



Do Current Medicare Rural Hospital Payment Systems Align with Cost Determinants?

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BACKGROUND

The financial performance of small, rural hospitals has long been a concern to federal and state agencies. Federal law makers have enacted legislation authorizing the Medicare program to develop reimbursement methods that provide higher payments to hospitals that serve rural communities.¹ The Medicare Payment Advisory Commission (MedPAC) describes rural hospitals as follows.²

KEY FINDINGS

Current payment methods for services provided to Medicare beneficiaries in rural hospitals can be conceptualized as adjusters for hospital, community, market, and geographic factors outside the control of hospital management. The reimbursement methods use different mixes of these adjusters, and this may explain some of the substantial variation in financial condition among rural hospitals and between rural and urban hospitals found in this study. This study also finds that:

- There are hospital, community, and market factors that are important in explaining rural hospital cost per adjusted patient day. However, some of these factors are not reflected in current payment methods.
- The lack of adjustment for important hospital, community and market factors known to affect rural hospital costs may result in inadequate Medicare reimbursement with adverse consequences for access to hospital care by residents of rural communities.
- It may be opportune to reconsider payment methods for rural hospitals.

- Critical Access Hospital (CAH) (61% of rural hospitals). To qualify for the CAH designation, a hospital must have 25 or fewer beds, be located at least 15 miles by secondary road and 35 miles by primary road from the nearest hospital, or be declared a “necessary provider” by the state.
- Sole Community Hospital (SCH) (17% of rural hospitals). To qualify for SCH designation, a hospital must be located at least 35 miles from the nearest like hospital (excluding CAHs), or meet other federal criteria for being deemed a community’s sole source of care.
- Medicare-Dependent Hospital (MDH) (8% of rural hospitals). To qualify for MDH designation, a hospital must be located in a rural area, have no more than 100 beds, not be classified as an SCH, and have at least 60% of inpatient days or discharges attributable to Medicare patients.
- Standard Prospective Payment System (PPS) (15% of rural hospitals). Standard PPS refers to hospitals paid under traditional PPS payment rates and includes rural referral centers (RRC) that are not SCHs or MDHs.

Current payment methods reflect legislative changes that have occurred since the rural hospital Medicare payment classifications were created. As a result, current rural hospital payment methods differ in eligibility criteria, adjustment factors, formulae, and timeliness of data. These differences may contribute to the variation in financial condition that has been found across the four types of rural hospitals. For example, Holmes et al state that “It is

inaccurate to characterize all rural hospitals as being under financial pressure; rather it appears that some types have many hospitals under a lot of pressure (CAHs, MDHs and PPS hospitals), some have some hospitals under pressure (SCHs), and some have few hospitals under pressure (RRCs and RRC/SCHs). The hospitals under a lot of pressure should be of greater concern to policy makers and those concerned with access to hospital care by people who live in rural America.”³ More recently, there have been several proposals to change the eligibility criteria of CAHs and to eliminate the MDH classification altogether.⁴ These proposed policy changes suggests that it is an opportune time to re-examine rural hospital payment methods and assess the feasibility of simplifying and rationalizing them.

Current payment methods

Medicare pays CAHs 99% of each hospital's reported costs for outpatient, inpatient, laboratory and therapy services, as well as post-acute care in the hospital's swing beds.⁵ SCHs receive the higher of standard inpatient PPS rates or payments based on the hospital's costs in a base year updated to the current year and adjusted for changes in their case mix. MDHs are similar to SCHs, but they are eligible for a PPS rate based on a blend of current PPS rates (25%) and their historical costs (75%).

MedPAC points out that “cost-based payments” provided to CAHs differ from “cost-based payments” paid to SCHs and MDHs in two ways. First, SCHs and MDHs only receive cost-based payments for inpatient care; CAHs receive cost-based payments for inpatient, outpatient, lab, therapy, and post-acute services in swing beds. Second, SCHs' and MDHs' payments are based on historical costs trended forward. Therefore, if a SCH or MDH increases its expenditures per patient, its payments will not be affected. Likewise, factors affecting PPS per diem rates—such as local wage indexes⁶—also influence payment although they are largely outside the ability of a hospital to influence. In contrast, if a CAH increases its expenditures per patient, Medicare payments increase accordingly.²

Hospitals receive an additional payment if they qualify as a low-volume facility. Currently, low-volume facilities are defined based on their Medicare discharges (fewer than 1,600 discharges) and are required to be located more than 15 miles from the nearest like hospital. These hospitals receive as much as a 25% add-on to the PPS rate of each case, depending on their number of Medicare discharges. For the second half of fiscal year 2015, low-volume facilities are defined based on their total discharges (200 or fewer, including Medicare) and must be at least 25 miles from the nearest like hospital. These hospitals receive a 25% add-on to the PPS rate for each case.²

To inform policy discussions on how complex current payment models may affect rural hospitals, this study's goals were to: 1) determine whether there are differences in financial condition among rural hospitals, and 2) identify important determinants of differences in rural hospital costs.

METHODS

Descriptive analysis. Empirical studies were reviewed to identify variables that have been found to be important in explaining financial performance of rural hospitals.^{7,8,9,10,11,12} These variables were then grouped into four categories—geographic, community, market, and hospital—and the variables were calculated for every acute care hospital, both urban and rural. Each hospital in the dataset was then assigned to one of six payment categories: CAH, MDH, RRC, SCH, rural hospital paid under the prospective payment system (rPPS), or urban hospital paid under the prospective payment system (uPPS). Analysis of variance (ANOVA) was used to test whether there are differences in the variables between payment classifications and between rural and urban hospitals.

Regression analysis. At its core, Medicare reimbursement is designed so that “provider payments are adequate to cover efficient providers' costs [emphasis added].”¹³ To identify important determinants of differences in rural hospital costs, cost per adjusted patient day was used as the dependent variable. A literature review identified geographic, community, market, and hospital variables that have been found to be associated with costs. From this, a set of independent variables was selected using five criteria likely to be relevant for policy makers. More specifically, the selected variables:

1. can be calculated from existing secondary data that are valid and reliable;
2. have been shown to have a significant effect on hospital cost or profitability;
3. are outside the control of hospitals;
4. are consistent with a basic policy objective of controlling costs, and;
5. provide relatively little opportunity for perverse gaming.

Data. Data were retrieved from four sources: Healthcare Cost Report Information System (HCRIS), Hospital Market Service Area (HMSA); Nielsen Claritas Pop-Facts database for ZIP Codes; demographic data; and Online Survey, Certification and Reporting (OSCAR). Medicare Cost Reports data were retrieved from HCRIS. A file was created using the most recent Medicare Cost Report data for all acute hospitals. The majority of hospitals had cost reports from 2012 (4,826 hospitals), while the remainder had data from 2011 (75 hospitals). Once each hospital in the dataset was identified from the Medicare Cost Report, data from the other sources was matched to each hospital and corresponded to the year of the cost report.

RESULTS

Table 1 presents the variable medians by Medicare payment classification. Consistent with previous research, measures of profitability—cash flow margin, operating margin, and total margin—were lower in CAHs, MDHs, and rPPS hospitals than in RRCs, SCHs, and uPPS hospitals. Consistent with the designation criteria, CAHs were smaller in size and operation than other hospitals, as indicated by the number of full-time equivalent (FTEs) positions, total beds, patient days, and revenue. MDHs, SCHs, and rPPS hospitals were larger than CAHs, but smaller than RRCs and uPPS hospitals. CAHs were more reliant on payment from Medicare versus other third party payers as indicated by the Medicare inpatient payer mix and Medicare outpatient payer mix of 71% and 37% respectively. Hospitals classified as uPPS had the lowest inpatient and outpatient Medicare payer mixes at 39% and 21% respectively.

Among market factors, for uPPS hospitals, both distance to a larger hospital and distance to a hospital with greater than 100 beds were within approximately 10 miles. For rural hospitals this distance is two to nearly four times further, and the population density and total population were much smaller compared to uPPS hospitals. Among community factors, uPPS hospitals were in communities with a smaller population of adults age 65+, a higher population of females age 18-44, and a higher per capita income in comparison to rural hospitals.

Table 1: 2011-2012 Medians of Study Variables by Type of Hospital

	Payment Categories					
	CAH	MDH	RRC	SCH	uPPS	rPPS
Financial Indicators						
Cash flow margin	7.3%	6.7%	9.9%	7.8%	9.1%	7.0%
Current ratio	2.4	2.2	2.1	2.2	1.8	1.9
Days cash on hand	67	39	97	59	30	35
Days revenue in accounts receivable	52	49	50	51	48	49
Debt service coverage	3.0	4.1	5.3	4.4	4.8	4.0
Equity financing	57%	64%	61%	61%	50%	53%
Long-term debt to capitalization	19%	7%	17%	17%	11%	7%
Operating margin	1.4%	2.2%	4.8%	3.4%	4.8%	1.8%
Return on equity	5.8%	4.3%	8.0%	6.2%	10.3%	7.1%
Total margin	2.6%	2.5%	5.1%	4.1%	5.2%	2.1%
Hospital Factors						
# FTEs	155	246	911	363	1030	334
Average age of plant	9.6	10.2	10.5	10.2	10.3	9.7
Average salary per FTE (thousand)	\$50.1	\$48.9	\$53.7	\$52.5	\$61.0	\$51.1
Discharges	480	1635	6327	2063	9255	2304
FTEs per adjusted occupied bed	5.73	5.34	5.83	6.19	5.52	5.48
Inpatient revenue (million)	\$7.5	\$28.5	\$180.0	\$39.7	\$331.0	\$42.2
Inpatient surgery service provided	78%	91%	99%	95%	97%	93%
Medicare inpatient days	1584	3351	12319	3425	15006	3455
Medicare inpatient payer mix	71%	61%	51%	52%	39%	49%
Medicare outpatient cost to charge	0.45	0.28	0.25	0.29	0.21	0.25
Medicare outpatient payer mix	37%	26%	27%	25%	21%	23%
Outpatient revenue (million)	\$23.0	\$60.0	\$208.0	\$76.4	\$274.0	\$81.4
Outpatient revenue to total revenue	74%	67%	56%	65%	46%	65%
Outpatient surgery service provided	83%	87%	96%	92%	95%	89%
Patient days	2698	6358	25568	7575	40493	8393
Patient deductions	41%	61%	62%	58%	69%	62%
Salaries to net patient revenue	44%	42%	37%	42%	36%	40%
Total beds	25	50	146.5	53	186	57.5
Total hospital expenditures (million)	\$17.5	\$33.3	\$130.0	\$48.8	\$174.0	\$43.8

Table 1 (continued): 2011-2012 Medians of Study Variables by Type of Hospital

	Payment Categories					
	CAH	MDH	RRC	SCH	uPPS	rPPS
Market Factors						
Distance to hospital (miles)	11.4	12.0	18.6	15.6	11.0	12.6
Distance to hospital >100 beds (miles)	33.5	25.2	33.1	40.0	10.6	22.7
Distance to larger hospital (miles)	22.1	19.2	32.3	31.4	9.9	19.2
Market share	21%	23%	30%	27%	17%	22%
Population density (people per sq mile)	23.2	48.7	52.5	26.1	302.0	65.2
Total population (thousand)	21.6	54.0	157.5	56.3	517.0	80.5
Community Factors						
Percent of population over 65	18.0%	17.6%	16.5%	16.6%	13.8%	15.9%
Percent of population female 18-44	14.5%	15.3%	16.1%	15.4%	17.4%	16.0%
Per capita income (thousands)	\$21.4	\$19.5	\$19.9	\$19.9	\$24.2	\$20.0
Percent of community in poverty	12.4%	15.6%	14.7%	14.5%	12.3%	14.7%
Unemployment rate	7.6%	9.4%	9.4%	8.6%	9.6%	9.8%

All cells contain medians except inpatient surgery service provided and outpatient surgery service provided, which represent percent of hospitals with service. All factors are significantly different by payment type except plant age (note - means for inpatient surgery service and outpatient surgery service were not compared).

Table 2 shows the results of the regression analysis. The 15 statistically significant variables fell across all four categories of variables tested—geographic, community, hospital, and market. Notably, inpatient volume (average daily census), payer mix, offered services (e.g., labor & delivery and outpatient surgery), community socioeconomics, and rurality were associated with variation in cost per adjusted patient day.

Table 2: Unit Cost and Hospital, Community, Market and Geography Factors

Indicator	Coefficient	SE	Indicator	Coefficient	SE
Hospital			Market		
Average daily census	-7.128**	1.523	Distance to hospital	20.904**	3.658
Average daily census-squared	0.009*	0.004	Distance to larger hospital	-2.999	1.752
Inpatient surgery service line	-77.930	80.084	Distance to hospital >100 beds	3.727**	1.318
Medicare inpatient payer mix	-1631.768**	203.133	Market share	16.492	254.457
Medicare outpatient payer mix	841.192**	312.542	Population density	0.157	0.439
Obstetrics service line	103.945*	51.023	Total population (1000s)	1.651**	0.442
Outpatient surgery service line	-194.788*	75.299			
Community			Geography		
Per capita income (1000s)	52.145**	8.745	Micro status	-14.521	52.441
Percent of population over 65	112.201	1008.185	Neither (micro or metro) status	-124.883*	57.424
Percent of population female 18-44	994.222	1875.304	Midwest	264.757**	73.559
Poverty rate	-1340.899*	678.051	South	-58.598	76.754
Unemployment rate	2677.988**	874.822	West	725.936**	88.216

* p < 0.05, ** p < 0.01

DISCUSSION

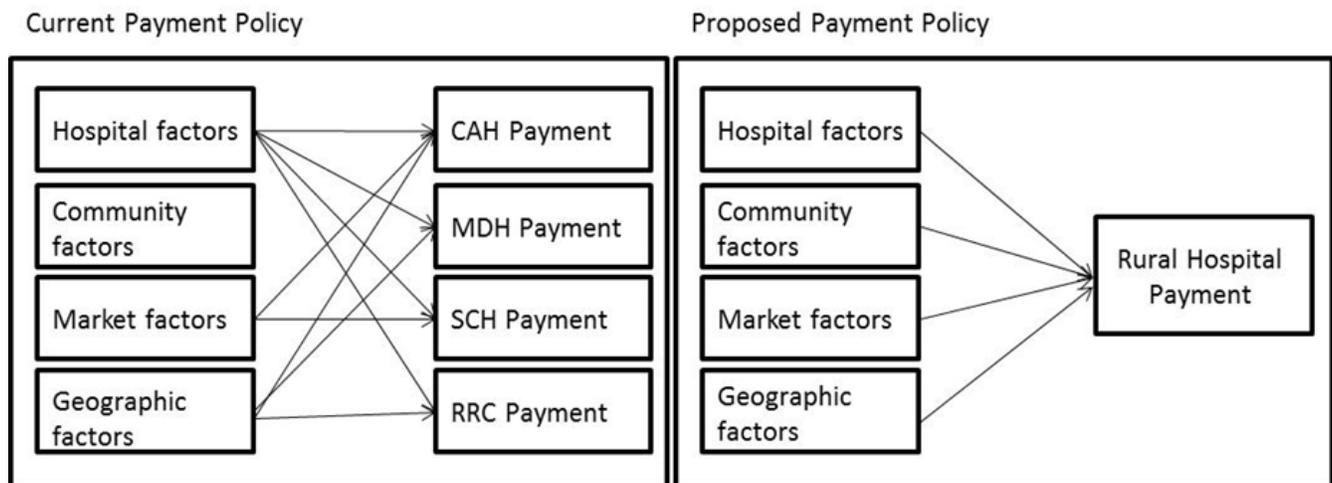
Current payment methods for services provided to Medicare beneficiaries in rural hospitals can be conceptualized as adjusters for hospital, community, market, and geographic factors outside the control of hospital management. The methods use differing mixes of these adjusters, and this may explain some of the substantial variation in financial condition among rural hospitals and between rural and urban hospitals that was found in this study. In addition, this study found that there are hospital, community, and market factors that are important in explaining rural hospital cost per adjusted patient day. However, some of these factors are not reflected in current payment methods—average daily census, local unemployment rate, and average distance from patient residence to hospital, for example—and these factors could be omissions of consequence.

Although some of the variables identified as important predictors of unit costs are currently explicitly included in Medicare reimbursement, they tend to be more associated with *eligibility* for programs rather than directly associated with *reimbursement*. For example, average daily census is one measure of inpatient volume, and others (e.g., number of beds) influence whether the hospital qualifies for a specific program.

There are two policy implications of this study. First, the lack of adjustment for important hospital, community and market factors known to affect rural hospital costs may result in inadequate Medicare reimbursement with adverse consequences for access to hospital care by residents of rural communities. For example, a lack of adjustment for remoteness may adversely affect rural hospitals that face higher unit costs because of their geographic location.

Second, it may be opportune to reconsider payment methods for rural hospitals. Given the complexity, uncertainty, and inequity tied to the current payment system, consideration of a single payment method for rural hospitals seems like a natural next step. Figure 1 below compares the current payment policy to a proposed payment policy.

Figure 1: Reforming the Rural Hospital Payment Model



A single payment method for all rural hospitals would streamline the reimbursement process for services provided to Medicare beneficiaries, offering several advantages. This shift from multiple payment methods to a single method for all rural hospitals could result in more consistency, less complexity, and greater transparency in reimbursement for Medicare services. This policy would recognize factors empirically shown to influence rural hospital costs, but not necessarily urban hospital costs. Although this study modeled costs using many predictor variables, a model with fewer inputs could be created to simplify the payment calculation. Fewer payment provisions and a single set of eligibility criteria could be easier for hospitals to manage and could be perceived as fairer and more equitable.

CONCLUSION

There are many technical, incentive, and other issues that make rural hospital payment a complex policy issue. This study is a simple, initial analysis that suggests it might be an opportune time to discuss the feasibility and desirability of a new payment method for rural hospitals.

REFERENCES AND NOTES

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4. American Hospital Association. Rural and Small Hospital Factsheet. April 7, 2014. Available at: www.aha.org/content/13/fs-rural-small.pdf.
5. Under the original legislation, CAHs received 101% of their costs but, under current law, Medicare pays 99% due to payment reductions imposed by a budget sequester on Medicare payments and changes to the share of hospital bad debt payments reimbursable by Medicare.
6. The Social Security Act requires that standardized payments including Medicare Acute Inpatient Prospective Payment System (IPPS) reimbursements amounts be adjusted “by a factor reflecting the relative hospital wage level in the geographic area of the hospital compared to the national average hospital wage level.” More information is at: <http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/wageindex.html>.
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