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The Increased Concentration Of Health Plan Markets Can Benefit Consumers Through Lower Hospital Prices

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ABSTRACT The long-term trend of consolidation among US health plans has raised providers' concerns that the concentration of health plan markets can depress their prices. Although our study confirmed that, it also revealed a more complex picture. First, we found that 64 percent of hospitals operate in markets where health plans are not very concentrated, and only 7 percent are in markets that are dominated by a few health plans. Second, we found that in most markets, hospital market concentration exceeds health plan concentration. Third, our study confirmed earlier studies showing that greater hospital market concentration leads to higher hospital prices. Fourth, we found that hospital prices in the most concentrated health plan markets are approximately 12 percent lower than in more competitive health plan markets. Overall, our results show that more concentrated health plan markets can counteract the price-increasing effects of concentrated hospital markets, and that—contrary to conventional wisdom—increased health plan concentration benefits consumers through lower hospital prices as long as health plan markets remain competitive. Our findings also suggest that consumers would benefit from policies that maintained competition in hospital markets or that would restore competition to hospital markets that are uncompetitive.

As the long-term trend of consolidation among US health plans continues, providers have voiced growing concern that health plans will acquire such market power that they will be able to depress the prices paid to providers. The American Hospital Association has argued that health plan consolidation leads to "reimbursement to hospitals and physicians that is below competitive levels," thereby threatening both the quality of care and patients' access to it.[1] The American Medical Association has proposed legislation that would allow physicians to bargain collectively with health plans without fear of antitrust prosecution, so as to "level the playing field" in price negotiations.[2,3]

Despite the importance of these issues, and the growing interest in them, there is limited empirical evidence regarding the relationship between concentrated health plan markets—that is, markets where most people with private health insurance purchase it from one to just several insurers—and the prices that plans pay to providers. There have also been few studies of the relationships among the level of concentration in the market of health plans; the level of concentration in the market of hospitals; and the prices that hospital charge.[4,5] This article adds to the literature by studying how both health plan market concentration and hospital market concentration interact to affect hospital prices in the United States.

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The Framework For The Study

The literature on hospital pricing and on bargaining between hospitals and health plans serves as the framework for our empirical analyses. Health plans compete with each other on price—the premiums they charge—along with the quality and accessibility of the providers included in their networks or benefit packages. Because the cost of hospital care represents about half of the health care costs that plans must pay, the prices that they pay hospitals have a large impact on the premiums they must charge. Mark Pauly suggests that larger plans should be able to secure lower prices from hospitals than smaller plans can.[6] Accordingly, because the average size of the plans in more concentrated markets—those with fewer health plans—is larger, prices should be lower.

However, health plans' bargaining power also depends on plans' ability to send their members to competing, lower-price hospitals for care, rather than having to use a more expensive hospital.[7,8] The ability of health plans to substitute one provider for another to create competition and generate lower prices depends on the concentration of the hospital market in which the plans are buying services. Research shows that in concentrated markets, health plans pay higher prices to hospitals.[9]

According to this framework, increasing the market concentration of health plans has the opposite effect on hospitals' prices from increasing the market concentration of hospitals. Thus, the prices that hospitals receive will depend on the relative concentration in the market of both plans and hospitals. Our analyses included plan and hospital market concentration measures to explore how these factors affect hospital prices.

Study Data And Methods

DATA Our sample included all general, acute care hospitals not owned by the federal government that were located in Metropolitan Statistical Areas in 2001 and 2004. Hospital data came from Medicare hospital cost reports, the American Hospital Association Annual Surveys, and a database of multihospital systems provided by Kristin Madison and Sujoy Chakravarty.[10–12]

The federal government's Area Resource File and the Medicare Impact files provided the area wage index, per capita income, unemployment rate, and population data. We obtained managed care data for health maintenance organizations and preferred provider organizations in 2001 and 2004 from InterStudy, a health care data company; these data cover more than 90 percent of the United States.

The final analytical sample contained 4,017 hospital-year observations and included more than 90 percent of all hospitals located in Metropolitan Statistical Areas.

METHODS First, we summarized the distribution of hospitals and Metropolitan Statistical Areas across different levels of market concentration for both health plans and hospitals. We constructed multivariate models to explore the effects of health plan and hospital market concentration on hospital prices. In one model, we estimated the effects of market concentration of both plans and hospitals on hospital prices, after adjusting for other factors that affect hospital prices. For example, because previous research has shown that prices can be lower in areas where more of the population is enrolled in managed care plans,[13] we included the level of managed care penetration in the market as an additional factor.

In a second model, we tested for the possibility that health plan concentration effects on hospitals were much stronger in the most concentrated markets, compared to less concentrated ones, by dividing health plan markets into four categories, based on health plan concentration.

We employed standard statistical methods to adjust for the fact that we used a pooled cross-sectional database for our analysis.[14] Finally, we conducted a series of statistical tests to validate our key assumptions and found that our results were unchanged and statistically robust.[15]

HOSPITAL PRICES Because actual hospital prices paid by private health plans, such as per diem prices, are not available on a national basis, we constructed our statistical models to produce a valid proxy for hospital prices. Following other researchers,[13,16,17] we regressed total hospital net revenue on a set of independent variables that included hospital volume (total adjusted patient days)[18] and hospital case-mix. Case-mix was measured by the Medicare case-mix index, a measure of patients' level of illness.

Because net revenue equals price times quantity, by including a quantity measure we controlled for and effectively held constant the changes in net revenue related to quantity, while the case-mix measure controlled for changes related to patient severity over time.[19] The total net revenue included Medicare and Medicaid revenue as well as revenue from private payers, so we also controlled for the changes in revenue due to the mix and prices of different payers.

HEALTH PLAN CONCENTRATION We constructed a standard concentration index variable with values that ranged from close to 0 to 10,000. A monopoly market—that is, a market with a single health plan—had a value of 10,000, while a value close to 0 represented a highly competitive, less concentrated market.

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Using Metropolitan Statistical Areas as the geographic market for health plans, we summed the squared value of each health plan's Metropolitan Statistical Area market share. If a health plan offered both health maintenance organization and preferred provider organization products in a given metropolitan area, we first added the enrollment in each together and then calculated the market share of the combined products before computing the concentration index.

Other studies have calculated these values separately for both health maintenance organization and preferred provider organization products under the assumption that they serve separate product markets. However, it is more likely that consumers see these two types of plans as similar enough that they are willing to switch between the two. Thus, both types of products should be included in the same market.[20–22]

To measure health plan concentration, we used a standard concentration index, again with values ranging from close to 0 to 10,000. We divided Metropolitan Statistical Areas into four categories, based on their health plan concentration index: less than 1,000, 1,000–1,800, 1,801–3,200, and greater than 3,200. These thresholds were chosen to facilitate comparison with other studies of health plan market concentration and are consistent with the Department of Justice 1997 Merger Guidelines.[23]

MANAGED CARE PENETRATION AND HOSPITAL MARKET CONCENTRATION Following previous studies,[24,25] we calculated managed care penetration as the total population of a metropolitan area that was enrolled in either a health maintenance organization or a preferred provider organization in a given year, divided by the total population of that area in that year.

We calculated a hospital-specific concentration index for each hospital's market, using standard methods.[26]

CONTROL VARIABLES Following other studies,[27,28] we included supply and demand variables that might affect hospital prices, including a wage index (as a proxy for input prices); Medicare's and Medicaid's shares of total inpatient discharges (to control for payer mix); hospital ownership (not-for-profit, for-profit, or government); hospital teaching status; hospital system membership status; Medicare case-mix index (log transformed); total adjusted patient days (log transformed); per capita income in the hospital's geographic area (log transformed); and the percentage of for-profit and government hospitals within a fifteen-mile radius.

We also included time variables to control for general trends in hospital prices over time, and geographic variables (including each hospital's census region) interacted with time variables to capture regional differences in hospital prices over time.

LIMITATIONS Although our market concentration data cover the period between 2001 and 2004, our results are likely to remain valid today. Consolidation has continued within both hospital and health plan markets, but increases in market concentration have slowed because antitrust regulations limit mergers and acquisitions that greatly increase concentration in local markets. Our statistical results are generally descriptive in nature, which limits our ability to make strong causal inferences regarding the welfare effects of the relative concentration between hospital and health plan markets.

Study Results

Hospital and health plan market concentration differs across the country (Exhibit 1). Thirty-two metropolitan areas (10 percent) are in the most competitive category for health plans and account for 13 percent of US hospital revenues for 2004. The most concentrated category for health plans contains thirty-five areas and 7 percent of hospital revenues for 2004.

Hospital market concentration varies only slightly across the categories, ranging from 3,204 to 3,661 (Exhibit 1). And only in the most concentrated health plan markets does the health plan concentration divided by the hospital concentration exceed 1.0. These results indicate that hospitals face less competition in their own markets than health plans face in theirs. More than 90 percent of all hospitals (2,111 of 2,276) operate in markets where the hospital market concentration exceeds the health plan market concentration.

Higher health plan market concentration reduces hospital prices, while higher hospital market concentration increases them. For example, a 1,000-point increase in the health plan concentration index is, on average, associated with 2.5 percent lower hospital prices, while a 1,000-point increase in hospital concentration values is associated with an 8.3 percent increase in hospital prices. Model 2 shows that health plan concentration reduces hospital prices at a much greater rate in those areas where health plan markets are the most concentrated but reduces them at a much smaller rate in less concentrated ones (Exhibit 2).

Discussion

Previous research has documented a trend of consolidation among US health plans.[29] Provider groups such as the American Hospital Association argue that health plan markets are already

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EXHIBIT 1

Concentrations Of Health Plans And Hospitals In Metropolitan Statistical Areas (MSAs), 2004

Health plan concentration index	Number of MSAs	Number of hospitals	Percent of total hospital revenue	Average health plan concentration	Average hospital concentration	Health plan concentration/ hospital concentration	Percent of population in managed care
<1,000	32	326	13	854	3,204	0.28	57
1,000–1,800	129	1,131	51	1,409	3,265	0.46	59
1,801–3,200	122	654	28	2,284	3,570	0.66	57
>3,200	35	165	7	3,977	3,661	1.11	59
Total	318	2,276	99	1,714	3,361	0.52	58

SOURCE Authors' calculations based on data from InterStudy and the American Hospital Association Annual Surveys. **NOTES** The concentrations, concentration index, and penetration are explained in the text. Percentages of hospital revenue do not sum to 100 because of rounding.

highly concentrated, and that continued consolidation will allow plans to gain additional market power, which will give them too much bargaining power over providers.[1]

Our findings add several new and important insights to this discussion. Our descriptive analyses show that 64 percent of hospitals operate in markets where health plans are not very concentrated, and only 7 percent are in the most concentrated health plan markets (Exhibit 1). These results suggest that contrary to conventional wisdom, very few hospitals operate in markets with only a few dominant health plans.

Our statistical results show that although higher health plan concentration is associated with lower hospital prices on average, this relationship is not constant. In fact, hospital prices are significantly affected only when health plan concentration index values are above 3,200 (Exhibit 2). These findings lend support to the argument that highly concentrated health plan markets can lead to lower provider prices.

At the same time, our results are consistent with previous research[9,30] showing that hospital prices are higher in more concentrated hospital markets. Higher hospital concentration is associated in all of our models with higher hospital prices. For example, a 1,000-percentage-point increase in the hospital concentration index raises prices by approximately 8.3 percent (Exhibit 2).

Taken together, our results show that more concentrated health plan markets can counteract the price-increasing effects of concentrated hospital markets.

POLICY IMPLICATIONS Our results have implications for health care policy. Under the Affordable Care Act of 2010, states are beginning to regulate insurance premiums to control costs; our results suggest that restoring competition to hospital markets would have an even larger effect. Regulators should continue to monitor health plan consolidation to prevent excess concentration, but they should also adopt proactive policies to increase hospital market competition.

Many areas in the United States are dominated by several large local or national hospital systems that negotiate collectively with health plans. This reduces competition and raises hospital prices. Because such large systems may provide increased efficiency and quality, we do not recommend breaking them up. But regulators could require hospitals in the systems to negotiate independently with health plans. The Federal Trade Commission recently applied this approach to hospitals operating in Illinois.[31] And Medicare should be careful not to create concentrated organizations that reduce competition when it establishes large, provider-based accountable care organizations.

Increased transparency would also benefit consumers. Providers should be required to share utilization and cost data with payers such as large employers. Currently, many of these employers do not have access to data on how much care their employees are using, and how much they are paying for it.

EXHIBIT 2

Changes In Hospital Prices Associated With Hospital And Health Plan Market Concentration

	Percent change in hospital prices	
Concentration index	**Model 1**	**Model 2**
Hospital (for 1,000-point increase)	8.3**	8.3**
Health plan (for 1,000-point increase)	-2.5**	—
Health plan 1,000–1,800	—	-1.0
Health plan 1,801–3,200	—	-3.0
Health plan > 3, 200	—	-12.17**

SOURCE Authors' calculations based on regression analysis. **NOTES** Estimates control for other variables. The results for other control variables are given in the online Appendix (to access the Appendix, click on the Appendix link in the box to the right of the article online). The two models are described in the text. $^{**}p < 0.05$

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FUTURE RESEARCH QUESTIONS We found that hospital markets, on average, were much more concentrated than health plan markets. These findings depend in part on the definition and measurement of health plan products and markets. We combined health maintenance organizations and preferred provider organizations into a single product market because we assumed that consumers are willing to substitute one for the other and that an insurer offering both products negotiates with providers as one entity. However, others have treated these organizations as separate product markets or used other approaches.[4,29] Assuming that there are separate product markets leads to smaller markets and higher health plan concentration index values. Research is needed to validate these assumptions.

Another question is whether fee-for-service care paid for by Medicare and Medicaid should be included in the denominator when calculating health plan market shares and concentration values. New studies should focus on these important conceptual and measurement issues and examine interactions with other markets—such as physician markets—which may have different underlying structures. We also need further research to extend our understanding of how these and other market structure variables work together to affect the prices that consumers ultimately pay each year to purchase health insurance and medical care. ■

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NOTES

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14 We estimated robust standard errors to take into account any unobserved factors that might be clustered at the hospital level. This robust standard error method also takes into account any unobserved correlations at the Metropolitan Statistical Area level, which is the level of aggregation at which managed care market characteristics are measured.

15 We performed several tests. First, to test for the possibility that the market penetration of health maintenance organizations is not random, we followed previous studies, re-estimating our models but using labor market characteristics that others have used to predict managed care penetration. The results from this test were similar to those in our original models. Second, since payer-mix data were not available for adjusted days, we used payer-specific discharge data to construct payer mix measures, finding that adjusted days and admissions were highly correlated (0.84). And third, we used pooled data across years to provide more precise estimates (the pooled coefficients were essentially the weighted average of the coefficients from the two separate models).

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be interpreted as the marginal relationship between the independent variables, including concentration measures, on average hospital price.
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Glenn A. Melnick is a professor at the University of Southern California.

In this month's *Health Affairs*, Glenn Melnick and coauthors report on their examination of markets in which health plans, hospitals, or both are highly concentrated. Their results show that more concentrated health plan markets can counteract the price-increasing effects of hospital concentration and that health plan concentration benefits consumers through lower hospital prices as long as health plan markets remain competitive.

The authors took up their study because lack of competition in insurance markets was cited as a main culprit behind rising health insurance premiums during the recent debate over health reform. Surprisingly even to him, Melnick says, the study refutes that claim. Melnick says he now hopes that this report will bolster the commitment of policy makers to "strengthening and restoring provider market competition" as a way to better control costs.

Melnick holds the Blue Cross of California Chair in Health Care Finance in the School of Policy, Planning, and Development at the University of Southern California. He is also a resident consultant for the RAND Corporation in Santa Monica, California. Melnick received his doctorate in urban and regional planning from the University of Michigan.

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