

ONLINE APPENDIXES

3

**Hospital inpatient and
outpatient services**

ONLINE APPENDIX

3-A

**Do charges matter for private
or Medicare patients?**

**TABLE
3-A1****Ratios of charges to costs are correlated with profits**

Characteristic	Decile of charge markup over cost				
	Decile 1	Decile 3	Decile 5	Decile 8	Decile 10
Median charge-to-cost ratio	690%	427%	330%	230%	136%
Median total (all-payer) margin	7.9	5.7	5.3	3.1	1.1

Source: MedPAC analysis of cost report data.

In our discussions with hospital executives regarding hospital charges, we often hear that “charges don’t matter” because most patients pay a negotiated rate. However, when we examine differences in charges across hospitals, we find a statistically significant correlation between hospitals’ markups and profitability. This association could be due to some insurers still paying hospitals discounts on charges; hospitals with more market power having higher charges; and/or hospitals balance billing patients for out-of-network services. We also have some concerns that the Medicare outlier system could be gamed by hospitals raising charges for certain services.

Hospital charges and prices

Each hospital has a “charge master” that lists the prices for all services. Medicare requires that these list prices (charges) be equal for all payers, but negotiated prices vary widely by hospital and by insurer. In some cases, negotiated prices are based on a fee schedule (e.g., a percentage of the Medicare rate, or a per diem amount); in other cases they are set at a percentage of charges (e.g., 75 percent of charges). While charges do not matter if prices are set based on a fee schedule, they do matter if prices are equal to a percent of charges. Charges also matter for a non-Medicare patient who enters the emergency department at a hospital that has not contracted with the patient’s insurer. The hospital may bill the insurer full charges, but if the insurer does not pay full charges, the hospital can balance bill the patient in some states (Robert Wood Johnson Foundation 2015). High out-of-network rates coupled with balance billing have created tension between providers and payers, have been the source of lawsuits, and may have led to new protections for patients from out-of-network billing in California (Hoadley et al. 2015).

Charges are correlated with profits

Hospitals vary widely in their charges and markups over cost. An examination of 2013 Medicare cost report data shows that the 10 percent of hospitals with the lowest markups set their charges on average equal to 136 percent of costs. The 10 percent of hospitals with the highest markups set their charges equal to 690 percent of costs on average. Other researchers have reported these wide variations in charges (Bai and Anderson 2015, Brill 2013, Centers for Medicare & Medicaid Services 2015, Kowalczyk 2013, Reinhardt 2006). What is not reported is that the higher markup hospitals tend to have higher profits. The highest charging hospitals (with an average charge equal to 690 percent of costs) had a median all-payer profit margin of 7.9 percent, and the hospitals in the bottom decile of markups (with an average charge equal to 135 percent of costs) had a median all-payer profit margin of 1.1 percent (Table 3-A1). The correlation does not prove causation, but it calls into question the assumption that “charges don’t matter.”

Private prices vary widely

Part of the additional profits from higher charges could come from out-of-network patients who enter the hospital from the emergency room. Higher profits could also stem from higher charges if the hospital has the market power to limit discounts to charges by insurers. When examining Truven Health MarketScan® data from private insurers, we see that prices received by hospitals from insurers vary widely for identical services (Medicare Payment Advisory Commission 2011). The variations in 2013 prices for two common emergency department services are shown

**TABLE
3-A2**

Wide variation in rates paid by privately insured patients

Service	Number of claims examined	Facility payment at the 10th percentile	Mean facility payment	Facility payment at the 90th percentile	Ratio of 90th percentile to the 10th percentile
Level 4 emergency department visit, CPT 99284					
Medicare payment rate	4,791,870	\$258	\$287	\$342	1.3 times
Private in-network rate	917,802	275	733	1,311	4.8 times
Private out-of-network rate	23,128	204	756	1,527	7.5 times
Head CT, hospital, CPT 70450					
Medicare payment rate	1,937,107	\$112	\$141	\$148	1.3 times
Private in-network rate	228,868	236	786	1,472	6.2 times
Private out-of-network rate	5,037	286	888	1,892	6.6 times

Note: CPT (Current Procedural Terminology), CT (computed tomography). Payment rates are the sum of facility payments due from by the insurer and the patient. The rates do not include physician payment rates, which also vary widely.

Source: MedPAC analysis of 2013 Medicare outpatient claims data and private insurer claims from the 2013 Truven Health MarketScan® Research Databases.

in Table 3-A2. We chose these services because they are often provided on an emergency basis and they give an indication of whether emergency out-of-network rates tend to be dramatically higher than in-network rates. Table 3-A2 shows wide variation in prices for both in-network and out-of-network patients, with only moderately higher top rates for out-of-network patients. This range suggests that some hospitals with high charges have enough market power to limit discounts accepted from at least some insurers. The threat of high out-of-network prices for emergency services may help hospitals with strong market positions to negotiate in-network commercial rates that are far above Medicare’s rates and far above private insurer rates paid to hospitals with less market power.

Charges and Medicare inpatient outlier payments

In addition to hospitals’ incentives to increase charges to increase private-payers’ payments, there is also a question of whether charge-master strategies can increase Medicare outlier payments. The outlier pool is fixed at an estimated 5.1 percent of inpatient diagnosis related group (DRG) payments. Therefore, over time, gaming of charges and the outlier system by some hospitals will result in a transfer

of payments from hospitals that do not game the system to hospitals that do.

The Department of Health and Human Services Office of Inspector General (OIG) has found that some hospitals are much more likely to receive outlier payments than other hospitals (Office of Inspector General 2013). In some instances, these hospitals care for patients with greater needs than are reflected in the average cost per case in each Medicare severity–DRG (MS–DRG). The outlier payments these hospitals receive are an appropriate compensating factor for the limitations of the MS–DRGs in capturing the full variation in resource use due to clinical factors. However, OIG reports that some hospitals receiving high outlier payments did not have particularly long lengths of stay. There is a concern that some hospitals may be increasing their charges for specific services to increase CMS’s estimate of their case-level costs and their outlier payments.

A hospital’s outlier payment for a case is computed as estimated case costs minus the hospital’s MS–DRG payment for the case (including indirect medical education (IME) and disproportionate share (DSH) hospital payments) minus the hospital’s adjusted fixed-loss amount (the national fixed loss amount of \$22,544, adjusted by the hospital’s wage index and the cost of living adjustment (COLA)) times 80 percent. In effect, however, the

estimated cost for the case is built up from the hospital's service charges for all services furnished to the patient, where each *department-level* charge is multiplied by the hospital's *overall* inpatient cost-to-charge ratio (CCR). Thus, for 2016, outlier payments are computed as:

$$80\% \times [(charge\ for\ specific\ Service\ A \times overall\ CCR) + (charge\ for\ specific\ Service\ B \times overall\ CCR) + \dots (charge\ for\ specific\ Service\ N \times overall\ CCR) - (MS-DRG\ payment + IME\ payment + DSH\ payment) - hospital's\ fixed\ loss\ amount\ (\$22,544\ adjusted\ by\ hospital's\ wage\ index\ and\ COLA)]$$

The question is whether hospitals increase charges for certain services that are disproportionately prevalent in outlier cases (e.g., operating room, anesthesia, intensive care unit) and set low markups on services that are less

likely to be prevalent on outlier claims (e.g., physical therapy). This pattern would result in overstatement of case costs and more outlier cases and payments for hospitals following this strategy. We are in the process of analyzing these data to evaluate the degree to which high-outlier hospitals are engaged in this strategy.

By inflating its charges for outlier-prevalent services but keeping its overall inpatient CCR unchanged by reducing markups on other services, a hospital could increase its outlier payments. If hospitals are taking advantage of the current formula's limitations, some limits on outliers may be necessary. For example, the Congress could impose a requirement that the length of stay be at least four or five days longer than expected for the DRG before the case could qualify for outlier payments.¹ This requirement would reduce hospitals' ability to game the outlier system. Another option would be to use department-level CCRs to compute case costs and outlier payments. ■

Endnotes

1 Until fiscal year 1998, Medicare made outlier payments for cases that had either long stays or high costs. In fiscal year 1998, Medicare began making outlier payments only for cases that had very high costs relative to their regular DRG payment rates. One alternative would be to tighten the outlier criteria

to only pay outlier payments when a case has both a long stay and high estimated costs. This may redistribute dollars away from low-occupancy hospitals with very high costs per day toward hospitals with lower costs per day but longer stays.

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ONLINE APPENDIX

3-B

**Methodology for evaluating
hospitals' efficiency**

We classify hospitals as relatively efficient if they consistently perform well on a combination of quality and cost metrics over a three-year period. By performing well, we mean that a provider cannot be in the worst one-third of the distribution on any quality or cost metric for three consecutive years, and the provider must be in the best one-third of the distribution in either risk-adjusted mortality or standardized cost per discharge for three consecutive years. For example, a hospital that is consistently in the best third on its risk-adjusted mortality rates and is in the middle third or best third on risk-adjusted readmission rates and standardized costs for all three years meets our criteria for a relatively efficient provider. Similarly, a provider that is consistently in the best one-third on the cost measure and has annual quality scores in the middle third or best third is also categorized as relatively efficient.

Initial screens on the population of hospitals examined

We have heard two concerns regarding the ability to risk adjust quality and cost metrics. One concern is that some hospitals may be in markets with high volumes of care but low unit costs of care. For example, a hospital with medical staff who are “aggressive admitters” may be disproportionately admitting patients that could be treated safely on an outpatient basis. This admitting pattern may result in the hospital appearing to have low costs and good outcomes. The second concern is that hospitals that avoid low-income patients may have an easier time achieving low readmission rates (Medicare Payment Advisory Commission 2014). To limit the chance that our group of relatively efficient hospitals includes these types of hospitals, we apply two initial screens to the hospitals analyzed:

- To avoid including markets with high volumes of care in our analysis, we removed hospitals from the population studied if they were located in counties in the top 10 percent of risk-adjusted annual Medicare fee-for-service (FFS) service use per FFS beneficiary (Medicare Payment Advisory Commission 2011). This reduces the chance that a hospital will appear to have low unit costs simply because it is located in an area with a high volume of inpatient cases that could have been safely treated in an outpatient setting.

- To allay concerns that our method does not account for the effect that low-income patients have on quality metrics, we removed the 10 percent of hospitals with the smallest shares of Medicaid patients from the analysis.

The net result of these two screens is to eliminate approximately 500 hospitals (almost 20 percent) from the sample of hospitals studied. Our goal in this screening process is to improve our ability to identify a set of hospitals that can provide good outcomes at a reasonable cost, while serving a broad spectrum of patients (including Medicaid patients) and that do not drive up the overall volume of hospital and nonhospital services provided in their local markets.

Computation of quality metrics

To measure quality of care, we use risk-adjusted mortality and risk-adjusted readmission rates. These two metrics are important to the patient, and the outcome (mortality or readmission) can be determined with a high degree of accuracy. The first quality metric we use is a composite risk-adjusted mortality rate during the hospital stay and the 30 days after discharge. The second quality metric is an all-condition 30-day risk-adjusted readmission rate. While other outcome metrics are important to the patient, such as hospital-acquired pressure ulcers and infections, these metrics are dependent on accurate coding by hospitals (Meddings et al. 2013). For example, less complete medical record documentation could result in the appearance of better performance on these metrics. Therefore, we have not included these measures. In contrast, for the mortality and readmission measures, the existence of the event (readmission or death) is clear.

One reason for using rates both of mortality and readmissions is that it further reduces the odds of having the relatively efficient set biased toward hospitals serving poorer or wealthier patients. The readmissions measure tends to have worse scores for hospitals with more low-income patients (Medicare Payment Advisory Commission 2014). In contrast, risk-adjusted mortality rates do not tend to be higher for poor patients and are lower for African American Medicare patients (Lindenauer et al. 2013, Polsky et al. 2008, Volpp et al. 2007). Requiring adequate performance on both measures, which tend to have offsetting correlations with socioeconomic

status (SES), reduces the odds of SES distorting our identification of top performers.

The annual risk-adjusted mortality measure we use is a composite of 30-day postdischarge mortality measures for Medicare patients admitted during the year with five conditions: acute myocardial infarction (AMI), congestive heart failure, pneumonia, stroke, and hip fracture. For each condition, we follow the Agency for Healthcare Research and Quality (AHRQ) risk-adjustment methodology, adapted for 30-day postdischarge data. This method uses the patient's age, all-patient refined–diagnosis related groups (APR–DRG) assignment, and APR–DRG risk of mortality subclass assignment for comorbidities that were present on admission to calculate an expected mortality rate. We then compare the hospital's actual mortality rate for each condition with its expected mortality rate to create a relative mortality measure. Each hospital's composite risk-adjusted relative mortality rate reflects its shares of Medicare admissions for each condition. For example, if a hospital had 50 AMI admissions, 100 heart failure admissions, and no admissions for the other conditions, 33.3 percent of its composite mortality score would be based on its AMI risk-adjusted relative mortality rate and 67.7 percent on its heart failure risk-adjusted relative mortality rate. If a hospital had equal numbers of admissions for all five conditions, the weight on each risk-adjusted relative mortality rate would be 20 percent.

We could use mortality data for similar conditions from CMS's Hospital Compare data set. However, the Hospital Compare methodology adjusts for risk *and* shrinks all hospitals' performance on each condition toward the national mean performance to avoid errantly calling a hospital low or high quality. Hospitals with fewer admissions are shrunken to a greater degree toward the mean (Mukamel et al. 2010, Silber et al. 2010). The shrinking toward the mean causes both poor and good performers to end up in the middle third of all performers if they have few admissions. Therefore, the CMS method of reporting shrunk estimates of mortality and readmission rates is not compatible with our objective of finding providers that are in the top third or bottom third of all hospitals. Therefore, we compute our own composite mortality rate using the AHRQ methods adapted to a 30-day postdischarge framework.

The time frame of our mortality metric also differs from CMS's method. CMS examines mortality during the 30 days starting with admission so that the time frame is consistent for all discharges. However, this approach

means that someone who is admitted, lives 31 days in the hospital, and dies in the hospital is deemed a successful outcome. In contrast, we consider only living more than 30 days outside of the hospital a successful outcome. Therefore, we measure mortality for the time period starting with admission and ending 30 days after discharge. The downside of using this time frame is that the number of days in each case's time frame is not equal. However, we are willing to accept this limitation because our methodology reflects a standard that, after accounting for the risk of mortality due to the condition, patient age, and comorbidities present on admission, a hospitalization is not successful if the patient dies in the hospital or within 30 days after discharge.

We measure hospitals' risk-adjusted rates of potentially preventable readmissions within 30 days of discharge for all conditions using annual Medicare claims and software from 3M™. The 3M method defines a potentially preventable readmission as a readmission that is clinically related to the initial hospitalization in that the underlying reason for the readmission may be plausibly related to the care during and immediately after discharge from the prior hospital stay. A clinically related readmission may have resulted from a process of care or treatment during the prior admission or lack of postdischarge follow-up, rather than from planned readmissions or unrelated events that occurred after the prior admission (3M Health Information Systems 2008).

Patient satisfaction

As a secondary screen on the quality of care provided, we require that at least 60 percent of respondents rate the hospital a 9 or 10 on a 10-point scale using the Hospital Consumer Assessment Healthcare Providers and Systems® (H-CAHPS®) survey. We use patient satisfaction only as a secondary indicator of quality because the satisfaction scores tend to be tightly grouped across hospitals and are subjective. However, patient satisfaction measures have the advantage of not being dependent on coding since they are not risk-adjusted measures. This screen excludes less than 10 percent of hospitals. Our intent is to exclude hospitals that may look good on risk-adjusted quality and cost metrics only because they are aggressive coders of comorbidities, again helping to ensure that we accurately identify only top-performing hospitals.

Computing cost metrics

We currently measure hospitals' relative costliness using risk-adjusted inpatient costs per discharge. We believe it is reasonable to examine only inpatient costs per unit because our past analysis shows hospital inpatient and outpatient Medicare margins (and hence relative costs) are highly correlated.

Standardizing inpatient costs

We standardize hospitals' reported annual Medicare inpatient costs to make them comparable across hospitals facing different local market conditions and treating different mixes of Medicare patients. We start with cost report estimates of operating and capital costs allocated to Medicare inpatient cases. We then make adjustments for factors such as case mix, local wage levels, and financial structure, to make Medicare inpatient costs per discharge comparable across facilities.

Adjust for patient severity and case mix

In standardizing costs, we account for differences in the set of Medicare cases hospitals treat. We account for annual differences in the reported case mix of patients by using the reported Medicare severity–diagnosis related group (MS–DRG) assignments on patients' Medicare claims and the annual MS–DRG cost-based relative weights. We also adjust for differences in patient severity within DRGs by accounting for differences across hospitals in the prevalence of extraordinarily high-cost cases (i.e., outliers). We believe that outlier cases to some extent reflect unmeasured differences in illness severity, and our past work suggests that high-outlier hospitals may attract more complex cases (for example, they get more transfers from other hospitals). Therefore, some adjustment for the cost impact of outliers is needed. However, we do not want to remove all outlier costs because high cost structures can also be a factor leading to high outlier payments. As a compromise, we adjust hospitals' costs down by an amount roughly equal to their outlier payments, which on average reflect roughly half of outlier costs. Other things being equal, hospitals with a disproportionate volume of outlier cases will still appear to have high costs, but not as high as they would have been without any outlier adjustment.

However, we decided not to use the raw outlier payments made by CMS because of distortions in these payments caused by the current law payment adjustments for local

market wage levels, the indirect effects of operating medical education programs (indirect medical education (IME) payments), and serving a disproportionate share of low-income patients (disproportionate share (DSH) hospital payments). Instead, we estimate what annual outlier payments would be if the current Medicare inpatient payment system used refined wage index, IME, and DSH adjustments. To reach this estimate, we try to determine what outlier payments would be if we used a version of the wage index recommended by the Commission and if IME and DSH payments were made at empirically justified levels. (We describe these adjustments in earlier Commission reports (Medicare Payment Advisory Commission 2010, Medicare Payment Advisory Commission 2007a). Then we divide each hospital's inpatient costs per discharge by an appropriate outlier index that reflects (adjusted outlier payments + base DRG payments)/base DRG payments. This calculation assumes that outlier payments (not outlier costs) are a rough proxy of unmeasured differences in illness severity. The practical effect of this step is to remove roughly half of hospitals' outlier costs on average from their annual estimated average costs per discharge.

To adjust for each hospital's annual Medicare case mix, we divide each hospital's outlier-adjusted inpatient costs by its MS–DRG case-mix index. To get a case-mix-adjusted cost per discharge, we also divide by the hospital's transfer-adjusted discharges. Transfer-adjusted discharges count cases that are transferred early (relative to the average length of stay for the MS–DRG) from the initial admitting hospital as partial discharges. We use transfer-adjusted discharges because patients who are transferred early to another acute care hospital or a post-acute care setting do not receive the typical full course of care and are expected to cost less than a typical discharge.

Adjust for the cost of teaching and serving low-income patients

Hospitals that participate in residency training and care for a large share of low-income Medicare patients tend to have higher patient care costs. In the standardization process, we adjust for the empirically estimated costs of teaching and an empirically estimated cost of serving poor patients. We use these estimates rather than the current adjustments used in payment, which can overstate the effects on inpatient costs of training residents. We discuss these regression methods in earlier Commission reports (Medicare Payment Advisory Commission 2010, Medicare Payment Advisory Commission 2007a).

Adjust for differences in input prices and costs

Hospitals' costs also vary because of differences in local market wage levels and other input prices between different areas of the country. We do three things to adjust for the resulting differences in input costs:

- CMS has estimated that 69.6 percent of hospital inpatient operating costs are wage related. Therefore, we adjust 69.6 percent of each hospital's Medicare inpatient operating costs for local wage levels. The CMS wage index has been distorted by many hospital-specific reclassification adjustments and other problems. To avoid these distortions, we use an updated version of a Commission local market wage index that is based on alternative methods and 2010 data (Medicare Payment Advisory Commission 2007b). This wage index uses data from the Bureau of Labor Statistics and the Census Bureau, and it reflects underlying input prices in each market area.
- Next, we adjust for interest expenses. The idea is that we do not want a hospital to appear more efficient just because it is financed with equity rather than debt. Therefore, we adjust each hospital's reported inpatient expenses to equalize across all hospitals the share of expenses that is interest related. In practice, this adjustment means slightly increasing costs at hospitals with no debt and slightly decreasing costs at hospitals with high levels of debt.

- Finally, because input prices for capital and nonlabor inputs are generally higher in Alaska and Hawaii, we adjust those costs downward using the cost of living adjustment that CMS uses for payments.

Addressing random variation

Even after adjusting hospitals' quality metrics for patient characteristics and standardizing their costs to the best of our ability, these metrics will still reflect some random variation. We address random variation in three ways. First, we exclude hospitals that have 500 or fewer discharges during their fiscal year, which removes hospitals that have too few cases to enable reliable assessment. Second, the remaining hospitals must show consistent performance over three years (2011 to 2013) to get into the relatively efficient group. Finally, we use a different year's data (2014) when comparing the performance of the efficient group with all other hospitals. This choice of data helps minimize the correlation between random variation in a hospital's 2014 performance metrics with the random variation in the data used to classify the hospital as relatively efficient. If we used the same data to classify hospitals as efficient and to compare the efficient hospitals with all other hospitals, we would overestimate the difference in efficiency due to correlation of the random errors. We minimize this problem by identifying hospitals as being relatively efficient or inefficient by looking at their performance from 2011 to 2013 and comparing performance between the two groups using only 2014 performance data. ■

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