applies exclusively to payment issues, not coverage issues, and thus a State may reduce the number of covered hospital days without violating the amendment (*Charleston Memorial Hospital v. Conrad*, 693 F.2d 324 [4th Cir. 1982]). It also concluded that, because the Boren Amendment was designed to lower payments from those required under Medicare retrospective reimbursement, State plans that continue to use Medicare reasonable-cost principles pay the maximum permissible rates and "clearly satisfy the less stringent requirements" of the amendment (*Charleston Memorial Hospital*, 693 F.2d at 331; *Alabama Hospital Association v. Beasley*, 702 F.2d 955, 958 [11th Cir. 1983]).

The major question is how low rates may be set using other more stringent methodologies, such as restrictive prospective payment systems with update factors that do not fully include actual cost increases for hospitals. The 7th Circuit Court of Appeals stated that "[i]n general, rates required to meet a standard of reasonableness may fall within a *zone* of reasonableness, and the establishment of one rate as 'reasonable' does not necessarily render every other rate 'unreasonable' " (*Wisconsin Hospital Association v. Reivitz*, 733 F.2d 1226, at 1233 [7th Cir. 1984]). What falls within this permissible zone of reasonableness depends in large part on how we interpret the central terms of the Boren Amendment.

DEFINITIONAL ISSUES

The terms of the Boren Amendment most frequently litigated are "efficiently and economically operated" facility and "costs that must be incurred." Very few States have explicitly defined these terms in their Medicaid plans, but the terms are often defined implicitly through the plan's operations. Moreover, only a few courts have based their decisions explicitly on such definitional issues.

Defining Efficiently and Economically Operated

The term that is most difficult to define, because of lack of Federal guidance, is efficiently and economically operated facility. In one case, *Multicare Medical Center v. State of Washington*, 768 F.Supp. 1349 (W.D. Wash. 1991), the State of Washington capped its base rates at the 50th percentile of operating expenses for each of its hospital peer groups and froze capital costs at the base-year level, implicitly defining these as the reasonable costs of an economic and efficient provider. The district court, in finding this approach impermissible, concluded that "[t]he State chose this measure of relative efficiency without considering whether it had any relevance whatsoever to efficient and economic hospital operations in the State" (*Multicare Medical Center*, 768 F.Supp. at 1394).

Virginia used median operating costs per hospital peer group, adjusted for wage variations in different standard metropolitan statistical areas, to set ceilings under an incentive system somewhat akin to that under the Tax Equity and Fis-

cal Responsibility Act (TEFRA) of 1982 (*Mary Washington Hospital*, 635 F.Supp. 891). The district court, in finding the use of median costs permissible in implicitly defining "efficiently and economically operated hospital," did not accept the hospital's argument that using the median implies that "all hospitals above the median are uneconomical and inefficient." The court seems to have accepted the State's argument that "if half of the hospitals in a grouping can operate at or below a certain level, then certainly an efficient and economic hospital can" (*Mary Washington Hospital*, 635 F.Supp. at 899).

In another case (*Michigan Hospital Association v. Babcock*, 736 F.Supp. 759 [W.D. Mich. 1990]), the State of Michigan reduced its base rates by 7 percent, and only 14 of its 182 hospitals received full reimbursement for their costs under the State plan. In its decision, the court found that ". . . such an inference [that only 7.7 percent of hospitals are efficiently and economically operated] is implausible for two reasons. It is hard to give credence to the idea that only 14 of 182 hospitals and only hospitals with high indigent volume are efficiently and economically operated" (*Michigan Hospital Association*, 736 F.Supp. at 763). Although this opinion does not offer firm insight as to how low is too low, it suggests that courts will be uncomfortable if some minimal threshold percentage of efficiently and economically operated providers is not reached, particularly in the absence of analysis justifying the low percentage.

Defining Costs That Must Be Incurred

In defining costs that must be incurred, the issues include whether these should comprise direct versus indirect, marginal versus average, or long- versus shortrun costs. The State of Washington was challenged for using an approximation of marginal costs, based on peer group variable operating cost percentages or on 60 percent of total costs, in setting its rates (*Multicare Medical Center*, 768 F.Supp. 1349). The court ruled that the use of marginal costs was not permissible under the Boren Amendment and that fixed costs must be included in calculating rates. It found that "[r]epresentatives from several hospitals with stable Medicaid population levels testified that they would not have to acquire as many beds and as much equipment if they did not treat Medicaid patients. Medicaid patients, like other patients, use the fixed assets of hospitals" (*Multicare Medical Center*, 768 F.Supp. at 1398). It is unclear at this time whether other courts will accept this rationale.

BUDGETARY CONSIDERATIONS

Several States have used budget neutrality as a justification for setting rates restrictively. The 10th Circuit Court of Appeals nullified Colorado's budget-neutrality-factor adjustment, which reduced diagnosis-related group (DRG) rates by 46 percent, finding that such a negative budget-based rate adjustment is not permissible under Boren, where no hospital, no matter how efficient and economical, is reasonably and adequately reimbursed and that there was no reasonable basis for the State's findings (*AMISUB*, 879 F.2d 789). The court found it significant that the Director of Colorado Medicaid "admitted at trial that he had no data that shows that the actual payment rates be-

ing made to Colorado hospitals under the new DRG system will reimburse any Medicaid providers reasonable costs" (*AMI-SUB*, 879 F.2d at 799).

However, a year earlier, the same court permitted the repeated suspension or elimination, because of budgetary considerations, of an incentive allowance for nursing homes with costs below Colorado's 90th percentile payment ceiling (*Colorado Health Care Association*, 842 F.2d 1158). The court made clear that States may consider budgetary constraints, stating that "[t]o terminate or affect one [program] component, even if only for reasons of budgetary considerations, does not automatically produce a non-compliant payment" (*Colorado Health Care Association*, 842 F.2d at 1167). An important factor in the decision was that the State "considered some forty different options for cutting program costs . . . [and analyzed] savings in Medicaid and General Funds appropriations, client and provider impact, comments on immediate and long-term implications, and potential for success in implementation" (*Colorado Health Care Association*, 842 F.2d at 1167-68).

Thus, courts have ruled that budgetary considerations are generally permissible. However, if such considerations are the sole factor (*Michigan Hospital Association*, 736 F.Supp. 759; *Temple University*, 729 F.Supp. 1093, *aff'd* 941 F.2d 201), or if they are not supported by objective evidence (*Lapeer County*, 765 F.Supp. 1299), the rates based on them are likely to be deemed in violation of the Boren Amendment. If budgetary considerations are the primary factor in developing a restrictive ratesetting methodology, the resulting rates are likely to be carefully scrutinized.

Adequacy of Update Factor

For State payment methodologies that use an update factor to adjust base-year costs annually, an important issue is what cost increases must be incorporated to achieve reasonable and adequate rates. Several update factors have been used by States, including the Consumer Price Index (CPI) (*Mary Washington Hospital*, 635 F.Supp. 891) and the Medicare Prospective Payment Update Factor (MPUF) (*Multicare Medical Center*, 768 F.Supp. 1349). The State of Washington used the MPUF for updating its rates. The court considered whether the use of this update factor is permissible where it results in increases lower than actual cost increases. It found that this was not permissible because the State did not consider the applicability of the MPUF to the Washington Medicaid program. Again, if the update factor is not driven by budgetary concerns, and particularly if it is supported by an analysis of cost factors in the State, it is likely to withstand judicial scrutiny.

Hospital Peer Groups

Some States group hospitals (and other types of health care facilities) into peer groups, based on specific characteristics or statistical analyses, for purposes of calculating rates appropriate for similarly situated facilities. Courts have generally deferred to States in their use of peer groups, except where it appears that they

are assembled arbitrarily.[2] It appears that peer grouping methodologies that are supported by some analysis, even if it is not exhaustive and does not result in perfect groups, will be found acceptable to the courts (*Mary Washington Hospital*, 635 F.Supp. 891; *Multicare Medical Center*, 768 F.Supp. 1349). However, if it is clear that the groupings are unsupported and arbitrary, and that very differently situated providers are grouped together, courts will not hesitate to invalidate the grouping methodology.

Disproportionate Share Hospitals

Under the Boren Amendment, States must take into account the situation of hospitals that serve a disproportionate number of low-income patients. In the Omnibus Budget Reconciliation Act (OBRA) of 1987 (Public Law 100-203), Congress clarified that States may calculate the required additional payments to disproportionate share hospitals either by adopting Medicare's formula for such allowances or by adopting their own formulas consistent with the legislative requirement. Specifically, OBRA 1987 provides that States' formulas must be based on "a minimum specified additional payment (or increased percentage amount) and for an increase in such payment amount (or percentage payment) in proportion to the percentage by which the hospital's utilization rate... exceeds one standard deviation above the mean." In analyzing this section, the courts appear to be concerned that the States make specific determinations that their rates meet the needs of disproportionate share providers (*West Virginia University Hospitals v. Casey*, 885 F.2d 11 [3rd Cir. 1989]) and that the disproportionate share adjustments be proportional to the actual increased costs of facilities that qualify for them (*Temple University*, 729 F.Supp. 1093, *aff'd* 941 F.2d 201).

RECOMMENDATIONS TO STATES

Certain general trends may be discerned from the court opinions that address aspects of the Boren Amendment. Initially, the courts granted substantial discretion to the States in setting their rates (*Mississippi Hospital Association v. Heckler*, 701 F.2d 511 [5th Cir. 1983]). Increasingly over time, because of growing budgetary pressures, States have been developing ratesetting methodologies with the primary intent of holding down rates, and courts have been less deferential to the States in reviewing their methodologies. Courts have been particularly willing to second-guess States when the courts sense that State budgets are the sole factor driving the determination of payment rates and the rates are not supported by objective analysis.

To the extent that a State plan uses the Medicare payment methodology, it is likely to withstand judicial scrutiny. State plans that use more restrictive retrospective, or particularly prospective, payment systems will be carefully scrutinized. Their acceptability will depend on how

[2] A district court did not approve Pennsylvania's DRG-based prospective payment system, which classified hospitals into 7 groups (plus a childrens' hospital group) based on 13 variables concerning teaching, Medicaid volume, environment, and cost. The court ruled that this grouping system was not permissible, in part because it assigned hospitals to groups "not because their scores on the ranking test were comparable, but simply in order to achieve seven groups of equal size." Thus, there was arbitrary variation in the size of the groups. (*Temple University*, 729 F.Supp. 1093, at 1098, *aff'd* 941 F.2d 201).

they define efficiently and economically operated facilities, costs that must be incurred, and disproportionate share providers, and how the States set update factors, budget neutrality factors, and peer groups. As important as the levels at which these parameters are set is the process by which they are set and justified.

Federal judges are typically generalists who are trained in law; few have backgrounds in economics and fewer still in health economics. These judges are particularly ill-prepared to discern whether a particular hospital or set of hospitals is economically and efficiently operated or what the appropriate standard for costs that must be incurred should include. In light of the Boren Amendment's statutory scheme, which relies primarily on the States to provide assurances and DHHS to review the adequacy of the assurances, courts will be hesitant to invalidate substantively a State payment mechanism that is strongly supported by objectively determined findings.

It is therefore advisable for States to take very seriously the requirement that they submit adequate findings supporting their assurances. To the extent possible, States should use uniform accounting and reporting methodologies in conducting studies, making findings, and setting rates.

Cost Basis for Ratesetting

Much debate has focused on whether payment rates should reflect variable versus total costs and long-term versus short-term costs in defining which costs must be incurred by efficiently and economically operated facilities. Although the number of court cases in which this issue has been decided is small, Medicaid programs would be best advised to consider fixed as well as variable costs when rates are set. At least one court has made clear that efficient hospitals that treat Medicaid patients must incur fixed costs (*Multicare Medical Center*, 768 F.Supp. at 1398). If fixed costs are paid on a passthrough basis, payment rates that reflect variable costs are easier to justify, provided that reasonable estimates of those costs can be made.

The fixed-variable dichotomy reflects capital (fixed) and routine (variable) operating costs. In most States, fixed costs are paid on a passthrough basis, subject to few if any cost-control provisions, while routine costs are often the focus of cost-containment efforts. However, some States are beginning to pay for capital costs on a prospective basis (e.g., Iowa, Kansas, Pennsylvania).

Fixed costs usually refer to building and fixed equipment depreciation, depreciation for major movable equipment, and long-term as well as short-term interest. The failure to tie reimbursement for these expenditures to actual utilization levels provides incentives to continually expand capital, leading to inefficient levels of capital in the facility. Long-term efficiencies could be gained by combining capital payment with payment for routine expenses before base rates are set, or by basing payments on utilization levels, as done in Maryland (Ashby, 1988).

Defining Efficiently and Economically Operated Facilities

What is most important in defining efficiently and economically operated facilities is that there be a clearly justifiable nexus between payment rates and costs that must be incurred in efficient facil-

ities. Boren Amendment provisions require that payment be adequate to compensate for efficient levels of production. The challenge to Medicaid programs is to set payment rates commensurate with these levels given extreme budgetary pressures.

Efficiency must be measured in terms of an objective that hospitals or payers strive to meet (e.g., cost minimization). Feldstein (1988) describes two types of efficiency: technical and economic. Technical efficiency addresses whether output (e.g., number of cases treated) has been maximized, given the current availability of inputs (e.g., skill of nurses and physicians and equipment availability) needed to produce care. Economic efficiency addresses whether the same level of output can be produced at less cost. Each type of efficiency should be kept in mind when designing ratesetting mechanisms that promote cost minimization in hospitals and other facilities.

As Berki (1972) notes, the objective of efficiency is to incorporate the least costly mode of production with the most productive set of inputs needed to produce care. However, this may not happen for reasons that are both within and beyond the hospital's control. For example, some hospitals may pride themselves (and market themselves) as "high-quality" facilities that use the latest equipment and provide more staff per patient, even if the availability of such inputs has no real bearing on the production or restoration of good health. Other hospitals may be forced to use higher cost or less productive input combinations because of area wage differentials or collective bargaining agreements.

Ratesetting procedures designed to promote efficiency should be derived after considering reasons for inefficient behavior. Hospitals without the ability to make major changes to treatment patterns because of their rigid cost structures should not be penalized, and hospitals with controllable inefficiencies must be motivated to change production patterns to reduce wasted resources. Thus, rates that are sufficient to compensate for the costs of efficiently and economically operated facilities should be based on studies that account for legitimate cost differences.

There are at least four methods that may be tried to account for legitimate cost differences when Medicaid payment rates are set: peer grouping; regression-based approaches; frontier analysis; and data envelopment analysis (DEA). The major attributes, advantages, and shortcomings of each method are described in the following sections.

Peer Grouping

The purpose of peer grouping is to recognize reasonable differences in costs resulting from location, case mix, teaching status, or size (Korda, 1991). Because these factors are generally accepted determinants of input cost variation, hospital administrators are likely to view the concept of peer grouping as useful for cost comparisons. In fact, hospitals often compare their own costs to those of similar hospitals in the industry.

Peer grouping can be either implicit or explicit. Implicit peer grouping involves subsequent adjustment to overall payment rates. Typically, these adjustments are based on some dichotomous breakdown (e.g., urban versus rural location, teaching versus non-teaching status) or index that measures a cost-influencing

characteristic (e.g., case-mix index). Explicit peer grouping involves the creation of separate groups before payment rates are calculated. If peer grouping is used to set rates, group membership should be based on factors affecting production costs, not on the charges billed for services provided. State Medicaid programs that rely on peer groups to set rates should be prepared to present results from systematic studies that show production cost differences between hospitals in different peer groups, with only minor differences among hospitals within the same group.

Regression-Based Approaches

The purpose of regression-based approaches is to consider a wide variety of factors that may influence input cost variation. Some of these factors, such as size, location, case mix, and Medicaid case load, have been used as a basis for implicitly or explicitly assigning peer group membership. Others, such as ownership type, are not typically used to assign peer group membership, though they could be. The regression approach can be helpful for ratesetting if it is grounded in the economic theory of a cost-minimizing firm and recognizes previous empirical work on the determinants of facility cost differences.

Economic theory suggests that facility costs will vary according to differences in output (e.g., Medicaid case loads, outpatient visits, and teaching and research activities) and input prices. In addition, a large body of empirical work shows that differences in case mix, location, size, occupancy rates, and market-area factors influence costs (Cowing, Holtmann, and Powers, 1983). Regression analysis is a technique that can be used to generate expected cost values for each facility, adjusting for differences in these factors. Some errors in these regression-based estimates will be obtained, with expected costs being overestimated for some facilities and underestimated for others, but the average of these errors will equal zero in a properly specified analysis.

Regression-based forecasts of expected costs could be used as a basis for ratesetting. For example, a State could assign payments to each hospital at the level of costs predicted by the regression analysis. Predicted costs for each hospital would equal the estimated average cost of facilities with similar output configurations, input cost structures, case mix, etc. Alternatively, payment rates could be based on the lower of actual versus predicted costs.

The primary disadvantage associated with regression-based approaches is that it is necessary to have data on many factors expected to influence costs. Information on many cost-influencing factors is contained in cost reports produced for the Federal Government. Further information can be found in other secondary data sources, such as the American Hospital Association's annual survey of hospitals and the Area Resource File from the U.S. Bureau of Labor Statistics. However, these data can be expensive to process and analyze for ratesetting purposes. Moreover, the relatively small number of hospitals in many States may lead to relatively unstable forecasts of hospital costs unless several years of data are analyzed, thus increasing the cost of the regression-based approach.

Frontier Analysis

Frontier analysis has been proposed as an alternative to other regression-based techniques that implicitly assume profit-maximizing, cost-minimizing production strategies. The purpose of frontier production function analysis is to estimate the relationship between each input and changes in output under a scenario in which all firms are experiencing at least some levels of technical inefficiency. Similarly, the purpose of a frontier cost function analysis is to estimate relationships between costs of production, output levels, and input prices when technical inefficiency is problematic. Maximum-likelihood regression techniques are used to estimate these relationships. The analysis also allows the researcher to estimate the average amount of technical efficiency for the industry as a whole. The major difference between frontier analysis and other regression-based approaches is in the nature of the error term in the equation that summarizes the cost or production relationships (Maddala, 1983). As noted earlier, the average of regression-based errors equals zero. In a typical frontier analysis, this is not so, because the underlying assumption of the analysis is that each facility has some technical inefficiencies that either reduce the amount of output being produced or increase the costs of treatment.

Frontier analysis may be used to produce information about the relationships between facility output or costs and the labor and capital inputs needed to produce care. Knowledge of these relationships could then be used to drive payment policy. For example, suppose the analysis shows that the number of nurses per bed has a greater impact on the number of treated cases than does the availability of advanced equipment such as computerized axial tomography or magnetic resonance imaging scanners. Medicaid policymakers might use this information to change the relative levels of reimbursement for routine costs versus payments for movable capital, to provide additional motivation to produce efficiently. Similarly, knowledge of the average amount of efficiency in the industry could be used to tailor the size of the total reimbursement pool of funds.

Although promising, frontier analysis has several drawbacks. First, hospital-specific estimates of technical efficiency cannot be estimated, so it is difficult to develop hospital-specific payment rates that account for differences in levels of efficiency (Center for Hospital Finance and Management, 1990). Moreover, because inefficient behavior is identified on the basis of residual (error) values identified from the estimation technique, the production model being estimated in the analysis must be perfectly specified. Omitting from the analysis variables that are correlated with productivity may result in over- or underestimates of inefficient behavior (Schmidt, 1985). Finally, though there are some exceptions, research in other industries shows little difference between the results of frontier analyses and more traditional regression approaches (Judge et al., 1985).

Data Envelopment Analysis

DEA uses a linear programming technique to estimate the relative efficiency of firms in an industry. DEA has been proposed as a complement to regression-based techniques. It measures the amount of input reductions that would

make inefficient firms as efficient as other firms in the industry. DEA has become popular in recent years for estimating relative efficiency relationships among non-profit firms, because it readily incorporates information about multiple inputs and outputs without assigning arbitrary weights to their importance (Huang, 1989).

In a DEA model, the ratios of outputs (e.g., treated cases, number of nurses and physicians trained, number of outpatient visits) to inputs (e.g., total number of full-time employees, number of bed-days) are used to estimate an efficiency ratio for each firm. This ratio must be less than or equal to 1.0, with lower numbers indicating relatively less efficient hospitals. Hospitals with efficiency ratios equal to 1.0 are not necessarily as efficient as they can be, but they are more efficient than others in the industry.

A major advantage of DEA is that the solution produced by the linear programming algorithm allows the researcher to identify the relative amount of inefficiency for each input-output combination. Thus, the results may inform payment policy decisions designed to motivate hospitals to become at least as efficient as others in the industry. Like other approaches, results of DEA are sensitive to the inputs and outputs considered (Sherman, 1984) and to their extreme values (Center for Hospital Finance and Management, 1990). Moreover, like regression analyses, DEA cannot identify all inefficient providers if all providers are inefficient to some extent. Therefore, although DEA cannot be used to identify the ideal production methods, it is useful for providing an indication of how inefficient certain hospitals are compared with less costly producers of care (Sherman, 1984).

Choosing Among Methods

In the unlikely event that time and budget constraints permit more intense study of cost or production relationships, and when multiple years of data are available, regression-based approaches, frontier analysis, and DEA may be preferred over peer-grouping strategies. These approaches take direct account of a wide variety of factors that influence costs, and many of these factors are not typically used to construct peer groups. As cost estimation techniques improve, frontier analysis and DEA will become more reliable because important cost- or output-influencing variables will less likely be omitted. If feasible, results from these analyses should be compared with rates based on implicit or explicit peer grouping.

A regression-based or frontier-analysis approach in place of a peer-grouping strategy may be more politically acceptable if the industry is offered the chance to comment on and influence the final list of input variables used. If regression-based or frontier-analytic-based payment rates would differ drastically from rates based on peer grouping or other more familiar approaches, the new rates might be phased in over time. DEA should be viewed as complementary to the other approaches. It can be used to fine-tune hospital-specific payment rates and account for differences in relative efficiency.

In many States, time and resource constraints may preclude regression-based approaches, frontier analysis, or DEA. In addition to its relatively lower cost and

ease of administration, peer grouping is easier to explain and more familiar to industry executives than the other approaches previously discussed. Hence, it is much more popular.

Adequacy of the Inflation Update Factor

The purpose of the inflation update factor is to compensate hospitals for exogenous (uncontrollable) changes in input costs. Inflation factor updates are unnecessary in prospective payment systems that are rebased annually or frequently enough to take into account inflation's effects. Rebasing involves substantial time and resources that do not need to be expended unless the relevant cost-influencing factors have changed substantially in type or magnitude. Like Medicare, many States prefer to address inflationary impacts by using an inflation update factor, a yearly adjustment to the base rate that accounts for uncontrollable increases in input prices.

If no State-specific updates can be found, a simple study that shows that regional or national updates are likely to compensate for State-specific cost changes should suffice. For example, if no update factor specific to a given State exists, one could obtain cost reports from that State and study changes over time in the most important input costs (i.e., wages for nurses and other personnel). If changes in these input costs are less than a regional or national average used to set rates, the State Medicaid program is likely to be on firm ground by choosing the regional or national update factor. Some States have applied the Medicare update factor or the TEFRA update factor to adjust for inflation. If changes in important input costs are radically different from regional or national averages, States would be advised to avoid the regional or national update factors and opt for their own instead.

The use of regional or national updates must be examined with care, because such updates also may include adjustments for factors not relevant to individual States. For example, the Prospective Payment Assessment Commission's (ProPAC's) annual update factor includes a discretionary adjustment factor in addition to the market basket index used to measure changes in input prices (Prospective Payment Assessment Commission, 1992). The discretionary adjustment factor is meant to reflect changes in costs resulting from scientific and technological advancement and productivity changes over time. However, because ProPAC assumes that increases in costs because of technological changes should be entirely offset by decreases resulting from increased productivity (regardless of actual productivity changes), ProPAC's update factor may not be relevant for an individual State.

Finally, some may question the logic of using hospital industry-specific rates of cost increases as the basis for generating inflation update factors. If the hospital industry has a history of inefficient behavior (as is likely, given previous cost-based reimbursement methods), there is little reason to expect that input cost increases over time have been truly beyond the control of the hospitals. Thus, inflation updates based on these cost increases may reward hospitals for previous inefficient behavior.

As an alternative, State Medicaid programs might consider variable inflation update factors. Hospitals identified as relatively more efficient (on the basis of

studies such as those previously recommended) could be provided with full or nearly full inflation updates, while hospitals found to be less efficient could be provided with proportionately less for inflation. However, this approach is without precedent and may therefore be contested in court. If implemented, it should be based on findings strongly justifying the differential treatment of hospitals.

Payment for Disproportionate Share

At least one court has interpreted the disproportionate share requirement to mean that State-specific plans should produce adjustments similar to those used by Medicare (*Temple University* 729 F.Supp., *aff'd.* 941 F.2d. 201). Our recommendation is to adopt the Medicare disproportionate share adjustment if detailed studies of excess costs attributable to low-income patients cannot be made. However, if resources permit and cost report and other data required to perform more detailed cost analyses can be collected, the increase in costs per case attributable to low-income patients could be identified in regression analyses, controlling for other factors that determine costs. The disproportionate-share adjustment per case would equal the expected influence of adding one more such case to the average hospital's workload; this adjustment would be based on the regression coefficient of the disproportionate share measure.

OVERALL RECOMMENDATIONS ON ANALYSES

The analyses conducted by a State should be undertaken with the idea of persuading an objective outsider who is not a health care expert that the State's rates are adequate to pay the costs of an efficient facility, to ensure access to quality care, and to meet the needs of disproportionate-share providers. Budgetary considerations should not drive the analy-sis but may be used as a general factor for justifying the lowest payment rates consistent with the average costs of efficiently and economically operated providers. Although the use of HCFA's Medicare update factor may be given presumptive validity by some courts, theState's analysis should include why that update factor is applicable to its hospitals.

Because it is not possible to perfectly specify a production or cost function, comparative analyses must be used to identify relatively more versus less efficient facilities. Hospitals often use such analyses to determine whether costs seem out of line. Systematic comparative analyses are likely to deter Boren suits. If a non-systematic or arbitrary approach is used for ease of administration or for other reasons, the State should be prepared to show how resulting payment rates are sufficient to compensate for the fixed and variable costs that must be incurred by efficient facilities. One way to do this is to demonstrate that the results of systematic studies would be consistent with the decisions that were made.

We recommend that factors expected to affect input costs be considered systematically to determine relative efficiency. States that base rates on regression-based or similar statistical approaches would seem to be on firm ground if the analyses are grounded in theory and account for several factors shown in the literature to influence costs. States without the capacity to use a regression-based approach should still attempt to examine differences in factors

expected to influence input costs. Rates could then be set on the basis of peer group percentiles or specific adjustments to base rates compensating for cost differences resulting from case mix, location, size, and other factors.

In summary, the case law on Boren issues in hospitals, although helpful, is not fully satisfying. It does not indicate what kinds of standards of efficiency will be adequate. In addition, economic analysis cannot be used to identify absolute standards of efficiency. Consequently, the concept of relative efficiency is the only readily available option. Unfortunately, there is not sufficient case law on matters of substance to provide guidance on the reasonableness of particular relative standards. It seems doubtful that the intent of Congress was to encourage Medicaid programs to pay the full cost of all providers, nor was it likely to be the intent of Congress to force States with limited resources to conduct pathbreaking economic studies in order to avoid paying the full cost in every facility.

Relative standards of efficiency are based on thresholds built around medians or means. Because means are subject to influence by unreasonable (inefficient?) values, we believe standards centered around medians or percentiles are to be preferred. Setting a relative standard at the 80th percentile, for example, would indicate that 80 percent of the facilities are able to provide patient care within the rate if it is set at that threshold level; 20 percent of the facilities are not able to cover costs at that same rate. A weighted standard would set the threshold where 80 percent of the admissions are treated in facilities that are able to cover costs by the rate set at the threshold amount; 20 percent of the admissions are treated at facilities that are unable to cover costs at that threshold rate.

Several concerns would seem to be important in establishing a case that a relative standard of efficiency is a defensible method of complying with the intent of Congress. First, the standard should be set prospectively. That is, the State should conduct a study of costs prior to setting methods. It would seem that the study must examine variations in case-mix adjusted cost, the potential for peer grouping, and the financial standing of the industry. The study should also determine the relationship between payment amounts and costs for the Medicaid program. Ideally, the study would show that payment rates are adequate to cover costs in some facilities, that those facilities able to cover costs include a broad representation of facility types, and that the group of facilities not able to recover full allowed costs are not systematic in any obvious fashion (size, case mix, location, etc.).

If such a study is used to help rebase the payment rates, there may be other prudent steps to be considered by the State. If the new rate base is not to be built upon full (100-percent) costs, then a method should be developed for determining reasonable costs. As an alternative to the methods proposed earlier for determining costs in efficiently and economically operated facilities, some States simply use information on allowed costs in previous years, updated to a new base year by applying the TEFRA update factor. This factor has been accepted as a reasonable allowance for inflation, but as noted later, caution is advised when applying this method.

The purpose of the TEFRA-based method is to provide an estimate of "reason-

able" costs for the base year, before further adjustments for case-mix differences or other factors are made. The difference between actual costs and this estimate of reasonable costs for the base rate represents the estimate of "unreasonable" costs to be excluded from a rate base, whether it be statewide or hospital-specific.

This methodology is, of course, similar to that used to establish upper limits on the amount of payment that is allowable for full Federal financial participation in Medicaid. These upper limit considerations, which are necessarily part of the assurances that States must give about their reimbursement policy, are commonly part of Boren deliberations at the State level. Essentially the "upper limit" is a constraint on reasonable costs, as illustrated in the rebasing example previously cited. More generally, the "upper limits" are an upper bound constraint on payments made under the ratesetting methodology. Boren, at least as commonly applied, represents a lower bound on rates.

The caution already advised arises from the potential conflict between TEFRA-based upper limits and the requirements of the Boren amendment. In Connecticut, for example, the ratesetting methodology is based on a TEFRA approach, where the TEFRA ceilings are now binding for all facilities in the State. In litigation, hospitals contended that because no facilities in the State were able to recover costs, the methodology was in violation of the Boren requirements. The State argued, successfully, that the methodology that was used to determine payment was constrained by the Federal upper limits, because the TEFRA ceiling amounts were the upper limits. If there was a uniform and explicit methodology for determining the upper limits, then the issue of conflict might be easier to represent. Unfortunately, the States appear to have no uniform view of what the "upper limit" assurance demands in terms of methodology, and HCFA regional offices, who administer the program, appear not to want to be specific about methodology either. Consequently, both of the primary external constraints imposed on Medicaid reimbursement policy — the Boren amendment and the Federal upper limit — are vague.

Ideally, there is a corridor of compliance between the two constraints, but there is no logical reason why this is necessarily true. Courts have yet to decide how Boren disputes are to be conditioned by upper limit considerations. Because rates of hospital inflation have exceeded the TEFRA index for many years, this conflict is increasingly apparent. States spend an extraordinary amount of resources attempting to resolve these ambiguous issues and must necessarily look to the courts, rather than to HCFA, for guidance. Ideally, the issue would not be left to the courts, but would be rectified by policy statements and guidance from HCFA concerning the reasonableness of rates and approaches to setting rates. Guidance and specificity concerning Boren and these other matters is long overdue.

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