DATEWATCH

Prices For Common Medical Services Vary Substantially Among The Commercially Insured

Using a national multipayer commercial claims database containing allowed amounts, we examined variations in the prices for 242 common medical services in forty-one states and the District of Columbia. Ratios of average state prices to national prices ranged from a low of 0.79 in Florida to a high of 2.64 in Alaska. Two- to threefold variations in prices were identified within some states and Metropolitan Statistical Areas.

It is well known that health care expenditures vary because of differences in prices as well as utilization. Some price variation is the result of differences in costs of doing business, such as labor, rent, and supplies. Variation is also a function of providers’ and insurers’ ability to negotiate prices. The Dartmouth Atlas of Health Care has highlighted geographical variations in the Medicare population, both in aggregate and by procedure. However, analyses of variation in the commercially insured population have been limited to aggregate measures because of a lack of data on prices.

This article contributes to the literature on geographical variation by examining variation in prices for common medical services. Using a national multipayer commercial claims database, we examined prices across states, compared overall price levels by state, and explored price variation within states.

Prices for medical services varied more than threefold in certain instances (Exhibit 1). Our study included prices for up to 242 services in

| Source: Authors’ analysis of claims data from the Health Care Cost Institute and from Guroo.com (see Note B in text). Note: Ratios are rounded to two decimal places. |
each of forty-one states and the District of Columbia. Prices for 162 of these services were reportable in all forty-one states and the District of Columbia. We found that the ratios of average state prices to the average national price for these 162 services varied from a low of 0.79 in Florida to a high of 2.64 in Alaska. Ratios at the twenty-fifth and seventy-fifth percentiles—Oklahoma (0.97) and New Mexico (1.25)—differed by 0.28.

Study Data And Methods

Data

We used data from the Health Care Cost Institute (HCCI), a commercial claims database that includes nearly three billion final, fully adjudicated, paid claim lines.7 (Claim line data are the line-item elements in a medical claim. The claim lines identify all of the tests, procedures, and other items billed for during a patient’s encounter with a medical service provider.) These data are used to calculate the average prices for services reported on the website of HCCI’s price transparency initiative.8 The data include patients’ and providers’ ZIP codes; diagnostic and procedure codes; and allowed amounts, which are the actual amounts paid by an insurer plus any copayments, deductibles, or coinsurance paid by the insured person. The data used for this article are for the period January 1, 2012–December 31, 2013. Prices were actuarially trended forward to reflect prices as of September 1, 2015, by applying actuarial trend factors—similar to inflation rates—to service categories (such as inpatient, outpatient, and professional—that is, provided by a physician, nurse practitioner, physician assistant, or other health care professional).

Methods

Average prices were computed for 242 services, some of which are standardized collections of common groupings of diagnostic and procedure codes.9 Some services have a single code (for example, Current Procedural Terminology [CPT] code 76811 is for pregnancy ultrasound). Other services encompass an episode of care, such as knee replacement, which includes a specialist’s evaluation, surgery, physical therapy, and follow-up evaluation.6 HCCI data were insufficient for reporting in eight states, and one state signaled its desire not to have its prices be compared with national prices.10 Within states, sufficient data were not

EXHIBIT 2

Ratios of state average prices to national average price for cataract removal with lens replacement, 2015 prices

source Authors’ analysis of claims data from the Health Care Cost Institute and of data from Guroo.com (see Note 8 in text).
always available to determine prices for all 242 services. Although average prices for services were calculated at the national, state, and Metropolitan Statistical Area (MSA) levels, a minimum number of claims and providers was required to ensure the reliability of the estimates and to protect confidential company information. “Masking rules,” which require a minimum number of providers, claims, and data contributor coverage, made it impossible for us to report all prices for every state or MSA. Summary statistics of selected services are described below to demonstrate the magnitude of price variation that exists.

**Study Results**

**PRICE VARIATION ACROSS STATES** To illustrate the extent of price variation across states, we compared the ratio of average state prices to the average national price for cataract removal surgery with lens replacement (Exhibit 2). Cataract surgery was selected because it is a widely performed service but is often elective, which makes the price of particular interest to consumers. We found that, for example, in the center of the United States the price ratio increased from 99 percent in Kansas to 104 percent in Missouri, 129 percent in Illinois, and 141 percent in Indiana, but then it dropped to 85 percent in Ohio (see the online Appendix).11

Examining price variation by service provides an understanding of the impact of the variation on patients and insurers. We selected three services—pregnancy ultrasound, knee replacement, and, again, cataract removal—for this examination because they exemplify the range of services and the extent of price variation that exist for common medical services. A list of average prices by state for these three services can be found in Appendix Exhibit A1.11

Based on the interquartile range ratio, knee replacement prices appear to have the least variation: 1.32, compared to 1.54 for pregnancy ultrasound and 1.47 for cataract removal (Exhibit 3). However, the national average price for knee replacement is more than a hundred times higher than the national average price for pregnancy ultrasound and ten times higher than the price for cataract removal (see the Appendix).11 Thus, even though knee replacement has less variation in price than the other two services do, its variation can have a substantial impact on total expenditures and on patient cost sharing.

**OVERALL PRICE LEVELS ACROSS STATES** We also examined the overall price level for the 242 services across states. For each service we calculated the ratio of each state’s average price to the national average price and graphed the ratios by percentiles, because the total number of reportable service prices differed in each state. Four states exemplify the range of variations across states (Exhibit 4). For example, 95 percent of the prices for the 241 services in Florida were at or below the national averages. In contrast, about 75 percent of the prices for Ohio’s 240 services were at or below the national averages. Thirty percent of the prices for Connecticut’s 232 services were at least 20 percent higher than the national averages. And more than 45 percent of the prices for Minnesota’s 221 services were at least 50 percent higher than the national averages.

**PRICES ACROSS METROPOLITAN STATISTICAL AREAS WITHIN STATES** Price variation within states was examined though MSA-level prices.12 We investigated average prices for knee replacement in the twelve states that had reported

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**Exhibit 3**

State-level average prices for three common medical services, 2015 prices

<table>
<thead>
<tr>
<th>Services</th>
<th>25th percentile</th>
<th>Median (50th percentile)</th>
<th>75th percentile</th>
<th>Interquartile range ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee replacement</td>
<td>$29,441</td>
<td>$33,648</td>
<td>$38,883</td>
<td>1.32</td>
</tr>
<tr>
<td>Pregnancy ultrasound</td>
<td>$242</td>
<td>$310</td>
<td>$373</td>
<td>1.54</td>
</tr>
<tr>
<td>Cataract removal (with lens replacement)</td>
<td>$3,249</td>
<td>$3,746</td>
<td>$4,787</td>
<td>1.47</td>
</tr>
</tbody>
</table>

**Source** Authors’ analysis of claims data from the Health Care Cost Institute and from Guroo.com (see Note 8 in text). **Note** The interquartile range ratio is the 75th percentile divided by the 25th percentile.

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**Exhibit 4**

Ratio of four state average prices to national average prices for medical services, 2015 prices

<table>
<thead>
<tr>
<th>Price ratio</th>
<th>Florida</th>
<th>Ohio</th>
<th>Connecticut</th>
<th>Minnesota</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 &lt; price ratio ≤ 0.6</td>
<td>blue</td>
<td>Green</td>
<td>blue</td>
<td>green</td>
</tr>
<tr>
<td>0.6 &lt; price ratio ≤ 0.8</td>
<td>green</td>
<td>blue</td>
<td>green</td>
<td>blue</td>
</tr>
<tr>
<td>0.8 &lt; price ratio ≤ 1.0</td>
<td>blue</td>
<td>green</td>
<td>blue</td>
<td>green</td>
</tr>
<tr>
<td>1.0 &lt; price ratio ≤ 1.2</td>
<td>green</td>
<td>blue</td>
<td>green</td>
<td>blue</td>
</tr>
<tr>
<td>1.2 &lt; price ratio ≤ 1.4</td>
<td>blue</td>
<td>green</td>
<td>blue</td>
<td>green</td>
</tr>
<tr>
<td>1.4 &lt; price ratio ≤ 1.6</td>
<td>green</td>
<td>blue</td>
<td>green</td>
<td>blue</td>
</tr>
<tr>
<td>1.6 &lt; price ratio ≤ 1.8</td>
<td>blue</td>
<td>green</td>
<td>blue</td>
<td>green</td>
</tr>
<tr>
<td>0.8 &lt; price ratio</td>
<td>green</td>
<td>blue</td>
<td>green</td>
<td>blue</td>
</tr>
</tbody>
</table>

**Source** Authors’ analysis of claims data from the Health Care Cost Institute and of data from Guroo.com (see Note 8 in text). **Note** There were 241 services in Florida, 240 in Ohio, 232 in Connecticut, and 221 in Minnesota.
data for two or more MSAs. California had the largest within-state difference in average price ($27,243), and Virginia had the smallest ($6) (Exhibit 5). It is worth noting that although the difference between the two MSAs in South Carolina was only $2,956 (Exhibit 5), both the highest and the lowest average prices in that state's MSAs were 30 percent higher than the national average price.

We also found considerable variation in the average price for pregnancy ultrasound (Exhibit 6). The average price in Cleveland ($522) was almost three times that in Canton ($183), even though these two Ohio MSAs are only 60 miles apart. Conversely, Virginia Beach ($275) and Richmond ($271), both in Virginia and 107 miles apart, had nearly identical average prices.

While price variations across MSAs within a state may be expected, we also found variations within MSAs. The difference between the twenty-fifth- and seventy-fifth-percentile prices of an ultrasound in Philadelphia, Pennsylvania ($460), was nearly twice the difference between prices in Harrisburg and Philadelphia ($234) (data not shown). This suggests that the variation in prices in Philadelphia was greater than the prices paid by the majority of people in Harrisburg.

Conclusion

This article has described geographical variation in prices of common health care services within the commercially insured population. Some of the variation may be justified by differences in wages or rent. However, the remaining variation is most likely due to differences in underlying market dynamics, such as varying market power, a lack of transparency, or the availability of alternative treatments.

Although revealing the extent of price variation is an important first step, more systematic and consistent research is necessary to identify the forces that drive prices. From a policy perspective, the goals are minimal unjustified differences in prices and low average prices—especially for services such as pregnancy ultrasound, which should be similar in scope and quality across providers, care settings, and geographical areas. The questions that remain for researchers, policy makers, and health care leaders are as follows: Why do prices for the same service differ markedly across distances of only a few miles, and what amount of that difference is justifiable?
The authors acknowledge the assistance of the Health Care Cost Institute and its data contributors, Aetna, Humana, and UnitedHealthcare, in providing the claims data analyzed in this study. [Published online April 27, 2016]

NOTES


3 For an examination of the market power that providers have to negotiate higher prices, see Ginsburg PB. How does managed care do it? Res Brief. 2010;(16):1–11.


6 The service prices seek to capture a typical patient’s total costs (facility, physician, and out of pocket). The services are not the basis for payments, which are based on the actual services provided instead of the typical services provided. Our estimates were based on historical claims and used both in-network and out-of-network claims. See Health Care Cost Institute. Guroo.com, Terms and conditions [Internet]. Washington (DC): HCCI; c 2016 [cited 2016 Apr 11]. Available from: http://www.guroo.com/#terms-and-conditions

7 The same data set was used to produce HCCI’s National Chartbook of Health Care Prices, released at the same time as this article’s publication. See Health Care Cost Institute. National chartbook of health care prices [Internet]. Washington (DC): HCCI; c 2016. Available from: http://www.healthcostinstitute.org/


9 HCCI has prices for 297 services, but 55 of the services were excluded from analysis because they had little or no price variation. Most of these services were laboratory tests, such as a basic metabolic panel test, or vaccinations.

10 HCCI data were insufficient for reporting prices in Alabama, Hawaii, Idaho, Michigan, Montana, South Dakota, Vermont, and Wyoming. This is largely attributable to the presence of a dominant Blue Cross/Blue Shield plan in those states. Prices for Arkansas were not reported because the state has signaled, by enactment of the Arkansas Healthcare Transparency Initiative Act of 2015, that it does not want its state data compared to national data. The act prohibits the incorporation into any national database of Arkansas’s all-payer claims database.

11 To access the Appendix, click on the Appendix link in the box to the right of the article online.
