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Competition, Regulation, and Hospital Costs, 1982 to 1986

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We used data on 5490 nonfederal, short-term general hospitals to evaluate the relative effectiveness of regulatory and market-oriented cost-control policies on hospital cost inflation between 1982 and 1986. All-payer rate-regulation programs reduced inflation rates by 16.3% in Massachusetts, 15.4% in Maryland, and 6.3% in New York, compared with the control hospitals in 43 states with neither all-payer rate regulation nor an aggressive market-oriented strategy. New Jersey hospitals experienced a rate of cost inflation similar to the control hospitals. Given the effectiveness of its regulatory program in the 1970s, however, New Jersey began and ended the period from 1982 to 1986 with the lowest costs, controlling for wages and patient mix. California's market-oriented cost-control policy reduced inflation rates by 10.1%. Hospitals with large percentages of patients insured by Medicare's prospective payment system experienced cost inflation rates 16.1% lower than hospitals with small percentages of Medicare patients. Investor-owned hospitals experienced rates of cost increase 11.6% higher than private nonprofit hospitals and 15.0% higher than public hospitals.

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THE 1980s have witnessed a number of major experiments in hospital financing methods as part of the nation's effort to slow the rate of health care–cost inflation. Since 1983 the federal Medicare program has reimbursed hospitals on a prospective rather than retrospective basis, with different rates for each of

467 diagnosis related groups. Four states (New York, New Jersey, Massachusetts, and Maryland) have extended the public utility form of hospital rate regulation to cover all third-party payers. California has pioneered a market-oriented approach to cost containment by permitting private insurers to contract selectively with hospitals on the basis of price.

Relatively little empirical evidence exists concerning the effectiveness of these various strategies. Data from 1982 to 1984 indicate that hospitals subject to Medicare's prospective payment system experienced lower rates of cost inflation than hospitals not subject to the system.[1] A considerable body of evidence suggests that state rate-regulation programs have slowed the rate of hospital cost inflation; however, these studies are based largely on data from the 1970s and early 1980s.[2-6] Schramm et al[7] found significant inflation-reducing effects in rate-regulated states using data through 1985. No published studies have compared these regulatory effects with the influence of price competition on hospital cost inflation in California. Such a comparison is essential, however, if public policy in the 1990s is to benefit from the turbulence of the 1980s by means of the design of better policy tools.

We analyzed data from 1982 to 1986 taken from 5490 hospitals to evaluate the relative effectiveness of California's market-oriented cost-control strategies; all-payer rate-regulation pro-

grams in New York, New Jersey, Massachusetts, and Maryland; and Medicare's prospective payment system on the rate of inflation in average hospital costs per admission. The effects of each policy strategy were evaluated using a multivariate statistical approach that controlled for hospital-specific changes in patient mix, wage rates, volume of services provided, and other relevant factors. In addition to analyzing the effects of each cost-control strategy on all hospitals, we examined how the effects of these strategies have differed for private nonprofit, public, or investor-owned institutions.

METHODS

Data on Hospitals

The primary sources of cost, utilization, and other data on individual hospitals used in this study were the 1982 and 1986 editions of the *Annual Survey of Hospitals*, published by the American Hospital Association. Of the approximately 6000 nonfederal, short-term general hospitals in the United States, 5490 provided all needed information on both the 1982 and 1986 surveys. Costs in 1982 and 1986 were measured in terms of the natural logarithm of annual expenses per admission in each of those years. The rate of inflation for each hospital was measured in terms of the difference in logarithms of 1986 and 1982 average costs. This is equivalent to the analysis of percentage rates of change in costs rather than absolute changes in costs.

The American Hospital Association surveys provided hospital-specific information on the mix of third-party payers reimbursing each hospital, wage costs, utilization levels, patient case mix, hospital teaching role, and ownership status. The vulnerability of each hospital to program changes on the part of the national Medicare program and the state Medicaid programs was measured by the fraction of annual dis-

charges reimbursed by each payer. Wage and utilization levels were measured in terms of the logarithms of average annual employee earnings, the number of staffed beds, annual volumes of inpatient and of outpatient surgery, and annual outpatient visits. To control for scale effects (given that expenditures were measured by costs per admission rather than by total costs), the bed, surgery, and outpatient visit variables were divided by annual admissions. The rationale for this approach to scale effects is discussed by Breyer.[8] Role of hospital teaching was measured in terms of whether the institution was a member of the Council of Teaching Hospitals. Ownership status was measured in terms of whether the hospital was public or investor owned, with private nonprofit hospitals being the comparison category.

An important statistical advantage of examining changes rather than levels of costs at the hospital-specific level is that all hospital-specific but time-invariant effects of case mix are eliminated. Case mix varies widely across hospitals at any one point in time, and hence exerts important effects on the levels of costs across hospitals, but does not vary as much over time in any one hospital, and hence exerts weaker effects on the rate of change in costs. Changes in hospital-specific patient case mix over time were measured in broad terms according to the change in the percentage of inpatient days in 1982 and 1986 that fell into each of six categories as follows: general medical and surgical care, pediatrics, obstetrics, other acute care, intensive care, and subacute care. From 1982 to 1986, virtually all US hospitals experienced declines in admissions and a corresponding increase in the case-mix severity. This undoubtedly contributed to increases in average costs per admission. Because these effects occurred in all hospitals simultaneously, they cannot explain most of the variance across hospitals in cost-inflation areas. Analyses of inflation rates in costs per capita rather than costs per admission will be necessary to adequately isolate the impact of changing utilization patterns.

Data on Hospital Markets

The structure of the local market within which each hospital operates was measured in terms of the number of neighboring nonfederal, short-term general hospitals within a 24-km (15-mile) radius. This creates a local market of approximately 1800 km² (700 square miles). The 24-km radius was chosen under the assumption that it was the maximum distance a community-based physician would travel between multi-

ple hospitals on a regular basis to conduct rounds. Neighboring hospitals are interpreted as competing with one another for patient admissions largely by competing for physician affiliations.

Calculation of the number of neighbors began by matching the zip code of each of the nonfederal, short-term general hospitals in the nation to the latitude and longitude of the main post office for its zip code. Using the Pythagorean theorem, we computed straight-line distances between each pair of hospitals, using latitude and longitude coordinates. For each hospital, we then identified the number of other hospitals within 24 km in 1982. Each hospital was categorized as having 0, 1, 2 to 4, 5 to 10, or more than 10 neighbors within 24 km. Of the full sample of 5490 hospitals, 27.5% had no neighbors, 18.4% had one, 18.5% had two to four, 11.2% had five to ten, and 24.4% had more than ten neighbors. No significant changes in hospital market structure, defined in this manner, occurred between 1982 and 1986. It should be emphasized that, although the cost analysis will be limited to those 5490 hospitals that provided full information on all relevant variables, the measurement of market structure was based on the universe of all nonfederal, short-term general hospitals in the continental United States. This measure of hospital market structure has been discussed in detail elsewhere.[9]

Physician and Population Data

Data on the number of physicians involved in patient care in 1982 and 1986 in the county where each hospital is located were derived from *Physician Distribution and Medical Licensure in the United States*, published by the American Medical Association. County population data for 1982 and 1986 were derived from census sources. The county physician and county population data were obtained from the Area Resource File, a computerized data source maintained by the Bureau of Health Professions of the US Department of Health and Human Services. We constructed a variable measuring the number of active physicians per 1000 county residents for the counties where our sample of hospitals was located.

Competitive hospital markets tend to be found in large urban areas, where hospital costs are likely to be higher than in small cities for reasons aside from the degree of competition. While we already controlled for wage differences at the hospital level, we obtained two additional variables from the Area Resource File to further distinguish low-cost from high-cost geographic ar-

eas. These include median family income and population per square kilometer, for both 1982 and 1986.

Analytic Techniques

Multivariate statistical techniques were used to estimate the independent effect of local market structure, state regulatory programs, and Medicare's prospective payment system on the rate of change in average costs per admission, controlling for changes in hospital-specific wage rates, utilization levels, patient mix, Medicaid patient share, ownership status, and teaching role. Also controlled for were changes in county-level differences in physician density, median family income, and population density. Cross-sectional analyses were first conducted separately on the 1982 and 1986 data. We then analyzed the rate of change in hospital costs during the period from 1982 to 1986. The dependent variable in this analysis of cost inflation was the change in the logarithm of average costs per admission between 1982 and 1986, which is equivalent to the percentage rate of change in average costs. Independent variables used in this analysis were the rates of change in those variables that exhibited significant change during the same period, including Medicare and Medicaid patient shares, wage rates, utilization levels, patient case mix, median family income, population per square kilometer, and number of physicians per 1000 population.

Market structure, ownership status, and teaching role did not exhibit significant change during the period. We included the 1982 levels of these variables in the 1982 to 1986 cost-change analyses to test the basic hypothesis guiding this study, ie, that the effects of financing and organizational characteristics on hospital costs have undergone substantial behavioral change since 1982. This "varying parameter" econometric approach is discussed by Augustyniak.[10] It allows the analysis to capture the influences on hospital costs both of changes in the levels of the independent variables and of changes in the coefficients on those independent variables.

The influence of the state regulatory environment was measured through the inclusion of state-specific variables indicating whether each hospital was located in any of five particular states or in one of the remaining 43 continental states. The five states chosen as being of particular interest were California, due to its lead in the deregulation of hospital markets, and the four states that established all-payer hospital rate–regulation programs: New York, New Jersey, Massachusetts, and Maryland. These

five states stand at the two extremes of the national debate over the appropriate mix of competition and regulation in controlling health care costs. The control group of hospitals in the remaining 43 states are subject to varying degrees of cost-control pressures from market-oriented and regulatory programs. This study will thus yield underestimates of the full impact of market-oriented and all-payer rate-regulation programs that would be experienced by hospitals in a completely noncompetitive, nonregulated financing environment.

In cross-sectional studies of hospital costs, variables that identify the state each institution is located in measure the combined influence of all state characteristics on hospital costs. The effects of regulatory and market-oriented cost-control programs per se cannot be isolated from other state-specific determinants of hospital costs. Longitudinal studies of hospital cost inflation, such as this one, do not suffer from this indeterminancy. Time-invariant state effects cannot explain the across-state variation in the rate of hospital cost change. State-specific variables in a cost-inflation study thus measure the influence of changing features of the state environments in which the individual hospitals operate. In the context of this study, these state variables measure the effects of the changes in the rate-regulation programs (ie, the transition to all-payer regulation) in Massachusetts, Maryland, New York, and New Jersey and the deregulation of the California hospital industry (ie, elimination of constraints on selective contracting).

RESULTS

Figure 1 presents adjusted percentage differences in average hospital costs per admission by the number of neighboring hospitals in the local market for 1982 and 1986. These competition-related differences in cost levels control for hospital-specific wage levels; Medicare and Medicaid patient shares; utilization levels; patient mix (six categories); teaching role; ownership status; area differences in physician density, median family income, and population density; and whether the hospital was located in one of the five states of particular interest. The comparison category is composed of hospitals with no neighbors within a 24-km radius.

In both years, hospitals in more competitive local markets experienced significantly higher costs than did hospitals in less competitive markets. The competition-related cost gradient became less steep during the four-year period considered, however. While hospitals with more than ten neighbors re-
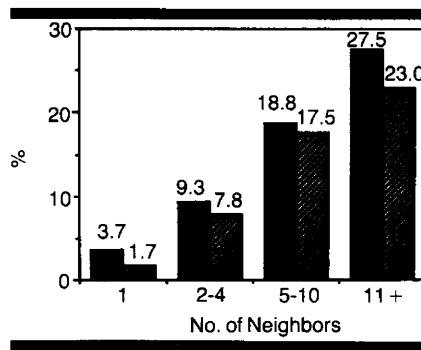

Fig 1.—Adjusted percentage differences in hospital costs per admission by number of neighboring hospitals, in 1982 (solid bars) and 1986 (slashed bars), in the United States (N = 5490).

ported average costs to be 27.5% higher than those in comparable hospitals in 1982, they reported costs to be only 23.0% higher in 1986. This suggests that the cost-increasing effect of nonprice hospital competition was diminishing in importance during this period, perhaps due to cost-control strategies adopted by third-party payers. This change in the cost-increasing effect of competition between 1982 and 1986 contrasts with the stability in the competition-cost relationship during the period from 1972 to 1982 reported in earlier studies.[11,12]

Figure 2 presents competition-related differences in adjusted costs per admission for California hospitals in 1982 and 1986. These percentage figures control for the same set of hospital, patient, third-party payer, and area physician and demographic variables used in computing the national figures in Fig 1.

The change in the association between competition and costs in California is more dramatic than for the nation as a whole. In 1982, hospitals in the most competitive California markets, those with 11 or more neighbors, experienced average costs 13.3% higher than did otherwise comparable hospitals in the least competitive markets ($P<.05$). The 1982 competition-cost gradient in California was not as steep as for the nation as a whole (Fig 1). Hospitals with one neighbor experienced costs 8.6% below those with no neighbors; this difference is not statistically significant ($P=.17$). By 1986, the positive competition-cost gradient had completely disappeared. Hospitals with 11 or more neighbors experienced costs 1.3% lower than did hospitals with no neighbors, a statistically insignificant amount ($P=.80$).

To evaluate the relative effectiveness of different state cost-control strategies, it is important to examine the overall rate of cost inflation across different states and not simply within-state differences for individual hospitals or local markets. The first row of Table 1
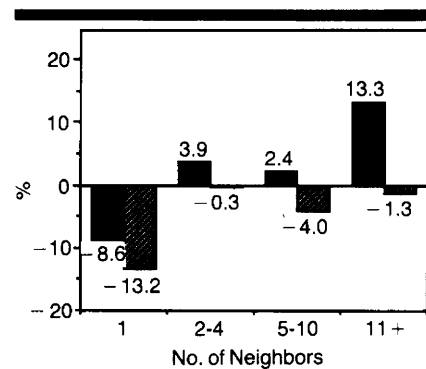

Fig 2.—Adjusted percentage differences in hospital costs per admission by number of neighboring hospitals, in 1982 (solid bars) and 1986 (slashed bars), in California (N = 460).

presents the percentage cost increases for hospitals in California, New York, New Jersey, Massachusetts, Maryland, and the remaining 43 states as a group. During the period from 1982 to 1986, average hospital costs per admission rose by 57.5% for the nation as a whole. Rates of cost increase in California and in the most stringently regulated states were substantially lower. The inflation rates in California, New York, New Jersey, and Massachusetts were rather similar, although the regulated states experienced inflation rates slightly lower than did California. These states experienced inflation rates approximately one fourth lower than did the comparison group of 43 other states, for whom the four-year rate of hospital cost inflation was 60.5%. The state with the lowest inflation rate was Maryland, where costs increased less than two thirds as fast as those of the nation as a whole and were 40% lower than those in the 43 states that adopted neither an aggressive market-oriented nor an aggressive regulatory strategy.

Overall differences in hospital cost inflation rates may be due to many factors aside from the direct impact of cost-containment efforts. The second row of Table 1 presents the independent effect of state programs on inflation rates after controlling for hospital-specific differences in wage rates, utilization levels, patient mix, and other relevant factors. These figures represent conservative estimates of the effects of market-oriented and regulatory cost-control programs, since they assume that changes in utilization levels (admissions, inpatient and outpatient surgery, and ambulatory care visits) were not themselves the result of policy changes at the state level. These analyses do not control for average length of patient stays, since these were directly targeted by most cost-control programs.

The two state programs most suc-

Table 1.—Effects of State Price Competition and All-Payer Rate Regulation Programs on Hospital Cost Inflation, 1982 to 1986*

Rates and Sample Sizes	California	New York	New Jersey	Massachusetts	Maryland	All Other States
Unadjusted inflation rate, all hospitals, %	45.1	42.6	43.6	41.6	35.8	60.5
Adjusted inflation rate, all hospitals, %	52.5	54.7	57.3	48.9	49.4	58.4
Total No. of hospitals	460	244	92	109	52	4533
Adjusted inflation rate, hospitals with >10 neighbors, %	40.5	44.6	49.2	39.4	43.5	51.7
No. of hospitals with >10 neighbors	254	116	60	59	32	820
Adjusted inflation rate, hospitals with ≤10 neighbors, %	62.0	58.3	60.2	51.9	48.9	60.8
No. of hospitals with ≤10 neighbors	206	128	32	50	20	3713

*Adjusted cost-per-admission inflation rates in rows 2, 4, and 6 represent rates that would have been experienced in each state if hospitals in those states had had the same (sample mean) values for each of the hospital, local market, and area physician and population characteristics controlled for in the statistical analysis. These variables are described in the "Methods" section.

cessful in controlling hospital cost inflation during the period from 1982 to 1986 were those in Massachusetts, which reduced inflation by 16.3% ($P<.01$), and Maryland, which reduced inflation by 15.4% ($P<.01$), compared with the 43 control states. California's market-oriented strategy reduced hospital cost inflation by 10.1% ($P<.01$). New York's regulatory program reduced cost inflation by 6.3% ($P<.05$). The New Jersey program reduced inflation rates by only 1.9%; this effect is not statistically significant.

To examine whether the various state cost-control efforts exerted different amounts of pressure on hospitals according to the degree of competition in the local market, separate analyses were conducted for hospitals with ten or fewer neighbors within 24 km and more than ten neighbors within 24 km. The fourth row of Table 1 presents the percentage reductions in rates of cost inflation among hospitals with more than ten neighbors achieved by the California and rate-regulation programs.

The effect of California's market-oriented cost-control program was restricted to hospitals operating in the most competitive local markets. California hospitals with more than ten neighbors experienced rates of cost inflation 21.7% lower than hospitals in comparably large markets but subject neither to California's selective contracting program nor all-payer rate regulation ($P<.01$). Analyses of hospitals with fewer than ten neighbors, presented in the sixth row of Table 1, revealed no cost-reducing effects of the California program.

The effects of the four stringent regulatory programs in New York, New Jersey, Massachusetts, and Maryland were also generally strongest among hospitals with the most neighbors.

Among hospitals with more than ten neighbors, percentage reductions in costs ranged from a low of 4.8% in New Jersey ($P=.47$), up through 13.7% in New York ($P<.05$) and 15.8% in Maryland ($P<.01$), to a high of 23.8% in Massachusetts ($P<.01$), as indicated in the fourth row of Table 1. The four rate-regulation programs reduced the rate of cost inflation in hospitals with ten or fewer neighbors by 19.6% in Maryland ($P=.11$), 14.6% in Massachusetts ($P<.10$), and less than 5% in New Jersey and New York.

The figures in Table 1 relate to a period of only four years. The period since 1982 is particularly important, since that year marked an important transition point in many aspects of the US health care system from cost-based reimbursement to various forms of prospective payment. Rates of change in costs per admission since 1982 are also influenced, however, by the dynamics of the system in the years before 1982, since these influence the extent to which expenditures had already been controlled or not. Two of the states in this study, New Jersey and New York, had maintained relatively strict cost controls during the 1970s. This undoubtedly influenced the extent to which they could continue to restrict costs, relative to those states that had maintained generous reimbursement policies during the 1970s.

To illustrate this point, Fig 3 presents adjusted levels of cost per admission in California and the four all-payer regulation states relative to the remaining 43 states for both 1982 and 1986. This figure controls for hospital-specific differences in local market structure, third-party–payer mix, patient mix, utilization levels, wage levels, teaching role, ownership status, and county-specific differences in physician density,

patient density, and median family income. Hospitals in California, Massachusetts, Maryland, and, to a lesser extent, New York began the period from 1982 to 1986 with higher costs per admission than did hospitals in the control group of 43 states. In marked contrast, New Jersey hospitals began the period from 1982 to 1986 with significantly lower average costs than those of hospitals in the rest of the nation, a testimony to the effectiveness of New Jersey's earlier regulatory efforts. Although its rate of inflation during the period from 1982 to 1986 was not significantly lower than that in the control group of states, New Jersey ended the period from 1982 to 1986 with the lowest average costs per admission of any of the states examined. It is important to emphasize that these figures relate to adjusted costs per admission, not raw-cost data. As a highly urbanized state, New Jersey has high wage rates and many large teaching hospitals, and, therefore, its unadjusted cost figures are large.

Table 2 presents the adjusted rates of cost increase in hospitals with differing degrees of vulnerability to Medicare's prospective payment system during the period from 1982 to 1986. These figures measure the independent effect of the Medicare program after controlling for hospital-specific differences in wage levels, utilization, and patient mix and geographic differences in the degree of competition, state cost-control programs, number of physicians per capita, median income, and population density. Medicare program effects were measured in terms of cost-inflation differences between hospitals in which the fractions of patients covered by the program were 20 percentage points (approximately 2 SDs) above the sample mean or 20 percentage points below the sample mean, respectively.
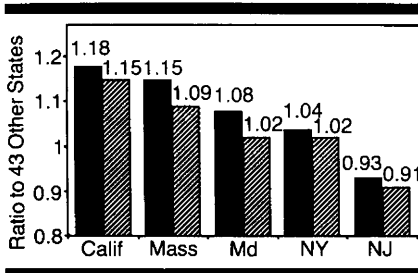
Fig 3.—Adjusted cost per admission in selected states relative to adjusted cost in remaining 43 states, in 1982 (solid bars) and 1986 (slashed bars).

Hospitals with large percentages of their patients covered by Medicare experienced inflation rates 16.1% below those in otherwise comparable hospitals with small percentages of patients covered by Medicare ($P<.01$). The effect of the Medicare program in California was slightly greater than in the nation as a whole, with a 17.6% reduction in inflation rates ($P<.01$). The fraction of discharges covered by Medicare was not significantly associated with rates of cost inflation in the four states with all-payer rate-regulation programs, because hospitals in these states received the same level of revenue for similar types of cases regardless of the nature of their insurance coverage.

Table 3 presents unadjusted and adjusted rates of cost inflation for private nonprofit, public, and investor-owned hospitals separately. The unadjusted figures in the first row of the table are the means of the inflation rates for each of the three groups of hospitals. They indicate that public hospitals experienced rates of cost inflation 11.7% higher than private nonprofit hospitals, while investor-owned hospitals experienced inflation rates 26.0% higher than public hospitals.

To assess the effect of ownership type, per se, on hospital inflation rates, it was necessary to control for the many differences among these hospital groups in hospital, local market, area demographic, and state-level regulatory factors. The second row of Table 3 presents adjusted inflation rates for each hospital type, after controlling for these other relevant factors. Public hospitals experienced inflation rates slightly lower than private nonprofit hospitals, after controlling for other relevant factors, but the difference is not statistically significant ($P<.11$). Investor-owned hospitals experienced inflation rates 11.6% higher than private nonprofit hospitals ($P<.01$) and 15.0% higher than public hospitals ($P<.01$), controlling for other relevant factors. In four years, investor-owned hospitals

Table 2.—Adjusted Rates of Cost Inflation in Hospitals With High and Low Percentages of Patients Covered by Medicare, 1982 to 1986*

State	High Percentage of Medicare Patients, %	Low Percentage of Medicare Patients, %	Ratio
All states (N = 5486)	52.5	62.6	0.839
California (n = 460)	40.8	49.5	0.824
Regulated states (n = 497) (NY, NJ, Mass, Md)	40.2	43.7	0.920
Other 43 states (n = 4529)	55.3	66.2	0.835

*These adjusted inflation rates are inflation rates that would be observed in hospitals with Medicare patient shares 20 percentage points above, and 20 percentage points below, the sample mean, respectively. They control for hospital, local market, and area physician and population characteristics, as discussed in the "Methods" section.

Table 3.—Rates of Inflation in Average Costs per Admission, 1982 to 1986, by Type of Hospital Ownership*

Inflation Rate	Private Nonprofit	Public	Investor Owned
Unadjusted, %	53.9	60.2	67.9
Adjusted, %	57.0	55.3	63.6

*Adjusted inflation rates correspond to those rates that would be observed if all hospitals in each ownership category had the same (sample mean) levels of wages and utilization, patient mix, teaching role, local market structure, state regulatory programs, Medicare and Medicaid patient spheres, physician-to-population ratios in county, county population density, and county median family income.

went from having adjusted costs per admission (controlling for utilization levels, wage rates, etc) that were 2.1% below those in private nonprofit hospitals ($P<.05$) to costs per admission that were 2.7% above those in private nonprofit hospitals ($P<.01$). Adjusted costs per admission in public hospitals were 4.3% ($P<.01$) and 3.9% ($P<.01$) below those in private nonprofit hospitals in 1982 and 1986, respectively. The effect of Medicare's prospective payment system on hospital cost inflation did not differ according to the ownership status of the institution.

COMMENT

Since 1982, the United States has been conducting a number of quite different policy experiments, each attempting to slow the rate of hospital cost inflation. This study permits the first comparison of the relative effectiveness of the various experiments during a four-year period.

The federal government and the government of California have invested heavily in various "procompetitive" or "market-oriented" policy strategies. The results of this study suggest that selective contracting and the other market-oriented policies adopted by the public and private sectors in California are bearing fruit. Controlling for wage rates, utilization levels, and other relevant factors, California hospitals experienced rates of inflation in average costs per admission 10.1% lower than did hospitals in the control group of 43 states (which excluded California and the four states with stringent regulatory programs). The slower rate of cost inflation between 1982 and 1986 in California reversed the historic tendency for costs to be higher in competitive

than in noncompetitive local markets.[11,12] While average costs were 13.3% higher in the most competitive than in the least competitive California markets in 1982, by 1986 there remained no significant association between number of competitors and levels of costs. In the nation as a whole, however, hospitals in the most competitive local markets continued in 1986 to experience costs 23.0% higher than in hospitals in the least competitive markets.

The success of the California program should be evaluated in light of the alternative path that could have been taken, ie, stringent regulation of hospital charges. All-payer rate-regulation programs in Massachusetts and Maryland reduced rates of cost inflation by 16.3% and 15.4%, respectively, thereby exceeding the California effect. Rate-regulation programs in New York and New Jersey were less effective than California's program, however. Overall, it appears that the various policy experiments were about equally successful in achieving their primary objective of moderating hospital cost inflation, at least in the short run. It is therefore necessary to consider what the long-run effects of each type of program are likely to be.

Economists have traditionally been hostile toward price-regulation programs of any kind, including hospital price regulation. One set of objections focuses on the incentives that hospitals face to evade the regulations, primarily through the "unbundling" and separate pricing of groups of services that were previously sold for a single price.[13] These theories predict that price controls will not be effective, and it was with some satisfaction that economists reported a lack of effectiveness of hospi-

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tal regulatory programs in the early years of those programs. More recent studies[2-7] have found rate-regulation programs to yield some desired effects, and the results presented herein should lay to rest once and for all the hypothesis that stringent hospital rate regulation cannot reduce the rate of cost inflation.

While the main body of economic thought has criticized hospital rate regulation for being ineffective, another strand of economic thought has criticized it as being potentially too effective in controlling costs. Held and Pauly[14] argue that reimbursement limits determine the rate of technology diffusion and hence of quality improvements in medical care, since most technological change increases cost. They raise the spectre of underfunded medical care of insufficient quality. Aaron and Schwartz[15] criticize the British National Health Service, which has been notably successful in containing costs, on precisely these grounds.

Market-oriented health care–reform policies are advocated by both sets of economists to decrease expenditures or, alternatively, to increase expenditures. Underlying these policy arguments is the basic philosophic position that the correct rate of expenditure inflation is that desired by individual consumers when fully informed and faced with trade-offs between quality and cost. In this worldview, market forces represent consumer preferences and government regulations do not.

It is useful to consider some of the problems potentially plaguing procompetition health care reforms. These problems fall into two groups. The first group of problems suggest that market-oriented policy strategies will be insufficiently successful in controlling hospital costs. The second group of problems suggests they will be too successful.

For competitive mechanisms to reduce hospital costs, buyers must be able to switch their purchases away from high-cost providers and toward low-cost providers. Hospital markets are inherently local rather than national in character, given the unwillingness of physicians and patients to travel large geographic distances except for the most complicated of hospital services. Buyers can thus only exploit cost and price differences within local markets, not among different local markets. This in turn implies that the procompetition strategy is likely to be most effective in markets with many competing institutions and least effective in markets with only one or two institutions. The evidence presented in this article, that the cost-reducing effect of California's program was limited to hospitals with more than ten neighbors within 24 km, is consistent with this perspective.

Whatever the overall potential for competition within a particular local market, the degree of competition at the service-specific level is often weaker, since not all hospitals offer all clinical services. To the extent that deregulation removes barriers preventing hospitals from expanding their range of services, it can increase the potential for service competition. However, such a "medical arms race" could both raise costs and reduce quality. For many procedures, hospitals that perform at higher volumes achieve both better outcomes and lower average costs. Nonprice market competition had been shown to undermine implicit regionalization agreements and generate a duplication of clinical services and, at least for cardiac services, a lower average patient volume.[16,17]

These considerations suggest that the cost-reducing potential for market-oriented policy strategies may be modest, at least in concentrated local markets. The evidence presented in this article on the substantial reductions in cost inflation in large hospital markets achieved by California's program suggests that considerable power is latent in selective contracting for hospital services, at least when wielded by large and astute third-party purchasers. If selective contracting can be effective, then it can also be too effective, however. The risk of underfunding of health care services is just as real when decisions are being made by the human resource departments of large corporations as when they are being made by state regulatory bodies. Many private-sector purchasers of health care services are undergoing fiscal strains just as severe as those wracking the public sector.

The national debate between market-oriented cost-control programs, as embodied in California's selective contracting system, and governmental regulatory programs, as embodied in all-payer rate regulations and Medicare's prospective payment system, must ultimately focus on the issue of which system better reflects the preferences of patients, consumers, and citizens. Economic theory is quite right in declaring that the appropriate rate of health care–cost inflation is the rate that embodies the citizenry's relative preferences between cost containment and quality enhancement. It is far from obvious, however, which approach better embodies those preferences. Governmental officials must be sensitive to the politically expressed preferences of their citizens in a way that employers need not. Furthermore, cost is not the only consideration. Markets are responsive only to those able to enter the market. The preferences of the poor and uninsured are not represented in marketplace solutions, but they sometimes can influence public policy decisions. Future research and policy discussions on cost containment should cover the social and political issues at stake in the reform of the health care system as well as the purely economic and technical ones.

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