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RESEARCH ARTICLE

Variation in Payment Rates under Medicare's Inpatient Prospective Payment System

Sam Krinsky, Andrew M. Ryan, Tod Mijanovich, and Jan Blustein

Objective. To measure variation in payment rates under Medicare's Inpatient Prospective Payment System (IPPS) and identify the main payment adjustments that drive variation.

Data Sources/Study Setting. Medicare cost reports for all Medicare-certified hospitals, 1987–2013, and Dartmouth Atlas geographic files.

Study Design. We measure the Medicare payment rate as a hospital's total acute inpatient Medicare Part A payment, divided by the standard IPPS payment for its geographic area. We assess variation using several measures, both within local markets and nationally. We perform a factor decomposition to identify the share of variation attributable to specific adjustments. We also describe the characteristics of hospitals receiving different payment rates and evaluate changes in the magnitude of the main adjustments over time.

Data Collection/Extraction Methods. Data downloaded from the Centers for Medicare and Medicaid Services, the National Bureau of Economic Research, and the Dartmouth Atlas.

Principal Findings. In 2013, Medicare paid for acute inpatient discharges at a rate 31 percent above the IPPS base. For the top 10 percent of discharges, the mean rate was double the IPPS base. Variations were driven by adjustments for medical education and care to low-income populations. The magnitude of variation has increased over time.

Conclusions. Adjustments are a large and growing share of Medicare hospital payments, and they create significant variation in payment rates.

Key Words. Medicare, hospitals, health care costs, price variation, prospective payment

Variation in hospital prices has been the subject of increasing interest in recent years, attracting attention from policy analysts (Ginsburg 2010; Reinhardt 2011; Gaynor and Town 2012), regulators (Coakley 2010; Ginsburg 2010; Xerox 2012; Gaynor 2014), payers and advocates (Katz et al.

2009; Delbanco 2013; Williams 2013), and the popular press (Allen et al. 2008; Brill 2013). Variations within local markets are due, at least in part, to differences in providers' market power, with large, specialized, or prestigious hospitals receiving the highest rates (Coakley 2010; Moriya, Vogt, and Gaynor 2010; Gaynor and Town 2012; White, Bond, and Reschovsky 2013; Delbanco 2014; Ginsburg and Pawlson 2014). Concentrated market power is costly for patients and payers, and it may indirectly threaten the viability and quality of care of low-cost institutions unable to compete with well-resourced rivals (Katz et al. 2009; Berenson et al. 2012; Williams 2013).

Hospitals' high prices have led payers to adopt several market-based strategies to redirect patients to low-priced providers, such as reference pricing, tiered benefits, and limited networks (Robinson and MacPherson 2012; Delbanco 2013; Ginsburg and Pawlson 2014). Policy makers and analysts have also begun reconsidering price regulation (Nichols et al. 2004; Frakt 2011; Ginsburg 2011; Reinhardt 2011; Berenson et al. 2012; Cutler and Scott Morton 2013; Delbanco 2013; Ginsburg and Pawlson 2014; Vladeck 2014; Zimmerman 2014), with the rationale that an increased government role in setting prices would lead to more uniformity and slower growth in average prices. In Massachusetts, a bill under consideration would void hospital contracts with insurers unless they fell within a narrow pricing band, and a ballot initiative may soon bring the issue directly to voters (McCluskey 2015).

Research has focused overwhelmingly on commercial markets, where hospitals and insurers set prices in closed negotiations. In contrast, variations under Medicare, where the federal government sets payment rates administratively, have received little attention. Acute care hospitals are paid by Medicare for inpatient care predominantly under the Inpatient Prospective Payment System (IPPS). The IPPS pays hospitals based on patients' diagnosis related groups (DRGs), and it also compensates hospitals for exceptionally costly patients through outlier payments. While each DRG is assigned a base price that applies to all U.S. hospitals, hospitals receive payment adjustments designed to account for differences in area wages, care for low-income patients

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Address correspondence to Sam Krinsky, M.A., 1199SEIU, 330 West 42nd Street., 7th Floor, New York, NY 10036; e-mail: samuel.krinsky@1199.org. Andrew M. Ryan, Ph.D., is with the University of Michigan School of Public Health and Institute for Healthcare Policy and Innovation, Ann Arbor, MI. Tod Mijanovich, Ph.D., is with NYU Steinhardt, New York, NY. Jan Blustein, M.D., Ph.D., is with NYU Wagner/NYU School of Medicine, New York, NY.

under the disproportionate share hospitals (DSHs) program, and the indirect costs associated with graduate medical education (IGME), among other adjustments (Government Accountability Office [GAO] 2013; Quinn 2014). Hospitals also receive additional payments from Medicare, the largest covering some of the direct costs for providing graduate medical education (DGME). Many hospitals are exempt from the IPPS, though these tend to be smaller, rural hospitals (GAO 2013; Medicare Payment Advisory Commission [MedPAC] 2013).

Within this administrative pricing system, hospitals have limited ability to affect their payment rates, so variation is not evidence of market power. However, this does not eliminate payment variation under Medicare as a policy concern. For instance, Medicare payment rates can affect prices in other markets (Frakt 2011, 2014; Clemens and Gottlieb 2013, 2014; White 2013; White and Wu 2014; Berenson et al. 2015). Separately, research by the MedPAC and others has raised concerns that payment adjustments, while in principle legitimate, are too large in the aggregate and poorly correlated with hospitals' resource needs (Nguyen and Sheingold 2011; Chandra, Khullar, and Wilensky 2014; Grover, Slavin, and Willson 2014). MedPAC found that "at most, 25 percent of the DSH payments [were] empirically justified by the higher Medicare costs at hospitals treating low-income patients" (MedPAC 2014) and that the $6.5 billion spent annually on IGME exceeds by $3.5 billion, the true added costs of teaching inpatient care (MedPAC 2010).

In response to these critiques, the Affordable Care Act (ACA) reduced DSH payments by 75 percent and introduced a new uncompensated care adjustment, beginning federal fiscal year (FY) 2014. This reform was intended to better target safety net providers and decrease subsidies for care to low-income populations as insurance coverage grows (Keough and Webster 2013). Though no comparable reform has been enacted regarding Medicare's support for graduate medical education financing, the Institute of Medicine recently proposed significant changes (Eden, Berwick, and Wilensky 2014), some of which were echoed in the President's 2016 budget proposal (Office of Management and Budget 2015). However, the policy debate concerning each adjustment has tended to ignore how they might interact.

To our knowledge, no prior evaluation has quantified the variation in Medicare reimbursement resulting from all payment adjustments. We attempt to fill this gap by assessing the magnitude of variations in payment rates under Medicare Part A and the key policies that drive variation.

METHODS

Data

We used Medicare Hospital Cost Reports (versions 2552-85, 2552-89, 2552-92, 2552-96, 2552-10) to obtain hospital-level data on Medicare payments, discharges, and other hospital characteristics for all Medicare-certified hospitals for FY 1987–2013 (Roth 2004; Centers for Medicare and Medicaid Services [CMS] 2015a). We also used geographic crosswalk files from the Dartmouth Atlas (The Dartmouth Institute 2015) to match hospitals to local service areas.

Sample

We analyzed hospitals paid under the IPPS. We excluded hospitals meeting the key criteria for Critical Access Hospitals and Long-Term Acute Care Hospitals (less than 25 beds or average length of stay greater than 25 days), as these were likely to exit the IPPS over the study period. We also excluded 6 percent of cost reports due to (1) missing or inconsistent data; (2) Medicare patient volumes that were too low to provide meaningful observations (<100 discharges/year); (3) implausible payment amounts. Further details are provided in the Appendix.

Our resulting sample for 2013 consisted of 3,212 hospitals, representing 90 percent of all Medicare Part A acute inpatient discharges. For our analysis of variation within local hospital referral regions (HRRs), we further restricted our sample to the 222 HRRs (out of a total of 306) with at least five valid observations for FY 2013. This yielded 2,911 hospitals in FY 2013, representing 82 percent of all Part A acute inpatient discharges.

Measures

We measured Medicare payment as total Part A reimbursement to hospitals for acute inpatient care in a FY. This measure included the standard federal operating and capital IPPS payments, adjustments for geographic factors, all special revenue components that are part of the IPPS (e.g., IGME, DSH), and all other acute inpatient payments not included in the IPPS but still paid under Part A (e.g., DGME). Because cost reports often span FYs, we made adjustments to obtain consistent estimates on a FY basis. For convenience, we use the term "Part A" to refer only to Medicare Part A acute inpatient care,

although hospitals receive other Part A payments (e.g., for skilled nursing units) that were not included in our measure. The Appendix provides further detail regarding our calculation of Part A payments.

We measured the Medicare payment rate as the ratio of total Part A reimbursement to the "base" IPPS payment the hospital would have received absent any hospital-specific adjustments or supplement payments. In our data, the base IPPS payment comprises payments under the standard federal operating and capital rates applicable to all IPPS hospitals, adjusted for case mix and geographic factors. Our measure of the payment rate uses the same cost report fields Medicare uses in settling the amounts owed to hospitals, helping to ensure data quality.

We used several measures to describe variation in the Medicare payment rate, both within hospital referral regions and across our full sample. Our principal method was to compare means at different quantiles of the payment rate distribution. Additionally, we calculated the Gini coefficient of the payment rate and the "p90–p10 ratio" (i.e., the ratio of payment rates at the 90th and 10th percentiles). Throughout, we weighted by Part A discharges, both in setting cut-points for quantiles and in tabulating summary statistics. Thus, we interpret our results as describing the distribution of Part A discharges.

For a subset of our analysis, we classified hospitals into four mutually exclusive categories according to the type(s) of payment adjustments they received. Categories were community (no DSH or medical education adjustments), DSH (DSH adjustment, but no medical education adjustments), teaching (medical education adjustments, but no DSH adjustment), and DSH/teaching (adjustments for both DSH and medical education).

Analysis

We decomposed Part A payments into seven components: operating, capital, outlier, DSH, IGME, DGME, and "other" (see Appendix for details).[1] For each FY 1987–2013, we calculated each component's share of Part A payments across all hospitals, and for each hospital.[2] We chose this study period because FY 1987 is the first to reflect the full phase-in of national standard base rates under the IPPS (Guterman and Dobson 1986), and FY 2013 is the most recent year for which complete data are available and the last before the ACA's main payment reforms.

To identify policies that drive variation in the Part A payment rate, for each hospital we calculated the ratios of each of five payment components

(outliers, DSH, IGME, DGME, other) to the hospital's base IPPS payment (the sum of the operating and capital components). By construction, these ratios sum to one minus the total Part A payment rate, and we interpret them as the percentage add-ons due to each adjustment. We calculated their means across our full sample for FY 2013, and in several subsets, including 10 deciles of Part A discharges (with cut-points determined by hospitals' Part A payment rates) and the four hospital types described above.

To compare characteristics of hospitals with high versus low adjustments, we calculated statistics for several sample subsets for FY 2013. Initial analysis revealed a large jump in mean payment rates between the highest and second-highest deciles. For this reason, we grouped Part A discharges into the first through fifth deciles, the sixth through ninth deciles, and the tenth decile alone. We visualized the relationship between teaching intensity and care to low-income populations across these three decile groups. We used the resident-to-bed ratio as our measure of teaching intensity and the DSH patient percentage as our measure of care to low-income populations. These two factors are the major determinants of medical education and DSH payments per discharge, respectively. The DSH patient percentage is supplemental security income (SSI) beneficiaries' share of Part A patient days plus the Medicaid share of total patient days.

To measure each component's contribution to variation in the Part A payment rate, we performed a Gini factor decomposition, applying the method developed by Lerman and Yitzhaki (1985). We first calculated the Gini coefficient of Part A payment rates across our FY 2013 sample, then decomposed this statistic into the shares of total variation contributed by each component (see Appendix for further detail).

To measure variation within local services areas, we calculated the p90–p10 ratio for each HRR in FY 2013 and summarized the distribution of this statistic across HRRs.

To assess the temporal persistence of payment rates, we calculated Pearson correlation coefficients between hospital payment rates in three 3-year periods in our sample (using 3-year averages to reduce year-to-year fluctuations): FY 1987–1989, FY 1995–1997, and FY 2011–2013. The FY 1995–1997 period served as a natural midpoint because it occurred just before the payment reforms of the Balanced Budget Act of 1997. We also calculated mean payment rates for each decile in the national distribution and charted trends over the study period.

For robustness, we reproduced the distribution of payment rates after removing extreme values. We also reproduced the distribution of payment

rates using an alternative definition of medical education payments which excluded the amounts based on Medicare HMO patient volumes. Details are provided in the Appendix.

RESULTS

Table 1 summarizes mean hospital characteristics for several payment rate deciles in 2013. On average, adjustments raised Part A payment rates by 31 percent. In the top decile, average payment rates were double the IPPS base. Discharges paid at the highest rates tended to occur in hospitals with relatively low Medicare patient volumes, but high Medicaid. At these hospitals, HMO patients represented a high share of the Medicare population. These hospitals also were more likely to be large, government-owned, and located in large urban referral regions. They had worse operating and total margins, and they were more financially dependent on Part A adjustments than other hospitals.

Table 1 also reveals that nearly all Part A discharges occurred in hospitals receiving at least some Medicare DSH, and more than half in hospitals with at least some medical education adjustment. However, Figure 1 shows that these binaries mask a rich heterogeneity in teaching intensities and low-income patient shares, both overall and among hospitals with similar Part A rates.

Figure 2 shows the 2013 distribution of payment adjustments (including non-IPPS Part A supplements) by decile and hospital type. Hospitals that received payment for both DSH and medical education had the highest rates (on average 39 percent above the IPPS base); community hospitals had the lowest (8 percent above the IPPS base). While many hospitals received relatively small adjustments, there was considerable variation in the upper part of the distribution.

Our Gini decomposition for 2013 found that the distribution of indirect medical education was responsible for the largest share of variation in Part A payments (36 percent), followed by DSH payments (33 percent), direct medical education payments (13 percent), "other" payments (9 percent), and outlier payments (8 percent). Figure 2 shows that in 2013, DSH amounts increased with each decile at a stable rate. This contrasts with medical education payments, which were negligible for the bottom half of the distribution, but played the largest part in driving variation within the top deciles.

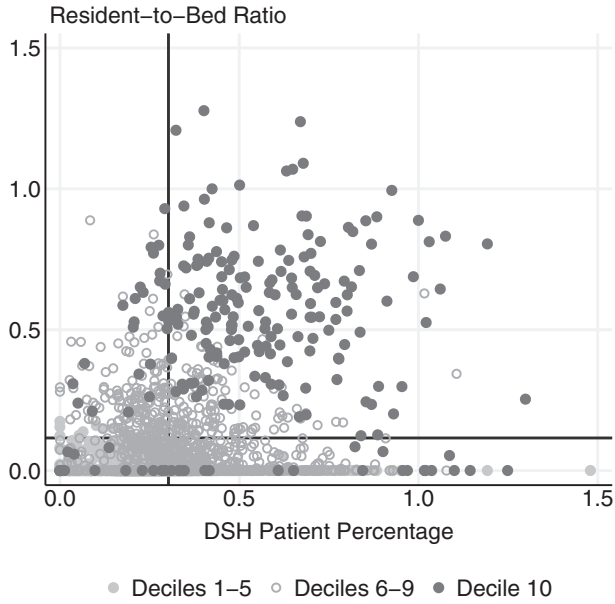
We also found substantial within-HRR variation in Part A payment rates for 2013, as measured by the p90–p10 ratio and shown in Appendix Exhibit

Table 1: Hospital Characteristics, by Part A Payment Rate, 2013

		Payment Rate Deciles		
	Total	*1–5*	*6–9*	*10*
Part A rate (mean)	1.31	1.12	1.37	2.01
Adjustments (mean)				
Outliers	0.05	0.03	0.05	0.11
DSH	0.14	0.07	0.17	0.33
IGME	0.08	0.01	0.09	0.37
DGME	0.03	0.00	0.03	0.13
Other	0.02	0.00	0.04	0.07
Type (%)				
Community	2.5	4.4	0.6	0.1
DSH only	44.1	67.4	25.6	2.3
Teach only	0.5	0.5	0.5	0.0
DSH/Teach	52.9	27.6	73.3	97.6
Payer mix (%, by IP days)				
Medicare (including HMO)	49.2	53.6	46.7	37.3
Part A	39.1	43.3	36.8	27.4
HMO	10.1	10.3	9.9	10.0
Medicaid	20.5	15.6	23.4	32.9
Teaching, DSH, and service intensity (mean)				
Resident-to-bed ratio	0.12	0.01	0.13	0.58
DSH patient percentage (%)	30.3	22.2	35.4	50.1
ICU share of Part A days (%)	15.0	13.9	15.5	18.6
Control (%)				
Voluntary	71.1	69.5	74.3	66.3
Proprietary	17.4	21.2	15.8	5.3
Government	11.5	9.3	9.9	28.4
Financial characteristics				
Total Part A payments ($, in billions)	121.4	47.5	52.2	21.7
Share of total Part A payments (%)	100.0	39.1	43.0	17.9
Operating margin (median, %)	0.18	0.85	0.36	−3.89
Total margin (median, %)	6.18	6.15	6.66	4.25
Part A share of net patient revenue (median, %)	18.9	19.0	19.1	17.4
Adjustments share of net patient revenue (median, %)	3.3	2.0	4.9	8.5
Sample size				
Hospitals	3,211	1,939	1,049	223
Discharges (in millions)	9.69	4.83	3.90	0.96
Other				
Beds (mean)	359	251	424	637
Urban (%)	87.0	84.1	87.9	97.6
Hospitals in HRR (mean)	19	18	19	26

Notes. Characteristics as defined in text and Appendix. Calculation of operating and total margins and shares of net patient revenue exclude observations with zero or missing values.
Source: Medicare cost reports, authors' calculations.

Figure 1: Relationship between Teaching Intensity, Care to Low-Income Populations, and Part A Payment Rates, 2013

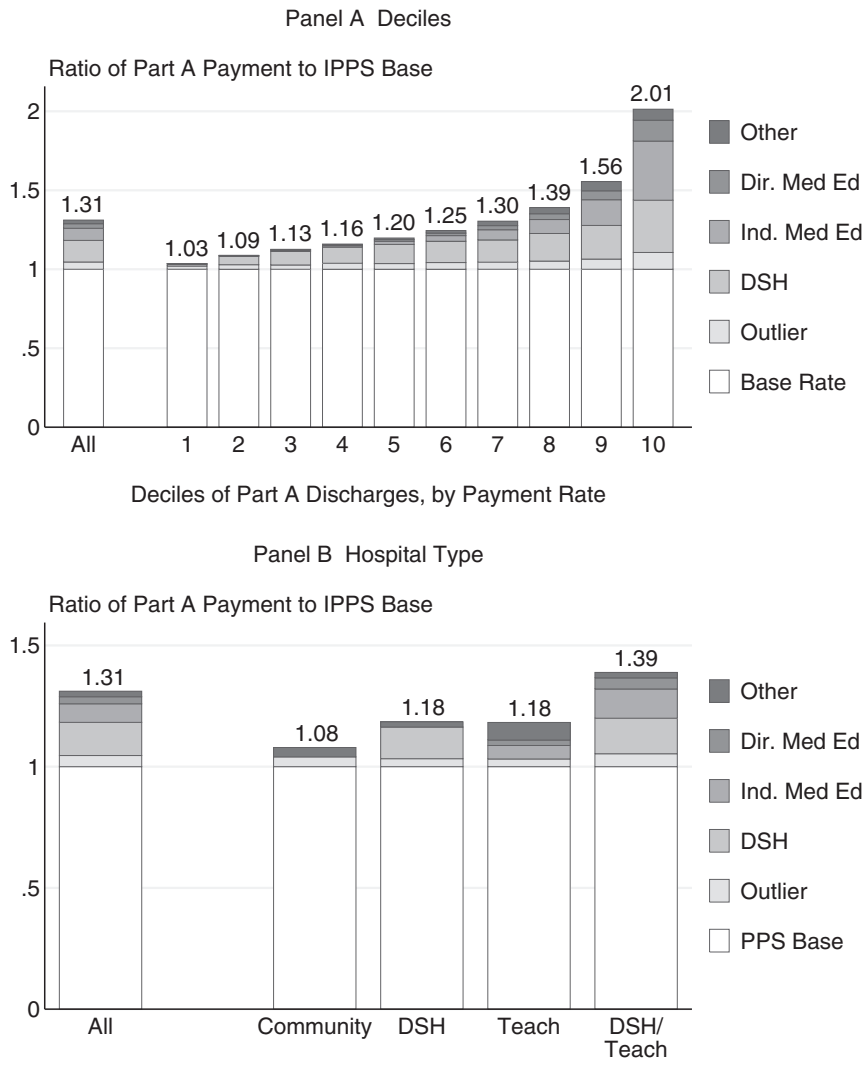


Notes: Each marker represent a hospital. For clarity, five outlying observations representing 0.18 percent of discharges are not shown. Added lines represent the mean resident-to-bed ratio and DSH patient percentages, respectively, weighted by Part A discharges.
Source: Medicare cost reports, authors' calculations.

A4. In some regions, rates clustered within a narrow band: 46 percent of HRRs had p90–p10s less than 1.3, though these tended to be smaller, accounting for 26 percent of discharges. At the other extreme, we observed five HRRs with p90–p10s above 2 (5 percent of discharges). The mean p90–p10 ratio was 1.56.

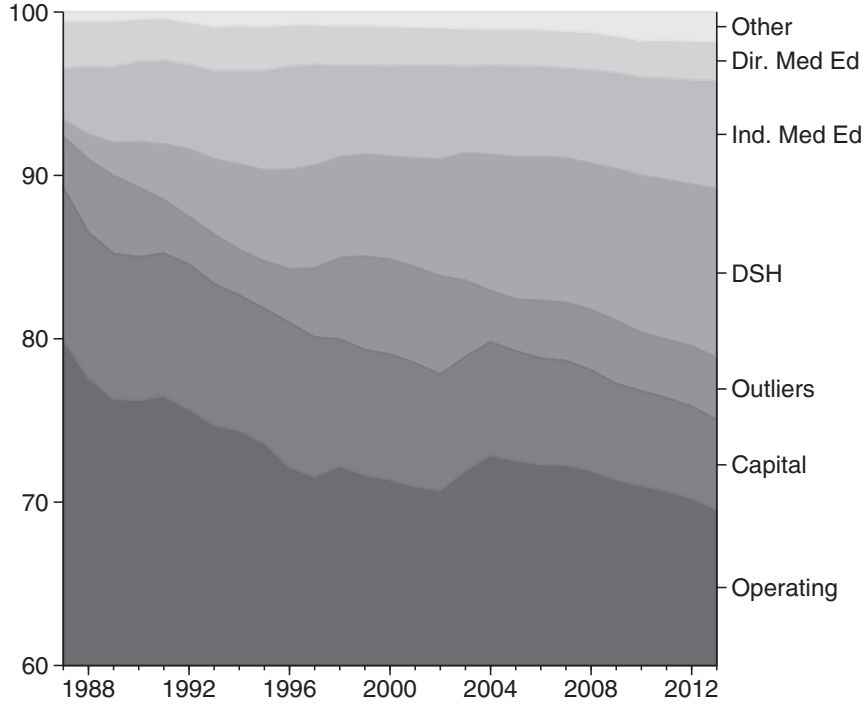
Figure 3 shows how each payment component's share of Part A payment shifted over the study period. Base IPPS payments, defined as the sum of operating and capital payments, decreased by 14 percentage points, from 89 percent of total Part A payments in 1987 to 75 percent in 2013. By contrast, the DSH share of Medicare payments increased by 9 percentage points, the combined direct and indirect graduate medical education share by 3 percentage points, and the outlier and "other" shares by 1 percentage point each.

Figure 2: Part A Payment Rates, by Payment Component, 2013



Notes: Values are the mean of Part A discharges within each grouping.
Source: Medicare cost reports, authors' calculations.

Figure 3: Percent of Aggregate Part A Payment, by Payment Component, 1987–2013



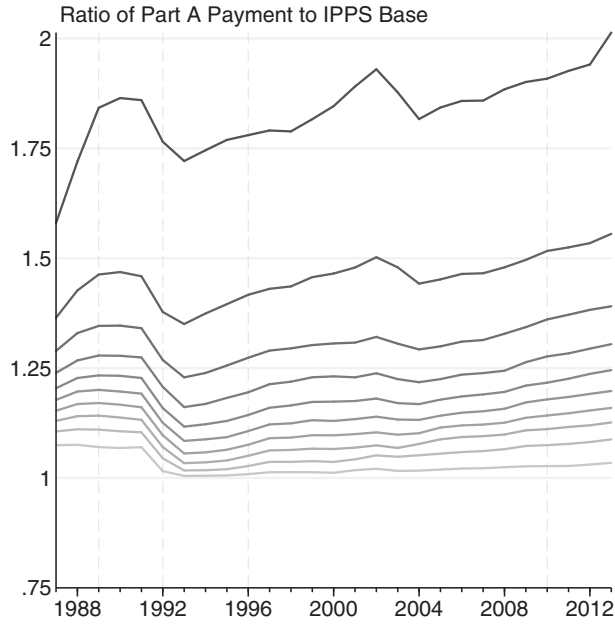
Notes: *Y*-axis begins at 60 percent.
Source: Medicare cost reports, authors' calculations.

Figure 4 shows the mean rates, 1987–2013, for 10 Part A payment rate deciles. Despite some fluctuations, especially in the early years, payment rates increased steadily in all parts of the distribution. However, the increase was greatest for the highest deciles, on both a percentage and absolute basis.

Our test for correlation in payment rates over time at the hospital level revealed considerable persistence, though also change over longer periods. The correlation between hospitals' Part A rates in 1987–1989 and 1995–1997 was 0.67. Between 1995–1997 and 2011–2013, the correlation was 0.76. Between 1987–1989 and 2011–2013, the correlation was 0.52.

The results of our sensitivity analysis, presented in the Appendix, confirm our main findings. The modest differences we observe after excluding

Figure 4: Part A Payment Rates, by Payment Decile, 1987–2013



Notes: *Y*-axis begins at 0.75. Vertical lines mark transitions to new cost report versions.
Source: Medicare hospital cost reports, authors' calculations.

extreme values provide reassurance that these observations did not drive our main findings. Similarly, we found that although IGME and DGME payments for Medicare HMO discharges played a significant role in elevating rates in the highest decile in 2013, substantial variation remained after excluding these payments.

DISCUSSION

We found that Medicare paid hospitals at rates that varied widely, even when using a measure that was insensitive to differences in case mix or geographic adjustments. Over the 27 years of the IPPS covered in our study, adjustments represented a large and increasing share of Medicare expenditures for acute inpatient care. The highest rates were paid to hospitals that received large

payments both for DSH and medical education. Community hospitals received the lowest rates.

Assessing Magnitudes

One way to interpret the magnitude of payment rate variation under the IPPS is to compare it with variation in the commercial market. While comparable national data are not available for commercial payers, data are available for Massachusetts, where in 2009 the range ratio of commercial prices for 14 high-volume DRGs varied between 1.3 and 2.1 (Massachusetts Division of Health Care Finance and Policy 2011). We found for the Boston referral region in 2009, a p90–p10 ratio in the middle of that range, at 1.6.

A second point of comparison is a study of prices paid by an autoworkers health benefit fund in 2011, spanning 13 predominantly Midwestern metropolitan areas (White, Bond, and Reschovsky 2013. The authors report that a case mix adjusted range ratio of 1.6 was typical for inpatient prices among the areas studied, which is identical to the mean of the p90–p10 ratios we observed in the corresponding referral regions for 2011.

Explaining the Growth in Adjustments Over Time

Though a full accounting of adjustments' increasing shares of aggregate payments is beyond the scope of our analysis, we can point to some factors that might be responsible for the trends observed in Figure 3. Some of the growth resulted from revisions to payment policies, via either law or agency rulemaking. For instance, the 2003 rule change intended to decrease outlier payments is clearly visible. But the distribution of payments between the various components can also be affected by changes in the patient population over time, even in the absence of policy changes. Perhaps most significantly, a hospital's DSH payments are based largely on the share of Medicaid and SSI beneficiaries in its patient population. The growth in these populations translated automatically into larger DSH payments. Similarly, since 1998, a hospital's IGME and DGME payments under Part A have been based, in part, on its Medicare HMO patient volume—even though it receives no IPPS base payments for these patients. As a result, the sharp increase in the Medicare HMO population since 2003 (The Henry J. Kaiser Family Foundation 2015) may explain much of the increase in these adjustments' shares over this period.

Limitations

The study reflects payment rates in a subset of hospitals, capturing between 82 percent and 90 percent of Medicare Part A discharges. Smaller, rural hospitals are underrepresented in our sample, although these hospitals are also underrepresented in the IPPS.

Our analysis does not capture all factors affecting variation in Medicare Part A payment rates. By design, it is insensitive to geographic adjustments (including geographic reclassifications for payment purposes), and so understates total variation in payment rates. This is most relevant for assessing interregional variation; however, even hospitals within the same local market may qualify for different geographic adjustments (Edmunds and Sloan 2012). Our analysis also excludes all performance-based payments (e.g., Medicare's Hospital Readmission Reduction or Value-Based Purchasing programs), though these are small in magnitude and only occurred in the tail-end of our study period. We also were not able to directly observe the effects of the ACA's DSH reforms, which took effect FY 2014.

Although we have attempted to ensure that all variables were measured accurately and consistently, some discrepancies may remain. In particular, Medicare's accounting guidance changes over time, as do the data elements available in the cost reports. Some breaks in our time series may be a result of reporting issues. Discontinuities are especially likely during CMS's periodic transitions to new cost report versions.

We do not provide independent assessments of hospitals' resource needs or variations in non-Medicare reimbursements. We also do not test what effects Medicare payment adjustments have had on quality of care, patient volumes, market composition, price spillovers onto the commercial market, physician supply, or other outcomes.

Anticipating the ACA's Impact on Adjustments

The ACA reduced the operating component of Medicare DSH payments to 25 percent of their former value and substituted in their place a new uncompensated care payment equal to 75 percent of the DSH payments that would have been paid absent this provision, less reductions for increases in insurance coverage due to the ACA and additional amounts set in legislation. Both changes took effect FY 2014. The latest CMS projections imply that in FY 2016, the combined Medicare DSH and

uncompensated care payments will be 73 percent of what they would have been absent these reforms (CMS 2015b). Through the payment's first 3 years, CMS has based each hospital's share on the same factor used in determining the standard DSH amount. As a result, these reforms function more as cut to the DSH program than a change in how the funds are targeted. A rough calculation based on our 2013 data suggests that for hospitals in the fifth decile of Part A rates, these reforms (as implemented through 2016) reduce the mean payment rate from 120 to 117 percent of the IPPS base. For hospitals in the tenth decile, the reforms reduce the mean from 201 to 192 percent.

A potentially more consequential change initiated by the ACA is the "productivity adjustment," which reduces the default annual rate increase under the IPPS by an estimated 1.1 percent, in perpetuity (Shatto and Clemens 2011). Although this provision affects IPPS payments across all hospitals uniformly, hospitals in higher payment deciles tend to have lower Medicare shares in their patient population, and also more non-IPPS Part A payments (e.g., DGME). Consequently, these hospitals are less exposed to the productivity adjustment.

Implications for Future Research

It is well known that Medicare pays elevated rates to some hospitals through the DSH and graduate medical education programs. However, research often obscures the magnitude of variation. For example, recent studies have used Medicare payment as a benchmark for assessing hospital prices in the commercial market (Ginsburg 2010; White, Bond, and Reschovsky 2013). We caution that unless careful attention is paid to what Medicare payments are included in the benchmark and their variation within the sample, this approach may produce findings that are, at best, difficult to interpret, and at worst, misleading.

Our study underscores the need to investigate how Medicare payments correspond to the prices paid by other payers at the hospital level. Compelling arguments can be made that Medicare should mirror the variations found outside of Medicare to efficiently secure access to the full range of hospitals; equally, it can be argued that Medicare should compensate for these variations to foster fairer competition and support otherwise vulnerable institutions (Dowd et al. 2006). But it is unclear which strategy the current policy best approximates, or how payment policy might be reformed to better meet these objectives. Table 1 suggests that the highest rates act as an important subsidy

for safety net providers, though Figure 1 also reveals that many hospitals receiving elevated Medicare rates do not serve particularly low-income populations, suggesting that the current policy may reflect some of both strategies, intentionally or otherwise. This state of affairs would be clarified if future research were to develop a more granular understanding of how Medicare payment rates relate to those of other payers.

Although our analysis tracks the distribution of the major payment components across hospitals, a similar exercise could identify the policy features most responsible for driving substantial variation within each of the major components. In particular, the wide variation in payment rates between hospitals with similar DSH patient percentages and resident-to-bed ratios in Figure 1 is striking. This is due, in part, to the fact that although DSH and medical education payments are largely determined by these factors, other hospital characteristics also play a role. For instance, each hospital's DGME payment is based substantially on the costs it reported in FYs 1984–1985, adjusted for inflation (Eden, Berwick, and Wilensky 2014). Likewise, the rules for calculating the DSH adjustment allow for a number of discontinuities, such as a ceiling of 0.12 for urban hospitals with up to 100 beds, but no ceiling for urban hospitals with 101 or more beds (Nguyen and Sheingold 2011).

Implications for Medicare Payment Policy

The finding of wide variation in payment rates is not, in and of itself, an argument that the highest rates should be reduced. One rationale for variation is that some patient populations have greater clinical needs than others, even after adjusting for standard measures of case mix. For instance, because teaching hospitals have reputations for clinical specialization and use of advanced technology, they may attract cases that are more complex in subtle ways (Newhouse 2003; American Hospital Association [AHA] 2015). Similarly, patients at DSH hospitals may have a greater burden of illness, even conditional on DRG, due to underprovision of primary care or any of the many other aspects of poverty that adversely affect health (Kominski and Long 1997). A conceptually distinct rationale is that hospitals' costs differ based on their differentiated roles within the health system, and that Medicare should adjust payment rates accordingly. The exemplary argument is that teaching hospitals have higher costs due to the use of inexperienced residents and provision of medical research and specialized services (AHA 2015). The parallel for DSH hospitals is a need to expend more resources when serving a

low-income population, through greater utilization of social workers or discharges planners (Kominski and Long 1997). Subsidies to ensure an adequate supply of physicians (medical education) or hospital care in low-income areas (DSH) can also be defended as being in the public interest.

But the IPPS was designed to create incentives for hospitals to more efficiently manage hospitalized patients. While base DRG payments are calibrated to reflect underlying costs of care, supplemental payments may map poorly on to costs. As the share of base DRG payments in total Part A payments has eroded over time, so has the link between prospective payment and hospital costs. This may have undermined the IPPS as a tool to enhance efficiency.

Moreover, current arrangements run the risk of reinforcing operational differences between providers, inhibiting competition. Consider the case of graduate medical education adjustments. If, as advocates insist, the advanced care that teaching hospitals provide would be compromised in the absence of elevated Medicare rates, then nonteaching hospitals face a strong disincentive to invest in the specialized services and advanced technologies necessary to compete for the most complex cases. Even if both types of hospitals might be able to recoup some portion of the elevated spending through higher rates in the commercial market, the nonteaching hospital's losses on Medicare patients would inevitably be greater. Though rarely mentioned in the public debate, the anticompetitive design of this policy is apparent. Certainly, compelling arguments exist in favor of differentiation (e.g., to ensure efficient service volumes, or foster innovation); nonetheless, policies that support differentiation must also be evaluated in light of the market power they may facilitate.

CONCLUSIONS

The large differences in payment rates documented in this study have applied persistently for the past three decades. Plausibly, they have substantially shaped the structure of the hospital industry and the supply of different models of care. Given concern about the lack of competition in hospital markets, a federal policy that provides a subset of facilities in each local area with additional resources to invest in higher levels of care should, at a minimum, warrant careful scrutiny. While in some circumstances elevated rates may be essential, in others they may actually do harm.

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Disclaimers: None.

NOTES

1. Originally, capital was paid based on reasonable costs, though CMS gradually transitioned to payments based on the standard federal capital IPPS rate. We include both types of payments in our measure of the capital component.
2. For FY 2013, DSH includes some Medicare uncompensated care payment (1 percent of Part A payments, in aggregate). Although Medicare uncompensated care payments did not begin until FY 2014, some cost reports span FYs, causing these payments to bleed into our observations for FY 2013.

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SUPPORTING INFORMATION

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

Appendix SA1: Author Matrix.
Appendix SA2: Appendix.