The Price Ain’t Right? Hospital Prices and Health Spending on the Privately Insured*

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www.healthcarepricingproject.org

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Introduction

• The average premium for employer-sponsored family health coverage was $17,545 in 2015; 20% of those under 65 with full insurance report problems paying medical bills
  [Kaiser Family Foundation, 2015; Kaiser Family Foundation, 2016]

• Wide ranging analysis of variation in health care spending via Medicare suggests quantity of care given drives spending variation
  [Dartmouth Atlas work: i.e. Fisher et al., 2009; Wennberg et al., 2002]

• However, results may not generalize to private markets where prices are not set administratively
  [Philipson et al. 2010; Chernew et al., 2010; IOM, 2013; Franzini et al. 2010]

• However, almost no nation-wide hospital-specific price data and scant data on spending for privately insured
• Analyzes employer sponsored insurance claims from Aetna, UnitedHealth, and Humana that includes negotiated transaction prices
This Paper

- Analyzes employer sponsored insurance claims from Aetna, UnitedHealth, and Humana that includes negotiated transaction prices

Key Findings – Price Plays Crucial Role in Spending by Privately Insured

1. Low correlation (0.140) between Medicare and private spending per person;
2. Price explains large portion of national variation in inpatient private spending;
3. Substantial variation in prices, both within and across markets;
4. Higher hospital market concentration is associated with higher hospital prices;
The Data and Our Price Measures
- **High Shares**: Texas, Arizona, Colorado, Florida, Georgia, Kentucky, Ohio, Wisconsin, New Jersey, DC, and Rhode Island have a high share of HCCI data.

- **Low Shares**: Vermont, Michigan, Alabama, Wyoming, Montana, South Dakota, and Hawaii

*Note*: Coverage rates were calculated using HCCI enrollment data. Statewide insurance coverage totals were derived from the American Community Survey for 2011.
Analyze Three Areas in Connecticut

Source: The Dartmouth Atlas
How Medicare Sets Prices

Operating base payment rate → Operating Amount → Geographic Adjustment Factors

- Capital Component
- Capital GAF Adjustment
- Adjustment for Geographic Hospital Wage Index
- Geo-specific Non-Labor Related Costs of Base Case

Base Rate Adjusted for Geographic Factors

Hospital Adjusters

Indirect Medical Education Payment + Disprop. Share (DSH) Payment = Adjusted Payment Rate

× MS-DRG Weight = Payment for MS-DRG
## Calculating Medicare PPS Payments

<table>
<thead>
<tr>
<th></th>
<th>Palo Alto, CA Stanford Hospital*</th>
<th>Atlanta, GA Emory University Hospital</th>
<th>Columbia, MO University of Missouri Hospital</th>
<th>Enterprise, AL Medical Center Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>416 IPPS beds</td>
<td>506 IPPS beds</td>
<td>307 IPPS beds</td>
<td>117 IPPS beds</td>
</tr>
<tr>
<td></td>
<td>Case Mix Index = 2.09</td>
<td>Case Mix Index = 2.40</td>
<td>Case Mix Index = 2.04</td>
<td>Case Mix Index = 1.07</td>
</tr>
<tr>
<td>National Standardized Amount*</td>
<td>$5,164.11</td>
<td>$5,164.11</td>
<td>$5,164.11</td>
<td>$5,164.11</td>
</tr>
<tr>
<td>× Labor-related percent</td>
<td>68.8%</td>
<td>62.0%</td>
<td>62.0%</td>
<td>62.0%</td>
</tr>
<tr>
<td>= Labor-related portion</td>
<td>$3,552.91</td>
<td>$3,201.75</td>
<td>$3,201.75</td>
<td>$3,201.75</td>
</tr>
<tr>
<td>× Wage index</td>
<td>1.6379</td>
<td>0.9522</td>
<td>0.8227</td>
<td>0.7436</td>
</tr>
<tr>
<td>= Labor-adjusted portion</td>
<td>$5,819.31</td>
<td>$3,048.70</td>
<td>$2,634.08</td>
<td>$2,380.82</td>
</tr>
<tr>
<td>+ Non-labor related portion</td>
<td>$1,611.20</td>
<td>$1,962.36</td>
<td>$1,962.36</td>
<td>$1,962.36</td>
</tr>
<tr>
<td>= Labor-adjusted standardized amount</td>
<td>$7,430.51</td>
<td>$5,011.07</td>
<td>$4,596.44</td>
<td>$4,343.18</td>
</tr>
<tr>
<td>IME &amp; DSH Add-ons†</td>
<td>$3,454.15</td>
<td>$1,528.22</td>
<td>$2,343.49</td>
<td>$255.34</td>
</tr>
<tr>
<td>Operating Payment Amount, MS-DRG wt = 1.000</td>
<td>$10,884.66</td>
<td>$6,539.29</td>
<td>$6,939.94</td>
<td>$4,598.52</td>
</tr>
</tbody>
</table>

Example: Stroke with Complication or Comorbidity (CC)

| MS-DRG 065 (intracranial hemorrhage or cerebral infarction with CC weight = 1.1667) | $12,699.13 | $7,629.39 | $8,096.82 | $5,365.09 |
Notes: Prices are averaged from 2008 – 2011, put in 2011 dollars. Note that we only include hospital-based prices – so we exclude, for example, colonoscopies performed in surgical centers and MRIs that are not carried out in hospitals.
Knee Replacement Negotiated Prices and Charges ‘08 – ‘11

Correlation: 0.311

Notes: Regression-adjusted prices presented in 2011 dollars
Spending Analysis and Decomposition
Correlation of Public and Private Total Spending Per Beneficiary: 0.140

Note: Data on Medicare is for 2011 and from the Dartmouth Atlas. Spending for Medicare beneficiaries includes Part A & B and is risk adjusted by age, race, and sex. Spending on private enrollees is adjusted by age and sex and includes all inpatient, outpatient, and physician claims.
Notes: Data on Medicare spending was downloaded from the Dartmouth Atlas [http://www.dartmouthatlas.org/]. An HRR with a rank of 1 has the lowest spending per beneficiary of all HRRs. An HRR with a rank of 306 has the highest spending per beneficiary of all HRRs. Overall spending does not include pharmaceutical spending. Private data from Cooper et al. 2015.
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Scatter Plot of Ranking of Medicare Spending Per Beneficiary and Private Spending Per Beneficiary

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Decomposition Results

<table>
<thead>
<tr>
<th>Medicare Spending Drivers</th>
<th>Share</th>
<th>Share</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Covar.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Variation in Spending per Beneficiary | 9.37% | 76.65% | 13.95% |

**Note:** This is based on a formal decomposition where: $\text{var}(\ln(p_dq_d)) = \text{var}(\ln(p_d)) + (\text{var}(\ln(q_d)) + 2\text{cov}(\ln(p_d), \ln(q_d)))$. This is carried out by DRG. To capture the share of variance in spending attributable to variation in price across HRRs, we divide the $\text{var}(\ln(p_d))$ term by the variation in total spending. To capture the share in spending attributable to the variation in quantity of care across HRRs, we divide the $\text{var}(\ln(q_d))$ term by the variation in total spending. We come up with the price/quantity contribution by averaging for decomposition results for each DRG by spending per DRG.
### Decomposition Results

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<th>Private Spending Drivers</th>
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<tr>
<td><strong>Share</strong></td>
<td><strong>Share</strong></td>
</tr>
<tr>
<td><strong>Price</strong></td>
<td><strong>Price</strong></td>
</tr>
<tr>
<td>9.37%</td>
<td>45.89%</td>
</tr>
</tbody>
</table>

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National Variation in Prices
Risk-Adjusted Inpatient Hospital Price, 2008-2011
The Price of a Knee Replacement is Higher in Grand Junction than it is in Boston
**National Variation in Prices and Medicare Fees: Knee Replacement**

**Medicare Knee Replacement Prices**

- **Mean**: 12,986
- **Min - Max**: 10,254 - 24,021
- **p10-p90**: 11,213 - 15,441
- **IQR**: 11,734 - 13,605
- **p90/10 ratio**: 1.38
- **IQR ratio**: 1.16
- **Coefficient of Variation**: 0.15
- **Gini Coefficient**: 0.07

**Private Knee Replacement Prices**

- **Mean**: 23,102
- **Min - Max**: 3,298 - 55,825
- **p10-p90**: 14,338 - 33,236
- **IQR**: 17,365 - 27,151
- **p90/10 ratio**: 2.32
- **IQR ratio**: 1.56
- **Coefficient of Variation**: 0.33
- **Gini Coefficient**: 0.18

Note: Each column is a hospital; Medicare prices are calculated using Medicare Impact Files.
National Variation in Prices and Medicare Fees: Knee MRI

Medicare Knee MRI Prices

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>353</td>
</tr>
<tr>
<td>Min - Max</td>
<td>293 - 546</td>
</tr>
<tr>
<td>p10-p90</td>
<td>325 - 389</td>
</tr>
<tr>
<td>IQR</td>
<td>335 - 366</td>
</tr>
<tr>
<td>p90/10 ratio</td>
<td>1.2</td>
</tr>
<tr>
<td>IQR ratio</td>
<td>1.09</td>
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<tr>
<td>Coefficient of Variation</td>
<td>0.08</td>
</tr>
<tr>
<td>Gini Coefficient</td>
<td>0.04</td>
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</tbody>
</table>

Private Knee MRI Prices

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1,331</td>
</tr>
<tr>
<td>Min - Max</td>
<td>260 - 3,174</td>
</tr>
<tr>
<td>p10-p90</td>
<td>745 - 2,036</td>
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<tr>
<td>IQR</td>
<td>960 - 1,629</td>
</tr>
<tr>
<td>p90/10 ratio</td>
<td>2.73</td>
</tr>
<tr>
<td>IQR ratio</td>
<td>1.70</td>
</tr>
<tr>
<td>Coefficient of Variation</td>
<td>0.38</td>
</tr>
<tr>
<td>Gini Coefficient</td>
<td>0.21</td>
</tr>
</tbody>
</table>

Note: Each column is a hospital; Medicare prices are calculated using Medicare Impact Files.
Within Market Variation in Prices
Knee Replacement Facility Prices Within Markets

Denver, CO

Min/Max Ratio: 3.09
Gini: 0.190
CoV: 0.382

Atlanta, GA

Min/Max Ratio: 6.10
Gini: 0.170
CoV: 0.316

Manhattan, NY

Min/Max Ratio: 2.10
Gini: 0.125
CoV: 0.260

Columbus, OH

Min/Max Ratio: 2.77
Gini: 0.121
CoV: 0.262

Philadelphia, PA

Min/Max Ratio: 2.94
Gini: 0.162
CoV: 0.292

Houston, TX

Min/Max Ratio: 5.42
Gini: 0.167
CoV: 0.304

Note: Each column is a hospital. Prices are regression-adjusted, measured from 2008 – 2011, and presented in 2011 dollars.
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Knee Replacement Prices in New Haven and Hartford

Knee Replacements, Hartford Ct
2008 - 2011

Knee Replacements, New Haven Ct
2008 - 2011

Max/Min Ratio: 1.46
CoV: 0.150

Max/Min Ratio: 1.49
CoV: 0.160

Price ($)

Hospital's Medicare Payment Rate
Hospital's Negotiated Transaction Price
Lower Limb MRI Facility Prices Within Markets

Note: Each column is a hospital. Prices are regression-adjusted, measured from 2008 – 2011, and presented in 2011 dollars.
Lower Limb MRI Facility Prices Within Markets

Note: Each column is a hospital. Prices are regression-adjusted, measured from 2008 – 2011, and presented in 2011 dollars.
Knee Replacement Prices in New Haven and Hartford

Lower Limb MRIs, Hartford Ct
2008 - 2011

Max/Min Ratio: 3.03
CoV: 0.292

Lower Limb MRIs, New Haven Ct
2008 - 2011

Max/Min Ratio: 1.95
CoV: 0.241
Drivers of Price Variation
Drivers of Price Variation

What is driving price growth and variation?

Providers’ Negotiated Prices

**Quality of the Provider?**
- Clinical quality
- Hotel-related services
- Perceived quality

**Hospital & Local Area Characteristics?**
- Teaching status
- Ownership
- Hospital size
- Local costs
- Local wage rates

**Medicare/Medicaid Penetration?**
- Hospitals’ share of patients funded by Medicare or Medicaid
- Medicare payment rates
- Share of uninsured

**Market Structure?**
- Provider market structure
- Payer market structure
Hospital Market Power Raises Hospital Prices

Note: An asterisk indicates significance at the 5% level. This figure is based on OLS estimates for 8,176 hospital-year observations with standard errors clustered at the HRR-level in parentheses. The controls include insurance market structure, HCCI insurer share by county, hospitals use of technology, U.S. News & World Report Ranking, hospital beds, indicators for teaching hospitals, government-owned hospitals, and not for profit hospitals, the Medicare base payment rate, the share of hospitals’ patients that are funded by Medicare, and the share funded by Medicaid. The regressions also include HRR fixed effects and year fixed effects.
Greater Insurance Market Power Lowers Hospital Prices

**Insurer Market Power and Hospital Price**

Note: An asterisk indicates significance at the 5% level. This figure is based on OLS estimates for 8,176 hospital-year observations with standard errors clustered at the HRR-level in parentheses. The controls include hospital market structure, HCCI insurer share by county, hospitals use of technology, U.S. News & World Report Ranking, hospital beds, indicators for teaching hospitals, government-owned hospitals, and not for profit hospitals, the Medicare base payment rate, the share of hospitals’ patients that are funded by Medicare, and the share funded by Medicaid. The regressions also include HRR fixed effects and year fixed effects.

<graph>
- 4.2%*
- 9.0%*
- 15.2%*

Percent Difference in Price

2nd Quartile 3rd Quartile 4th Quartile
*Relative to Lowest HCCI Share Markets
Bigger, High Tech Hospitals Have Higher Prices

Hospital Characteristics and Hospital Price

Note: An asterisk indicates significance at the 5% level. This figure is based on OLS estimates for 8,176 hospital-year observations with standard errors clustered at the HRR-level in parentheses. The controls include hospital market structure, insurance market structure, HCCI insurer share by county, hospitals use of technology, U.S. News & World Report Ranking, hospital beds, indicators for teaching hospitals, government-owned hospitals, and not-for-profit hospitals, the Medicare base payment rate, the share of hospitals’ patients that are funded by Medicare, and the share funded by Medicaid. The regressions also include HRR fixed effects and year fixed effects.
Quality is Weakly Related to Price

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Conclusions

Fact 1: Low correlation between Medicare spending per beneficiary and private spending per beneficiary

- We need to look beyond Grand Junction, Colorado, Rochester, Minnesota, and La Crosse, Wisconsin → Rochester, New York, Dubuque, Iowa, Lynchburg, VA, Des Moines, Iowa;

- We need data on all payers: Medicare, Medicaid, and the privately insured

Fact 2: Providers’ prices drive spending variation for the privately insured

- Areas that are high spending for the privately insured are areas with high prices;

- Applying Medicare rates +30% lowers private inpatient spending by 11%
Fact 3: Providers’ Prices Vary Significantly Within and Across Geographies

- Rather than attending current provider, if everyone paying above median prices got Median prices in their HRR, it would lower inpatient spending by 20.3%.

- We need price transparency. It alone won’t address all issues, but it’s imperative

Fact 4: Hospitals with Market Power Have Higher Prices

- Monopoly hospitals have a 15.3% price premium;

- Consistent with wider body of evidence: hospital mergers can raise prices by more than 20%;

- Evidence that hospital competition raises quality (Kessler and McClellan, 2000; Cooper et al., 2010)

- No evidence that mergers bring gains to consumers
Policy Changes to Address Price

**Fundamental Tension:**

- **Bigger hospitals** often have better quality; integration has virtues; in a push towards pay-for-performance, size gives stability;

- **Bigger Hospitals** also clearly have market power, which allows them to raise prices and it stymies incentives for quality;

**Policy Options**

1. More vigorous antitrust enforcement (including vertical integration)

2. Regulating prices (particularly out-of-network billing and trauma charges)

3. Make patients more price sensitive (leveraged by price transparency where the devil is in the details)