



High Value for Hospital Care: High Value for All?

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*Commissioned by the National Business Group on
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Given the high stakes involved and the important policy implications, it is essential that we understand which cities and hospitals are providing the best value for all payers, consumers and the community as a whole, based on solid data and careful analysis.

Helen Darling, President
National Business Group on Health

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EXECUTIVE SUMMARY

In the last year, there has been much discussion about reforming our health care system, including the current payment system. As part of these discussions, there has been a focus on identifying communities in which Medicare costs are relatively low and quality is high. Private payers have questioned whether this high value care for Medicare is shared with private payers, or, if private payers in effect subsidize low cost for Medicare through higher payments. In an alternative approach that considers private payer data as well as Medicare data, we sought to identify communities where hospital care is being provided at a relatively low cost for Medicare and for private payers.

This report identifies a number of U.S. cities with “high value for inpatient hospital care.” We define a city with high value for inpatient hospital care as delivering,

- Low per capita inpatient cost for Medicare
- Low per capita inpatient cost for commercial payers (private insurance)
- Positive hospital financial margins

We also identify some cities that are low cost for Medicare inpatient stays and charge significantly higher amounts to commercial payers, as well as cities that charge high amounts to both Medicare and commercial payers.

The need for this analysis was identified by Helen Darling, President of the National Business Group on Health, who noted that a number of communities had recently been singled out as providing exceptional value to Medicare, and, thus, were important to understand and possibly emulate.¹ Private payers often believe that hospitals use their market power to charge them more than is paid by Medicare, Medicaid and the uninsured. They use the term “cost shift,” although a more proper term might be, “billing or charges shift,” because the hospital adjusts the amounts it charges, not its costs.

Many private payers are concerned that current government (Medicare and Medicaid) provider payments get translated into higher provider charges to commercial payers, which increases private payer premiums and claims costs for self-insured plans. This study was commissioned to look at actual data from commercial insurers to help answer this question:

¹ On July 21, 2009, four health care improvement experts — Drs. Donald Berwick, Elliott Fisher, Atul Gawande, and Mark McClellan — invited health care leaders from a select group of high-performing regions of the US to share their experiences at a gathering in Washington, DC. Called *How Do They Do That?™ Low-Cost, High-Quality Health Care in America*, the meeting brought together teams from ten high-performing regions to explore openly the local, regional, and national factors — including culture, financing, infrastructures, and more — that underlie the mechanisms for delivering health care in their communities. Not all of the cities discussed in that meeting are included in this report, because we excluded cities with fewer than 40,000 Medicare lives in our data.

“Are cities that are high value for Medicare inpatient care also high value for private payers, or do they look better because private payers were charged more to enhance inpatient revenue?”

There are important policy implications, depending on which part of the question above is correct. It is important to reframe the high value definition as those cities and hospitals that provide the best inpatient hospital value for all payers, consumers and the community as a whole.

Key Findings

We found that cities with high value for hospital care exhibited great variation (to each other) in several factors widely believed to be cost drivers (described below).

Our conclusion is that, under a wide variety of circumstances, it is possible for hospitals to provide high value for Medicare and commercial payers – and to be profitable. This is an optimistic view, because it implies that communities and hospitals are not locked into choosing trade-offs among various constituents. Rather, the data suggests it may be possible to produce high value under a wide variety of circumstances.

Our goal was twofold: first to determine if such high value cities exist, second to determine the characteristics of such cities. We identified 16 cities (out of the 65 we examined) that meet our 3 criteria for high value hospital inpatient care. We note that in some of these high value cities, the hospitals may be cost shifting to outpatient setting – charging commercial much more than Medicare for outpatient – but our investigation did not examine that issue. For our second goal, we were surprised to find that the 16 cities have little in common when it comes to what we thought were key drivers, such as:

- Hospital market concentration
- Commercial payer market concentration
- Wage index
- Ratio of primary care to specialty care
- Hospital Care Intensity index,¹ a measure of the intensity of services provided in a locale

Prominent among our findings are the lack of consistent association of these characteristics among our set of high value cities. Our analysis was not designed to test for such associations for the entire nation. The authors hypothesize that hospitals can meet financial goals through controlling costs (strong management of resources) or by attempting to maximize revenue (high charges to private payers).

We note there may be some other factors common among the cities that are high value for hospital care, and finding those factors would be a great public service.

However, the authors would like to suggest that the data supports another hypothesis:

Hospitals in some cities are managed in such a way that they prosper despite current Medicare inpatient payments and without charging disproportionately higher amounts to commercial payers, at least for inpatient charges. Cost shifting and cost management appear to be independent or alternative tactics adopted by hospital management.

In the course of our work, we identified some cities that demonstrate low Medicare inpatient costs but, relatively very high commercial reimbursement. These cities' data highlight the danger of using only Medicare data to identify high-value locales. In these cities, hospitals appear to meet their business objectives by obtaining higher payments from commercial payers – in other words, cost-shifting.

Methodology Limitations

The authors analyzed inpatient hospital medical claims data, which has its limitations. In particular, the commercial claims data we used is not necessarily a statistically representative sample of commercial payers in a community – rather, it represents the experience of *some* commercial payers. Other researchers using different data or different methods could come to different conclusions.

Other important limitations include our exclusive focus on inpatient costs – high (or low) hospital inpatient costs could, to some extent balance or be balanced by low (or high) hospital outpatient, physician or drug costs. In particular, hospitals in high value cities could be cost shifting with high billings for hospital outpatient services, such as emergency room, diagnostic testing or ambulatory surgery. For several reasons, the use of outpatient services has been growing faster than other services, for example orthopedic procedures are increasingly performed on an outpatient basis. The hospitals in some of the high value cities could receive exceptional funding from endowments or other sources that allow them to charge commercial payers less. We have not taken into account the differences in proportions of Medicare, Medicaid, uninsured, or commercial payers by market, and these could certainly impact the financial pressures hospitals face. Our use of one year of claims data, and our comparisons among different measures from several sources could introduce inconsistencies in a variety of ways, including random fluctuation. Please refer to the methodology section for a description of the analysis.

Our criteria for “high value” are certainly not the only approach. Our criterion of below national average cost is certainly imperfect, as it does not reflect differing local cost levels. Two of the metrics we use, the Hospital Care Index (HCI) and the ratio of Primary Care to Specialty Care are associated with quality and costs. However, the absence of direct quality metrics in our work will be noted, although

there is ample evidence that higher cost does not necessarily mean higher quality and may even mean worse quality.²

Our study was commissioned by and is written for the sole benefit of the National Business Group on Health, whose members consist of mostly large employers concerned with employee health benefits. This report contains the findings of the authors and should not be considered an endorsement of any policy or position by Milliman, Inc. This study is also a bridge between the work done by the Institute for Healthcare Improvement (IHI) and the Dartmouth Atlas in identifying the 10 communities for study, and additional work with high value communities that is being undertaken at this time.

The authors were guided by the talents and insights of a very knowledgeable advisory group. We would like to especially thank Helen Darling (National Business Group on Health), Elliott Fisher (Dartmouth Atlas), (Sam Nussbaum, MD, (Wellpoint, Inc.), Thomas Nolan, and Carol Beasley (Institute for Healthcare Improvement), and Arnold Milstein (Mercer and Pacific Business Group on Health), for their help, and the staffs at the National Business Group on Health and Milliman. Lapses or errors are solely the authors and not attributable to these advisors.

BACKGROUND

This paper compares regional variations in utilization and hospital costs paid by Medicare and commercial payers. Variations in utilization and cost have been extensively reported for Medicare data but less so for commercial insurance. We examine historical hospital inpatient payment data to compare the financial value that particular cities deliver to Medicare and commercial payers.

We acknowledge the significant differences between Medicare and commercial payers:

- Populations: Medicare beneficiaries are mostly age 65 or older, but there is also a significant population of under-65 disabled beneficiaries. Commercial is mostly active employees plus their dependents.
- Payments to hospitals: Medicare uses an open and uniform payment approach with adjustments to reflect local and historical cost levels with additional payments for medical education. Each commercial payer negotiates prices with each hospital or hospital system.
- Medical management: Medicare has historically used passive, retrospective approaches to medical management (such as the recent Recovery Audit Contractor program), while commercial payers often use active techniques such as concurrent review and prospective approval and retrospective payment denials for services not meeting medical necessity criteria.
- Networks: Virtually all U.S. hospitals participate in Medicare, while commercial payers may have broad or narrow networks of participating hospitals.

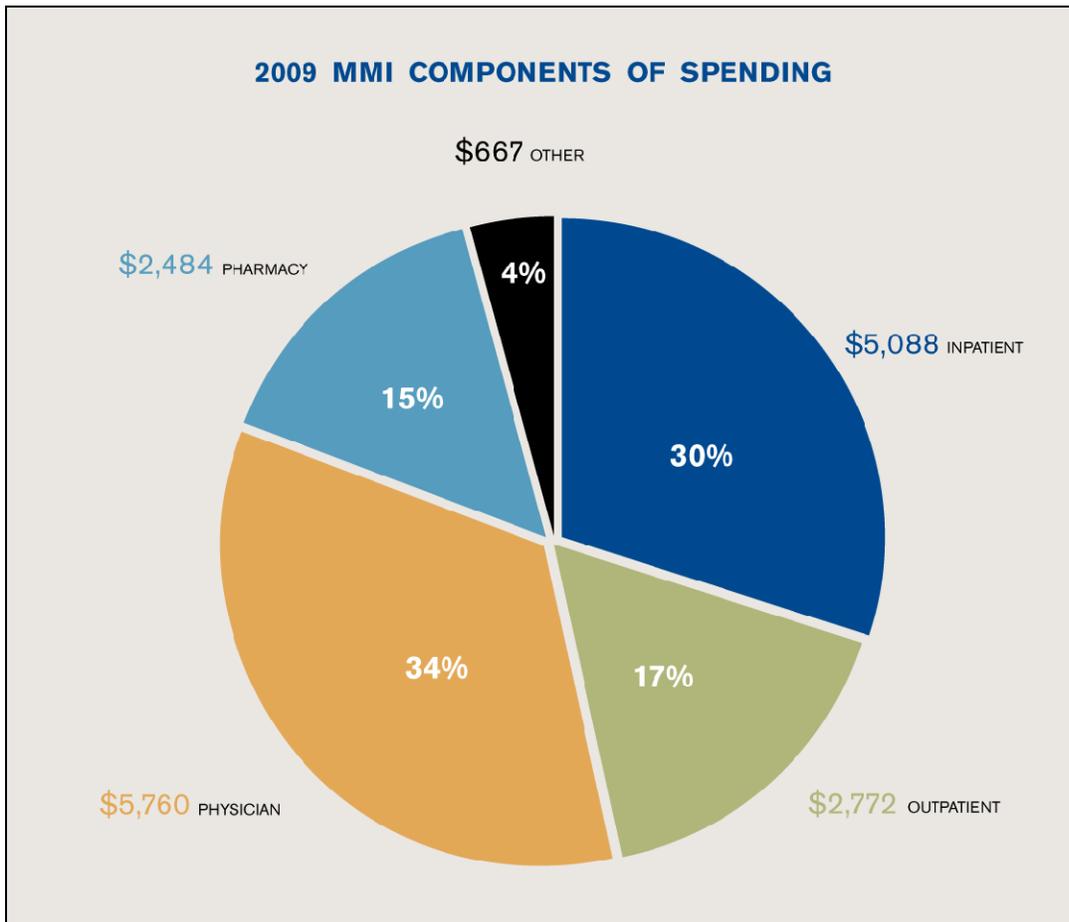
Medicare and commercial payers share the same providers and administrative forms but little else. We examined cities' hospital inpatient costs and utilization for Medicare and commercial payers separately. We compared Medicare and commercial averages in each city to the respective national averages for Medicare or commercial.

We also examined the relative amounts paid to hospitals and hospitals' financial margins by city. Hospital margins depend on both hospital revenue and hospital cost, and we obtained figures that hospitals report in their Medicare Cost Reports. Payer costs become the hospital's revenue (after adding patient deductibles, coinsurance, etc. plus other sources of revenue such as non-operating contributions). Hospital costs are the sum of expenditures for supplies, labor, debt, tax, etc. We do not examine hospital costs directly in this paper, but we do examine hospital margin. For each metric, we compare the figures for the populations or hospitals in a city to the national average. While our measurement was at a Hospital Referral Region (HRR), it is also likely that within communities there is significant variation in payments to the different hospitals within a HRR, and our analysis does not explore that variation.

The variation in hospital margins among cities, given similar Medicare or commercial revenue situations, suggests that hospitals vary significantly in how well they manage costs, although this is an inference we do not examine directly.

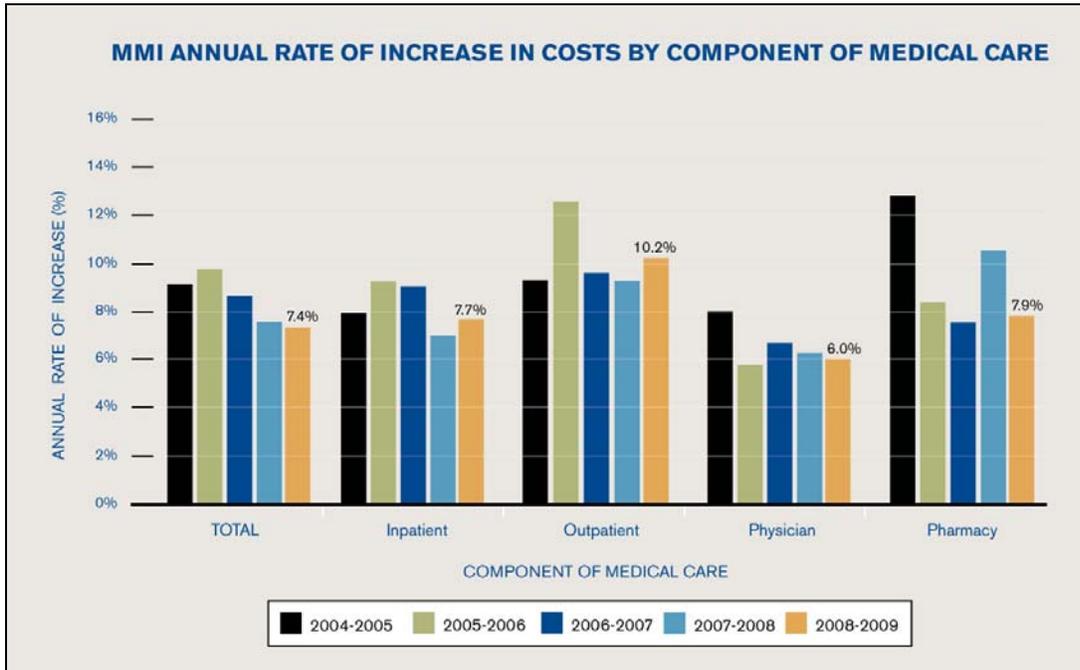
The Focus on Hospital Inpatient

Hospitals receive a significant portion of healthcare spending. The following chart is from the Milliman Medical Index³ (MMI) and shows the portion of total spending by or on behalf of a defined family of four in 2009. For a family of four, the total annual spending is \$16,771.



For the MMI's family of four, hospital inpatient accounts for 30% and hospital outpatient adds another 17%. Of course, the composition of spending can vary widely by region, among hospitals, and for different demographics. Nonetheless, our focus on hospital inpatient makes sense because it is a large component of spending, it is concentrated in relatively few people (only about 5% of commercial people are admitted to a hospital each year), and because hospitals are prominent businesses.

However, a focus on hospital inpatient may not paint a complete picture. Some apparently high value cities may look that way for commercial inpatient care, but may have very high charges for commercial outpatient care. In particular, hospital outpatient services have been growing much faster than other components for several years, as shown in the following chart, also from the MMI.



The increase in total cost 2004 to 2009 was about 49%, and hospital inpatient was very close to the total with an increase of 48%. However, hospital outpatient costs increased by 63% over the same period. By contrast, physician costs increased only 38%. The growing role of hospital outpatient suggests an opportunity for a study similar to ours that includes outpatient charges.

FINDINGS

We evaluated the characteristics of 65 cities and found 16 cities with high hospital value – defined as cities whose hospitals deliver low cost per capita to Medicare, low cost per capita to commercial and have positive hospital margins. We found a number of cities with mixed value for Medicare and commercial, some with evidence of considerable inpatient charges to private payers.

For each city, we calculated the allowed PMPM hospital inpatient expense from our data sources separately for the Medicare and commercial residents of each city that were in our databases. This is described in the Methodology section. We also assembled for each city other indices and information from several sources.

In summary, our key findings are as follows:

1. The “high value” cities, which deliver low inpatient costs per capita for Medicare and commercial and positive margins for hospitals, exhibit considerable variation (within the group) in what are believed to be important cost drivers including wage levels, payer and hospital competition, geographic location, and ratio of primary care physicians to specialist physicians. Hospitals may achieve positive total margin by higher charges for outpatient services but we did not test that directly in this study.
2. Cities whose hospitals offer good financial value for Medicare may offer good or poor value to commercial payers. Hospitals in some cities are profitable despite current Medicare reimbursement and without charging disproportionately more to commercial payers for inpatient stays. Yet, hospitals in other cities are receiving relatively greater reimbursement from commercial payers than from Medicare.
3. Medical Efficiency (inpatient admissions/1000) runs parallel for Medicare and commercial – cities with high efficiency (low admissions) are low for both Medicare and commercial; cities with low efficiency (high admissions) are high for both Medicare and commercial. This also suggests that medical practice patterns are tied to geographic areas. Medical management is not used by Medicare but used by some commercial payers. The strong correlation suggests that commercial utilization is not necessarily strongly impacted by medical management interventions.
4. Hospital margins do not appear to be strongly related to either payer market concentration or to hospital market concentration, as measured by the Herfindahl-Hirschman Index (HHI).⁴
5. Wage levels, payer competition, hospital competition, and the ratio of primary care physicians to specialist physicians (PCP/SP ratio) all seem to have a random relationship to Medicare inpatient cost, commercial

inpatient cost and hospital margins. Hospitals appear to respond to these business environment issues in a variety of ways.

6. The variation in Medicare inpatient admissions/1000 is well documented, and it corresponds well to Medicare cost. However, an additional factor – how hospitals set their prices – is very important to commercial cost.
7. “Cost shifting” -- charging commercial payers more to compensate for Medicare reimbursement -- is a common explanation for the higher prices hospitals charge commercial payers. However, considering cost shifting to be inevitable ignores both the potential for cost management within hospitals and hospitals’ flexibility to set commercial prices. The data demonstrates that hospitals can prosper in some low-Medicare cost regions without cost shifting to commercial payers for their inpatient services. Perhaps cost shifting and cost management are independent or alternative tactics, as is the amount of cost shifting for outpatient or inpatient care.

The following tables show summary statistics for the high value cities as well as summaries for a similar number of cities that demonstrate significant cost shifting or poor value. To make comparisons easier, we created indices for inpatient admissions, inpatient PMPM, and the wage index. The index is defined as 1.00 for the national average of each statistic.

A city with a PMPM index of 1.00 for both Medicare and commercial is at the national average for both payers. This does not mean the city’s hospitals have no cost shifting or the no differential in value for Medicare and commercial! A city with a PMPM index for both Medicare and commercial may imply that the hospitals in that city have national average cost shifting or national average differential in value. A city whose hospitals have significant cost shifting could show a much lower Medicare PMPM index than commercial PMPM index.

Table 1: Characteristics of Cities with High Hospital Value

<u>City Name</u>	<u>Medicare IP Admits Category</u>	<u>Medicare IP PMPM Index</u>	<u>Commercial IP PMPM Index</u>	<u>Total All- Payer Margin</u>	<u>Health Care Intensity Index</u>	<u>CMS Wage Index</u>	<u>Primary / Specialist Care Ratio (2006)</u>	<u>HMO/PPO HHI (2008)</u>	<u>Hospital System Discharge HHI (2007)</u>
AZ-Tucson	Low Admits	0.78	0.92	3.4%	0.76	0.94	0.54	3,104	1,771
FL-Sarasota	Low Admits	0.87	0.94	6.8%	0.86	0.97	0.43	1,734	2,436
HI-Honolulu	Low Admits	0.51	*	0.9%	1.15	1.15	0.62	6,357	1,349
ID-Boise	Low Admits	0.72	0.97	8.9%	0.52	0.93	0.55	3,159	2,740
ME-Portland	Low Admits	0.98	0.94	6.4%	0.73	0.99	0.67	5,046	940
MI-Grand Rapids	Low Admits	0.98	0.80	7.5%	0.63	0.92	0.62	4,299	2,623
NC-Asheville	Low Admits	0.86	0.88	2.5%	0.70	0.92	0.67	3,672	2,334
ND-Fargo/Moorhead MN	Low Admits	0.87	0.91	7.3%	0.62	0.91	0.80	**	1,837
NM-Albuquerque	Low Admits	0.69	0.68	7.4%	0.64	0.94	0.64	1,895	1,162
OH-Akron	High Admits	0.96	0.78	3.5%	0.98	0.88	0.59	1,658	3,831
OR-Medford	Low Admits	0.83	0.95	5.4%	0.52	1.09	0.70	4,613	2,620
OR-Portland	Low Admits	0.51	0.90	6.8%	0.54	1.12	0.64	1,704	1,479
PA-Pittsburgh	High Admits	0.82	0.79	4.1%	1.25	0.86	0.55	**	1,424
TN-Knoxville	High Admits	0.83	0.81	2.4%	0.99	0.79	0.63	2,221	1,483
VA-Newport News	Low Admits	0.92	0.86	5.3%	0.86	0.88	0.59	1,844	2,302
WA-Spokane	Low Admits	0.95	0.87	6.1%	0.57	1.05	0.70	5,554	1,445

* Several sources confirm that Honolulu has low commercial inpatient PMPM, but the data source used for this study had insufficient volume to reliably report an index.

** HMO/PPO HHI Index was not available for Fargo, ND, and Pittsburgh, PA.

*** All High Utilizers consist of 33 cities among our Total Selected Cities; all Low Utilizers consist of 32 cities.

Table 2: Nine Cities with Relatively Low Medicare Cost That Exhibit Cost Shifting for Inpatient Services

<u>City Name</u>	<u>Medicare IP Admits Category</u>	<u>Medicare IP PMPM Index</u>	<u>Commercial IP PMPM Index</u>	<u>Total All-Payer Margin</u>	<u>Health Care Intensity Index</u>	<u>CMS Wage Index</u>	<u>Primary / Specialist Care Ratio (2006)</u>	<u>HMO/PPO HHI (2008)</u>	<u>Hospital System Discharge HHI (2007)</u>
CA-Fresno	Low Admits	0.86	1.19	7.5%	0.77	1.20	0.64	2,260	1,318
CA-Modesto	Low Admits	0.87	1.46	8.5%	0.81	1.21	0.67	1,902	1,854
CA-Sacramento	Low Admits	0.67	1.32	6.5%	0.71	1.31	0.64	1,958	1,613
CA-San Francisco	Low Admits	0.70	1.38	6.5%	0.96	1.51	0.65	2,024	1,629
CA-San Jose	Low Admits	0.69	1.51	4.8%	0.90	1.58	0.62	1,956	1,635
CO-Denver	Low Admits	0.73	1.13	7.5%	0.74	1.05	0.58	2,143	1,435
IN-Fort Wayne	Low Admits	0.88	1.17	8.6%	0.70	0.90	0.57	3,112	2,236
NV-Reno	Low Admits	0.94	1.14	4.8%	0.73	1.04	0.53	*	1,736
WA-Seattle	Low Admits	0.79	1.03	6.7%	0.64	1.15	0.65	2,583	566

* HMO/PPO HHI Index was not available for Reno, NV.

Although the above nine cities have relatively low inpatient cost for Medicare, they are high cost for commercial. The hospitals in all these cities have positive margins. For these cities, our data shows below-average Medicare inpatient cost, but above average commercial inpatient cost. This suggests that the hospitals in those cities are cost shifting to commercial payers.

Table 3: Thirteen Cities with High Medicare Cost and High Commercial Cost

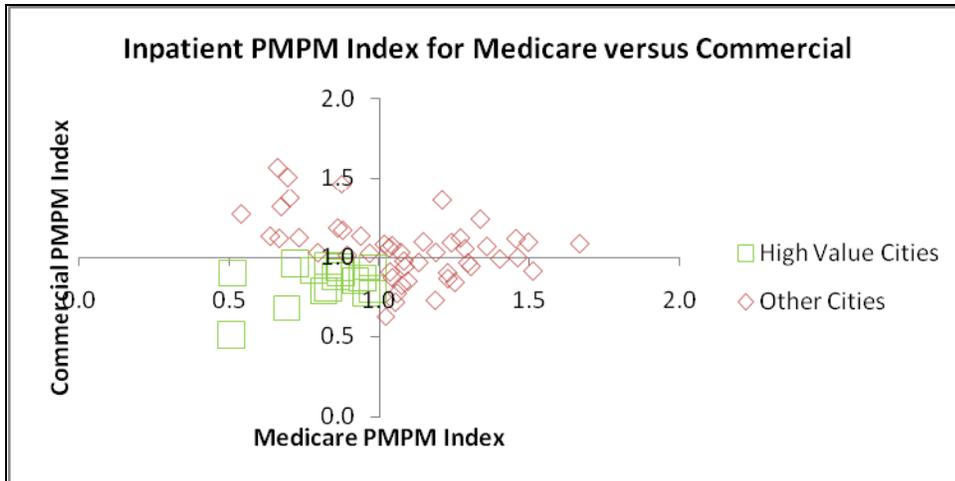
<u>City Name</u>	<u>Medicare IP Admits Category</u>	<u>Medicare IP PMPM Index</u>	<u>Commercial IP PMPM Index</u>	<u>Total All-Payer Margin</u>	<u>Health Care Intensity Index</u>	<u>CMS Wage Index</u>	<u>Primary / Specialist Care Ratio (2006)</u>	<u>HMO/PP O HHI (2008)</u>	<u>Hospital System Discharge HHI (2007)</u>
GA-Macon	High Admits	1.24	1.10	7.7%	0.86	0.98	0.59	5,507	1,555
IL-Chicago	High Admits	1.46	1.00	7.0%	1.45	1.03	0.63	3,820	657
IN-Gary	High Admits	1.45	1.12	2.0%	1.17	0.93	0.51	3,788	2,602
KY-Paducah	High Admits	1.19	1.03	7.7%	0.88	N/A	0.58	-	1,241
LA-Lafayette	High Admits	1.36	1.07	-9.4%	1.11	0.84	0.56	4,045	1,014
LA-Shreveport	High Admits	1.49	1.10	3.4%	1.22	0.85	0.50	2,502	1,402
MD-Baltimore	High Admits	1.67	1.09	3.1%	0.96	1.00	0.52	2,530	1,155
MS-Jackson	High Admits	1.04	1.08	1.6%	1.16	0.94	0.52	-	796
PA-Philadelphia	High Admits	1.02	1.08	3.9%	1.40	1.09	0.54	-	699
TX-Beaumont	High Admits	1.27	1.12	4.9%	1.16	0.86	0.51	3,289	2,884
TX-Corpus Christi	High Admits	1.03	1.06	2.4%	1.14	0.85	0.58	2,678	3,226
WV-Charleston	High Admits	1.21	1.36	3.4%	1.02	0.84	0.71	2,781	1,308
WV-Morgantown	High Admits	1.15	1.10	3.8%	0.92	0.86	0.59	-	2,457

* HMO/PPO HHI Index was not available for Paducah, KY, Morgantown, WV, Jackson, MS, or Philadelphia, PA.

Above average cost for Medicare does not necessarily translate into lower cost for commercial. Each of the cities in the table above have above average Medicare inpatient cost. All also have relatively high commercial inpatient cost. All but one of the cities has positive hospital margins.

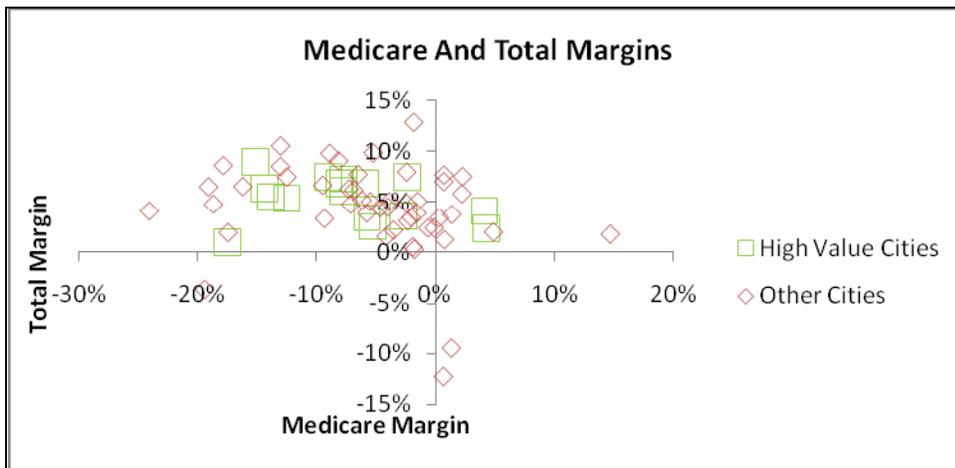
Please review the methodology section to obtain an understanding of these results.

High Value Cities Offer Low Inpatient Costs to Medicare and Commercial Payers



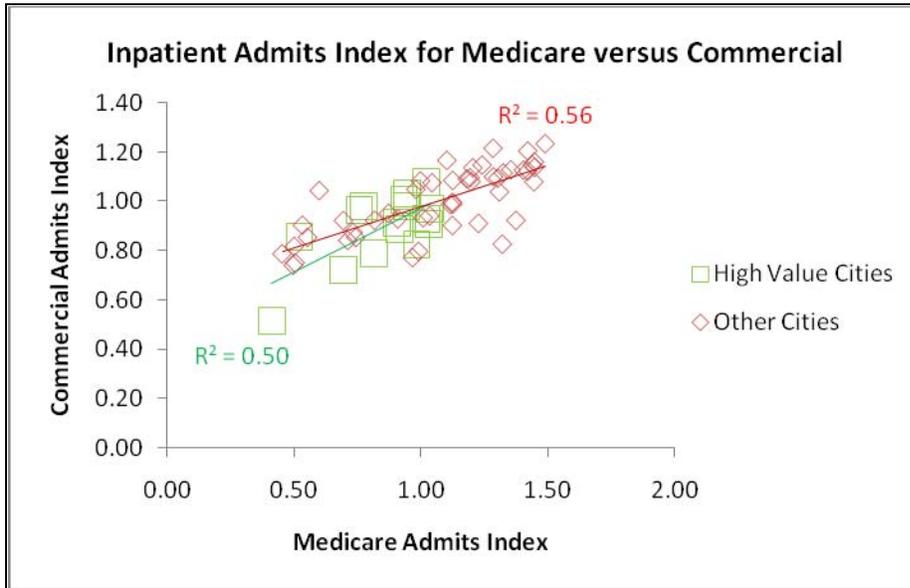
By definition, the green squares are all in the lower left quadrant of the graph – they are all relatively low cost for Medicare and commercial. Some counterpart cities are low cost for commercial or low cost for Medicare but not low cost for both. Other counterpart cities are high cost for both Medicare and commercial.

High Value Cities Have Positive Total Margins, but Many Have Negative Medicare Margins



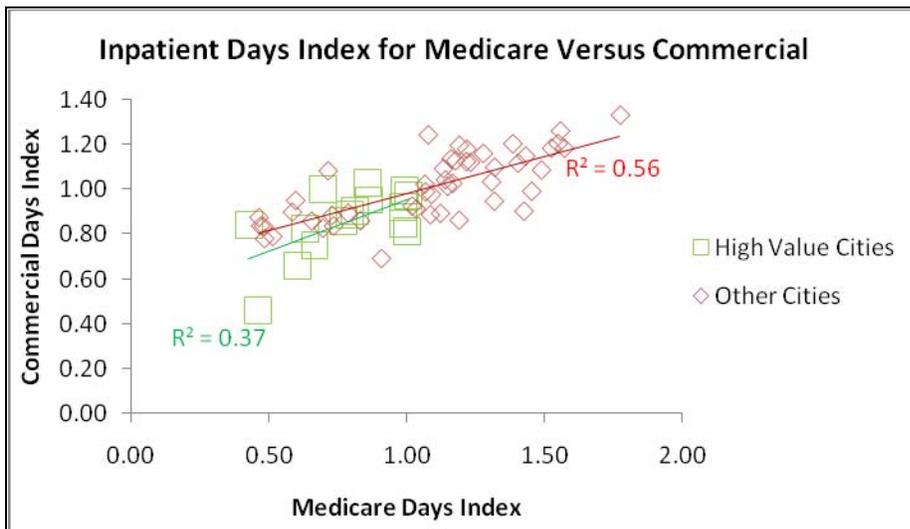
Both high-value and other cities exhibit a broad range of Medicare margins. Most cities show a positive total margin. By definition, all high value cities (green boxes) show positive total margin. We obtained margin information from Medicare Cost Reports. Hospital margins approximate the concept of financial gain or loss.

Medicare and Commercial Admission Rates are Highly Correlated



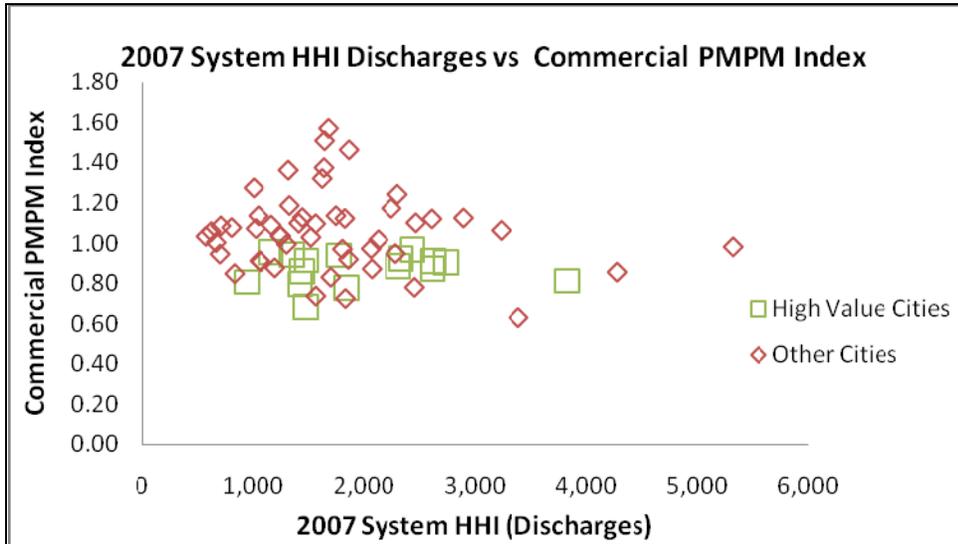
A low or high rate of Medicare admissions is a good predictor of a low or high rate of commercial admissions. This is true of high value cities as well as other cities. This suggests that the efficiency of hospital care in these communities does not differ for Medicare or commercial patients.

Medicare and Commercial Days-per-Thousand Rates are Highly Correlated



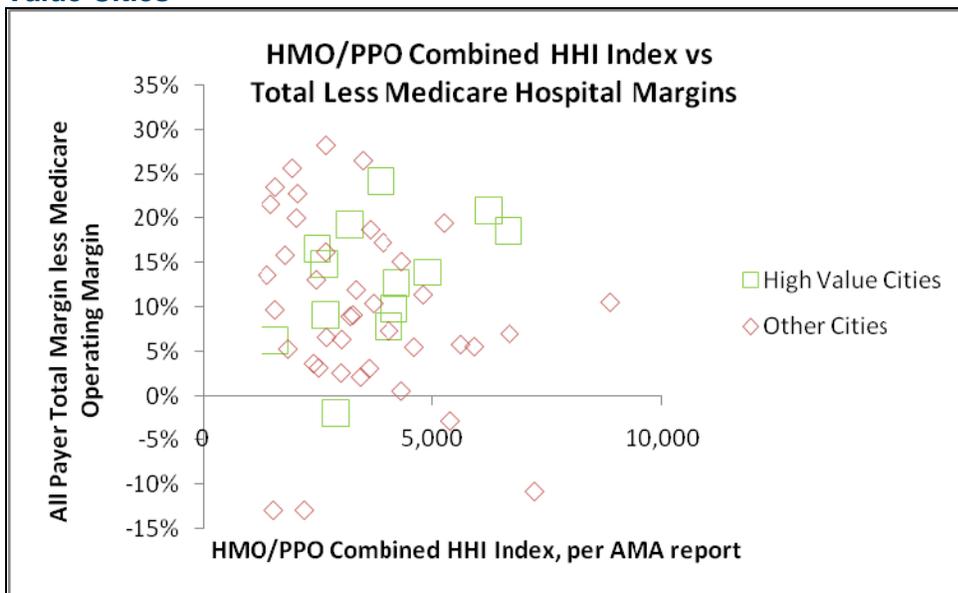
As with admits, a low or high rate of Medicare days/1000 is a good predictor of a low or high rate of commercial days/1000. This is true of high value cities as well as other cities. This suggests that the efficiency of hospital care in these communities does not differ for Medicare or commercial patients.

Hospital Market Concentration Does Not Drive Commercial Cost for High Value Cities



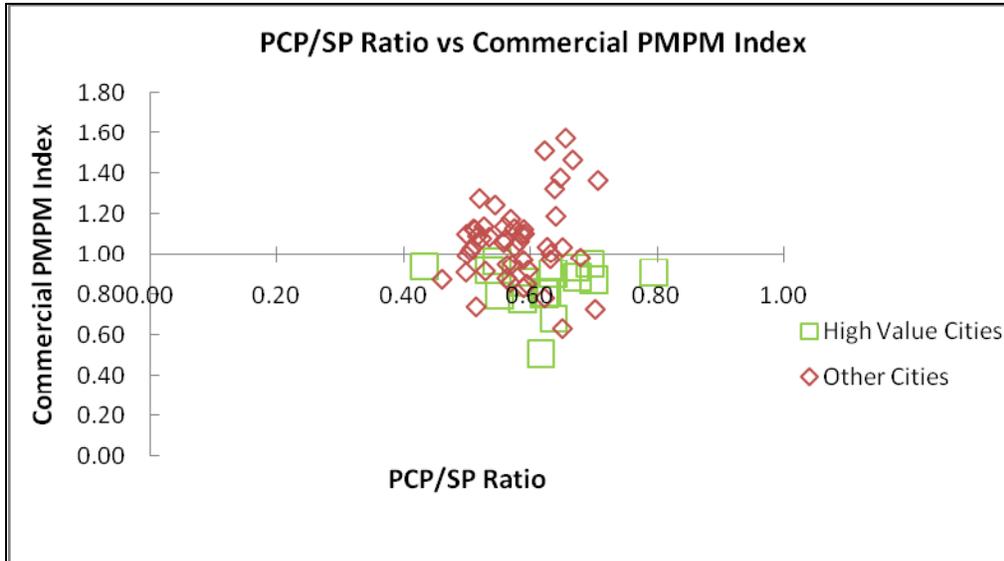
A higher HHI (horizontal axis) means higher market concentration. By definition, the high value cities all have commercial PMPM index < 1.0. However, the high value cities and other cities are widely dispersed across the values of hospital market concentration. The hospitals in some cities do not charge commercial payers proportionately higher amounts despite their market concentration. This dynamic in cities with high HHI scores may reflect high competition among the few health systems in these communities.

Payer Market Concentration Does Not Drive Hospital Margins for High Value Cities



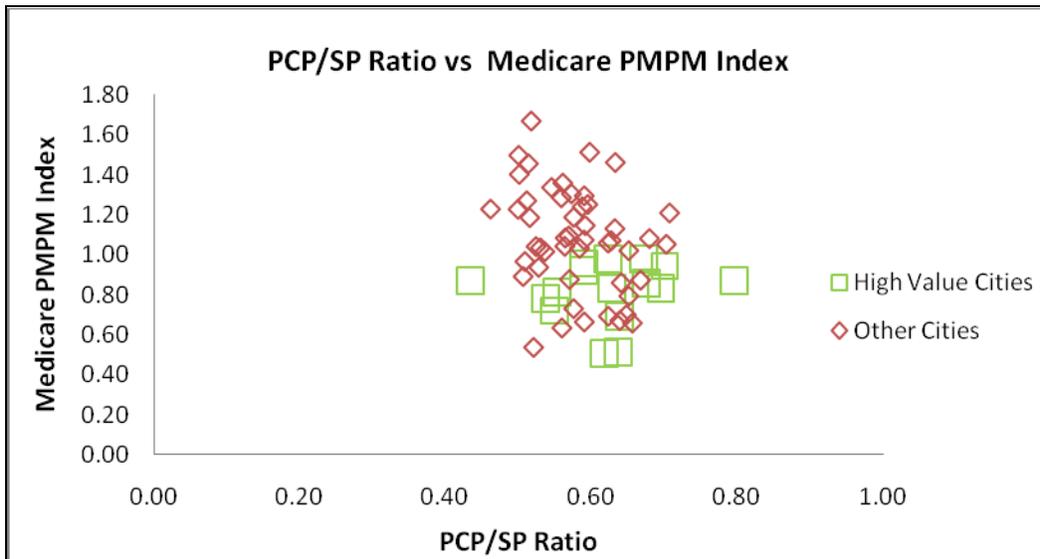
Private insurers who are powerful in a market could use their market clout to drive down reimbursement. We took the difference between total hospital margin and Medicare operating margin as a surrogate for the contribution of other payers (who are mostly commercial for most hospitals). The high value cities and their counterparts appear across a wide range of payer concentration. Furthermore, commercial cost appears independent of payer concentration. This suggests payer clout is not always used to reduce hospital cost.

The Ratio of Primary to Specialty Physicians Does Not Drive Commercial Hospital Costs for High Value Cities



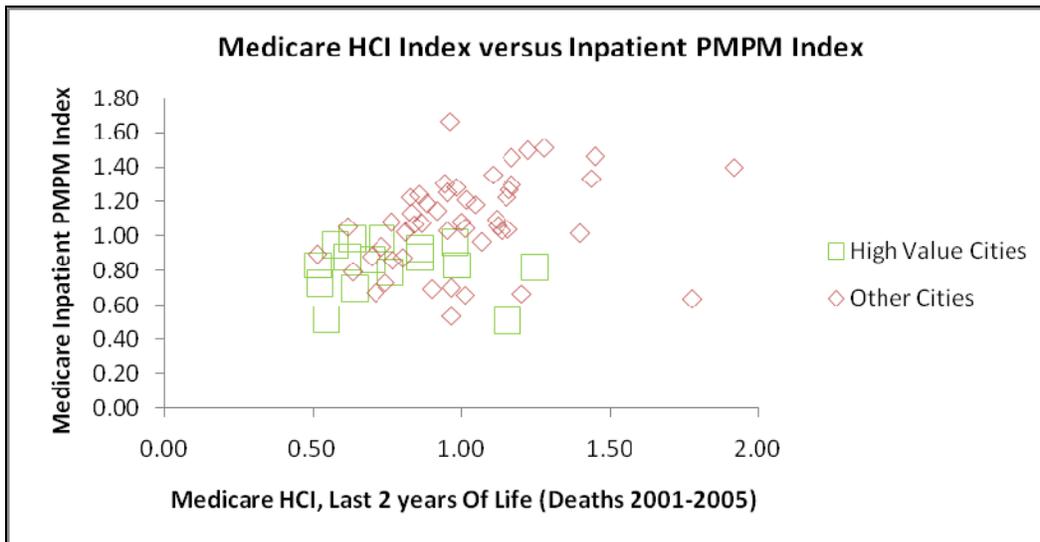
The importance of primary care for quality outcomes has been highlighted by the medical home movement and other research. However, the High Value cities and their counterparts exhibit a wide range of ratios of primary care physicians to specialty physicians. By definition, all the High Value cities have below average commercial PMPM.

The Ratio of Primary to Specialty Physicians Does Not Drive Medicare Hospital Costs for High Value Cities



The importance of primary care for quality outcomes has been highlighted by the medical home movement and other research. However, the High Value cities and their counterparts exhibit a wide range of ratios of primary care physicians to specialty physicians. By definition, all the High Value cities have below average Medicare PMPM.

Hospital Care Intensity Index Does Not Drive Medicare Hospital Costs for High Value Cities



HCI is a measure of the propensity of a community to rely on the acute care hospital in managing chronic illness.⁵ Lower HCIs tend to use community resources more efficiently. The high value cities, like their counterparts, exhibit a range of HCI values.

METHODOLOGY

This section summarizes the methodology used in our analysis.

- We initially choose cities that are at opposite ends of the Medicare admission/1000 scale. We used 2006 Medicare data from the Dartmouth Atlas, which is reported for Hospital Referral Regions (HRR), and selected cities with over 40,000 Medicare lives. We chose the 40 lowest and 40 highest admission/1000 figures. We removed 15 cities from our analysis because of ambiguities and overlaps in geographical definitions among our different databases.
- Commercial utilization and PMPM data are from MedStat 2007. We used the resident 3-digit zip codes available in MedStat to select members in each region and to tabulate their utilization and PMPM.
- Medicare utilization and PMPM data are from the Medicare 5% Sample 2007. We used the resident county codes available in the Medicare 5% Sample to select members in each region and to tabulate their utilization and PMPM.
- For each city, we calculated the allowed PMPM hospital inpatient expense from our data sources separately for the Medicare and commercial residents of each city that were in our databases. Allowed expense is the amount Medicare or commercial payers would pay before any cost sharing. We developed PMPM indexes by dividing the PMPM for each city by the national average, separately for Medicare and commercial. A city with an index of 1.00 has the same expense as national average. A city with an index of less than 1.00 is less expensive than national average.
- The HRRs are identified by 5-digit zip code, but our data sources identify individuals by 3-digit zip code. We constructed mappings that determined the contribution of each 5-digit zip code or county to the 3-digit area based on population. We used that contribution to allocate our various statistics (developed on a 3-digit zip basis) to the HRRs.
- We adjusted the admits/1000, days/1000 and inpatient PMPMs for demographics by stratifying each statistic into age-sex categories for each HRR. We then reweighted the statistics using the national average demographics.
- We created indices for admits/1000, days/1000 and inpatient PMPM. The national average is 1.00. The indices are separate for Medicare and commercial. We produced an index for each city.
- Payer market concentration was taken from the American Medical Association's 2007 study of the Herfindahl-Hirschman Index (HHI) of the payer market (HMOs and PPOs) in various cities.

- We relied on data produced by Jonathan Clark (Harvard Business School) for hospital market concentration on 65 Hospital Referral Regions (HHR) and for data on the per-capita presence of primary care physician and specialist physician by region.
- Regression lines were formed using equal weights for each city. Please bear in mind that our commercial data source, MedStat, represents what some commercial payers are paying – but it is not necessarily representative of what all commercial payers are paying.

APPENDIX A: DESCRIPTION OF KEY DATA SOURCES AND THEIR APPLICATION

Medicare 5% Sample. This Limited Data Set contains all Medicare paid claims generated by a statistically-balanced sample of Medicare beneficiaries. Information includes diagnosis codes, procedure codes, and diagnosis-related group (DRG) codes, along with site of service information as well as beneficiary age, eligibility status and an indicator for HMO enrollment. We used Medicare 5% beneficiary sample data from 2007.

We used the Medicare 5% Sample to generate the Medicare utilization and PMPM information. We excluded HMO (Medicare Advantage) lives because the 5% Sample does not have complete claims information for HMOs. We also excluded beneficiaries who did not have both Part A and B.

Thompson Reuters MedStat database. This dataset contains all paid claims generated by over 20 million commercially insured lives. Member identification codes are consistent from year-to-year and allow for multi-year longitudinal studies. Information includes diagnosis codes, procedure codes and DRG codes, NDC codes along with site of service information, and the amounts paid by commercial insurers. For this study, we used MedStat 2007.

We used MedStat to generate the commercial utilization and PMPM information. We included only lives that were coded as associated with an actively at work employee. We excluded individuals covered through high deductible health plans, as these could be concentrated in some cities and produce low costs because of benefit design.

Dartmouth Atlas Medicare Admission Rates. This is a listing of U.S. Hospital Referral Regions⁶ (HRRs) and the Medicare inpatient admission rates associated with each.

Because our analysis is intended to highlight extremes rather than averages, we started our analysis by choosing cities from the lowest and highest ends of the inpatient admission rate listing.

Competition in Health Insurance: A Comprehensive Study of U.S. Markets, 2007 update. American Medical Association. This monograph reports insurer competitiveness information (HII scores) for by Metropolitan Statistical Area, based on the lives that insurers report as covering by county.

We used the combined HMO/PPO index for discharges provided in the report. We were interested in learning whether markets with more payer clout (higher HMO/PPO HHI score) would be associated with the High Value cities.

Healthcare Cost Report Information System (HCRIS) June 2009 release (which has data from hospital reports for several fiscal years). This was our source for hospital margins. We used the hospital 3-digit zip code to select hospitals in each region and data from fiscal year 2007.

Information Provided to National Business Group on Health by Jonathan Clark (Harvard Business School, private correspondence). The information consisted of,

- Per-capita information about Primary Care Physician (PCP) and Specialist Physicians (SP) by HRRs, which was derived from Dartmouth Atlas sources.
- HHI scores for hospitals by HRR, which was derived from American Hospital Association data.

We formed the PCP/SP ratio and examined the relationship of that ratio to the commercial and Medicare IP PMPM indexes. We compared the HHI score (based on hospital system discharges) to the commercial PMPM index, because we were interested in learning whether markets with less hospital clout (lower hospital system discharge HHI score) would be associated with the high value cities.

REFERENCES

¹ Hospital Care Intensity Index (HCI) reflects both the amount of time spent in hospital and the intensity of physician services delivered in the hospital. The HCI figures we use were developed by the Dartmouth Atlas from Medicare data and are based on care given during the last two years of life.

http://cecsweb.dartmouth.edu/atlas08/datatools/hci_s1.php

² Fisher E, Goodman D, Skinner J, et al. Health Care Spending, Quality, and Outcomes: More Isn't Always Better. Feb 27, 2009. Available at

http://www.dartmouthatlas.org/atlas/atlas_series.shtm

³ Milliman Medical Index measures average annual medical spending for a typical American family of four covered by an employer-sponsored preferred provider organization (PPO) program. The MMI provides a consistent benchmark of healthcare benefit costs by annually assessing the changes in those costs over the most recent five-year period. Available at ,

<http://www.milliman.com/expertise/healthcare/publications/mmi/index.php>

⁴ The Herfindahl-Hirschman Index (HHI) calculation is a measure of market concentration. HHI produces a score of 10,000 for a complete monopoly in a market. It is produced by summing the squares of (% company market shares x 100).

⁵ HCI op cit.

⁶ Hospital Referral Regions (HRRs) are geographic regions defined by 5-digit zip codes. They were developed by the Dartmouth Atlas to define areas within which people seek tertiary hospital care. www.dartmouthatlas.org/data/download.shtm