

## The Impact of HMOs on Hospital Use and Cost? A Matter of Interpretation

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The article by Anderson and colleagues in this issue<sup>1</sup> concludes that health maintenance organization (HMO) penetration at the metropolitan statistical area (MSA) level has little or no effect on hospital cost, a finding that contradicts previous research. This conclusion is qualified with several caveats, however, any of which could reverse the findings. This situation highlights the need for researchers to rethink strategies being used to examine the complex issues surrounding the impact of HMOs on hospital use and cost.

In the paper, the authors note that the algorithms used to classify the MSAs according to HMO penetration and to evaluate the impact of HMOs on hospital utilization and costs have an effect on the outcomes of their analysis. In one case (the use of discriminant analysis), the results were reversed for the highest HMO penetration group. The authors also caution that HMO penetration rates occurred at different rates in different MSAs and consequently using 1996 data to create the groupings may not accurately reflect what actually happened during the 1993-1996 time period. This and the spillover effect of even low levels of HMO penetration on managed care in an MSA was noted as an additional factor complicating this analysis.

HMOs have been an important component of the healthcare delivery system for nearly three decades and dozens of research projects have focused on them. Yet there is considerable controversy about the effects of HMOs on the costs and quality of healthcare.

During the 1990s, the growth rate in hospital spending slowed from a high of 10.1% in 1991 to 3.8% in 1996 while managed care enrollment increased from 28.7% of the population in 1990 to 59.5% in 1996 (see Table). Is the growth in managed care enrollment responsible for slowing the rate of the growth in hospital spending? Recent studies provide evidence that HMO growth has reduced hospital utilization and the growth rate in hospital expenditures.<sup>4,9</sup> These studies, based on patient-level and hospital-level analyses, find that HMO membership for patients and the presence of HMOs in the marketplace influence hospitals by altering the process of care, modes of delivery, and resource use. Based on an analysis of MSA-level data, however, Anderson and colleagues present evidence that suggest otherwise. Their study is an update and extension of an earlier study by McLaughlin.<sup>10-12</sup> Both of these studies find that HMO penetration has had little effect on hospital use and cost at the MSA level.

Before discussing plausible explanations why the results from these MSA-level analyses differ from results from patient- and hospital-level analyses, let us first review conceptually the impact of HMOs on hospital use and costs. Theoretically, we expect HMOs to have direct and indirect effects on hospital use and costs.<sup>9,13,14</sup> HMOs are dual agents for their enrollees, managing both the financial risk associated with illness and the delivery of medical services. HMOs purchase and provide medical care for their enrollees, balancing the enrollees' desires for high quality but affordable medical care. The direct effect of HMOs on hospital use and costs is their effect on the care of their own enrollees. HMOs lower the use and cost of hospital care for their enrollees by (1) negotiating lower rates with hospitals; (2) substituting less expensive primary and outpatient care for inpatient hospital stays; (3) limiting the use of expensive laboratory tests and procedures; and (4) encouraging the use of less expensive drugs and therapy.

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HMOs indirectly affect hospital use and costs through spillover effects. Because HMOs influence their enrollees' care, physicians who treat a lot of HMO patients alter their practice style to accommodate HMO rules. Hospitals that serve numerous HMO patients may accommodate them by investing in certain staff, facilities, and technologies at the expense of other investments in human and physical capital. This in turn may affect the way physicians serve their fee-for-service (FFS) patients. Because HMOs negotiate lower rates for their enrollees, hospitals may increase rates for less price sensitive FFS patients to compensate for loss revenues.

Finally, in markets with low HMO penetration, hospitals, physicians, and health plans may implement cost-saving and resource-saving measures to pre-exempt HMO growth in their markets. Hospitals can control costs by reducing excess staff and capacity. In order to maintain professional autonomy, hospitals and physician groups have teamed to form physician-hospital organizations, to launch integrated health systems, and to offer their own prepaid health insurance products. In addition, private FFS health plans may implement monitoring and utilization review to control health insurance premiums, further discouraging HMO growth.

The conceptual models yield testable hypotheses about the impact of HMOs on patients and providers. These hypotheses are rooted in the behavioral relationships between HMOs, providers, and patients. These models, however, do not explain the impact of HMO growth on hospital cost and use per capita in a geopolitical area such as an MSA. What

we observe at the MSA level is some aggregation of individual hospitals, physicians, and patient behaviors across HMO, preferred provider organization (PPO), private FFS, Medicare, and Medicaid plans.

The earlier criticism of McLaughlin's study demonstrates how difficult it is to interpret the relationship between HMO growth and MSA level hospital use and expenditures.<sup>15,16</sup> McLaughlin's original work was criticized for failing to address 3 methodological problems: 1) disentangling HMOs' decision as to where they operate and expand enrollment from their impact on hospital cost and use; 2) adjusting for adverse patient and health plan selection; and 3) the aggregation of HMO, PPO, private FFS, Medicare, and Medicaid patients' hospital cost and use. HMO growth is partly determined by the level of hospital expenditures and utilization in the market. HMOs locate and expand in areas where there are opportunities to make profits and lower premiums by lowering hospital costs and use. Separating the HMOs' location and expansion decisions from their subsequent effects on hospital cost and use is difficult. If we find a correlation between HMO growth and high hospital cost and use, are we observing HMOs' location decisions or a minimal effect of HMOs on the cost and use of hospital care?

Adverse selection refers to HMOs' relative attractiveness to healthier patients because of the patient's lower premiums and HMOs' reluctance to promote quality chronic care for fear of attracting sicker patients (ie, bad financial risk). Hence, these sicker, more costly patients are insured in the FFS sector. Hospitals could respond to the reduction in

**Table.** National Trends in Hospital Spending and Managed Care Enrollment, 1990-1996

	1990	1991	1992	1993	1994	1995	1996
Hospital Care Spending (in \$ billions)	256.4	282.3	305.3	323.0	335.7	347.2	360.8
Annual Percent Growth in Hospital Spending	8.8	10.1	8.2	5.8	3.9	3.4	3.9
Percent of Population enrolled in HMOs	14.0	14.7	15.6	16.7	18.7	21.4	24.3
Percent of Population enrolled in PPO	14.7	16.7	19.1	22.4	30.2	33.3	35.2
Percent of Population enrolled in Managed Care	28.7	31.4	34.7	39.1	48.9	54.7	59.5

HMO=health maintenance organization; PPO=preferred provider organization.  
Adapted from references 2 and 3.

use by HMO patients by increasing services to their sicker, more costly FFS, PPO, Medicare, and Medicaid patients. Also, hospitals could broaden the breadth of their geographic market and expand the scope of their services to adjust for the decline in demand due to HMO penetration. Suppose that hospitals located in MSAs with high HMO penetration maintain their census by attracting patients from areas outside these MSAs. An MSA level analysis would misinterpret this phenomenon as a small HMO effect on hospital use.

The aggregation of hospital expenditures and use across HMOs, PPOs, FFS health plans, Medicare, and Medicaid is problematic. Other types of private health plans use administrative mechanisms to control hospital use and expenditures. Medicare and some state Medicaid programs have implemented prospective payment and other policies to control hospital costs. If administrative controls and payment policies are not adequately controlled for in an MSA level analysis, this will tend to bias any observed differences between high HMO penetration MSAs and low HMO penetration MSAs towards zero.

There are several other methodological issues that limit the evaluation of HMOs' impact on costs at the state or MSA levels. For example, enrollment data and penetration rates are often hard to quantify in a manner that equates with provider service areas. Consequently the effects on the costs of one set of hospitals or physicians may be masked by the lack of enrollment in the service areas of other providers. Specifying the type of HMO being studied is somewhat easier, but measuring the other managed care activities that often accompany HMOs is extremely difficult and often ignored. Aside from HMO penetration, the number of HMOs in a market and their relative market shares influence the level of competition. Health maintenance organization age, and differences in the performance of alternate HMO models when more than half are classified as "mixed models" in the Interstudy data all present special analytic challenges.<sup>17,18</sup> Regrettably, it appears that little progress is being made in resolving these methodological issues.

Whose report should we believe? Findings and conclusions based on hospital- and patient-level analyses are much more credible because these analyses are based on underlying structural relationships that make good economic sense. These studies estimate the effects of HMOs on hospital costs and use, using proven theoretical costs and demand models, applying robust concepts and empirical techniques. The relationship between

overall MSA level HMO penetration and hospital costs and use per capita is at best ad hoc. The absence of a conceptual framework that explains these relationships at the MSA level makes any empirical observations difficult to interpret.

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