Consolidation in California's Health Care Market 2010-2016: Impact on Prices and ACA Premiums

Nicholas C. Petris Center on Health Care Markets and Consumer Welfare
School of Public Health
University of California, Berkeley

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Executive Summary[1]

This report details the rapid consolidation of the hospital, physician, and insurance markets in California from 2010 to 2016. According to the U.S. Department of Justice and Federal Trade Commission's *Horizontal Merger Guidelines*, 44 counties had highly concentrated hospital markets. For physician markets, 12 counties had highly concentrated primary care markets, 20 counties had highly concentrated orthopedics markets, 22 counties had highly concentrated cardiology markets, 24 counties had highly concentrated hematology/oncology markets, and 26 counties had highly concentrated radiology markets. The commercial insurance market was also highly concentrated with 42 counties considered highly concentrated according to the Guidelines. There was also an increasing trend of hospitals purchasing physician practices. The percent of physicians working for foundations owned by hospitals increased from 24% to 39% between 2010 and 2016.

We found evidence that highly concentrated markets are associated with higher prices for a number of hospital and physician services and Affordable Care Act (ACA) premiums. In markets with Herfindahl-Hirschman Indices (HHIs) above 1,500, average inpatient procedures prices were 79% higher than the prices in markets with HHIs below 1,500. Likewise, average outpatient physician prices ranged from 35% to 63% higher (depending on the physician specialty) in markets with HHIs above 1,500. In Northern California – which is considerably more concentrated than Southern California across all measures of health care market concentration that we analyzed – inpatient prices were 70% higher, outpatient prices were 17-55% higher (depending on the specialty of physician performing the procedure), and ACA premiums were 35% higher than they were in Southern California. Even after adjusting for input cost differences (i.e. wages) between Northern California and Southern California, procedure prices are still often 20-30% higher in Northern California than Southern California.

In sum, the pace of market consolidation in California has increased significantly. The vast majority of counties in California warrant concern and scrutiny according to the DOJ/FTC Guidelines. Consumers are paying more for health care as a result of market consolidation. It is now time for regulators and legislators to take action.

[1] We are grateful to Ted Frech (Professor of Economics, Department of Economics, University of California, Santa Barbara), Sherry Glied (Dean and Professor of Public Service, Robert F. Wagner Graduate School of Public Service, New York University), and Tom Rice (Distinguished Professor, Department of Health Policy and Management, UCLA Fielding School of Public Health, University of California, Los Angeles) for helpful comments and suggestions on this report. All remaining errors are our own.

Introduction

Following a national trend (Fulton 2017), California insurer and provider markets are becoming more concentrated (Scheffler 2017, Melnick and Fonkych 2016). Market concentration is important because it is well known that as health care markets become more concentrated, prices and premiums for consumers increase (Scheffler and Arnold 2017, Scheffler et al. 2016, Scheffler et al. 2015, Gaynor et al. 2015). This report details the changes in health care market concentration in California from 2010 to 2016. The three objectives of the report are (1) to describe trends in market concentration for hospitals, physician organizations, and insurers (2) to demonstrate the increase in the percent of physicians who work for foundations owned by hospitals or health systems (3) to analyze the relationship between market concentration and health care procedure prices, as well as Affordable Care Act (ACA) premiums.

The report proceeds as follows. In the next section, we describe the data and methods used in our analysis. The following section presents California health care market concentration trends from 2010 to 2016. We then analyze changes in the percent of physicians working foundations owned by a hospital or health system that occurred from 2010 to 2016. The report concludes with a section that describes the association between health care market concentration and health care procedure prices/ACA premiums. This section that discusses the differences in prices and premiums that exist between Northern and Southern California, and a summary of our findings.

Data and Methods

Our first set of analyses use the well-known Herfindahl-Hirschman Index (HHI) to measure insurer, hospital, and physician market concentration. HHI is used in the U.S. Department of Justice and Federal Trade Commission (DOJ/FTC)'s *Horizontal Merger Guidelines* (U.S. Department of Justice and the Federal Trade Commission 2010) and can range from 0 to 10,000. The measure is calculated by summing the squared market shares of firms. For example, if a market included two firms, one with 80% market share and the other with 20% market share, the HHI of the market would be 6,800 (or $80^2 + 20^2$). The *Horizontal Merger Guidelines* consider markets with HHIs between 1,500 and 2,500 points to be moderately concentrated and markets with HHIs in excess of 2,500 points to be highly concentrated. In the context of mergers, the Guidelines assign the highest concern and scrutiny to mergers that would increase the HHI in a market by over 200 points and leave the market with an HHI of over 2,500. Other HHI changes and levels trigger different degrees of concern and scrutiny (see Table 1 for details). For this report, we defined markets using counties, but other definitions such as metropolitan statistical areas (MSAs) are possible. We highlight the counties that increased by over 200 HHI points from 2010 to 2016 and had HHIs of over 2,500 in 2016.

Table 1. Level of Concern and Scrutiny Based on HHI Change and Resulting HHI Level

		HHI Level in 2016		
		< 1,500	1,500 to 2,500	>2,500
HHI Change 2010 to 2016	<100	Low	Low	Low
	100 to 200	Low	Moderate	Moderate
	>200	Low	Moderate	High

Low: "Unlikely to have adverse competitive effects and ordinarily require no further analysis"
Moderate: "Potentially raise significant competitive concerns and often warrant scrutiny"
High: "Presumed to be likely to enhance market power"

Source: Authors' analysis of U.S. Department of Justice and Federal Trade Commission's 2010 Horizontal Merger Guidelines (pg. 19)
Note: HHI=Herfindahl-Hirschman Index.

We measured the market shares of health insurers and hospitals using commercial enrollment (both fully- and self-insured) and inpatient admissions, respectively. Hospital systems were treated as a single firm for the purposes of our market share calculations, and we only accounted for short-term general hospitals when computing market share.[2] Our measures of the market shares of specialist and primary care groups are based on the number of physicians within each group.[3] The data sources we used to calculate these measures included: for health insurers, the Managed Market Surveyor provided by Decision Resources Group (formerly HealthLeaders-Interstudy); for hospitals, the American Hospital Association's (AHA) Annual Survey Database; and for physicians, the SK&A Office Based Physicians Database provided by QuintilesIMS.

For physicians, we computed an HHI for five separate specialties: primary care, cardiology, hematology/oncology, orthopedics, and radiology. These specialties were chosen because there was ample sample size (at least 10,000 physicians) in the data source and because the four specialty physicians are among the most highly compensated specialties.

Our second set of analyses look at the percent of physicians in a market who work for foundations owned by a hospital or health system.[4] In both the first set of analyses with HHIs and this second set, we use counties to define a market geographically. Using counties as the geographic market has been used frequently for research purposes (Frech et al. 2015, Baker et al. 2014).

Our next set of analyses correlate health care prices and ACA premiums with measures of market concentration. The prices we analyze are the median 2014 ACA rating area-level prices

[2] Specialty hospitals (e.g. rehabilitation centers) or hospitals not open to the general public (e.g. VA hospitals) are not included.
[3] See Fulton (2017) for methodological details.
[4] Corporate practice of medicine laws in California restrict physicians from being directly employed by corporations. See Martin and Neville (2016) for details.

displayed on the California Healthcare Compare website.[5] The prices we analyze are the median amount paid by insurers and consumers for procedures in a specific rating area and were calculated using data from Truven Health MarketScan.[6] Since the prices we have available to us are rating area-level, we correlated the prices with rating area-level HHIs rather than the county-level HHIs in our first set of analyses.

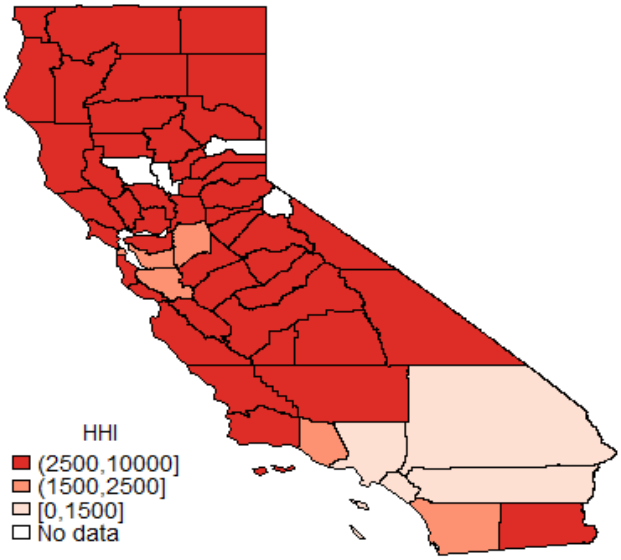
We chose which measure of market concentration to correlate with each procedure prices as follows. If the procedure was an inpatient procedure, we correlated it with hospital market concentration. If the procedure was an outpatient procedure, we identified which physician specialty would be associated with the procedure, and then correlated the market concentration of that specialty with procedure prices. For example, we correlated rating area-level cardiomyopathy prices with rating area-level cardiology HHI.

Finally, we correlate ACA premiums with the market concentration of commercial insurers using ACA rating areas.

Health Care Market Concentration Trends

Figure 1 shows the hospital HHI, by California county, in 2016. Of the 54 California counties with a hospital in 2016, 44 were highly concentrated (HHI above 2,500), and six were moderately concentrated (HHI between 1,500 and 2,500). The mean HHI across the 54 counties analyzed was a staggering 5,613 in 2016.

Figure 1. Hospital Market Concentration, 2016

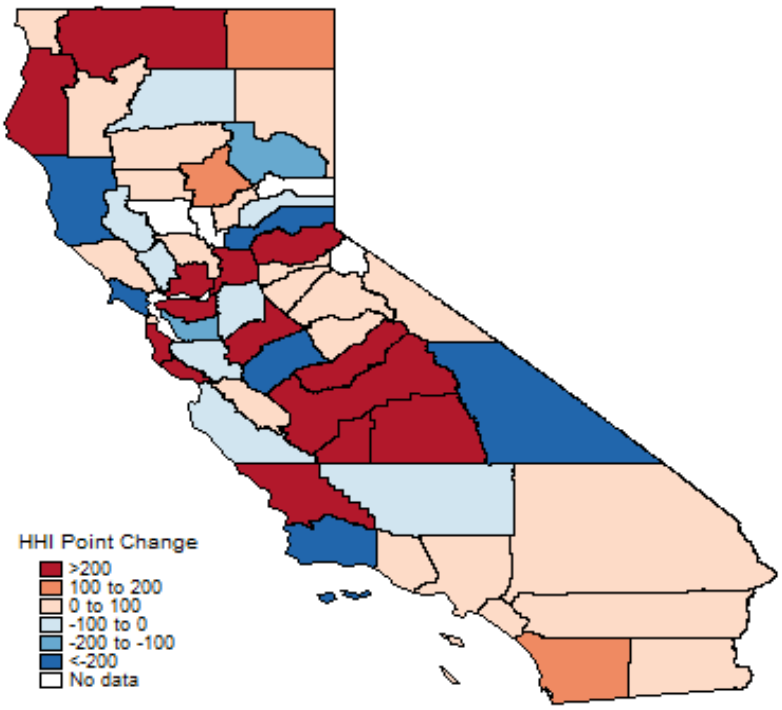


Source: Authors' analysis of the American Hospital Association's Annual Survey Databases.
Note: HHI=Herfindahl-Hirschman Index.

[5] http://www.cahealthcarecompare.org/cost_select.jsp
[6] http://article.images.consumerreports.org/prod/content/dam/cro/news_articles/health/PDFs/CAHealthCareCompare_methods.pdf

Figure 2 examines the changes in hospital HHI that occurred across counties between 2010 and 2016. Hospital concentration was stable during this period with a mean decrease of only 24 HHI points during the period. However, there was significant variation across counties, with 14 counties experiencing HHI increases of over 200 points from 2010 to 2016. These 14 counties qualify for the list of high concern and scrutiny counties according to the DOJ/FTC Guidelines (2016 HHI > 2,500 and HHI change > 200). The list of high concern and scrutiny counties is presented as Table 2.

Figure 2. Hospital Market Concentration Changes from 2010 to 2016



Source: Authors' analysis of the American Hospital Association's Annual Survey Databases.
Note: HHI=Herfindahl-Hirschman Index.

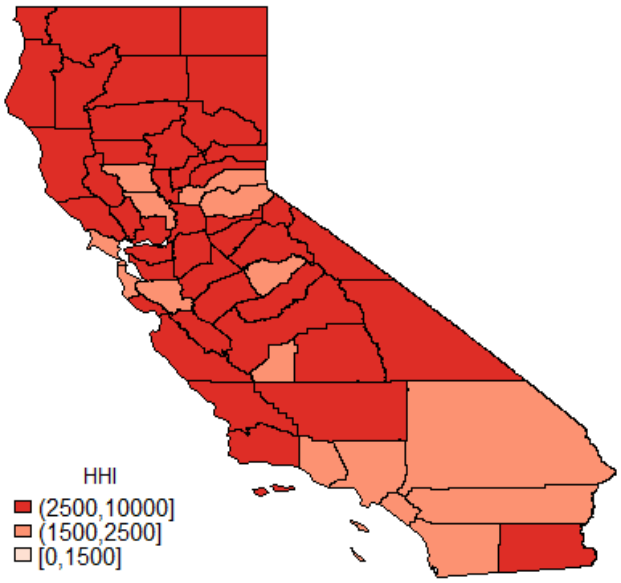
Table 2. Hospital Market Concentration – High Concern and Scrutiny Counties

County	2010 Hospital HHI	2016 Hospital HHI	HHI Change
Stanislaus	3,361	5,172	1,811
Kings	8,534	10,000	1,466
Madera	9,017	10,000	983
Tulare	4,463	5,422	958
Fresno	3,984	4,884	901
San Luis Obispo	5,208	5,753	544
Contra Costa	2,335	2,860	526
Humboldt	6,080	6,480	400
Solano	4,017	4,375	359
Sacramento	2,592	2,844	253
Siskiyou	5,027	5,272	244
San Mateo	2,303	2,543	240
Santa Cruz	5,760	5,974	214
El Dorado	5,747	5,951	203

Source: Authors' analysis of the American Hospital Association's Annual Survey Databases.
Note: HHI=Herfindahl-Hirschman Index.

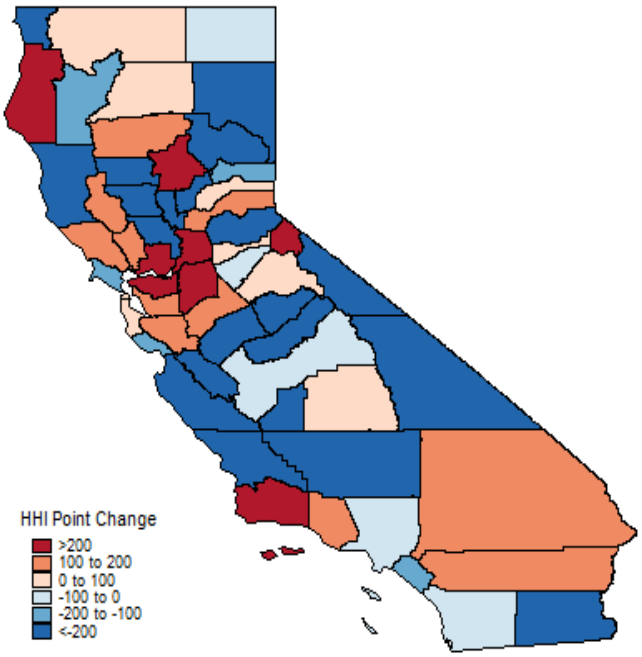
Figures 3 and 4 and Table 3 repeat the same analysis, but for insurer market concentration. Similar to the hospital market, most insurer markets are highly concentrated as of 2016. Among the 58 California counties, 42 were highly concentrated and 16 were moderately concentrated (Figure 3). The mean insurer HHI was 2,953 in 2016. Insurer concentration decreased by 203 points on average across the 58 counties between 2010 and 2016 (Figure 4). However, eight counties experienced concentration increases of greater than 200 points during this time. Seven of these eight counties qualify for the list of high concern and scrutiny counties according to the DOJ/FTC Guidelines and are listed in Table 3.

Figure 3. Insurer Market Concentration, 2016



Source: Authors' analysis of the Managed Market Surveyor provided by Decision Resources Group (formerly HealthLeaders-Interstudy).
Note: HHI=Herfindahl-Hirschman Index.

Figure 4. Insurer Market Concentration Changes from 2010 to 2016



Source: Authors' analysis of the Managed Market Surveyor provided by Decision Resources Group (formerly HealthLeaders-Interstudy).
Note: HHI=Herfindahl-Hirschman Index.

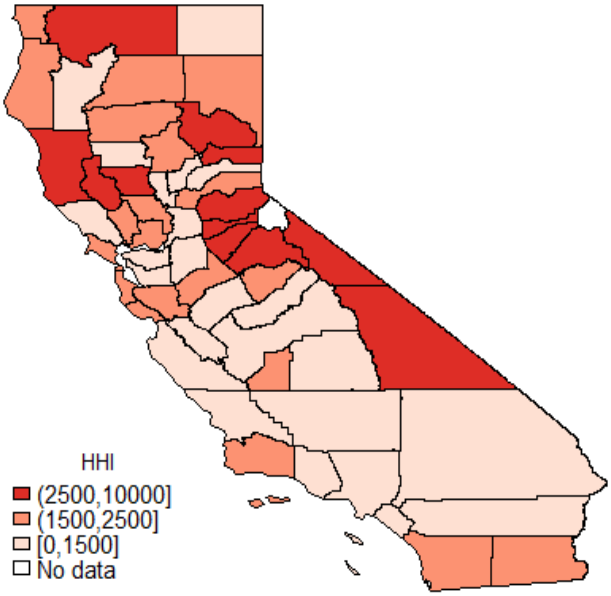
Table 3. Insurer Market Concentration – High Concern and Scrutiny Counties

County	2010 Insurer HHI	2016 Insurer HHI	HHI Change
Solano	3,333	4,742	1,409
Humboldt	3,106	3,634	528
Butte	3,815	4,286	471
San Joaquin	2,471	2,906	435
Sacramento	2,536	2,951	415
Contra Costa	2,634	2,952	318
Santa Barbara	2,803	3,008	205

Source: Authors' analysis of the Managed Market Surveyor provided by Decision Resources Group (formerly HealthLeaders-Interstudy).
Note: HHI=Herfindahl-Hirschman Index.

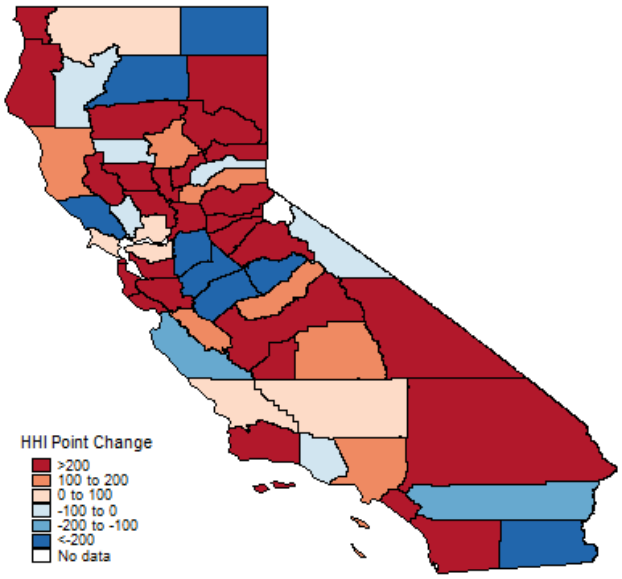
Figures 5 and 6 show the market concentration of primary care physicians in 2016 and the change in primary care market concentration between 2010 and 2016, respectively. The mean HHI across counties was 1,984 in 2016. Of the 57 counties analyzed, 12 were highly concentrated and 21 were moderately concentrated. The seven counties that warrant high concern and scrutiny according to the DOJ/FTC Guidelines are listed in Table 4.

Figure 5. Primary Care Market Concentration, 2016



Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Figure 6. Primary Care Market Concentration Changes from 2010 to 2016



Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Table 4. Primary Care Market Concentration – High Concern and Scrutiny Counties

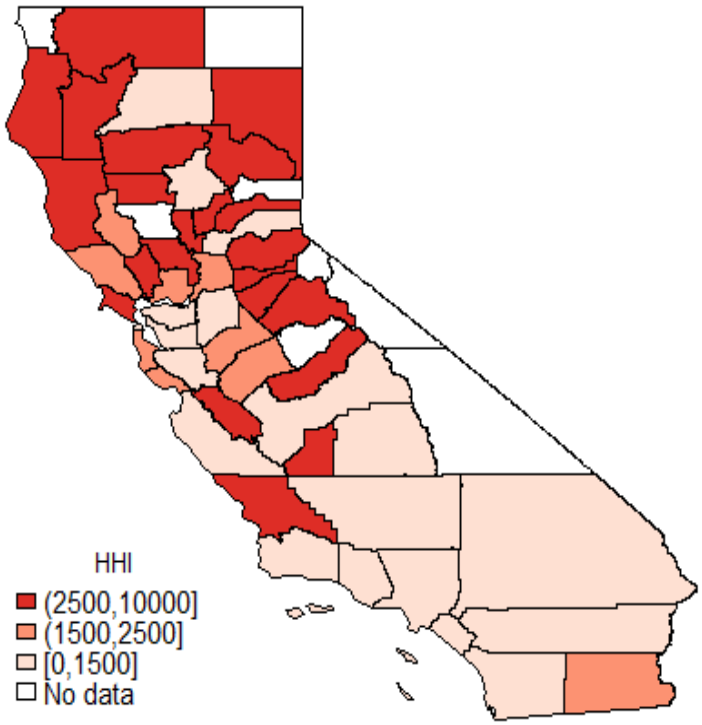
County	2010 Primary Care HHI	2016 Primary Care HHI	HHI Change
Amador	655	2,934	2,279
Plumas	6,303	8,515	2,212
Calaveras	2,888	4,831	1,943
Lake	799	2,505	1,707
Colusa	3,585	4,314	729
Inyo	2,166	2,873	707
El Dorado	2,526	2,902	376

Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Figures 7, 9, 11, and 13 show the levels of cardiology, hematology/oncology, orthopedics, and radiology market concentration in 2016. Figures 8, 10, 12, and 14 show the changes in market concentration of each of these four markets between 2010 and 2016. Tables 5-9 show the high concern and scrutiny counties for each of the four markets.

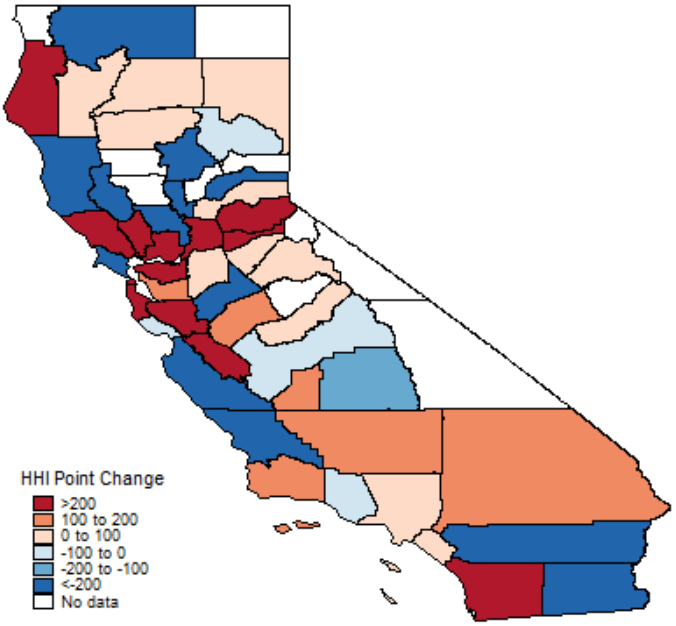
The mean cardiology HHI across counties was 3,357 in 2016 (Figure 7) and concentration increased by 134 HHI on average across counties between 2010 and 2016 (Figure 8). Five counties warrant high concern and scrutiny for cardiology markets (Table 5). For hematology/oncology markets, the mean HHI was 4,388 in 2016 (Figure 9) and concentration increased by 506 HHI on average between 2010 and 2016 (Figure 10). Ten counties warrant high concern and scrutiny for hematology/oncology markets (Table 6). The mean orthopedics HHI across counties was 3,073 in 2016 (Figure 11) and concentration increased by 691 HHI on average between 2010 and 2016 (Figure 12). Fourteen counties warrant high concern and scrutiny for orthopedics markets (Table 7). Finally, for radiology markets, the mean HHI was 4,237 in 2016 (Figure 13); concentration also increased by 438 HHI on average between 2010 and 2016 (Figure 14). Fourteen counties warrant high concern and scrutiny for radiology markets (Table 8).

Figure 7. Cardiology Market Concentration, 2016



Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Figure 8. Cardiology Market Concentration Changes from 2010 to 2016



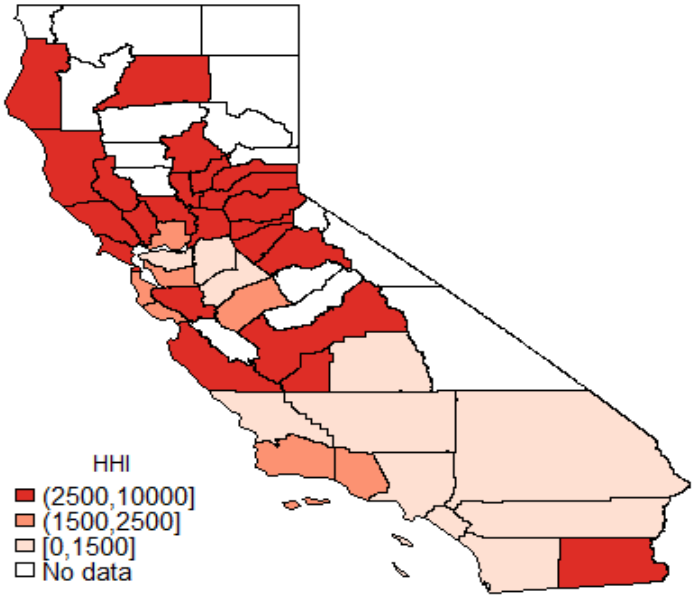
Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Table 5. Cardiology Market Concentration – High Concern and Scrutiny Counties

County	2010 Cardiology HHI	2016 Cardiology HHI	HHI Change
El Dorado	2,653	7,222	4,569
Humboldt	1,000	5,556	4,556
Napa	857	3,288	2,431
Amador	2,171	4,136	1,965
San Benito	3,930	5,000	1,070

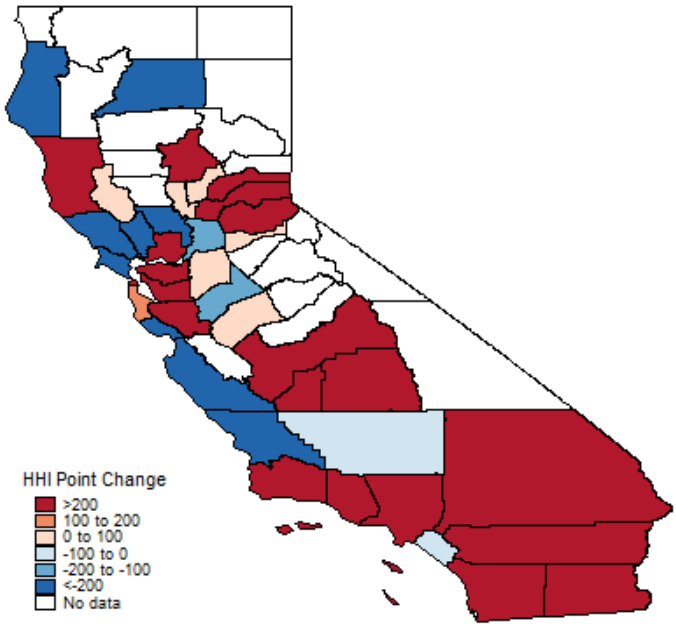
Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Figure 9. Hematology/Oncology Market Concentration, 2016



Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Figure 10. Hematology/Oncology Market Concentration Changes from 2010 to 2016



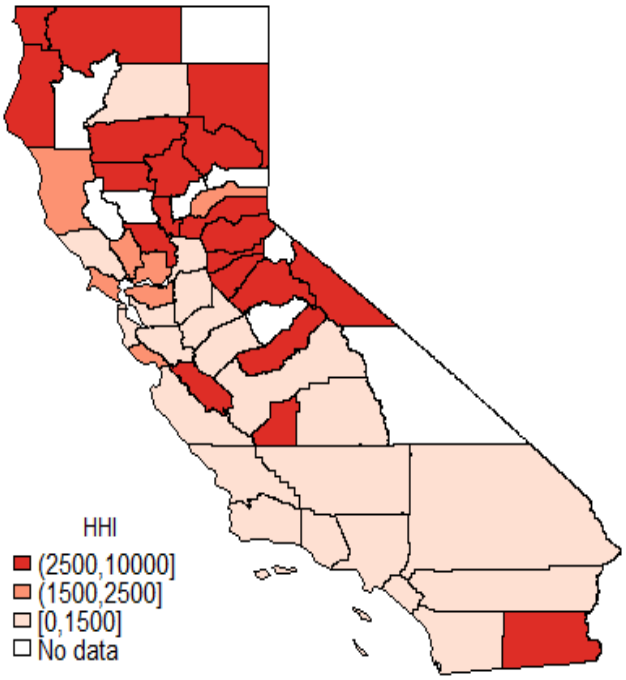
Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Table 6. Hematology/Oncology Market Concentration – High Concern and Scrutiny Counties

County	2010 Hematology/ Oncology HHI	2016 Hematology/ Oncology HHI	HHI Change
Kings	3,750	10,000	6,250
Mendocino	4,335	10,000	5,665
Imperial	5,000	10,000	5,000
Butte	1,515	5,062	3,547
San Francisco	1,343	4,192	2,849
Fresno	600	2,868	2,268
Santa Clara	1,190	3,130	1,940
Nevada	3,333	5,000	1,667
Placer	2,613	3,127	514
El Dorado	9,763	10,000	237

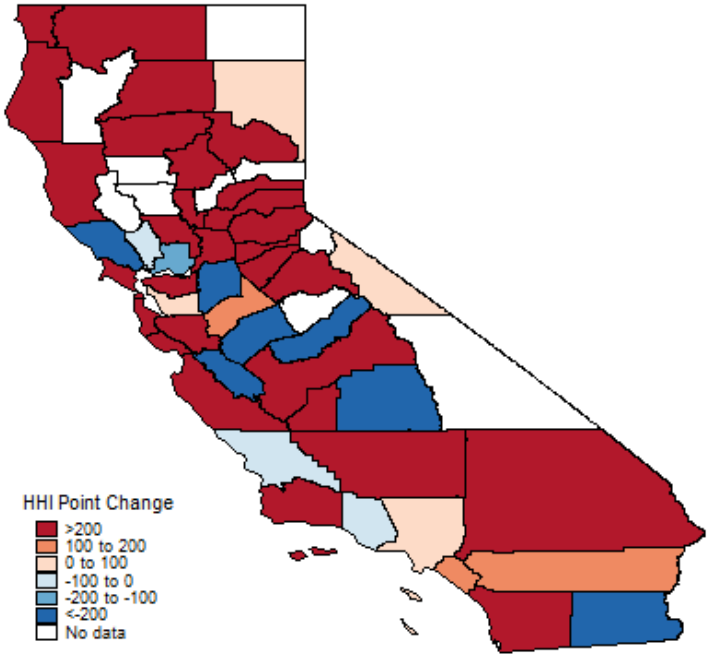
Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Figure 11. Orthopedics Market Concentration, 2016



Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Figure 12. Orthopedics Market Concentration Changes from 2010 to 2016



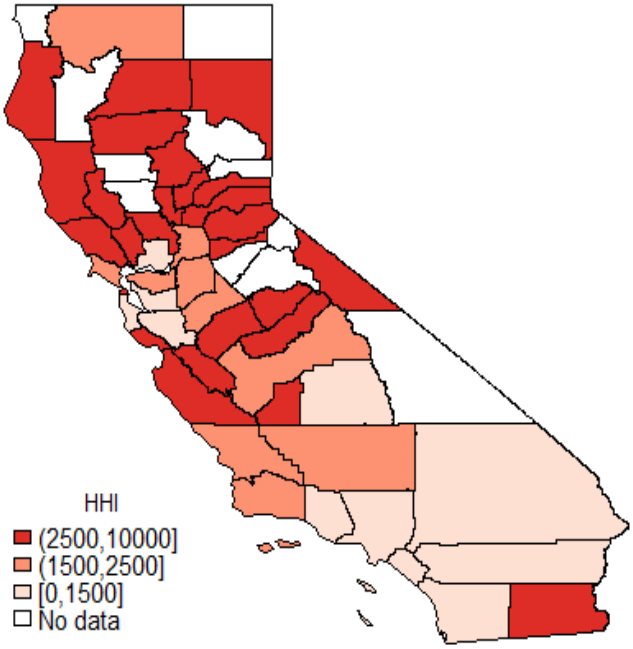
Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Table 7. Orthopedics Market Concentration – High Concern and Scrutiny Counties

County	2010 Orthopedics HHI	2016 Orthopedics HHI	HHI Change
Yolo	2,581	5,950	3,369
Siskiyou	2,203	5,556	3,353
Humboldt	1,250	4,375	3,125
Placer	1,304	4,369	3,065
Sutter	3,888	6,406	2,518
El Dorado	2,727	5,000	2,273
Tehama	3,333	5,509	2,176
Amador	3,122	4,137	1,015
Butte	2,492	3,437	945
Kings	2,800	3,421	621
Calaveras	5,125	5,556	431
Plumas	7,689	8,081	392
Marin	2,126	2,500	374
Del Norte	5,000	5,313	313

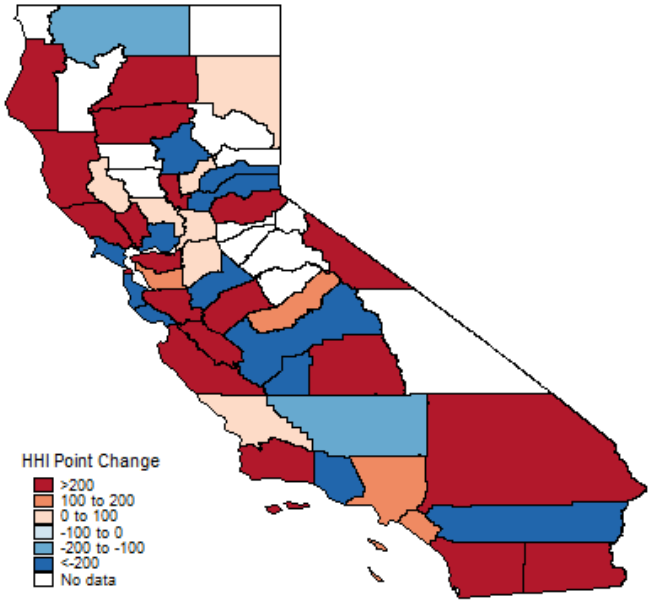
Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Figure 13. Radiology Market Concentration, 2016



Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Figure 14. Radiology Market Concentration Changes from 2010 to 2016



Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Table 8. Radiology Market Concentration – High Concern and Scrutiny Counties

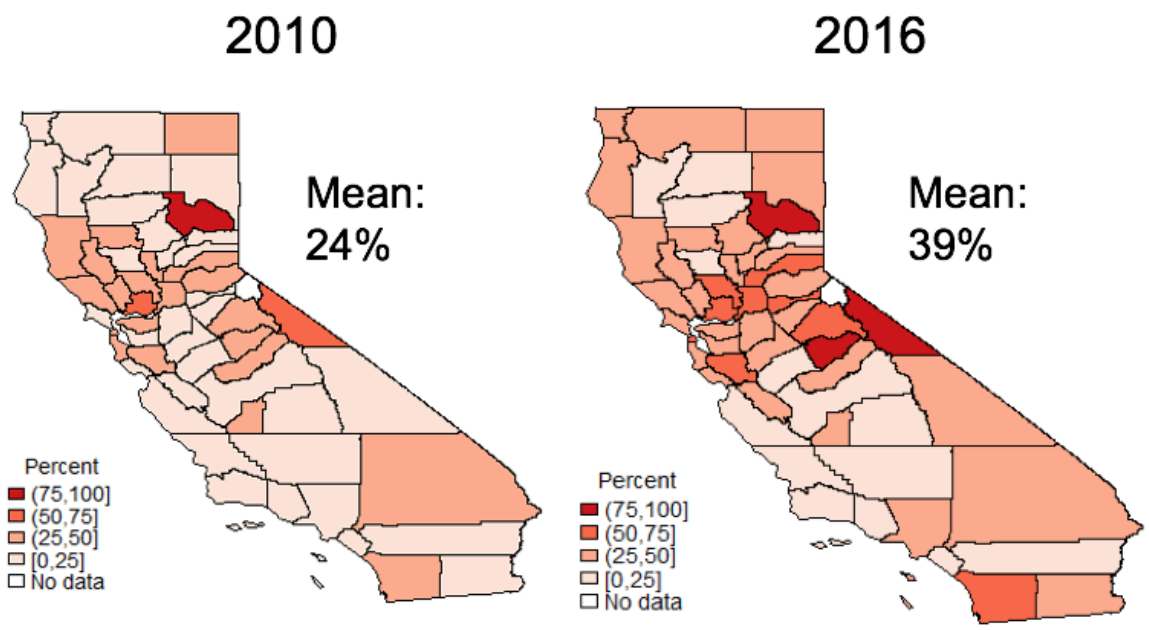
County	2010 Radiology HHI	2016 Radiology HHI	HHI Change
Mono	1,667	10,000	8,333
Humboldt	4,050	10,000	5,950
San Benito	5,000	10,000	5,000
Mendocino	3,889	6,800	2,911
San Francisco	1,385	3,781	2,396
Shasta	1,441	3,579	2,138
Sonoma	1,557	3,081	1,523
Napa	5,460	6,676	1,216
Sutter	6,600	7,813	1,213
Imperial	1,947	2,796	849
Tehama	2,500	3,333	833
Monterey	2,792	3,373	581
Merced	2,097	2,653	556
El Dorado	4,397	4,776	378

Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.
Note: HHI=Herfindahl-Hirschman Index.

Changes in the Percent of Physicians Working for Foundations Owned by a Hospital or Health System

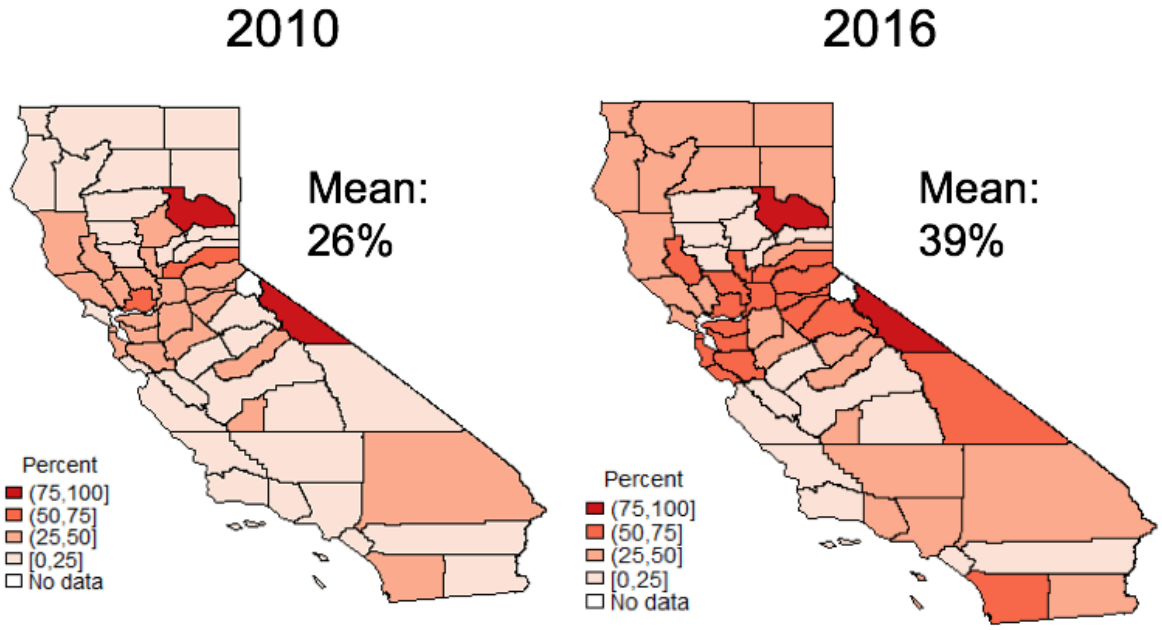
The next set of results examine how the percent of physicians working foundations owned by a hospital or health system changed from 2010 to 2016. For these analyses, we show the results for three groups: all physicians, primary care physicians, and specialist physicians, where we define specialist physicians to consist of the four specialists we analyzed previously – cardiologists, hematologists/oncologists, orthopedists, and radiologists. Figure 15 displays the results for all physicians. In 2010, 24% of a California county's physicians worked for a foundation owned by a hospital or health system, on average. By 2016, the percent had jumped to 39%. We found a similar pattern for primary care physicians. Figure 16 shows the same measure to increase from 26% to 39% between 2010 and 2016 for primary care physicians. Figure 17 shows the increase to be even more dramatic for specialist physicians. In 2010, the average county had 21% of its specialist physicians working for a foundation owned by a hospital or health system. By 2016, the average county had 50% of its specialist physicians working for a foundation owned by a hospital or health system.

Figure 15. Percent of Physicians in Each County Who Work for Foundations Owned by a Hospital or Health System



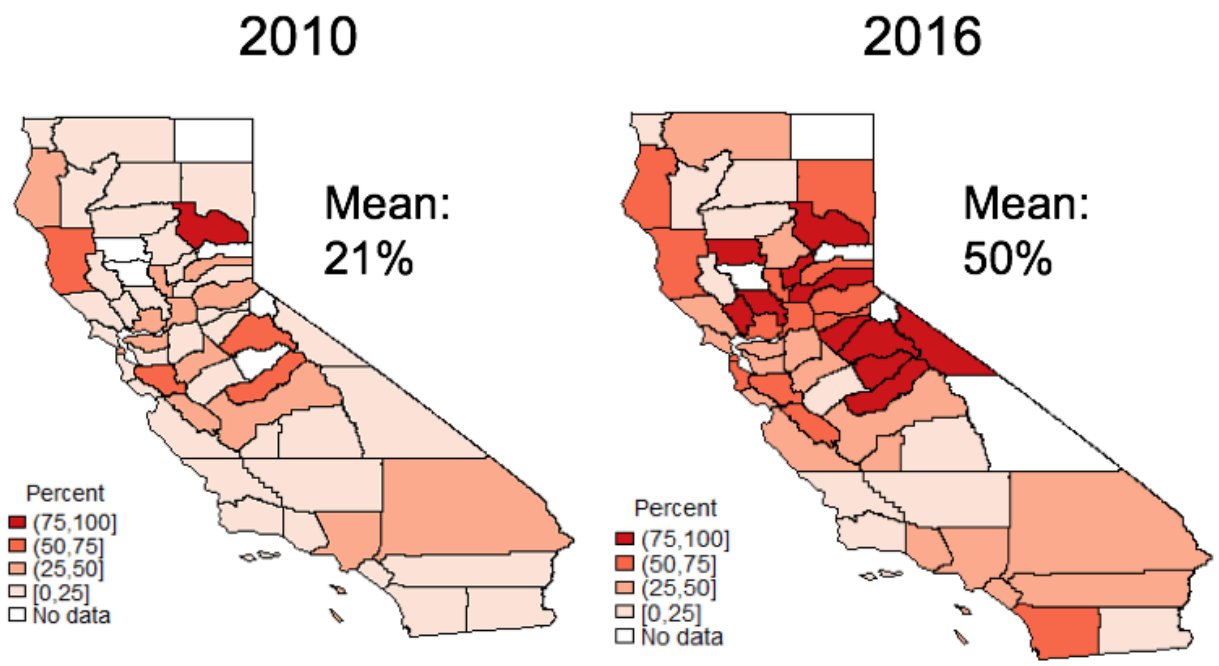
Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.

Figure 16. Percent of Primary Care Physicians in Each County Who Work for Foundations Owned by a Hospital or Health System



Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.

Figure 17. Percent of Specialist Physicians in Each County Who Work for Foundations Owned by a Hospital or Health System



Source: Authors' analysis of the SK&A Office Based Physicians Database provided by QuintilesIMS.

The Association between Health Care Market Concentration and Health Care Prices/ACA Premiums

Our next analyses examine the association between health care procedure prices and measures of market concentration. We show this association using ACA rating area-level median procedure prices. There are 19 ACA rating areas in California (see Figure A1 in the appendix for a map). The ACA rating area-level median procedure prices we utilized are publicly available from California Healthcare Compare.[7] California Healthcare Compare does not provide price information for rating area 14 (Central Valley), so the figures we present in the following section have a maximum of 18 observations. For certain procedures, price data is available for fewer than 18 rating areas. Since the prices available to use are rating area-level, we correlate them with rating area-level measures of market concentration. Table A1 in the appendix displays the rating area-level concentration measures that we used in the price correlations that follow.

Figures 19-23 graphically depict the correlation between health care market concentration and the prices of various health care procedures. In total, we selected three inpatient procedures and 18 outpatient procedures to correlate with measures of health care market concentration. We correlated the inpatient procedure prices with hospital market concentration. For each outpatient procedure, we correlated the procedure's prices with the market concentration of the specialty that performs the procedure. For instance, we correlated cardiomyopathy (heart muscle disease)

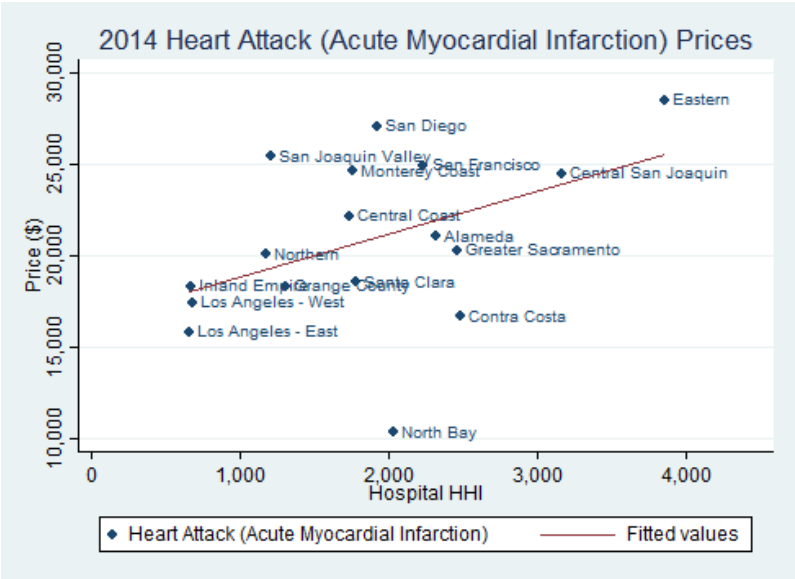
[7] http://www.cahealthcarecompare.org/cost_select.jsp

prices with measures of cardiology market concentration. The full list of the three inpatient procedures and the 18 outpatient procedures (by specialty) we analyzed are footnoted below.[8] For brevity, we discuss the results of one procedure price correlation each for hospital, primary care, cardiology, hematology/oncology, and radiology (Figure 19-23, respectively). Graphical depictions of the remaining 17 procedure price/market concentration correlations are available in the appendix (Figures A2-A17). Additionally, the regression estimates that underlie Figures 19-23 and Figures A2-A17 are also available in the appendix as Tables A3-A8. Tables A3-A8 estimate the association between both unadjusted and input cost adjusted procedure prices and market concentration. Tables A9-A14 are identical to Tables A3-A8, except that the regressions in Tables A9-A14 are weighted by rating area population to account for the fact that population varies considerably across rating areas. While all the figures presented within the main text of the report use unadjusted prices (i.e. actual prices that are paid), the regression tables in the appendix present the results for both unadjusted and input cost adjusted prices. We used the Medicare wage index to input cost adjust prices.[9] The Medicare program uses the Medicare wage index to adjust standardized amounts paid to hospitals to account for differences in hospital wage levels across regions. Results using input cost adjusted prices are similar to the unadjusted price results that we present in the main text (see the appendix for details).

Figure 19 shows the correlation between heart attack (acute myocardial infarction) prices and hospital market concentration. The average median heart attack price across the 17 rating areas analyzed was $20,809. In Los Angeles – East, which had a hospital HHI of 656 in 2014, the median price to treat a heart attack was $15,795. In contrast, in the Eastern rating area, where hospital HHI was 3,851, the median price to treat a heart attack was $28,477 – 80% above the price to treat a heart attack in Los Angeles.

[8] **Inpatient procedures (3)**: heart attack (acute myocardial infarction), partial hip replacement revision, premature baby (extremely low weight)
Outpatient procedures (18): Primary Care (9) – cervical cancer screening converted, colon cancer screening – sigmoidoscopy, diagnostic blood fecal test, diverticular disease, fibroids, kidney (renal) failure, sore throat, upper respiratory infection/common cold (adult), urinary tract stone; Cardiology (3) – cardiomyopathy (heart muscle disease), cardiovascular symptoms (other), coronary artery disease with heart bypass surgery; Hematology/Oncology (3) – breast cancer, lung, bronchi, or mediastinum cancer, prostate cancer; Orthopedics (3) – ankle fracture/sprain, knee ligament injury, wrist or hand fracture/dislocation/sprain
[9] https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/wageindex.html

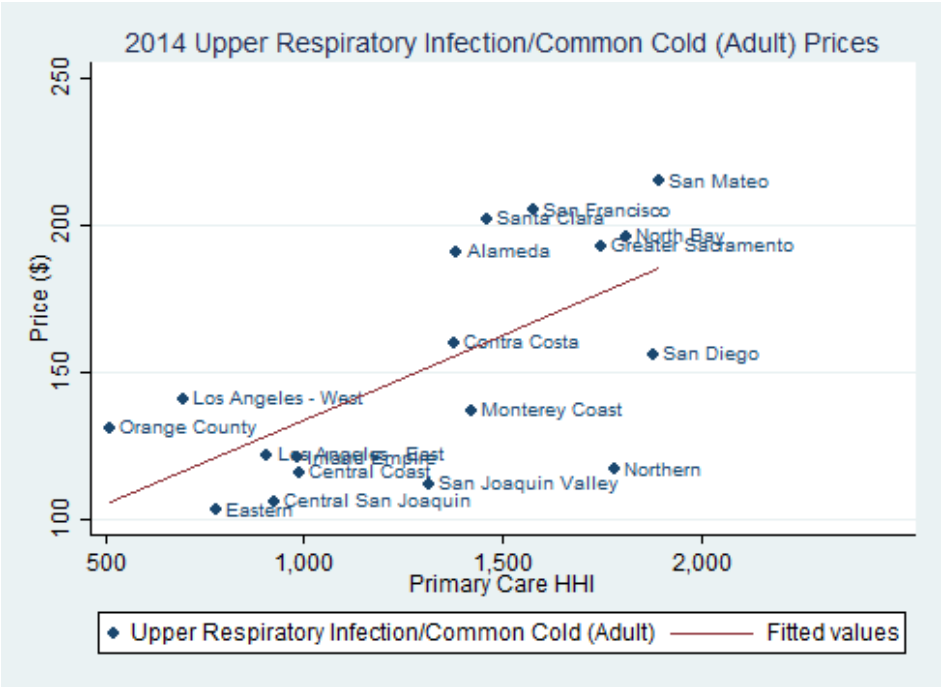
Figure 19. Heart Attack (Acute Myocardial Infarction) Price and Hospital HHI Correlation



Note: HHI=Herfindahl-Hirschman Index. The slope of the regression line in the figure is statistically significant at the p<0.10 level. See Table A3 in the appendix for the regression output that corresponds to this figure.

Our analysis of the correlation between outpatient procedure prices and the market concentrations of the physician specialties that perform the procedures begins with Figure 20. The figure shows the correlation between upper respiratory infection/common cold (adult) prices and primary care market concentration. The average median upper respiratory infection/common cold (adult) price across the 18 rating areas analyzed was $151. In Orange County, which had a primary care HHI of 513 in 2014, the median price to treat a common cold was $131. Alternatively, in San Mateo, where primary care HHI was 1,892, the median price to treat a common cold was $215 – 64% above the price to treat a common cold in Orange County.

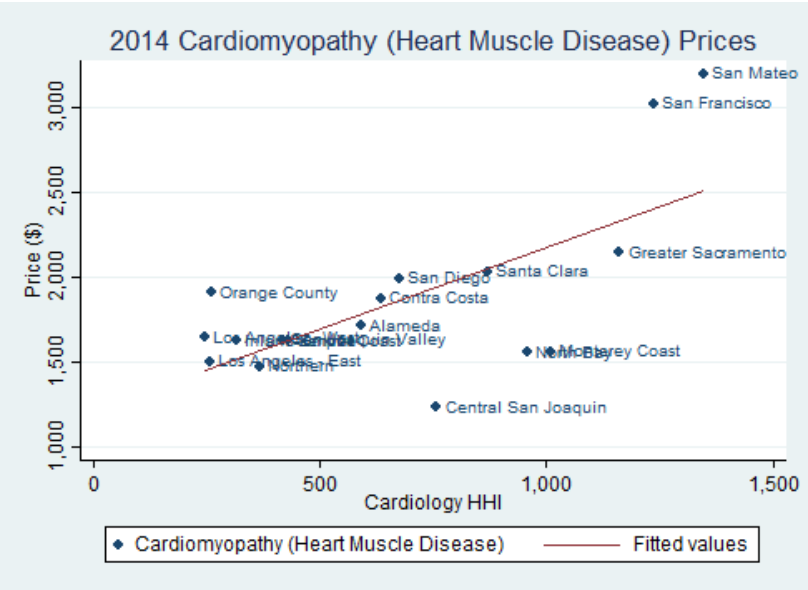
Figure 20. Upper Respiratory Infection/Common Cold Price and Primary Care HHI Correlation



Note: HHI=Herfindahl-Hirschman Index. The slope of the regression line in the figure is statistically significant at the p<0.01 level. See Table A4 in the appendix for the regression output that corresponds to this figure.

Figure 21 shows the correlation between cardiomyopathy (heart muscle disease) prices and cardiology market concentration. The average median cardiomyopathy price across the 17 rating areas analyzed was $1,867. In Los Angeles – East, which had a cardiology HHI of 259 in 2014, the median cardiomyopathy price was $1,500. In San Francisco, where cardiology HHI was 1,237, the median cardiomyopathy price was $3,023 – about double the cardiomyopathy price of Los Angeles.

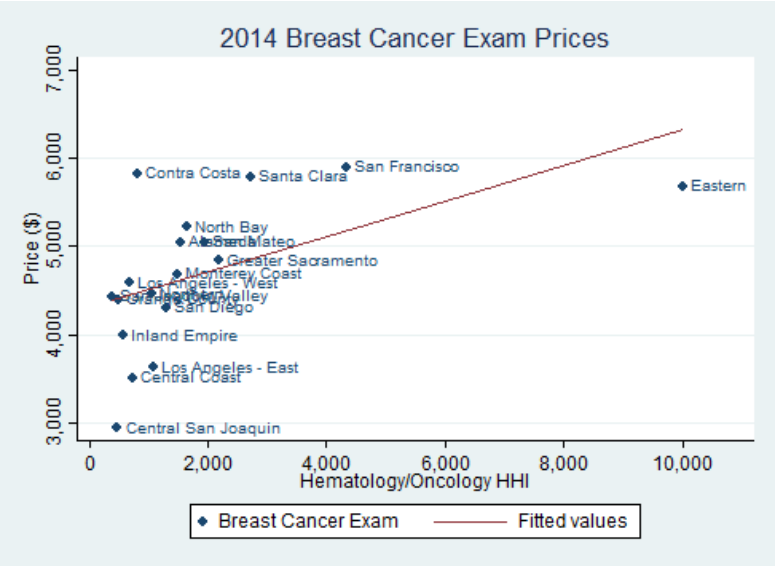
Figure 21. Cardiomyopathy (Heart Muscle Disease) Price and Cardiology HHI Correlation



Note: HHI=Herfindahl-Hirschman Index. The slope of the regression line in the figure is statistically significant at the p<0.01 level. See Table A5 in the appendix for the regression output that corresponds to this figure.

The correlation between breast cancer exam prices and hematology/oncology market concentration is shown in Figure 22. The average median breast cancer exam price across the 18 rating areas analyzed was $4,686. In San Diego, which had a hematology/oncology HHI of 1,298 in 2014, the median breast cancer exam price was $4,310. In San Francisco, where hematology/oncology HHI was 4,331, the median breast cancer exam price was $5,898 – 37% above the median breast cancer exam price in San Diego.

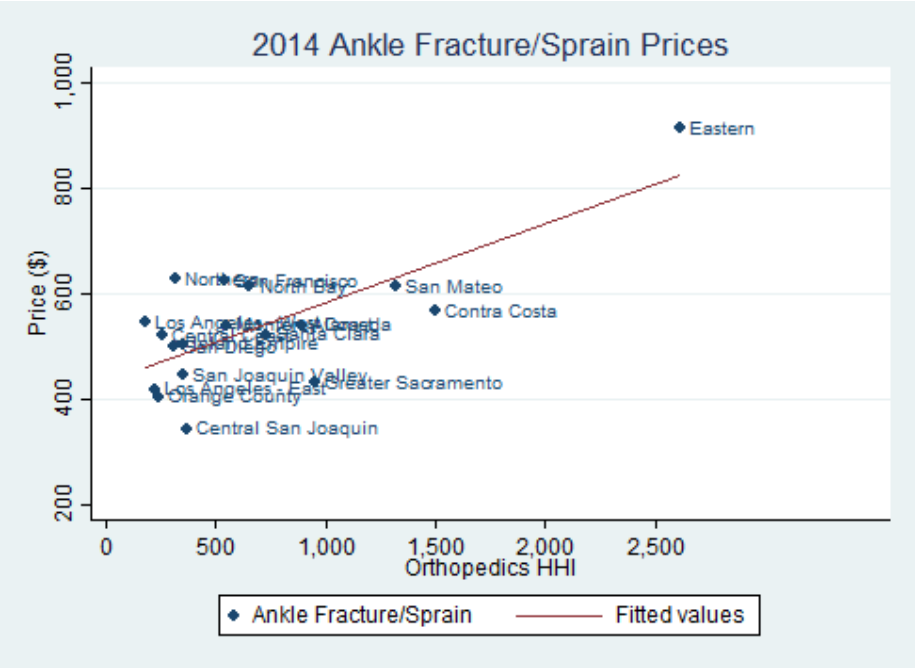
Figure 22. Breast Cancer Exam Price and Hematology/Oncology HHI Correlation



Note: HHI=Herfindahl-Hirschman Index. The slope of the regression line in the figure is statistically significant at the p<0.05 level. See Table A6 in the appendix for the regression output that corresponds to this figure.

Figure 23 shows the correlation between ankle fracture/sprain prices and orthopedics market concentration. The average median ankle fracture/sprain price across the 18 rating areas analyzed was $537. In Orange County, which had an orthopedics HHI of 240 in 2014, the median ankle fracture/sprain price was $404. In the Eastern rating area, where orthopedics HHI was 2,612, the median ankle fracture/sprain price was $911 – over double the median ankle fracture/sprain price in Orange County.

Figure 23. Ankle Fracture/Sprain Price and Orthopedics HHI Correlation

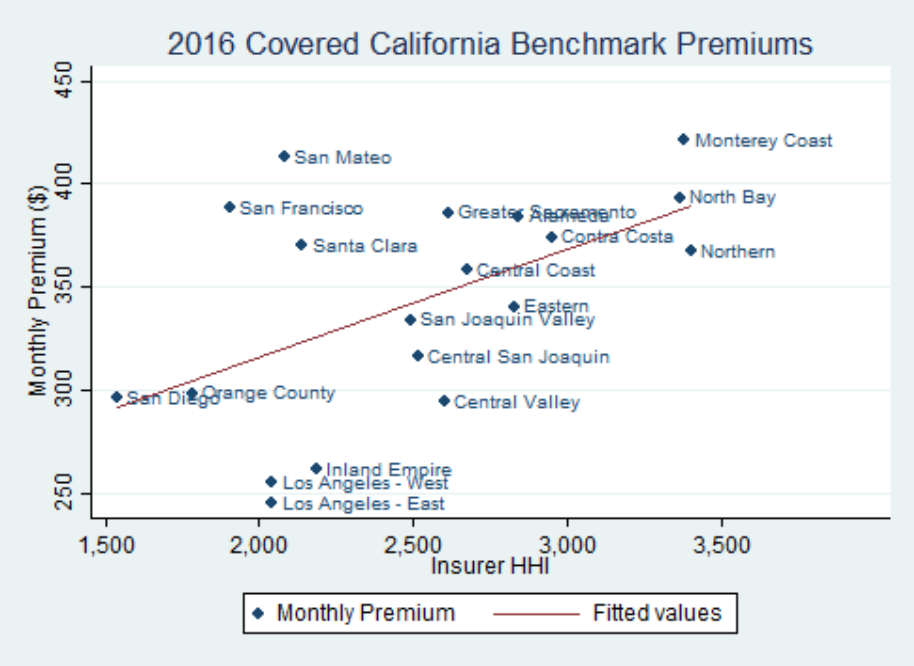


Note: HHI=Herfindahl-Hirschman Index. The slope of the regression line in the figure is statistically significant at the p<0.01 level. See Table A7 in the appendix for the regression output that corresponds to this figure.

Figure 24 shows the correlation between ACA premiums and insurer market concentration (see Table A2 in the appendix for benchmark premiums and insurer HHIs by rating area). The premiums shown in the figure are the second-lowest cost silver plan (hereafter, benchmark plan) in each rating area in 2016. The premium of the benchmark plan in each rating area is used to compute the advance premium tax credits available to household between 138% and 400% of the federal poverty level. The average monthly benchmark plan premium for an unsubsidized 40-year old across the 19 rating areas analyzed was $342 in 2016.[10] In San Diego, which had an insurer HHI of 1,539 in 2016, the average monthly benchmark plan premium was $296 for an unsubsidized 40-year-old. In the Monterey Coast rating area, where insurer HHI was 3,380, the average monthly benchmark plan premium was $421 for an unsubsidized 40-year-old – 42% above the monthly premium in San Diego.

[10] http://www.chcf.org/aca-411/explore-the-data#chart%2Caffordability%2Cpremiums%2Cprem_assistance%2CRegionMap%20(totalprem)%2C2016%2Cregion12

Figure 24. Covered California Benchmark Premium and Insurer HHI Correlation



Notes: HHI=Herfindahl-Hirschman Index. The benchmark premium shown in the figure is the monthly premium an unsubsidized 40-year-old would pay for the second-lowest-cost silver plan in each rating area. The slope of the regression line in the figure is statistically significant at the p<0.01 level. See Table A8 in the appendix for the regression output that corresponds to this figure.

The Association between the Percent of Physicians Working for Foundations Owned by Hospitals or Health Systems and Outpatient Procedure Prices

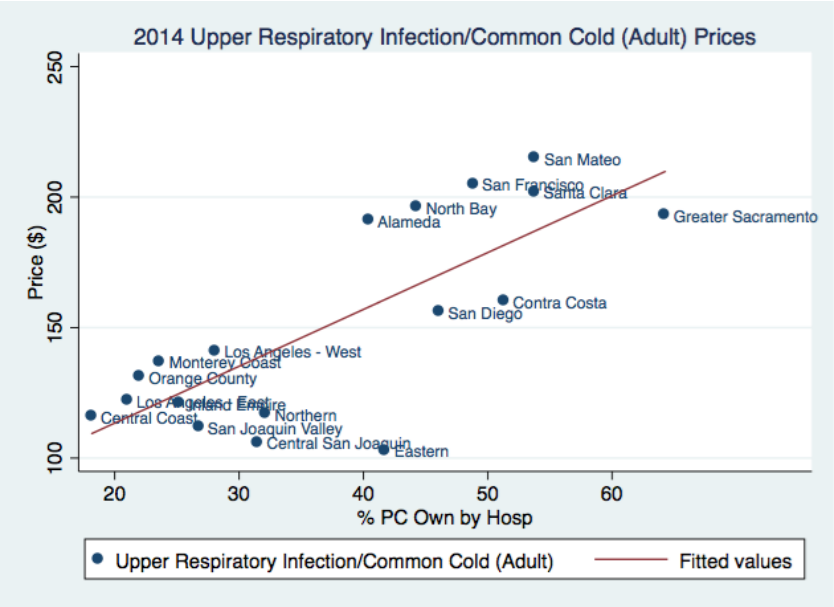
The next set of analyses (Figures 25-28) repeat the analyses in Figures 20-24 above, but with the percent of physicians who work for foundations owned by hospitals or health systems. Based on previous studies, we predict that rating areas with a higher percent of physicians working for foundations owned by hospitals or health systems will be associated with higher outpatient procedure prices (see Post et al. (2017) for a review of this literature). Table A15 in the appendix displays the rating area-level percent of physicians working for foundations owned by hospitals or health systems that we used in the price correlations that follow. We did performed the analysis for the same 18 outpatient procedures we analyzed in the previous section.[11] Again, for brevity, we show the result for one procedure with each specialty in the main text. The graphical depictions of the results for the remaining 14 procedures are available in the appendix as Figures A18-A31. The regressions from which the figures were produced are also available in the appendix. Tables A16-A19 show unweighted regressions while the regressions in Tables A20-A23 are weighted by the population in each rating area. Tables A16-

[11] **Outpatient procedures (18)**: Primary Care (9) – cervical cancer screening converted, colon cancer screening – sigmoidoscopy, diagnostic blood fecal test, diverticular disease, fibroids, kidney (renal) failure, sore throat, upper respiratory infection/common cold (adult), urinary tract stone; Cardiology (3) – cardiomyopathy (heart muscle disease), cardiovascular symptoms (other), coronary artery disease with heart bypass surgery; Hematology/Oncology (3) – breast cancer, lung, bronchi, or mediastinum cancer, prostate cancer; Orthopedics (3) – ankle fracture/sprain, knee ligament injury, wrist or hand fracture/dislocation/sprain

A23 all perform the analysis using both unadjusted prices and input cost adjusted prices. All the figures shown in the main text use unadjusted prices.

Figure 25 shows the correlation between upper respiratory infection/common cold (adult) prices and the percent of primary care physicians in a rating area who work for foundations owned by a hospital or health system. The average median upper respiratory infection/common cold (adult) price across the 18 rating areas analyzed was $151. In Orange County, which had 22% of its primary care physicians working for a foundation owned by a hospital or health system, the median price to treat a common cold was $131. Alternatively, in San Francisco, where 49% of primary care physicians work for a foundation owned by a hospital or health system, the median price to treat a common cold was $205 – 56% above the price to treat a common cold in Orange County.

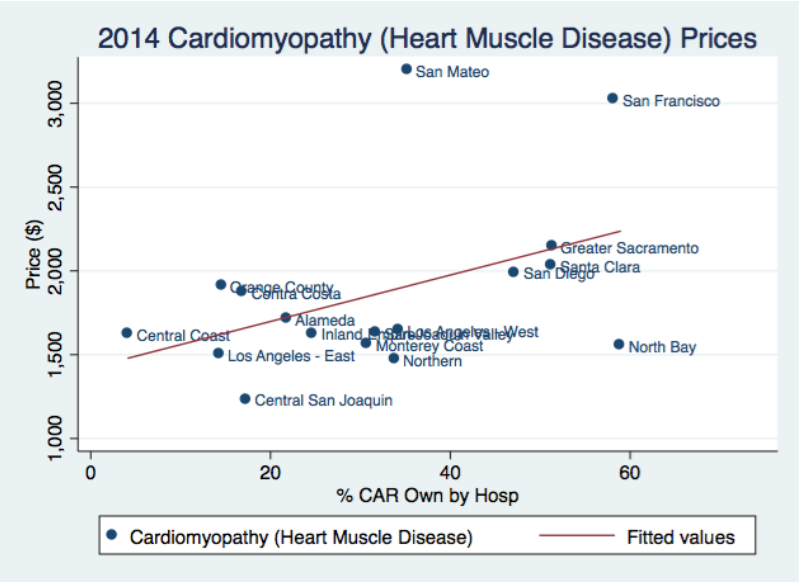
Figure 25. Upper Respiratory Infection/Common Cold Price and the Percent of Primary Care Physicians Working for Foundations Owned by a Hospital or Health System Correlation



Note: % PC Own by Hosp = the percent of primary care physicians in a rating area who work for foundations owned by hospital or health systems. The slope of the regression line in the figure is statistically significant at the p<0.01 level. See Table A16 in the appendix for the regression output that corresponds to this figure.

Figure 26 shows the correlation between cardiomyopathy (heart muscle disease) prices and the percent of cardiologists in a rating area who work for foundations owned by a hospital or health system. The average median cardiomyopathy price across the 17 rating areas analyzed was $1,867. In Los Angeles – East, which had 14% of its cardiologists working for a foundation owned by a hospital or health system, the median cardiomyopathy price was $1,500. In San Francisco, where 58% of cardiologists work for a foundation owned by a hospital or health system, the median cardiomyopathy price was $3,023 – about double the cardiomyopathy price of Los Angeles.

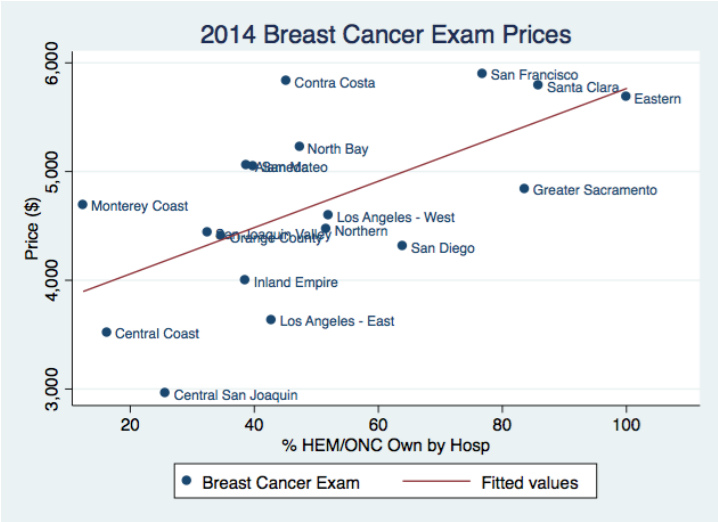
Figure 26. Cardiomyopathy (Heart Muscle Disease) Price and the Percent of Cardiologists Working for Foundations Owned by a Hospital or Health System Correlation



Note: % CAR Own by Hosp = the percent of cardiologists in a rating area who work for foundations owned by hospital or health systems. The slope of the regression line in the figure is statistically significant at the p<0.10 level. See Table A17 in the appendix for the regression output that corresponds to this figure.

The correlation between breast cancer exam prices and the percent of hematologists/oncologists in a rating area who work for foundations owned by a hospital or health system is shown in Figure 27. The average median breast cancer exam price across the 18 rating areas analyzed was $4,686. In the Central Coast, which had 16% of its hematologists/oncologists working for a foundation owned by a hospital or health system, the median breast cancer exam price was $3,516. In San Francisco, where 77% of hematologists/oncologists work for a foundation owned by a hospital or health system, the median breast cancer exam price was $5,898 – 68% above the median breast cancer exam price in the Central Coast.

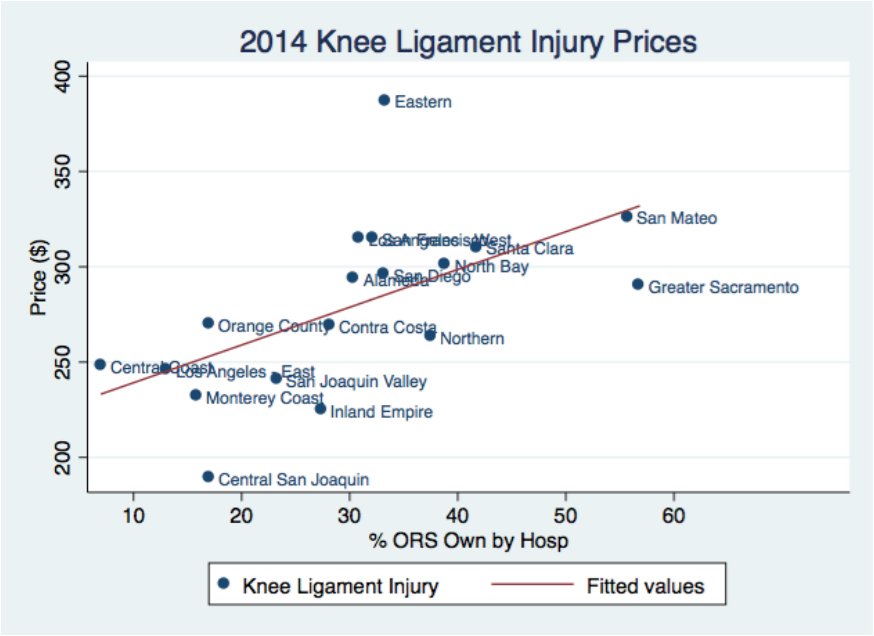
Figure 27. Breast Cancer Exam Price and the Percent of Hematologists/Oncologists Working for Foundations Owned by a Hospital or Health System Correlation



Note: % HEM/ONC Own by Hosp = the percent of hematologists/oncologists in a rating area who work for foundations owned by a hospital or health system. The slope of the regression line in the figure is statistically significant at the p<0.01 level. See Table A18 in the appendix for the regression output that corresponds to this figure.

Figure 28 shows the correlation between knee ligament injury prices and the percent of orthopedists in a rating area who work for foundations owned by a hospital or health system. The average median knee ligament injury price across the 18 rating areas analyzed was $279. In Orange County, which had 17% of its orthopedists working for a foundation owned by a hospital or health system, the median knee ligament injury price was $270. In San Mateo, where 56% of orthopedists work for a foundation owned by a hospital or health system, the median knee ligament injury price was $326 – 21% above the median breast cancer exam price in the Central Coast.

Figure 28. Knee Ligament Injury Price and the Percent of Orthopedists Working for Foundations Owned by a Hospital or Health System Correlation



Note: % ORS Own by Hosp = the percent of orthopedists in a rating area who work for foundations owned by a hospital or health system. The slope of the regression line in the figure is statistically significant at the p<0.05 level. See Table A19 in the appendix for the regression output that corresponds to this figure.

Prices and Premiums in Rating Areas with HHIs Above and Below the HHI Thresholds Used by the Horizontal Merger Guidelines

Tables 9 and 10 show how prices and premiums vary in rating areas above and below *Horizontal Merger Guidelines* thresholds (U.S. Department of Justice and the Federal Trade Commission 2010). For hospital and physician prices, we use HHI=1,500 as our cutoff for dividing rating areas. According to the Guidelines, 1,500 is the threshold for a moderately concentrated market.

Table 9 shows that 6 rating areas have hospital HHIs below 1,500 while 12 rating areas have hospital HHIs above 1,500 (see Table A1 in the appendix for the list of rating area-level hospital and physician HHIs). The average inpatient procedure price was $139,909 in rating areas below HHI=1,500 and $250,203 in rating areas above HHI=1,500 – a 79% difference. The three inpatient procedures used to compute average inpatient procedure price are listed in the notes below the table. Results for individual procedures are available in Table A24 in the appendix.

Likewise, average outpatient primary care, hematology/oncology, and orthopedics procedure prices were much higher in rating areas above HHI=1,500 than in rating areas below HHI=1,500. Average outpatient primary care procedure prices were 35% higher ($898 vs. $665), average outpatient hematology/oncology procedure prices were 51% higher ($20,819 vs. $13,762), and average outpatient orthopedics procedure prices were 63% higher ($715 vs. $439).

At the bottom of Table 9, we show how ACA premiums differ in rating areas above and below HHI=2,500 – the Guidelines' threshold for a highly concentrated market. In the 9 rating areas below insurer HHI=2,500 average ACA benchmark plan monthly premiums were $318 versus $363 in the 10 rating areas with insurer above HHI=2,500 – a 14% difference.

Table 9. Prices (2014) and ACA Premiums (2016) by HHI Level

	HHI < 1,500	HHI ≥ 1,500	% Difference
Avg. Inpatient Procedure Price	**$139,909**	**$250,203**	**79%**
# of rating areas (Hospital HHI)	*6*	*12*	
Avg. Outpatient Primary Care Procedure Price	**$665**	**$898**	**35%**
*# of rating areas (Primary Care HHI***)*	*12*	*6*	
Avg. Outpatient Hematology/Oncology Procedure Price	**$13,762**	**$20,819**	**51%**
# of rating areas (Hematology/Oncology HHI)	*11*	*7*	
Avg. Outpatient Orthopedist Procedure Price	**$439**	**$715**	**63%**
# of rating areas (Orthopedics HHI)	*17*	*1*	
	HHI < 2,500	HHI ≥ 2,500	% Difference
Avg. ACA Benchmark Plan Monthly Premium	**$318**	**$363**	**14%**
# of rating areas	*9*	*10*	

*Notes: The procedures below were used to compute average prices for each provider category. The average reported above is a straight average across the procedures within each category. Cardiology prices are not reported as no rating areas had a cardiology HHI below 1,500 (see Table A1 in the appendix). The premiums listed in Table A2 were used for the analysis of Avg. ACA Benchmark Plan Monthly Premiums. *** Primary Care HHI was calculated at the primary care service area (PCSA)-level and then weighted up to the rating area-level (see Goodman et al. (2003) for details on PCSAs). All other HHIs were calculated directly at the rating area-level.*

Inpatient procedures (3)*: heart attack (acute myocardial infarction), partial hip replacement revision, premature baby (extremely low weight)*
Outpatient procedures (15)*:*
Primary Care (9) – cervical cancer screening converted, colon cancer screening – sigmoidoscopy, diagnostic blood fecal test, diverticular disease, fibroids, kidney (renal) failure, sore throat, upper respiratory infection/common cold (adult), urinary tract stone
Hematology/Oncology (3) – breast cancer, lung, bronchi, or mediastinum cancer, prostate cancer
Orthopedics (3) – ankle fracture/sprain, knee ligament injury, wrist or hand fracture/dislocation/sprain

Table 10 repeats the analysis performed in Table 9 but with input cost adjusted prices. Results for individual procedures are available in Table A25 in the appendix. In Table 10, all procedure prices and premiums were input cost adjusted using the Medicare wage index. The Medicare program uses the Medicare wage index to adjust standardized amounts paid to hospitals to account for differences in hospital wage levels across regions.[12] Table 10 shows that while accounting for regional input cost differences generally shrinks the price (ACA premium) difference, there are still considerable differences in procedure prices (ACA premiums) in rating areas above and below HHI=1,500 (HHI=2,500). For instance, unadjusted inpatient procedure prices are 79% higher in rating areas above HHI=1,500 than in rating areas below HHI=1,500 (Table 9), while input cost adjusted inpatient procedure prices are 52% higher in rating areas above HHI=1,500 than in rating areas below HHI=1,500 (Table 10).

[12] The Centers for Medicare & Medicaid Services currently defines "hospital geographic areas (labor markets areas) based on the definitions of Core-Based Statistical Areas (CBSAs) established by the Office of Management and Budget and announced in December 2003." We population-weighted CBSA-level Medicare wage indices to construct the rating area-level Medicare wage indices used in our analysis.

Table 10. Input cost adjusted Prices (2014) and ACA Premiums (2016) by HHI Level

	HHI < 1,500	HHI ≥ 1,500	% Difference
Input cost adjusted Avg. Inpatient Procedure Price	**$108,483**	**$165,119**	**52%**
# of rating areas	*6*	*12*	
Input cost adjusted Avg. Outpatient Primary Care Procedure Price* **	**$472**	**$622**	**32%**
# of rating areas	*12*	*6*	
Input cost adjusted Avg. Outpatient Hematology/Oncology Procedure Price	**$10,370**	**$13,269**	**28%**
# of rating areas	*11*	*7*	
Input cost adjusted Avg. Outpatient Orthopedist Procedure Price	**$311**	**$577**	**85%**
# of rating areas	*17*	*1*	
	HHI < 2,500	HHI ≥ 2,500	% Difference
Input cost adjusted Avg. ACA Benchmark Plan Monthly Premium	**$233**	**$256**	**10%**
# of rating areas	*9*	*10*	

*Notes: The procedures below were used to compute average prices for each provider category. The average reported above is a straight average across the procedures within each category. Cardiology prices are not reported as no rating areas had a cardiology HHI below 1,500 (see Table A1 in the appendix). The premiums listed in Table A2 were used for the analysis of Avg. ACA Benchmark Plan Monthly Premiums. Prices and ACA premiums were input cost adjusted using the Medicare wage index to adjust for input cost differences across regions. The Centers for Medicare & Medicaid Services currently defines "hospital geographic areas (labor markets areas) based on the definitions of Core-Based Statistical Areas (CBSAs) established by the Office of Management and Budget and announced in December 2003." We population-weighted CBSA-level Medicare wage indices to construct the rating area-level Medicare wage indices used in our analysis. *** Primary Care HHI was calculated at the primary care service area (PCSA)-level and then weighted up to the rating area-level (see Goodman et al. (2003) for details on PCSAs). All other HHIs were calculated directly at the rating area-level.*

***Inpatient procedures (3)**: heart attack (acute myocardial infarction), partial hip replacement revision, premature baby (extremely low weight)*
***Outpatient procedures (15)**:*
Primary Care (9) – cervical cancer screening converted, colon cancer screening – sigmoidoscopy, diagnostic blood fecal test, diverticular disease, fibroids, kidney (renal) failure, sore throat, upper respiratory infection/common cold (adult), urinary tract stone
Hematology/Oncology (3) – breast cancer, lung, bronchi, or mediastinum cancer, prostate cancer
Orthopedics (3) – ankle fracture/sprain, knee ligament injury, wrist or hand fracture/dislocation/sprain

A Tale of Prices and Premiums in Northern vs. Southern California

There are stark differences in prices and ACA premiums between Northern and Southern California. Covered California defines Northern California as rating areas 1-14 and Southern California as rating areas 15-19.[13] Table 11 compares the average median price in Northern California to the average median price in Southern California for the same 21 procedure prices we have been analyzing throughout the report. Results for individual procedures are available in Table A26 in the appendix. Inpatient procedure prices were 70% higher in Northern California than Southern California $131,586 vs. $223,278) while hospital HHI was 110% higher in Northern California than Southern California (2,202 vs. 1,047) in 2014. Among outpatient procedures, Northern California prices were 17-55% higher than Southern California prices in 2014, depending on the physician specialty. The average outpatient hematology/oncology procedure price was 17% higher in Northern California than Southern California ($11,905 vs. $18,445) while hematology/oncology HHI was 174% higher in Northern California than Southern California (2,257 vs. 823). Average outpatient cardiology procedure price was 55% higher in Northern California than Southern California ($17,653 vs. $28,955) while cardiology HHI was 143% higher in Northern California than Southern California (857 vs. 352).

ACA premiums were similarly much higher in Northern California than Southern California. In 2016, benchmark monthly premiums for an unsubsidized 40-year-old were 35% higher in Northern California than Southern California ($367 vs. $271) while insurer HHI was 41% higher in Northern California than Southern California (2,700 vs. 1,919).

[13] Rating Areas (#-name): 1-Northern counties, 2-North Bay counties, 3-Greater Sacramento, 4-San Francisco, 5-Contra Costa, 6-Alameda, 7-Santa Clara, 8-San Mateo, 9-Central Coast, 10-Central Valley, 11-Central Valley, 12-Central Coast, 13-Eastern Region, 14-Central Valley, 15-Los Angeles (Northeast), 16-Los Angeles (Southwest), 17-Inland Empire, 18-Orange County, 19-San Diego. No pricing data for rating area 14 was available from California Health Care Compare, so the north vs. south price comparison we show is for rating areas 1-13 (north) vs. rating areas 15-19 (south).

Table 11. Northern California vs. Southern California Prices (2014) and ACA Premiums (2016)

	Southern California	Northern California	% Difference
Avg. Inpatient Procedure Price	**$131,586**	**$223,278**	**70%**
Avg. Hospital HHI	*1,047*	*2,202*	*110%*
Avg. Outpatient Primary Care Procedure Price	**$588**	**$802**	**36%**
*Avg. Primary Care HHI****	*996*	*1,420*	*43%*
Avg. Outpatient Cardiology Procedure Price	**$17,653**	**$28,955**	**55%**
Avg. Cardiology HHI	*352*	*857*	*143%*
Avg. Outpatient Hematology/Oncology Procedure Price	**$11,905**	**$18,445**	**17%**
Avg. Hematology/Oncology HHI	*823*	*2,257*	*174%*
Avg. Outpatient Orthopedist Procedure Price	**$396**	**$477**	**20%**
Avg. Orthopedist HHI	*263*	*851*	*224%*
Avg. ACA Benchmark Plan Monthly Premium	**$271**	**$367**	**35%**
Avg. Insurer HHI	*1,919*	*2,700*	*41%*

Notes:
Procedures included in each price average:
***Inpatient procedures (3)**: heart attack (acute myocardial infarction), partial hip replacement revision, premature baby (extremely low weight)*
***Outpatient procedures (15)**:*
Primary Care (9) – cervical cancer screening converted, colon cancer screening – sigmoidoscopy, diagnostic blood fecal test, diverticular disease, fibroids, kidney (renal) failure, sore throat, upper respiratory infection/common cold (adult), urinary tract stone
Cardiology (3) – cardiomyopathy (heart muscle disease), cardiovascular symptoms (other), coronary artery disease with heart bypass surgery
Hematology/Oncology (3) – breast cancer, lung, bronchi, or mediastinum cancer, prostate cancer
Orthopedics (3) – ankle fracture/sprain, knee ligament injury, wrist or hand fracture/dislocation/sprain

- *Covered California defines Northern California as rating areas 1-14 and Southern California as rating areas 15-19. Rating Areas (#-name): 1-Northern counties, 2-North Bay counties, 3-Greater Sacramento, 4-San Francisco, 5-Contra Costa, 6-Alameda, 7-Santa Clara, 8-San Mateo, 9-Central Coast, 10-Central Valley, 11-Central Valley, 12-Central Coast, 13-Eastern Region, 14-Central Valley, 15-Los Angeles (Northeast), 16-Los Angeles (Southwest), 17-Inland Empire, 18-Orange County, 19-San Diego*
- *The average Northern California HHIs were computed by taking a straight average across the HHIs in rating areas 1-14 and the Southern California HHIs were straight average across the HHIs in rating areas 15-19. No procedure price data was available for rating area 14 and thus the hospital and physician average HHIs above do not include rating area 14.*
- *** Primary Care HHI was calculated at the primary care service area (PCSA)-level and then weighted up to the rating area-level (see Goodman et al. (2003) for details on PCSAs). All other HHIs were calculated directly at the rating area-level.*

Table 12 repeats the analysis of Table 11 but with input cost adjusted prices. Results for individual procedures are available in Table A27 in the appendix. In Table 12, all procedure prices and premiums were input cost adjusted using the Medicare wage index.[14] Table 12 shows that while accounting for regional input cost differences generally shrinks the price difference between Northern and Southern California, the difference is still often considerable in magnitude. For instance, unadjusted inpatient procedure prices are 70% higher in Northern California than Southern California (Table 11), while input cost adjusted inpatient procedure prices are 32% higher in Northern California than Southern California .

[14] The Centers for Medicare & Medicaid Services currently defines "hospital geographic areas (labor markets areas) based on the definitions of Core-Based Statistical Areas (CBSAs) established by the Office of Management and Budget and announced in December 2003." We population-weighted CBSA-level Medicare wage indices to construct the rating area-level Medicare wage indices used in our analysis.

Table 12. Input Cost Adjusted Northern California vs. Southern California Prices (2014) and ACA Premiums (2016)

	Southern California	Northern California	% Difference
Input Cost Adjusted Avg. Inpatient Procedure Price	**$111,816**	**$147,922**	**32%**
Avg. Hospital HHI	*1,047*	*2,202*	*110%*
Input Cost Adjusted Avg. Outpatient Primary Care Procedure Price	**$495**	**$532**	**8%**
*Avg. Primary Care HHI****	*996*	*1,420*	*43%*
Input Cost Adjusted Avg. Outpatient Cardiology Procedure Price	**$14,844**	**$18,954**	**28%**
Avg. Cardiology HHI	*352*	*857*	*143%*
Input Cost Adjusted Avg. Outpatient Hematology/Oncology Procedure Price	**$10,042**	**$12,071**	**20%**
Avg. Hematology/Oncology HHI	*823*	*2,257*	*174%*
Input Cost Adjusted Avg. Outpatient Orthopedist Procedure Price	**$333**	**$324**	**-3%**
Avg. Orthopedist HHI	*263*	*851*	*224%*
Input Cost Adjusted Avg. ACA Benchmark Plan Monthly Premium	**$228**	**$251**	**10%**
Avg. Insurer HHI	*1,919*	*2,700*	*41%*

Notes:
Procedures included in each price average:
***Inpatient procedures (3)**: heart attack (acute myocardial infarction), partial hip replacement revision, premature baby (extremely low weight)*
***Outpatient procedures (15)**:*
Primary Care (9) – cervical cancer screening converted, colon cancer screening – sigmoidoscopy, diagnostic blood fecal test, diverticular disease, fibroids, kidney (renal) failure, sore throat, upper respiratory infection/common cold (adult), urinary tract stone
Cardiology (3) – cardiomyopathy (heart muscle disease), cardiovascular symptoms (other), coronary artery disease with heart bypass surgery
Hematology/Oncology (3) – breast cancer, lung, bronchi, or mediastinum cancer, prostate cancer
Orthopedics (3) – ankle fracture/sprain, knee ligament injury, wrist or hand fracture/dislocation/sprain

- *Covered California defines Northern California as rating areas 1-14 and Southern California as rating areas 15-19. Rating Areas (#-name): 1-Northern counties, 2-North Bay counties, 3-Greater Sacramento, 4-San Francisco, 5-Contra Costa, 6-Alameda, 7-Santa Clara, 8-San Mateo, 9-Central Coast, 10-Central Valley, 11-Central Valley, 12-Central Coast, 13-Eastern Region, 14-Central Valley, 15-Los Angeles (Northeast), 16-Los Angeles (Southwest), 17-Inland Empire, 18-Orange County, 19-San Diego*
- *The average Northern California HHIs were computed by taking a straight average across the HHIs in rating areas 1-14 and the Southern California HHIs were straight average across the HHIs in rating areas 15-19. No procedure price data was available for rating area 14 and thus the hospital and physician average HHIs above do not include rating area 14.*
- *** Primary Care HHI was calculated at the primary care service area (PCSA)-level and then weighted up to the rating area-level (see Goodman et al. (2003) for details on PCSAs). All other HHIs were calculated directly at the rating area-level.*

- *All procedure prices and premiums were input cost adjusted using the Medicare wage index. The Centers for Medicare & Medicaid Services currently defines "hospital geographic areas (labor markets areas) based on the definitions of Core-Based Statistical Areas (CBSAs) established by the Office of Management and Budget and announced in December 2003." We population-weighted CBSA-level Medicare wage indices to construct the rating area-level Medicare wage indices used in our analysis.*

Limitations

Our analyses of the association between prices of hospital and physician services in California and the market power of hospitals and physicians does have limitations. The analyses are based on one year of price data. With more years of price data we would be able to relate the changes in market power to the changes in prices. Moreover, with additional data, we would be able to have more measures of prices, including the mean prices and the variation of prices within areas. Finally, we have not adjusted for possible quality differences between hospitals and physicians in different regions of California.

Conclusion

It is clear that the market for health care and health insurance is now highly concentrated in California. The vast majority of counties in California warrant concern and scrutiny according to the DOJ/FTC Guidelines. This has likely reduced the level of competition, which has resulted in higher prices and ACA premiums in California. The significant variation in prices and ACA premiums across the state suggests regulatory and legislative solutions need to be implemented. Consumers are paying prices for health care that are considerably above what a more competitive market would produce.

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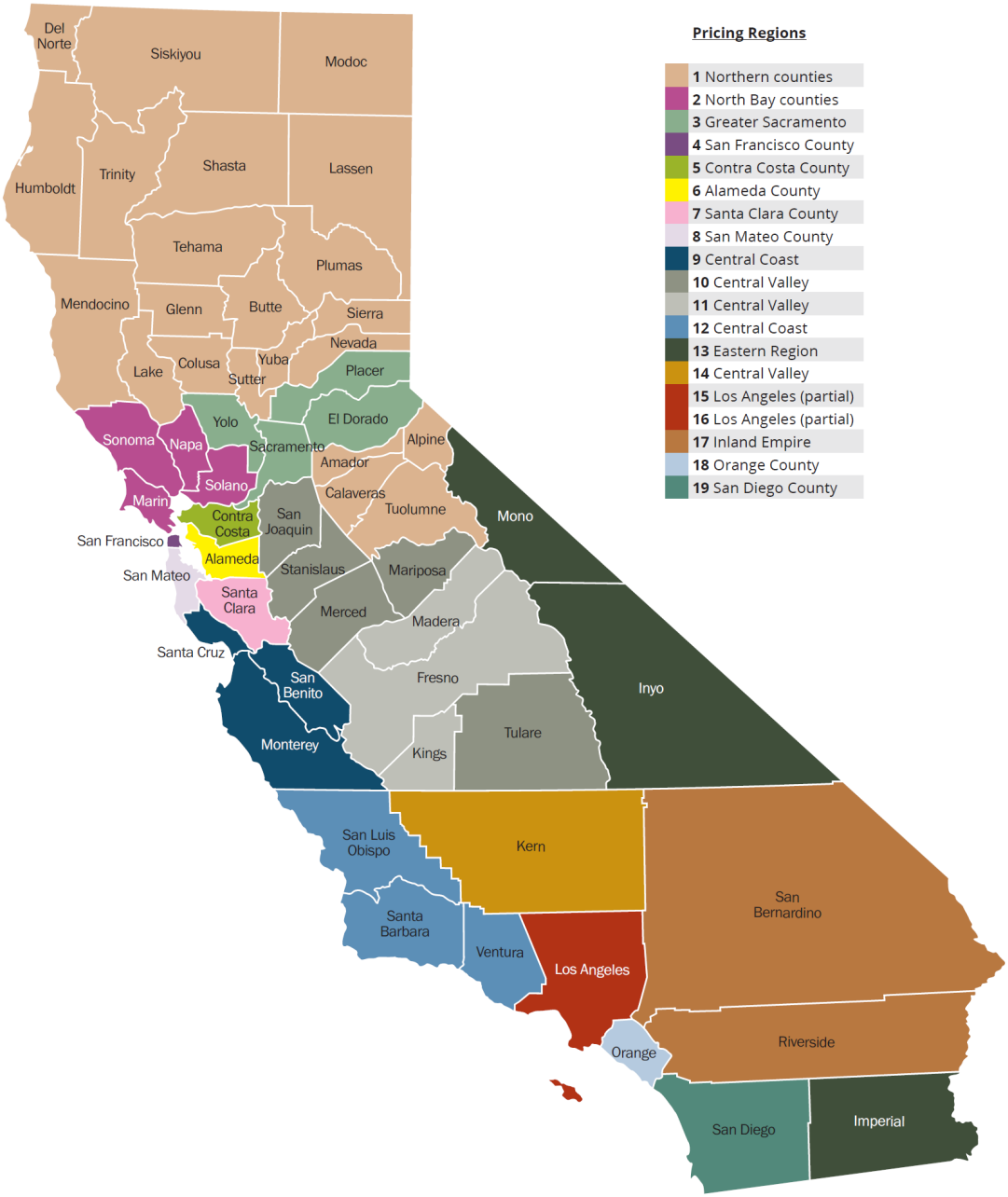
Appendix

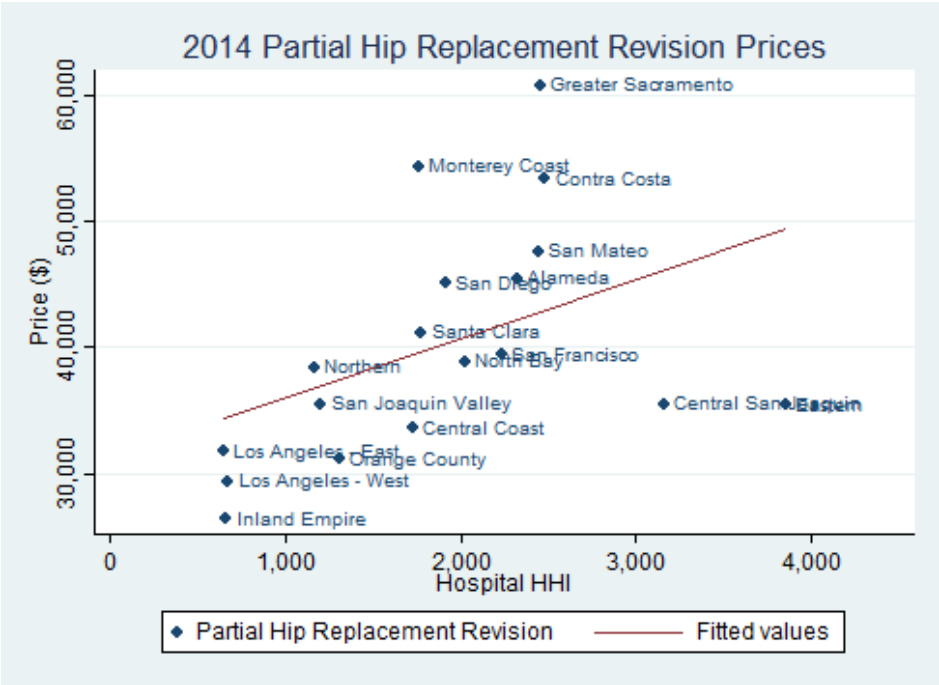
Appendix Figures

Figure A1. Covered California Rating Areas



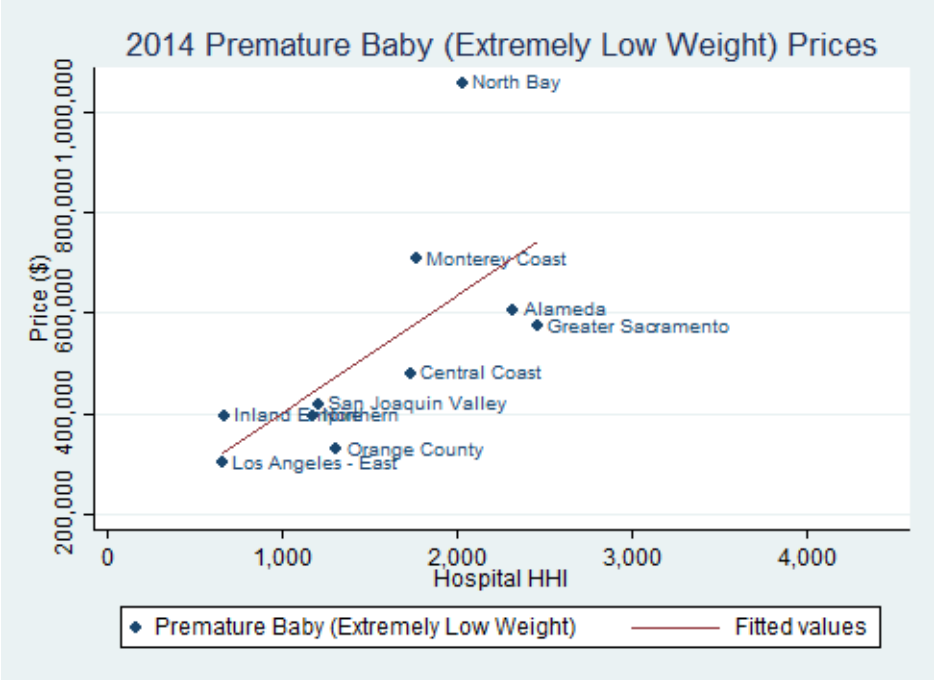
Source: Covered California. 2014. "Health Insurance Companies and Plan Rates for 2015." https://coveredca.com/PDFs/CC-health-plans-booklet-2015.pdf

Figure A2. Partial Hip Replacement Revision Price and Hospital HHI Correlation



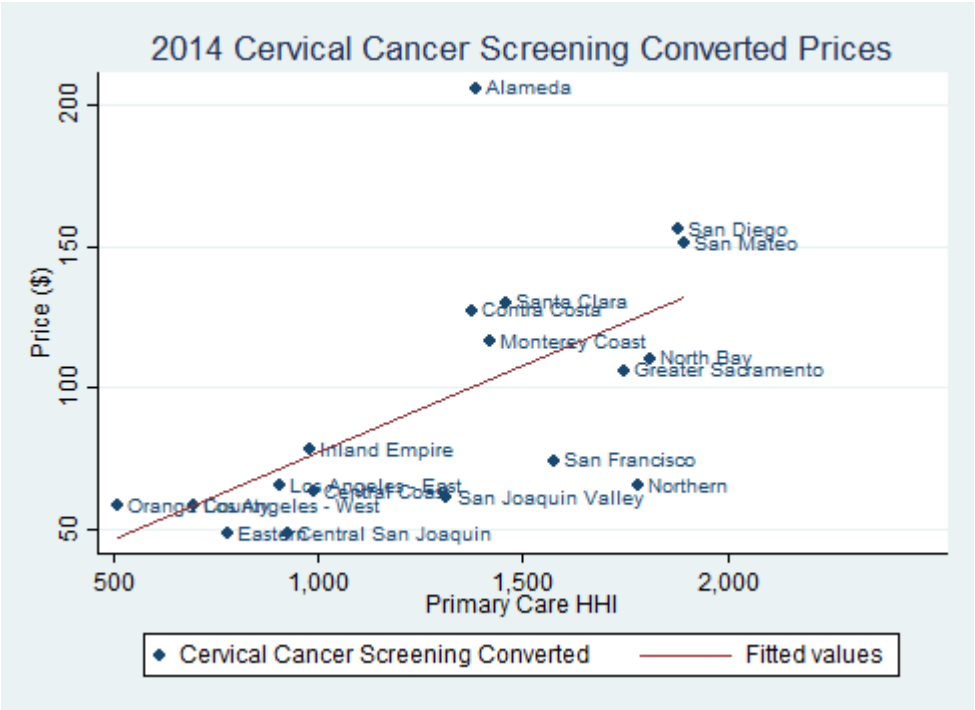
Note: HHI=Herfindahl-Hirschman Index.

Figure A3. Premature Baby (Extremely Low Weight) Price and Hospital HHI Correlation



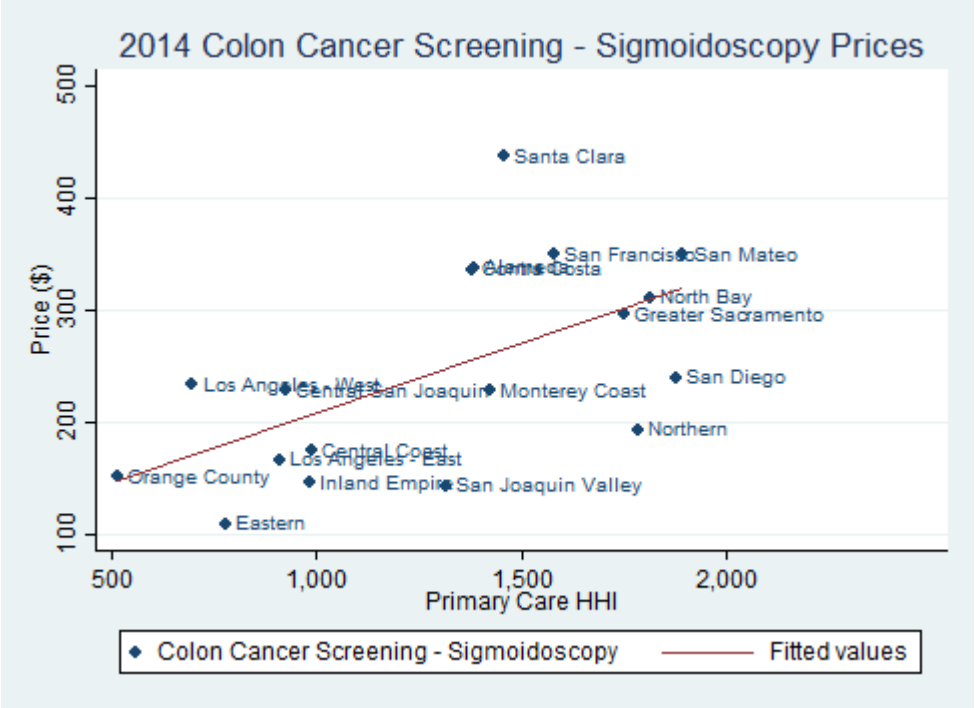
Note: HHI=Herfindahl-Hirschman Index.

Figure A4. Cervical Cancer Screening Converted Price and Primary Care HHI Correlation



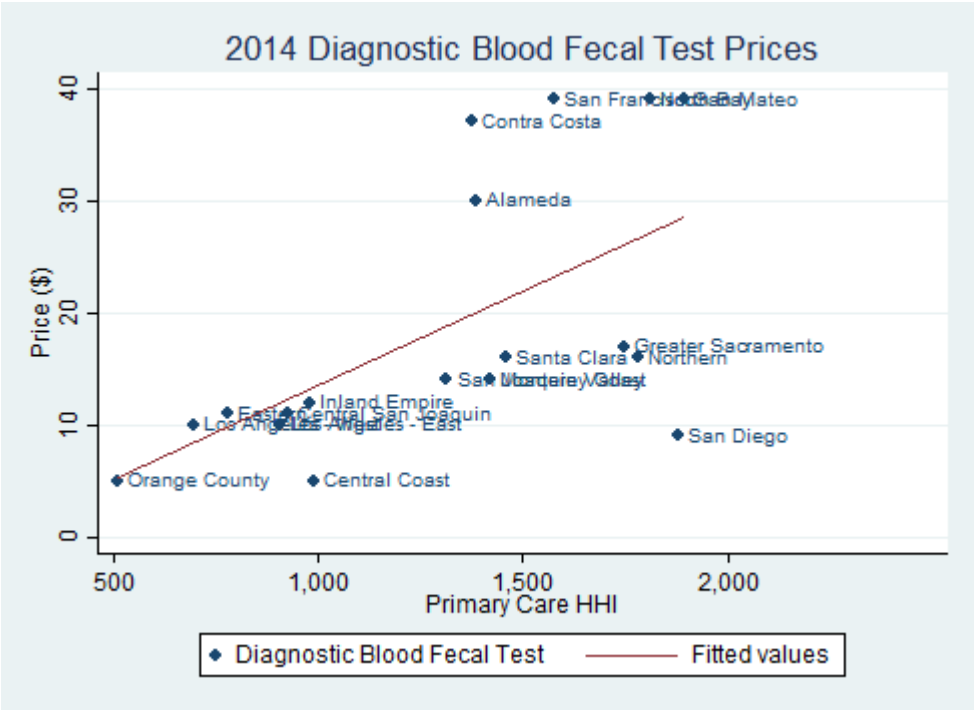
Note: HHI=Herfindahl-Hirschman Index.

Figure A5. Colon Cancer Screening Price and Primary Care HHI Correlation



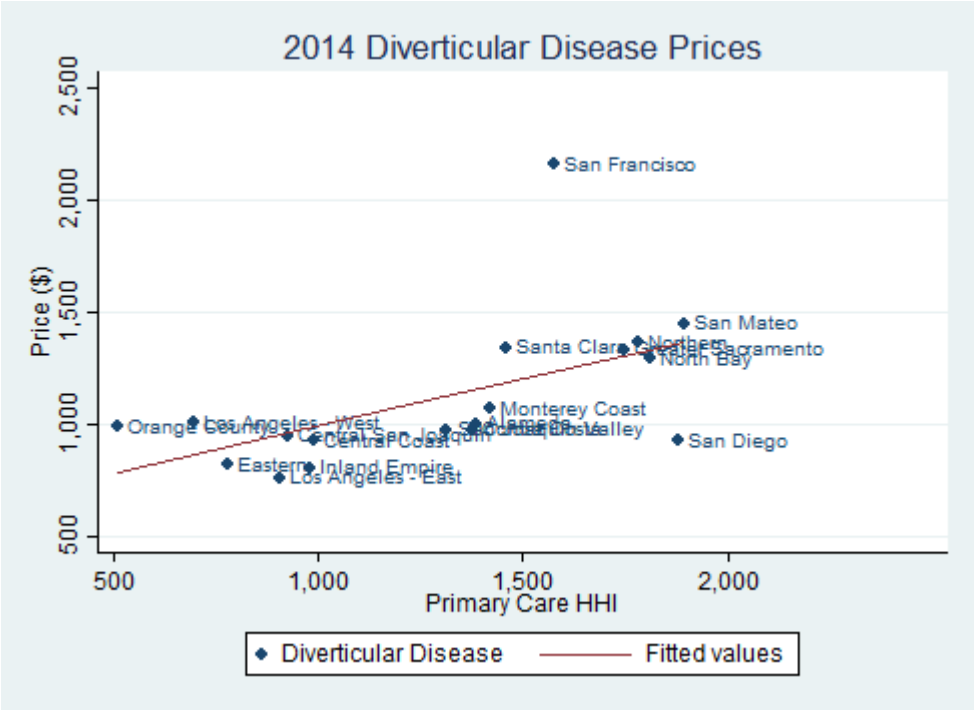
Note: HHI=Herfindahl-Hirschman Index.

Figure A6. Diagnostic Blood Fecal Price and Primary Care HHI Correlation



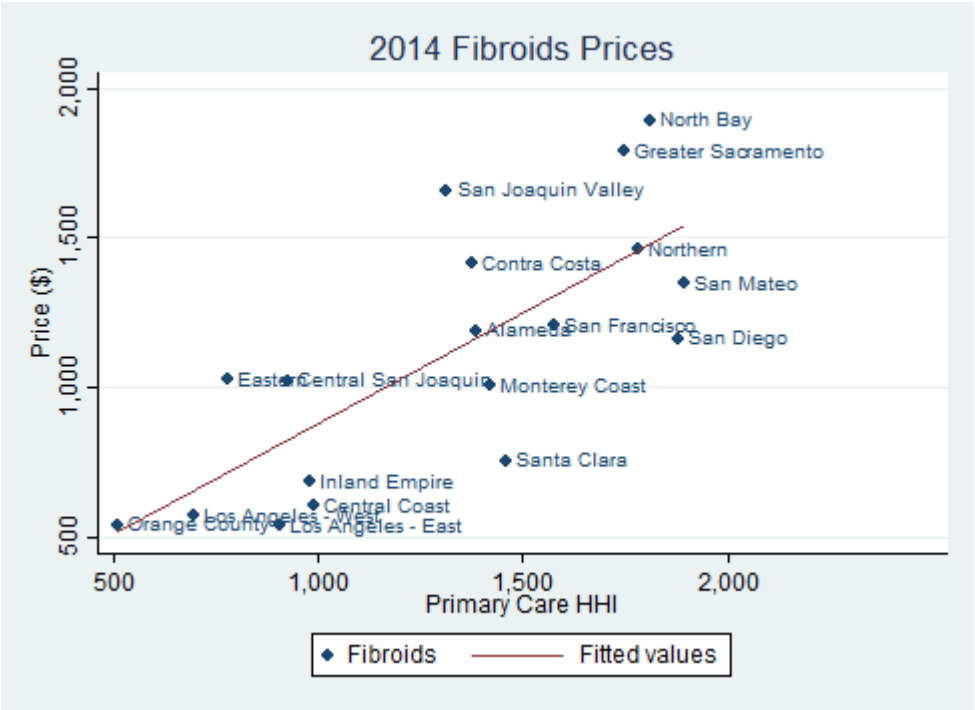
Note: HHI=Herfindahl-Hirschman Index.

Figure A7. Diverticular Disease Price and Primary Care HHI Correlation



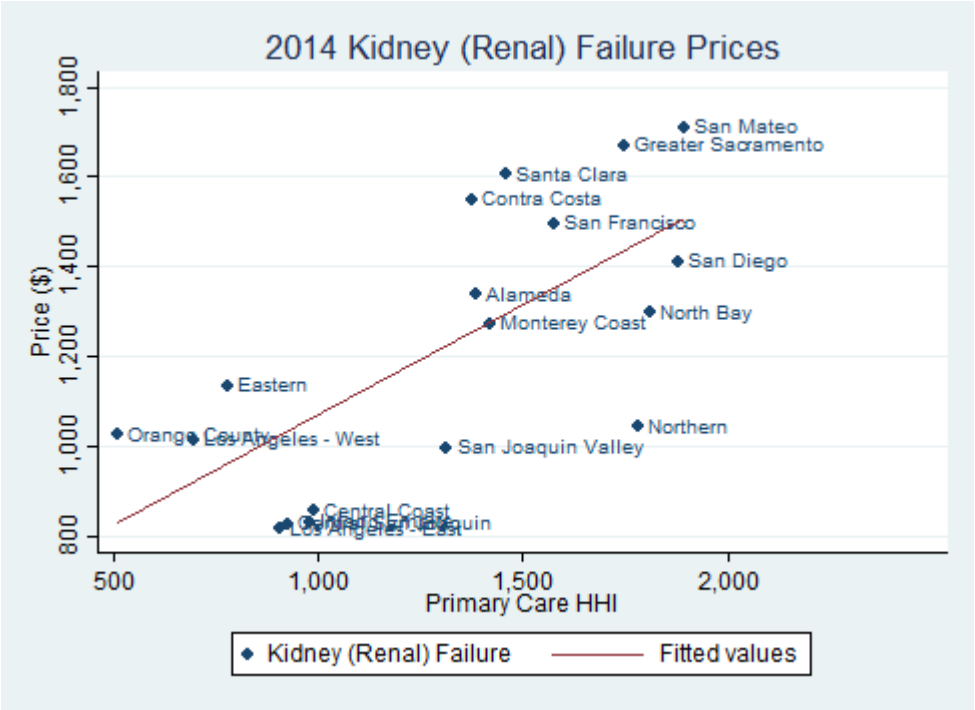
Note: HHI=Herfindahl-Hirschman Index.

Figure A8. Fibroids Price and Primary Care HHI Correlation



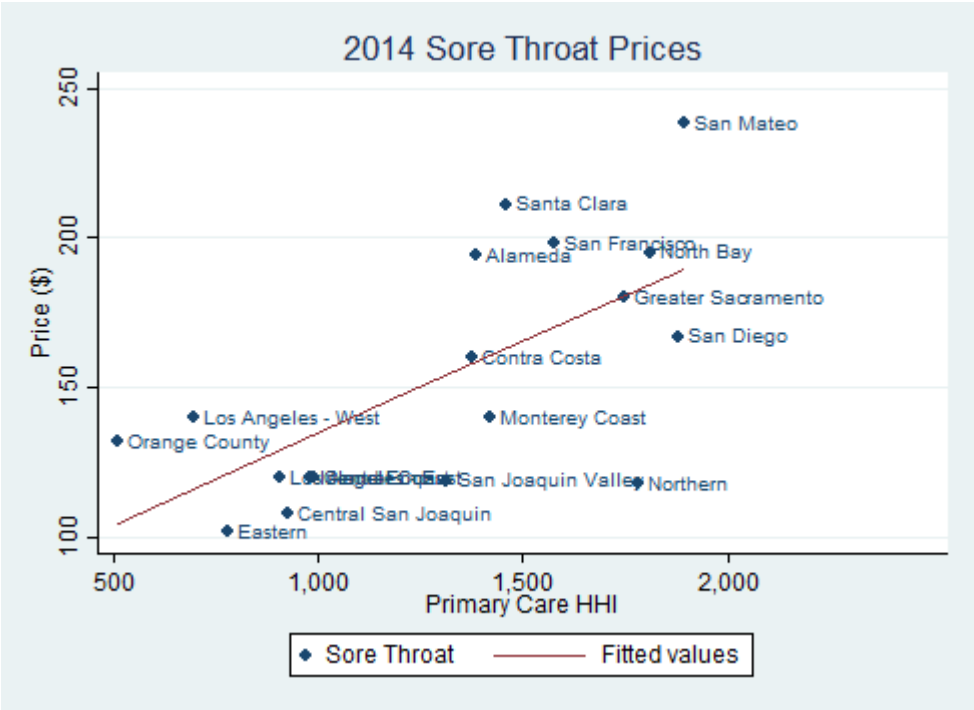
Note: HHI=Herfindahl-Hirschman Index.

Figure A9. Kidney (Renal) Failure Price and Primary Care HHI Correlation



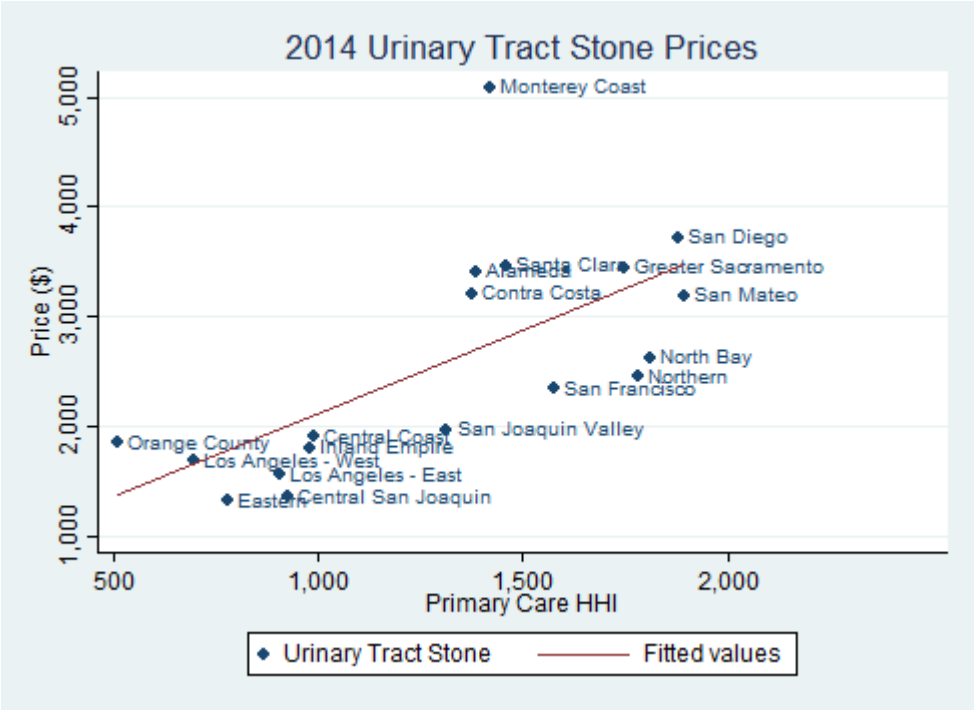
Note: HHI=Herfindahl-Hirschman Index.

Figure A10. Sore Throat Price and Primary Care HHI Correlation



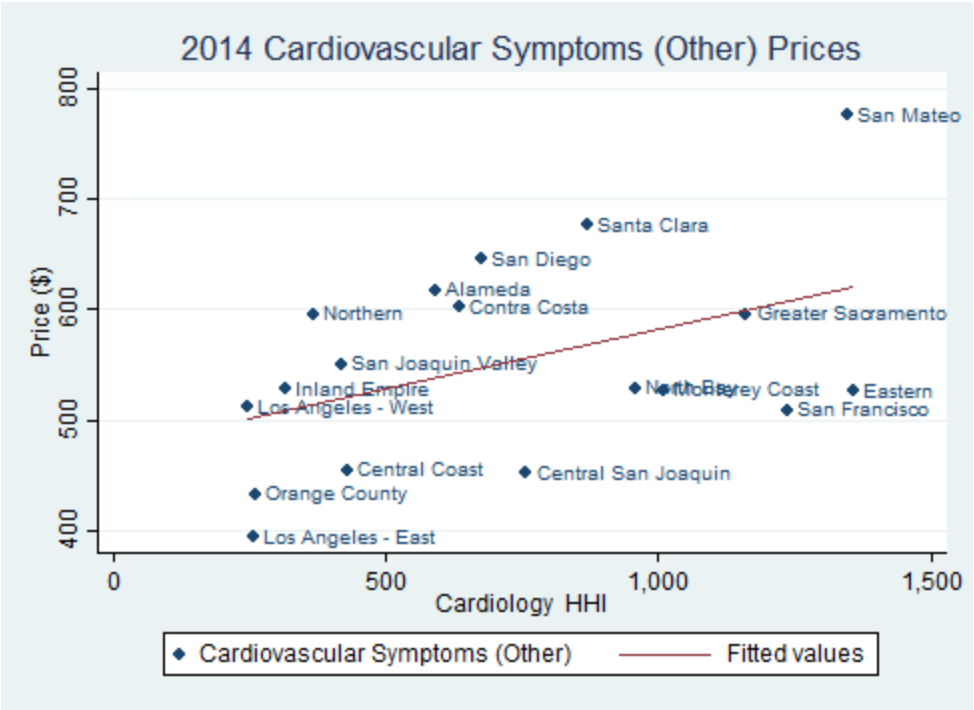
Note: HHI=Herfindahl-Hirschman Index.

Figure A11. Urinary Tract Stone Price and Primary Care HHI Correlation



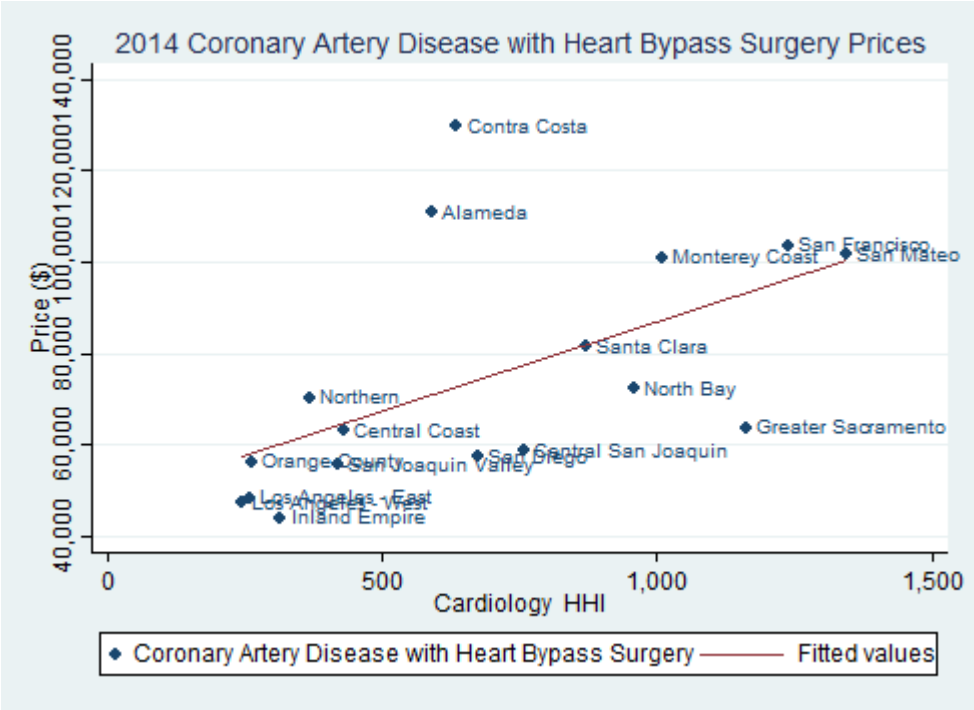
Note: HHI=Herfindahl-Hirschman Index.

Figure A12. Cardiovascular Symptoms (Other) Price and Cardiology HHI Correlation



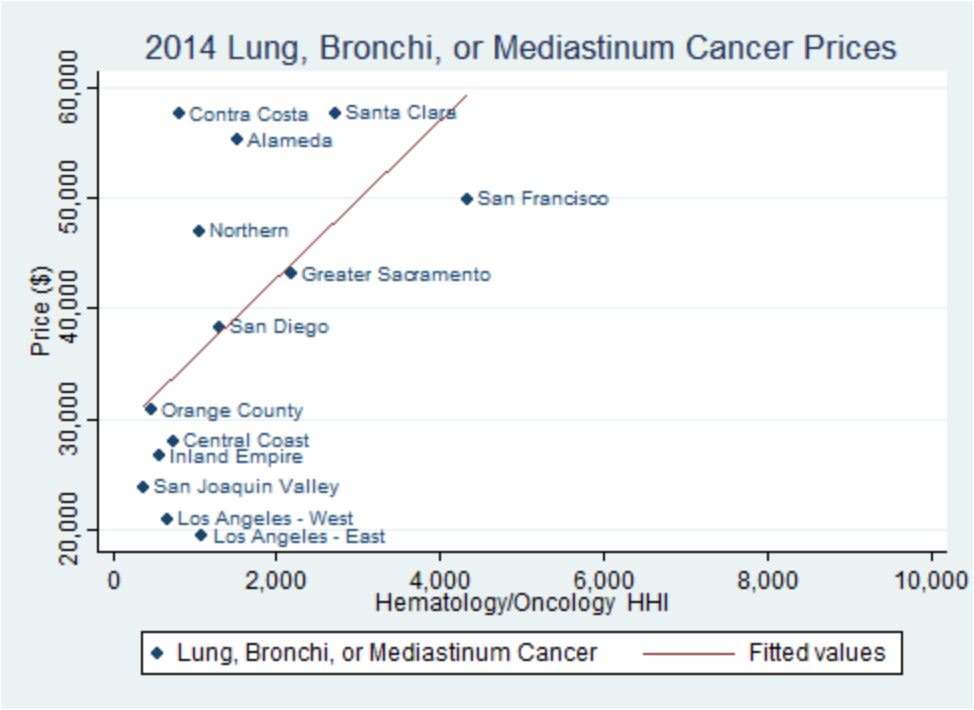
Note: HHI=Herfindahl-Hirschman Index.

Figure A13. Coronary Artery Diseases with Heart Bypass Surgery Price and Cardiology HHI Correlation



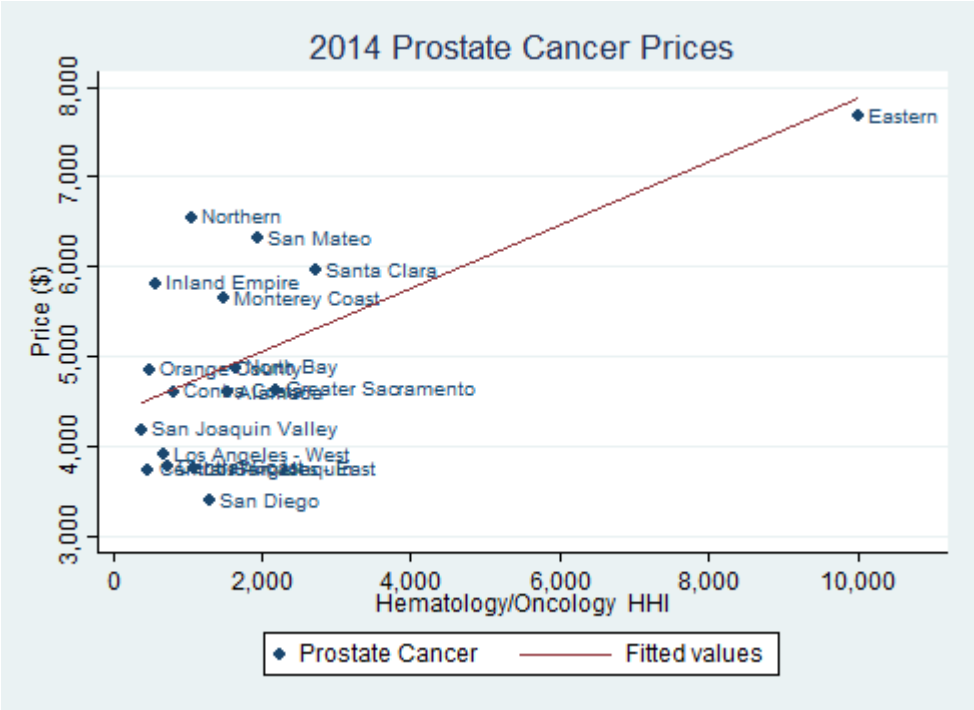
Note: HHI=Herfindahl-Hirschman Index.

Figure A14. Lung, Bronchi, or Mediastinum Cancer Price and Hematology/Oncology HHI Correlation



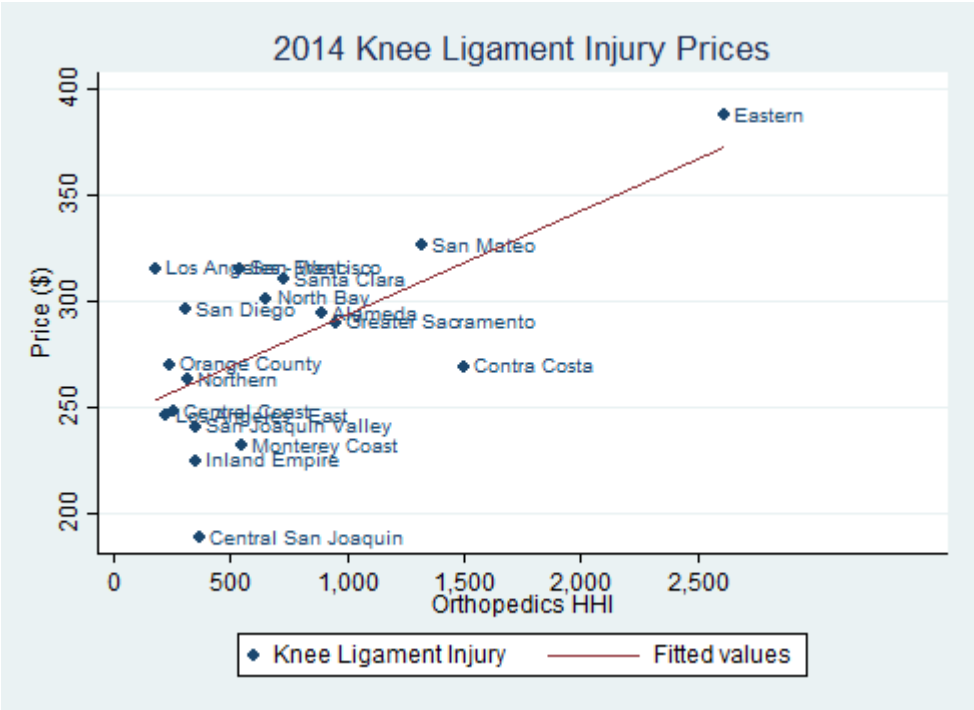
Note: HHI=Herfindahl-Hirschman Index.

Figure A15. Prostate Cancer Price and Hematology/Oncology HHI Correlation



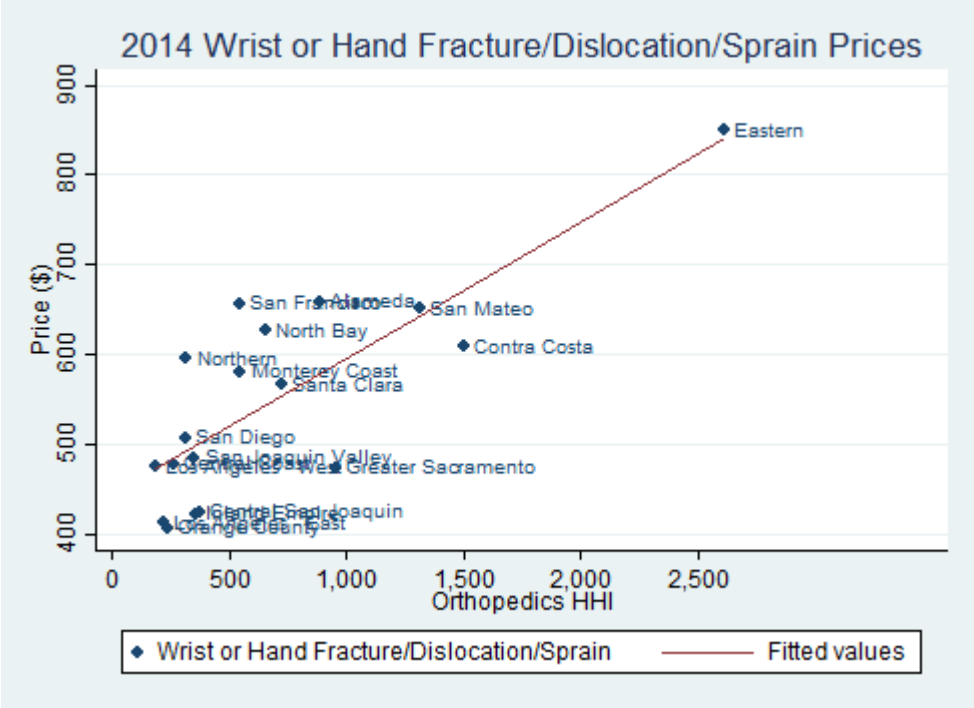
Note: HHI=Herfindahl-Hirschman Index.

Figure A16. Knee Ligament Injury Price and Orthopedics HHI Correlation



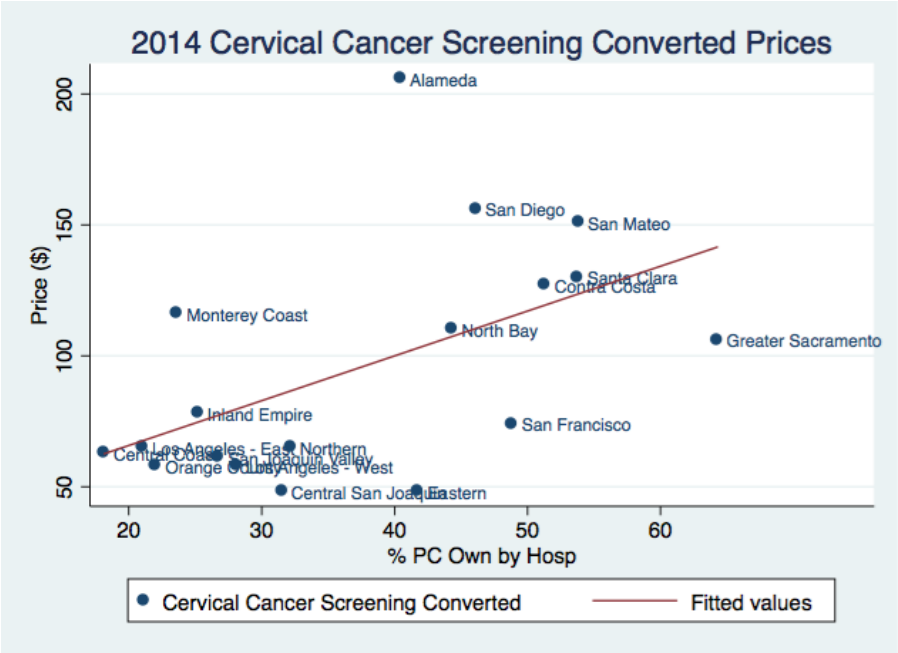
Note: HHI=Herfindahl-Hirschman Index.

Figure A17. Wrist or Hand Fracture/Dislocation/Sprain Price and Orthopedics HHI Correlation



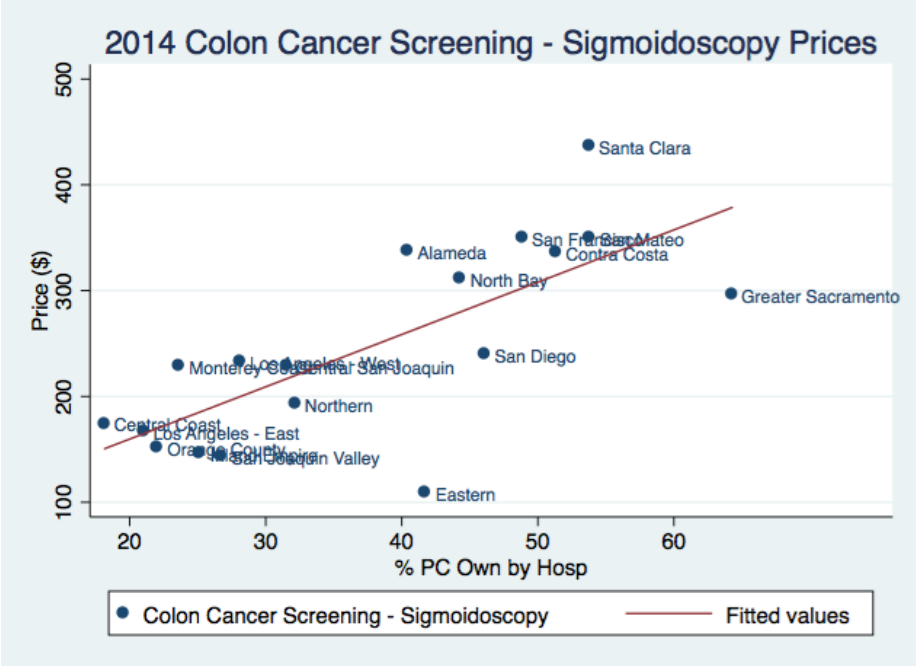
Note: HHI=Herfindahl-Hirschman Index.

Figure A18. Cervical Cancer Screening Converted Prices and the Percent of Primary Care Physicians Working for Foundations Owned by a Hospital or Health System Correlation



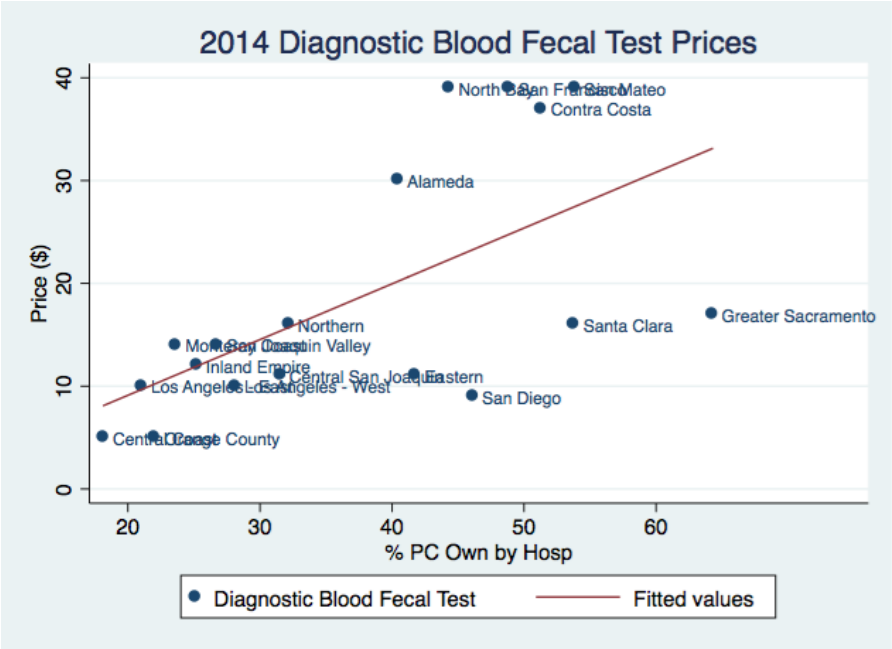
Note: % PC Own by Hosp = the percent of primary care physicians in a rating area who work for foundations owned by a hospital or health system

Figure A19. Colon Cancer Screening Price and the Percent of Primary Care Physicians Working for Foundations Owned by a Hospital or Health System Correlation



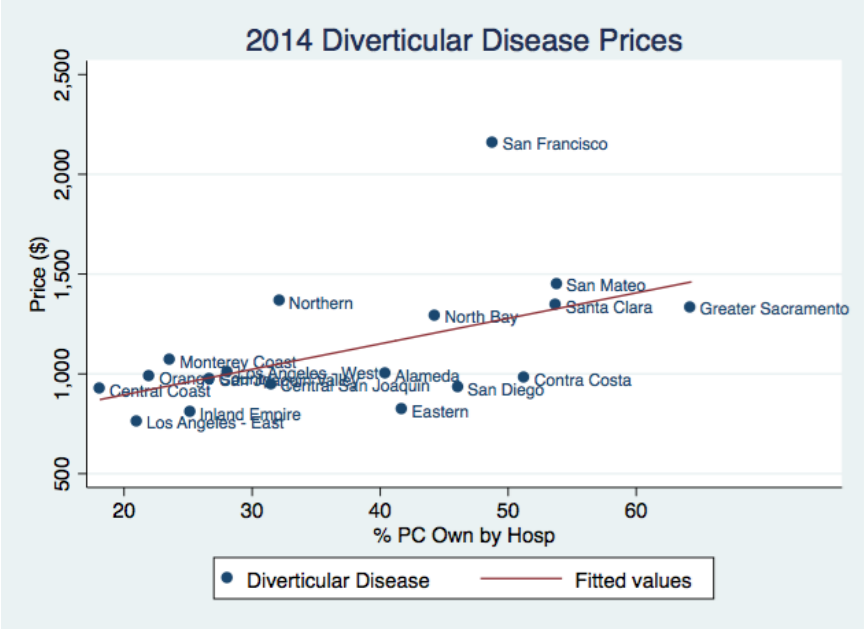
Note: % PC Own by Hosp = the percent of primary care physicians in a rating area who work for foundations owned by a hospital or health system

Figure A20. Diagnostic Blood Fecal Price and the Percent of Primary Care Physicians Working for Foundations Owned by a Hospital or Health System Correlation



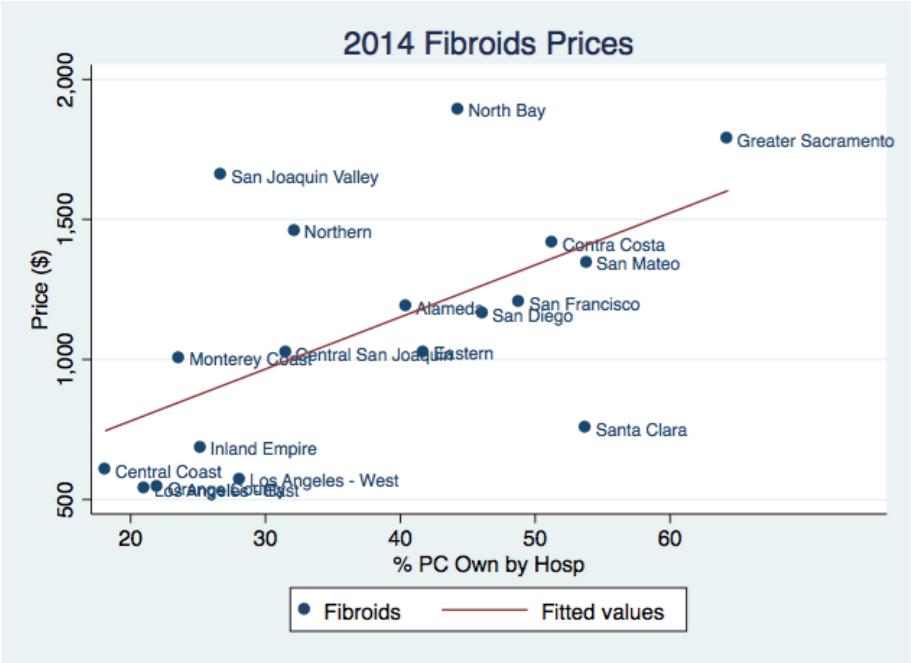
Note: % PC Own by Hosp = the percent of primary care physicians in a rating area who work for foundations owned by a hospital or health system

Figure A21. Diverticular Disease Price and the Percent of Primary Care Physicians Working for Foundations Owned by a Hospital or Health System Correlation



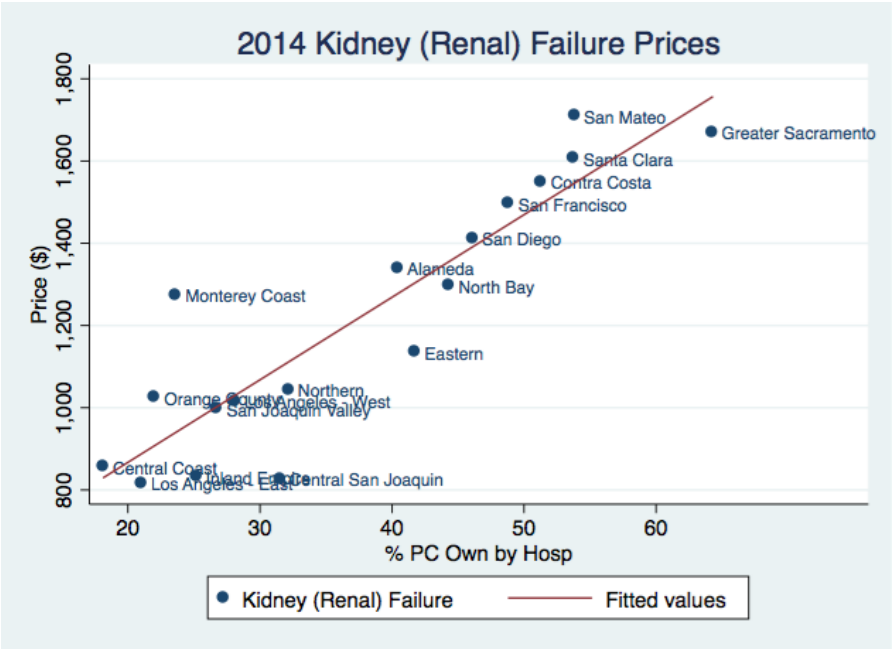
Note: % PC Own by Hosp = the percent of primary care physicians in a rating area who work for foundations owned by a hospital or health system

Figure A22. Fibroids Price and the Percent of Primary Care Physicians Working for Foundations Owned by a Hospital or Health System Correlation



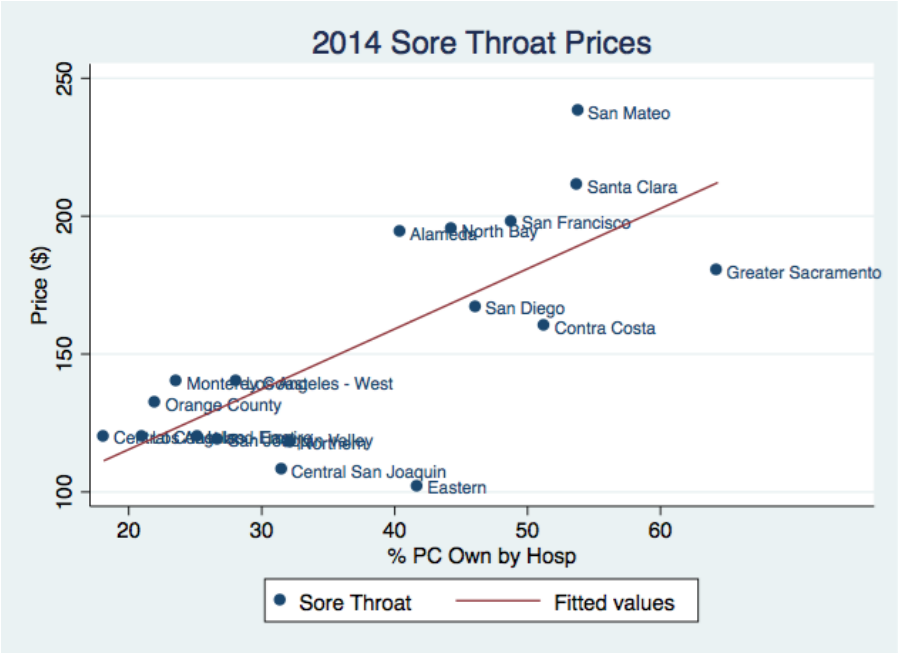
Note: % PC Own by Hosp = the percent of primary care physicians in a rating area who work for foundations owned by a hospital or health system

Figure A23. Kidney (Renal) Failure Price and the Percent of Primary Care Physicians Working for Foundations Owned by a Hospital or Health System Correlation



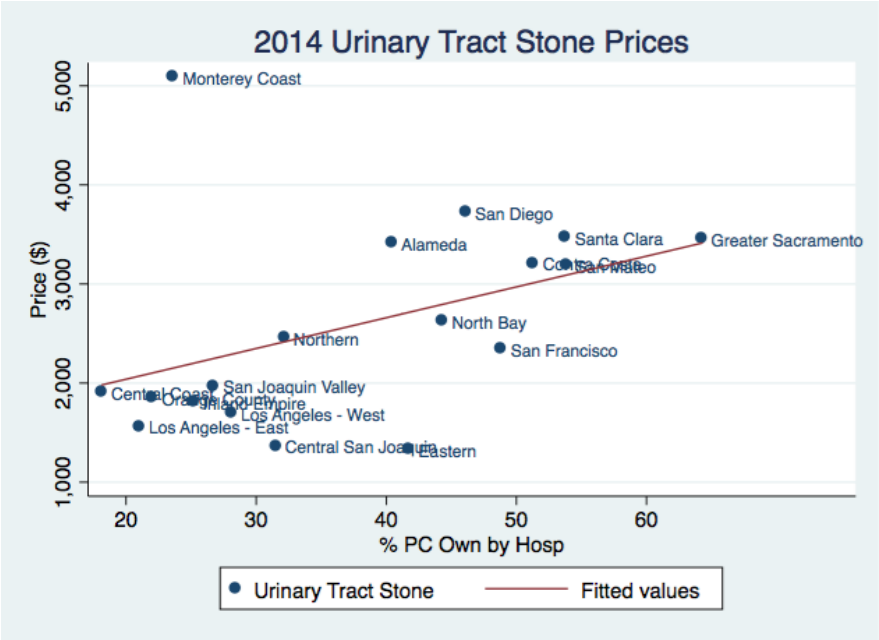
Note: % PC Own by Hosp = the percent of primary care physicians in a rating area who work for foundations owned by a hospital or health system

Figure A24. Sore Throat Price and the Percent of Primary Care Physicians Working for Foundations Owned by a Hospital or Health System Correlation



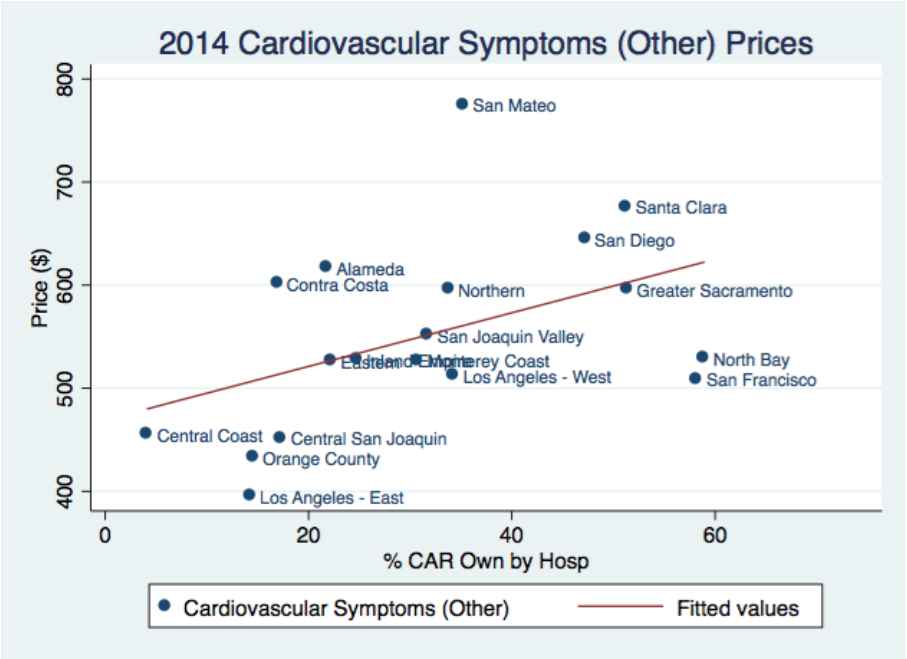
Note: % PC Own by Hosp = the percent of primary care physicians in a rating area who work for foundations owned by a hospital or health system

Figure A25. Urinary Tract Stone Price and the Percent of Primary Care Physicians Working for Foundations Owned by a Hospital or Health System Correlation



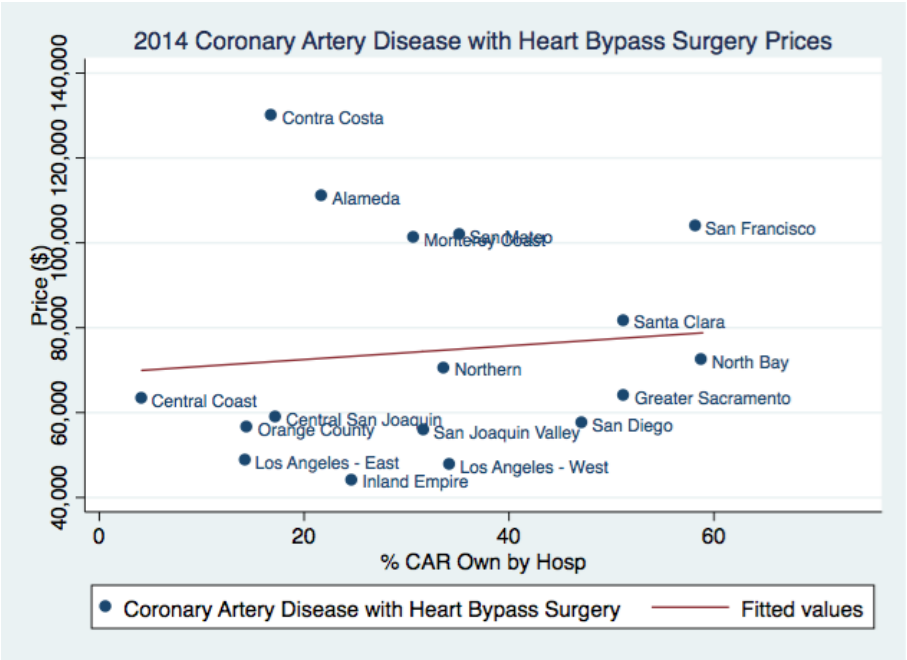
Note: % PC Own by Hosp = the percent of primary care physicians in a rating area who work for foundations owned by a hospital or health system

Figure A26. Cardiovascular Symptoms (Other) Price and the Percent of Cardiologists Working for Foundations Owned by a Hospital or Health System Correlation



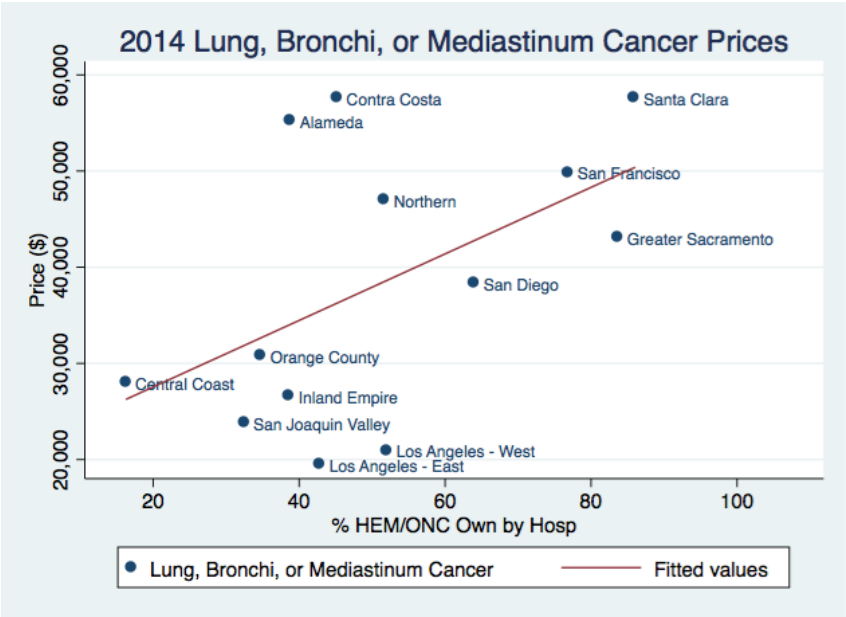
Note: % CAR Own by Hosp = the percent of cardiologists in a rating area who work for foundations owned by a hospital or health system

Figure A27. Coronary Artery Diseases with Heart Bypass Surgery Price and the Percent of Cardiologists Working for Foundations Owned by a Hospital or Health System Correlation



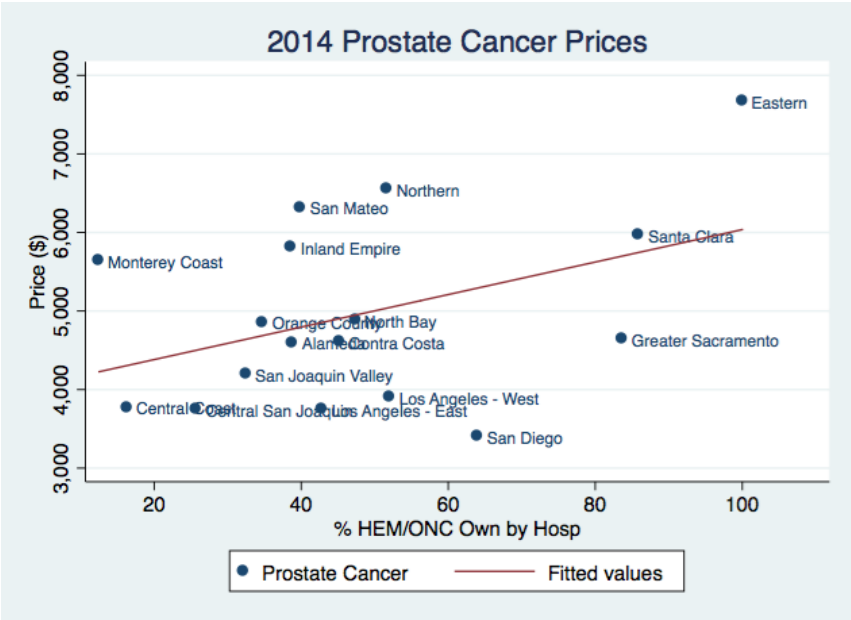
Note: % CAR Own by Hosp = the percent of cardiologists in a rating area who work for foundations owned by a hospital or health system

Figure A28. Lung, Bronchi, or Mediastinum Cancer Price and the Percent of Hematologists/Oncologists Working for Foundations Owned by a Hospital or Health System Correlation



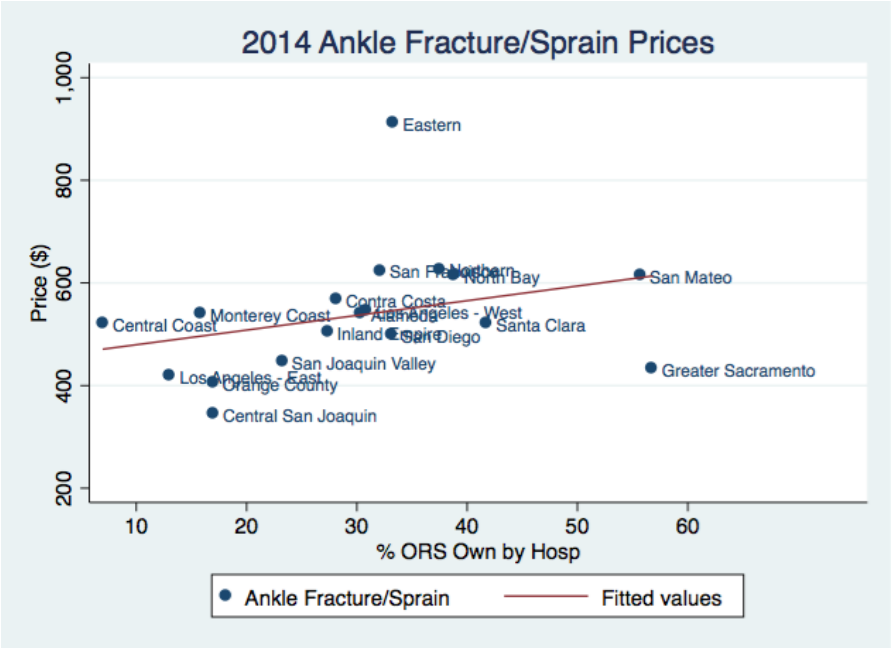
Note: % HEM/ONC Own by Hosp = the percent of hematologists/oncologists in a rating area who work for foundations owned by a hospital or health system

Figure A29. Prostate Cancer Price and the Percent of Hematologists/Oncologists Working for Foundations Owned by a Hospital or Health System Correlation



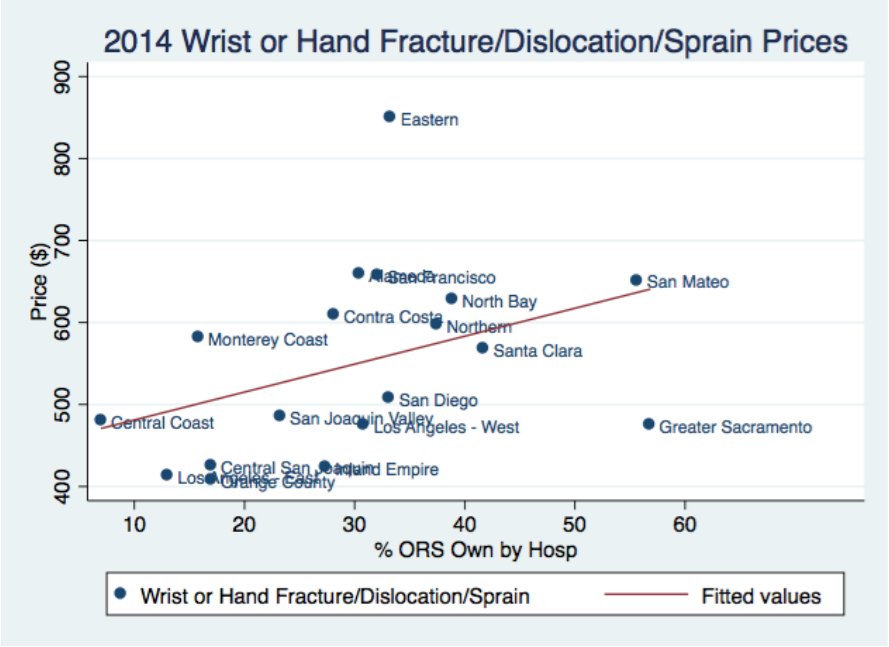
Note: % HEM/ONC Own by Hosp = the percent of hematologists/oncologists in a rating area who work for foundations owned by a hospital or health system

Figure A30. Ankle Fracture/Sprain Price and the Percent of Orthopedists Working for Foundations Owned by a Hospital or Health System Correlation



Note: % ORS Own by Hosp = the percent of orthopedists in a rating area who work for foundations owned by a hospital or health system

Figure A31. Wrist or Hand Fracture/Dislocation/Sprain Price and the Percent of Orthopedists Working for Foundations Owned by a Hospital or Health System Correlation



Note: % ORS Own by Hosp = the percent of orthopedists in a rating area who work for foundations owned by a hospital or health system

Appendix Tables

Table A1: Rating Area-Level Hospital and Physician HHIs, 2014

Rating Area #	Rating Area Name	Hospital HHI	Primary Care HHI	Cardiology HHI	Hematology/ Oncology HHI	Orthopedics HHI	Radiology HHI
1	Northern	1,171	1,781	367	1,063	319	663
2	North Bay	2,031	1,811	957	1,638	657	1,102
3	Sacramento Valley	2,459	1,748	1,161	2,188	955	2,097
4	San Francisco	2,233	1,576	1,237	4,331	544	2,820
5	Contra Costa	2,483	1,377	636	811	1,499	2,366
6	Alameda	2,319	1,384	590	1,529	889	1,067
7	Santa Clara	1,779	1,458	870	2,728	727	1,372
8	San Mateo	2,443	1,893	1,345	1,948	1,318	1,277
9	Monterey Coast	1,760	1,422	1,010	1,493	550	2,012
10	San Joaquin Valley	1,207	1,315	420	383	354	501
11	Central San Joaquin	3,160	925	758	480	373	1,693
12	Central Coast	1,731	990	429	743	262	442
13	Eastern	3,851	779	1,358	10,000	2,613	3,421
15	Los Angeles - East	656	908	259	1,093	224	266
16	Los Angeles - West	680	698	246	674	185	537
17	Inland Empire	669	982	316	568	354	693
18	Orange	1,308	513	263	481	240	567
19	San Diego	1,920	1,878	675	1,298	313	675
	AVERAGE	1,881	1,302	717	1,858	688	1,310

Note: HHI=Herfindahl-Hirschman Index.

Table A2: Insurer HHIs and Covered California Benchmark Plan Monthly Premiums, 2016

Rating Area #	Rating Area Name	Insurer HHI	Benchmark Plan Monthly Premium
1	Northern	3,403	$367
2	North Bay	3,362	$393
3	Sacramento Valley	2,615	$386
4	San Francisco	1,906	$388
5	Contra Costa	2,952	$374
6	Alameda	2,842	$384
7	Santa Clara	2,140	$370
8	San Mateo	2,084	$413
9	Monterey Coast	3,380	$421
10	San Joaquin Valley	2,491	$334
11	Central San Joaquin	2,518	$316
12	Central Coast	2,673	$358
13	Eastern	2,828	$340
14	Central Valley	2,602	$294
15	Los Angeles - East	2,042	$245
16	Los Angeles - West	2,042	$255
17	Inland Empire	2,185	$261
18	Orange	1,785	$298
19	San Diego	1,539	$296
	AVERAGE	2,494	$342

Notes: HHI=Herfindahl-Hirschman Index. The premiums quoted here are the monthly premium an unsubsidized 40-year-old would pay for the benchmark plan (second-lowest-cost silver plan) in a rating area. Insurer HHI is computed using the commercial enrollment of insurers.

Table A3. The association between inpatient procedure prices and hospital market concentration (HHI), 2014.

Unadjusted Prices

	Heart Attack (Acute Myocardial Infarction)	Partial Hip Replacement Revision	Premature Baby (Extremely Low Weight)
Hospital HHI	2.351*	4.716*	231.8**
	(0.0754)	(0.0710)	(0.0419)
Observations	17	18	10
Avg. Median Price	$20,809	$40,162	$526,580
R-squared	0.196	0.189	0.423

Input cost adjusted Prices

	Heart Attack (Acute Myocardial Infarction)	Partial Hip Replacement Revision	Premature Baby (Extremely Low Weight)
Hospital HHI	1.576	2.592*	112.7
	(0.194)	(0.0618)	(0.108)
Observations	17	18	10
Input cost adjusted Avg. Median Price	$15,193	$28,460	$367,682
R-squared	0.110	0.201	0.290

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A4. The association between outpatient primary care procedure prices and primary care market concentration (HHI), 2014.

Unadjusted Prices

	Cervical Cancer Screening Converted	Colon Cancer Screening - Sigmoidoscopy	Diagnostic Blood Fecal Test	Diverticular Disease	Fibroids
Primary Care HHI	0.0617***	0.124**	0.0167***	0.421**	0.738***
	(0.00807)	(0.0103)	(0.00882)	(0.0170)	(0.000374)
Observations	18	18	18	18	18
Avg. Median Price	$96	$246	$19	$1,118	$1,104
R-squared	0.364	0.346	0.357	0.307	0.557

	Kidney (Renal) Failure	Sore Throat	Upper Respiratory Infection/ Common Cold (Adult)	Urinary Tract Stone
Primary Care HHI	0.490***	0.0615***	0.0573***	1.518***
	(0.00125)	(0.00276)	(0.00393)	(0.00326)
Observations	18	18	18	18
Avg. Median Price	$1,217	$153	$151	$2,580
R-squared	0.489	0.438	0.415	0.427

Input cost adjusted Prices

	Cervical Cancer Screening Converted	Colon Cancer Screening - Sigmoidoscopy	Diagnostic Blood Fecal Test	Diverticular Disease	Fibroids
Primary Care HHI	0.0347**	0.0578**	0.0096**	0.146	0.406***
	(0.0187)	(0.0321)	(0.0124)	(0.156)	(0.00312)
Observations	18	18	18	18	18
Input cost adjusted Avg. Median Price	$67	$172	$12	$791	$776
R-squared	0.300	0.256	0.332	0.121	0.430

	Kidney (Renal) Failure	Sore Throat	Upper Respiratory Infection/ Common Cold (Adult)	Urinary Tract Stone
Primary Care HHI	0.198**	0.0238**	0.0208*	0.817***
	(0.0269)	(0.0464)	(0.0708)	(0.00612)
Observations	18	18	18	18
Input cost adjusted Avg. Median Price	$860	$109	$107	$1,801
R-squared	0.271	0.226	0.190	0.384

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A5. The association between outpatient cardiology procedure prices and cardiology market concentration (HHI), 2014.

Unadjusted Prices

	Cardiomyopathy (Heart Muscle Disease)	Cardiovascular Symptoms (Other)	Coronary Artery Disease with Heart Bypass Surgery
Cardiology HHI	0.960***	0.107*	38.74**
	(0.00329)	(0.0648)	(0.0224)
Observations	17	18	17
Avg. Median Price	$1,867	$551	$74,476
R-squared	0.448	0.197	0.302

Input cost adjusted Prices

	Cardiomyopathy (Heart Muscle Disease)	Cardiovascular Symptoms (Other)	Coronary Artery Disease with Heart Bypass Surgery
Cardiology HHI	0.327	0.0134	15.74*
	(0.150)	(0.735)	(0.0537)
Observations	17	18	17
Input cost adjusted Avg. Median Price	$1,324	$394	$51,517
R-squared	0.133	0.007	0.226

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A6. The association between outpatient hematology/oncology procedure prices and hematology/oncology market concentration (HHI), 2014.

Unadjusted Prices

	Breast Cancer	Lung, Bronchi, or Mediastinum Cancer	Prostate Cancer
Hematology/Oncology HHI	0.201**	7.147**	0.352***
	(0.0199)	(0.0452)	(0.00399)
Observations	18	13	17
Avg. Median Price	$4,686	$38,299	$4,957
R-squared	0.295	0.317	0.435

Input cost adjusted Prices

	Breast Cancer	Lung, Bronchi, or Mediastinum Cancer	Prostate Cancer
Hematology/Oncology HHI	0.148***	3.245*	0.283***
	(0.00243)	(0.0880)	(0.00314)
Observations	18	13	17
Input cost adjusted Avg. Median Price	$3,340	$26,912	$3,584
R-squared	0.447	0.242	0.451

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A7. The association between outpatient orthopedics procedure prices and orthopedics market concentration (HHI), 2014.

Unadjusted Prices

	Ankle Fracture/ Sprain	Knee Ligament Injury	Wrist or Hand Fracture/ Dislocation/ Sprain
Orthopedics HHI	0.150***	0.0488***	0.152***
	(0.000440)	(0.00343)	(6.85e-05)
Observations	18	18	18
Avg. Median Price	$537	$279	$549
R-squared	0.548	0.424	0.639

Input cost adjusted Prices

	Ankle Fracture/ Sprain	Knee Ligament Injury	Wrist or Hand Fracture/ Dislocation/ Sprain
Orthopedics HHI	0.0993***	0.0274*	0.0989***
	(0.00918)	(0.0938)	(0.000371)
Observations	18	18	18
Input cost adjusted Avg. Median Price	$386	$201	$392
R-squared	0.354	0.166	0.558

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A8. The association between ACA premiums and insurer market concentration (HHI), 2016.

Unadjusted Monthly Premiums	
	Benchmark Plan Monthly Premium
Insurer HHI	0.0526***
	(0.007)
Observations	19
Avg. Monthly Premium	$342
R-squared	0.283

Input cost adjusted Monthly Premiums	
	Benchmark Plan Monthly Premium
Insurer HHI	0.0218*
	(0.063)
Observations	19
Input cost adjusted Avg. Monthly Premium	$245
R-squared	0.094

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A9. The association between inpatient procedure prices and hospital market concentration (HHI), 2014. (weighted by rating area population)

Unadjusted Prices

	Heart Attack (Acute Myocardial Infarction)	Partial Hip Replacement Revision	Premature Baby (Extremely Low Weight)
Hospital HHI	2.375*	9.302***	195.7**
	(0.0696)	(0.0003)	(0.0295)
Observations	17	18	10
Weighted Avg. Median Price	$19,716	$37,099	$459,341
R-squared	0.203	0.558	0.467

Input cost adjusted Prices

	Heart Attack (Acute Myocardial Infarction)	Partial Hip Replacement Revision	Premature Baby (Extremely Low Weight)
Hospital HHI	0.741	4.459***	88.44
	(0.537)	(0.0050)	(0.110)
Observations	17	18	10
Input cost adjusted Weighted Avg. Median Price	$15,114	$27,795	$340,143
R-squared	0.026	0.398	0.288

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A10. The association between outpatient primary care procedure prices and primary care market concentration (HHI), 2014. (weighted by rating area population)

Unadjusted Prices

	Cervical Cancer Screening Converted	Colon Cancer Screening - Sigmoidoscopy	Diagnostic Blood Fecal Test	Diverticular Disease	Fibroids
Primary Care HHI	0.0632***	0.0946**	0.0117**	0.278**	0.794***
	(0.00152)	(0.0243)	(0.0194)	(0.0394)	(5.57e-05)
Observations	18	18	18	18	18
Weighted Avg. Median Price	$90	$229	$15	$1,032	$955
R-squared	0.477	0.279	0.297	0.239	0.648

	Kidney (Renal) Failure	Sore Throat	Upper Respiratory Infection/ Common Cold (Adult)	Urinary Tract Stone
Primary Care HHI	0.470***	0.0453***	0.0415**	1.529***
	(0.000688)	(0.00585)	(0.0104)	(0.000148)
Observations	18	18	18	18
Weighted Avg. Median Price	$1,132	$147	$146	$2,372
R-squared	0.524	0.387	0.345	0.604

Input cost adjusted Prices

	Cervical Cancer Screening Converted	Colon Cancer Screening - Sigmoidoscopy	Diagnostic Blood Fecal Test	Diverticular Disease	Fibroids
Primary Care HHI	0.0388***	0.0418*	0.00657**	0.0701	0.486***
	(0.00446)	(0.0724)	(0.0268)	(0.352)	(9.27e-05)
Observations	18	18	18	18	18
Input cost adjusted Weighted Avg. Median Price	$67	$169	$11	$775	$704
R-squared	0.406	0.188	0.271	0.054	0.626

	Kidney (Renal) Failure	Sore Throat	Upper Respiratory Infection/ Common Cold (Adult)	Urinary Tract Stone
Primary Care HHI	0.217**	0.0157	0.0127	0.899***
	(0.0107)	(0.102)	(0.175)	(0.000696)
Observations	18	18	18	18
Input cost adjusted Weighted Avg. Median Price	$848	$110	$110	$1,764
R-squared	0.342	0.158	0.112	0.523

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A11. The association between outpatient cardiology procedure prices and cardiology market concentration (HHI), 2014. (weighted by rating area population)

Unadjusted Prices

	Cardiomyopathy (Heart Muscle Disease)	Cardiovascular Symptoms (Other)	Coronary Artery Disease with Heart Bypass Surgery
Cardiology HHI	0.706***	0.156**	39.82**
	(0.00551)	(0.0105)	(0.0114)
Observations	17	18	17
Weighted Avg. Median Price	$1,774	$533	$63,191
R-squared	0.411	0.344	0.356

Input cost adjusted Prices

	Cardiomyopathy (Heart Muscle Disease)	Cardiovascular Symptoms (Other)	Coronary Artery Disease with Heart Bypass Surgery
Cardiology HHI	0.135	0.0155	15.97**
	(0.494)	(0.747)	(0.0335)
Observations	17	18	17
Input cost adjusted Weighted Avg. Median Price	$1,345	$403	$46,652
R-squared	0.032	0.007	0.267

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A12. The association between outpatient hematology/oncology procedure prices and hematology/oncology market concentration (HHI), 2014. (weighted by rating area population)

Unadjusted Prices

	Breast Cancer	Lung, Bronchi, or Mediastinum Cancer	Prostate Cancer
Hematology/Oncology HHI	0.373**	10.22**	0.350
	(0.0163)	(0.0172)	(0.187)
Observations	18	13	17
Weighted Avg. Median Price	$4,461	$32,759	$4,594
R-squared	0.310	0.417	0.113

Input cost adjusted Prices

	Breast Cancer	Lung, Bronchi, or Mediastinum Cancer	Prostate Cancer
Hematology/Oncology HHI	0.0740	4.751*	0.0409
	(0.428)	(0.0544)	(0.853)
Observations	18	13	17
Input cost adjusted Weighted Avg. Median Price	$3,369	$24,449	$3,504
R-squared	0.040	0.296	0.002

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A13. The association between outpatient orthopedics procedure prices and orthopedics market concentration (HHI), 2014. (weighted by rating area population)

Unadjusted Prices

	Ankle Fracture/ Sprain	Knee Ligament Injury	Wrist or Hand Fracture/ Dislocation/ Sprain
Orthopedics HHI	0.0849	0.0287	0.159***
	(0.103)	(0.258)	(0.00186)
Observations	18	18	18
Weighted Avg. Median Price	$500	$273	$496
R-squared	0.157	0.079	0.464

Input cost adjusted Prices

	Ankle Fracture/ Sprain	Knee Ligament Injury	Wrist or Hand Fracture/ Dislocation/ Sprain
Orthopedics HHI	-0.0219	-0.0263	0.0299
	(0.620)	(0.254)	(0.288)
Observations	18	18	18
Input cost adjusted Weighted Avg. Median Price	$380	$208	$373
R-squared	0.016	0.080	0.070

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A14. The association between ACA premiums and insurer market concentration (HHI), 2016. (weighted by rating area population)

Unadjusted Monthly Premiums	
	Benchmark Plan Monthly Premium
Insurer HHI	0.0715***
	(0.001)
Observations	19
Weighted Avg. Monthly Premium	$313
R-squared	0.394

Input cost adjusted Monthly Premiums	
	Benchmark Plan Monthly Premium
Insurer HHI	0.0151
	(0.171)
Observations	19
Input cost adjusted Weighted Avg. Monthly Premium	$236
R-squared	0.109

*Notes: HHI=Herfindahl-Hirschman Index. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A15: Rating Area-Level Percent of Physicians Working for Foundations Owned by Hospitals or Health Systems, 2014

Rating Area #	Rating Area Name	% PC Own by Hosp	% CAR Own by Hosp	% HEM/ONC Own by Hosp	% ORS Own by Hosp
1	Northern	32	34	52	38
2	North Bay	44	59	47	39
3	Sacramento Valley	64	51	84	57
4	San Francisco	49	58	77	32
5	Contra Costa	51	17	45	28
6	Alameda	40	22	39	30
7	Santa Clara	54	51	86	42
8	San Mateo	54	35	40	56
9	Monterey Coast	24	31	13	16
10	San Joaquin Valley	27	32	33	23
11	Central San Joaquin	32	17	26	17
12	Central Coast	18	4	16	7
13	Eastern	42	22	100	33
15	Los Angeles - East	21	14	43	13
16	Los Angeles - West	28	34	52	31
17	Inland Empire	25	25	39	27
18	Orange	22	15	35	17
19	San Diego	46	47	64	33
	Avg. across rating areas	37	32	49	30

Note: PC = primary care physician, CAR = cardiologists, HEM/ONC = hematologists/oncologists, ORS = orthopedists

Table A16. The association between primary care procedure prices and the percent of primary care physicians in a rating area who work for foundations owned by a hospital or health system, 2014.

UNADJUSTED PRICES

	Cervical Cancer Screening Converted	Colon Cancer Screening - Sigmoidoscopy	Diagnostic Blood Fecal Test	Diverticular Disease	Fibroids
% PC Own by Hosp	1.711**	4.944***	0.542***	12.77**	18.57***
	(0.0252)	(0.000474)	(0.00729)	(0.0244)	(0.00999)
Observations	18	18	18	18	18
Avg. Median Price	$96	$246	$19	$1,118	$1,104
R-squared	0.276	0.544	0.371	0.279	0.348

	Kidney (Renal) Failure	Sore Throat	Upper Respiratory Infection/ Common Cold (Adult)	Urinary Tract Stone
% PC Own by Hosp	20.08***	2.183***	2.178***	31.06*
	(3.98e-07)	(0.000470)	(0.000195)	(0.0825)
Observations	18	18	18	18
Avg. Median Price	$1,217	$153	$151	$2,580
R-squared	0.808	0.545	0.591	0.177

INPUT COST ADJUSTED PRICES

	Cervical Cancer Screening Converted	Colon Cancer Screening - Sigmoidoscopy	Diagnostic Blood Fecal Test	Diverticular Disease	Fibroids
% PC Own by Hosp	0.929*	2.580***	0.318***	5.127	10.40**
	(0.0544)	(0.000975)	(0.00853)	(0.117)	(0.0245)
Observations	18	18	18	18	18
Input cost adjusted Avg. Median Price	$67	$172	$12	$791	$776
R-squared	0.212	0.503	0.360	0.147	0.278

	Kidney (Renal) Failure	Sore Throat	Upper Respiratory Infection/ Common Cold (Adult)	Urinary Tract Stone
% PC Own by Hosp	10.22***	0.989***	0.988***	15.75
	(9.87e-06)	(0.00598)	(0.00355)	(0.125)
Observations	18	18	18	18
Input cost adjusted Avg. Median Price	$860	$109	$107	$1,801
R-squared	0.715	0.385	0.421	0.141

*Notes: % PC Own by Hosp = % of primary care physicians who work for a foundation owned by a hospital or health system. Input cost adjusted prices were computed by deflating unadjusted prices by the Medicare Wage Index https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/wageindex.html . p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A17. The association between cardiology procedure prices and the percent of cardiologists in a rating area who work for foundations owned by a hospital or health system, 2014.

UNADJUSTED PRICES

	Cardiomyopathy (Heart Muscle Disease)	Cardiovascular Symptoms (Other)	Coronary Artery Disease with Heart Bypass Surgery
% CAR Own by Hosp	13.84*	2.599*	161.6
	(0.0776)	(0.0596)	(0.690)
Observations	17	18	17
Avg. Median Price	$1,867	$551	$74,476
R-squared	0.193	0.204	0.011

INPUT COST ADJUSTED PRICES

	Cardiomyopathy (Heart Muscle Disease)	Cardiovascular Symptoms (Other)	Coronary Artery Disease with Heart Bypass Surgery
% CAR Own by Hosp	5.537	0.743	-12.11
	(0.275)	(0.430)	(0.949)
Observations	17	18	17
Input cost adjusted Avg. Median Price	$1,324	$394	$51,517
R-squared	0.079	0.039	0.000

*Notes: % CAR Own by Hosp = % of cardiologists who work for a foundation owned by a hospital or health system. Input cost adjusted prices were computed by deflating unadjusted prices by the Medicare Wage Index https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/wageindex.html . p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A18. The association between hematology/oncology procedure prices and the percent of hematologists/oncologists in a rating area who work for foundations owned by a hospital or health system, 2014.

UNADJUSTED PRICES

	Breast Cancer	Lung, Bronchi, or Mediastinum Cancer	Prostate Cancer
% HEM/ONC Own by Hosp	21.32***	345.9*	20.69*
	(0.00633)	(0.0732)	(0.0981)
Observations	18	13	17
Avg. Median Price	$4,686	$38,299	$4,957
R-squared	0.381	0.263	0.172

INPUT COST ADJUSTED PRICES

	Breast Cancer	Lung, Bronchi, or Mediastinum Cancer	Prostate Cancer
% HEM/ONC Own by Hosp	15.31***	179.9*	16.85*
	(0.000419)	(0.0731)	(0.0869)
Observations	18	13	17
Input cost adjusted Avg. Median Price	$3,340	$26,912	$3,584
R-squared	0.551	0.263	0.183

*Notes: % HEM/ONC Own by Hosp = % of hematologists/oncologists who work for a foundation owned by a hospital or health system. Input cost adjusted prices were computed by deflating unadjusted prices by the Medicare Wage Index https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/wageindex.html . p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A19. The association between orthopedics procedure prices and the percent of orthopedists in a rating area who work for foundations owned by a hospital or health system, 2014.

UNADJUSTED PRICES

	Ankle Fracture/ Sprain	Knee Ligament Injury	Wrist or Hand Fracture/ Dislocation/ Sprain
% ORS Own by Hosp	2.862	1.980**	3.407
	(0.207)	(0.0113)	(0.104)
Observations	18	18	18
Avg. Median Price	$537	$279	$549
R-squared	0.097	0.339	0.156

INPUT COST ADJUSTED PRICES

	Ankle Fracture/ Sprain	Knee Ligament Injury	Wrist or Hand Fracture/ Dislocation/ Sprain
% ORS Own by Hosp	0.817	0.671	1.158
	(0.670)	(0.381)	(0.444)
Observations	18	18	18
Input cost adjusted Avg. Median Price	$386	$201	$392
R-squared	0.012	0.048	0.037

*Notes: % ORS Own by Hosp = % of orthopedists who work for a foundation owned by a hospital or health system. Input cost adjusted prices were computed by deflating unadjusted prices by the Medicare Wage Index https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/wageindex.html . p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A20. The association between primary care procedure prices and the percent of primary care physicians in a rating area who work for foundations owned by a hospital or health system, 2014 (weighted by rating area population)

UNADJUSTED PRICES

	Cervical Cancer Screening Converted	Colon Cancer Screening - Sigmoidoscopy	Diagnostic Blood Fecal Test	Diverticular Disease	Fibroids
% PC Own by Hosp	2.005***	4.878***	0.413**	11.95***	22.64***
	(0.00389)	(6.45e-05)	(0.0143)	(0.00617)	(0.00207)
Observations	18	18	18	18	18
Weighted Avg. Median Price	$90	$229	$15	$1,032	$955
R-squared	0.415	0.642	0.320	0.383	0.457

	Kidney (Renal) Failure	Sore Throat	Upper Respiratory Infection/ Common Cold (Adult)	Urinary Tract Stone
% PC Own by Hosp	20.70***	2.031***	2.020***	47.86***
	(1.00e-08)	(2.89e-05)	(1.16e-05)	(0.000835)
Observations	18	18	18	18
Weighted Avg. Median Price	$1,132	$147	$146	$2,372
R-squared	0.878	0.675	0.709	0.512

INPUT COST ADJUSTED PRICES

	Cervical Cancer Screening Converted	Colon Cancer Screening - Sigmoidoscopy	Diagnostic Blood Fecal Test	Diverticular Disease	Fibroids
% PC Own by Hosp	1.126**	2.500***	0.228**	4.212*	13.20***
	(0.0194)	(0.000233)	(0.0231)	(0.0892)	(0.00486)
Observations	18	18	18	18	18
Input cost adjusted Weighted Avg. Median Price	$67	$169	$11	$775	$704
R-squared	0.297	0.582	0.283	0.170	0.400

	Kidney (Renal) Failure	Sore Throat	Upper Respiratory Infection/ Common Cold (Adult)	Urinary Tract Stone
% PC Own by Hosp	10.36***	0.840***	0.569**	26.43***
	(3.04e-05)	(0.00539)	(0.0176)	(0.00546)
Observations	18	18	18	18
Input cost adjusted Weighted Avg. Median Price	$848	$110	$110	$1,764
R-squared	0.673	0.393	0.304	0.392

*Notes: % PC Own by Hosp = % of primary care physicians who work for a foundation owned by a hospital or health system. Input cost adjusted prices were computed by deflating unadjusted prices by the Medicare Wage Index https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/wageindex.html . Regressions are weighted by rating area population. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A21. The association between cardiology procedure prices and the percent of cardiologists in a rating area who work for foundations owned by a hospital or health system, 2014 (weighted by rating area population)

UNADJUSTED PRICES

	Cardiomyopathy (Heart Muscle Disease)	Cardiovascular Symptoms (Other)	Coronary Artery Disease with Heart Bypass Surgery
% CAR Own by Hosp	11.08*	3.825***	216.4
	(0.0625)	(0.00375)	(0.569)
Observations	17	18	17
Weighted Avg. Median Price	$1,774	$533	$63,191
R-squared	0.213	0.418	0.022

INPUT COST ADJUSTED PRICES

	Cardiomyopathy (Heart Muscle Disease)	Cardiovascular Symptoms (Other)	Coronary Artery Disease with Heart Bypass Surgery
% CAR Own by Hosp	3.698	1.716*	20.78
	(0.388)	(0.0930)	(0.906)
Observations	17	18	17
Input cost adjusted Weighted Avg. Median Price	$1,345	$403	$46,652
R-squared	0.050	0.166	0.001

*Notes: % CAR Own by Hosp = % of cardiologists who work for a foundation owned by a hospital or health system. Input cost adjusted prices were computed by deflating unadjusted prices by the Medicare Wage Index https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/wageindex.html . Regressions are weighted by rating area population. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A22. The association between hematology/oncology procedure prices and the percent of hematologists/oncologists in a rating area who work for foundations owned by a hospital or health system, 2014 (weighted by rating area population)

UNADJUSTED PRICES

	Breast Cancer	Lung, Bronchi, or Mediastinum Cancer	Prostate Cancer
% HEM/ONC Own by Hosp	21.69**	367.6*	4.928
	(0.0116)	(0.0771)	(0.722)
Observations	18	13	17
Weighted Avg. Median Price	$4,461	$32,759	$4,594
R-squared	0.337	0.257	0.009

INPUT COST ADJUSTED PRICES

	Breast Cancer	Lung, Bronchi, or Mediastinum Cancer	Prostate Cancer
% HEM/ONC Own by Hosp	10.29**	192.9*	-2.520
	(0.0360)	(0.0949)	(0.822)
Observations	18	13	17
Input cost adjusted Weighted Avg. Median Price	$3,369	$24,449	$3,504
R-squared	0.247	0.233	0.003

*Notes: % HEM/ONC Own by Hosp = % of hematologists/oncologists who work for a foundation owned by a hospital or health system. Input cost adjusted prices were computed by deflating unadjusted prices by the Medicare Wage Index https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/wageindex.html . Regressions are weighted by rating area population. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A23. The association between orthopedics procedure prices and the percent of orthopedists in a rating area who work for foundations owned by a hospital or health system, 2014 (weighted by rating area population)

UNADJUSTED PRICES

	Ankle Fracture/ Sprain	Knee Ligament Injury	Wrist or Hand Fracture/ Dislocation/ Sprain
% ORS Own by Hosp	2.439	1.712**	3.178*
	(0.113)	(0.0135)	(0.0535)
Observations	18	18	18
Weighted Avg. Median Price	$500	$273	$496
R-squared	0.149	0.325	0.214

INPUT COST ADJUSTED PRICES

	Ankle Fracture/ Sprain	Knee Ligament Injury	Wrist or Hand Fracture/ Dislocation/ Sprain
% ORS Own by Hosp	0.308	0.373	0.777
	(0.814)	(0.590)	(0.350)
Observations	18	18	18
Input cost adjusted Weighted Avg. Median Price	$380	$208	$373
R-squared	0.004	0.019	0.055

*Notes: % ORS Own by Hosp = % of orthopedists who work for a foundation owned by a hospital or health system. Input cost adjusted prices were computed by deflating unadjusted prices by the Medicare Wage Index https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/wageindex.html . Regressions are weighted by rating area population. p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A24. Individual Procedure Prices (2014) and ACA Premiums (2016) by HHI Level

	HHI < 1,500	HHI ≥ 1,500	% Difference
Avg. Inpatient Procedure Price	**$139,909**	**$250,203**	**79%**
# of rating areas (Hospital HHI)	*6*	*12*	
Heart Attack (Acute Myocardial Infarction)	*$19,210*	*$21,681*	*13%*
Partial Hip Replacement Revision	*$32,086*	*44,200*	*38%*
Premature Baby (Extremely Low Weight)	*$368,431*	*$684,728*	*86%*
Avg. Outpatient Primary Care Procedure Price	**$665**	**$898**	**35%**
*# of rating areas (Primary Care HHI***)*	*12*	*6*	
Cervical Cancer Screening Converted	*$88*	*$110*	*25%*
Colon Cancer Screening – Sigmoidoscopy	*$224*	*$290*	*29%*
Diagnostic Blood Fecal Test	*$15*	*$27*	*80%*
Diverticular Disease	*$967*	*$1,419*	*47%*
Fibroids	*$918*	*$1,475*	*61%*
Kidney (Renal) Failure	*$1,106*	*$1,438*	*30%*
Sore Throat	*$139*	*$183*	*32%*
Upper Respiratory Infection/Common Cold (Adult)	*$137*	*$180*	*31%*
Urinary Tract Stone	*$2,388*	*$2,964*	*24%*
Avg. Outpatient Hematology/Oncology Procedure Price	**$13,762**	**$20,819**	**51%**
# of rating areas (Hematology/Oncology HHI)	*11*	*7*	
Breast Cancer	*$4,255*	*$5,362*	*26%*
Lung, Bronchi, or Mediastinum Cancer	*$32,466*	*$51,421*	*58%*
Prostate Cancer	*$4,564*	*$5,675*	*24%*
Avg. Outpatient Orthopedist Procedure Price	**$439**	**$715**	**63%**
# of rating areas (Orthopedics HHI)	*17*	*1*	
Ankle Fracture/Sprain	*$515*	*$911*	*77%*
Knee Ligament Injury	*$272*	*$387*	*42%*
Wrist or Hand Fracture / Dislocation / Sprain	*$531*	*$849*	*60%*
	HHI < 2,500	HHI ≥ 2,500	% Difference
Avg. ACA Benchmark Plan Monthly Premium	**$318**	**$363**	**14%**
# of rating areas	*9*	*10*	

*Notes: The average reported above is a straight average across the procedures within each category. Cardiology prices are not reported as no rating areas had a cardiology HHI below 1,500 (see Table A1 in the appendix). The premiums listed in Table A2 were used for the analysis of Avg. ACA Benchmark Plan Monthly Premiums. *** Primary Care HHI was calculated at the primary care service area (PCSA)-level and then weighted up to the rating area-level (see Goodman et al. (2003) for details on PCSAs). All other HHIs were calculated directly at the rating area-level.*

Table A25. Input Cost Adjusted Individual Procedure Prices (2014) and ACA Premiums (2016) by HHI Level

	HHI < 1,500	HHI ≥ 1,500	% Difference
Input Cost Adjusted Avg. Inpatient Procedure Price	**$108,483**	**$165,119**	**52%**
# of rating areas (Hospital HHI)	*6*	*12*	
Heart Attack (Acute Myocardial Infarction)	*$14,933*	*$15,334*	*3%*
Partial Hip Replacement Revision	*$24,974*	*$30,202*	*21%*
Premature Baby (Extremely Low Weight)	*$285,543*	*$449,820*	*58%*
Input Cost Adjusted Avg. Outpatient Primary Care Procedure Price	**$472**	**$622**	**32%**
*# of rating areas (Primary Care HHI***)*	*12*	*6*	
Cervical Cancer Screening Converted	*$61*	*$78*	*28%*
Colon Cancer Screening – Sigmoidoscopy	*$159*	*$198*	*25%*
Diagnostic Blood Fecal Test	*$10*	*$18*	*80%*
Diverticular Disease	*$704*	*$965*	*37%*
Fibroids	*$656*	*$1,017*	*55%*
Kidney (Renal) Failure	*$794*	*$993*	*25%*
Sore Throat	*$100*	*$126*	*26%*
Upper Respiratory Infection/Common Cold (Adult)	*$99*	*$124*	*25%*
Urinary Tract Stone	*$1,662*	*$2,078*	*25%*
Input Cost Adjusted Avg. Outpatient Hematology/Oncology Procedure Price	**$10,370**	**$13,269**	**28%**
# of rating areas (Hematology/Oncology HHI)	*11*	*7*	
Breast Cancer	*$3,198*	*$3,562*	*11%*
Lung, Bronchi, or Mediastinum Cancer	*$24,470*	*$32,404*	*32%*
Prostate Cancer	*$3,442*	*$3,842*	*12%*
Input Cost Adjusted Avg. Outpatient Orthopedist Procedure Price	**$311**	**$577**	**85%**
# of rating areas (Orthopedics HHI)	*17*	*1*	
Ankle Fracture/Sprain	*$365*	*$735*	*101%*
Knee Ligament Injury	*$194*	*$312*	*61%*
Wrist or Hand Fracture / Dislocation / Sprain	*$375*	*$685*	*83%*
	HHI < 2,500	HHI ≥ 2,500	% Difference
Avg. ACA Benchmark Plan Monthly Premium	**$233**	**$256**	**10%**
# of rating areas	*9*	*10*	

*Notes: The average reported above is a straight average across the procedures within each category. Cardiology prices are not reported as no rating areas had a cardiology HHI below 1,500 (see Table A1 in the appendix). *** Primary Care HHI was calculated at the primary care service area (PCSA)-level and then weighted up to the rating area-level (see Goodman et al. (2003) for details on PCSAs). All other HHIs were calculated directly at the rating area-level.*

Table A26. Northern California vs. Southern California Individual Procedure Prices (2014) and ACA Premiums (2016)

	South	North	% Difference
Avg. Inpatient Procedure Price	**$131,586**	**$223,278**	**70%**
Avg. Hospital HHI	*1,047*	*2,202*	*110%*
Heart Attack (Acute Myocardial Infarction)	*$19,371*	*$21,408*	*11%*
Partial Hip Replacement Revision	*$32,741*	*$43,017*	*31%*
Premature Baby (Extremely Low Weight)	*$342,646*	*$605,408*	*77%*
Avg. Outpatient Primary Care Procedure Price	**$588**	**$802**	**36%**
*Avg. Primary Care HHI****	*996*	*1,420*	*43%*
Cervical Cancer Screening Converted	*$83*	*$100*	*20%*
Colon Cancer Screening – Sigmoidoscopy	*$187*	*$268*	*43%*
Diagnostic Blood Fecal Test	*$9*	*$22*	*144%*
Diverticular Disease	*$897*	*$1,203*	*34%*
Fibroids	*$700*	*$1,259*	*80%*
Kidney (Renal) Failure	*$1,020*	*$1,292*	*27%*
Sore Throat	*$136*	*$160*	*18%*
Upper Respiratory Infection/Common Cold (Adult)	*$134*	*$158*	*18%*
Urinary Tract Stone	*$2,125*	*$2,755*	*30%*
Avg. Outpatient Cardiology Procedure Price	**$17,653**	**$28,955**	**64%**
Avg. Cardiology HHI	*352*	*857*	*143%*
Cardiomyopathy (Heart Muscle Disease)	*$1,735*	*$1,922*	*11%*
Cardiovascular Symptoms (Other)	*$503*	*$570*	*13%*
Coronary Artery Disease with Heart Bypass Surgery	*$50,720*	*$84,374*	*66%*
Avg. Outpatient Hematology/Oncology Procedure Price	**$11,905**	**$18,445**	**55%**
Avg. Hematology/Oncology HHI	*823*	*2,257*	*174%*
Breast Cancer	*$4,185*	*$4,878*	*17%*
Lung, Bronchi, or Mediastinum Cancer	*$27,187*	*$45,243*	*66%*
Prostate Cancer	*$4,343*	*$5,213*	*20%*
Avg. Outpatient Orthopedist Procedure Price	**$396**	**$477**	**20%**
Avg. Orthopedist HHI	*263*	*851*	*224%*
Ankle Fracture/Sprain	*$474*	*$561*	*18%*
Knee Ligament Injury	*$270*	*$282*	*4%*
Wrist or Hand Fracture / Dislocation / Sprain	*$445*	*$589*	*32%*
Avg. ACA Benchmark Plan Monthly Premium	**$271**	**$367**	**35%**
Avg. Insurer HHI	*1,919*	*2,700*	*41%*

*Notes: The average reported above is a straight average across the procedures within each category. Cardiology prices are not reported as no rating areas had a cardiology HHI below 1,500 (see Table A1 in the appendix). The premiums listed in Table A2 were used for the analysis of Avg. ACA Benchmark Plan Monthly Premiums. *** Primary Care HHI was calculated at the primary care service area (PCSA)-level and then weighted up to the rating area-level (see Goodman et al. (2003) for details on PCSAs). All other HHIs were calculated directly at the rating area-level.*

Table A27. Northern California vs. Southern California Input Cost Adjusted Individual Procedure Prices (2014) and ACA Premiums (2016)

	South	North	% Difference
Input Cost Adjusted Avg. Inpatient Procedure Price	**$111,816**	**$147,922**	**32%**
Avg. Hospital HHI	*1,047*	*2,202*	*110%*
Heart Attack (Acute Myocardial Infarction)	*$16,315*	*$14,725*	*-10%*
Partial Hip Replacement Revision	*$27,517*	*$28,822*	*5%*
Premature Baby (Extremely Low Weight)	*$291,615*	*$400,218*	*37%*
Input Cost Adjusted Avg. Outpatient Primary Care Procedure Price	**$495**	**$532**	**8%**
*Avg. Primary Care HHI****	*996*	*1,420*	*43%*
Cervical Cancer Screening Converted	*$70*	*$66*	*-6%*
Colon Cancer Screening – Sigmoidoscopy	*$157*	*$178*	*13%*
Diagnostic Blood Fecal Test	*$8*	*$15*	*88%*
Diverticular Disease	*$754*	*$806*	*7%*
Fibroids	*$590*	*$848*	*44%*
Kidney (Renal) Failure	*$858*	*$861*	*0%*
Sore Throat	*$114*	*$106*	*-7%*
Upper Respiratory Infection/Common Cold (Adult)	*$113*	*$105*	*-7%*
Urinary Tract Stone	*$1,790*	*$1,805*	*1%*
Input Cost Adjusted Avg. Outpatient Cardiology Procedure Price	**$14,844**	**$18,954**	**28%**
Avg. Cardiology HHI	*352*	*857*	*143%*
Cardiomyopathy (Heart Muscle Disease)	*$1,460*	*$1,267*	*-13%*
Cardiovascular Symptoms (Other)	*$423*	*$383*	*-9%*
Coronary Artery Disease with Heart Bypass Surgery	*$42,648*	*$55,212*	*29%*
Input Cost Adjusted Avg. Outpatient Hematology/Oncology Procedure Price	**$10,042**	**$12,071**	**20%**
Avg. Hematology/Oncology HHI	*823*	*2,257*	*174%*
Breast Cancer	*$3,521*	*$3,270*	*-7%*
Lung, Bronchi, or Mediastinum Cancer	*$22,934*	*$29,397*	*28%*
Prostate Cancer	*$3,670*	*$3,547*	*-3%*
Input Cost Adjusted Avg. Outpatient Orthopedics Procedure Price	**$333**	**$324**	**-3%**
Avg. Orthopedist HHI	*263*	*851*	*224%*
Ankle Fracture/Sprain	*$399*	*$381*	*-5%*
Knee Ligament Injury	*$227*	*$191*	*-16%*
Wrist or Hand Fracture / Dislocation / Sprain	*$374*	*$399*	*7%*
Input Cost Adjusted Avg. ACA Benchmark Plan Monthly Premium	**$228**	**$251**	**10%**
Avg. Insurer HHI	*1,919*	*2,700*	*41%*

*Notes: The average reported above is a straight average across the procedures within each category. *** Primary Care HHI was calculated at the primary care service area (PCSA)-level and then weighted up to the rating area-level (see Goodman et al. (2003) for details on PCSAs). All other HHIs were calculated directly at the rating area-level.*