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COMPETITION VERSUS REGULATION: ITS EFFECT ON HOSPITALS

by Gerard Anderson, Robert Heyssel, and Robert Dickler

Prologue: The power of place, as a new book suggests, influences greatly the lives of both people and institutions. This is particularly true in health care because of the absence of scientific consensus regarding appropriate care for particular clinical problems and the varying levels of available resources that communities bring to bear against illness. This reality presents a particularly vexing problem for the Clinton administration as it seeks to constrain the future growth of health spending in some politically acceptable fashion. What role do the models of competition and regulation play in this equation? This is the question that Jerry Anderson and his colleagues address in this paper. The Twin Cities of Minneapolis/St. Paul, Minnesota, stand out as communities that embraced market-oriented principles as their preferred approach to resource allocation. By contrast, Maryland established the first and now has the only all-payer hospital prospective payment system, an approach that reflects a belief that government, as society's collective voice, is in the best position to make allocative decisions. The authors' findings show that compared with the national average, the strategies pursued by these communities have had only a minor impact on controlling hospital expenditures per capita, but they have influenced hospital productivity and hospital utilization differently. Anderson, who has studied the issues of health care finance from many perspectives, is director of the Center for Hospital Finance and Management at The Johns Hopkins University in Baltimore. Robert Heyssel is president emeritus of The Johns Hopkins Hospital, having stepped down in 1992 after almost twenty years at the helm. Robert Dickler, formerly general director of the University of Minnesota Hospital and Clinic, is now vice-president of the Division of Clinical Services at the Association of American Medical Colleges.
Abstract: While factors other than competition and regulation influence hospitals’ behavior, these two strategies have dominated the health policy debate. To examine the impact of these two competing strategies on patients and hospitals, the authors examine experiences in Baltimore, which has followed a regulatory strategy since the early 1970s, and Minneapolis/St. Paul, which has pursued a competitive strategy during the same timeframe. Compared with the national average, both strategies had only a minor impact on containing hospital costs per capita, but they influenced hospital productivity, cost per discharge, and utilization in different ways.

Competition versus regulation has been a fundamental health policy choice since the mid-1970s. In this paper we examine the long-run impact of these two policy alternatives by examining two metropolitan statistical areas (MSAs), Minneapolis/St. Paul, Minnesota, and Baltimore, Maryland, which have been in the vanguard of the competition-versus-regulation debate since the early 1970s. After reviewing the policy directions taken by Minneapolis/St. Paul in the 1970s and 1980s, John Iglehart concluded that the “Twin Cities of Minnesota stand out as a metropolitan area where private-sector interests have been leading architects of a redesigned health care landscape,” believing that adherence to market principles is a preferred strategy to government regulation. On the other hand, Baltimore is located in a state that has followed a regulatory strategy since the early 1970s. Maryland established the first and now has the only all-payer hospital prospective payment system, has promulgated regulations that forbid hospitals from offering price discounts (except for relatively minor discounts for specific reasons), maintains an active certificate-of-need (CON) program, has comprehensive regulation of utilization review, and has more mandated health benefits than any other state.

In comparing only two MSAs, we recognize that there are many factors in addition to competition and regulation that could influence behavior, that it is impossible to control for all exogenous factors, and that neither geographic area or political jurisdiction has adopted a purely competitive or purely regulatory strategy. However, we believe that an examination of these two MSAs can suggest some of the long-term effects on patients and hospitals of choosing one strategy over the other.

In this paper we compare the evolution of the regulatory, financing, and delivery systems in the Baltimore and Twin Cities MSAs from 1971 to 1990. We then discuss the effects of competitive and regulatory strategies in the two areas on overall health care spending and hospital costs, use, and operations. We have chosen to focus on hospitals because both the regulatory and competitive strategies have targeted this sector.

Study methods. We obtained data on community hospital characteristics from the 1972 to 1991 editions of Hospital Statistics and the Guide to the Health Care Field, both published by the American Hospital Association (AHA). Demographic information on the two MSAs was obtained
from Statistical Abstract of the United States, 1990, and we used the published estimates of the annual percentage change in population to interpolate from 1971 to 1989. Information on the regulatory environment in each state was compiled by the American Association of Retired Persons (AARP) and is reported in Reforming the Health Care System: State Profiles 1990. The number of health maintenance organization (HMO) enrollees was obtained from Interstudy Edge: Managed Care, A Decade of Review. We adjusted for age and sex differences in the two MSAs using the direct method. The Medicare case-mix index is the weighted average (by Medicare discharges) of the Medicare case-mix values for each hospital in the MSA.

Policy Development

The regulatory and competitive environments facing hospitals and patients in both MSAs were relatively similar in 1971. Hospitals were paid predominantly on a cost- or charge-based reimbursement basis, most physicians were paid fee-for-service, hospital regulation was just being initiated, there was virtually no price competition, and there was minimal HMO penetration in both MSAs. The MSAs had other characteristics in common as well. In 1971 hospital expenditures per capita were $141 in Baltimore, compared with $142 in Minneapolis/St. Paul (Exhibit 1). The two MSAs were comparable in such areas as total population and payroll expenditures per full-time-equivalent (FTE) personnel.

However, along other dimensions, there were major differences between the two MSAs, and these may be a partial explanation for the different policy directions taken in the two MSAs. Hospitals in Baltimore had higher costs per discharge, higher costs per day, longer lengths-of-stay, more FTE personnel per occupied bed, and higher occupancy rates. In Minneapolis/St. Paul there were more days of care per capita, discharges per capita, hospitals, hospital beds, and hospital beds per capita. In general, costs and intensity of services were greater in Baltimore, while availability and use of services were greater in Minneapolis/St. Paul.

After 1971 the policy directions in the two MSAs diverged. For example, most of the growth in HMO enrollment in Minneapolis/St. Paul occurred after 1972, with all but one of the HMOs starting in the period 1972-1975. By 1980 a procompetitive strategy for controlling health care costs was almost universally accepted in Minneapolis/St. Paul. In contrast, the Maryland Health Services Cost Review Commission, which was established in 1971, started setting hospital rates in 1974 and had established rates for all hospitals in Baltimore by 1976. While an emphasis on state regulation and control has been the major policy direction in Maryland
### Exhibit 1
Hospital Characteristics In Baltimore And Twin Cities Metropolitan Statistical Areas (MSAs), 1971-1990

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital expenditures per capita</td>
<td>$141</td>
<td>$942</td>
<td>0.99</td>
<td>$142</td>
<td>$868</td>
<td>1.26</td>
</tr>
<tr>
<td>Hospital expenditures per discharge</td>
<td>5,180</td>
<td>882</td>
<td>1.31</td>
<td>5,517</td>
<td></td>
<td>1.06</td>
</tr>
<tr>
<td>Hospital expenditures per day</td>
<td>123</td>
<td>717</td>
<td>1.22</td>
<td>101</td>
<td>864</td>
<td>0.94</td>
</tr>
<tr>
<td>Average length-of-stay (days)</td>
<td>9.4</td>
<td>7.2</td>
<td>1.08</td>
<td>8.7</td>
<td>6.4</td>
<td>1.13</td>
</tr>
<tr>
<td>Days per capita</td>
<td>1.15</td>
<td>1.02</td>
<td>0.82</td>
<td>1.41</td>
<td>0.76</td>
<td>1.34</td>
</tr>
<tr>
<td>Medicare case-mix index</td>
<td>-a</td>
<td>1.28</td>
<td>-a</td>
<td>-a</td>
<td>1.42</td>
<td>-a</td>
</tr>
<tr>
<td>Number of inpatient discharges per 1,000 population</td>
<td>122</td>
<td>142</td>
<td>161</td>
<td>119</td>
<td>0.76</td>
<td>1.19</td>
</tr>
<tr>
<td>Number of emergency visits per 1,000 population</td>
<td>-a</td>
<td>331</td>
<td>-a</td>
<td>282</td>
<td>-a</td>
<td>1.17</td>
</tr>
<tr>
<td>Number of hospital outpatient visits per 1,000 population</td>
<td>991</td>
<td>1,091</td>
<td>543</td>
<td>931</td>
<td>1.83</td>
<td>1.17</td>
</tr>
<tr>
<td>Number of hospitals</td>
<td>25</td>
<td>35</td>
<td>0.71</td>
<td>29</td>
<td>0.71</td>
<td>0.93</td>
</tr>
<tr>
<td>Number of beds</td>
<td>8,225</td>
<td>10,193</td>
<td>0.81</td>
<td>7,480</td>
<td>0.81</td>
<td>1.11</td>
</tr>
<tr>
<td>Number of beds per 1,000 population</td>
<td>3.9</td>
<td>5.1</td>
<td>3.0</td>
<td>3.0</td>
<td>0.76</td>
<td>1.16</td>
</tr>
<tr>
<td>Occupancy</td>
<td>80%</td>
<td>81.1%</td>
<td>74%</td>
<td>68.7%</td>
<td>1.08</td>
<td>1.18</td>
</tr>
<tr>
<td>FTEs per occupied bed</td>
<td>3.6</td>
<td>5.7</td>
<td>3.2</td>
<td>5.9</td>
<td>1.13</td>
<td>0.96</td>
</tr>
<tr>
<td>Payroll expenses per FTE</td>
<td>$7,167</td>
<td>$27,628</td>
<td>1.03</td>
<td>$6,976</td>
<td>$32,796</td>
<td>0.84</td>
</tr>
<tr>
<td>Labor as percentage of expenditures</td>
<td>0</td>
<td>54.2%</td>
<td>59.8%</td>
<td>55.7%</td>
<td>0.97</td>
<td>0.97</td>
</tr>
<tr>
<td>Population (thousands)</td>
<td>2,099</td>
<td>2,382</td>
<td>1.05</td>
<td>1,998</td>
<td>2,464</td>
<td>0.97</td>
</tr>
<tr>
<td>Percent black</td>
<td>23.5%</td>
<td>25.9%</td>
<td>1.6%</td>
<td>3.6%</td>
<td>14.69</td>
<td>7.19</td>
</tr>
<tr>
<td>Percent female</td>
<td>50.8%</td>
<td>50.0%</td>
<td>47.4%</td>
<td>51.0%</td>
<td>1.07</td>
<td>0.98</td>
</tr>
<tr>
<td>Percent over age 65</td>
<td>8.4%</td>
<td>11.9%</td>
<td>8.7%</td>
<td>10.2%</td>
<td>0.97</td>
<td>1.17</td>
</tr>
<tr>
<td>Percent of population enrolled in HMO/C</td>
<td>-a</td>
<td>17%</td>
<td>-a</td>
<td>29%</td>
<td>-a</td>
<td>0.55</td>
</tr>
</tbody>
</table>


*a* Not available.

*b* Full-time-equivalent personnel.

*c* Health maintenance organizations.

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Since the mid-1970s, Minnesota gradually shifted more reliance to voluntary control and market forces. For instance, a rate review program in Minnesota never developed into a mandatory rate regulation system, and only limited voluntary price reporting has been undertaken by the metropolitan hospitals. In addition, CON review was terminated in the early 1980s in Minnesota and was replaced by a limited hospital construction moratorium.
Effect Of Cost Containment Initiatives

Between 1971 and 1990 the annualized rate of increase in hospital costs per capita in the Twin Cities was 10.0 percent, compared with 10.5 percent in Baltimore and 11.2 percent nationwide. As shown in Exhibit 2, the rate of increase in both MSAs was roughly similar throughout the time period. However, this “bottom-line” comparison of the effects of the two policies on hospital cost containment ignores important differences in patient and hospital responses to the policy initiatives.

Hospital expenditures per discharge (adjusted for outpatient activity) increased 1.9 percentage points per year more slowly in Baltimore than in the Twin Cities (Exhibit 3). The cumulative effect was that by 1990 hospital expenditures per discharge, which had been 31 percent more expensive in 1971, were 6 percent less expensive in Baltimore than in the Twin Cities (Exhibit 1). Most of the difference is attributable to slower rates of growth in the number of FTE personnel per occupied bed (not adjusted for outpatient activity) and in the payroll expenditures per employee (Exhibit 3).

Although these data do not permit a conclusion that the regulatory program in Maryland controlled the rate of increase in hospital expenditures per discharge or caused a change in the method of hospital production, the empirical results presented here are similar to previous evaluations of state prospective payment systems, which have found that such systems have lowered the rate of increase in hospital expenditures per discharge by 2 to 4 percent per year and have increased hospital productivity.\(^{13}\) Data prepared by the Maryland Health Services Cost Review Commission show

### Exhibit 2
Per Capita Hospital Costs In Baltimore And Minneapolis/St. Paul, 1971-1990

<table>
<thead>
<tr>
<th>Dollars 1,000</th>
<th>1971</th>
<th>1975</th>
<th>1980</th>
<th>1985</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: American Hospital Association, Chide to the Health Care Field, various years; and AHA, Hospital Statistics, various years.
that Maryland’s cost per discharge, which was 26 percent above the national average in 1976, was 6 percent below the national average in 1990. The data also show that Maryland continued to control costs per discharge after the level of expenditures fell below the national average, discounting the contention that the apparent effectiveness of the program could be attributed to “regression to the mean.”

The data presented in Exhibit 3 indicate that the rate of increase in hospital costs per discharge in Minneapolis/St. Paul was slightly lower than the national average in spite of higher rates of increase in FTE personnel per occupied bed and faster increases in payroll expenses per FTE than in Baltimore or across the nation. In spite of the lower growth rate during this period, hospital expenditures per day and per discharge were higher in the Twin Cities than the nationwide average in 1990.

A possible explanation for the higher costs is suggested by the Medicare case-mix index. The index value for Minneapolis/St. Paul in 1990 is above the value for Baltimore or the nation. It is possible that the level of severity of illness has increased more rapidly in Minneapolis/St. Paul, which could explain the higher hospital expenditures per discharge and per day in Minneapolis/St. Paul. However, without a value for 1971 and an overall measure of case-mix, it is impossible to determine how case-mix has changed over time in the three geographic areas.

The number of hospital days per capita declined more rapidly in the
Twin Cities than in Baltimore (Exhibit 4). As a result, the number of days per capita shifted from being 18 percent less in Baltimore in 1971 to being 34 percent more in 1990 (Exhibit 1). Looking more closely at the factors behind the reduction in the number of days of care per capita, we see that both MSAs posted relatively similar declines in average length-of-stay (Exhibit 4). However, during this period the number of hospital discharges per capita declined by 26 percent in the Twin Cities, compared with a 16 percent increase in Baltimore (Exhibit 1). While this finding cannot prove that competition lowers utilization rates, it is in agreement with earlier findings that show that enrollees in HMOs have lower hospital discharge rates and have reduced overall utilization in a geographic area.\textsuperscript{15}

The two strategies appear to have affected hospitals differently. Hospitals in Minneapolis/St. Paul responded to the reduction in patient days by closing, merging, and downsizing their existing facilities. Minneapolis/St. Paul had 1.2 more beds per thousand population in 1971 than the national average (5.1 versus 3.9); by 1990 the Twin Cities had 0.8 fewer beds per capita (3.0 versus 3.8).\textsuperscript{16} Given the difficulties in determining the correct number of discharges per capita, average length-of-stay, or number of beds per capita, it is difficult to determine if the initial rate was too high or the later rate in Minneapolis/St. Paul was too low. The bed reductions, however, did not keep pace with the decline in the number of patient days, and so the average occupancy rate declined from 74 percent to 69 percent. In Baltimore the number of hospital beds appears to have responded to the changing inpatient demand; as a result, the occupancy rate increased slightly, from 80 percent to 81 percent.

\begin{table}
\centering
\begin{tabular}{|c|c|c|}
\hline
\textbf{Percent increase} & \textbf{Baltimore} & \textbf{Twin Cities} & \textbf{U.S. average} \\
\hline
1.0 & & & 0.81 \\
0.0 & -0.63 & -1.47 & -1.52 \\
-1.0 & -1.37 & -1.47 & -1.52 \\
-2.0 & -1.47 & -1.52 & -1.67 \\
-3.0 & -1.52 & -1.67 & -2.00 \\
-4.0 & -1.67 & -2.00 & -1.85 \\
\hline
\end{tabular}
\caption{Annualized Increases For Hospital Utilization, Baltimore And Twin Cities MSAs Compared With U.S. Average, 1971-1990}
\end{table}

\textbf{Source:} American Hospital Association, Guide to the Health Care Field, various years; and AHA Hospital Statistics, various years.
More recently hospitals in Minneapolis/St. Paul have responded to competition and requests for discounts from managed care organizations by forming hospital systems. During the 1970s and 1980s individual hospitals may have lacked sufficient market power to negotiate effectively with a few managed care organizations. Profit margins declined during this period, and several hospitals were in precarious financial condition. Hospitals closed in Minneapolis/St. Paul, and most of the remaining hospitals reorganized into four hospital systems, primarily along geographic lines. Negotiations are now taking place that may result in only three major hospital systems with a few independent and public hospitals. It seems safe to conclude that one of the primary objectives of these systems has been to set prices collectively to negotiate more effectively with the managed care organizations. The economic environment in Minneapolis/St. Paul moved from competition to bilateral oligopsony during the late 1980s and early 1990s.

A number of studies have suggested that hospitals respond to increased competition by offering a wider array of services and new technologies.\textsuperscript{17} Other studies have suggested that hospitals respond to regulation, especially certificate-of-need, by expanding the scope and depth of services.\textsuperscript{18} To explore this further, we used AHA data to calculate the percentage of hospitals in each MSA with various types of expensive technologies in 1990. The results (not presented here) showed no consistent pattern. Hospitals in the Baltimore MSA were more likely to offer certain types of services, while hospitals in the Minneapolis/St. Paul MSA were more likely to offer others. For the two expensive technologies for which the AHA collected data in both 1971 and 1990 (open-heart surgery and coronary care units), the rate of diffusion was greater in Baltimore for one service and greater in Minneapolis/St. Paul for the other. We cannot conclude, therefore, that either strategy is more likely to slow the diffusion of expensive technologies.

Caveats

We recognize that any conclusions from these data must be qualified by a number of significant caveats. In making the comparisons, we have not adjusted explicitly for changes in demographic characteristics, health status, quality of care, input prices, scope and extent of insurance coverage, intensity of utilization review, or other factors that could influence utilization rates and the cost of hospital services. The lack of adequate controls could lead to incorrect conclusions about the effect of competition or regulation.\textsuperscript{19} However, the overall effect of these variables may be small in this instance, since many of the differences between the two areas that existed in 1971 tended to persist throughout the 1980s. For example, a
calculation of the expected number of days of care based on demographic characteristics suggests that demographic characteristics (age and sex distributions) changed at nearly the same rate in both MSAs. Studies of input price increases suggest that regional differences are small.\textsuperscript{20}

We also have not adjusted for changes in patient origin that might have occurred—specifically, increases or decreases in the number of patients coming from outside the MSA. Unfortunately, no overall patient origin data from 1971 and 1990 exist to enable a comparison. Our only evidence that patient origin has remained relatively constant over this period is a comparison of patient origin data at The Johns Hopkins Hospital and the University of Minnesota Hospital and Clinic, two institutions that are likely to generate referrals from outside the MSA. These data suggest that the percentage of patients coming from out of state and outside the MSA was relatively constant for these institutions during 1971-1990.\textsuperscript{21}

We have not adjusted for external stimuli, such as the introduction of the Medicare prospective payment system (PPS). It is important to remember that Maryland is exempt from PPS. Exhibit 2, however, suggests no significant change in the slope of the line that occurred following PPS. Data on aggregate health expenditures in the two MSAs are not available. As a result, it cannot be determined if there is greater substitution of ambulatory services for hospital services in one MSA or the other. The focus only on hospital services could be misleading.

Finally, it must be recognized that neither MSA is following only one policy. Competitive mechanisms play a role in Baltimore: In 1990, 17 percent of the area’s population was enrolled in HMOs, and many preferred provider organizations operate there as well. Conversely, regulatory mechanisms are in place in Minnesota. The state has had a rate-setting program, voluntary price reporting in the MSA, and certificate-of-need during the study period.

Conclusions

Compared with the national average, the regulatory strategy in Baltimore and the competitive strategy in Minneapolis/St. Paul have had only a minor impact on controlling hospital expenditures per capita during 1971-1990. Despite the small cost containment differences, however, the programs have influenced hospital productivity and hospital utilization differently. Regulation has had a greater impact on hospital production processes, primarily by controlling expenditures per discharge and per day, while the impact of competition has been greater on utilization, primarily through lowering the number of discharges per capita.

In 1992 Minnesota enacted new legislation designed to lower the num-
ber of uninsured persons. As part of the Health Project legislation, additional regulation controls will be imposed on the hospital industry. It is too early to evaluate its impact. Maryland, on the other hand, is seriously considering all-payer rate setting for physicians and is continuing to favor regulation.

NOTES


7. Raetzman, Reforming the Health care System.

8. InterStudy, Interstudy Edge: Managed Care, A Decade of Review (Excelsior, Minn.: InterStudy, 1990).


13. Ibid.; and C. Coelen and D. Sullivan, “An Analysis of the Effects of Prospective Reimbursement Programs on Hospital Expenditures,” Health care Financing Review