

# Taking the pulse of health care markets

## A discussion of the Healthy Marketplace Index (HMI) price and utilization metrics

### Introduction

The Health Care Cost Institute (HCCI), with grant funding from the Robert Wood Johnson Foundation (RWJF), has developed a set of economic metrics, collectively referred to as the Healthy Marketplace Index (HMI). These metrics are intended to provide baseline measurements of health care market performance related price, productivity, and competition. This HCCI *Data Brief* discusses patterns in the price and utilization indices reported in the 2015 *Healthy Marketplace Index Report*. The full report also includes numerous other measures regarding resource use, health, and provider concentration as well as a detailed description of the methodology.<sup>1</sup>

Only recently has administrative claims data for the privately insured population become more accessible for research and reporting purposes. Historically, many studies have used data from Medicare, which has administered prices and generally covers an older and less healthy population. Much of what is known about the markets for health care services for the privately insured population has been based on case studies of individual markets or subsets of the privately insured population, which are not necessarily representative of the overall population. For example, little was known about how prices (i.e., actual

amounts paid by insurers including the patient cost share component) compared across geographies. Even less has been reported on comparisons of prices within geographies.

Examination of the HMI metrics reveal that health care markets are more complex than some may have expected. For example, to date, much of the research on health care services markets has been focused on inpatient hospital markets.<sup>2</sup> The price and utilization indices demonstrate that the features of inpatient hospital markets may not appropriately characterize markets for other types of services. In particular, the price indices suggest that prices for inpatient and outpatient services vary within markets; there are often different price levels for health care services even within a single geography. This implies there may actually be different markets for different types of services and/or that the geographic boundaries of the markets differ.<sup>3</sup> It is also likely that prices differ between primary care and specialists or insurance product type (e.g., HMO, PPO, etc.). Within the broad categories of inpatient and outpatient services there may also be differences depending on the types of services (e.g., orthopedics, cardiology, oncology, etc.). Furthermore, the amount of services used within a geography is not necessarily indicative of the price level. Areas with higher prices may

## KEY FINDINGS

### Health care markets are more complex than some may have expected

The price indices suggest inpatient and outpatient price levels vary across and within markets.

### High price areas

High price areas—Boulder, CO, El Paso, TX, Bridgeport, CT, Dallas, TX, Milwaukee, WI, Philadelphia, PA, Denver, CO, and Fort Collins, CO.

### Low price areas

Low price areas—Tucson, AZ, St. Louis, MO, New Orleans, LA, Peoria, IL, and Louisville, KY.

### Differing inpatient and outpatient price areas

Low inpatient—high outpatient price levels include: Corpus Christi, TX, Green Bay, WI, Miami, FL, Lakeland, FL, and Trenton, NJ.

High inpatient—low outpatient price levels include: Orlando, FL, and Jacksonville, FL.

### Prices do not predict utilization

No statistical relationship was found between the price and utilization indices.

not always use more of the higher priced services.

The HMI, one of the first of its kind, is a set of comprehensive economic performance metrics on the privately insured population. The HMI metrics were developed using actual prices from the administrative claims data of a commercially insured population. The measures are intended to provide economic performance reference points (e.g., prices, resource use, hospital concentration, etc.) for researchers, policy makers, employers, and health care industry leaders. As demon-

strated in this brief, the metrics offer unique insights at a national and local level.

### **The HMI allows for comparisons of price and utilization across markets and over time**

All HMI metrics were calculated using HCCI's administrative claims database, which includes membership and claims data for over one quarter of the national under 65 ESI population. HMI metrics were calculated for the population of individuals with employer sponsored insurance (ESI) for the years 2011 through 2013 in 41 Core Based Statistical Areas (CBSAs), which is referred to as the "total population."<sup>4</sup> This brief reports on the three year averages of metric values by CBSA. Although, the metrics discussed in this brief are price and utilization indices, any or all of the metrics can be used to make comparisons across markets or over time.

The HMI price and utilization indices were constructed from a fixed set or "basket" of health care services allowing for consistent comparisons. The price index holds the set of services fixed and allows prices for those service to vary between regions. Therefore, differences between markets can be attributed to prices rather than the types or amounts of services used. A CBSA index value of 1.00 indicates that, on average for a basket of services, the prices in the CBSA were equal to those of the total population. CBSAs with higher than average prices have index values larger than 1.00, and CBSAs with lower than average prices have index values less than 1.00.

The utilization index uses the same basket of services as the price index but holds the price of each service constant

across markets. Instead, the utilization index allows the mix of services to vary and measures how the amount of services used, given a fixed price, influence expenditures. A utilization index greater than 1.00 suggests more high-priced services were used in a given CBSA relative to the mix of services used in the total population. In CBSAs where more lower cost services were used, relative to the total population, the utilization index values was less than 1.00. If the costs of the mix of services in a CBSA was equal to the total population the utilization index value was 1.00.

The HMI includes separate indices of inpatient and outpatient price and utilization. The CBSA-level three year average index values are reported in Table 1.<sup>5</sup> Patterns in the CBSA-level price and utilization index values are discussed in this brief, including: similarities as well as differences across geographies in price and utilization and relative rankings of CBSAs differed by inpatient versus outpatient price indices; moreover, no statistical relationship between price and utilization was found.

### **Although many factors such as practice patterns, population health status, technology, and competition, differ across markets, consistent price and utilization levels were observed for some markets within states**

Consistent with a large body of literature regarding geographic variation in health care prices and utilization, variations were observed across CBSAs within the same state.<sup>6</sup> The variation is exemplified by the differences between CBSAs in Florida, Texas, and Colorado. Each of these states had HMI metrics reported for multiple CBSAs (8 in FL, 6 in TX, and 4 in CO). The average differ-

ence between the maximum and minimum index values within the states was 38% for inpatient prices and 25% for outpatient prices. For example, the Fort Collins, CO inpatient price index (1.47) was 43% larger than the Colorado Springs, CO inpatient price index (1.03). The variation in utilization indices between CBSAs in these states was slightly less. The average difference in inpatient utilization between the minimum and maximum index value was 12%; the average outpatient utilization difference was 19%.

There are, however, "neighboring" CBSAs with similar index values. For example Atlanta, GA and Augusta, GA have similar inpatient price indices (0.92 and 0.94, respectively) and outpatient price indices (0.99 and 0.95, respectively).<sup>7</sup> Even within FL and TX there are CBSAs with similar indices. For example, the outpatient price index value in North Port, FL was 0.98 and it was 0.97 in Tampa, FL. El Paso, TX and Austin, TX had inpatient utilization indices of 0.97 and 0.98, respectively. While there is a vast and growing literature examining geographic variation, additional understanding of health care markets may be achievable through investigations of geographic similarities.

### **The HMI price indices suggest price levels within markets are not consistently higher or lower for all services**

A positive, statistically significant correlation was found between inpatient and outpatient price indices in each analysis year, ranging from 0.532 to 0.597.<sup>8</sup> This results suggest inpatient and outpatient prices are related. However, further examination of the CBSA-level index values demonstrated that making generalizations about overall price levels from a

single index may be inappropriate. For example, Miami, FL had relatively low inpatient price levels and high outpatient price levels, while the opposite pattern of price levels was observed in Orlando, FL.

As seen in Figure 1, a scatter plot of the average HMI inpatient and outpatient price indices, many of the CBSAs have either higher inpatient or patient prices levels. The figure is divided into four quadrants, numbered clockwise starting from the upper right. Quadrant I are CBSAs with higher than average inpatient and outpatient prices. Quadrant II contains CBSAs with inpatient price index values over 1.00 but outpatient price index values less than 1.00. CBSAs with inpatient and outpatient price indices less than 1.00 appear in Quadrant III. In Quadrant IV, CBSAs have lower than average inpatient prices and higher than average outpatient prices.

There are noticeable outliers with high inpatient and outpatient prices (Boulder, CO, El Paso, TX, Bridgeport, CT, Dallas, TX, Milwaukee, WI, Philadelphia, PA, Denver, CO, and Fort Collins, CO), as well as outliers with low inpatient and outpatient prices (Tucson, AZ, St. Louis, MO, New Orleans, LA, Peoria, IL, and Louisville, KY). High price and low price areas are often compared and both are of interest to researchers and policy makers trying to understand the factors influencing prices.

The findings, that receive seemingly less attention in research and policy, were differences between inpatient and outpatient price levels within the same market. For example, Corpus Christi, TX, Green Bay, WI, Miami, FL, Lakeland, FL, and Trenton, NJ have lower than average inpatient prices but higher than average outpatient prices. Conversely,

Orlando, FL and Jacksonville, FL have lower outpatient and higher inpatient prices.

More detailed analyses of prices in markets where prices diverge by service location may also be useful for obtaining insights with broader implications to health care markets. There are most likely differences in market structures between those markets with differing prices levels and those with similar price levels. Efforts to characterize both types of markets may lead to a better understanding of the demand and supply of health care services, as well as identify additional areas for more detailed investigations.

Within markets, some health care services may be available in both settings (inpatient and outpatient). There are many services that are available in only one or the other. This is similarly true for the labor and capital needed to provide the services. Where individuals receive services, however, is dependent on their health care needs as well as market factors. A better understanding of the complexities of markets will also, hopefully, result in appreciation of how the health of the population influences the market as well as how the market performance affects health.

#### **No consistent relationship was found between prices and utilization of health care services across markets**

The HMI results found no statistically significant correlation between price and utilization indices. Figure 2 and Figure 3 provide visual representation of the price index relative to the utilization index, respectively, for inpatient and outpatient services.<sup>9</sup> The results suggest at an aggregate level, prices cannot be used to make generalizations about utilization or vice versa. However, just as

with the comparison of price indices, particular CBSAs of interest can be identified on the basis of price and utilization index values.

Markets of particular interest for interventions are likely those where both utilization and price levels are higher than average. These are also the markets where health care expenditures are likely to be higher than average given that expenditures are the products of prices and quantities. The CBSAs with three year average price and utilization index values of 1.05 or greater are labeled in Figure 2 and Figure 3. Denver, CO has price and utilization index values 5% higher than the total population for both inpatient and outpatient services. Greensboro, NC, and Palm Bay, FL also had price and utilization index values greater than 1.05 for inpatient services. Corpus Christi, TX, Fort Collins, CO, Boulder, CO, Philadelphia, PA, and Trenton, NJ had outpatient services price and utilization indices over 1.05.

Other markets of interests to researchers as well as policy makers, employers, and health care leaders may be those markets where both utilization and price indices are below average. For example, Miami, FL, and Trenton, NJ had low index values for inpatient services for both price and utilization and Augusta, GA and Peoria, IL had low price and utilization index values for outpatient services.

Interestingly, of the CBSAs identified in Figures 2 and 3, Boulder, CO, Philadelphia, PA, and Denver, CO were identified as CBSAs with higher than average prices in both inpatient and outpatient prices. However, only Denver, CO had similarly higher utilization index values for both service types. Additionally, Trenton, NJ, which had above average outpa-

tient price and utilization indices, had a below average inpatient price and utilization for inpatient services.

### Conclusion

There are two main conclusions from this descriptive analysis of the HMI price and utilization indices. First, better performing markets can be identified based on the HMI metrics. For example, some CBSAs have lower prices or lower prices and a less costly mix of services. Second, although CBSAs with better or worse HMI metrics can be identified, a ranking of market “health” is nearly impossible. Given that price levels varied by type of service within a CBSA and there was no statistical relationship between prices and utilization it is difficult to determine how all of those should be incorporated into a single ranking. While the HMI is a source of performance measurement data, analysis of HMI metrics also reveals the need for additional research to better understand the dynamics underlying economic behavior in health care markets.

The indices discussed in this brief and the other HMI metrics provide a common set of measures to employers, health plans, and providers within their communities. Offering this type of information to individuals and organizations who are active participants in health care financing and delivery will hopefully lead to an improved understanding of the markets they operate in and provide a basis for sensible and meaningful policies that improve the value of health care services.

### Data and methods

HCCI’s data is comprised of HIPAA compliant, statistically de-identified administrative claims data for approximately 27% of the national under 65 ESI popu-

lation and includes claims from all 50 states and the District of Columbia for over 40 million individuals per year.<sup>10</sup> The HMI analysis cohort includes all adult ESI members ages 18 – 64 for the years 2011, 2012, and 2013. Core Based Statistical Areas (CBSAs) were used to define market areas for the HMI because they contain sufficiently large populations for analyses and are clearly defined by collections of counties. The metrics were developed using data from CBSAs where the total 18 – 64 ESI population was greater than 100,000 and HCCI data included at least 25% of the membership.<sup>11</sup>

The price and utilization indices were built using a set of DRG codes common to the inpatient setting and Current Procedural Terminology or Health Care Common Procedure Coding System (CPT/HCPCS) codes in frequently observed in the outpatient setting. The inpatient market basket of services included the 100 most commonly occurring DRGs on the basis of the number of admissions for each DRG in the year 2012. Counts of codes were limited to the 41 CBSAs included in the analyses.

For the price index, code level weights were calculated by dividing the number of observations for a given code by the total number of codes observed in the claims from the total population. A mean price for each code was calculated from the 2012 claims within each CBSA and for the full population. For the utilization index, an average price for each code was calculated using the total population. Code weights were calculated within each CBSA and for the total population. For both sets of indices, for a given year, the mean price of each code was multiplied by its respective weight. The weighted mean prices were summed to

produce a weighted mean market basket price for each CBSA and the total population in each year. The CBSA weighted mean market basket prices were divided by the total population weighted mean market basket price from the same year to create CBSA-level index values.

### Endnotes

1. HCCI (Health Care Cost Institute). September 2015. 2015 *Healthy Marketplace Index Report*, DC: HCCI. Web.
2. For many reasons, geo-political boundaries such as state, county, or ZIP-code are often used as the basis for discussions of health care service areas and/or markets. Ongoing HCCI research is also examining characteristics of markets with more intricate definitions based on patient flows.
3. Gaynor, M. and Town R., "Competition in Health Care Markets," Handbook of Health Economics, vol. 2 Ed. Pauly, MV, McGuire, TG, and Barros, PP. Waltham, MA North Holland 2012 pages: 499–637.
4. United States Census Bureau. "Metropolitan and Micropolitan," Available at: <http://www.census.gov/population/metro/>.
5. Index values are reported by year in the HMI report for the years 2011–2013.
6. For a comprehensive discussion and analysis of geographic variation, see IOM (Institute of Medicine). 2013. *Variation in Health Care Spending: Target Decision Making, Not Geography*. Washington, DC: The National Academies Press.
7. For convenience, CBSAs are referred to throughout the *Brief* by the first city and state in the CBSA name. Complete CBSA names are listed in Table 1.
8. HCCI (Health Care Cost Institute). September 2015. 2015 *Healthy*

*Marketplace Index Report*, DC: HCCI.  
Web.

9. There may be statistical relationships between price and utilization for particular services. The correlations were performed using the HMI index values.
10. The percentage estimate is based on HCCI's 2012 membership data compared to The U.S. Census Bureau's American Community Survey 3-yr (2010—2012) estimate of the ESI population.
11. The total ESI population was assumed to be the ESI population estimated by The U.S. Census Bureau's American Community Survey.

**Author**

Eric Barrette  
ebarrette@healthcostinstitute.org  
571-257-1584

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**Health Care Cost Institute, Inc.**

1100 G Street NW, Suite 600  
Washington, DC 20005  
202-803-5200

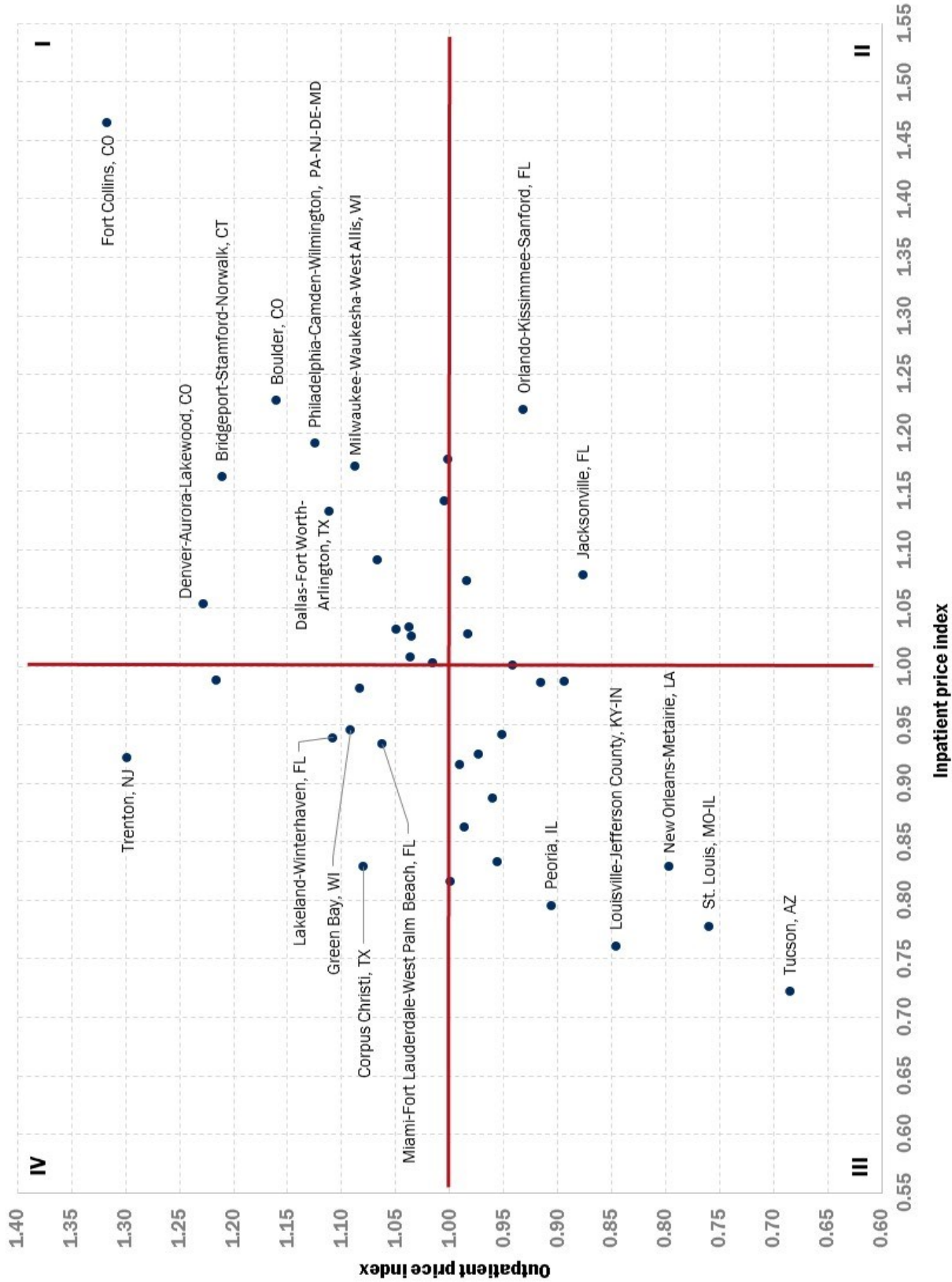
**Table 1. Three year averages of HMI price and utilization indices**

CBSA name	Price		Utilization	
	Inpatient	Outpatient	Inpatient	Outpatient
Atlanta-Sandy Springs-Roswell, GA	0.92	0.99	1.01	1.15
Augusta-Richmond County, GA-SC	0.94	0.95	1.06	0.84
Austin-Round Rock, TX	1.01	1.04	0.97	1.11
Beaumont-Port Arthur, TX	0.98	1.08	1.14	1.01
Boulder, CO	1.19	1.13	1.01	1.11
Bridgeport-Stamford-Norwalk, CT	1.23	1.16	0.95	0.70
Cape Coral-Fort Myers, FL	1.03	1.04	1.05	0.92
Cincinnati, OH-KY-IN	0.99	0.89	1.03	1.01
Colorado Springs, CO	1.03	1.04	1.03	0.99
Columbus, OH	1.03	1.05	1.03	0.88
Corpus Christi, TX	0.83	1.08	1.06	1.10
Dallas-Fort Worth-Arlington, TX	1.13	1.11	1.01	0.97
Dayton, OH	1.18	1.00	1.04	0.93
Denver-Aurora-Lakewood, CO	1.05	1.23	1.05	1.12
El Paso, TX	1.16	1.21	0.98	1.00
Fort Collins, CO	1.47	1.32	0.97	1.06
Green Bay, WI	0.95	1.09	1.07	0.90
Greensboro-High Point, NC	1.07	0.98	1.08	0.98
Houston-The Woodlands-Sugar Land, TX	0.99	1.22	1.00	1.03
Jacksonville, FL	1.08	0.88	1.01	1.03
Kansas City, MO-KS	0.89	0.96	1.00	0.99
Lakeland-Winter Haven, FL	0.94	1.11	1.01	0.94
Lexington-Fayette, KY	0.83	0.96	1.04	0.95
Louisville/Jefferson County, KY-IN	0.76	0.85	1.04	1.16
Miami-Fort Lauderdale-West Palm Beach, FL	0.93	1.06	0.95	1.02
Milwaukee-Waukesha-West Allis, WI	1.09	1.07	1.04	0.83
New Orleans-Metairie, LA	0.83	0.80	1.02	0.80
North Port-Sarasota-Bradenton, FL	0.93	0.97	1.06	0.97
Omaha-Council Bluffs, NE-IA	1.00	1.02	1.00	0.81
Orlando-Kissimmee-Sanford, FL	1.22	0.93	0.96	1.06
Palm Bay-Melbourne-Titusville, FL	1.14	1.01	1.06	0.89
Peoria, IL	0.80	0.91	1.04	0.96
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	1.17	1.09	0.95	1.15
Phoenix-Mesa-Scottsdale, AZ	1.00	0.94	0.98	1.09
St. Louis, MO-IL	0.78	0.76	1.02	0.80
San Antonio-New Braunfels, TX	0.86	0.99	1.01	1.21
Tampa-St. Petersburg-Clearwater, FL	1.03	0.98	1.00	0.91
Trenton, NJ	0.92	1.30	0.94	1.10
Tucson, AZ	0.72	0.69	1.03	0.88
Tulsa, OK	0.82	1.00	1.09	1.06
Washington-Arlington-Alexandria, DC-VA-MD-WV	0.99	0.92	0.95	1.15

Source: HCCI, 2015.

Note: Values reported are the averages of 2011 through 2013 CBSA-level indices from the 2015 *Healthy Marketplace Index Report*.

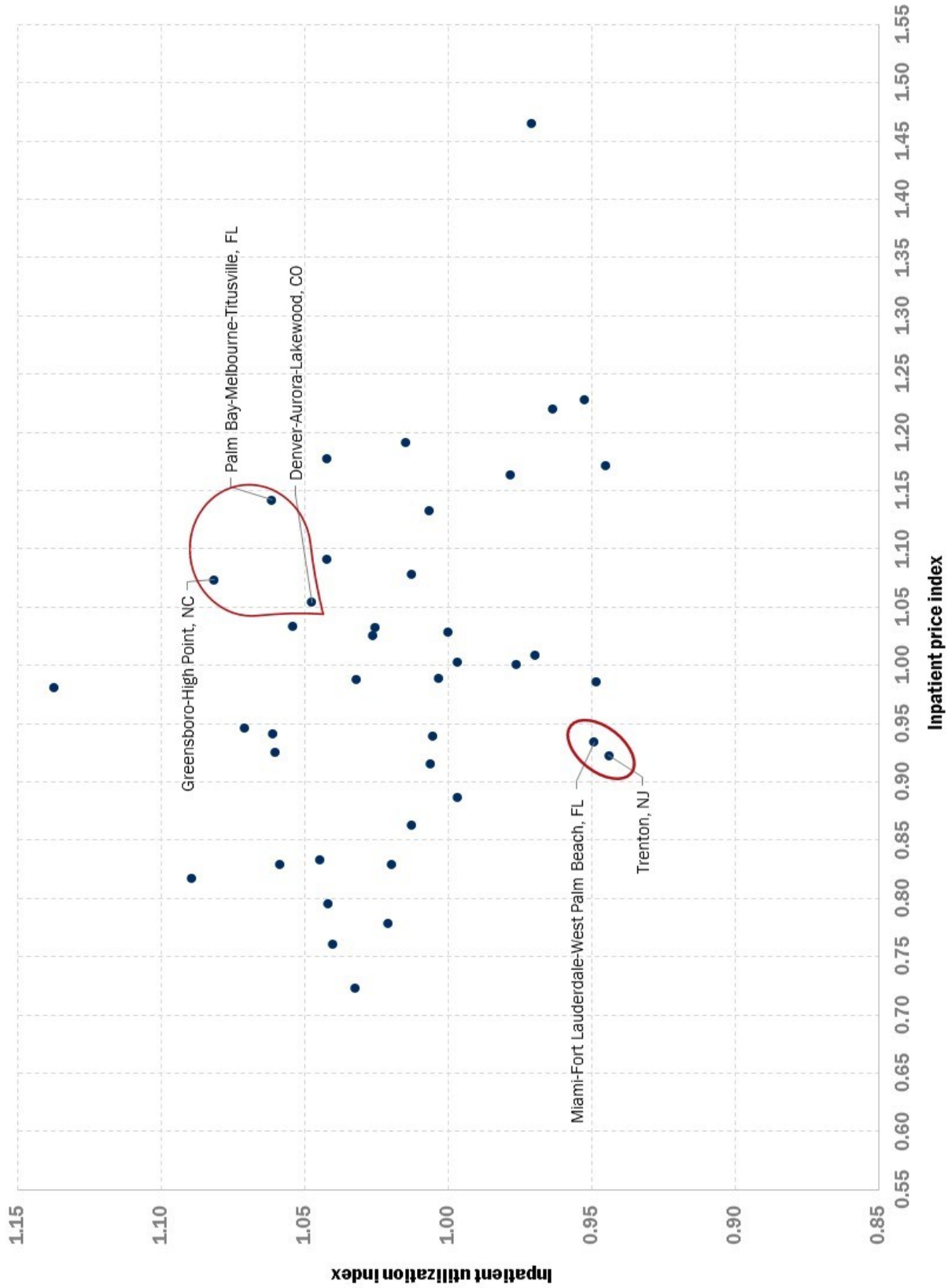
**Figure 1. Scatter plot of CBSA-level inpatient and outpatient price indices**



Source: HCCI, 2015.

Note: Values reported are the averages of 2011 through 2013 CBSA-level indices from the 2015 Healthy Marketplace Index Report.

**Figure 2. Scatter plot of CBSA-level inpatient price and utilization indices**

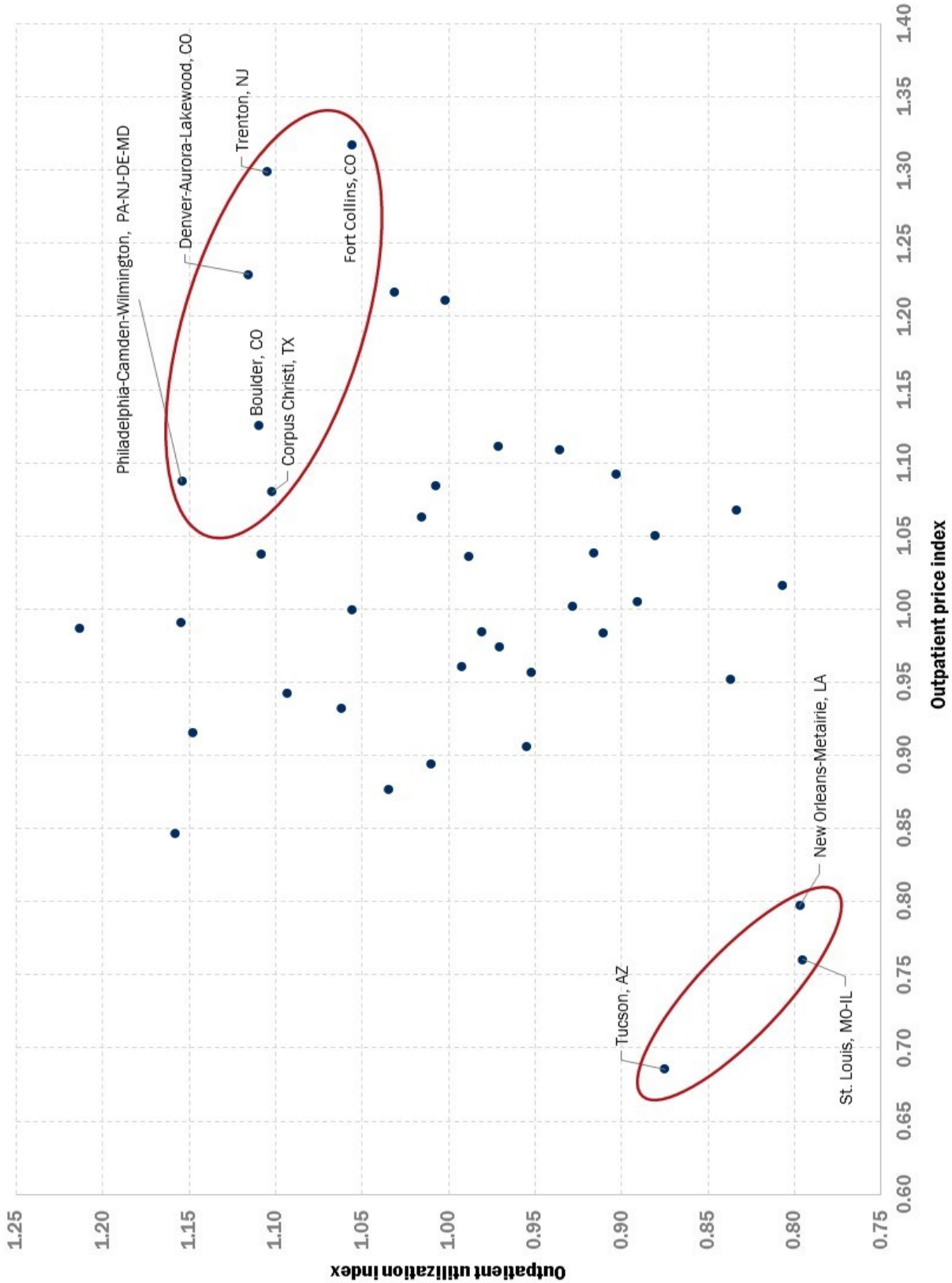


Source: HCCI, 2015.

Note: Values reported are the averages of 2011 through 2013 CBSA-level indices from the 2015 Healthy Marketplace Index Report.



**Figure 3. Scatter plot of CBSA-level outpatient price and utilization indices**



Source: HCCI, 2015.

Note: Values reported are the averages of 2011 through 2013 CBSA-level indices from the 2015 Healthy Marketplace Index Report.