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RESEARCH ARTICLE

Variation in Inpatient Hospital Prices and Outpatient Service Quantities Drive Geographic Differences in Private Spending in Texas

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Objective. To measure the contribution of market-level prices, utilization, and health risk to medical spending variation among the Blue Cross Blue Shield of Texas (BCBSTX) privately insured population and the Texas Medicare population.

Data Sources. Claims data for all BCBSTX members and publicly available CMS data for Texas in 2011.

Study Design. We used observational data and decomposed overall and service-specific spending into health status and health status adjusted utilization and input prices and input prices adjusted for the BCBSTX and Medicare populations.

Principal Findings. Variation in overall BCBSTX spending across HRRs appeared driven by price variation, whereas utilization variation factored more prominently in Medicare. The contribution of price to spending variation differed by service category. Price drove inpatient spending variation, while utilization drove outpatient and professional spending variation in BCBSTX. The context in which negotiations occur may help explain the patterns across services.

Conclusions. The conventional wisdom that Medicare does a better job of controlling prices and private plans do a better job of controlling volume is an oversimplification. BCBSTX does a good job of controlling outpatient and professional prices, but not at controlling inpatient prices. Strategies to manage the variation in spending may need to differ substantially depending on the service and payer.

Key Words. Health care spending variation, price, utilization, private payer, Medicare

Health care costs account for almost 18 percent of GDP in the United States, higher than in all other developed countries, which has prompted an intense search for opportunities to increase the efficiency of the health system (National Institute for Health Care Management 2012; Hartman et al. 2013). While a

very large literature has examined variation in Medicare spending, evidence on private medical spending is much more limited due to difficulties accessing private claims data. With private spending representing 55 percent of total spending (Hartman et al. 2013), it is critical for policy and budgetary purposes to understand what drives variation in spending in the private sector. Based on several recent analyses of variation in private spending, it is becoming increasingly clear that Medicare and private spending patterns differ, such that Medicare spending may not be a good proxy for the overall health system. In this article, we use newly available data from the largest private insurer in Texas, Blue Cross Blue Shield of Texas (BCBSTX), to examine the role of prices and utilization as drivers of geographic variation in health care spending.

An extensive literature examining geographic variation in Medicare spending has been influential in framing health care policy, including the Affordable Care Act. The literature distinguishes two main sources of Medicare spending variation with different policy implications (Newhouse and Garber 2013). The first emphasizes health status variation to explain geographic spending variation (Reschovsky, Hadley, and Romano 2013). The second focuses on differing provider practice patterns, including the intensity of health care use, as the root of geographic spending variation (Dartmouth Atlas Project 2007). Disentangling those two factors has proved exceedingly difficult. While disagreements remain over the role played by health status, it is clear the spending variation in Medicare is at least partly explained by unwarranted differences in postacute care utilization (Institute of Medicine [IOM] 2013).

Recent studies have found considerable spending variation in the private sector as well (Chernew et al. 2010; Philipson et al. 2010; White 2012). However, the drivers of spending variation among the privately insured differ from Medicare, in particular the role of utilization and price. Price variation plays a relatively small role in Medicare variation, because Medicare uses a nationally administered price-setting system. In contrast, negotiated prices are the norm in the private sector, which can result in prices for similar services that vary widely even within a geographic area (Reinhardt 2011). The role of price and utilization in spending variation has important policy implications

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(Ginsburg 2010; White, Reschovsky, and Bond 2013). For example, if spending variation is mainly due to utilization, policies that control utilization variation (particularly at the higher-use end) such as those promoting greater care management efforts to prevent unnecessary aggressive treatment or efforts to improve population health when utilization variation appears due to variation in health status. If, on the other hand, price is the largest source of spending variation, policies designed to rein in price variation, such as those promoting increased competition or price regulations, may be more appropriate (Oberlander and White 2009; Ginsburg 2010).

New Contribution

In previous work (Franzini et al. 2011), variations across Texas in total spending and inpatient utilization were found to be similar in BCBSTX and Medicare both in level and in direction. However, in that study, the role of price and utilization in spending variation could not be investigated.

This study expands previous work by using newly available and more detailed claims data to measure market-level prices, utilization, and health risk among the BCBSTX privately insured population in Texas. This approach allows us to directly compare various components of variation in BCBSTX and Medicare spending, both for overall and service-specific spending such as inpatient hospital care. Our analyses of BCBSTX private spending adds geographic diversity and generalizability to previous studies which originated in the Midwest and Northeast (Ginsburg 2010; White 2012). Moreover, other research has largely focused on national trends (e.g., Health Care Cost Institute, Inc 2013). By taking a more in-depth look within a specific state, we hope to further the spending variation research to better be able to inform effective policies for reducing unnecessary spending variation.

DATA AND METHODS

For each hospital referral region (HRR) in Texas, we measure spending per person among BCBSTX enrollees and among Medicare fee-for-service beneficiaries. Spending per person is decomposed in two ways. First, spending is decomposed by service category (hospital inpatient, facility outpatient, professional, and pharmacy). Second, spending consist of price multiplied by quantity and can be decomposed into prices versus quantities. We start by computing a spending index across HRRs by dividing spending in each HRR

by the Texas average spending. Next we decompose the spending index into a price index and a quantity (utilization) index. The method of indirect standardization is used to construct a price indexes for each HRR, first for each service category and then overall. The price index is further decomposed into an input prices index, which reflects local input prices, and an adjusted price index (adjusted for input prices). The quantity index is obtained by dividing the spending index by the price index. The quantity index is further decomposed into a health status index and an adjusted quantity index (adjusted for health status). This approach allows us to measure the contributions of input prices, adjusted prices, health status, and adjusted quantities as drivers of geographic variation for both BCBSTX and Medicare.

Data

The principal data source was claims data on 3,829,083 BCBSTX members, all the BCBSTX members residing in Texas in 2011, or approximately one third of all commercial sector enrollments in Texas. In the analyses, we included members of preferred provider organizations (PPO), but subscribers in health maintenance organizations, point of service plans, and indemnity plans were excluded because financial data for those plans, were not easily comparable. Similarly, members who are primarily insured through Medicare were excluded. PPO members represent 95 percent of BCBSTX subscribers. The BCBSTX plans cover all medical, mental health, and diagnostic services. Only 63 percent of enrollees had prescription drug spending data; the remainder either did not have a pharmacy benefit or they received it through a non-BCBSTX carveout. Our final population consisted of 2,262,354 BCBSTX members with valid zipcodes, residing in Texas, aged 0–64 years, enrolled in PPO plans, and with BCBSTX pharmacy benefits during 2011.

The BCBSTX data come from four files: claims, enrollment, physician, and pharmacy. Additionally, we retrieved from the CMS website the final rule average hourly wage by provider and CBSA and the geographic adjustment factor to compute input prices (Center for Medicare and Medicaid Services 2012). The Medicare data used for comparing variation in private and public sector were obtained from CMS (Center for Medicare and Medicaid Services 2013a). To create comparable categories for the two payers, we limited the comparison between BCBSTX and Medicare medical spending to hospital inpatient, facility outpatient, and professional services. Furthermore, Medicare spending was restricted to acute care spending, since BCBSTX enrollees consume negligible amounts of postacute care.

Geographic Units

We examine variation across HRRs, which represent regional health care markets for tertiary medical care that generally requires the services of a major referral center (The Dartmouth Institute For Health Policy and Clinical Practice 2013). HRRs are the most widely established geographic unit used in the literature on geographic variation (Bach 2010; Skinner, Staiger, and Fisher 2010; Zuckerman et al. 2010; IOM 2013; Newhouse and Garber 2013). In Texas, there are 22 HRRs.

Measures

We created two BCBSTX spending measures, one that excludes prescription drugs and another that includes prescription drugs. For comparability, all comparisons with Medicare excluded prescription drug spending. Spending in the BCBSTX data include any deductible, copay, and coinsurance paid out-of-pocket by the patient, as well as payments made by BCBSTX to providers. Spending was computed as spending per member per month multiplied by 12 to obtain spending per member per year estimates. Spending was categorized by four service categories: hospital inpatient, facility outpatient, professional services, and prescription drugs. Claims were primarily categorized using the “claim filing code” provided by BCBSTX. Facility claims were further classified using the bill type code (from form UB-04).

Input prices at the HRR level for inpatient and outpatient facility spending was proxied using data on hospital staff wages obtained from the previously referenced average hourly wage file. The geographic adjustment factor was used to control for operating expenses associated with professional services (Center for Medicare and Medicaid Services 2013b). No input prices adjustment was used for drugs, as there is more of a national market for drugs (Donohue et al. 2012).

Health status for the BCBSTX population was computed at the patient level using the Adjusted Clinical Groups (ACG) scores. ACG scores for each patient were calculated based on age, gender, and diagnoses during the study year (The Johns Hopkins ACG® system: Technical reference guide. version 10.0 2011). Medicare health status was based on Hierarchical Condition Codes (HCC) scores as reported with the Medicare geographic variation data. HCC scores are similarly estimated with various patient-level characteristics and diagnosis codes. However, the ACG system was developed specifically for the nonelderly population, while the HCC system was developed specifically for

the Medicare population. This is important as both populations tend to have significant differences in health care needs.

Using the BCBSTX data, we computed a spending index for each HRR and decomposed it into a price index and a quantity (utilization) index. We used the methodology described in White (2012) to calculate price and quantity indices. The method of indirect standardization was used to construct the price indexes for each HRR, first for each service category and then overall. These are Paasche-type price indexes, meaning that the mix of services, and their weights in the price index, are allowed to vary from HRR to HRR. This approach has the advantage of including all services in the price calculation (not just those in a fixed basket), and it avoids the problems that arise when some HRRs are missing prices for specific services in a fixed basket.

We first used the actual prices for each service i in HRR h in service category s ($p_{h,s,i}$) to measure the Texas average price for each specific type of service within each service category. We then assigned that average price to each service ($\bar{p}_{h,s,i}$). For this calculation of average prices, facility inpatient services were categorized based on DRGs for each admission, while facility outpatient services were categorized based on CPT or HCPCS codes and revenue code for each service received by the patient. Professional claims were also categorized using the CPT or HCPCS codes.

The price index for each service category ($P_{h,s}$) was computed by comparing the actual amount $S_{h,s} = \sum p_{h,s,i}$, that is, the total amount paid to medical providers in HRR h for service category s with the hypothetical allowed amount calculated using the Texas average price for each specific type of service ($\sum \bar{p}_{h,s,i}$).

$$P_{h,s} = \frac{S_{h,s}}{\sum_i \bar{p}_{h,s,i}} \quad (1)$$

An overall price index, P_h , was then calculated for each HRR by summing actual and hypothetical allowed amounts across all service categories and calculating the ratio.

$$P_h = \frac{\sum_s S_{h,s}}{\sum_s \sum_i \bar{p}_{h,s,i}} \quad (2)$$

The price index was then adjusted for input prices by dividing the price index in a given HRR by an input prices index in that HRR. This separates the price index into two factors, both of which are included in the analysis: (1) input prices and (2) adjusted price, where price has been adjusted for input prices.

Quantity ($\hat{q}_{h,s}$) was measured by spending per capita ($\frac{S_{h,s}}{n_h}$) adjusted for differences in prices HRRs:

$$\hat{q}_{h,s} = \frac{\left(\frac{S_{h,s}}{n_h}\right)}{P_{h,s}} \quad (3)$$

Note that, by definition, the quantity equals hypothetical spending per capita calculated using Texas average prices (see McKeller et al. 2012):

$$\hat{q}_{h,s} = \frac{\sum_i \bar{p}_{h,s,i}}{n_h} \quad (4)$$

Quantity indices, overall and for each service category, were computed by comparing the quantity in each HRR with the average Texas quantity. The quantity index was further decomposed into the health status index and the adjusted quantity index (adjusted for health status). The health status index was calculated for each HRR using the health status score of each individual in the HRR weighted by the number of months of BCBSTX enrollment. The adjusted quantity index (adjusted for health status) was calculated by dividing the quantity index in a given HRR by the health status index in that HRR.

We obtained Medicare actual costs and standardized costs (which controls for the variation in input prices as well as Medicare specific payment policy adjustments) for each service category and each HRR from the Medicare geographic variation data provided on the CMS website (Center for Medicare and Medicaid Services 2013a). The data were at the HRR level and for beneficiaries enrolled in the fee-for-service program and aged 65 years and older. The Medicare standardized costs are similar in concept to the quantity measures we calculated with the BCBSTX data ($\bar{q}_{h,s}$). The price index for each service category was computed by comparing the actual allowed amount in each HRR with the computed standardized amount for each specific type of service. The spending index and the utilization index were calculated using the same methodology used with the BCBSTX data. The input prices index was used for BCBSTX and Medicare. The Medicare adjusted price index and adjusted quantity index (adjusted for health status) were calculated using a

similar methodology as with the BCBSTX data. However, the interpretation of price differs in Medicare, as Medicare prices reflect disproportionate share hospital, indirect medical education, graduate medical education, and other Medicare payment adjustments for which there are no direct correlates in the private sector.

While our study has the usual limitations of studies using claims data and BCBSTX data represent the privately insured population in only one state, BCBSTX is the largest insurer in Texas, which is a large and under-studied state with wide diversity in its socio-demographics and composition of health care markets. Thus, this study has the opportunity to provide important information on private sector spending and its relation to Medicare spending.

Statistical Methods

We computed the coefficients of variation (CV, standard deviation divided by the mean) to measure variation by HRR for yearly spending per member, overall and by service category, for BCBSTX and Medicare (Chernew et al. 2010; Philipson et al. 2010). The shares of spending variation overall and in each service category attributable to price, for example, were calculated in two steps using a decomposition of variance approach (White 2012). In the first step, the variation in total spending was allocated among service categories using the weighted variance-covariance matrix across service categories. The second step involved decomposing the share of variation of each service category that was attributable to price, using the weighted variance-covariance matrix of the natural logarithm of the indices (input prices index, adjusted price index, health status index, and adjusted quantity index). The share of variation attributable to price can be negative because of negative covariances between logs of indices. A negative share of variation attributable to price indicates that the variation in price reduced overall spending variation. The share of variation in total spending attributable to price was then calculated by adding across service categories the share of variation attributable to price within each service category (step 2) multiplied by the share of variation in spending allocated to the corresponding service category (step 1). Similar calculations provided the share of spending attributable to quantity, input prices, and health status.

Enrollment weighted correlation coefficients were used to compare correlations between indices and across BCBSTX and Medicare. Unweighted quintiles for spending, price, and quantity, overall and by category, showed the pattern of BCBSTX spending, price, and utilization across HRR.

Table 1: Spending Variation in Texas for Total Health Care Spending and by Service Categories

	BCBSTX				Medicare Medical Spending			
	Spending per Member	Spending CV	Price CV	Quantity CV	Spending per Enrollee	Spending CV	Price CV	Quantity CV
Total spending	\$3,701	0.08						
Medical	\$3,022	0.08	0.05	0.06	\$6,717	0.07	0.03	0.06
Outpatient	\$964	0.12	0.09	0.15	\$1,203	0.14	0.03	0.15
Inpatient	\$801	0.10	0.13	0.09	\$2,883	0.09	0.06	0.07
Professional	\$1,257	0.09	0.04	0.08	\$2,630	0.10	0.01	0.10
Pharmacy	\$679	0.10	0.00	0.10				

Note. Medicare inpatient does not include postacute care.
CV, coefficient of variation.

RESULTS

The average BCBSTX total spending per member per year was \$3,702, of which 82 percent was medical and 18 percent was pharmacy (Table 1). Of medical spending, 42 percent was for professional services, 32 percent for outpatient facility, and 26 percent for inpatient. Medicare medical spending per enrollee per year was \$6,717, 18 percent of which was for outpatient, 43 percent for inpatient, and 39 percent for professional services. Overall spending variation was similar for Medicare and BCBSTX medical spending (CV = 0.08 in BCBSTX and CV = 0.07 in Medicare). As expected, price variation was higher in BCBSTX, but quantity variation was similar in the two payers.

Figure 1 reports the decomposition of spending variation into price and quantity for total spending and spending by service category in BCBSTX and Medicare. Price variation is further decomposed into input prices variation and adjusted price (input price adjusted price) variation, while quantity variation is further decomposed into health status variation and adjusted quantity (health status adjusted quantity) variation. In the privately insured population, adjusted quantity variation explains 66.3 percent and adjusted price variation 26.3 percent of total spending variation. However, the contribution of price and quantity to spending variation varies considerably across service categories. Inpatient spending variation is almost exclusively due to adjusted price variation (85.9 percent). Variation in outpatient and professional services is dominated by adjusted quantity variation (87.6 and 78.2 percent, respectively).

Figure 1: Sources of Health Care Spending Variation for Total Health Care Spending and by Categories, 2011

Variation in drug spending is almost completely explained by quantity variation, consistent with the lack of geographic variation in drug prices (Donohue et al. 2012). Health status variation explains very little of spending variation in all service categories. To test the robustness of the health status contribution in the BCBSTX population, we computed the variation decomposition using HCC, instead of ACG, and found very similar results (results not shown). The contribution of input prices to spending variation is also small.

The role of price and utilization differs in Medicare compared to BCBSTX. As expected, the contribution of price variation to spending variation is significantly lower in Medicare than in BCBSTX, whether looking overall (6.9 percent compared to 33.1 percent) or service-specific spending (Figure 1). On the other hand, variation in utilization accounts for most of the spending variation in Medicare. Utilization explains 78 percent of overall spending variation in Medicare versus 60 percent in BCBSTX. However, most of the utilization variation in Medicare is due to health status, while health status does not explain utilization variation in BCBSTX.

Table 2 reports the BCBSTX indices by HRR, and Figure 2 uses maps to summarize that information. Table 3 ranks HRRs by spending quintile and reports lowest and highest quintile for spending, price, and quantity overall and by service category. The lowest spending HRRs tend to have low prices and low utilization (Harlingen, McAllen, Amarillo), while Wichita Falls, the highest spending HRR, had high prices and high utilization. Most HRRs had a mix of above average and below average prices and utilization. Above

Figure 2: Maps Showing Spending, Utilization, and Price Variation in BCBSTX

average spending could be due to high prices (Beaumont) or high utilization (Dallas and Fort Worth). Similarly low spending HRRs could have low utilization (El Paso and Corpus Christi) or low prices (Odessa). In fact, while both price and quantity indices were correlated with the spending index (correlation coefficient were 0.67 and 0.75, respectively), there was no correlation between price and quantity indices across HRRs (correlation coefficient 0.03).

Spending quintiles were generally similar across service categories, indicating that high (or low) spending HRRs had high (or low) spending across outpatient, inpatient, professional, and pharmacy services. For outpatient, professional, and drugs, spending was driven mainly by utilization, while inpatient spending was driven by price. These findings are consistent with the decomposition results in Figure 1.

Comparing medical spending, price, and utilization in BCBSTX and Medicare across HRRs, we find low correlations between the two payers. Medical spending and prices had low negative correlations (-0.10 and -0.13 , respectively), while quantity was positively correlated (0.24). The highest correlations across payers were for health status at 0.36 and quantity at 0.51 . However, as noticed before (Franzini et al. 2011), McAllen and Harlingen were outliers. They had the highest Medicare spending and the lowest BCBSTX spending. Excluding them from the comparison, the correlations between the two payers increased to 0.23 for spending, 0.08 for price, and 0.40 for utilization.

DISCUSSION

We found that the influence of price and utilization on per capita health care spending differed in the private sector and Medicare. Price had a considerable

Table 3: Quintiles for BCBSTX Spending, Price, and Quantity Overall and by Service Category

HRR	Overall						Outpatient						Inpatient						Professional						Drugs					
	Spending	Price	Quant	Spending	Price	Quant	Spending	Price	Quant	Spending	Price	Quant	Spending	Price	Quant	Spending	Price	Quant	Spending	Price	Quant	Spending	Price	Quant	Spending	Price	Quant	Spending	Price	Quant
Harlingen	1	1	1	1	2	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1
McAllen	1	1	1	1	1	1	2	1	3	2	1	2	2	1	1	2	1	1	1	1	1	1	1	4	1	1	1	1	1	1
Amarillo	1	1	1	1	1	2	2	1	1	4	1	4	2	1	2	2	1	5	1	3	1	3	1	3	1	1	1	1	1	1
El Paso	1	4	1	1	4	1	1	5	5	2	1	2	1	1	2	2	2	2	1	5	1	5	1	5	1	1	1	1	1	1
Corpus Christi	1	4	1	1	5	2	2	2	4	1	2	4	2	2	1	2	1	1	4	1	3	1	3	1	1	1	1	1	1	1
San Antonio	2	3	2	2	4	1	1	1	2	3	1	2	3	1	1	3	1	1	4	2	2	3	2	2	3	1	1	1	1	1
Bryan	2	2	2	2	3	3	1	1	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1
Odessa	2	1	4	2	1	3	3	3	1	4	3	1	4	3	1	3	3	5	3	5	3	5	5	5	5	5	5	5	5	5
Waco	2	3	3	2	2	4	3	3	3	3	1	4	3	3	1	1	4	1	2	1	2	2	1	1	2	1	1	1	1	1
Victoria	3	3	3	3	4	3	3	1	2	2	2	2	2	1	1	1	1	1	3	3	3	3	4	4	3	3	3	3	3	3
Tyler	3	2	3	3	2	4	1	1	1	3	3	3	3	1	1	3	5	2	2	1	1	2	1	1	2	1	1	1	1	1
Houston	3	4	3	3	3	3	3	3	4	1	3	4	3	3	2	4	2	2	3	4	3	3	4	3	3	3	3	3	3	3
San Angelo	3	4	4	3	4	3	2	1	1	4	4	1	4	4	4	5	5	1	3	5	3	3	5	3	3	3	3	3	3	3
Austin	3	5	2	3	5	1	4	4	5	1	5	1	5	4	5	5	3	5	4	4	4	4	4	4	4	4	4	4	4	4
Temple	4	3	4	4	2	5	3	4	4	3	3	4	3	2	3	2	3	1	2	1	2	1	1	2	1	1	1	1	1	1
Lubbock	4	2	4	4	1	5	4	3	3	5	4	3	5	4	3	3	4	2	4	2	4	2	4	2	4	4	4	4	4	4
Longview	4	1	5	4	3	4	3	1	1	5	4	3	5	4	3	4	3	4	4	4	4	4	1	4	4	4	4	4	4	4
Abilene	4	3	5	4	1	5	4	3	3	5	4	3	5	4	4	4	4	3	4	4	4	4	2	4	4	4	4	4	4	4
Fort Worth	5	5	2	5	5	2	5	5	5	3	5	5	5	5	5	5	4	5	3	2	3	5	3	2	3	3	3	3	3	3
Dallas	5	5	3	5	5	2	4	4	4	1	5	5	5	4	3	5	3	5	5	3	5	5	3	5	5	5	5	5	5	5
Beaumont	5	2	5	5	3	5	5	5	2	5	5	5	5	5	5	5	2	5	5	5	5	5	5	5	5	5	5	5	5	5
Wichita Falls	5	5	5	5	3	4	5	5	5	4	5	5	5	5	4	4	3	3	5	3	5	5	3	5	5	5	5	5	5	5

Note. Lowest quintile (1) in light gray; highest quintile (5) in dark gray.

impact on spending variation across Texas HRRs in the privately insured population, but a much smaller impact on Medicare spending. This is expected since Medicare rates are not negotiated but rather regulated to use nationally applicable price schedules. Price accounted for 32 percent of BCBSTX spending variation, a similar proportion to that found among autoworkers in the Midwest (White and Ginsburg 2012). Further supporting the notion that negotiations play a significant role in price variation is the fact that input prices made up only a small portion of the price variation in our data. These findings are consistent with analyses of a national sample of private sector data conducted for the IOM (2013), also finding that spending in the commercial sector is largely influenced by differences in prices.

Importantly, we found that the contribution of price to spending variation differed by service category. The conceptual framework for understanding price setting in the private health care sector is based on the notion of “price discrimination”—the practice of providers charging different prices to payers based on their willingness to pay. Prices are negotiated between payers and providers and, while the negotiation process is sophisticated and complex, final negotiated prices are heavily dependent on the relative market power of providers and payers (Ginsburg 2003). Providers’ market power can be defined as the ability to raise prices without losing patients. In a market where providers have low market power, for example, where providers are plentiful and provide fairly uniform services, negotiated prices tend to be low as providers are generally price takers. In markets where providers have strong market power, for example, where a few providers dominate the market or provide unique services, prices tend to be higher as providers can act as price setters. Based on anecdotal evidence in Texas and insights from research in other parts of the country, it is possible to see how the context in which negotiations occur may help explain the patterns across services.

Price explained only slightly more than 10 percent of the variation in facility outpatient spending, a much smaller proportion than found among other insured populations outside of Texas (Ginsburg 2010; White 2012). An explanation for this may be that BCBSTX tends to negotiate these prices using Medicare rates as a starting point, with resulting provider-specific rates determined as a percentage of Medicare rates. Starting negotiations from a common schedule reduces the influence of historical variation and seems effective in reducing outpatient price variation in BCBSTX.

Only 12 percent of BCBSTX professional spending variation was explained by price. In this case, it is likely that because professional service providers tend to be in relatively small practices, particularly in Texas where

small and solo practices are the norm, they have limited market power and are likely to be price-takers from BCBSTX (MedPAC 2012). Given the limited market leverage, professional providers are also more likely to be paid based on the Medicare fee schedule (Ginsburg 2010). However, there is evidence that certain providers, such as larger specialty practices, have more clout in negotiating with insurers (Berenson et al. 2012). In Houston, for example, while only anecdotal, a multispecialty group practice with 20+ locations and several hundred physicians was able historically to negotiate better rates from private insurers because it had the infrastructure and capability to demonstrate that the episodic cost of patients treated at their facilities were less costly, on an episodic basis, than similar patients treated by other physicians/groups.

Our finding that a large portion of spending variation for inpatient services is due to price variation is likely due to many hospitals having significant market leverage in negotiating prices. In Texas, price negotiations in the inpatient setting revolve often on an overall spending increase; for example, BCBSTX may target a 5 percent spending increase for a given hospital but leaves it to the hospital to allocate the increase internally. Thus, high-priced markets for inpatient services continue to be high priced over time.

In Texas, as well as nationally, must-have hospitals offering a unique service and hospitals with large market shares have been shown to exert considerable leverage to increase payment rates from insurers (Berenson et al. 2012). For example, based on the authors' personal knowledge of the Houston market, high reputation focused hospitals, like a children's hospital or a cancer center, and hospitals with large geographic coverage and/or relatively unique services, such as burn and trauma services, generally have been able to leverage their unique capabilities to negotiate better prices from private insurers.

Variation in utilization accounted for the preponderance of variation in outpatient, professional, and pharmacy spending for BCBSTX. When also including the variation in spending due to health status, utilization explained more of the variation in comparable medical spending for Medicare. However, somewhat surprisingly, health status adjusted utilization variation was actually higher for BCBSTX spending.

Health status played a much bigger role in explaining variation in Medicare than among BCBSTX. In the younger BCBSTX privately insured population, health status did not explain much variation, while health status accounted for 35 percent of Medicare variation. Other studies have found an even more substantial contribution, 75–85 percent, of health status to Medicare spending variation (Reschovsky, Hadley, and Romano 2013). The disparity between Medicare and BCBSTX could reflect the fact that differences in

underlying health status only really begin to manifest themselves clinically after age 65 because of greater variability in health among the older group (Philipson et al. 2010; Precision Health Economics 2013). Or this could reflect the fact that the BCBSTX population is likely to be more homogenous in socioeconomic as well as health status, compared to the Medicare population, as only those with jobs offering health insurance are in the BCBSTX population, while almost all aged 65 and older are enrolled in Medicare. There are also potential biases in using health status scores based on diagnoses to adjust for health status, both in BCBSTX and Medicare, since utilization intensity leads to diagnostic intensity and areas of intensive utilization also have more diagnoses, thus diminishing true geographic variation (Skinner, Staiger, and Fisher 2010; Song et al. 2010). Given the more prominent role of price and utilization, as opposed to health status, particularly for the BCBSTX population, in explaining spending variation, these findings suggest that it should be possible to change prices and utilization in the private sector without hurting health.

The major implication of our findings is that strategies to manage the variation in spending may need to differ substantially depending on the service and population covered. If, in fact, negotiation off a state-wide fee schedule for outpatient facilities helps reduce price variation, then, from a policy perspective, such practice should be encouraged. For example, it may be more appropriate to direct policies geared toward controlling outpatient, professional, and pharmacy spending to reducing utilization variation. Thus, measures aimed at improving the efficiency of health care delivery and reducing inappropriate utilization should be developed. However, much more research is needed to know which specific services are over-utilized. Being able to target specific services/medical conditions will help determine the best policies.

When looking at how to control spending variation for inpatient hospital services, policies aimed at reducing price variation, such as those that strengthen competition or constrain payment rates through regulation, would be appropriate (Ginsburg 2010). This could include improving the transparency of cost and quality data available to consumers, coupled with redesigning insurance benefits so that consumers have incentives to use lower cost providers. In Texas, as in other states, price transparency efforts are underway (Kullgren, Duey, and Werner 2013). The Texas Department of Insurance is actively working toward the establishment of a state-wide price transparency tool as well as encouraging insurance companies to offer quality, price, and out of pocket information to their members.

Regulation and stronger antitrust measures to reduce hospital market power could also contribute to controlling inpatient price variation. However,

there does not appear to be anything either in Texas or nationally that is slowing down the consolidation of hospital systems and the employment of physicians by hospitals. In fact, provider consolidation seems to be on the rise in an effort to create economies-of-scale, improved accountability, enhanced infrastructure, and stronger negotiating positions. Neither antitrust measures nor the ACA appears to be slowing down this trend (Dafny 2014).

While spending by the private sector and Medicare differs in important ways (e.g., differences in ages, disease prevalence, and provider reimbursement methods), we attempted to increase comparability by computing BCBSTX and Medicare medical spending, excluding postacute care spending (Chernew et al. 2010). As the IOM found that postacute spending accounted for most of the variation in Medicare spending, considering only nonpost-acute spending reduces variation in Medicare spending but allows for a better comparison of the role of price and utilization in Medicare and private spending by focusing on services that are commonly used in both populations. We found that private sector and Medicare spending variation, as measured by the coefficients of variation, was similar, consistent with our previous work in Texas but unlike findings at the national level (Chernew et al. 2010; Philipson et al. 2010). But across HRRs, spending was only weakly (and negatively) correlated and utilization was positively correlated in the BCBSTX and Medicare populations, a result consistent with the literature (Chernew et al. 2010; IOM 2013; Precision Health Economics 2013). However, high spending HRRs for Medicare were not necessarily high spending for BCBSTX, similar to what was also found in the IOM report (2013). In fact, McAllen and Harlingen, the highest spending HRRs for Medicare, were the lowest spending for BCBSTX. These results suggest that policy makers should consider the peculiarities of private and public payers in the different geographic regions and develop specific policies to incentivize efficiency for each payer while also coordinating policies across payers in order to avoid any inadvertent effects.

CONCLUSIONS

The conventional wisdom is that Medicare does a better job of controlling prices, and private plans do a better job of controlling volume. Our results show that this is an oversimplification. BCBSTX actually does a good job of controlling facility outpatient prices and professional prices, probably due to their uniform fee schedule and the relatively limited negotiating leverage of outpatient facilities and physician practices in Texas. Prices are a much more

prominent factor in the variation in inpatient hospital spending. This suggests the need for in-depth studies of the markets where BCBSTX inpatient prices are unusually high.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.