

By Brent D. Fulton

DOI: 10.1377/hlthaff.2017.0556  
 HEALTH AFFAIRS 36,  
 NO. 9 (2017): 1530–1538  
 ©2017 Project HOPE—  
 The People-to-People Health  
 Foundation, Inc.

# Health Care Market Concentration Trends In The United States: Evidence And Policy Responses

**Brent D. Fulton** (fultonb@berkeley.edu) is an assistant adjunct professor in the School of Public Health at the University of California, Berkeley.

**ABSTRACT** Policy makers and analysts have been voicing concerns about the increasing concentration of health care providers and health insurers in markets nationwide, including the potential adverse effect on the cost and quality of health care. The Council of Economic Advisers recently expressed its concern about the lack of estimates of market concentration in many sectors of the US economy. To address this gap in health care, this study analyzed market concentration trends in the United States from 2010 to 2016 for hospitals, physician organizations, and health insurers. Hospital and physician organization markets became increasingly concentrated over this time period. Concentration among primary care physicians increased the most, partially because hospitals and health care systems acquired primary care physician organizations. In 2016, 90 percent of Metropolitan Statistical Areas (MSAs) were highly concentrated for hospitals, 65 percent for specialist physicians, 39 percent for primary care physicians, and 57 percent for insurers. Ninety-one percent of the 346 MSAs analyzed may have warranted concern and scrutiny because of their concentration levels in 2016 and changes in their concentrations since 2010. Public policies that enhance competition are needed, such as stricter enforcement of antitrust laws, reducing barriers to entry, and restricting anticompetitive behaviors.

The US health care system relies on competition in the provider and health insurer markets to lower costs and improve quality. However, the market concentration of hospitals and insurers has been a matter of concern for several decades.<sup>1–6</sup> More recently, Martin Gaynor and colleagues reviewed studies of the competitive landscape of hospitals, health insurers, and physician services and found that hospital and health insurer markets have become more concentrated since the 1990s.<sup>7</sup>

To measure market concentration, the Anti-trust Division of the Department of Justice (DOJ) and Federal Trade Commission (FTC) often use the Herfindahl-Hirschman Index (HHI),

which is calculated by squaring the market shares of each firm competing in a market and summing those values across all firms, resulting in a range from 0 to 10,000.<sup>8</sup> Gaynor and colleagues reported that 65 percent of Metropolitan Statistical Areas (MSAs) had highly concentrated hospital markets (those with HHIs greater than 2,500) in 1990, and that share had increased to 77 percent by 2006.<sup>7</sup> By way of example, an HHI of 2,500 could result from each of four firms in a given market having a 25 percent market share. There is less historical information on concentration in physician markets, but Gaynor and colleagues reported that those markets were generally unconcentrated (with HHIs less than 1,500), particularly for primary care

physicians.

Although provider concentration could produce efficiencies that benefit purchasers of health care services, the evidence does not point in that direction. For example, reviews of studies of hospital markets have found that concentrated markets are associated with higher hospital prices, with price increases often exceeding 20 percent when mergers occur in such markets.<sup>7,9</sup> Of even greater concern, the reviews found that these price increases did not appear to improve quality: In some cases, higher hospital concentration was associated with higher mortality rates.

In comparison to the number of hospital market studies, a relatively small number of studies has examined the impact of physician organization concentration. Overall, these studies found that higher concentration was associated with higher physician prices across a range of services, including three types of commonly billed office visits,<sup>10</sup> office visits across ten prominent specialties,<sup>11</sup> orthopedics,<sup>12</sup> cardiology and orthopedics,<sup>13</sup> and common outpatient procedures.<sup>14</sup>

A significant share of health care services in the United States is purchased by health insurers via employer-sponsored insurance and the individual market, including the Affordable Care Act Marketplaces. Increased health insurer concentration could result in lower premiums to employers and consumers along two pathways: having efficiencies from economies of scale and insurers' negotiating lower prices with hospitals and physician organizations that are attempting to charge prices above the competitive level. To some extent, research shows that this is happening, with higher health insurer concentration being associated with lower hospital<sup>15-17</sup> and physician prices.<sup>10,17</sup> However, the evidence shows that these price reductions are not passed on to consumers. A number of studies have found that higher health insurer concentration leads to higher premiums,<sup>7,18</sup> including for employers<sup>19-21</sup> and for individuals purchasing Marketplace plans.<sup>22</sup> (This effect was moderated in Covered California, the Marketplace in an active-purchaser state that selectively contracts and negotiates premiums with insurers.)<sup>23</sup>

## Objectives

The Council of Economic Advisers recently expressed concern about the lack of estimates of market concentration across many sectors of the US economy.<sup>24</sup> This study fills that gap for the most recent period for a significant portion of the health care sector. First, it shows how hospital, physician organization, and health insurer

market concentration changed at the MSA level from 2010 to 2016. Second, it reports the number of MSAs that may have warranted concern and scrutiny, based on the market concentration level in 2016 and the change in concentration since 2010. Third, because of the large increase in primary care physician market concentration during this period, it examines whether the other health care subsectors' concentration levels and changes were associated with this increase.

## Study Data And Methods

### MARKET CONCENTRATION MEASURE AND DATA SOURCES

Market concentration was measured by the HHI, because of its widespread use. The sources used to estimate HHIs included the following annual data for the period 2010–16 (as of January 1 each year): for hospitals, the American Hospital Association (AHA) Annual Survey database; for physicians, the SK&A Office Based Physicians Database provided by IMS Health (now Quintiles); and for insurers, the Managed Market Surveyor File from HealthLeaders InterStudy (now Decision Resources Group). The market shares of hospitals, physician organizations, and insurers were based on the numbers of inpatient admissions, physicians, and enrollees, respectively.

Market concentration was measured using the product and geographic market definitions that are discussed next.

**PRODUCT MARKET DEFINITIONS** The hospital product was defined as a cluster of all inpatient services from short-term general hospitals. Hospital systems were treated as a single firm because they typically negotiate with payers as a system.

The physician organization products included services from the following five types of providers: primary care physicians, cardiologists, oncologists/hematologists, radiologists, and orthopedists. These types were selected because in each case at least 10,000 physicians were included in the data source, and all of the types except for primary care physicians are among the most highly compensated types. Physician organizations owned by a group medical practice, hospital, or health care system (which always included at least one hospital) were treated as a single firm. The four specialist physician organization products were combined into one HHI by calculating the mean HHI across the specialties, weighted by the number of physicians in each specialty.

The health insurer product was defined as point-of-service plans and plans with preferred provider organizations, exclusive provider organizations, and health maintenance organiza-

tions for the employer-sponsored market—including fully and self-insured plans—and the individual market outside of the Marketplaces (because these two markets could not be separated in the data). This product was constructed because an insurer's market share of enrollees across these lines of business is correlated with the insurer's market share of purchased hospital and physician services, thus indicating the concentration level of the primary purchasers of provider services.

Marketplace, Medicare Advantage, and Medicaid managed care enrollees were excluded, because provider reimbursement rates for these enrollees are low, constrained by Medicare fee-for-service prices and Medicaid managed care premiums, or both. Additional information on the product definitions is in the online Appendix.<sup>25</sup>

**GEOGRAPHIC MARKET DEFINITIONS** The geographic market for hospitals, specialist physician organizations, and insurers in this study was an MSA, which has been commonly used in other studies on market concentration of hospitals,<sup>15,26</sup> specialist physicians,<sup>27</sup> and insurers.<sup>15,26,28</sup> The Office of Management and Budget delineated 382 MSAs in the United States,<sup>29</sup> in which 278 million people (86 percent of the US population) resided in 2016, according to the Census Bureau.<sup>30</sup> The geographic market for primary care physician organizations was a primary care service area (PCSA), the smallest geographic area that can be a discrete service area for primary care physicians.<sup>31</sup> The Health Resources and Services Administration defined 7,144 PCSAs in the United States,<sup>32</sup> and PCSA-level HHIs were aggregated to the MSA level by weighting them using the PCSA population.

**SUMMARY MEASURE TO EVALUATE CHANGES IN MARKET CONCENTRATION** When the DOJ or FTC evaluates a proposed merger or acquisition, the agency considers how the proposed action will change the market concentration and what the resulting concentration will be. The agencies' *Horizontal Merger Guidelines*<sup>8</sup> specify the following postmerger HHI thresholds and the changes in the HHI that warrant different levels of concern and scrutiny, as the basis for further investigation: The level is high if the HHI is more than 2,500 and the change in HHI is more than 200, because the merger or acquisition is "presumed to be likely to enhance market power"; moderate either if the HHI is more than 2,500 and the change in HHI is at least 100 and not more than 200, or if the HHI is at least 1,500 and not more than 2,500 and the change in HHI is at least 100, because the merger or acquisition "potentially raise[s] significant competitive concerns and often warrant[s] scrutiny"; and low if either the

**Although provider concentration could produce efficiencies that benefit purchasers, the evidence does not point in that direction.**

HHI is less than 1,500 or the change in HHI is less than 100, because in this case the merger or acquisition is "unlikely to have adverse competitive effects and ordinarily require[s] no further analysis."

These criteria were applied to evaluate changes in market concentration at the MSA level in the period 2010–16 and to identify the number of MSAs that might warrant either a high or moderate level of concern and scrutiny. The change in HHI in each MSA for each product or product grouping was based on regressing the HHI on the year, to estimate the change using up to seven data points (for more details, see the Appendix).<sup>25</sup> Because the criteria were based on both changes in concentration and ending levels of concentration, an MSA that was highly concentrated (for example, one with an HHI of 5,000) in a particular subsector in 2016 would not even warrant moderate concern and scrutiny unless the HHI increased by at least 100 points. Therefore, these criteria were relevant for analyzing concentration trends and ending levels, not merely concentration levels at a point in time.

**REGRESSION MODELS** From 2010 to 2016, the concentration of primary care physician organizations increased more than that of any other subsectors I examined. Therefore, I explored factors associated with the 2016 levels and this change using four regression models. In models 1 and 2, the dependent variable was the primary care physician organization HHI in 2016, and the key independent variables were the HHIs of hospitals, specialist physician organizations, and insurers in the same year. These models tested whether primary care physician concentration in 2016 was associated with concentration levels in other subsectors. Model 2 added health care and demographic control variables described in the Appendix.<sup>25</sup>

In models 3 and 4, the dependent variable was

the annual change in the primary care physician organization HHI from 2010 to 2016. The key independent variables were the 2010 HHIs and the annual changes in the same period in the HHIs of hospitals, specialist physician organizations, and insurers. These long-differenced models (described in the Appendix)<sup>25</sup> tested whether the increase in the concentration of primary care physician organizations was associated with levels and changes in concentration in other subsectors. Model 4 added health care and demographic control variables (described in the Appendix).<sup>25</sup>

**LIMITATIONS** The study had several limitations. First, the AHA defines a system as “an entity with two or more hospitals owned, leased, sponsored, or contract managed by a central organization,”<sup>33</sup> but it has been known to inaccurately record which hospitals are part of hospital systems.<sup>34</sup> Therefore, I used Irving Levin Associates’ annual *Health Care Services Acquisition Report*<sup>35</sup> to check whether the AHA captured those mergers during the years of my study period, and I made a few minor corrections to the AHA data to account for them. My reported hospital market concentrations may still be understated, because some affiliations among hospitals that did not meet the AHA definition of a system may operate as a system when negotiating with payers.

Second, the geographic definitions of MSAs and PCSAs have limitations, because some of the areas are either too small or too large for some products. Because my study primarily examined trends, if MSAs or PCSAs are sometimes too small or too large, they are likely to remain so over time. It was not feasible to define markets using formal hypothetical monopolist tests and structural models.<sup>8,36</sup> However, when I compared my mean concentration estimates to those of a study that estimated market concentration boundaries using fixed travel times to cardiologists and orthopedists, my estimates were consistent with that study.<sup>13</sup>

Third, to identify MSAs that may warrant either a high or moderate level of concern and scrutiny, I examined the HHI level in 2016 and the change in HHI since 2010, based on the thresholds in the *Horizontal Merger Guidelines*.<sup>8</sup> However, the DOJ and FTC use many nuanced criteria to evaluate markets and do not apply these thresholds strictly.<sup>37</sup> Thus, using only the thresholds in this manner should be considered as simply an initial screen. Moreover, these thresholds are used along with other criteria to evaluate proposed mergers. Thus, the thresholds that these agencies might use to evaluate changes in market concentration in general may differ.

## Study Results

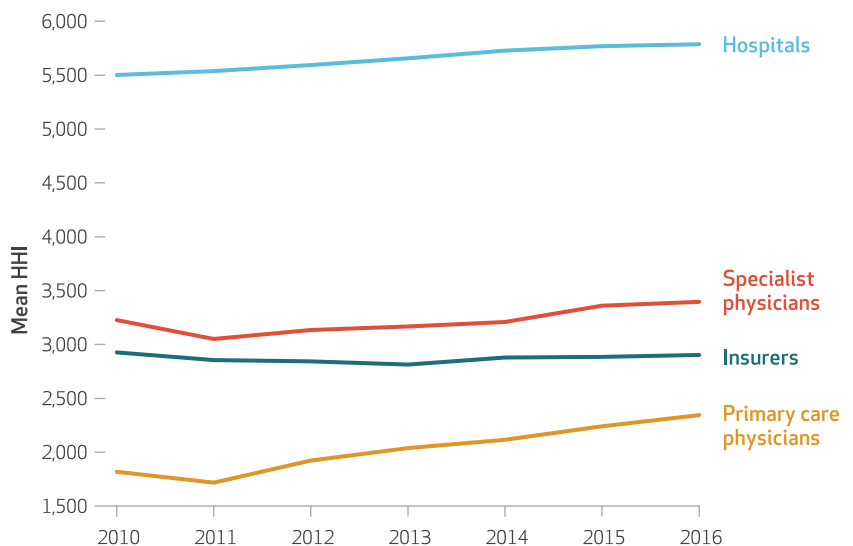
From 2010 to 2016, the mean HHIs for hospitals and specialist physician organizations each increased by about 5 percent, while the HHI for health insurers declined by less than 1 percent (Exhibit 1). The HHI for primary care physician organizations increased the most among the subsectors, by nearly 29 percent. As a result of these changes, 90 percent of MSAs had an HHI for hospitals of more than 2,500 in 2016 (Exhibit 2). Nearly 39 percent of MSAs had an HHI of that level for primary care physician organizations in 2016—an increase of 85 percent from 2010.

Ninety-one percent of the 382 MSAs analyzed (in which 202 million people resided in 2016) may have warranted either a high or moderate level of concern and scrutiny for a least one of the four products or product groupings based on the *Horizontal Merger Guidelines*<sup>8</sup> (Exhibit 3). This concern may have been warranted for hospitals in 184 MSAs, specialist physician organizations in 196 MSAs, primary care physician organizations in 205 MSAs, and insurers in 170 MSAs.

However, there was some overlap across subsectors. For example, concern may have been warranted for hospitals and primary care physi-

### EXHIBIT 1

Mean Metropolitan Statistical Area Herfindahl-Hirschman Index (HHI) for hospitals, physician organizations, and health insurers, 2010–16

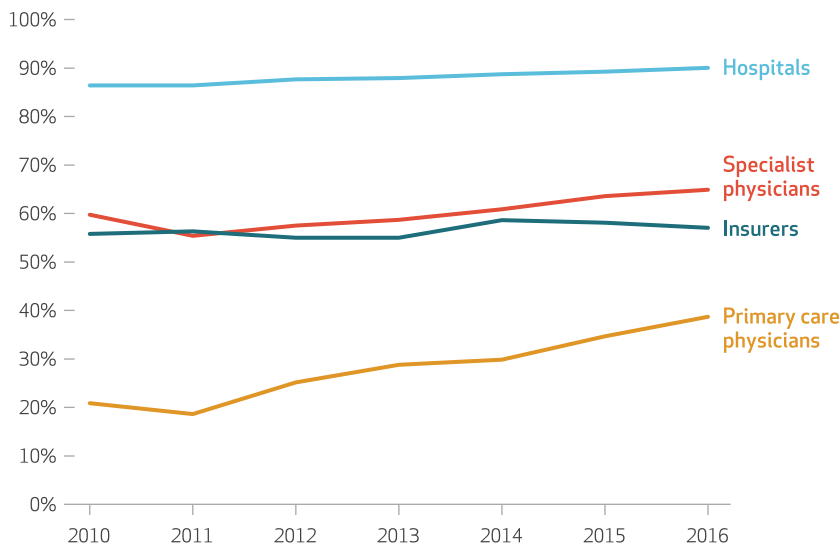


**SOURCES** Author’s analysis of data from the American Hospital Association Annual Survey, the SK&A Office Based Physicians Database from IMS Health, and the Managed Market Surveyor File from HealthLeaders InterStudy. **NOTES** The HHI calculations are explained in the text. Specialist physicians include providers in the fields of cardiology, oncology or hematology, radiology, and orthopedics. Insurers include preferred provider organization, exclusive provider organization, point-of-service plan, and health maintenance organization products in both the group and non-Marketplace individual markets, as explained in the text. HHIs for hospitals and specialist physician organizations increased 5.2 percent; for insurers, they declined 0.9 percent; and for primary care physician organizations, they increased 28.8 percent.



## EXHIBIT 2

Percentages of Metropolitan Statistical Areas (MSAs) whose Herfindahl-Hirschman Index (HHI) was above 2,500 for hospitals, physician organizations, and health insurers, 2010–16



**SOURCES** Author's analysis of data from the American Hospital Association Annual Survey, the SK&A Office Based Physicians Database from IMS Health, and the Managed Market Surveyor File from HealthLeaders InterStudy. **NOTES** The HHI calculations are explained in the text. Specialist physicians and insurers are explained in the Notes to Exhibit 1. The percentage of MSAs with HHIs above 2,500 increased 4.2 percent for hospitals, 8.7 percent for specialist physician organizations, 2.3 percent for insurers, and 85.2 percent for primary care physician organizations.

cian organizations in 110 MSAs. When all four products or product groupings were combined, concern may have been warranted in only 36 MSAs. This is because the pairwise correlations of the annual change in HHI from 2010 to 2016 were low among the four products or product groupings (for the pairwise correlations, see Appendix Exhibit A4).<sup>25</sup>

From 2010 to 2016, the share of primary care physicians working in organizations owned by a hospital or health care system increased from 28 percent to 44 percent—a dramatic increase of 57 percent—while the shares in independent solo practice or organizations owned by a medical group decreased (Exhibit 4).

In the regression analysis, a one-point increase in the HHI for specialist physician organizations in 2016 was associated with a 0.24 increase in the primary care physician organization HHI in 2016 ( $p < 0.001$ ) (Appendix Exhibit A6, model 2).<sup>25</sup> In contrast, a one-point increase in the HHI for insurers in 2016 was associated with a 0.13 decrease in the primary care physician organization HHI in 2016 ( $p < 0.05$ ). The hospital HHI in 2016 was not associated with the primary care physician organization HHI in 2016. Model 4 shows that a 1-point higher annual change in the HHI for specialist physician organizations from 2010

to 2016 was weakly associated with 0.10-point higher annual change in the HHI for primary care physician organizations ( $p = 0.12$ ). No such association was found for changes in the HHI for hospitals or insurers.

## Discussion

The markets for hospitals, specialist physician organizations, and primary care physician organizations at the Metropolitan Statistical Area level became more concentrated across the United States between 2010 and 2016. In 2016, 90 percent of MSAs were highly concentrated for hospitals, 65 percent for specialist physicians, 39 percent for primary care physicians, and 57 percent for insurers. The hospital concentration trends from the 1990s and early 2000s have continued.<sup>7</sup> Furthermore, my results are consistent with the fact that more physicians are joining larger physician organizations<sup>38</sup> and that more physicians work either directly for hospitals or in organizations that are owned by hospitals.<sup>39</sup>

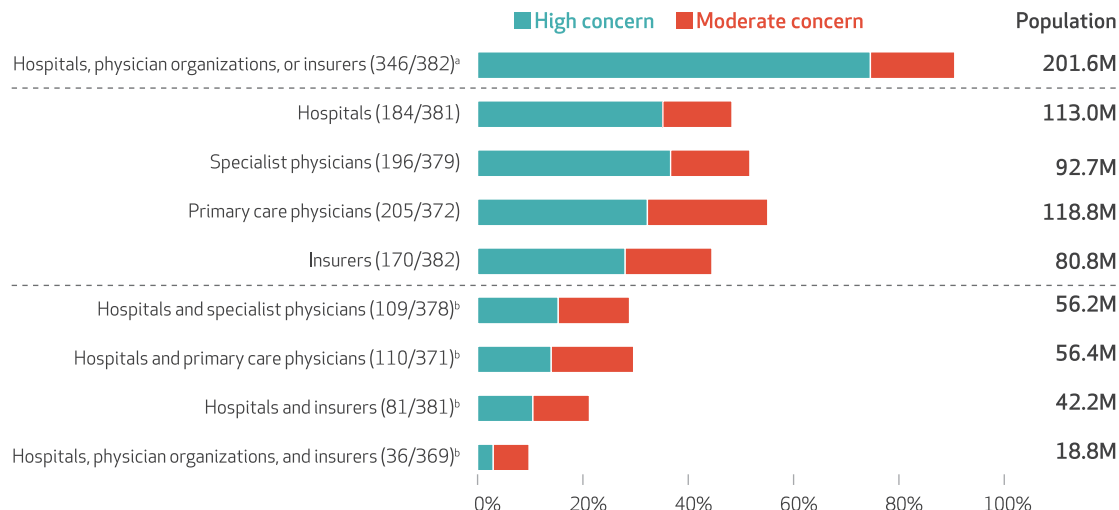
Based on the criteria for HHI levels and changes in them in the *Horizontal Merger Guidelines*,<sup>8</sup> in 2016, 202 million people resided in 346 MSAs where either a high or a moderate level of concern and scrutiny may have been warranted for at least one of the four products or product groupings described above. However, relatively few MSAs were found to warrant scrutiny across all of the products or product groupings, which suggests that systematic market-level factors do not drive concentration increases across all subsectors. This scrutiny typically includes examining other competitive factors that may influence the potentially harmful impact of increased concentration, such as the likelihood of coordinated or unilateral exercise of market power—including ease of entry, significant consolidation-specific efficiencies, and the presence of powerful buyers.

The increased concentration in primary care physician organizations was associated with more physician organizations being owned by hospitals or health care systems. However, no relationship was found between this increased concentration and either hospital market concentration trends or levels.

On the one hand, larger physician organizations, particularly those owned by hospitals or health care systems, have been linked to using more health information technology, electronic medical records, and care management processes, which enables them to more easily adapt to value- and risk-based reimbursement.<sup>40,41</sup> On the other hand, if a physician organization had market power before being acquired, the acquisition

### EXHIBIT 3

#### Percentages of Metropolitan Statistical Areas (MSAs) possibly warranting a high or moderate level of concern and scrutiny based on market concentration in 2016, and changes in that concentration, 2010–16



**SOURCES** Author's analysis of data from the American Hospital Association Annual Survey, the SK&A Office Based Physicians Database from IMS Health, and the Managed Market Surveyor File from HealthLeaders InterStudy. **NOTES** The HHI calculations are explained in the text. Specialist physicians and insurers are explained in the Notes to Exhibit 1. "Physician organization" includes both specialist and primary care physician organizations, with both types separately analyzed. In the ratios in parentheses, the numerator is the number of MSAs that warrant a high or moderate level of concern and scrutiny (hereafter, "concern"), and the denominator is the number of MSAs analyzed (which could be less than 382 MSAs because some MSAs were without a given type of product or product grouping). The population numbers are the 2016 populations (in millions) of the MSAs that may warrant a high or moderate level of scrutiny. Levels of concern are based on the *Horizontal Merger Guidelines* of the Department of Justice and Federal Trade Commission (see Note 8 in text). <sup>a</sup>The level of concern and scrutiny in an MSA was based on the product or product grouping with the highest level. <sup>b</sup>The level of concern and scrutiny in an MSA was high if all products or product groupings were at the high level. It was moderate if all products or product groupings were at the moderate or high level, but all were not at the high level.

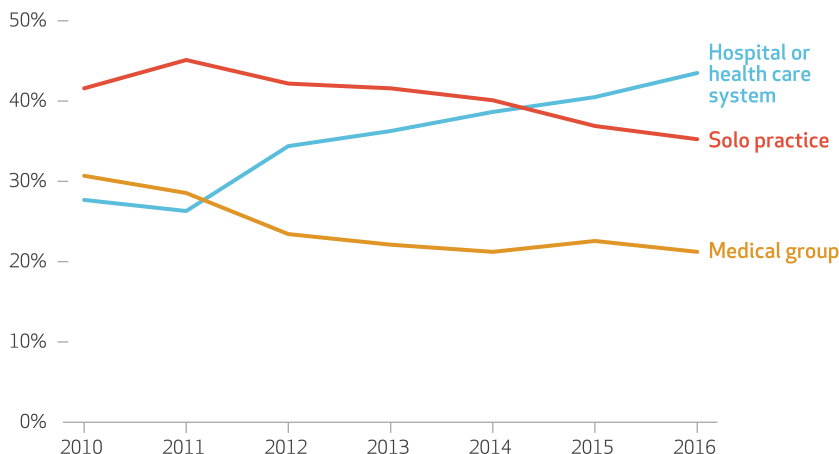
could increase hospital market power if it foreclosed rival hospitals from access to physician services,<sup>42</sup> a concern recently discussed by the FTC.<sup>43</sup> In fact, hospitals that have stronger affiliations with physicians have been found to have higher prices.<sup>44,45</sup> Similarly, if a hospital or health care system had market power before it acquired a physician organization, the acquisition could increase physician market power if it foreclosed rival physician organizations from access to hospital services. The combined effect of higher hospital and physician prices results in health insurance premiums becoming even more unaffordable to many employers and consumers. A recent article provides a framework that can be used to assess vertical mergers and advocates for the DOJ's 1984 *Non-Horizontal Merger Guidelines* to be updated.<sup>46</sup>

### Policy Responses

Given the evidence that increased concentration leads to higher health care prices and health insurance premiums, several important recent articles have suggested policy responses to en-

### EXHIBIT 4

#### Percentages of primary care physicians working in organizations, by ownership type, 2010–16



**SOURCE** Author's analysis of data from the SK&A Office Based Physicians Database from IMS Health. **NOTE** The percentage of physicians working in an organization owned by a hospital or a health care system increased 57.0 percent, while the percentages in independent solo practice and in a medical group declined 15.1 percent and 30.9 percent, respectively.

hance market competition,<sup>47–50</sup> and I discuss the following five below: enforce antitrust laws, reduce barriers to entry, restrict anticompetitive behaviors, revise anticompetitive reimbursement incentives, and set provider and health insurer rates.

First, proposed mergers and acquisitions should be scrutinized by the federal and state governments to evaluate whether the net result is pro- or anticompetitive, as the DOJ and attorneys general from multiple states did in the previously proposed Anthem-Cigna and Aetna-Humana insurer mergers.<sup>51</sup> This scrutiny includes evaluating whether the procompetitive effects could be achieved without the merger, as was ruled possible in the St. Luke's case—which involved a hospital's acquisition of a physician group.<sup>52</sup> This scrutiny could be enhanced at the state level. For example, the Massachusetts Health Policy Commission provides analyses of proposed health care mergers for the state's attorney general and the public.<sup>53</sup>

Second, policies that restrict market entry—such as hospital certificate-of-need laws, any-willing-provider regulations, and restrictive provider licensing and scope-of-practice regulations—should be evaluated to determine whether they enhance consumer welfare.

Third, to enhance competition, particularly in markets where providers are already highly concentrated, anticompetitive behaviors should be restricted. Examples of these behaviors include antitiering clauses that force insurers to include a provider in the top tier and tying agreements that force insurers to contract with all hospitals in a system.

Fourth, reimbursement policies that reduce competition should be revised. For example, my study found an increase in the share of primary care physicians working in organizations owned by a hospital or health care system. One reason for this increase is because of Medicare's facility fee, which is paid to hospitals for physician services that are provided outside the hospital at a site where the overhead is lower.<sup>47</sup> The facility fee should be adjusted to reflect the site's actual overhead rate. Otherwise, it provides an incentive for these acquisitions, which have the

## Policies that restrict market entry should be evaluated to determine whether they enhance consumer welfare.

potential to reduce competition among hospitals and among physician organizations.<sup>42</sup>

Fifth, seven states that began to regulate hospital rates in the 1970s generally had lower hospital spending growth.<sup>54</sup> However, all but two of the states discontinued this practice because of private insurers' shift to managed care and Medicare's shift to reimbursements based on diagnosis-related groups. At the insurer level, health insurance rate review and Marketplace active-purchaser states that use selective contracting have both been found to be associated with lower growth rates in premiums.<sup>23,55</sup> Although provider and insurer rate setting may be promising, it is challenging for regulators to set rates that account for changes in technology and input costs, and rating setting is subject to regulatory capture—whereby regulators become overly influenced by the regulated industry.

### Conclusion

Future studies should evaluate the impact of these policy options on competition and consumer welfare. Given health care market concentration levels and trends, it will be important to closely monitor market competition and to implement policies that help enhance competition, to ensure that competition plays a key role in lowering health care costs and improving health care quality. ■

An earlier version of this article was presented at the "Impact of Healthcare Market Concentration on Healthcare Prices and Premiums: What Can and Should Be Done" conference at the Robert F. Wagner Graduate School of Public Service, New York University,

New York City, on April 14, 2017. The meeting was organized and funded by the Nicholas C. Petris Center on Health Care Markets and Consumer Welfare, University of California, Berkeley. The author thanks participants at the conference for their comments. Funding

for this study was provided by the Commonwealth Fund (Grant Nos. 20160413 and 20170922). The author thanks Daniel Arnold, Jason Tilipman, and Grayson Dimick, of the University of California, Berkeley, for their research assistance.

## NOTES

- 1 Gaynor M, Haas-Wilson D. Change, consolidation, and competition in health care markets. *J Econ Perspect*. 1999;13(1):141–64.
- 2 Haas-Wilson D. *Managed care and monopoly power: the antitrust challenge*. Cambridge (MA): Harvard University Press; 2003.
- 3 Frech HE III. *Competition and monopoly in medical care*. Washington (DC): American Enterprise Institute Press; 1996.
- 4 Robinson JC. Consolidation and the transformation of competition in health insurance. *Health Aff (Millwood)*. 2004;23(6):11–24.
- 5 American Medical Association. *Competition in health insurance*. Chicago (IL): AMA; 2002–2016.
- 6 Department of Justice, Federal Trade Commission. *Improving health care: a dose of competition* [Internet]. Washington (DC): FTC; 2004 Jul [cited 2017 Jul 31]. Available from: <https://www.ftc.gov/sites/default/files/documents/reports/improving-health-care-dose-competition-report-federal-trade-commission-and-department-justice/040723healthcarerpt.pdf>
- 7 Gaynor M, Ho K, Town RJ. The industrial organization of health-care markets. *J Econ Lit*. 2015;53(2):235–84.
- 8 Department of Justice, Federal Trade Commission. *Horizontal merger guidelines* [Internet]. Washington (DC): FTC; 2010 Aug 19 [cited 2017 Jul 21]. Available from: <https://www.ftc.gov/sites/default/files/attachments/merger-review/100819hmg.pdf>
- 9 Gaynor M, Town R. The impact of hospital consolidation—update [Internet]. Princeton (NJ): Synthesis Project, Robert Wood Johnson Foundation; 2012 Jun [cited 2017 Aug 1]. (Policy Brief No. 9). Available from: [http://www.rwjf.org/content/dam/farm/reports/issue\\_briefs/2012/rwjf73261](http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2012/rwjf73261)
- 10 Roberts ET, Chernew ME, McWilliams JM. Market share matters: evidence of insurer and provider bargaining over prices. *Health Aff (Millwood)*. 2017;36(1):141–8.
- 11 Baker LC, Bundorf MK, Royalty AB, Levin Z. Physician practice competition and prices paid by private insurers for office visits. *JAMA*. 2014;312(16):1653–62.
- 12 Sun E, Baker LC. Concentration in orthopedic markets was associated with a 7 percent increase in physician fees for total knee replacements. *Health Aff (Millwood)*. 2015;34(6):916–21.
- 13 Dunn A, Shapiro AH. Do physicians possess market power? *Journal of Law and Economics*. 2014;57(1):159–93.
- 14 Schneider JE, Li P, Klepser DG, Peterson NA, Brown TT, Scheffler RM. The effect of physician and health plan market concentration on prices in commercial health insurance markets. *Int J Health Care Finance Econ*. 2008;8(1):13–26.
- 15 Melnick GA, Shen Y-C, Wu VY. The increased concentration of health plan markets can benefit consumers through lower hospital prices. *Health Aff (Millwood)*. 2011;30(9):1728–33.
- 16 Moriya AS, Vogt WB, Gaynor M. Hospital prices and market structure in the hospital and insurance industries. *Health Econ Policy Law*. 2010;5(4):459–79.
- 17 Scheffler RM, Arnold DR. Insurer market power lowers prices in concentrated provider markets: who benefits? *Health Aff (Millwood)*. 2017;36(9):1539–46.
- 18 Dafny LS. Health insurance industry consolidation: what do we know from the past, is it relevant in light of the ACA, and what should we ask? [Internet]. Washington (DC): Senate Committee on the Judiciary, Subcommittee on Antitrust, Competition Policy, and Consumer Rights; 2015 Sep 22 [cited 2017 Jul 25]. Available from: [http://www.hbs.edu/faculty/Profile%20Files/Testimony%20to%20Senate%20in%20re%20Insurance%20Industry%20Mergers%20-%202015\\_050cdb4e-db12-4a9d-9d50-48d917d39e2a.pdf](http://www.hbs.edu/faculty/Profile%20Files/Testimony%20to%20Senate%20in%20re%20Insurance%20Industry%20Mergers%20-%202015_050cdb4e-db12-4a9d-9d50-48d917d39e2a.pdf)
- 19 Dafny LS. Are health insurance markets competitive? *Am Econ Rev*. 2010;100(4):1399–431.
- 20 Dafny L, Duggan M, Ramanarayanan S. Paying a premium on your premium? Consolidation in the US health insurance industry. *Am Econ Rev*. 2012;102(2):1161–85.
- 21 Trish EE, Herring BJ. How do health insurer market concentration and bargaining power with hospitals affect health insurance premiums? *J Health Econ*. 2015;42:104–14.
- 22 Dafny L, Gruber J, Ody C. More insurers lower premiums: evidence from initial pricing in the health insurance Marketplaces. *Am J Health Econ*. 2015;1(1):53–81.
- 23 Scheffler RM, Arnold DR, Fulton BD, Glied SA. Differing impacts of market concentration on Affordable Care Act Marketplace premiums. *Health Aff (Millwood)*. 2016;35(5):880–8.
- 24 Council of Economic Advisers. *Benefits of competition and indicators of market power* [Internet]. Washington (DC): CEA; 2016 Apr [cited 2017 Aug 1]. (Issue Brief). Available from: [https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160414\\_cea\\_competition\\_issue\\_brief.pdf](https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160414_cea_competition_issue_brief.pdf)
- 25 To access the Appendix, click on the Appendix link in the box to the right of the article online.
- 26 Gaynor M. Health care industry consolidation [Internet]. Washington (DC): House Committee on Ways and Means; 2011 Sep 9 [cited 2017 Aug 1]. Available from: [https://waysandmeans.house.gov/UploadedFiles/Gaynor\\_Testimony\\_9-9-11\\_Final.pdf](https://waysandmeans.house.gov/UploadedFiles/Gaynor_Testimony_9-9-11_Final.pdf)
- 27 Kleiner SA, White WD, Lyons S. Market power and provider consolidation in physician markets. *Int J Health Econ Manag*. 2015;15(1):99–126.
- 28 Emmons DW, Guardado JR, Kane CK. *Competition in health insurance: a comprehensive study of U.S. markets*. Chicago (IL): American Medical Association; 2016.
- 29 Office of Management and Budget. *Revised delineations of Metropolitan Statistical Areas, Micropolitan Statistical Areas, and Combined Statistical Areas, and guidance on uses of the delineations of these areas* [Internet]. Washington (DC): OMB; 2015 Jul 15 [cited 2017 Aug 1]. (OMB Bulletin No. 15-01). Available from: <https://obamawhitehouse.archives.gov/sites/default/files/omb/bulletins/2015/15-01.pdf>
- 30 Census Bureau. *Metropolitan and Micropolitan Statistical Area population totals tables: 2010–2016* [Internet]. Washington (DC): Census Bureau; [cited 2017 Aug 21]. Available from: <https://www.census.gov/data/tables/2016/demo/popest/total-metro-and-micro-statistical-areas.html>
- 31 Goodman DC, Mick SS, Bott D, Stukel T, Chang CH, Marth N, et al. Primary care service areas: a new tool for the evaluation of primary care services. *Health Serv Res*. 2003;38(1 Pt 1):287–309.
- 32 Health Resources and Services Administration. *Primary care service area version 3.1 methods* [Internet]. Rockville (MD): HRSA; 2013 Sep 17 [cited 2017 Aug 1]. Available from: [https://datawarehouse.hrsa.gov/DataDownload/PCSA/2010/PCSA\\_Version3.1\\_methods\\_9\\_17\\_2013.pdf](https://datawarehouse.hrsa.gov/DataDownload/PCSA/2010/PCSA_Version3.1_methods_9_17_2013.pdf)
- 33 American Hospital Association. *AHA annual survey database: fiscal year 2015*. Chicago (IL): AHA; 2016, p. 7.
- 34 Madison K. Hospital-physician affiliations and patient treatments, expenditures, and outcomes. *Health Serv Res*. 2004;39(2):257–78.
- 35 Irving Levin Associates. *The health care services acquisition report*. Norwalk (CT): Irving Levin Associates; 2011–16.
- 36 Gaynor MS, Kleiner SA, Vogt WB. A structural approach to market definition with an application to the hospital industry. *J Ind Econ*. 2013;61(2):243–89.
- 37 Shapiro C. The 2010 horizontal merger guidelines: from hedgehog to fox in forty years. *Antitrust Law Journal*. 2010;77(1):49–107.



- 38 Muhlestein DB, Smith NJ. Physician consolidation: rapid movement from small to large group practices, 2013–15. *Health Aff (Millwood)*. 2016; 35(9):1638–42.
- 39 Kane CK. Updated data on physician practice arrangements: inching toward hospital ownership [Internet]. Chicago (IL): American Medical Association; 2015 [cited 2017 Aug 1]. Available from: [https://www.m3globalresearch.com/img/resources/AMA\\_PRP\\_Physician\\_Practice\\_Arrangements.pdf](https://www.m3globalresearch.com/img/resources/AMA_PRP_Physician_Practice_Arrangements.pdf)
- 40 Rittenhouse DR, Ramsay PP, Casalino LP, McClellan S, Kandel ZK, Shortell SM. Increased health information technology adoption and use among small primary care physician practices over time: a national cohort study. *Ann Fam Med*. 2017;15(1):56–62.
- 41 Rittenhouse DR, Shortell SM, Gillies RR, Casalino LP, Robinson JC, McCurdy RK, et al. Improving chronic illness care: findings from a national study of care management processes in large physician practices. *Med Care Res Rev*. 2010;67(3): 301–20.
- 42 Gaynor M. Is vertical integration anticompetitive? Definitely maybe (but that's not final). *J Health Econ*. 2006;25(1):175–80.
- 43 Brill J. A common goal: the U.S. Federal Trade Commission's health-care enforcement program and its implications for ACOs [Internet]. Washington (DC): Federal Trade Commission; 2015 Jun 17 [cited 2017 Aug 1]. Available from: [https://www.ftc.gov/system/files/documents/public\\_statements/673881/150617aco-summit.pdf](https://www.ftc.gov/system/files/documents/public_statements/673881/150617aco-summit.pdf)
- 44 Baker LC, Bundorf MK, Kessler DP. Vertical integration: hospital ownership of physician practices is associated with higher prices and spending. *Health Aff (Millwood)*. 2014;33(5):756–63.
- 45 Neprash HT, Chernew ME, Hicks AL, Gibson T, McWilliams JM. Association of financial integration between physicians and hospitals with commercial health care prices. *JAMA Intern Med*. 2015;175(12): 1932–9.
- 46 Salop SC, Culey DP. Revising the U.S. vertical merger guidelines: policy issues and an interim guide for practitioners. *Journal of Antitrust Enforcement*. 2016;4(1):1–41.
- 47 Gaynor M, Mostashari F, Ginsburg PB. Making health care markets work: competition policy for health care. *JAMA*. 2017;317(13):1313–4.
- 48 Fuse Brown EC, King JS. The double-edged sword of health care integration: consolidation and cost control. *Indiana Law J*. 2016;92(55):55–112.
- 49 National Academy of Social Insurance. Addressing pricing power in health care markets: principles and policy options to strengthen and shape markets: the final report of the academy's panel on pricing power in health care markets [Internet]. Washington (DC): The Academy; 2015 Apr [cited 2017 Aug 1]. Available from: <http://www.urban.org/sites/default/files/publication/50116/2000212-Addressing-Pricing-Power-in-Health-Care-Markets.pdf>
- 50 Gaynor M, Mostashari F, Ginsburg PB. Making health care markets work: competition policy for health care: actionable policy proposals for the executive branch, Congress, and the states [Internet]. Pittsburgh (PA): Carnegie Mellon University Heinz College; 2017 Apr [cited 2017 Aug 1]. Available from: <https://www.brookings.edu/wp-content/uploads/2017/04/gaynor-et-al-final-report-v11.pdf>
- 51 Dafny LS. Good riddance to big insurance mergers. *N Engl J Med*. 2017;376(19):1804–6.
- 52 Singer T. New health care symposium: unpacking the issues of vertical and horizontal consolidation—the St. Luke's case. *Health Affairs Blog [blog on the Internet]*. 2016 Mar 3 [cited 2017 Aug 1]. Available from: <http://healthaffairs.org/blog/2016/03/03/new-health-care-symposium-unpacking-the-issues-of-vertical-and-horizontal-consolidation-the-st-lukes-case/>
- 53 Mass.gov. Health Policy Commission [Internet]. Boston (MA): Commonwealth of Massachusetts; c 2017 [cited 2017 Aug 1]. Available from: <http://www.mass.gov/anf/budget-taxes-and-procurement/oversight-agencies/health-policy-commission/>
- 54 Atkinson G. State hospital rate-setting revisited [Internet]. New York (NY): Commonwealth Fund; 2009 Oct [cited 2017 Aug 1]. (Issue Brief). Available from: [http://www.commonwealthfund.org/~media/files/publications/issue-brief/2009/oct/1332\\_atkinson\\_state\\_hospital\\_ratesetting\\_revisited\\_1015.pdf](http://www.commonwealthfund.org/~media/files/publications/issue-brief/2009/oct/1332_atkinson_state_hospital_ratesetting_revisited_1015.pdf)
- 55 Karaca-Mandic P, Fulton BD, Hollingshead A, Scheffler RM. States with stronger health insurance rate review authority experienced lower premiums in the individual market in 2010–13. *Health Aff (Millwood)*. 2015;34(8):1358–67.