Medicaid hospital spending: Effects of reimbursement and utilization control policies

by Stephen Zuckerman

Numerous Medicaid hospital spending policies were developed following the passage of the 1981 Omnibus Budget Reconciliation Act. The impact of reimbursement and utilization control policies on Medicaid hospital spending was measured using Medicaid program data for 1977-84. Medicaid prospective reimbursement was found to contain real hospital spending by controlling spending per recipient. However, sustained reductions in the growth in real Medicaid spending are achieved only when Medicaid is included in a broader regulatory framework, not when it is the sole regulated payer. Prior authorization for specific services reduces growth in hospital spending by reducing the growth in inpatient recipients.

Introduction

Any State government desiring to limit its Medicaid expenditures must control payments for inpatient hospital care, a service accounting for more than 50 percent of all Medicaid acute care spending in 1984 (Table 1). Two basic sets of policy options are available: a State government can either impose direct controls on the utilization of hospital services by Medicaid enrollees or alter the rates it is willing to pay for these services. Although about one-half of the States have had utilization control policies (e.g., limits on days or required prior authorization in nonemergency situations) in place since the 1970's, prior to 1982, only 13 Medicaid programs had developed alternative reimbursement systems that did not rely on Medicare reasonable-cost principles. Despite growing evidence that retrospective cost-based reimbursement creates inefficiencies, States generally accepted the status quo because Federal guidelines required reasonable-cost reimbursement unless an "alternative method" waiver was granted, winning approval for such a waiver was a difficult administrative process, and many States did not acknowledge the benefits of these waivers.

Resistance to alternative reimbursement systems was greatly reduced by the passage of the 1981 Omnibus Budget Reconciliation Act (OBRA). Section 2173 of this act removed the reasonable-cost requirement and allowed States to pay only "reasonable and adequate" rates to meet the costs of "efficiently and economically operated facilities." These new rules made waivers easier to obtain and therefore a more desirable policy tool for a broader range of Medicaid programs. The OBRA-induced shifts were so dramatic that, by 1984, the number of States with a hospital reimbursement waiver had grown to 35. Most of these systems are prospective in nature. They set rates prior to service delivery and do not have end-of-year reconciliations. A small number (four) of alternative retrospective systems also were developed. Additional details on these waiver systems are presented in the following section of this article.

Although OBRA did not directly change the conditions under which utilization controls could be implemented, several States did adopt or modify policies of these types after its passage. Either States were motivated to reexamine the full range of cost-control policies in light of other OBRA changes, or the legislation was simply passed at a time when they were already addressing concerns about Medicaid costs. Eight States added utilization controls and others expanded controls already in place in the 3 years following OBRA.

Table 1

Amount and percent distribution of Medicaid expenditures for acute care services, by type of service: United States, 1984

Service	Amount in millions	Percent distribution
All acute care	$17,443	100.0
Hospital inpatient care	8,986	51.5
Physicians' services	2,460	14.1
Hospital outpatient care	2,231	12.8
Prescription drugs	2,011	11.5
Dental care	474	2.7
Other care	1,280	7.4

SOURCE: Health Care Financing Administration, Office of the Actuary: HCFA 2082 data from the Medicaid Statistical Information System.

To begin to explore how these policy choices may have affected Medicaid inpatient hospital spending, we compare aggregate spending growth before and after OBRA. In Table 2, total spending, total recipients, expenditures per recipient, and a hospital input price index for the years 1977-84 (the study period) are shown. In order to focus on variation in real spending trends across States with different hospital policies, all monetary measures were deflated by the HCFA Hospital Market Basket Index, a nationwide annual index of the cost of hospital inputs. Aged inpatient recipients and their associated payments were excluded from this table and the subsequent analyses because Medicare policies, rather than Medicaid policies, exert the major influence over their hospital costs. Prior to OBRA, expenditures for

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Table 2

Medicaid expenditures for inpatient hospital services for nonaged recipients and annual compound rate of growth, by year: United States, 1977-84

Year	Total expenditures	Number of recipients in thousands	Nominal expenditure per recipient	HCFA[1] Hospital Market Basket Index	Real expenditure per recipient[2]
1977	$4,229	2,831	$1,493.80	1.00	$1,493.80
1978	4,514	2,852	1,583.15	1.08	1,465.88
1979	5,106	2,738	1,864.94	1.19	1,567.18
1980	5,651	2,809	2,011.67	1.32	1,523.99
1981	6,433	2,833	2,270.52	1.48	1,534.14
1982	6,718	2,703	2,485.70	1.65	1,506.48
1983	7,287	2,773	2,627.55	1.77	1,484.49
1984	7,536	2,652	2,841.42	1.87	1,519.48
			Annual compound rate of growth		
1977-81	11.1	0.02	11.0	10.3	0.7
1981-84	5.4	-2.2	7.7	8.0	-0.2
1981-83	6.4	-1.1	7.6	9.4	-1.6
1983-84	3.4	-4.4	8.1	5.6	2.4

[1] Health Care Financing Administration.

[2] Ratio of nominal expenditures per recipient to the HCFA Hospital Market Basket Index.

NOTE: Expenditures per recipient and annual compound rates of growth are based on unrounded total expenditures and number of recipients.

SOURCE: Health Care Financing Administration, Office of the Actuary: HCFA 2082 data from the Medicaid Statistical Information System.

nonaged inpatients grew at an average annual rate of 11.1 percent. This growth rate dropped to 5.4 percent in the years immediately following the legislation (1981-84). Three factors appear to underlie this reduction. First, hospital input price inflation slowed. Second, recipient counts began to decline at an accelerating rate. Finally, real spending per recipient fell off sharply in 1982 and 1983. The last two factors could certainly be associated with the policy initiatives that resulted from OBRA's passage. However, the upswing in real spending per recipient from 1983 to 1984 raises questions about the long-term effectiveness of these programmatic changes.

The purpose of this article is to evaluate the importance of various reimbursement and utilization control policies in a State government's efforts to contain Medicaid inpatient hospital spending. This analysis may be used to explain why the growth in inpatient spending slowed so dramatically after the passage of OBRA. However, its primary objective is to identify those policies that have been able to significantly influence Medicaid hospital payments. The questions addressed in this study include the following: Are alternative reimbursement methods more or less effective than utilization controls as a method of containing inpatient spending? Do certain features of alternative systems seem to be more or less relevant to the system's ability to contain Medicaid costs? Is required prior authorization a weaker or stronger utilization control than fixed limits on inpatient days?

Previous studies of prospective reimbursement (PR) can be broken into two general categories: those that measure the impact of PR on overall hospital spending and utilization patterns and those that specifically address the impact of PR on an individual payer, such as Medicaid. Eby and Cohodes (1985) provide an excellent review of studies falling into the former category. Studies in the latter group include Morrisey, Sloan, and Mitchell (1983), a study of Medicare effects, and Zuckerman (1986), a study of commercial payer effects. The primary previous studies that focused on Medicaid were conducted by Cromwell and Hurdle (1984, 1986). They explored the impact of PR on both total and hospital Medicaid spending by analyzing State-level spending patterns and by grouping State programs according to whether the system was implemented before or after OBRA. Their 1986 study suggests that PR effects differ for Aid to Families with Dependent Children (AFDC) and Supplemental Security Income eligibles; however, their regression analyses uncover little impact on growth in hospital spending per recipient for either eligibility group. In this study, we extend the Cromwell and Hurdle studies by categorizing Medicaid PR systems according to a set of potentially more meaningful dimensions than their PR implementation date relative to OBRA. Included in these dimensions are the program's age, non-Medicaid payer coverage, and a number of specific rate-setting design features.

The remainder of this article is organized as follows. In the next section, the specific alternative reimbursement and utilization control policies that States had in place or adopted from 1977 to 1984 are described. The data and methods employed are discussed in the following section. Next, the results of both tabular and multivariate analyses of policy effects are presented. The implications of these results for Medicaid as well as other payers are reviewed in the final section.

Policy options

Within the categories of alternative reimbursement methods and utilization control policies, State governments have a wide range of specific policy design choices. One State may choose to institute controls by limiting the annual number of covered inpatient days per recipient, and another may require that prior authorization be granted before payment

Table 3

Descriptions of specific features of Medicaid alternative reimbursement and utilization control policies

Policy	Description
Alternative reimbursement	
Prospective reimbursement	The State sets payment amounts prior to the provision of services as opposed to basing payments on the incurred costs of care. The other alternative reimbursement policies shown are specific features that can be incorporated in a prospective reimbursement system.
Payments per case	The State pays for hospital care on a per-admission basis, as opposed to a per diem basis or global budget approach.
Rate ceilings	The State has a Medicaid reimbursement system that groups "similar" hospitals (i.e, peers) for the purpose of determining a relevant ceiling on hospital payment rates.
Uncompensated care allowance	The State's Medicaid reimbursement system provides some additional payment to hospitals with a disproportionate share of uncompensated care.
Volume adjustment	The State alters a hospital's rate when the actual volume of cases, services, or revenues exceeds or falls short of some prospectively determined level. For example, a State may provide a facility additional payments to cover fixed costs if volume is not as great as anticipated.
Case-mix adjustment	The State adjusts a hospital's rates when case mix differs from the level used in determining base-year payment amounts.
Minimum occupancy requirement	The State requires that a hospital's payment rates be computed as if the facility achieved some minimum occupancy level, independent of the actual occupancy rate achieved. This tends to reduce average payments for hospitals with low occupancy rates.
Utilization control	
Limits on inpatient days per year	The State sets a fixed limit on the number of annual inpatient days per recipient that Medicaid will pay for.
Limits on inpatient days per stay	The State sets a limit on the number of inpatient days per stay per recipient that Medicaid will pay for. Sometimes this is a fixed number, but usually stay limits vary according to diagnosis.
Prior authorization for nonemergency admissions	The State requires prior authorization from the Medicaid program in order for the hospital to be paid for nonemergency admissions.
Prior authorization for specific services	The State requires prior authorization from the Medicaid program for elective procedures for certain specific services.

SOURCE: (Laudicina, 1985).

for certain types of procedures can be received. Still another may implement both policies simultaneously. Policy variations may also arise because of differences in the actual day limits imposed or the services designated as requiring prior authorization. When one adds to these utilization options those associated with reimbursement methods, it becomes clear that no two State governments have identical approaches to the management of Medicaid hospital spending.

In Table 3, we identify and define a range of policy choices that States have at their disposal. Policies are grouped according to whether they pertain to alternative reimbursement systems or utilization controls. We describe these choices in a generic fashion and do not explore in great detail the potential variations within each element. For example, allowing higher payment rates to hospitals with a disproportionate share of uncompensated care will vary in its effect on program payments, depending on the size of the allowance and the State's definition of disproportionate share. Details of these types are contained in a report by Laudicina (1985). Laudicina's review of Medicaid policies allowed us to identify the policy options shown. We focus on these because they appear to be the most widely adopted options and also because conceptually they seem most likely to alter inpatient spending levels.

In Tables 4 and 5, implementation dates for the specific policy features are shown by State. For reimbursement methods (Table 4) we indicate when, if ever, the State adopted prospective payment. Six specific design options that may accompany a prospective (or, in limited instances, a retrospective) system are also detailed. Several developments in Medicaid hospital payment policy are apparent. First, the increase in PR systems after OBRA is dramatic. In the 2 years immediately following OBRA, 1982 and 1983, the number of Medicaid PR programs grew from 15 to 31. Second, no new waivers were implemented in the 3 years prior to OBRA, 1978, 1979, and 1980. Third, none of the post-OBRA waivers were for systems designed to include any payers besides Medicaid. Fourth, four States (California, 1980-82; Idaho, 1979-84; Louisiana, 1982-84; and Wisconsin, 1981-84) had payment systems that incorporated several features normally associated with prospective reimbursement but maintained retrospectivity in their rate process. Finally, although providing an uncompensated care allowance was a feature of the majority of the prospective systems, few systems were truly alike in terms of other design elements.

Turning to utilization control policies (Table 5), we find that only six States (Delaware, Massachusetts,

Table 4

Year of implementation of Medicaid alternative reimbursement policies, by State: United States, 1977-84

State	Prospective reimbursement	Payments per case	Rate ceilings	Uncompensated care allowance	Volume adjustment	Case-mix adjustment	Minimum occupancy requirement
	Year of implementation						
Alabama	1982	—	1982	1982	—	—	1982
Alaska	1983	—	—	—	—	—	—
Arkansas	—	—	—	—	—	—	—
California	1983	[1]1980	[1]1982	1982	[1]1980	[1]1980	[1]1981
Colorado	1977	—	1980	—	—	—	—
Connecticut	—	—	—	—	—	—	—
Delaware	—	—	—	—	—	—	—
District of Columbia	1983	1983	—	—	1983	—	—
Florida	1981	—	1981	1981	—	—	—
Georgia	1981	1981	1981	—	1981	1981	—
Hawaii	—	—	—	—	—	—	—
Idaho	—	1979	—	—	1979	—	—
Illinois	1982	—	—	1982	1982	—	—
Indiana	—	—	—	—	—	—	—
Iowa	1982	—	—	1982	—	—	—
Kansas	1983	—	1983	1983	1983	—	—
Kentucky	1981	—	1981	1983	—	—	1981
Louisiana	—	1982	—	—	—	1982	—
Maine	—	—	—	—	—	—	—
Maryland	[2]1977	1983	—	1980	1977	—	—
Massachusetts	[2]1977	—	—	1982	1982	1982	1982
Michigan	1977	1977	1982	1982	1980	1981	—
Minnesota	1983	1983	—	1983	—	1983	—
Mississippi	1981	—	1981	1982	—	1981	1981
Missouri	1981	—	—	1981	—	1981	—
Montana	—	—	—	—	—	—	—
Nebraska	1982	—	—	—	—	—	—
Nevada	1983	1983	1983	1983	—	—	—
New Hampshire	—	—	—	—	—	—	—
New Jersey	[2]1977	1980	1980	1980	1977	1977	—
New Mexico	—	—	—	—	—	—	—
New York	[2]1977	—	1977	1983	1977	1977	1977
North Carolina	1981	—	—	1981	1982	—	—
North Dakota	—	—	—	—	—	—	—
Ohio	—	—	—	—	—	—	—
Oklahoma	1983	—	—	—	—	1983	—
Oregon	1983	1983	—	1983	—	—	—
Pennsylvania	—	—	—	—	—	—	—
Rhode Island	[2]1977	—	—	—	1977	1977	—
South Carolina	—	—	—	—	—	—	—
South Dakota	—	—	—	—	—	—	—
Tennessee	1983	—	—	1983	—	1983	1983
Texas	—	—	—	—	—	—	—
Utah	1983	1983	—	—	—	—	—
Vermont	1983	—	—	—	—	—	—
Virginia	1982	—	1982	1982	—	—	—
Washington	[3]1977	—	1977	1977	1977	—	—
West Virginia	—	—	—	—	—	—	—
Wisconsin	[2,4]1977	1981	—	1983	[5]1977	1983	1982
Wyoming	—	—	—	—	—	—	—

[1] Policy dropped in 1983.
[2] Covered some or all other payers in addition to Medicaid.
[3] Covered all payers in addition to Medicaid until 1981; became Medicaid only in 1982.
[4] Policy dropped in 1981.
[5] Policy not in effect during 1980.

NOTE: Unless otherwise indicated, all policies were in effect from implementation through the end of the study period, 1984.

SOURCE: (Laudicina, 1985).

Table 5

Year of implementation of Medicaid utilization control policies, by State: United States, 1977-84

State	Limits on inpatient days		Prior authorization	
	Per year	Per stay	Nonemergency admissions	Specific services
	Year of implementation			
Alabama	1977	—	—	—
Alaska	[1]1982	—	1983	[1]1982
Arkansas	[2]1977	1981	—	—
California	—	1977	1977	1982
Colorado	—	1980	—	—
Connecticut	—	—	—	1977
Delaware	—	—	—	—
District of Columbia	—	—	—	1982
Florida	1977	—	—	1977
Georgia	[1]1981	—	—	—
Hawaii	—	1977	1977	—
Idaho	1982	[3]1977	—	1984
Illinois	[3]1981	1982	—	—
Indiana	—	—	—	1982
Iowa	—	1982	—	1981
Kansas	—	1982	—	1977
Kentucky	—	1977	1983	—
Louisiana	1977	—	—	1977
Maine	—	—	—	1977
Maryland	—	1981	1981	1977
Massachusetts	—	—	—	—
Michigan	1982	1982	—	1977
Minnesota	—	—	—	1983
Mississippi	1977	—	1984	—
Missouri	—	1977	—	1984
Montana	—	—	—	—
Nebraska	—	—	—	—
Nevada	—	—	1981	—
New Hampshire	[3]1981	—	—	[4]1977
New Jersey	—	—	—	1983
New Mexico	—	—	—	1980
New York	—	—	—	—
North Carolina	—	—	—	1977
North Dakota	—	—	—	—
Ohio	—	1977	1984	—
Oklahoma	—	1977	—	1984
Oregon	1977	—	—	1981
Pennsylvania	—	—	—	1977
Rhode Island	—	1977	—	1983
South Carolina	1977	—	—	1980
South Dakota	[1]1977	—	—	—
Tennessee	1977	—	—	1982
Texas	—	1977	—	—
Utah		([5])	—	1982
Vermont	—	—	—	1982
Virginia	—	1977	—	—
Washington	—	1982	1977	1977
West Virginia	1977	—	—	—
Wisconsin	—	—	—	1977
Wyoming	—	1977	—	—

[1] Policy dropped in 1983.
[2] Policy dropped in 1981.
[3] Policy dropped in 1982.
[4] Policy not in effect during 1981.
[5] Policy in effect only during 1977 and 1981.

NOTE: Unless otherwise indicated, all policies were in effect from implementation through the end of the study period, 1984.

SOURCE: (Laudicina, 1985).

Montana, Nebraska, New York, and North Dakota) went through the entire study period without some policy of this type. Although OBRA did not directly alter a State's ability to implement utilization control policies, it seems to be associated with an era of substantial expansion in this area. Possibly OBRA's cut in Federal matching rates or the recession of 1982 gave States the impetus to reexamine all policies that could reduce Medicaid outlays. Under any circumstances, 26 States either instituted or expanded inpatient hospital utilization control policies in the years following OBRA. Clearly, the most widespread control policy was a requirement of prior authorization for certain elective procedures or specific services. Despite State-to-State variations in the precise features of this policy, this requirement is apparently considered to be effective. Some decisionmakers also support limiting inpatient days. However, there is little agreement on the desirability of per-year versus per-stay limits. Tests of the relative effectiveness of these policies are contained in the empirical section of this article.

Data and methods

The primary data source used in this study is information reported to the Federal Government by the State governments through the Statistical Report on Medical Care: Eligibles, Recipients, Payments, and Services of the Health Care Financing Administration (HCFA), known as the HCFA 2082 Medicaid expenditure report. This report contains information on Medicaid expenditures, utilization by eligibility status (e.g., AFDC, blind and disabled, aged), and type of service (e.g., inpatient hospital, physician, nursing home), as well as an unduplicated count of recipients. Because aged Medicaid patients are also Medicare eligible, their inpatient hospital use and payments are influenced by national as opposed to State policy decisions. Therefore, the aged have been excluded from this study. All data on Medicaid inpatient hospital policies were derived from the report by Laudicina (1985). Her primary sources were descriptions of State Medicaid plans, which must be filed as part of any major policy overhauls. Summary characterizations of the policies were developed from Laudicina's compilations and are shown in Table 3.

The 2082 form is probably the most comprehensive source of Medicaid program data that is consistent in structure across States, but it is not without its drawbacks. The major problems relate to the utilization data. Many States simply do not or cannot report hospital utilization data. In addition, at various points during the study period, States did not correctly exclude days paid for by Medicare when reporting on utilization of Medicaid-Medicare joint eligibles. As Cromwell and Hurdle (1984) point out, working around these problems with 2082 report data would require analysis of a curtailed timeframe and a reduced number of States, as well as some degree of data interpolation. Therefore, we chose to omit analyses based on utilization measures and, instead, rely on the recipient and expenditure data, about which there is a greater degree of confidence.

The expenditure data were verified against audited data reported in the HCFA 64 forms, which are used to determine matching payments and seem to contain the most credible information available. Some inconsistencies arise in the recipient data because of States' difficulties in consistently and accurately assigning recipients to particular eligibility classes. Changes in the 2082 form have reduced this problem over time. HCFA also "corrected," at least cross-sectionally, errors or omissions in the expenditure and recipient data by drawing on comparable data from other reports or by requesting additional information directly from the States.

Despite our belief that the expenditure and recipient data are of sufficiently high quality to serve as the basis of this study, some implausibly large annual fluctuations can be detected. Prior to conducting any empirical analyses, we investigated all observations in which a State's real total hospital spending per recipient changed by more than 33 percent, positively or negatively, from one year to the next. Real spending per recipient was used as a screen because it is an indicator of large changes in spending and/or recipients that are inconsistent with one another. We examined the remaining data for the State involved to determine if the problems arose because of seemingly inaccurately reported payments or recipient counts. After this determination was made, we imputed a new value for the appropriate variable by using a trend regression based on the remaining observations. Because only 14 out of 800 values (2 variables $\times$ 50 programs $\times$ 8 years) were altered, it is unlikely that the findings were substantively affected.

Three analysis variables were defined in order to measure the relative effectiveness of Medicaid hospital policies on program outcomes: annual percent change in real inpatient hospital expenditures, annual percent change in inpatient hospital recipients, and annual percent change in real inpatient hospital spending per recipient. The 8 years of data from each State allow us to compute seven annual percent change measures, so our maximum sample size for these analyses is 350 (50 States $\times$ 7 annual percent changes). The variable most appropriate for evaluating rate-setting systems, in light of the fact that utilization-based measures of payment are not available, is spending per recipient. However, rate-setting effects also could emerge as slower recipient growth if rates are reduced to the point at which access is curtailed. Recipient analysis is also necessary because some utilization controls are designed to keep Medicaid enrollees out of hospitals when less costly services can be substituted. Using these variables enables us to determine if policies are slowing growth in total Medicaid hospital outlays and if this is occurring as a result of curtailing increases in recipients or curtailing increases in real payments per recipient.

Both tabular and multivariate analyses are employed in this article. In the tabular analyses, presented as background information, comparisons

are made among States with and without the particular policies described in Table 3. For the specific aspects of rate-setting designs, all comparisons are made among States with prospective reimbursement waivers in place. Using average annual percent changes is a self-controlling technique to deal with cross-sectional differences in the underlying characteristics of States or their Medicaid programs.

However, tabular analyses do not allow us to clearly isolate policy effects because they are confounded by potential intervening variables. Therefore, we rely on multivariate regressions to control for these factors. To measure the true impact of a particular hospital spending policy, it is necessary to control for three specific types of confounding influences: the presence of other hospital policies, changes in the size and composition of the Medicaid population, and general trends in hospital use patterns and Medicaid spending. Our dependent (or analysis) variables are measured as changes, so it is not necessary to include variables whose values tend to be relatively constant over time but vary from State to State, e.g., proportion of care provided in public hospitals or percent of population residing in urban areas.

The reimbursement or utilization control policies are measured by categorical variables equal to one if the State had the policy in place in a given year and zero otherwise. A number of alternative specifications were employed to evaluate different aspects of hospital spending policies. In particular, different forms of the reimbursement policy variables were employed. First, we treated all States with Medicaid PR as a single group. We then divided them into two groups: States in which Medicaid is the only payer regulated by the State, and States that regulate other payers in addition to Medicaid. These two types of Medicaid PR programs were then analyzed with respect to the number of years they have been in effect. We were unable to isolate the independent effects of the remaining design elements shown in Table 4 because of the high degree of collinearity among the variables measuring these factors; i.e., many States with Medicaid PR used similar combinations of design elements.

Other independent variables we control for in the regressions relate to the size and composition of the Medicaid population and time trends. To hold constant changes in Medicaid eligibility rules that would influence the size of the potential pool of inpatient hospital recipients, we include the percent change in the annual unduplicated count of total Medicaid recipients available from the 2082 data. As the rate of change in the potential recipient group grows, the rate of change in inpatient recipients should also grow. As an alternative, we could have used the percent change in average monthly enrollee counts, which can be computed from Social Security Administration sources and the HCFA 120 form. However, these data do not allow one to account for turnover rates, so an unduplicated enrollee count that is analogous to the 2082 unduplicated recipient count cannot be derived. Turnover of Medicaid enrollees appears to be extensive (Wilensky, Walden, and Kasper, 1980). Therefore, we have opted to use changes in the unduplicated count of total recipients as a measure of changes in overall program size. This variable is not independent of utilization factors. However, as long as the proportion of Medicaid enrollees utilizing some service is independent of eligibility changes among the nonaged, the unduplicated number of recipients is a reasonable proxy for program size. Even if utilization patterns alter the ratio of total recipients to eligibles across all services, we still feel it is defensible to use changes in unduplicated total recipients to measure changes in the pool of eligibles for any single service.

Although this variable can be used to account for eligibility changes affecting the size of Medicaid programs, it cannot be used to account for eligibility changes affecting the composition of potential recipient groups. To control for this, we use the proportion of unduplicated recipients who are AFDC adults and the proportion who are AFDC children. Because both child and adult AFDC recipients are less likely to be hospitalized than disabled beneficiaries, we expect these proportions to be inversely related to the rate of change in inpatient recipients. Finally, general trends in hospital spending are captured by the inclusion of time dummies in each of the subsequent regressions.

Results

The two general types of policies considered, prospective reimbursement and utilization controls, would be expected to affect the growth in Medicaid hospital spending through different mechanisms. In terms of the analysis variables discussed here, effective PR programs are likely to save Medicaid money by reducing the growth in spending per recipient. The reason for this is that PR is focused on setting payment rates (per diem, per case, or per service) but is not necessarily used to reduce admissions, i.e., inpatient recipients. Medicaid's prospective rates might be set so low that its beneficiaries would be viewed as financial liabilities for hospitals, and hospitals thus might attempt to curtail Medicaid admissions. This outcome could result in PR having a negative impact on inpatient recipient growth in addition to spending per recipient. A PR recipient effect seems more likely to develop in States where Medicaid is the sole regulated payer than in States in which Medicaid is part of a broader regulatory process.

Utilization controls, on the other hand, are geared toward screening out unnecessary hospital care as opposed to controlling rates. Limiting inpatient days per stay could reduce spending per recipient by shortening Medicaid lengths of stay. However, if the limits are severe, hospitals could selectively shun Medicaid inpatients and cause a reduction in recipients. Annual day limits appear less likely than per-stay limits to shorten individual lengths of stay

Table 6

Average annual percent change in Medicaid inpatient hospital expenditures and recipients, by type of alternative reimbursement policy: United States, 1977-84

Policy	Sample size		Real total inpatient expenditures		Inpatient recipients		Real expenditures per recipient	
	Without policy	With policy	Without policy	With policy	Without policy	With policy	Without policy	With policy
				Average annual percent change				
Prospective reimbursement	228	122	6.4	[2]0.6	1.4	[2]–0.9	5.7	[2]1.7
Specific features of prospective reimbursement systems:[1]								
Payments per case	93	29	0.9	–0.1	–0.6	–1.7	1.6	2.2
Rate ceilings	68	54	1.4	–0.2	–1.5	–0.1	2.9	0.3
Uncompensated care allowance	52	70	1.8	–0.2	–0.6	–1.1	3.0	0.8
Volume adjustment	61	61	1.9	–0.6	–0.7	–0.9	2.8	0.7
Case-mix adjustment	74	48	0.7	0.5	–1.2	–0.4	2.0	1.4
Minimum occupancy requirement	98	24	0.5	–1.4	–1.2	0.4	1.8	[2]–1.4

[1] The average annual percent changes in the remaining rows are based only on States with prospective reimbursement for Medicaid. These are the 122 observations with prospective reimbursement shown in the first row.
[2] Differences between the percent changes for groups with and without the policy are statistically significant at the 95-percent level of confidence.

NOTE: Aged recipients are excluded from this analysis because payments for their services are mainly affected by Medicare rules.

SOURCE: Health Care Financing Administration, Office of the Actuary: HCFA 2082 data from the Medicaid Statistical Information System.

and, in fact, unless set at very low levels, would not reduce the unduplicated recipient counts either. Prior authorization policies are more clearly directed at reducing the number of recipients. Either by requiring approval for nonemergency admissions or by not allowing hospitals to provide certain services without first contacting the Medicaid program, such policies give hospitals incentives to screen potential inpatients. Hospitals are unlikely to admit those for whom authorization might be hard to receive. If prior authorization is effective, we would expect to see its impact in the number of recipients rather than spending per recipient.

The relationship between Medicaid hospital payment waivers and hospital spending patterns is described in Table 6. As shown in the first row, real total spending grew significantly more slowly when a prospective reimbursement system was in place. The growth rate reductions appear to be associated with both lower growth in the number of inpatient recipients (actually an average annual reduction) and lower growth in real spending per recipient. In the remainder of Table 6, data are shown only for States with Medicaid prospective reimbursement waivers and their experiences with specific payment system features. In general, none of the features seem to result in significantly different patterns of hospital spending across the waiver States. The only exception is alternative payment systems containing a minimum occupancy requirement (MOR) in its rate calculations. States with these MOR systems experienced an average annual decrease of 1.4 percent in real expenditures per recipient, compared with 1.8-percent increase for other Medicaid PR systems. However, because one-third of the observations on which this result is based come from New York data, it is conceivable that some unique aspect of the New York system, rather than the occupancy requirement, may be responsible for this finding.

In Table 7, spending patterns among States both with and without utilization control policies are described. The results show that neither limiting inpatient days nor requiring prior authorization for nonemergency admissions has any statistically significant effect on real inpatient spending per recipient. Although these policies could act to contain the amount of care delivered to Medicaid inpatients, in reality they do not appear to do so. In fact, we find that only prior authorization for elective procedures or other specific services bears any relation to inpatient hospital spending. This policy is associated with an average annual reduction in the number of recipients of 1.2 percent, compared with a 1.9-percent increase for programs that do not have this policy in effect. As might be expected, these differences translate into slower real growth in overall Medicaid hospital payments.

Although these data suggest that the policy choices made by States have some effect on inpatient spending, we must turn to multivariate analyses in order to be certain that the policy variables are not capturing other changes in the Medicaid program or the State's environment. The means and standard deviations of the variables used in the regressions are included in Table 8. Results of the regression analysis are shown in Table 9.

Regression set 1 contains estimates in which all Medicaid PR programs are treated as a single group. Using these results, we find that PR reduces the rate of growth in real spending per recipient by 3.1 percent

Table 7

Average annual percent change in Medicaid inpatient hospital expenditures and recipients, by type of utilization control policy: United States, 1977-84

Policy	Sample size		Real total inpatient expenditures		Inpatient recipients		Real expenditures per recipient	
	Without policy	With policy	Without policy	With policy	Without policy	With policy	Without policy	With policy
			Average annual percent change					
Limits on inpatient days								
Per year	272	78	4.3	4.7	0.4	1.4	4.4	4.0
Per stay	241	109	4.6	3.9	0.7	0.3	4.6	3.7
Prior authorization								
Nonemergency admissions	315	35	4.5	3.5	0.6	0.8	4.5	2.6
Specific services	205	145	6.5	[1]1.4	1.9	[1]–1.2	4.8	3.6

[1] Differences between percent changes for groups with and without the policy are statistically significant at the 90-percent level of confidence.

NOTE: Aged recipients are excluded from this analysis because payments for their services are mainly affected by Medicare rules.

SOURCE: Health Care Financing Administration, Office of the Actuary: HCFA 2082 data from the Medicaid Statistical Information System.

Table 8

Mean and standard deviation of variables used in regression analyses of annual percent changes in Medicaid inpatient hospital spending, by type of variable: United States, 1977-84

Type of variable	Mean	Standard deviation
Dependent		
Annual percent change in real inpatient hospital spending	0.032	0.140
Annual percent change in inpatient hospital recipients	0.006	0.120
Annual percent change in real inpatient hospital spending per recipient	0.031	0.125
Independent		
Any Medicaid PR system[1]	0.349	0.477
Medicaid-only PR system[1]	0.220	0.415
Age of PR system:		
1 year[1]	0.077	0.267
2 years[1]	0.069	0.253
More than 2 years[1]	0.074	0.263
Medicaid PR system as part of broader system[1]	0.129	0.335
Limits on inpatient days per recipient, per year, or per stay[1]	0.526	0.500
Required prior authorization, nonemergency admission[1]	0.100	0.300
Required prior authorization, specific services[1]	0.414	0.493
Annual percent change in total Medicaid recipients	0.015	0.109
Share of total Medicaid recipients who are AFDC children	0.564	0.049
Share of total Medicaid recipients who are AFDC adults	0.271	0.043

[1] Binary variables equal to 1 if the State-year observation has the characteristic; 0 otherwise.

NOTES: Aged recipients are excluded from this analysis because payments for their services are mainly affected by Medicare rules. Sample size = 350. PR is prospective reimbursement. AFDC is Aid to Families with Dependent Children.

SOURCES: Health Care Financing Administration, Office of the Actuary: HCFA 2082 data from the Medicaid Statistical Information System; (Laudicina, 1985).

per year, on average, relative to the rate in States without such programs. In general, reimbursement policies do not exert a significant influence over changes in the number of recipients. As might be expected from the tabular analysis, the only utilization control policy that affects Medicaid hospital spending is prior authorization for elective surgery and certain specific services. This requirement is associated with an average 2.7-percent annual reduction in the rate of change in recipients; no impact on real spending per recipient is observed. These results show that both alternative methods of reimbursement and some utilization controls can reduce the growth in real hospital expenditures; one method does so by lowering spending per recipient, and one does so by containing the growth in recipients.

Regressions in set 2 show that a Medicaid payment system's success appears to be related to the coverage of other payers. Real spending growth is not significantly lower in Medicaid-only PR systems. On the other hand, States that control Medicaid rates as part of a broad-based regulatory process seem to have kept changes in real spending per recipient 4.8 percent below those in States that apply Medicare reasonable-cost principles. We considered variation among these broad-based systems that, as a group, appear to contain Medicaid spending without adverse consequences regarding patient access. Although New

Table 9

Regression analyses of annual percent changes in real Medicaid inpatient hospital spending: United States, 1977-84

Independent variable	Set 1			Set 2			Set 3		
	Hospital spending	Number of recipients	Spending per recipient	Hospital spending	Number of recipients	Spending per recipient	Hospital spending	Number of recipients	Spending per recipient
	Regression coefficient								
Any PR	[2]–0.040	–0.013	[3]–0.031	—	—	—	—	—	—
	(2.36)	(0.99)	(2.08)						
Medicaid-only PR	—	—	—	–0.026	–0.011	–0.019	—	—	—
				(1.26)	(0.66)	(1.02)			
Medicaid PR plus other payers	—	—	—	[2]–0.058	–0.017	[3]–0.048	[3]–0.058	–0.017	[3]–0.048
				(2.50)	(0.80)	(2.30)	(2.52)	(0.90)	(2.30)
Age of Medicaid-only PR system:									
1 year	—	—	—	—	—	—	–0.002	0.006	–0.015
							(0.09)	(0.24)	(0.57)
2 years	—	—	—	—	—	—	[2]–0.076	[4]–0.042	–0.039
							(2.47)	(1.68)	(1.36)
More than 2 years	—	—	—	—	—	—	–0.005	–0.001	–0.003
							(0.17)	(0.06)	(0.10)
Any limits on inpatient days	–0.003	–0.009	0.006	–0.008	–0.010	0.002	–0.009	–0.011	–0.001
	(0.20)	(0.73)	(0.41)	(0.47)	(0.77)	(0.11)	(0.55)	(0.81)	(0.04)
Prior authorization, nonemergency admission	0.009	0.005	–0.001	0.012	0.006	0.001	0.009	0.004	–0.0001
	(0.38)	(0.26)	(0.04)	(0.47)	(0.28)	(0.05)	(0.38)	(0.22)	(0.01)
Prior authorization, specific services	[4]–0.030	[3]–0.027	0.008	[3]–0.031	[3]–0.027	0.006	[3]–0.031	[3]–0.027	0.006
	(1.90)	(2.10)	(0.53)	(1.99)	(2.11)	(0.43)	(2.01)	(2.12)	(0.44)
Percent change in total Medicaid recipients	[2]0.200	[2]0.476	[2]–0.295	[2]0.193	[2]0.475	[2]–0.301	[2]0.193	[2]0.475	[2]–0.301
	(2.92)	(8.56)	(4.71)	(2.80)	(8.49)	(4.80)	(2.81)	(8.50)	(4.79)
Share of total recipients who are AFDC adults	0.268	–0.142	–0.090	–0.273	–0.143	–0.094	–0.285	–0.149	–0.100
	(1.42)	(0.93)	(0.52)	(1.45)	(0.93)	(0.55)	(1.52)	(0.98)	(0.58)
Share of total recipients who are AFDC children	–0.061	–0.202	0.191	–0.056	–0.201	0.195	–0.040	–0.191	0.201
	(0.38)	(1.56)	(1.31)	(0.35)	(1.55)	(1.34)	(0.25)	(1.47)	(1.38)
Year:[1]									
1978	–0.003	–0.002	–0.013	–0.002	–0.002	–0.012	0.001	–0.0002	–0.012
	(0.10)	(0.09)	(0.54)	(0.06)	(0.09)	(0.49)	(0.04)	(0.01)	(0.48)
1979	–0.003	–0.004	–0.007	–0.002	–0.003	–0.006	–0.001	–0.002	–0.006
	(0.12)	(0.16)	(0.28)	(0.08)	(0.15)	(0.24)	(0.03)	(0.10)	(0.25)
1980	0.00002	–0.012	0.010	0.002	–0.012	0.011	0.003	–0.011	0.011
	(0.001)	(0.56)	(0.41)	(0.06)	(0.55)	(0.47)	(0.10)	(0.51)	(0.46)
1982	[2]–0.070	–0.023	[3]–0.053	[2]–0.072	–0.023	[3]–0.054	[2]–0.067	–0.020	[3]–0.053
	(2.56)	(1.03)	(2.11)	(2.62)	(1.04)	(2.16)	(2.45)	(0.90)	(2.10)
1983	0.044	0.031	0.003	0.039	0.030	–0.002	0.038	0.030	–0.003
	(1.59)	(1.39)	(0.12)	(1.39)	(1.33)	(0.06)	(1.35)	(1.32)	(0.11)
1984	–0.034	–0.037	–0.007	–0.040	–0.038	–0.012	–0.034	–0.033	–0.012
	(1.22)	(1.39)	(0.28)	(1.41)	(1.65)	(0.48)	(1.17)	(1.41)	(0.47)
Intercept	0.172	[4]0.177	–0.033	0.174	[4]0.178	–0.031	0.166	0.174	–0.033
	(1.41)	(1.79)	(0.30)	(1.42)	(1.79)	(0.28)	(1.37)	(1.75)	(0.30)
R^2	0.130	0.229	0.094	0.133	0.229	0.097	0.145	0.235	0.100

[1] Each year variable is a dummy variable that is equal to 1 if the observation is from the given year; 0 otherwise. The year 1981 is omitted and used for comparison purposes.
[2] Statistically different from 0 at the 99-percent level of confidence.
[3] Statistically different from 0 at the 95-percent level of confidence.
[4] Statistically different from 0 at the 90-percent level of confidence.

NOTES: Absolute values of *t* statistics are shown in parentheses. Aged recipients are excluded from this analysis because payments for their services are mainly affected by Medicare rules. Sample size = 350. PR is prospective reimbursement. AFDC is Aid to Families with Dependent Children.

SOURCES: Health Care Financing Administration, Office of the Actuary: HCFA 2082 data from the Medicaid Statistical Information System; (Laudicina, 1985).

York and Massachusetts seemed to exert greater downward pressure on real spending growth than other States with regulatory systems that go beyond Medicaid, an F-test did not allow us to reject the null hypothesis that these two States have the same impact on hospital spending as the other five States in this group (Maryland, New Jersey, Rhode Island, Washington, and Wisconsin).

One reason that Medicaid-only systems are found to be inferior may be that these approaches are, on average, newer than the more comprehensive systems. Prior research has shown that, in general, PR becomes effective as a means of containing hospital costs only after it has been in place for more than 2 years (Sloan, 1983). To explore the relationship between payer coverage and program age, we grouped

the Medicaid-only systems according to the number of years each system had been operating. The programs are separated into those that are 1 year old, 2 years old, and more than 2 years old. A similar division for broad-based programs is not appropriate because we do not observe any of the systems in year 1 and only three in year 2. Results of these analyses, shown in set 3 of Table 9, indicate that the effectiveness of Medicaid-only systems is related to program age. Growth in total hospital spending is not reduced in the first year of a Medicaid-only program. This may result from the fact that the first year, as our variables are defined, is a partial year for many systems. However, in year 2 (the first full year we observe), real spending growth is 7.6 percent below growth in States without waivers. Beyond year 2, these systems once again return to growth rates similar to those in States without prospective controls on Medicaid rates. The lower year 2 growth rates result in lower levels of spending in year 2 than would have existed in the State if no Medicaid-only PR system had ever been adopted. Because growth rates in these States are no different from those in non-PR States after year 2, the level of Medicaid hospital spending will remain below where it otherwise would have been, and therefore some permanent savings will be attained.

What happens in the second year of Medicaid-only rate-setting systems to reduce the rate of growth in hospital spending? To answer this question, we refer to the corresponding regressions on number of recipients and spending per recipient. Both the change in number of recipients and the change in real spending per recipient are lowered by about 4 percent in Medicaid-only PR as compared with States with retrospective payment methods. The differential in spending per recipient, however, is not statistically significant at conventional levels of confidence. These findings suggest that when Medicaid rates are the only rates regulated, hospitals may find Medicaid patients less desirable and may implement procedures geared toward reducing the number of beneficiaries admitted. Put differently, when Medicaid rates fall relative to rates of other payers, Medicaid enrollees seem to experience some hospital access problems. It may well be that nonhospital services are substituted for hospital care in these instances; however, exploration of this issue is beyond the scope of this study. Our findings with respect to later years in Medicaid-only PR systems indicate that States respond to developing hospital access barriers by providing more generous rates of growth and making Medicaid inpatients more desirable again.

The remaining variables, which relate to general eligibility, recipient composition, and general trends, yield similar results in all of the alternative regressions. Increased growth in total recipients is associated with higher growth in the number of inpatient recipients and smaller increases in real spending per recipient. This latter result suggests that, as eligibility expands, the marginal people added to the program are less costly than enrollees who were already in the program when eligibility was tight, i.e., the people added tend to be healthier than the people already covered. The share of children has a weak (not statistically significant) negative effect on changes in the number of recipients and a positive effect on real spending per recipient. These findings suggest that, as more children are covered, fewer people are hospitalized, but those who are hospitalized may be sicker. As the proportion of unduplicated recipients who are adults grows, recipient growth falls and spending per recipient slows. However, neither result is significant.

The time variables show that, relative to 1981 (the year of OBRA's implementation), significantly different patterns of expenditure growth were exhibited only in 1982. Inpatient spending grew 7.0 percent more slowly from 1981 to 1982 than it had from 1980 to 1981 (set 1, Table 9). This pattern is primarily caused by lower growth in real spending per recipient over this period. No significant trend in the annual rate of change in recipients can be seen when the policy and eligibility controls are introduced in the regression. There has been a general sense that increases in hospital spending fell after OBRA because of the proliferation of alternative methods waivers, utilization controls, and eligibility tightening. Our results indicate, however, that even after controlling for these factors, a one-time downward shock to hospital payments is still associated with OBRA's passage. States may have viewed OBRA as a window of opportunity to contain rates below the level indicated by general PR policies. Under any circumstances, it seems clear that new policies alone do not explain the immediate post-OBRA changes in hospital spending.

Conclusions and policy implications

The 1981 OBRA legislation initiated many changes in Medicaid policies related to inpatient hospital services. Some significant changes in eligibility standards also led to a reduction in the total pool of Medicaid recipients. The majority of States that had been reimbursing according to Medicare reasonable-cost principles applied for and received a waiver that allowed them to develop a prospective payment system for Medicaid. In addition, many States either initiated or expanded a number of utilization control policies. Growth in hospital spending fell dramatically in the years immediately after OBRA. Real expenditures per recipient fell by 1.6 percent annually from 1981 to 1983, compared with 0.7-percent growth in the 4 years immediately preceding the legislative initiative. At the same time, the number of inpatient recipients fell by 1.1 percent per annum.

Based on the analyses in this article, it appears that the OBRA-induced policy changes definitely contributed to the reduced growth in hospital spending. However, some of the reduction remains unexplained. Although the focus of OBRA was on making alternative reimbursement waivers easier to obtain, it appears that expanded prior authorization

requirements may have a more long-lasting effect on containing spending growth. In the post-OBRA era, 16 States added such policies to join the 12 States that already had them. Because prior authorization for specific services had virtually the same impact in the pre- and post-OBRA periods, it seems clear that the expansion of this type of policy contributed to the reduction in hospital spending growth. Although this policy works by reducing the growth in inpatient recipients, it should not create general Medicaid access problems if recipients are truly screened on the basis of medical necessity.

The effectiveness of the new prospective reimbursement movement in Medicaid is somewhat more questionable. All of the systems implemented after OBRA covered only Medicaid payment rates. We find that these programs have limited (not statistically significant) capability to contain real spending per recipient in the second year of their existence (first full year), but the growth rate effect does not seem to be sustained in the subsequent years. Because these policies also reduce the growth in inpatient recipients, we conclude that the impact of this approach as a means of containing spending is limited by the emergence of potential hospital access problems for Medicaid enrollees. However, the one-time reduction in spending growth does result in some permanent savings because the level of Medicaid hospital spending in States that adopted Medicaid-only PR is driven below the level at which it would have otherwise been. States that include Medicaid in a broader regulatory system are able to control the growth in spending per recipient over a longer period without any apparent barriers to access. One caveat is in order. Only Michigan and Colorado had Medicaid-only PR prior to 1981. Our estimates of Medicaid-only effects beyond year 2, therefore, are based on a limited time series for 13 States. These systems could mature into more effective regulatory structures, but always at the risk of curtailing service availability for eligibles.

General policy changes that led to a 0.7-percent annual decline in total recipients of any service from 1981 to 1984 (Holahan and Cohen, 1986) also affected hospital spending. Not surprisingly, as the growth in total recipients fell (a proxy for the decline in the pool of potential eligibles), changes in the number of inpatient recipients were reduced as well. Hence, part of the reductions in Medicaid hospital spending were caused by general programmatic changes that reduced the number of eligibles. Even after taking these changes and hospital policy initiatives into account, there still appears to be some unexplained tightening in hospital expenditures emanating from slower growth in real payments per recipient. This is captured by the time variables in our regressions. The time effect is consistent with the notion that general changes in the hospital sector (e.g., declining lengths of stay) are spilling over into the Medicaid program. However, the time effect is observed only for the 1981-82 period, so it may be capturing some measure of immediate post-OBRA policy intensity. For instance, more prior authorization requests may have been denied, or payment rates may have been set well below longrun PR program targets in order to get at least some shortrun savings from OBRA.

What are the implications of these results for the design of future Medicaid policies addressing the growth in inpatient hospital spending? In the area of utilization controls, it seems clear that States should consider some form of required prior authorization for specific services. Although there can be considerable variation in how these policies are implemented, our results show that the typical approach appears effective. Case study analyses of selected States with prior authorization would provide greater insight into the specific features that are associated with the more successful programs. In this study, little evidence has been uncovered that would lead us to endorse inpatient day limits or prior authorization for nonemergency admissions as an effective policy tool.

Our results also indicate that State governments that have implemented or are considering implementing a Medicaid-only prospective payment system might want to consider expanding the system to include some other payers. Medicaid-only rate-setting approaches seem to have some shortrun ability to contain spending but have not yet exhibited the sustained success evident in States with broader based regulation. However, it would be an oversimplification to suggest that any form of rate setting that includes more than one payer will necessarily be successful. Further review of Laudicina (1985) shows that, in addition to regulating payers other than Medicaid, all seven of these rate-setting programs controlled hospitals' total revenues by adjusting the prospectively set rates in response to the actual volume of care provided. In addition, New York and Massachusetts (whose systems seemed to be somewhat more successful) applied minimum occupancy requirements in calculating the average costs of treating patients. Unfortunately, given the available data and the difficulties in measuring specific policies, it is not feasible to estimate the effects of these policy choices independently.

Although volume adjustment, as a generic policy option, did not seem to alter hospital spending patterns, when coupled with rate setting that covers other payers, it may be a central factor in regulatory success. In this type of system, volume adjustments allow authorities to control overall hospital revenues and, thus, to contain Medicaid rates in absolute terms without having them fall relative to those of other payers. In Medicaid-only approaches, volume adjustments are generally made in response to the number of Medicaid days and, if applied stringently, could make Medicaid inpatients undesirable. As an example, in 1982, Illinois began adjusting its rates based on volume to keep Medicaid hospital payments at a fixed level based on State appropriations. This policy lowered real spending per recipient from 1982 to 1983 by about 13 percent, but it also resulted in a nearly 6-percent reduction in the number of Medicaid

inpatient recipients. Nationally, inpatient recipients rose by almost 3 percent over the same period. Therefore, although broad-based systems may successfully use volume adjustments without creating access problems, this does not appear to be the case when Medicaid is the sole regulated payer.

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