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Perspective

Are Multihospital Systems More Efficient?
by David Dranove, Amy Durkac, and Mark Shanley

Jamie Robinson and Larry Casalino, in their paper that leads off this volume of Health Affairs, offer the provocative view that there may be less vertical integration than many experts predict. Of course, health care providers are integrating horizontally as well as vertically. That is, hospitals in many cities are merging to form local multihospital systems. However, although the conventional wisdom is that these systems will generate efficiencies in the production of services, surprisingly little systematic evidence exists to support this view.

To fill this research gap, and to determine the benefits of horizontal integration, we did a cross-sectional analysis of local hospital systems in California in the late 1980s and then in the early 1990s. In both studies we found that the benefits of horizontal integration stem from greater efficiencies in marketing hospital systems to the community rather than from efficiencies in the production of services.1 Our analysis does not control for self-selection into systems, however, so it is not fully conclusive. Further research is necessary to settle the issues that we raise.

Why Are Hospitals Integrating?

With the exception of Columbia/HCA, a nationwide chain of nearly 350 hospitals, most horizontal hospital integration is local. There are several explanations for hospital integration.2 First, hospital systems can exploit economies of scale and scope, for example, by eliminating duplicative equipment. Second, hospital systems can reduce administrative costs and realize purchasing economies. Independent hospitals also can achieve these economies, by unilateral elimination of services or by collaboration with other independent hospitals.

Third, system membership may confer marketing benefits. Employers and insurers may prefer “one-stop shopping,” which minimizes purchasers' ...
transaction costs. Hospital systems can offer stability—purchasers can expect to gain access to the same providers year after year. Hospital systems also can reduce purchasers’ uncertainty about quality of care, geographic access to hospitals and specialists, availability of technology, referral patterns, and so forth.

Anecdotal evidence confirms that hospital systems confer marketing benefits on their members. In advertisements, annual reports, and presentations to consumers, hospital systems boast of their geographic coverage and consistent quality across providers.\(^3\) Such consistency presumably fetches a premium price in contract negotiations.

While systems may offer production and/or marketing efficiencies, antitrust enforcers worry that they might enhance market power. However, none of the systems that we studied has a sufficiently large share of its local market to give it overweening market power.

### Evaluating System Performance

For our later study we used data provided by the California Office of Statewide Health Planning and Development (OSHPD) for fiscal year 1991-1992. We restricted our attention to local systems, defined as three or more jointly owned private community hospitals in the same market. Eleven such systems met our criteria. Notably absent is the Kaiser system, which we omitted because of lack of usable data. The OSHPD data are well known to researchers; thus, we do not describe them here.

The natural unit of analysis was the system. But with what does one compare system performance? Intuitively, we needed to determine if hospital systems can be distinguished from random collections of independent hospitals. Thus, we evaluated system performance by comparing systems with “pseudosystems.” Pseudosystems are combinations of independent hospitals that are matched to system hospitals on the basis of size, ownership (for-profit/nonprofit), and location. We matched hundreds of pseudosystems to each actual system to determine if the actual systems performed differently from the pseudosystems.\(^4\)

### Results

**High-technology services.** We first examined the provision of high-tech services: magnetic resonance imaging (MRI), open-heart surgery, radioisotope therapy, neonatology, cardiac catheterization, and therapeutic radiology. We computed the number of high-tech services in each system and pseudosystem and then measured each system’s percentile score (the percentage of pseudosystems with lower high-tech services scores than...
those of the actual system). A score below 50 implies that the system has fewer high-tech services than the median pseudosystem has. Only six of eleven systems scored below 50. Thus, we conclude that multihospital systems do not consistently reduce high-tech service offerings.

**Cost per admission.** We next examined cost per admission. To control for cost differences driven by the severity of patients’ illnesses, we computed the adjusted cost per admission in each system and pseudosystem. This is the average cost per admission divided by the average Medicare case weight for all patients in the system. Although seven of eleven systems had scores below 50, only three scored below 38. We therefore conclude that system hospitals do not, in general, have lower patient care costs than their nonintegrated counterparts have. In unreported analyses we controlled for variation in local labor costs, with similar results. We also assessed whether our results were an artifact of including outpatient costs. To do this, we examined the ratio of outpatient to inpatient charges. System hospitals actually had slightly lower ratios, which suggests that our methods may be biased toward finding a favorable system effect.

**Administrative costs.** We next examined the ratio of administrative costs (defined as the sum of expenditures for general, fiscal, and administrative services) to total costs. Interestingly, five of eleven systems scored 85 or higher. This has a less than .02 probability of occurring because of random chance. We conclude that integrated hospital systems are more likely than their nonintegrated hospital counterparts to have unusually high administrative costs. Perhaps hospital systems use tight administrative controls to hold down use of medical resources. Overall, it appears that hospital systems do not have lower costs. These results confirm our earlier findings.

**Price/cost margins.** Hospital systems still may be profitable if they can generate marketing benefits. We computed each system’s price/cost margin for a market basket of hospital services, as well as each system’s net operating margin. Only seven of eleven systems scored above 50 on price/cost margins, and six of eleven scored above 50 on operating margins. However, the high-scoring systems scored very high. Four systems had price/cost margins above the eightieth percentile, and five had operating margins above the ninetieth percentile. (It is highly improbable that the latter would occur at random.) The correlation between the two scores is .75—systems with high price/cost margins tend to have high operating profits.

These results are consistent with those we obtained in our earlier study. Systems do not, in general, exhibit production efficiencies. Several, however, command unusually high price/cost margins and operating profits. Because the systems with high price/cost margins tended not to have lower costs, we believe that they achieved substantial marketing efficiencies instead.
**Limitation.** An important limitation of cross-sectional analyses such as ours is the failure to control for self-selection of hospitals into systems. In light of this possibility, there appear to be two types of explanations for system formation that are consistent with our findings. The first is that integration helps inefficient hospitals to achieve average but not superior production efficiency. The second is that integration has no effect on production efficiency but does promote marketing efficiency. Although we are unable to distinguish between these explanations, we note that both explanations have the same powerful implication: We should not expect local multihospital systems to achieve superior production efficiency.

**Implications And Comments**

Our findings challenge the current conventional wisdom that horizontally integrated hospitals generate production efficiencies. If systems do not help to reduce production costs, then why should policymakers continue to support them, and why should hospitals join them?

We believe that if policymakers support hospital systems, they should do so for the right reasons. For example, it may be desirable to support marketing economies, even if this leads to higher prices. This could be acceptable if policymakers believe that consumers are poorly informed and have no other way to obtain information that will help them to select hospitals.

If, as we hypothesize, hospital systems prosper from marketing efficiencies, then they may prosper by establishing “brand” identities. These identities may be based on the strengths of a central teaching hospital, a religious affiliation, or the brand equity of a proprietary chain. This raises two questions. First, which identities are most viable? Second, which types of hospitals align themselves with which identities? For example, do hospitals without well-regarded identities seek to join national chains that have well-established identities? Conversely, do established hospitals seek out other established hospitals rather than national ownership? These are questions for future research.

Marketing efficiencies eventually may be eroded by advances in quality measurement. If purchasers can confidently evaluate the quality of individual hospitals, the value of a system’s brand name will decrease. If systems still do not provide production efficiencies, they may be left with no strategic edge in the market.
NOTES


4. Our algorithm for constructing pseudosystems is similar to that used in our earlier study. For details, as well as for tables of our results, contact the authors at the J.L. Kellogg Graduate School of Management, Leverone Hall, Northwestern University, 2001 Sheridan Road, Evanston, Illinois 60208-2013.

5. Medicare diagnosis-related group (DRG)-specific case weights are assigned for all patients. This may cause problems because resource needs may vary according to the age of the patient. Unfortunately, we have no better alternative.

6. See Dranove and Shanley, “Cost Reductions or Reputation Enhancement as Motives for Mergers.”