



Health Care  
Cost Trends



# Health Care Provider Consolidation and Shortages

The Impact on Morbidity—Cost and  
Utilization

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## The Impact on Morbidity—Cost and Utilization

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# Health Care Provider Consolidation and Shortages

## The Impact on Morbidity—Cost and Utilization

### Executive Summary

In the past two decades, there has been considerable consolidation among U.S. health care providers, including among hospitals, physician practices, and private equity (PE) entities. And currently, the U.S. has been experiencing a shortage of physicians and other health care providers—shortages that are projected to be exacerbated in the next decade. In this paper, we explore the recent trends, current landscape and reasons for provider consolidations and provider shortages, as well as their impact on health care morbidity, specifically on health care costs and utilization.

Since 2006, hospital mergers and acquisitions (M&A) between hospitals (i.e., horizontal consolidation) have occurred at an average rate of approximately 80 per year, peaking at 117 unique transactions in 2017. In recent years, the rate of hospital M&A has slowed due to the COVID-19 pandemic, rising interest rates and increased regulatory scrutiny. Research has found that the increased concentration of hospitals into health care systems has resulted in larger health care systems: 68% of all community hospitals in 2023 are part of a health care system, up from 53% in 2005. The consolidation has been accompanied by closure of health care facilities due to deteriorating finances, as is evident in the decline in the number of U.S. hospitals from roughly 8,000 in 1998 to just over 6,000 in 2021.

With larger health systems has come a push to employ physicians as part of health systems or by other corporate entities, as opposed to physicians independently owning their practice. In 2013, 27% of physicians were employed by a hospital system, a share that increased to 52% in 2022. Factoring in other corporate entities, 74% of all physicians were employed by either a hospital system or another corporate entity in 2022. In the past decade, there has also been more private equity ownership of physician practices and other health care entities. Between 2012 and 2021, private equity firms engaged in 1,094 unique transactions involving U.S. physician practices, of which 484 took place in 2021.

Various reasons explain the consolidations among hospitals and physicians over the past two decades. These factors include legislative changes (most importantly, passage of the Affordable Care Act in 2010 and the Medicare Access and CHIP Reauthorization Act in 2015), deteriorating financial performance, potential operating-cost savings through economies of scale, increased revenue through enhanced market power in contract negotiations, ability to integrate care through various health care services, access to capital for enhancements of services and technology, and constraints of regulatory oversight.

Studies of the impacts of hospital consolidations show that negotiated prices at monopoly hospitals (i.e., hospitals that are the only hospital in a metropolitan area) are 12% higher than those in competitive markets. And studies of physician practices show increases of 1% to 20%, depending on the type of practice and size of the acquiring health system. Large price increases have similarly been observed among private-equity-backed physician groups, where increases as great as 20%

While consolidations can offer potential for reduced operating costs, existing research has shown that the consolidations and involvement of private equity firms have been accompanied by increases in health care costs and utilization of services, resulting in higher premiums and out-of-pocket cost sharing amounts by insurance premium payers.

have followed a PE transaction. These price increases are compounded by increases in utilization within acquiring health systems after mergers, as providers may steer health care referrals to system-owned hospitals and other system-employed physicians. Studies have shown 23% growth in specialist visits by patients of primary care practices acquired by hospital systems, as well as a 10% shift in cases from an independent ambulatory surgical center to a hospital outpatient department.

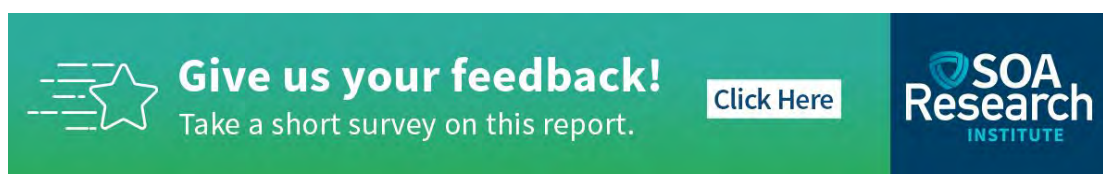
Meanwhile, shortages of health care providers exist across the nation, with 25% of people living in a county marked as a primary care health professional shortage area (HPSA). The shortages range from 10% in the Northeast to 58% in the West, according to HPSA data provided by the Health Resource & Services Administration. Projected medical worker shortages vary significantly by profession, with the largest gaps for low-wage (health care assistance and aides) and mental health workers. Projections show that these shortages of providers will become exacerbated. The Association of American Medical Colleges (AAMC) projects that by 2034, there will be a nationwide shortage of 18,000 to 48,000 primary care physicians and 21,000 to 77,000 non-primary care physicians. Further demand for behavioral health providers is expected to create a gap of more than 500,000 mental health workers by 2026. The shortage among lower-wage health care workers (including home health aides, medical assistants and nursing assistants) is projected to be 3.2 million by 2026.

The current and projected shortages result from many different factors, which include population growth, especially among those age 65 and older; aging of the current workforce; high levels of burnout in the medical field; limited slots in undergraduate, graduate and residency programs; and closure of hospitals and other health care facilities. Population projections show that the total U.S. population is expected to grow 10% from 2020 to 2035, while the population over 65 is expected to grow 39% over the same period, with higher population growth rates in the South and West. Among currently active physicians, 40% are expected to reach age 65 within the next decade. Reported levels of burnout—already 32% of physicians and 41% of nurses prior to the COVID-19 pandemic—rose to 40% of doctors and 49% of nurses in 2022. Health care facility closures, which are highest in rural areas, further exacerbate the shortage of medical professionals.

There is scant research demonstrating the specific effects of regional shortages on the cost or utilization of medical care; however, some studies suggest that the medical provider shortage has a greater impact in rural areas and decreases utilization among Medicaid patients. In one study, more than 90% of non-pediatric primary care physicians said they would accept new clients with Medicare and private insurance, but only 67% said the same about patients with Medicaid. According to the Medicare Payment Advisory Commission's (MedPAC's) 2021 report to Congress, rural and urban patients have similar utilization of overall care, but rural beneficiaries have fewer specialist visits, given the substantial distance to visit one.

Shortages of health care providers exist and are expected to be greater in the coming decade. In this paper, we outline the reasons for anticipated shortages and the impacts of shortages on costs and utilization by payer types and in rural and urban areas.

In Section 4, we present a framework for analyzing the cost and utilization of health care under three potential transactions: (1) an acquisition of a community hospital by a larger health system; (2) an acquisition of a multi-specialty physician practice by a large vertically integrated health system; and (3) an acquisition of a specialty physician practice by a private-equity-backed firm.



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## Section 1: Background

In this section, we present the research objective and methods, and any key terms used throughout this paper.

### 1.1 RESEARCH OBJECTIVE

The goal of this research is to present an overview of health care provider consolidations and shortages by provider type, geography and payer type (as applicable) and to provide a framework for estimating the impact of consolidation on morbidity (cost and utilization of health care services). The impact of each consolidation will vary based on the specifics of that market (concentration, rural vs. urban, etc.), the type of consolidation (vertical or horizontal) and the size of the entities involved. A significant amount of available research addresses provider consolidation and its impact, while research related to the impact of provider shortages is more limited. Based on the available literature, our paper covers the following research objectives:

- Summarize recent trends and the current landscape of provider consolidations, including horizontal consolidation among hospitals, horizontal consolidation among physicians, vertical consolidation, and private equity buyouts. Understand the drivers of these trends and the cost and utilization impacts resulting from these consolidations.
- Summarize the current landscape of provider shortages, considering differences by provider type, geography and payer type (commercial, Medicaid, Medicare, etc.). Understand the drivers of these trends and the cost and utilization impacts resulting from these shortages.
- Provide a framework and data sources for considering the impact of future consolidations.

Our research covers physicians, other clinicians (nurses, physician assistants, etc.), hospitals and some other facilities (skilled nursing facilities, ambulatory surgical centers, nursing homes). Our research does not include specific analysis on the impact caused or experienced by insurers, pharmacy benefit managers or other stakeholders in the health care space. The focus is on overall impacts and not, for example, insurer liability or plan premiums.

### 1.2 RESEARCH METHOD

The research method involved two phases. First, we performed a literature review to identify key trends and issues related to health care provider consolidation and provider shortages in the U.S. by provider type, geography and payer type, where available. We have presented hypotheses regarding the drivers of the consolidations and shortages, as well as the impact on morbidity—both cost and utilization—based on our review of existing research. The literature review was supplemented by several data analyses we compiled from underlying data sources, which we have presented throughout the paper.

Second, we walked through three example scenarios of consolidations and discussed considerations for each stakeholder in the market. Since each transaction is unique, we did not provide a single estimate of the cost and utilization impact, but rather a framework for identifying what components may change after a consolidation. We also listed relevant data sources that can be used in analyzing such a transaction.

### 1.3 KEY TERMS

Several key terms are used in this paper:

- **Vertical consolidation** is a merger or acquisition of companies that produce upstream/downstream services. An example of a vertical consolidation within a health care setting would be the acquisition of physician practices by a hospital or hospital system (NCCI 2018).
- **Horizontal consolidation** is a merger or acquisition of companies producing the same or similar services—for example, the acquisition of a hospital by another hospital or hospital system (NCCI 2018).
- A **shortage** is the condition that occurs when demand exceeds supply. Shortages can be temporary distributions or ongoing or projected concerns. The primary source of shortage information used in this paper is the Health Resources & Services Administration (HRSA). The HRSA designates shortage areas for three provider categories: primary care, dental health and mental health, generating a score based on the population-to-provider ratio, percent of population below 100% of the Federal Poverty Level, and travel time to the nearest source of care outside the designated shortage area (HRSA 2023).
- **Health care cost**, in the context of this report, generally means the total cost of care (medical and pharmacy costs) per patient.
- **Health care prices** are the costs charged by providers for delivering health care services to patients.
- **Health care allowed costs** are either set by government agencies (e.g., Medicare and Medicaid reimbursements) or negotiated with private payers (commercial insurance reimbursements). The allowed cost includes the amount reimbursed by the payer as well as any out-of-pocket cost paid by the member.
- **Hospital or physician operating costs** are components of determining health care prices. Operating costs include the costs to deliver care, which encompass facility costs (e.g., overhead) and staff costs (e.g., clinicians and administrative salaries).
- A **metropolitan area (metro)** is a core geographic area consisting of a large urban core together with surrounding communities. In some studies, the measurement of a metro area is a core-based statistical area (CBSA), which requires at least 50,000 people in the largest urban city. Other studies refer to Metropolitan Statistical Areas (MSAs), which include metros without a city surpassing 50,000 people (Baker 2016). CBSAs and MSAs are both official categories used by the United States Office of Management and Budget (OMB).

## Section 2: Health Care Provider Consolidation

In this section, we review the latest trends in health care provider consolidations, including horizontal and vertical consolidations, as well as mergers and acquisitions (M&A) of provider practices by private equity firms. We highlight differences by provider types and across geographic regions. Further, we review the drivers of health care provider consolidations and their impact on cost and utilization.

Some articles we found also reviewed and analyzed the impacts on health care quality. However, that topic is beyond the scope of this research project.

### 2.1 RECENT TRENDS AND CURRENT LANDSCAPE

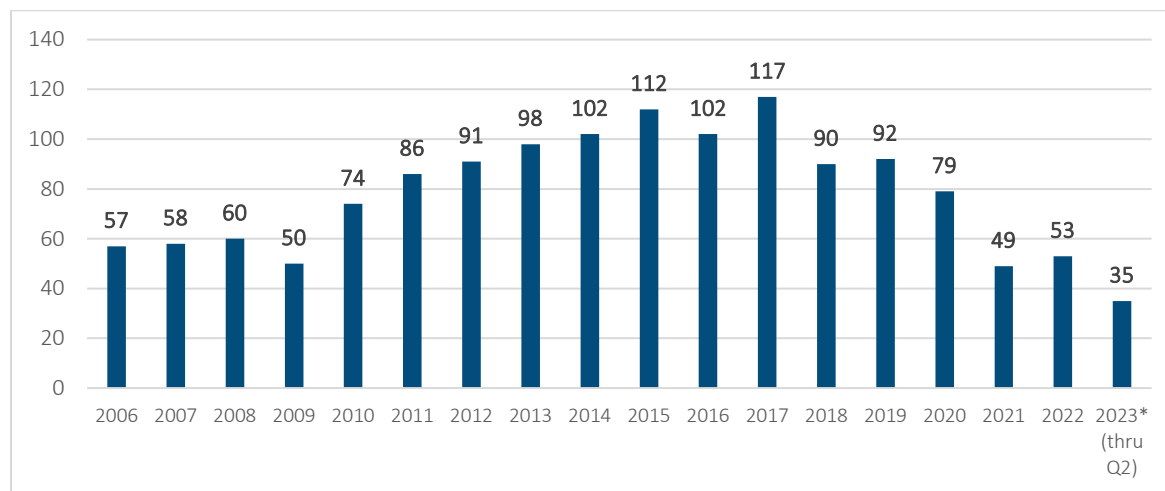
Consolidation among health care providers and hospitals is continuing through 2023. In this section, we present the latest findings and trends of hospital system consolidations (horizontal), ownership of private practices (vertical), and the growing trend of private equity ownership of provider practices. The underlying drivers of these results are discussed in Section 2.2, and the corresponding cost and utilization impacts are discussed in Section 2.3.

#### 2.1.1 HORIZONTAL CONSOLIDATIONS AMONG HOSPITALS

Each year Kaufman, Hall & Associates, LLC (Kaufman Hall), a management consulting firm in the health care industry, tracks M&A of U.S. hospitals and health systems. These transactions increased in the 2010s and peaked in 2017, when 117 M&A deals took place (see Figure 1). Recently, a slowdown in M&A activity coincided with the COVID-19 pandemic. Other reasons cited by the consultants for the drop-off in transactions include a higher-interest-rate environment increasing the cost of capital for such acquisitions and increased regulatory scrutiny of health care transactions (Kaufman Hall 2018; 2023b; 2023c).

Figure 1

#### COUNT OF MERGERS AND ACQUISITIONS OF U.S. HOSPITALS OR HEALTH SYSTEMS



\*2023 reported results are through June 2023.

Sources: Reported U.S. hospital mergers and acquisitions (Kaufman Hall 2018, 2023a, 2023b).

The results presented by Kaufman Hall align with American Hospital Association (AHA) data, reported by researchers from the University of Pennsylvania, demonstrating there were 1,887 hospital mergers in the U.S. between 1998 and 2021 (Levins 2023). Larger health care systems result in higher concentration of health care markets and have a



direct impact on competing hospitals (Gaynor 2018). From 1998 to 2021, there was an overall reduction in the total number of hospitals from 8,000 to just over 6,000 (Levins 2023). Based on AHA survey data, 66% of all community hospitals were part of a larger system in 2017, compared with 53% in 2005 (Schwartz et al. 2020). As of 2023, this figure has risen further to 68% (AHA 2023). Of these transactions, research shows that a large number occur between close competitors. In a study performed of hospital mergers between 2007 to 2011, one-third of all transactions were between hospitals within 15 miles of each other (Cooper et al. 2019). Another study showed that 61% of all transactions between 2009 and 2013 were acquisitions of another hospital within the same state (Beaulieu et al. 2020).

A commonly used metric to assess the concentration of a health care market is the Herfindahl-Hirschman Index (HHI). This index measures the market share across all competitors in a market, where a value close to 0 represents perfect competition and a value close to 10,000 represents a monopoly. The HHI is calculated by squaring the market share percentage for each entity and then adding those results. Based on the U.S. Department of Justice Horizontal Merger Guidelines, markets with HHI values greater than 2,500 are considered highly concentrated, those between 1,500 and 2,500 moderately concentrated, and those with values less than 1,500 not concentrated (U.S. DOJ, 2018). The Health Care Cost Institute (HCCI 2023a) reports that the majority (71%) of hospital markets, measured as CBSAs, were already highly concentrated in 2017, rising to 77% in 2021.

Table 1 shows the 2021 hospital HHI of selected U.S. metros, as well as each metro's population, health care cost index and cost-of-living index. The top portion of the table includes the values for the 25 largest U.S. metros by population size, while the bottom portion shows the 10 metros with the largest hospital HHI. In the column for the hospital HHI, a heat map uses darker blue cells to indicate low concentration and darker red values to indicate high concentration. The heat map makes clear one of HCCI's main findings: the larger metro areas tend to be less concentrated than the smaller metro areas. Further demonstrating this pattern, metros that include some of the largest U.S. cities—New York, Los Angeles, Chicago, Washington, DC, Philadelphia, Miami, Riverside and Seattle—rank among the bottom 10 in terms of their HHI.

Table 1

#### HERFINDAHL-HIRSCHMAN INDEX (HHI) AND COST INDICES FOR SELECTED U.S. HOSPITAL METROPOLITAN AREAS

Rank by Population	State(s)	Metropolitan Area	2022 Population (000s)	2021 Health Care Cost Index	2021 Cost-of-Living Index	2021 Hospital HHI
1	NY-NJ-PA	New York–Newark–Jersey City	19,618	1.30	1.28	775
2	CA	Los Angeles–Long Beach–Anaheim	12,872	1.25	1.41	1,059
3	IL-IN-WI	Chicago–Naperville–Elgin	9,442	0.98	1.00	1,356
4	TX	Dallas–Fort Worth–Arlington	7,944	1.12	0.99	1,889
5	TX	Houston–The Woodlands–Sugar Land	7,340	1.02	0.96	2,550
6	DC-VA-MD-WV	Washington–Arlington–Alexandria	6,374	0.98	1.20	1,156
7	PA-NJ-DE-MD	Philadelphia–Camden–Wilmington	6,241	1.01	1.03	1,226
8	GA	Atlanta–Sandy Springs–Roswell	6,222	1.22	1.00	2,007
9	FL	Miami–Fort Lauderdale–West Palm Beach	6,139	1.06	1.10	1,359
10	AZ	Phoenix–Mesa–Scottsdale	5,016	0.93	1.04	3,161
11	MA-NH	Boston–Cambridge–Newton	4,901	1.09	1.33	2,123
12	CA	Riverside–San–Bernardino–Ontario	4,668	1.14	1.16	657
13	CA	San Francisco–Oakland–Hayward	4,580	1.77	1.79	1,867
14	MI	Detroit–Warren–Dearborn	4,346	0.80	0.93	2,129
15	WA	Seattle–Tacoma–Bellevue	4,034	1.18	1.25	1,419
16	MN-WI	Minneapolis–St. Paul–Bloomington	3,694	1.18	1.05	2,281
17	FL	Tampa–St. Petersburg–Clearwater	3,291	1.13	1.01	1,966
18	CA	San Diego–Carlsbad	3,276	1.36	1.36	2,441
19	CO	Denver–Aurora–Lakewood	2,986	1.16	1.12	2,414

20	MD	Baltimore-Columbia-Towson	2,836	0.87	1.07	1,411
21	MO-IL	St. Louis	2,801	0.88	0.90	2,527
22	FL	Orlando-Kissimmee-Sanford	2,764	1.10	1.01	3,773
23	NC-SC	Charlotte-Concord-Gastonia	2,756	1.11	0.98	3,030
24	TX	San Antonio-New Braunfels	2,655	0.95	0.93	3,228
25	OR-WA	Portland-Vancouver-Hillsboro	2,509	1.24	1.17	2,580
<b>1-25</b>	<b>Weighted average (by population)</b>		<b>139,304</b>	<b>1.13</b>	<b>1.15</b>	<b>1,716</b>
<b>26-183</b>	<b>Weighted average (by population)</b>		<b>100,465</b>	<b>1.04</b>	<b>0.98</b>	<b>3,244</b>
64	FL	Cape Coral-Fort Myers	822	1.07	1.02	6,804
71	NC	Wilmington	746	1.00	0.99	7,719
117	IL	Peoria	396	1.08	0.87	5,648
129	SC	Spartanburg	346	0.98	0.91	5,910
130	NE	Lincoln	342	1.05	0.95	5,963
140	TN-VA	Kingsport-Bristol-Bristol	311	0.91	0.86	7,590
153	MI	Kalamazoo-Portage	261	0.89	0.89	5,626
158	WA	Bellingham	231	1.35	1.12	6,692
163	TN	Johnson City	210	0.87	0.88	8,246
180	MO-KS	St. Joseph	120	0.97	0.86	6,219
<b>Total</b>	<b>Weighted average</b>		<b>239,769</b>	<b>1.10</b>	<b>1.08</b>	<b>2,356</b>

Sources and notes: Population census data is from the U.S. Census Bureau (2022b: metropolitan statistical area population tables, vintage 2022). The population of 240 million in the table includes only people in one of the 183 CBSAs (metro areas). The remaining U.S. population (total U.S. population is approximately 315 million in 2022) resides outside these CBSAs. HHI values are the reported hospital HHIs from HCCI 2023a, which are available for 183 CBSAs. The reported cost index is an aggregate cost index that includes inpatient, outpatient and physician costs and is reported from HCCI 2023b; values are normalized to the nationwide average, 1.00. Cost of living is the AdvisorSmith Cost of Living Index (AdvisorSmith 2023), based on the primary city listed for each metropolitan area. Values are normalized to the nationwide average, 1.00. For full results across all 183 metros, see the appendix.

We further analyzed the concentration of metro areas by indices for health care costs and cost of living. We observed that in areas where the cost of living was at least 1.10, or higher than average (compared with nationwide), representing 25 metro areas and 25% of the total U.S. population, the hospital concentration index was 27% lower than for metro areas with a cost-of-living index less than 1.10, representing 158 metros and 47% of the U.S. population. The relationship between the overall health care cost index and the health care concentration index is more complicated, as there was no apparent pattern between the two.

Going forward, Kaufman Hall expects further consolidations to continue, given some hospitals are still experiencing financial pressures, as well as for strategic reasons. They point to the fact that the median hospital operating margin was 0.2% for 2022, representing the worst financial year since the start of the pandemic. They also predict that further large transformational mergers will continue, noting that the average revenue of a hospital acquired in 2022 exceeded \$850 million, which surpassed the previous high of \$619 million in 2021 (Kaufman Hall 2023c).

### 2.1.2 HORIZONTAL CONSOLIDATIONS AMONG PHYSICIANS

Transactions involving acquisition of a physician practice or group of practices are smaller than combinations of hospitals, so they are harder to track. According to a study of physician market concentration by Capps and his team, nearly all transactions involving physician practices are below the threshold required to report the transaction to federal antitrust authorities. The researchers also found that the smallest physician practices (groups of 10 or fewer) were more likely to consolidate with larger group practices (groups more than 10) over the study period from 2007 to 2013 (Capps, Dranove and Ody 2017).

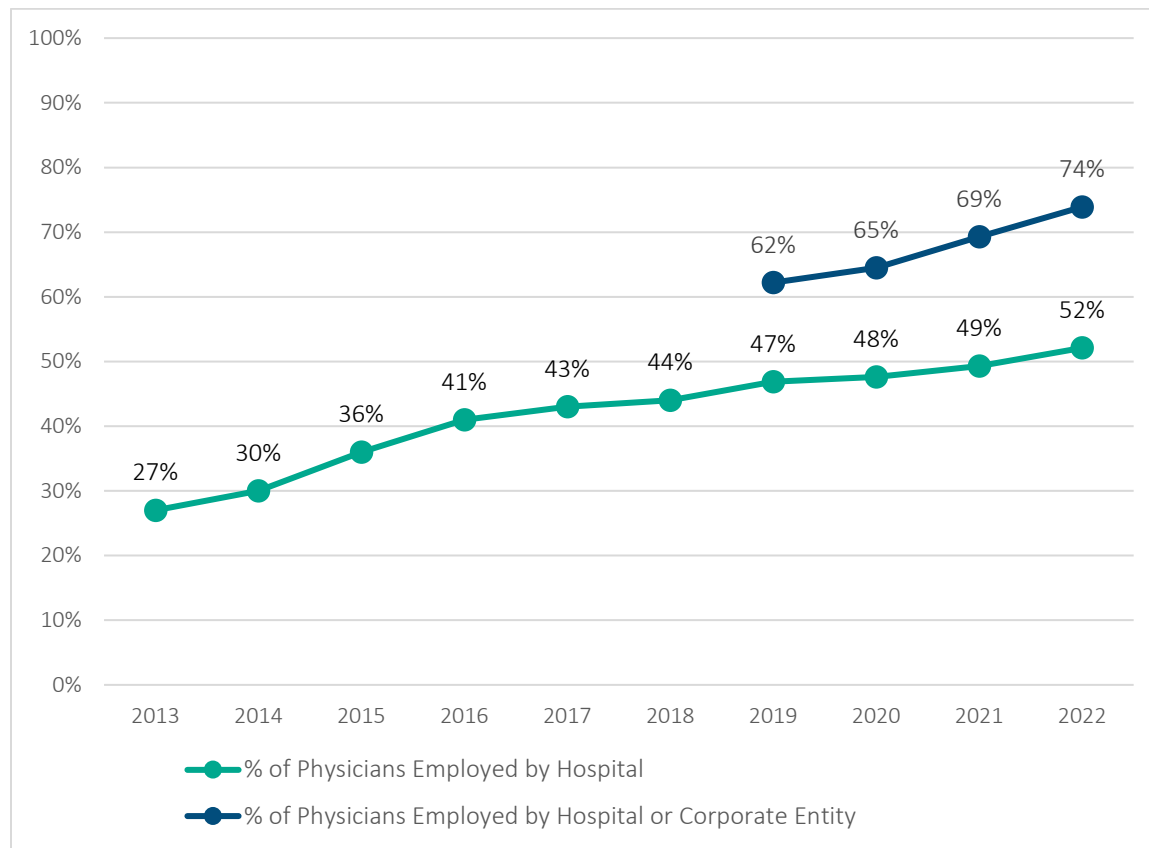
### 2.1.3 VERTICAL CONSOLIDATIONS OF PHYSICIANS

While vertical consolidations in the health care industry can apply to various types of providers (such as allied health providers) or health care facilities (such as skilled nursing facilities), here we primarily focus on vertical consolidation of physicians that become employees of a health system or larger corporate entity.

Survey data from 2008 shows that 16% of physicians were employed by a hospital or community health center, while the majority, 66%, worked in a solo or group practice (Boukus, Cassil and O’Malley 2009). As shown in Figure 2, this employment percentage shifted during the 2010s and 2020s, as annual results reported by the Physicians Advocacy Institute (PAI) show that the percentage of physicians employed by a hospital increased from 27% in 2013 and to 52% in 2022 (PAI 2019; 2022a). Additionally, starting in 2019, PAI began tracking physicians employed by a corporate entity (where a corporate entity is defined as a health insurer, private equity firm or an umbrella corporation owning multiple physician practices). These results show that physician employment by corporate entities increased from 15% in 2019 to 22% in 2022. Overall, the majority of physicians are no longer employed in a solo or group practice, as 74% of all physicians were employed in 2022 by either a hospital system or corporate entity.

Figure 2

#### EMPLOYMENT OF U.S. PHYSICIANS BY A HOSPITAL OR CORPORATE ENTITY



Sources and notes: Results are from PAI 2018 and PAI 2022a, based on data reported in the SK&A data set. Percentage of physicians employed is reported as of January of each year. Values for physicians employed by a corporate entity are not available prior to 2019. Physicians are defined as MDs and DOs and do not include nurse practitioners or physician assistants.

Applying the HHI to physicians’ markets, as Fulton did in his 2017 study, shows that 39% of metropolitan areas were highly concentrated (HHI greater than 2,500) among primary care physicians (Fulton 2017). This value was greater

among specialists, for which 65% of all metros were highly concentrated in 2016. A more recent measurement of the HHI across physicians was not available. The Physicians Advocacy Institute studied the employment rates by hospitals or other corporate entities across categories of specialties, including internal medicine, surgical, pediatricians and all other specialists. Their 2022 results show that internal medicine physicians had the highest employment rates by hospitals or corporate entities, 84%, while all other specialists had the lowest, 64% (PAI 2022b). Across all regions in 2022, the Midwest had the highest percentage, 80%, of physicians employed by hospitals or other corporate entities, while the South had the lowest, at 71% (PAI 2022a).

#### 2.1.4 PRIVATE EQUITY OWNERSHIP

Similar to hospital acquisitions of physician groups, the majority of acquisitions of a physician group by a PE firm are below the thresholds required for regulatory scrutiny and are reported at even lower rates than non-PE deals. One study found that the frequency of reporting acquisition deals to antitrust authorities was 25% less for deals by PE firms than for deals by non-PE firms, even when controlling for the size of the transaction (Asil, Barrios and Wollmann 2023).

Accounting of PE deals in the health care industry is primarily based on those reported in PitchBook, a private M&A database of PE deals. One study of PE-related transactions from 2013 to 2016 found that of the approximately 18,000 unique physician practices in the U.S., PE firms acquired 355 practices (involving nearly 6,000 physicians). These practices were primarily represented by the following physician specialty distribution: anesthesiology (19%), multi-specialty (19%), emergency medicine (12%), family practice (11%) and dermatology (10%) (Zhu et al. 2020). A more recent analysis of PE-related health care deals conducted by researchers at the University of California, Berkeley (UCB) found that PE deals have continued to increase: there were 75 reported physician acquisition deals in 2012, increasing to 484 deals in 2021 (Scheffler et al. 2023).

Of the 1,094 deals reviewed over the 10-year period by Scheffler and his colleagues, 34% were for dermatology practices, 25% for ophthalmology, 11% for gastroenterology and 11% for primary care. In 2021, the concentration of PE ownership across U.S. metros was widespread and had experienced significant growth from prior years. The UCB researchers found that in 28% (108 out of 384) of MSAs, a single PE firm had more than 30% of the market share for one or more of the 10 specialties reviewed (including primary care), and 13% of MSAs had a single PE firm attaining a 50% market share. In 2012, less than 2% of the MSAs had this same concentration. Of the 108 MSAs, the five specialties represented were urology, oncology, orthopedic, dermatology and radiology (Scheffler et al. 2023). Looking further at concentration of other specialties, research shows 25% of all U.S. emergency rooms were staffed by clinicians (physicians, physician assistants and nurse practitioners) employed by PE firms as of December 2022 (Adelman 2023). Another recent study of anesthesia providers found that 19% of all physicians were employed by PE firms or publicly traded companies in 2019, which was a marked increase from 3% as of 2009 (Adler, Milhaupt and Valdez 2023).

Private equity investments in the health care space also include acquisitions of hospitals and other health care facilities, such as nursing homes and ambulatory surgical centers (ASCs). Details on ownership of facilities by PE firms across the health care industry is not comprehensive; however, existing research shows that 204 hospitals were acquired by PE firms between 2005 and 2017 (Bruch, Gondi and Song 2020). Additionally, 12% of nursing homes were reportedly owned by PE firms in 2008 (GAO 2010), and as of 2011, this value was reported to be 10% (Scheffler, Alexander and Godwin 2021). From our review of existing research, a full accounting of PE ownership of ASCs is not yet available; however, one study found that of 193 PE investments in surgery facilities and physician practices between 2000 and 2020, 100 were for ASCs (Billig, Kotsis and Chung 2021).

The UCB researchers observed that PE deals of physician practices were temporarily slowed by the COVID-19 pandemic, but this pace accelerated to pre-pandemic levels in 2021 (Scheffler et al. 2023). Another study found that PE investment in the health care industry makes up a significant portion (10%) of deals across all industries, based on 2021 PitchBook data (Bugbee 2023). Additional PE deals are expected, as PE firms generally have a limited investment time frame (often three to seven years), leading to further consolidations and buyouts (MedPAC 2021); however, new PE deals could be affected by recent rises in interest rates (Scheffler et al. 2023).

## 2.2 REASONS FOR CONSOLIDATIONS

As shown in Section 2.1, consolidation of both physicians and hospitals has increased significantly over the past two decades. The causes for the intensification are many and overlap when we look at mergers and acquisitions of physician practices and hospitals. In this section, we highlight the prominent reasons for past consolidations; however, this is not an exhaustive list, as there often are many other factors involved for each individual transaction.

### Legislative Changes

The passage of the Affordable Care Act (ACA) in 2010 and the Medicare Access and CHIP Reauthorization Act (MACRA) in 2015 set the stage for further consolidation based on key provisions in those acts. Specifically, the ACA both encouraged formation of Accountable Care Organizations (ACOs) for adoption of Medicare alternative payment models and provided incentives for movement of patient care from an inpatient to an outpatient setting (NCCI 2018). ACOs enhance integration of care by aligning operational services, clinical services and financial incentives among providers (Brown and King 2016). Consolidating into larger organizations that serve more plan enrollees allows for taking on increased risk through value-based care arrangements, as opposed to traditional fee-for-service (FFS) reimbursement. Research shows that not all ACOs require integration of both hospital and physician services, but most ACO arrangements are vertically integrated (Brown and King 2016). The passage of MACRA further pushed providers to consolidate in an ACO, as there were increased physician fee bonuses based on participation in alternative payment models.

### Financial Distress and Administrative Burden

Significant changes in reimbursement programs and quality incentive programs have increased the administrative burden of operating a physician practice as well as a hospital system. Increases in administrative functions require more staff or less time with patients (Brown and King 2016). According to Kaufman Hall, 40% of transactions between 2015 and 2019 involved a hospital that was financially challenged or financially distressed (defined as having operating margins at or below -2% for multiple years prior to an acquisition). The COVID-19 pandemic exacerbated financial distress among hospitals. Prior to the pandemic, 25% of hospitals had a negative operating margin, but this percentage increased to half of hospitals in 2021 (Kaufman Hall 2021).

### Economies of Scale and Increased Market Power

Horizontal and vertical consolidations and PE acquisitions offer the potential to gain efficiencies through elimination of redundant services (including both administrative functions and overlapping clinical care services) and to attain economies of scale through enhanced purchasing power (NCCI 2018). According to MedPAC (2020), larger practice groups are able to obtain higher rates from private insurance payers than smaller practices. In a larger consolidated organization, the increased market power provides a stronger position in private insurance contract negotiation (Schwartz et al. 2020). For the larger health systems, acquiring local physician practices offers potential for an increase in patient referrals (Brown and King 2016).

### Integration of Care Through Capital Investments

A commonly cited reason for both horizontal and vertical consolidations is that joining two entities will enable the consolidated organization to gain efficiencies through improved integration of health care services and a reduction in fragmentation among providers. After a smaller hospital consolidates with a larger system, it often receives capital infusions to provide for enhanced services, including technology upgrades to electronic medical records and other care coordination resources (NCCI 2018). Research shows that when larger physician groups are purchased by a hospital, they increase their use of health information technology, electronic health records, and care management processes. These upgrades allow for an easier transition to value-based care and risk-based reimbursements. Joining hospital and physician services can enable an alignment of financial incentives and a reduction in duplicative or unnecessary care (Brown and King 2016). Providing access to capital for practice improvements and operational efficiencies are also reasons cited for the growth in PE deals of physician practices (Singh et al. 2022).

### Regulatory Constraints

Consolidations among hospitals and physicians pose different regulatory challenges. As discussed in Section 2.1.2, nearly all physician acquisitions are below regulatory thresholds for reporting a transaction. According to MedPAC, the court systems have been more concerned about horizontal consolidations than vertical ones (MedPAC 2020). Altogether, at a federal level, the Federal Trade Commission (FTC) has challenged 2% to 3% of hospital mergers each year, which is consistent with overall challenges of mergers in other industries (MedPAC 2020; Capps et al. 2019). FTC officials have cited budgetary reasons as a constraint on their reviews (Schwartz et al. 2020). According to research by Hulver and Levinson (2023), the FTC has yet to challenge a cross-market merger (horizontal consolidations among hospitals in different geographic markets). The FTC has recently explored challenges of monopolistic practices backed by PE firms, as the FTC announced in September 2023 that it was suing the dominant anesthesia provider in Texas and its associated PE firm for consolidating anesthesia practices to drive up prices and profits (FTC 2023).

State-level review of mergers varies by state. Thirty-four states require that the attorney general be notified of some pending mergers, and the other states require no such notification. A smaller number of states require final merger approval from the state government. Additionally, some states consider a set of criteria to evaluate each transaction. In California, for example, criteria include the general public's interest and impacts on the access to care (Hulver and Levinson 2023).

## **2.3 COST AND UTILIZATION IMPACT**

In the previous two sections, we reviewed the recent trends and current landscape of provider consolidation (Section 2.1) and the drivers of those transactions (Section 2.2). In this section, we review the stated impacts as documented in various studies regarding changes in health care cost and utilization.

### **2.3.1 COST IMPACTS**

The following paragraphs highlight the cost impacts of a merger or acquisition involving a hospital (or hospital system) and physician practices. These impacts may vary across insured (private or commercial insurance, Medicare, Medicaid) or uninsured populations.

#### Hospital Operating Costs

As discussed in Section 2.2, a commonly cited reason for hospitals merging is the cost savings from reduction of hospital operating costs. An analysis performed by the consulting firm PwC found that consolidated hospital systems could reduce operating costs by 15% to 30%, but many hospital systems do not achieve this level of savings (Kaul, Prabha and Katragadda 2016). A 2021 study conducted by Charles River Associates on behalf of the American Hospital Association found that operating expenses were reduced by 3.3% for an acquired hospital (May, Noether, and Stearns 2021). In another study, the level of operating cost savings was in the range of 4% to 7% (Schmitt 2017). While these studies show the possibility of achieving operating savings through a consolidation, another recent study found that academic medical centers (AMCs) struggle to redesign clinical workflows and change their economic relationships with their own specialists and primary care providers (Kocher and Wachter 2023). Kocher and his team found that AMCs have historically not succeeded in delivering cost-effective care through new alternative payment models, as they have not adapted their compensation systems that regard volume over value and maintain complex organization structures that are resistant to change.

#### Health Care Costs for Patients: Horizontal Consolidations of Hospitals

While the studies on hospital operating costs have shown that mergers can result in operating cost efficiencies of the acquired hospital, other studies show that this does not lead to price decreases (i.e., lower costs for consumers). These price impacts are specific to commercial insurance, which are negotiated between a hospital system and payers, while Medicare and Medicaid have reimbursement structures not based on negotiations. Across the nation, the hospital prices negotiated by hospitals for commercial insurance vary widely from Medicare prices (White and Whaley 2019). One study of the hospital systems in Indiana found wide variation in the negotiated commercial prices as a percentage of Medicare prices. For inpatient and outpatient prices combined, the largest multi-hospital systems had the highest commercial prices, ranging from 281% to 370% of Medicare prices, while smaller independent community hospitals had the lowest commercial prices, ranging from 121% to 191% of Medicare prices (White 2017).

Research has shown that consolidations among hospitals are a driver for this variation. In an analysis on price impacts of highly concentrated markets, Cooper and his team (2019) found that negotiated prices at monopoly hospitals are 12% higher than those in competitive markets (ones with at least four other hospitals). Another analysis of all hospital mergers over a five-year period found that mergers of two hospitals within 5 miles of one another resulted in an average price increase of 6.2%, and that price increases continued for at least two years following the merger (Gaynor 2018). A different study of hospital mergers within the same state found price increases of 7% to 9% greater than control hospitals (Dafny, Ho and Lee 2019). Looking at mergers among out-of-state hospitals showed reimbursement rates increase 17% more than unacquired hospitals. Lewis and Pflum (2017) also found that nearby competitors in the area of the acquired hospital raised prices by 8% after market dynamics changed following the merger.

#### Health Care Costs for Patients: Horizontal Consolidations of Physicians

Research of consolidations of physician practices shows higher prices in highly concentrated markets and among larger practices. Baker and his team (2014) found the prices for physician office visits were 8% to 16% higher in the counties with higher HHIs (90th percentile) than in those with a lower HHI (10th percentile). In a study of six orthopedic groups merging in Pennsylvania, researchers observed that the price impact was between 15% and 25% across different payers (Koch and Ulrick 2017).

#### Health Care Costs for Patients: Vertical Consolidations of Physicians

As discussed in Section 2.2, one of the driving reasons behind increased ownership of physician practices is the increased market power that can have an impact on negotiations with private payers. Practices that join a health system can benefit from the system negotiating higher prices. Other forms of leveraging increased market power

among vertically integrated providers include “all or nothing” provisions (a contract clause requiring health plans to contract with all the hospitals in a hospital system, regardless of their price and quality) and foreclosure of competitors (Brown and King 2016).

Many studies have investigated the impacts on physician and outpatient prices as a result of vertical consolidation. The following are some we reviewed (organized by the years of observation):

- **2007–2013.** Capps and his team found that outpatient prices rose 14% for the same services after a vertical integration of physicians. They further found that roughly half of the increase was due to exploitation of payment rules (charging a facility fee for services in a non-hospital setting). Overall, the researchers found that integration of physicians within a health system increased total enrollee health care costs by 5% (Capps, Dranove and Ody 2018).
- **2009–2012.** A study of California health systems found that commercial insurance prices were 10% higher for physician practices owned by a local hospital and 20% higher for physician practices owned by a multi-hospital system, all in comparison to physician-owned practices (Robinson and Miller 2014).
- **2013–2016.** An analysis of highly concentrated markets in California found that an increase in ownership of physician practices was associated with a 12% increase in ACA marketplace premiums (Scheffler, Arnold and Whaley 2018).
- **2013–2017.** A study of Massachusetts health systems found that, as a result of vertical integrations and joint contracting with a hospital system, physician prices increased between 2% and 12% for primary care physicians and between 1% and 6% for specialists. The greatest increases were among the larger integrated systems (Curto, Sinaiko and Rosenthal 2023).

In the first study listed, Capps and his team observed that site-of-service differentials accounted for a quarter of the overall price change. The site-of-service differentials represent facility fees for services performed in a facility setting that, prior to a vertical integration, were performed in a non-facility setting and thus did not include a facility fee. The Centers for Medicare & Medicaid (CMS) has made some modifications to its Medicare payment rules to bring hospital outpatient reimbursements in line with independent physician practices; however, certain site-of-service differentials exist today. Examples of these differentials include a 141% and 105% price difference for chemotherapy (first hour of treatment) and midlevel office visits, respectively, when they are performed in a hospital outpatient setting instead of a freestanding office, based on rules for the 2022 payment year. MedPAC further analyzed the change in the percentage of time these services were performed in a hospital outpatient setting between 2012 and 2019. In 2012, 9.6% of office visits were in an outpatient setting, compared with 13.1% for 2021. The rate was higher for chemotherapy administration, which increased from 35.2% (2012) to 50.9%. Based on changes from 2015 to 2019 for the share of office visits in an outpatient setting, MedPAC estimated that the impact over the five-year period was \$615 million in additional cost to Medicare plus \$150 million in additional cost sharing to beneficiaries (MedPAC 2022).

These site-of-service differentials also exist in commercial insurance. A small number of states have passed laws to address differentials for facilities outside of the hospital campus, as well as transparency. However, according to the Committee for a Responsible Federal Budget (2023), no comprehensive laws yet address full site neutrality of reimbursements. The committee estimates that enacting site-neutral payments would result in reductions of \$386 billion in commercial premiums and \$73 billion in patient cost sharing over the next 10 years (2024–2033).

#### Health Care Costs for Patients: Private Equity

Several recent studies have assessed private equity’s ownership of physician practices. One study looked at specialist practices (dermatology, gastroenterology and ophthalmology) acquired by PE firms between 2016 and 2020. The researchers found that a PE-owned practice had a price 20% higher than at non-PE practices (Singh et al.



2022). Another study analyzed prices for anesthesiology practices operated by physician management companies (PMCs), which are often backed by PE firms. This study found that unit price increases were 18.7% higher than non-PMC practices (La Forgia, Bond and Braun 2022). A third study found that in eight of 10 specialties reviewed, there were significant increases in price changes for PE backed firms following an acquisition compared to non-PE practices. The greatest differences were 16% for oncology practices, 14% for gastroenterology and 9% for OB/GYNs (Scheffler et al. 2023).

Additional evidence shows increases in income and prices for hospitals acquired by private equity firms. Bruch and his team found significant increases in inpatient charges per day and in net income among 204 hospitals acquired by PE firms from 2005 to 2017, compared with 532 control hospitals not owned by a PE firm (Bruch, Gondi and Song 2020). As noted in Section 2.1.4, 25% of emergency rooms in the U.S. are staffed by PE firms. In 2020, Congress passed the No Surprises Act, which eliminated surprise billing among emergency room physicians, a practice pioneered by PE firms that resulted in high out-of-pocket fees for health plan participants (Scheffler et al. 2023). Another recent study of ambulatory surgical centers (ASCs) found that PE-backed firms raised prices gradually over four to five years, with the researchers' final comparison showing prices 50% above the baseline levels (Lin et al. 2023).

#### Health Care Costs: Summary

The studies just described show that while consolidation of hospitals, other non-hospital facilities, and physician practices could lead to operating cost reductions, they usually lead to price increases following the transaction. As Martin Gaynor—a leading researcher on competition and incentives in health care, as well as antitrust policy—points out, the consolidated systems are charging higher prices on an ongoing basis, making this a permanent issue and not a transitory one (Gaynor 2020).

### **2.3.2 UTILIZATION IMPACTS**

A horizontal consolidation, vertical consolidation or acquisition by a private equity firm can have many impacts on utilization. A few prominent reasons highlighted in existing research include changes to referral patterns, shifting care between inpatient and outpatient settings, and reduction in service offerings, each of which is discussed in the following paragraphs.

In a consolidated and integrated care system, one of the key strategies is to keep patients within the system, so that care can be better managed across the same information systems. As just discussed, this has cost implications in larger systems, but there are also utilization impacts. A 2023 study found a market-wide increase in specialist visits, +23% versus the comparison group, when a primary care physician became part of a vertically integrated health system. When looking at utilization only within the vertically integrated system, the same study observed statistically significant increases in specialist visits (+29%), emergency room visits (+14%) and hospital admissions (+22%) (Sinaiko, Curto and Ianni 2023). In a study conducted among Medicare patients, referrals to specialists employed by the acquiring system increased by 52% following an acquisition, while referrals to other competing systems fell 7% on average (Walden 2016). An analysis of MRI usage following an acquisition found that patients traveling to receive an MRI, on average, passed six lower-priced providers; the patient's referring physician was the strongest determinant of where a patient received care. In 79% of cases, patients were sent to the primary referral location, which was a higher-cost provider, resulting in greater out-of-pocket expenses (Chernew et al. 2018). Baker and his team (2015) found that the agency problem between physicians and patients (i.e., failing to act in the best interest of the patient) is worsened because patients are more likely to choose a higher-cost and lower-quality hospital when their physician is employed by that hospital.

Other studies reviewed changes in the setting for care received. Richards and his colleagues found that following a hospital acquisition, nearly 10% of Medicare and commercial insurance cases were shifted away from ASCs to

hospitals. Going forward, these patients were 18% less likely to use an ASC (Richards, Seward and Whaley 2022). Another study by some of the same researchers found increases in diagnostic imaging tests (26.3 per 1,000 beneficiaries) in a hospital setting and decreases of roughly the same magnitude (24.8 per 1,000) for the same tests in a non-hospital setting. Laboratory tests displayed a similar pattern, with hospital-based tests increasing 44.5 per 1,000, and non-hospital tests decreasing 36.0 per 1,000. As a result of these changes in utilization and site of care, average reimbursement rose by \$6.38 per diagnostic imaging test and \$0.57 per laboratory test, which corresponds to an aggregate increase of \$73 million in Medicare spending (Whaley et al. 2021). In a study of common services that are safe and appropriate to be performed in physician offices for care provided between 2009 and 2017, HCCI observed the following shifts to outpatient settings: level 3 ultrasounds increased from 21% to 25%, level 5 drug administration rose from 23% to 46%, and Level 5 endoscopies (no change). Over the same period, they observed greater price increases in the outpatient setting than the physician setting. For example, prices for level 5 drug administration increased 15% in a physician setting over the study period, while it increased 57% in an outpatient setting (Hargraves et al., 2019).

In an analysis of the impacts of New York hospital concentration on Medicaid enrollees, researchers found that a 1% increase in the HHI leads to a 0.6% reduction in the number of Medicaid admissions for the average hospital (Desai et al. 2023). The same study also found that the increased concentration results in a shift of admissions from nonprofit hospitals to public hospitals. Also, utilization changes across payer populations were observed following hospital privatization, due to a reduction in services available. In a study of 258 hospital mergers from 2000 to 2018, researchers observed an 8.4% decrease in overall patient volume following privatization of the hospital. The decreases were partially caused by the hospital ownership reducing capacity for patient populations with lower reimbursements (i.e., Medicare and Medicaid) following the transaction. After five years, the volume of services provided still had not returned to the pre-privatization level. Looking at specific payer populations, the researchers reported that overall Medicare admissions dropped by 5% and Medicaid admissions fell by 15%. Prior to a transaction, Medicaid patients made up 20% of the patient volume, yet they accounted for 30% of the drop in admissions (Duggan et al. 2023).

Research has shown that utilization increases or changes for practices acquired by PE firms. This occurs through increases of new patients and longer visits with existing patients. According to a study by Singh and his team (2022), practices acquired by PE firms achieved an increase in the number of unique patients that was 26% greater than non-PE practices. Compared to non-PE practices, new patient volume was 38% greater, and the number of existing patients being billed for longer visits (those beyond 30 minutes) was 9% greater. Research by Zhu and her team (2020) shows that any increases in new visits are not equal across payers, because practices backed by PE firms accept new Medicaid patients at a lower rate, 60%, than for new Medicare patients, 83%.

## Section 3: Health Care Provider Shortages

In this section, we review the current landscape of health care provider shortages. In Section 3.1, we highlight differences by provider type, across geographic regions and by payer type. Then we discuss the underlying drivers of these results in Section 3.2 and the effects of shortages on the cost and utilization of care in Section 3.3.

### 3.1 CURRENT LANDSCAPE

Health care shortages in the United States are projected to increase throughout the next decade, with some residents more affected than others. In Sections 3.1.1 to 3.1.3, we present the latest findings, trends and projections of health care shortages broken out by region, provider type and payer type.

#### 3.1.1 DIFFERENCES BY PROVIDER TYPE

While medical provider shortages exist across all practice areas in the United States, the severity of the shortfall differs by specialty and region. For example, looking at provider shortage data from the Health Resources & Services Administration (HRSA), as shown in Table 2, nationwide there is a 25% deficit in primary care physicians, an 8% deficit in dental providers, and a 34% deficit in mental health providers (HRSA 2023). By region, the dental shortage ranges from a 0% deficit in the Northeast to a 21% deficit in the West, while the primary care and mental health shortages are larger, ranging from 10% and 5% shortages in the Northeast to 58% and 68% shortages in the West, respectively. More information on geographic differences is included in Section 3.1.2.

Table 2

#### PROVIDER SHORTAGES IN THE U.S. BY REGION

Census Region	Percent of Population in Counties Designated as Geographic Health Professional Shortage Areas (HPSAs)		
	Primary Care	Dental Health	Mental Health
Northeast	10%	0%	5%
Midwest	25%	4%	40%
South	13%	5%	24%
West	58%	21%	68%
Nationwide	25%	8%	34%

Sources and notes: Authors' calculations, using provider shortage data from the Health Workforce Shortage Area (HWSA) data produced by the Health Resources & Services Administration (HRSA) and census data from the U.S. Census Bureau (2022a, county population tables, vintage 2022). Shortage areas are based on the HPSA type equal to "Geographic Area," or U.S. counties by state. We include counties where the HPSA status is equal to "Designated" and do not include those labeled "Proposed for Withdrawal."

Projected medical worker shortages vary significantly by profession, with lower-wage health care workers and mental health providers representing the largest gaps. For example, analysts at Mercer project there will be a shortfall of 100,000 nurses by 2026 (Bateman et al. 2021), and the Association of American Medical Colleges (AAMC) projects that by 2034, there will be a shortage of 18,000 to 48,000 primary care physicians and 21,000 to 77,000 non-primary care physicians nationwide, with 16,000 to 30,000 of those being surgical specialists (IHS Markit 2021). Shortages in primary care physicians may be offset by the increase in nurse practitioners and physician

assistants, as Mercer projects their annual growth to range between 9% and 21% from 2023 to 2026, versus less than 5% annual growth projected for primary care physicians over the same period (Bateman et al. 2021).

In 2021, mental health specialists in the U.S. numbered around 800,000 skilled or semi-skilled mental health workers, 400,000 of whom were expected to leave the workforce by 2026. Further demand increases are expected, leaving a gap of more than 500,000 mental health workers by 2026 (Bateman et al. 2021).

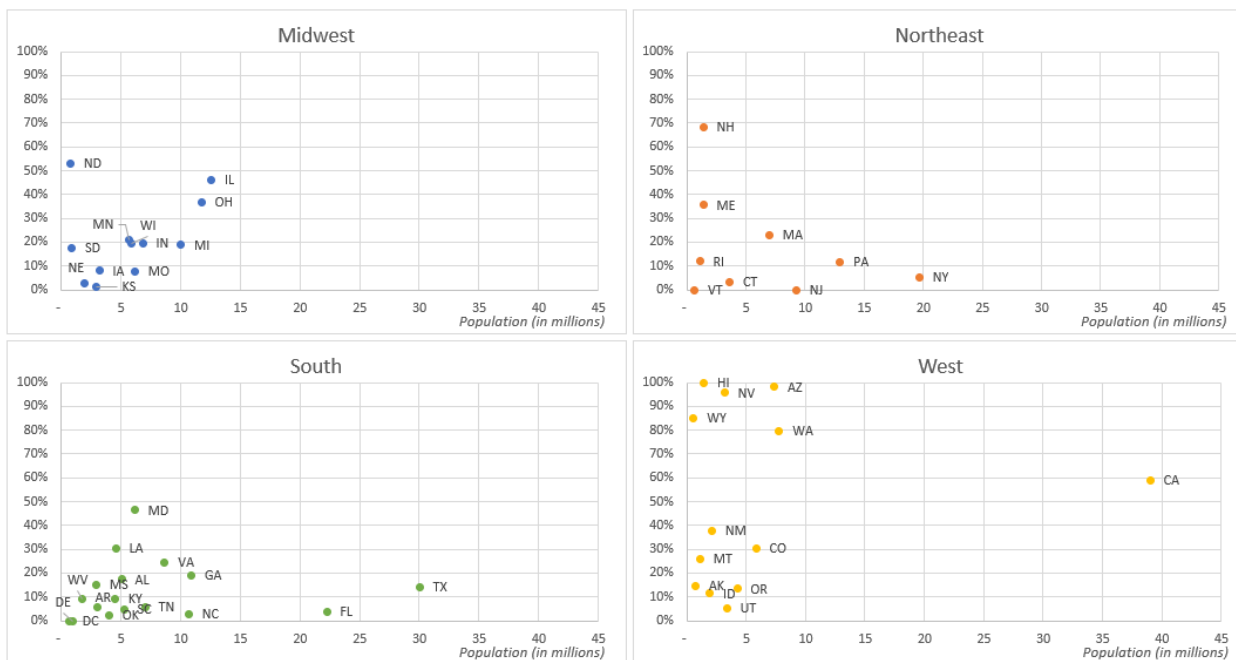
Perhaps the largest and most widespread medical provider gap will stem from a lack of low-wage health care workers, including home health aides, medical assistants and nursing assistants. While around 9.7 million individuals currently work in low-wage health care occupations, projections show that over the next five years, demand for these positions will increase to approximately 10.7 million, while supply is not expected to keep pace, leaving a gap of 3.2 million critical health care workers. The largest gaps for these workers appear in states with large metropolitan areas, such as New York, California, Pennsylvania, Massachusetts and Illinois, while a few states—Georgia, South Carolina and Washington—have projected surpluses (Bateman et al. 2021).

### 3.1.2 DIFFERENCES BY GEOGRAPHY

As we saw in the previous section, the shortages in primary care, mental health and dental care providers in the U.S. are the most extreme in the West and the least extreme in the Northeast, with the Midwest and the South falling closer to the national average. On a state-by-state level for each of the four regions, Figure 3 shows the percentage of the population in a primary care shortage area for each state plus DC (organized by region). As shown in the scatter plot of states in the West, six states—Arizona, California, Hawaii, Nevada, Washington and Wyoming—have more than 50% of the population in counties designated as shortage areas.

Figure 3

#### PROVIDER SHORTAGES IN THE U.S. BY STATE: PERCENT OF POPULATION IN A PRIMARY CARE HPSA



Sources and Notes: Authors’ calculations, using provider shortage data from the HWSA data produced by the HRSA and census data from the U.S. Census Bureau (2022a, county population tables, vintage 2022). Shortage areas are based on the HPSA Type equal to

“Geographic Area,” or U.S. counties by state. We include counties where the HPSA status is equal to “Designated” and do not include those labeled “Proposed for Withdrawal.”

This trend may be exacerbated by a growing and aging population. Projections from the U.S. Census show that the overall U.S. population is expected to grow by 10% from 2020 to 2035, while the population 65 and over is expected to grow 39% over the same period (U.S. Census Bureau 2017). From 2015 to 2030, the South and West are expected to have overall population increases of 19% and 20%, respectively, and the elderly population is expected to grow by more than 60% in both regions (Zhang et al. 2017).

Along with the differences in medical provider shortages across regions of the United States, medical access differs between rural and urban regions. The federal government considers 80% of Americans in rural regions to be medically underserved. Around 20% of the U.S. population lives in rural communities, but only 10% of doctors practice in rural communities, and this disparity is getting more pronounced over time (Saslow 2019). In 2022, researchers found that while the number of primary care doctors in metropolitan areas, adjusted for population, remained steady between 2010 and 2017, the number of primary care doctors in rural counties decreased. Over that same period, the majority of rural counties in America lost primary care doctors, while most metropolitan areas saw an increase. Using data from 2010 to 2017, the research found that the median physician density was lower in rural counties, at 59.7 physicians per 100,000 residents, than in metropolitan counties, at 125.3 physicians per 100,000 residents (Machado et al. 2021).

### 3.1.3 DIFFERENCES BY PAYER TYPE

As of December 2022, Medicaid has grown to become the single largest payer in the United States, covering more than 90 million Americans (Corallo 2023). However, while the proportion of Medicaid patients in the US has steadily increased over time, research has shown that provider shortages are compounded by physicians not accepting Medicaid reimbursements. In a 2015 study, 93% of non-pediatric primary care physicians indicated they would accept new clients with Medicare and 94% indicated they would accept new clients with private insurance, but only 67% said they would accept new clients with Medicaid (Boccuti et al. 2015). Another analysis in 2019, which aggregated the results of 34 audit studies of health care appointments and schedules, demonstrated that Medicaid insurance is associated with less likelihood of successfully scheduling appointments: those with private insurance were 1.6 times likelier than those with Medicaid to schedule a primary care appointment and a 3.3 times likelier to schedule a specialty appointment (Hsiang et al. 2019).

## 3.2 REASONS FOR SHORTAGES

Research points to several primary reasons for the anticipated shortage of medical professionals in the U.S.: demand induced by demographics and reduced supply induced by retirements, provider burnout, and shortages of education slots.

Demographics are projected to be the primary driver of increasing demand from 2019 to 2034. During this time, the U.S. population is projected to increase 10.6%, from 328.2 million people to 363.0 million. However, while the population under age 18 is projected to grow 5.6%, the population aged 65 and older is projected to grow by 42.4%, and the population aged 75 and older is projected to grow at 74.0% (IHS Markit 2021). Thus, while 17% of people in the U.S. were older than 65 in 2021, 21% are expected to be older than 65 in 2035 (U.S. Census Bureau 2017). Since older populations tend to have more chronic illness, this trend suggests an increasing demand for health care overall, with especially high growth in demand for physicians specializing in elder care (IHS Markit 2021).

At the same time, the supply of doctors is expected to lag behind demand. While licensed physicians numbered just over 1 million in 2020, up 19.8% from about 850,000 in 2010 (Robeznieks 2022), over 40% of currently active physicians will exceed the traditional retirement age of 65 within the next decade (IHS Markit 2021). Unless these

physicians delay retirement, the U.S. could see low growth in the number of practicing physicians, or even a decrease. Furthermore, future retirement rates among medical professionals may rise above historical levels, given the high levels of burnout reported among nurses and physicians in the wake of the COVID-19 pandemic. Whereas in 2019, 32% of physicians and 41% of nurses reported feeling burned out, these rates increased to 40% among doctors and 49% among nurses by 2022. As a result, 34% of nurses reported that they planned to leave their jobs by the end of 2022, with 44% citing stress/burnout as a factor in their decision (Sexton et al. 2022). More recently, another study found that approximately a third of nurses were burnt out and dissatisfied with their career (Nikpour and Carthon 2023).

Another factor driving the shortage of providers is the limited number of slots in medical schools and residencies for physicians, as well as in undergraduate and graduate nursing programs. Research on forecast physician shortages shows that medical school openings increased 21% from 2006 to 2016, and residents and fellows increased 13% over the same period, but based on the rate of demand and retirements, the demand will continue to outpace the supply (Zhang et al. 2020). Also, during the 2021–2022 school year, nursing schools in the U.S. turned away 91,938 qualified applications from baccalaureate and graduate nursing programs in 2021 due to insufficient staff, clinical sites, classroom space and budget concerns (Rosseter 2022).

Consolidation of hospitals and doctors' offices into larger systems is another factor contributing to the shortage of providers, especially in rural areas. Studies have shown post-merger decreases in inpatient pediatric services (Joseph, Davis and Kahn 2023); maternal, neonatal and surgical care services (Henke et al. 2021); intensive care; psychiatric care; and cardiac surgery (Levins 2023), with the largest impacts being in rural areas. Carroll and her team (2023) also found that unprofitable hospitals in rural areas close at higher rates due to deteriorating finances and lack of competitiveness, leaving a hole in health care services. According to research on rural hospitals by the Center for Healthcare Quality and Payment Reform (2023), there are many reasons for the deteriorating finances of smaller rural hospitals, including lower reimbursement from insurance plans and government payers, cost of clinical staff to deliver care, and bad debt incurred by patients.

### 3.3 COST AND UTILIZATION IMPACT

Although little research demonstrates the specific effects of regional shortages on the cost or utilization of medical care, aggregate data and some recent studies suggest that the medical provider shortage has a greater impact in rural areas and results in decreased utilization among Medicaid patients.

COVID-19 has raised awareness of the disparities in health and access to care, which have a disproportionate impact on minority populations, people living in rural communities and people without medical insurance. If underserved populations had health care use patterns like those of populations with fewer access barriers, demand would rise such that the nation would be short by about 102,000 to 180,000 physicians relative to the current supply (IHS Markit 2021).

As noted previously, significantly fewer non-pediatric primary care physicians say they would accept clients with Medicaid than say they would accept new clients with Medicare or private insurance (Boccuti et al. 2015). These differences are more pronounced among specialists. For example, on average, only 36% of psychiatrists indicate that they would accept new Medicaid patients, compared with 71% of physicians overall (Saunders, Guth and Eckart 2023). This leads to a situation where care for Medicaid recipients is highly concentrated among a small number of physicians; one study estimates that 25% of primary care physicians provide 86% of the primary care delivered to Medicaid patients, and 25% of specialists provide 75% of specialist care received by these patients (Ludomirsky et al. 2022).

A 2021 study on the effects of medical provider shortages in Delaware found that, over a 20-year period, provider shortages increased average wait times by 15.3 to 21.7 days, with rural counties experiencing longer wait times in

2018, 28 to 34 days, than urban counties, 20 days (Malayala et al. 2021). Another analysis of patient stay data found that rural hospitals were more likely to shut down their maternal, neonatal and surgical care services, with 7.2% fewer hospitals providing maternal or neonatal care two years after a merger (Henke et al. 2021). They found similar results for surgical services, with a 9.8% decrease in the proportion of rural hospitals offering surgical services five years after a merger. Similarly, there was a 12.4% difference in the number of mental health and substance use disorder stays between independent and merged rural hospitals after three years, which researchers said could indicate decreased access to behavioral health care. A longitudinal study on US hospitals from 2011 to 2020 observed a decline in inpatient pediatric services over time, from 41.5% in 2011 to 32.6% in 2020, as joining a hospital system was associated with a loss of inpatient pediatric services within the five years following a merger (Joseph, Davis and Kahn 2023).

For rural residents, decreased access to care from their local hospital after a merger may require them to drive significant distances to receive care when the next nearest hospital may be hours away. Where transportation cost and time become unduly burdensome or prohibitive, such residents may choose to either postpone or forgo care, worsening their health outcomes over time. We did not find many research studies assessing these impacts, so further research is warranted on the cost and utilization impacts (as well as the negative long-term health consequences) of traveling longer distances for care or forgoing it altogether due to provider shortages. As discussed in MedPAC's 2021 report to Congress, rural and urban patients have similar utilization of care, except rural beneficiaries have fewer specialist visits, given the substantial distance to visit one (MedPAC 2021). A Chartis study found that 217 rural hospitals have ceased offering labor and delivery services to expectant mothers since 2011. The researchers found that in 89 of the communities studied, women seeking OB-related care would have to drive an additional 30 minutes to reach the nearest provider. Chemotherapy also experienced similar if not greater drops in availability, as the researchers found that more than 300 hospitals in rural areas no longer offered the service between 2014 and 2019 (Topchik et al. 2023). According to a report published by the Congressional Research Service, rural hospitals remain vulnerable in the wake of the COVID-19 pandemic as relief funds through the public health emergency stop. Some estimates show that as many as 40% of rural hospitals are operating in a financial deficit, potentially leading to more closures (Villagrana, Heisler and Romero 2023).

## Section 4: Framework for Analyzing Future Cost and Utilization Impacts

In Section 2 (Health Care Provider Consolidation) and Section 3 (Health Care Provider Shortages), we have described the impacts as presented in various research studies. In this section, we present three scenarios of consolidations and acquisitions where we discuss considerations for how health care cost and utilization impacts could be modeled in the aftereffects of a transaction. These impacts may be immediate or may take years to fully materialize.

These hypothetical scenarios are intended to provide an informational perspective on potential impacts; however, the relevant impact may be different depending on the organization and will vary based on the specifics of the market and the transaction. For example, an actuary who works at an insurance company may be more concerned with modeling the price impacts on commercial insurance premiums than an actuary who works at or for a hospital system or regulatory agency or in another governmental capacity.

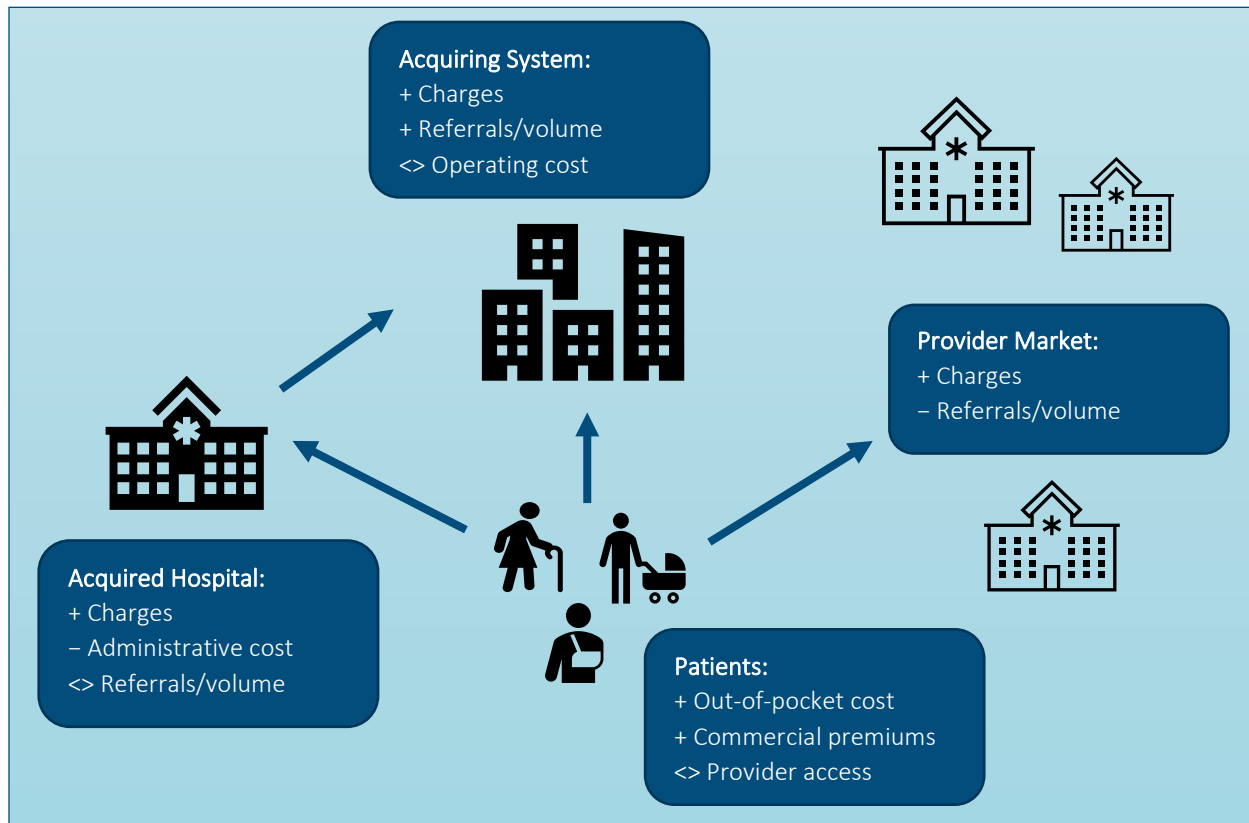
### 4.1 SCENARIOS AND IMPACTS

This section shows three hypothetical scenarios: (1) a horizontal consolidation, (2) a vertical consolidation and (3) an acquisition of a physician practice by a PE firm. Each scenario includes a brief description of the transaction, a visual representation of the impact, and a table summarizing the impacts (presented throughout the paper). This is based on common impacts that we identified in the research described in the prior sections; we do so for illustrative purposes and not to represent actual impacts. The impacts for any specific transaction will vary, perhaps materially, from the following illustrative scenarios. In the tables for each scenario, a “+” sign refers to an increase, a “-” sign refers to a decrease, and “<>” refers to mixed impacts (i.e., both increases and decreases).



**Scenario 1**  
**HORIZONTAL CONSOLIDATION**

A local community hospital merges with a large vertically integrated in-state multi-hospital health system in a highly concentrated market.



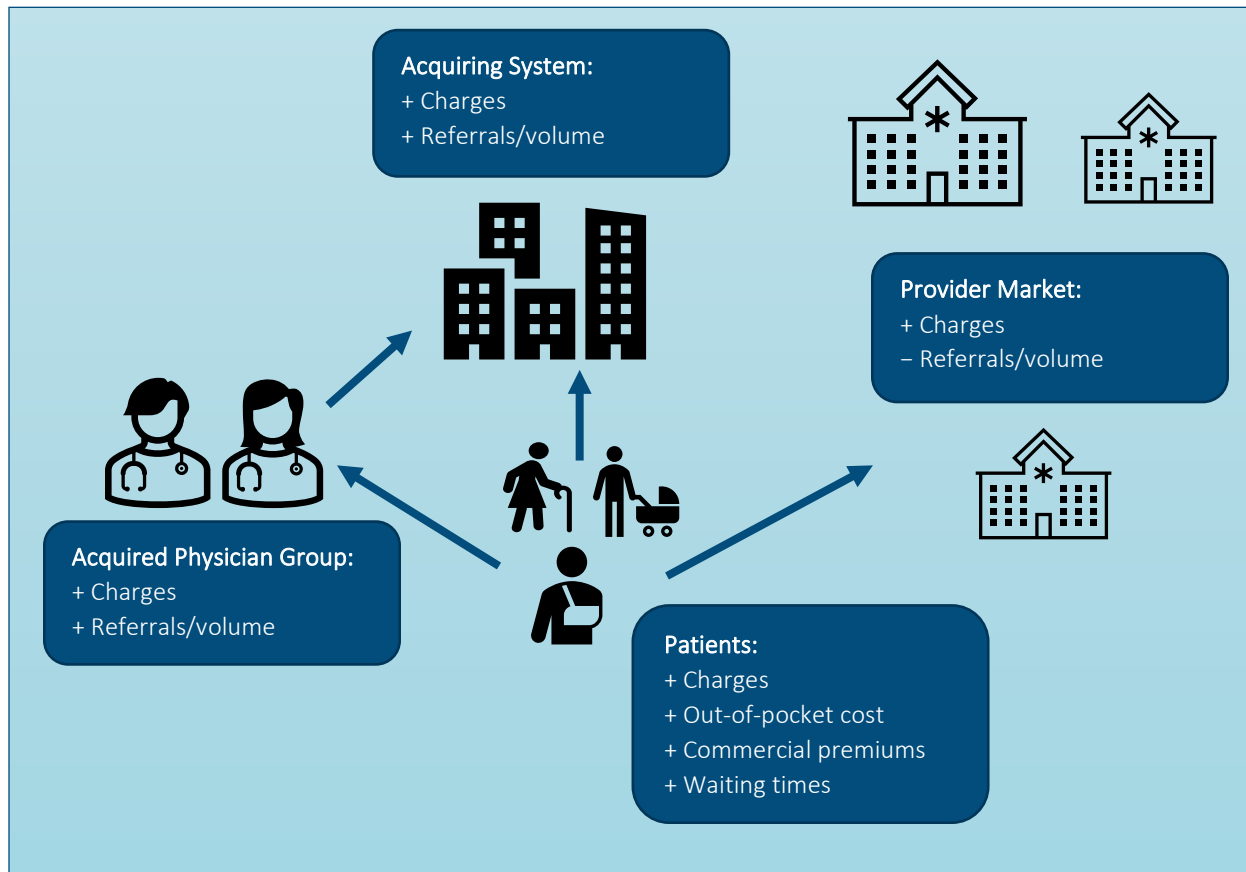
**Table 3**  
**COST AND UTILIZATION IMPACTS OF SCENARIO 1**

Acquired Hospital	Acquiring System	Provider Market	Patients and Premium Payers
<p><u>Health Care Costs</u> Increase in billed charges and negotiated prices for commercial insurance payers due to market share</p> <p><u>Health Care Utilization</u> Increase in referrals from acquiring hospital system due to referrals/volume, coordination of care Closure of services, primarily in rural areas</p> <p><u>Hospital Operating Expenses</u> Increases in expenses for capital upgrades (e.g. IT, EMR systems) Decreases in administrative cost due to efficiencies</p>	<p><u>Health Care Costs</u> Increased market power for negotiations with private insurance companies resulting in higher prices</p> <p><u>Health Care Utilization</u> Increase in referrals from acquired hospital system due to coordination of care</p>	<p><u>Health Care Costs</u> Prices do not increase at same rate as at hospitals in acquiring system</p> <p><u>Health Care Utilization</u> Decrease in referrals from acquired community hospital patient base Closure of hospitals due to deteriorating finances</p>	<p><u>Health Care Costs</u> Increases in hospital charges for uninsured patients, in commercial insurance premiums, and in out-of-pocket cost sharing for all insurance types</p> <p><u>Health Care Utilization</u> Increased waiting times; varying impacts among commercial, Medicare and Medicaid patients post-merger (e.g., Medicaid patients having a drop in admissions and less access</p>

Sources: Baker, Bundorf and Kessler 2015; Brown and King 2016; Carroll et al. 2023; Chernew et al. 2018; CHQPR 2023; Cooper et al. 2019; Desai et al. 2023; Duggan et al. 2023; Henke et al. 2021; Joseph, Davis and Kahn 2023; Kaul, Prabha and Katragadda 2016; Levins 2023; Richards et al. 2022; Schmitt 2017; Schwartz et al. 2020; Topchik et al. 2023; Walden 2016; Whaley et al. 2021; White 2017.

**Scenario 2**  
**VERTICAL CONSOLIDATION**

A large multi-specialty physician practice is acquired by a large vertically integrated in-state multi-hospital health system.



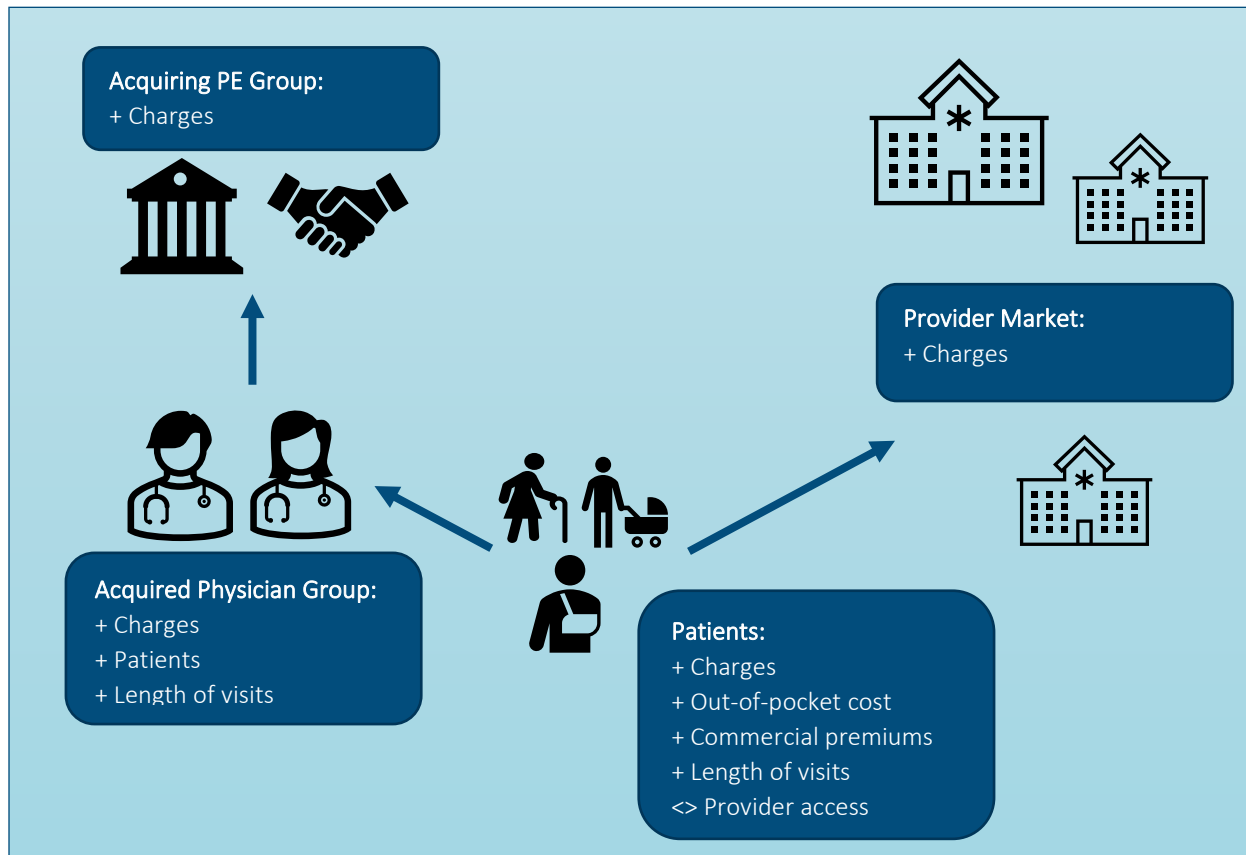
**Table 4**  
**COST AND UTILIZATION IMPACTS OF SCENARIO 2**

Acquired Physician Group	Acquiring System	Provider Market	Patients and Premium Payers
<p><u>Health Care Costs</u> Increase in billed charges and prices negotiated with commercial insurance payers, with site-of-service differentials (facility fees) representing a portion of the increase in prices</p>	<p><u>Health Care Costs</u> Increased market power for negotiations with private insurance companies, resulting in higher prices</p>	<p><u>Health Care Costs</u> Prices do not increase at same rate as at acquiring system</p>	<p><u>Health Care Costs</u> Increases in hospital charges for uninsured patients, in commercial insurance premiums, and in out-of-pocket cost sharing for all insurance types</p>
<p><u>Health Care Utilization</u> Referrals increase from acquiring hospital system due to coordination of care</p>	<p><u>Health Care Utilization</u> Increase in referrals from acquired physician practice due to coordination of care and steering</p>	<p><u>Health Care Utilization</u> Decrease in referrals from acquired physician practice patient base</p>	<p><u>Health Care Utilization</u> Increased waiting times; varying impacts (increases and decreases) among commercial, Medicare and Medicaid patients post-merger</p>

Sources: Brown and King 2016; Capps, Dranove and Ody 2018; CRFB 2023; Curto, Sinaiko and Rosenthal 2023; Hargraves and Reiff 2019; Malayala et al. 2021; MedPAC 2020; MedPAC 2022; Richards et al. 2022; Robinson and Miller 2014; Scheffler, Arnold and Whaley 2018; Sinaiko, Curto and Ianni 2023; Whaley et al. 2021; White 2017.

**Scenario 3**  
**PRIVATE EQUITY/CORPORATE OWNERSHIP**

A specialty physician practice is acquired by a managed service organization (MSO) operated by a PE firm.



**Table 5**  
**COST AND UTILIZATION IMPACTS OF SCENARIO 3**

Acquired Physician Group	Acquiring PE-Backed Firm	Market	Patients and Premium Payers
<p><u>Health Care Costs</u>                      Increase in billed charges and prices negotiated with commercial insurance payers</p> <p><u>Health Care Utilization</u>                      Increase in new patients; longer visits with existing patients</p>	<p><u>Health Care Costs</u>                      Increased market power for negotiations with private insurance companies, resulting in higher prices</p>	<p><u>Health Care Costs</u>                      Prices do not increase at same rate as at PE-owned practice</p>	<p><u>Health Care Costs</u>                      Increases in physician charges for uninsured patients, in commercial insurance premiums, and in out-of-pocket cost sharing for all insurance types</p> <p><u>Health Care Utilization</u>                      Increase in new patients                      Longer visits with existing patients                      Varying levels of acceptance for new commercial, Medicare and Medicaid patients</p>

Sources: Adelman 2023; Adler, Milhaupt and Valdez 2023; La Forgia, Bond and Braun 2022; Lin et al. 2023; Scheffler et al. 2023; Singh et al. 2022; (7) Zhu, Hua and Polsky 2020.

## 4.2 MEASURING COST AND UTILIZATION IMPACTS

For each of the hypothetical scenarios in Section 4.1, the hospital or physician group being acquired, the hospital system or ownership group making the acquisition, competing hospitals, hospital systems and physician groups, and patients and premium payers (individuals, families and employer groups) will all likely experience cost and utilization impacts of the transaction, as shown in Tables 3 through 5. When assessing these impacts, one may want to consider the following information for the entire health care market under observation. Following this list, we discuss what data exists, even though it may not be readily available to all stakeholders or may have limitations in each case.

- Hospital prices (e.g., inpatient and outpatient services). Since 2021, federal law requires hospitals to post their standard charges as well as any negotiated rates with payers, which are made available on each hospital's website. Existing studies of the data made available show that the data is inconsistent, has questionable values and lacks pertinent information, such as contracting method and payer class (Lo et al. 2023). As of July 2022, the same transparency requirement also applies to payers (CMS 2023).
- Actual hospital patients' encounters, claims, and financial data. Patient encounter data and payer claims data stored by a health system are important data points for health systems to use in managing their value-based care contracts and implementing population health strategies. As an example, the largest health system in Massachusetts, Mass General Brigham, has worked with Health Catalyst, one of the leading IT/health claim data warehousing providers in the U.S., to implement an enterprise data warehouse to store clinical, operational, financial and claims data (Health Catalyst 2016).
- Payers' claim data. For each insurance arrangement, including commercial insurance, Medicare and Medicaid, payers store and track historical claim data in data warehouses.
- Market data sets. There are privately owned data sets such as IBM MarketScan (formerly known as Truven MarketScan) and HCCI Institute data. The IBM data set tracks claims data for commercial insurance, Medicare and Medicaid and includes over 40 million distinct patients in its most recent year (IBM 2023). The HCCI Commercial Claims Research data set includes claim experience for over 55 million lives per year from participating Blue Cross Blue Shield (BCBS) plans, Aetna and Humana. Both data sets have limitations in that they are reliant on private companies' reporting of claims data and may not be fully representative of the full population (Kulaylat et al. 2019; Scheffler et al. 2023).
- All payer claims databases (APCDs). These data sets are managed by individual state agencies, which are developed based on regular reporting from participating payers. A limitation of the APCDs is that self-funded employers (which represented 61% of workers in the U.S. as of 2016) are not required to provide their data to the state agencies (Brown and King 2016).
- Physicians' data. The OneKey, SK&A and American Medical Association Physician Masterfile are health care provider data sets that are privately owned. They track detail about U.S. physicians, including their location, size of practice and specialty (Scheffler et al. 2023).
- Medicare Prospective Payment Systems and Physician Fee Schedules. We reviewed several analyses in which commercial prices were measured as a percentage of Medicare prices. On its site, CMS provides the underlying factors for both its Inpatient Prospective Payment System (IPPS) and its Outpatient Prospective Payment System (OPPS), as well as the factors to derive rates for the Medicare Physician Fee Schedule (MPFS). The ultimate rates depend on a variety of factors, including site of care and geography.

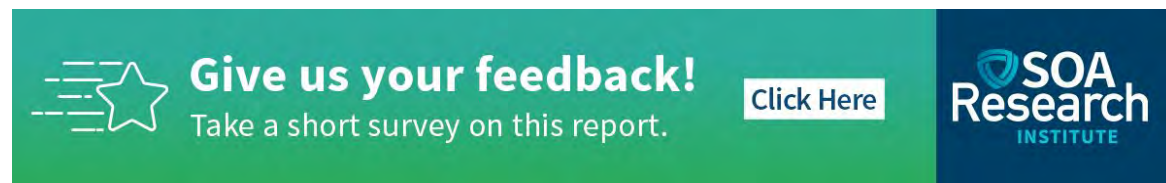
- Private equity transaction data. PitchBook is a privately owned database that tracks mergers and acquisitions across industries, including any private equity deals in the health care industry. The data set is supplemented with additional news sources for further transaction detail (Scheffler et al. 2023).
- Alternative data sources. Other data sources we came across in our review include detail on market concentration (e.g., HCCI's hospital market concentration index), provider shortage data (e.g., HRSA provider shortage data), Medicare data made available by CMS (e.g., Hospital Cost Report, Hospital General Information, Change of Ownership Report, Health Expenditures data), and hospital staffing shortage reports from HealthData.gov.

## Section 5: Conclusion

Existing research shows that as health systems have become larger, there have been significant impacts on the cost of health care and utilization of health care. A larger market share enables greater negotiating power, higher prices and increased referrals. In addition, many independent hospitals have struggled to compete with the larger systems, resulting in either a merger with a larger system or closure.

At the same time, availability of health care providers is currently lacking in many parts of the U.S., with ongoing shortages in physicians, other clinicians and supporting health care workers. These shortages are projected to increase over the next 10 to 15 years, with changing demographics causing a reduced supply of providers and increased demand due to a rapidly aging population. High levels of burnout among medical professionals, limited available slots in health educational and training programs, and rural facility closures exacerbate the shortage of health professionals.

Further study is required to understand the cost and utilization impacts from provider shortages, as there is scant research on the specific impacts. Additionally, the impact of provider concentration is an ongoing issue, rather than a transitory one, so further research will be required to understand the continuing cost and utilization impacts as health care systems grow larger.



A horizontal banner with a green-to-blue gradient background. On the left is a white star icon with horizontal lines extending from its left side. To the right of the icon is the text "Give us your feedback!" in a bold, white font, followed by "Take a short survey on this report." in a smaller white font. Further right is a white rectangular button with the text "Click Here" in blue. On the far right is the SOA Research Institute logo, which consists of a blue shield icon with a white 'S' inside, followed by the text "SOA Research INSTITUTE" in white and blue.

## Section 6: Acknowledgments

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- Erika Schulty, Research Administrator

## Appendix: Hospital HHI and Cost Indices for U.S. Metropolitan Areas

Table 6 shows the 2021 hospital HHI, health care cost index and cost-of-living index for 183 U.S. metros, ranked by population size. For the hospital HHI, a heat map ranges from darker blue values indicating low concentration to darker red values indicating high concentration.

**Table 6**

### HERFINDAHL-HIRSCHMAN INDEX (HHI) AND COST INDICES FOR U.S. HOSPITAL METROPOLITAN AREAS

Rank by Population	State(s)	Metropolitan Area	2022 Population (000s)	2021 Health Care Cost Index	2021 Cost-of-Living Index	2021 Hospital HHI
1	NY-NJ-PA	New York–Newark–Jersey City	19,618	1.30	1.28	775
2	CA	Los Angeles–Long Beach–Anaheim	12,872	1.25	1.41	1,059
3	IL-IN-WI	Chicago–Naperville–Elgin	9,442	0.98	1.00	1,356
4	TX	Dallas–Fort Worth–Arlington	7,944	1.12	0.99	1,889
5	TX	Houston–The Woodlands–Sugar Land	7,340	1.02	0.96	2,550
6	DC-VA-MD-WV	Washington–Arlington–Alexandria	6,374	0.98	1.20	1,156
7	PA-NJ-DE-MD	Philadelphia–Camden–Wilmington	6,241	1.01	1.03	1,226
8	GA	Atlanta–Sandy Springs–Roswell	6,222	1.22	1.00	2,007
9	FL	Miami–Fort Lauderdale–West Palm Beach	6,139	1.06	1.10	1,359
10	AZ	Phoenix–Mesa–Scottsdale	5,016	0.93	1.04	3,161
11	MA-NH	Boston–Cambridge–Newton	4,901	1.09	1.33	2,123
12	CA	Riverside–San Bernardino–Ontario	4,668	1.14	1.16	657
13	CA	San Francisco–Oakland–Hayward	4,580	1.77	1.79	1,867
14	MI	Detroit–Warren–Dearborn	4,346	0.80	0.93	2,129
15	WA	Seattle–Tacoma–Bellevue	4,034	1.18	1.25	1,419
16	MN-WI	Minneapolis–St. Paul–Bloomington	3,694	1.18	1.05	2,281
17	FL	Tampa–St. Petersburg–Clearwater	3,291	1.13	1.01	1,966
18	CA	San Diego–Carlsbad	3,276	1.36	1.36	2,441
19	CO	Denver–Aurora–Lakewood	2,986	1.16	1.12	2,414
20	MD	Baltimore–Columbia–Towson	2,836	0.87	1.07	1,411
21	MO-IL	St. Louis	2,801	0.88	0.90	2,527
22	FL	Orlando–Kissimmee–Sanford	2,764	1.10	1.01	3,773
23	NC-SC	Charlotte–Concord–Gastonia	2,756	1.11	0.98	3,030
24	TX	San Antonio–New Braunfels	2,655	0.95	0.93	3,228
25	OR-WA	Portland–Vancouver–Hillsboro	2,509	1.24	1.17	2,580
26	TX	Austin–Round Rock	2,421	1.06	1.07	3,791
27	PA	Pittsburgh	2,349	0.90	0.93	2,564
28	NV	Las Vegas–Henderson–Paradise	2,323	1.09	1.01	2,788
29	OH-KY-IN	Cincinnati	2,265	0.99	0.92	1,442
30	MO-KS	Kansas City	2,209	0.99	0.92	1,423
31	IN	Indianapolis–Carmel–Anderson	2,142	1.13	0.90	1,894
32	OH	Cleveland–Elyria	2,063	0.89	0.90	3,323
33	TN	Nashville–Davidson–Murfreesboro–Franklin	2,047	1.00	1.00	2,340
34	CA	San Jose–Sunnyvale–Santa Clara	1,939	1.92	1.74	2,441
35	VA-NC	Virginia Beach–Norfolk–Newport News	1,807	1.06	0.99	3,353
36	FL	Jacksonville	1,676	0.99	0.99	3,043
37	RI-MA	Providence–Warwick	1,674	0.95	1.12	1,343
38	WI	Milwaukee–Waukesha–West Allis	1,560	1.47	0.94	2,577
39	OK	Oklahoma City	1,459	0.79	0.87	1,991
40	VA	Richmond	1,339	1.08	0.84	3,386
41	TN-MS-AR	Memphis	1,332	0.90	0.88	3,709
42	KY-IN	Louisville–Jefferson County	1,285	0.83	0.92	3,275



43	UT	Salt Lake City	1,266	0.98	1.06	2,278
44	LA	New Orleans–Metairie	1,246	0.84	0.92	3,070
45	CT	Hartford–West Hartford–East Hartford	1,222	1.17	1.05	2,754
46	NY	Buffalo–Cheektowaga–Niagara Falls	1,161	0.85	0.97	3,847
47	MI	Grand Rapids–Wyoming	1,094	0.92	0.94	3,640
48	AZ	Tucson	1,058	0.80	0.98	2,381
49	OK	Tulsa	1,034	0.84	0.87	3,240
50	CA	Fresno	1,015	1.15	1.06	4,369
51	NE-IA	Omaha–Council Bluffs	977	1.08	0.93	3,033
52	CT	Bridgeport–Stamford–Norwalk	963	1.28	1.19	2,165
53	SC	Greenville–Anderson–Mauldin	959	0.98	0.95	3,188
54	CA	Bakersfield	916	1.20	1.03	3,348
55	TN	Knoxville	908	0.82	0.92	3,083
56	NY	Albany–Schenectady–Troy	905	0.98	1.00	2,634
57	FL	North Port–Sarasota–Bradenton	891	0.99	1.04	2,886
58	TX	McAllen–Edinburg–Mission	888	0.90	0.86	2,829
59	LA	Baton Rouge	873	0.85	0.91	2,883
60	TX	El Paso	872	1.06	0.89	4,177
61	PA-NJ	Allentown–Bethlehem–Easton	871	1.00	0.99	3,280
62	CT	New Haven–Milford	870	1.22	1.08	3,339
63	CA	Oxnard–Thousand Oaks–Ventura	833	1.30	1.32	1,626
64	FL	Cape Coral–Fort Myers	822	1.07	1.02	6,804
65	ID	Boise City	811	1.11	1.00	4,401
66	CA	Stockton–Lodi	793	1.65	1.14	1,697
67	FL	Lakeland–Winter Haven	787	1.13	0.96	3,227
68	NC	Greensboro–High Point	784	1.03	0.91	3,928
69	CO	Colorado Springs	765	1.13	1.02	3,711
70	AR	Little Rock–North Little Rock–Conway	758	0.77	0.88	3,649
71	NC	Wilmington	746	1.00	0.99	7,719
72	IA	Des Moines–West Des Moines	729	0.98	0.92	3,948
73	UT	Provo–Orem	715	1.00	1.01	2,783
74	UT	Ogden–Clearfield	714	0.99	1.00	2,967
75	FL	Deltona–Daytona Beach–Ormond Beach	706	1.03	1.00	3,289
76	OH	Akron	698	0.91	0.89	3,018
77	NC	Winston-Salem	688	1.05	0.91	4,258
78	NY	Syracuse	654	0.95	0.95	2,536
79	KS	Wichita	650	0.91	0.87	3,715
80	OH	Toledo	640	0.87	0.88	3,584
81	FL	Palm Bay–Melbourne–Titusville	631	1.05	0.99	3,630
82	GA-SC	Augusta–Richmond County	624	0.88	0.92	2,909
83	PA	Harrisburg–Carlisle	603	1.04	0.96	4,142
84	WA	Spokane–Spokane Valley	598	1.09	1.00	4,865
85	AR-MO	Fayetteville–Springdale–Rogers	576	0.82	0.90	2,484
86	TN-GA	Chattanooga	575	0.87	0.91	4,316
87	PA	Scranton–Wilkes-Barre–Hazleton	568	0.99	0.91	3,178
88	ME	Portland–South Portland	562	1.20	1.13	4,716
89	PA	Lancaster	557	1.06	1.00	4,252
90	CA	Modesto	551	1.67	1.12	3,736
91	MI	Lansing–East Lansing	541	0.82	0.89	4,099
92	SC-NC	Myrtle Beach–Conway–North Myrtle Beach	536	0.98	0.95	1,597
93	OH-PA	Youngstown–Warren–Boardman	535	0.85	0.86	3,184
94	FL	Pensacola–Ferry Pass–Brent	523	0.90	0.98	2,822
95	FL	Port St. Lucie	521	1.00	1.01	3,175
96	KY	Lexington–Fayette	518	0.90	0.91	2,788
97	NV	Reno	501	1.02	1.07	4,094
98	TX	Killeen–Temple	496	0.94	0.89	3,340

99	MO	Springfield	487	1.14	0.87	3,863
100	LA	Lafayette	481	0.80	0.89	4,006
101	CA	Visalia–Porterville	478	1.06	1.04	3,849
102	NC	Asheville	476	1.02	1.03	4,451
103	PA	York–Hanover	461	1.15	0.96	3,214
104	CA	Santa Maria–Santa Barbara	444	1.56	1.43	4,004
105	MD-DE	Salisbury	439	0.99	1.03	2,788
106	CA	Salinas	433	1.84	1.38	2,682
107	PA	Reading	430	1.08	0.96	3,962
108	NH	Manchester–Nashua	427	1.21	1.10	2,050
109	IN	Fort Wayne	426	1.08	0.87	4,421
110	TX	Brownsville–Harlingen	425	0.94	0.88	3,977
111	TX	Corpus Christi	422	1.05	0.93	4,270
112	MS	Gulfport–Biloxi–Pascagoula	421	0.79	0.87	1,984
113	GA	Savannah	418	0.96	0.97	2,901
114	MI	Flint	402	0.82	0.86	2,042
115	AK	Anchorage	400	1.79	1.11	3,760
116	FL	Naples–Immokalee–Marco Island	398	0.99	1.09	4,341
117	IL	Peoria	396	1.08	0.87	5,648
118	FL	Ocala	396	1.01	0.95	3,235
119	TX	Beaumont–Port Arthur	394	0.93	0.89	2,707
120	LA	Shreveport–Bossier City	385	0.87	0.86	3,288
121	NJ	Trenton	381	1.16	1.04	2,581
122	IA-IL	Davenport–Moline–Rock Island	379	0.88	0.87	3,036
123	NC	Hickory–Lenoir–Morganton	368	0.97	0.90	2,030
124	CO	Fort Collins	367	1.20	1.09	4,634
125	MI	Ann Arbor	366	0.89	0.99	4,203
126	WV-KY-OH	Huntington–Ashland	354	1.16	0.84	4,064
127	CO	Greeley	350	1.16	1.06	2,748
128	FL	Gainesville	348	1.35	0.97	5,002
129	SC	Spartanburg	346	0.98	0.91	5,910
130	NE	Lincoln	342	1.05	0.95	5,963
131	TN-KY	Clarksville	337	0.91	0.89	2,619
132	IL	Rockford	335	1.07	0.87	2,970
133	TX	Lubbock	328	0.95	0.89	5,004
134	CO	Boulder	327	1.16	1.19	1,805
135	OH	Columbus	324	1.12	0.89	3,048
136	IN-MI	South Bend–Mishawaka	324	1.03	0.87	3,336
137	VA	Roanoke	314	1.10	0.94	5,134
138	IN-KY	Evansville	314	1.02	0.87	4,685
139	WA	Kennewick–Richland	311	1.10	1.00	4,433
140	TN-VA	Kingsport–Bristol–Bristol	311	0.91	0.86	7,590
141	MD-WV	Hagerstown–Martinsburg	303	0.97	1.00	2,430
142	FL	Crestview–Fort Walton Beach–Destin	300	1.01	1.05	2,907
143	WA	Olympia–Tumwater	299	1.16	1.11	3,772
144	TX	Longview	291	0.93	0.89	3,248
145	NY	Utica–Rome	289	0.91	0.94	1,424
146	TX	Waco	284	0.92	0.90	4,474
147	TX	College Station–Bryan	278	0.89	0.92	4,020
148	WA	Bremerton–Silverdale	278	1.25	1.15	5,217
149	NJ	Atlantic City–Hammonton	276	1.20	1.02	2,832
150	TX	Amarillo	271	0.90	0.88	4,483
151	TX	Laredo	268	0.95	0.90	3,899
152	PA	Erie	268	0.84	0.92	3,905
153	MI	Kalamazoo–Portage	261	0.89	0.89	5,626
154	WV	Charleston	252	1.36	1.02	4,978

155	NY	Binghamton	245	1.15	0.93	2,611
156	TX	Tyler	242	0.92	0.93	4,409
157	KS	Topeka	232	0.98	0.86	4,478
158	WA	Bellingham	231	1.35	1.12	6,692
159	NY	Rochester	228	0.95	0.97	4,914
160	VA	Charlottesville	224	1.06	1.02	4,100
161	SC	Columbia	215	1.01	0.90	3,552
162	GA	Gainesville	213	1.35	0.97	5,365
163	TN	Johnson City	210	0.87	0.88	8,246
164	LA	Lake Charles	207	0.82	0.89	2,469
165	IL	Springfield	207	1.14	0.88	4,582
166	LA	Houma–Thibodaux	201	0.78	0.90	2,617
167	WI	Racine	196	1.47	0.91	2,947
168	DE	Dover	187	1.17	1.01	4,306
169	NC	Burlington	176	1.04	0.92	3,400
170	IL	Bloomington	171	1.04	0.89	4,006
171	PA	East Stroudsburg	167	1.01	0.96	3,499
172	ID	Idaho Falls	166	1.03	0.92	3,647
173	TX	Odessa	161	0.83	0.93	3,313
174	MS	Jackson	160	0.83	0.87	2,263
175	PA	State College	158	1.15	1.00	5,524
176	IL	Ottawa–Peru	146	1.06	0.87	2,083
177	PA	Lebanon	144	1.09	0.95	3,181
178	PA	Pottsville	143	1.01	0.87	2,170
179	KS	Lawrence	120	0.96	0.92	3,656
180	MO-KS	St. Joseph	120	0.97	0.86	6,219
181	NY	Ithaca	105	1.10	1.02	4,597
182	TX	Midland	84	0.87	0.87	4,917
183	OH	Dayton	34	0.96	0.88	3,942
<b>Total</b>	<b>Weighted average</b>		<b>239,769</b>	<b>1.10</b>	<b>1.08</b>	<b>2,356</b>

Sources and notes: Population census data is from the U.S. Census Bureau (2022b: metropolitan statistical area population tables, vintage 2022). The population of 240 million in the table includes only people in one of the 183 CBSAs (metro areas). The remaining U.S. population (total U.S. population is approximately 315 million in 2022) resides outside these CBSAs. HHI values are the reported hospital HHIs from HCCI 2023a, which are available for 183 CBSAs. The reported cost index is an aggregate cost index that includes inpatient, outpatient and physician costs and is reported from HCCI 2023b; values are normalized to the nationwide average, 1.00. Cost of living is the AdvisorSmith Cost of Living Index (AdvisorSmith 2023), based on the primary city listed for each metropolitan area. Values are normalized to the nationwide average, 1.00.

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