The Secret Menu in Health Care: A Cash Market for Imaging in California

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Rising health care costs and growing high deductible health plans call for price transparency and new payment options

**Cash price**: price for patients without or not using insurance
- Can be paid via cash, check, tax-adv. health account, cards

Relevant to: 1) uninsured patients; 2) in-network insured facing high shadow price; 3) insured who want to go out-of-network or prefer not to wait for in-network appointment

Q: Can we reduce health care costs using the cash price option?
Research Questions

Can we reduce health care costs using the cash price option?

- Visualize price variation within procedure across payer-facility
- Compare private & cash prices across procedure-facility pairs
- Potential savings to privately insured patients & insurers if
  - Cash and/or insurer-negotiated prices were observed
  - Allow price search within a county vs over the SF Bay
The Market for Imaging Services

- **Radiology industry**: large market size and utilization rate
  - $100B imaging/year, 12,000+ sites, ~50% utilization

- Incredibly competitive and fragmented market structure
  - 6,800+ independent sites, largest <5% market share

- Fairly homogeneous goods with extreme price dispersion

- An early context for cash price as a new payment option
Data Sources: Healthcare-IT & Public Information

- Price data: in the greater San Francisco Bay Area
  - Prices for 194 procedures provided by 142 imaging facilities
  - Negotiated in-network prices with 5 large private insurers

- Utilization data: volume and facility information
  - CMS state level provider utilization and payment data
  - Information on imaging facilities: id, affiliation, location, etc.

- Deductible data: generated for 753 insured people
  - Time points: 1/1/2015, 12/27/2015, 1/1/2016, 5/29/2016
  - Info: deductible; oop max remaining; co-insurance and co-pay
## Data: Summary Statistics

### Table 1. Sample Statistics.

| Facility-service-level data | N  | Mean ($) | Median ($) | SD ($)  | Min ($) | Max ($) |
|-----------------------------|----|----------|------------|---------|---------|---------|
| Medicaid price              | 6818 | 245.6    | 105.1      | 283.4   | 15.6    | 2027    |
| Medicare price              | 7595 | 262.4    | 238.8      | 215.6   | 26.2    | 817.5   |
| Private 1 price             | 7811 | 511.8    | 285.0      | 824.7   | 2.9     | 10674.1 |
| Private 2 price             | 7811 | 489.9    | 310.2      | 703.8   | 23.0    | 10674.1 |
| Private 3 price             | 7811 | 527.3    | 317.3      | 723.3   | 23.1    | 10674.1 |
| Private 4 price             | 7811 | 439.0    | 308.9      | 677.2   | 23.1    | 10674.1 |
| Private 5 price             | 7811 | 489.5    | 329.9      | 735.3   | 23.1    | 10674.1 |
| Cash price                  | 7811 | 528.4    | 365.0      | 1127.1  | 30.0    | 10000.0 |

Consumer’s insurance benefits and use of in-network medical care

| | Individual policies (n=700) | Family policies (n=556) |
|---|-----------------------------|-------------------------|
| 1/1/2015-12/27/2015 | Mean ($) | SD ($) | Range ($) | Mean ($) | SD ($) | Range ($) |
| Deductible | 996 | 1188 | 0-6600 | 2106 | 2391 | 0-13200 |
| Out-of-pocket maximum | 3349 | 1636 | 0-8850 | 6761 | 3333 | 0-15000 |
| Deductible remaining on 12/27, conditional on a positive balance | 1022 | 1272 | 8.2-6316 | 1556 | 1556 | 0-15000 |
| % with deductible remaining | 63.3 | | | 73.4 | | |
Data: Distribution of Imaging Facilities in the SF Bay Area
Variation of In-Network Prices and Cash Prices

- 70547: MRA neck, w/o contrast
- 72190: X-ray pelvis, complete
- 76830: Ultrasound pelvis, transvaginal, nonobstetric
Price Comparison: Cash vs. Private Prices (Procedure-Facility Level)
Simulation 1: Private vs Cash Prices, On the Spot

- Joint cost savings to patients and private insurers combined

- Upper bound: a privately-insured patient always pay the lesser of the cash price or the in-network private price

\[
\sum_i \max\{\text{private}_i - \text{cash}_i, 0\} \times \frac{\text{volume}_i}{\sum \text{volume}_i}
\]

- More conservative: only enrollees who do not exhaust their deductible by the end of year (63%) would ask for cash prices

|                     | Saving measures       | Insurer 1 | Insurer 2 | Insurer 3 | Insurer 4 | Insurer 5 |
|---------------------|-----------------------|-----------|-----------|-----------|-----------|-----------|
| Upper-bound         | average per service   | $58       | $77       | $96       | $40       | $81       |
|                     | as % of in-network price | 15.0%     | 18.1%     | 22.2%     | 10.1%     | 21.5%     |
| More conservative   | average per service   | $37       | $49       | $61       | $25       | $51       |
|                     | as % of in-network price | 9.5%      | 11.5%     | 14.1%     | 6.4%      | 13.6%     |
Simulation 2: In-Network Private Price Shopping

- Patients pay the lowest in-network price in a county or the Bay area (i.e., price shopping for in-network private prices only)

\[
\sum_{i} \max \left\{ \text{private}_i - \min_{i \in C_i} \{\text{private}_i\}, 0 \right\} \times \text{weight}_i
\]

| County         | Saving measures            | Insurer 1 | Insurer 2 | Insurer 3 | Insurer 4 | Insurer 5 |
|----------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|
|                | per service                 | $172      | $178      | $203      | $130      | $182      |
|                | as % of in-network price    | 38.3%     | 37.0%     | 41.5%     | 26.5%     | 39.5%     |
| Bay            | per service                 | $258      | $257      | $280      | $191      | $280      |
| Area           | as % of in-network price    | 64.0%     | 58.8%     | 63.0%     | 45.4%     | 63.2%     |
Patients pay the lowest in-network or cash price in a county or the Bay area (i.e., price shopping for private & cash prices)

\[
\sum_i \max \left\{ \text{private}_i - \min_{i \in C_i} \{\text{private}_i, \text{cash}_i\}, 0 \right\} \times \text{weight}_i
\]

| County   | Saving measures          | Insurer 1 | Insurer 2 | Insurer 3 | Insurer 4 | Insurer 5 |
|----------|--------------------------|-----------|-----------|-----------|-----------|-----------|
|          | per service              | $184      | $194      | $220      | $147      | $212      |
|          | as % of in-network price | 41.7%     | 40.8%     | 46.9%     | 30.8%     | 46.7%     |
| Bay      | per service              | $259      | $258      | $283      | $196      | $284      |
| Area     | as % of in-network price | 64.1%     | 59.1%     | 63.9%     | 46.8%     | 64.0%     |
Conclusion and Discussion

- Patients can save 10-22% of their insurer’s in-network price by paying cash and 45-64% when shop both prices in the Bay.

- More transparent private and cash prices can reduce costs.

- Need joint effort from public and private sectors to implement.