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2022 Healthy Marketplace Index

Frequently Asked Questions

June 2022

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General Questions

How is a metro area defined?
We used Core Based Statistical Areas (CBSAs), as identified by the Office of Management and Budget, to define our metro areas.

How were the sample metro areas chosen? For example, why are there so many data points in areas like Florida but so few in New York?
To be included in the HMI, a CBSA had to have a minimum average of 25,000 member years and 10% coverage of the ESI population within the HCCI data. See the methodology document for greater detail.

What constitutes an inpatient, outpatient, or professional service?
Inpatient services are rendered to patients who are kept in a health care facility overnight for treatment but not for observation.

Outpatient services are rendered to patients by sections of a hospital that provide medical services not requiring an overnight stay or hospitalization (e.g., emergency room [ER], outpatient surgery, observation room).

Professional services are rendered to patients by a health care professional. Service claims with no valid revenue code are assumed to be professional services (e.g., office and preventative visits, administered drugs).

How does the 2022 HMI differ from previous versions?
The 2022 HMI included 186 CBSAs across 44 states, compared to 185 CBSAs across 48 states in the previous version.

The methodology used to calculate the price index in the HMI 2022 remained unchanged. We used a weighted arithmetic average of per service prices across services within each category of health care services), among each service that existed in any sample year. We calculated a single weight across all sample years.

In both versions, the use index was calculated as a simple count of per-capita services used within each service category. See the methodology document for greater detail.

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Spending Index Questions

What does per person "spend" mean?
We define spending as the sum of all dollars spent per person on medical services in a given year across inpatient, outpatient, and professional services. We measure spending using allowed amounts (the sum of any insurer and individual out-of-pocket spending). Note that our measure of spending does not include any prescription spending. Our measure of spending also does not account for any premium spending or direct spending between a provider and patient (i.e., balance bills).

How does overall spending relate to spending by service category?
Overall spending is the summation of spending per person across all three service categories in a given year.

How does per person spending relate to per person price, use, and service mix indices?
Within each service category (inpatient, outpatient, and professional), per person spending can be expressed as the product of our average price and use measures summed with our service mix measure. For a more comprehensive description of how we calculate the measures used in our report, see our methodology document.

Does the per person spending measure capture spending on all services?
Yes; in the 2022 HMI, we capture spending per person on all inpatient, outpatient, and professional services observed in our data.

Do changes in per person spending account for changes in which services people use?
Changes in our per person spending index capture changes in spending on each service that existed in any sample year. For example, if a new service was introduced between 2016 and 2020, the resulting change in spending would be captured by changes in our per person spending measure.

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Price Index Questions

What does "prices" mean?
We define "prices" as the allowed amount paid for a health care service. The allowed amount is the total payment from both the insurer and the patient to a health care provider.

How are "prices" used to compute the "price level"?
Using the prices paid for health care services by patients who live in each CBSA, we calculate a measure of the average price paid for a representative health care service within each service category. We then calculate the "price level" by comparing this measure to the national average.

For a more comprehensive description of how we calculate the measures used in our report, see our methodology document.

Are differences in prices due to people receiving different services across areas?
When calculating our measure of the average price paid for a representative health care service, we hold the set of services and the amount of each service used constant across areas. In other words, our measure is designed to compare the prices an individual would face for the same basket of health care services in each metro area.

Are differences in prices due to the fact that people may be sicker and therefore requiring more expensive procedures in different areas?
We standardized our sample across areas in several ways to limit the degree to which differences in CBSA populations were influencing the computed price measures. First, we studied the same population in each area: individuals under the age of 65 with employer sponsored insurance, non-individual coverage with one of the following plan types: Health Maintenance Organization, Preferred Provider Organization, Point of Service Plan, or Exclusive Provider Organization. Further, we excluded claims with extreme costs or lengths of stay from our analysis.

Consequently, our analysis compared the prices paid for the same set of services for largely similar populations across areas. That said, it is possible that underlying health differences of different CBSAs are one among many local factors that affect variation in health care prices. To explore this possibility further, we also calculated a "service mix" index which shows how much of a CBSAs spending is due to the use of more intensive or expensive services compared to the national average.

Are the prices based on where I live or where I receive care?
Prices are based on where patients live.

Health care prices in my metro area were above the national average. Why might this have been the case?
Health care prices are dependent on a number of local factors (e.g., cost of living, demand for health care services, health care provider market structure, health insurer provider market structure, etc.). Our price index is not meant to explain why prices may be high or low. Subsequent releases will provide more information on commercial health care markets that can help unpack the factors which may be influencing price.

Health care prices in my metro area were below the national average. Does this mean there were low health care prices in my area?
Not necessarily. Comparing a metro to the national average simply tells you how high (or how low) that metro's prices were on the distribution of prices at that time. It could be the case that all prices across all metros were high (or low).

Diving further into our Price Index data, we found that, regardless of their relation to the national average, health care prices were dramatically more expensive in 2020 than in they were in 2016 almost everywhere. While an area might have below average prices in 2020, those prices were on average 10% higher than they were just a few years before.

Price levels and growth rates are often compared in this report. What is the difference between these two measures?
Price levels compare the prices of different CBSAs within one year, in this case 2020. Growth rates compare the price level of the same CBSA over time; most often we report the growth rate between the first and last year of our study (2016 and 2020).

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Use Index Questions

What does per person "use" mean?
We define use as the total number of services used per person.

How are "use" rates used to compute "use levels"?
Using data on how many services are performed for each type of service in each CBSA, we calculate the use index as a weighted average of per person use rates. We define the weights based on the share of total spending accounted for by each service in our base year, 2016. For a more complete description see our methodology document.

How should we interpret the use level of a metro?
Let's say the overall use level of a metro is 20% above the national median. This means that on average, patients who lived in that metro utilized 20% more health care services than the patients who lived in the median market.

Is use measured based on a member's residence or site of care?
We measure use based on where the patient receiving care resides.

What factors may relate to high use?
High use may result from a variety of factors relating to both the supply of and demand for health care services. For example, a place may have high use due to underlying population health characteristics, a large number of providers, or provider practice patterns, to name a few.

Can overall use levels reflect the fact that some metros use different services than others across categories of services?
Yes, overall use levels in our study are the result of different use levels within metros across service categories. We also see that metros can have different changes in use levels by service category over time. You can explore these trends and more using the dashboard in our interactive report comparing use levels across metros.

Does the use index account for which services metros are using within categories of services?
No, the use index only accounts for the volume of services used by patients within a given metro. It does not account for different metros using a different mix of services. However, we calculated a "service mix" index to explore this possibility which examines how much of a metro's spending is due to the specific services provided.

Do changes in the use index account for changes in which services metros are using over time?
Changes in the use index only account for changes in the volume of services used by patients within a given metro over time. It does not account for a metro using different

proportions of the same set of services across years. However, the service mix index does capture this change.

Are service use levels in the HMI analytic data representative of all services performed in a given year? Does it change over time?

Our HMI sample of claims is highly representative of the full HCCI commercial claims data set. From 2016 through 2020, the HMI sample used more than 78% of the HCCI universe of claims, which accounted for over 85% of total spending, suggesting significant overlap between data sets.

How correlated were price and use levels?

Overall, we observed a negative correlation between price and use index values (Table 1). That is, areas with higher price levels tended to have lower use levels more so than areas with lower price levels. There was some variation in the correlation between price and use index values across service categories, though, as seen below. Inpatient services experienced a greater negative correlation between price and use, while outpatient and professional services had a weaker negative correlation.

Table 1. Correlation Coefficients between CBSA Price, Use Index Values, 2016-2020

Service Category	2016 - 2020
Overall	-0.35
Inpatient	-0.54
Outpatient	-0.23
Professional	-0.09

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Service Mix Index Questions

What does the Service Mix Index measure?

The service mix index measures the degree to which spending in a particular metro area is higher or lower than the national median solely due to the use of more or less expensive services on average. In other words, it measures how would spending in a particular metro differ from the median metro if it faced the same prices and used the same volume of services – with the only difference being which services it used

Take, for instance, two hypothetical metro areas which faced the same prices for the same 6 sample services. Assume these metros also used the same number of total services. However, each metro area used a different mix of services. For example, Metro Area B happened to use a relatively larger amount of the more expensive services (i.e., a 60-minute doctor's office visit as opposed to a 15-minute visit) than did Metro Area A. As a result, total spending in Metro Area B was 16.5% higher than in Metro Area A. This spending difference is despite both metro areas facing the same prices and using the same volume of services. This 16.5% difference in spending was solely the mix of services used in Metro Area B relative to Metro Area A (Table 2).

Table 2. Hypothetical Comparison of Two CBSA's Total Spending Broken Down by Service Mix

	Metro Area A			Metro Area B		
Service	Price	Use	Spending	Price	Use	Spending
Vaginal Delivery	$10,000	3	$30,000	$10,000	1	$10,000
C-Section Delivery	$15,000	2	$30,000	$15,000	4	$60,000
2-view Chest X-Ray	$200	18	$3,600	$200	6	$1,200
4-view Chest X-ray with Computer Aid	$275	7	$1,925	$275	19	$5,225
15-Minute Doctors Visit	$75	17	$1,275	$75	8	$600
60 Minute Doctors Visit	$115	13	$1,495	$115	22	$2,530
Total:		60	$68,295		60	$79,555

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What does it mean that in Binghamton, NY Service Mix Index was 11%?

In Binghamton, spending was 11% higher than the national median, solely due to the use of more expensive services, on average, than the nation as a whole.

Then how is spending in Binghamton only 4% higher than the national median?

It is possible that the difference in spending between a particular metro area and the national median to be higher (or lower) than the value of the Service Mix Index. For example, in Binghamton spending was only 4% higher than the national median (the spending index value). This implies that, despite the use of more expensive services on average, relatively low price and use levels in Binghamton collectively lowered spending by 7% relative to the national median.

What does the Service Mix Index measure over time?

A change in the service mix index measures how spending in a particular metro area has changed over time solely due to a shift to using more or less expensive services on average.

In Washington, DC the Service Mix Index decreased 5% from 2016 to 2020. What does that mean?

In Washington, DC, there was a shift to using less expensive services on average. Absent changes in price and utilization, this shift would have resulted in 5% lower spending in 2020 than in 2016.

Then how did spending in Washington, DC increase 4% from 2016 to 2020?

Spending overall in Washington, DC increased 4%. This implies that increases in average prices and changes in the volume of services used cumulatively resulted in a 9% increase in spending, despite a 5% decrease in spending due to using less expensive services.

How is the Service Mix index computed?

Service mix is computed as the difference between observed per capita spending in a particular metro area and per capita spending as implied by the price and use levels in that metro area. Our price index measures what the average service price in a metro area would have been had each metro area used services in the same proportions as the nation as a whole. As a result, the product of our price and use indices represents what per capita spending in each metro area *would have been* had they used services in the same proportions as the nation as a whole – given the prices faced and volume of services used. We call this hypothetical spending “implied spending”. If a metro area has higher implied spending than observed spending, it suggests that it uses higher

proportions of more expensive services and a lower proportion of less expensive services on average than the nation as a whole (and vice-versa).

The difference between observed spending and implied spending, therefore, measures whether spending in a particular metro area was higher (or lower) than it would have been if it had that metro area used services in the same proportions as the nation as a whole. In other words, it measures whether spending in a metro area was higher (or lower) solely due to the use of more (or less) expensive services on average.

We compute service mix metrics separately in each metro area for each category of service, and for spending overall. For a more complete discussion of how these are computed, see our comprehensive methodology document.

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Hospital Concentration Index Questions

What does market concentration mean?
Within a market, concentration is a measure describing the distribution of market share amongst competing firms. A highly concentrated market means that a small number of firms hold a large majority of the market share; and vice versa for an unconcentrated market. Therefore, a highly concentrated market is considered to be a less competitive market.

In the context of this report, a highly concentrated market means that a smaller number of hospital systems account for a larger share of inpatient admissions from residents in a given metro area. While markets with lower concentration can be interpreted as the admissions of patients from a given area are more evenly distributed across a higher number of hospital systems.

Are market concentration and competition the same thing?
No. Competition is the act of more than one firm vying for a share of a given market against one another. Measuring the concentration of a market is a common way to measure how competitive that market is. A highly concentrated market typically signifies low competition and vice versa.

What is Herfindahl-Hirschman Index (HHI)? What does it measure?
The Herfindahl-Hirschman Index (HHI) is a frequently used method of measuring concentration in a market. It is calculated, in this report, by squaring the share of all admissions for residents in a metro area that occurred at a given hospital system, for each hospital system in which those residents received care. Those resulting squares are then summed together to give a number between 0 and 10,000. That number represents the inpatient hospital system HHI for the market. A HHI of 0 means that the market is perfectly competitive, while a market with a HHI of 10,000 can be interpreted as a monopoly.

What is meant by the term “market” in the report?
We defined a market as all hospital systems at which patients residing in a particular metro area received care – regardless of whether the hospital system was located in the same metro as the patient. It is important to note that we use the term “market” primarily for notational simplicity. The goal of our report is not to analyze product markets for antitrust purposes.

Why choose CBSAs as the geographic market rather than alternative market geographic definition (e.g., Hospital Referral Region, Hospital Service Area, Commuting Zone)? How does this impact your analysis?
The goal of this report is to publicly produce a measure of hospital market concentration at the most local geographic level possible. We found that the CBSA (commonly referred to in our reports as a "metro area") was the most disaggregated geographic unit that still allowed for the reporting of a substantial number of areas across the country, while maintaining our minimum data thickness requirements.

As stated, both above and explicitly in the report, this geographic market definition does not and is not intended to represent a product market for antitrust analysis.

A limitation of choosing CBSAs is that, in many cases, they may be too large to precisely represent a geographic market. As a result, using metro areas to define hospital markets may potentially understate the actual level of concentration experienced by patients in some areas. For example, in larger, more densely-populated metros, the CBSA boundaries might encapsulate multiple areas that could be considered a hospital market. As a result, it is not surprising that many of the larger metro areas (such as New York City, NY and Philadelphia, PA) appear to have some of the least concentrated hospital markets according to our HHI measure. It is possible that, by construction, our HHI measure may understate the true level of concentration in these markets.

Given your market geographic definition - Core-Based Statistical Area - how would constructing HHIs differently impact the analysis?
Using our market definition - a CBSA or "metro area" - we compute what is referred to as a "patient-flow" based HHI measure. That is, we consider a hospital market to be all hospital systems at which individuals from a given CBSA are admitted. We then compute our HHI measure as the sum of squared hospital system market shares. That is, we compute the sum of squared hospital system shares of total admissions for individuals from each metro area in each year in our sample.

Even given our geographic market definition, there are many other ways we could have computed HHIs. For instance, we could have computed a "geographic location" HHI where we defined the hospital market as all hospital systems physically located within our geographic market (metro area). In general, the distributions of the patient flow and geographic location HHIs tend to be largely similar. In other words, areas that had relatively (un)concentrated hospital markets as measured by the "patient flow" HHI, in a given year are also relatively (un)concentrated hospital markets as measured by the "geographic location" HHI. Geographic location HHI generally tends towards slightly higher concentration levels.

The goal of this report is to publicly produce a measure of inpatient hospital market competition that allows readers to compare metro areas across the country and over time. Due to this objective, we feel the selected method for computing HHI in this report is qualitatively similar to other alternative computation methods, despite the potential limitations. Further, we felt that the "patient flow" method presented the most straightforward way to compute HHIs. Lastly, as discussed in greater detail here, the patient flow method of HHI is more robust to potentially mis-specifying geographic boundaries for markets (a potential concern with our choice of CBSAs as geographic markets - discussed above).

Methods Note: Our discussion of these methods draws heavily from the work of John Graves and co-author(s); for a more complete discussion of these methods for computing HHIs, their similarities/differences, and more see this working paper.

Given the choice of market definition and HHI computation method, how would using an alternative market size definition or data source to compute HHI affect your analysis?

Given our choice of geographic market (CBSA) and that we computed a patient flow HHI, we used HCCI data on inpatient hospital admissions to determine market shares. A potential concern with using HCCI data is that it is a convenience sample which may not be representative. That is, the hospitals to which commercially insured individuals are admitted in the HCCI data may be biased by factors such as insurer networks, negotiated discounts, or other such factors. For instance, we may observe market shares that overstate some hospital systems' true market share and therefore overstate that hospital market's level of concentration. Similarly, using admissions as a measure of market size, rather than a capacity-based measure such as the number of hospital beds, may result in observing a concentration measure that is biased by factors such as hospital quality that result in patients disproportionately being admitted to particular hospitals relative to their size.

Prior work suggests that changing the way in which market size is defined to calculate comparable HHI measures (e.g. using alternative data sources, such as the AHA data on admissions or beds rather than HCCI data on admissions) would produce qualitatively similar results, given similar distributions across data sets and HHI measures.

It is important to note that changes in each HHI measure may be driven by different factors. The HHI measure based on HCCI admission data can be related to factors such as network structure and hospital quality, among many others. As a result, changes in HHI may be related to these factors, which potentially confounds a comparison between

changes in our HHI measure and changes in measures of prices, such as our price index.

What is patient flow?

Due to our defining the market as all residents who live in a given metro area, patients that travel outside of their resident metro area to receive inpatient care are included in the calculation of the resident market HHI. To show both how prevalent as well as where patients traveled outside their resident metro for care, we calculated the share of total inpatient admissions from residents in a given metro area that occurred at hospital systems located in all other metros. These shares for each resident metro area are considered its “patient flows”.

The 2020 patient flow shares for all resident (member) metro areas are publicly available to download. All provider-based metro areas that received less than 10 admissions from the given resident metro area, as well as admissions to providers in unidentifiable rural areas were summed together and categorized as “Other”.

Do your HHI measures take rural hospitals into account?
Identifiable rural areas were included in the analysis, however as discussed, the markets studied were defined by patients who lived in the 186 sample metro areas. As such, rural areas infrequently factored in to our HHI calculations, as it was uncommon for patients that lived in a metro area to have sought out inpatient care at rural provider.

What is considered a substantial change in HHI?
A merger that causes an increase in HHI of 2,000 is sufficiently large enough to warrant further investigation within at least moderately concentrated markets and above per Department of Justice and Federal Trade Commission Horizontal Merger Guidelines. While our analysis is not intended to be interpreted as antitrust analysis, this standard provides some context to what may be considered a large change in HHI.
Reference:

"Horizontal Merger Guidelines: 5.3 Market Concentration," The United States Department of Justice, last modified August 19, 2010,

https://www.justice.gov/atr/horizontal-merger-guidelines-08192010#5c

How could a metro area that experienced merger activity see a decrease in concentration?
As we describe above, we computed a patient flow HHI using HCCI data on inpatient hospital admissions. Where patients are admitted in the HCCI data can be biased by factors such as insurer networks, patient preferences, or many other factors that are both related and un-related to hospital market structure. Decreases in our HHI measures in metro areas where we identified a hospital merger could reflect changes in said factors, such as quality improvements in a hospital system attracting a larger share of patients that were unrelated to changes in hospital market structure due to mergers.