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The Association Between System Affiliation and Financial Performance in Critical Access Hospitals

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KEY FINDINGS

- In 2018, 582 of 1,360 (43%) Critical Access Hospitals (CAHs) were affiliated with a health system according to data from the Medicare cost report and the American Hospital Association Annual Survey.
- System affiliation was associated with higher profitability (total margin, operating margin, cash flow margin), greater use of equity financing and greater ability to cover debt service payments, higher revenues from outpatient as compared to inpatient services, higher patient deductions, higher average salary per full-time equivalent (FTE), and higher uncompensated care.
- System affiliation was associated with fewer days in net and gross accounts receivable (faster receivables collection), lower use of debt financing, lower Medicare outpatient cost to charge, lower average age of plant, and fewer FTEs per adjusted occupied bed.
- System affiliation should be considered a potentially important factor when interpreting, comparing, or evaluating CAH financial performance.

BACKGROUND

Since 2010, 65 Critical Access Hospitals (CAHs) have closed,¹ reducing access to health care in many rural communities. Because of poor financial health due to numerous factors, such as county demographics, decreasing operating margins,² and a decreasing population size, many CAHs have joined larger health systems as an alternative to closure. The number of all rural hospitals merging with a health system increased steadily from 2009 to 2014, and between 2005 and 2016, 380 rural hospitals were involved in a merger.³ Overall, CAHs saw a 6.2% increase in affiliation between 2007 and 2016.⁴

Critical Access Hospitals may choose system affiliation because of the perceived financial benefits, such as access to technology, staff recruitment and retention, expanded health care and operational services, group purchasing, and reduced cost of capital.⁴ Similarly, it has been suggested that mergers provide services to a more varied population, increase the range of services available, and decrease duplicative services.⁵

Rural hospitals involved in a merger between 2005 and 2012 were found to have weaker financial performance, fewer full time-equivalent employees per bed, and lower costs,⁶ and those merging between 2005 and 2016 were shown to have lower total margins, and less ability to cover current debt.³ One study showed that in the first five years after joining a system, previously independent, acute-care hospitals experienced a \$15,927 increase in capital expenditures per bed.⁷ Another study found short-term reductions in operating margins and declines in salary expense following a merger.⁶



In sum, there is growing evidence to suggest that affiliation with a health system may have important implications for rural hospitals. However, most studies have not investigated the effects of system affiliation on CAHs, specifically, and it is important for hospitals and state Flex programs to anticipate the consequences and potential impact of system affiliation. The purpose of this study is to examine the association between system affiliation and the financial indicators included in the Critical Access Hospital Measurement and Performance Assessment System (CAHMPAS). We define affiliation as ownership of a CAH by a health system. We exclude management contracts and other agreements between hospitals and health systems that are not the result of mergers or acquisitions.

DATA AND SAMPLE

Data on system affiliation in 2018 were drawn from the Medicare Cost Reports in the Healthcare Cost Reporting Information System (HCRIS) and from the American Hospital Association (AHA) Annual Survey. The specific fields used to determine affiliation are shown in Appendix Table 1. Data on hospital financial performance, size, ownership, and operation of long-term care or rural health clinics in 2018 came from HCRIS.

The starting sample included all non-Indian Health Service CAHs with a cost report for the fiscal year ended 2018 that included at least 360 days.

CAHs were assigned to two groups:

- 1) *Agreement about system affiliation between Medicare Cost Report and AHA Annual Survey.* CAHs were assigned to this group if both data sources reported that a hospital was either a) not affiliated with a health system, or b) affiliated with a health system and the name was identical in both sources. 1,127 CAHs were assigned to this group.
- 2) *Disagreement about system affiliation between Medicare Cost Report and AHA Annual Survey.* CAHs were assigned to this group if the data sources differed in whether they reported that a hospital was: a) affiliated with a system or b) affiliated

with a health system but the name was not identical in both sources. 233 CAHs were assigned to this group.

The system affiliation status of the 233 CAHs in the second group was determined using several other sources, including a survey collected by the University of Minnesota that included CAHs' self-reported system affiliation, and the websites of the hospitals and their alleged systems.⁸ The final sample included 1,360 CAHs, 582 of which were identified as being affiliated with a health system and 778 of which were identified as not being affiliated.

ANALYTIC APPROACH

Using an observational, cross-sectional study design, we examined which CAH financial indicators were significantly associated with system affiliation. Separate multivariate least squares regression analyses were run for each of the 23 CAHMPAS financial indicators, where the dependent variable was the financial indicator and the independent variable of interest was a dichotomous measure of system affiliation (yes/no). All analyses included the following control variables: hospital size measured by net patient revenue (less than \$10 million, \$10-20 million or greater than \$20 million); government ownership (yes/no); operates a rural health clinic (RHC) (yes/no); operates a distinct part long-term care (LTC) unit (yes/no).

RESULTS

Appendix Table 2 shows the 2018 summary statistics by system affiliation status. Descriptive results show that across the majority of financial indicators, system affiliated CAHs exhibit stronger performance than CAHs that are not affiliated with a system. For example, system affiliated CAHs exhibit higher profitability (median operating margin of 2.6% versus -1.0%, $p < 0.001$); total margin of 3.5% versus 0.9%, $p < 0.001$); collect receivables faster (median days revenue in net accounts receivable of 48 versus 53, $p < 0.001$); and have newer facilities (median average age of plant of 10.5 years versus 12.1 years, $p < 0.001$.)

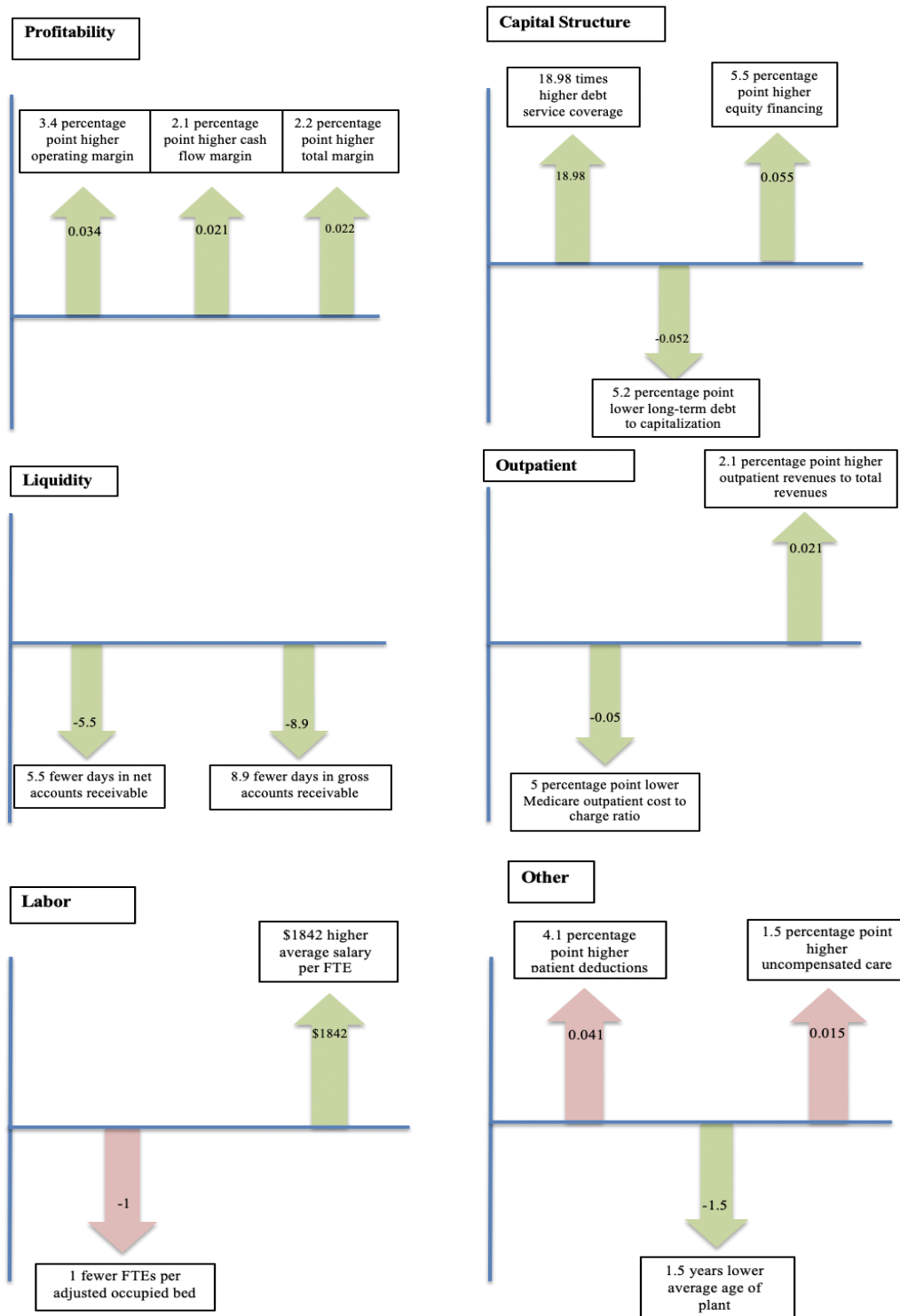
Results of the multivariate regressions were generally



consistent with the descriptive findings. As shown in Figure 1, system affiliated CAHs on average were more

profitable, collected receivables faster, and had lower costs as compared to non-system affiliated CAHs.

FIGURE 1: Association of System Affiliation with Selected Financial Indicators, 2018



Notes: Only statistically significant (p<0.05) associations are shown; arrow directions indicate higher or lower values for system-affiliated as compared to non-system-affiliated CAHs; green arrows indicate better performance and red arrows indicate worse performance.



Appendix Table 3 presents the associations of system affiliation with all of the CAHMPAS financial indicators and full results, including control variables are shown in Appendix Table 4.

Our analyses showed a strong (statistically significant at $p < 0.01$ or $p < 0.001$) positive association between system affiliation and total margin, cash flow margin, operating margin, equity financing, debt service coverage, outpatient revenues to total revenues, patient deductions, average salary per FTE, and uncompensated care. For example, system affiliation was associated with: (1) higher profitability, i.e., 3.4 percentage point higher operating margin and 2.2 percentage point higher total margin; (2) higher labor cost, i.e., \$1,842 higher average salary per FTE; and (3) a higher percentage of outpatient revenues, i.e., 2.1 percentage point higher outpatient to total revenues. Results also showed a strong negative association between system affiliation and days in net and gross accounts receivable, long term debt to capitalization, Medicare outpatient cost to charge, average age of plant, and FTEs per adjusted occupied bed. For instance, system affiliated CAHs exhibit faster receivables collection (5.5 fewer days in net accounts receivable), lower debt usage (5.2 percentage point lower long-term debt to capitalization), and 1.0 fewer FTE per adjusted occupied bed.

There was no statistically significant association between system affiliation and cash flow margin, return on equity, current ratio, days cash on hand, Medicare inpatient payer mix, Medicare outpatient payer mix, average daily census swing-SNF beds, average daily census acute beds, and Medicaid payer mix.

DISCUSSION

Consistent with previous studies of rural hospitals generally, results from this analysis showed that system affiliation is significantly associated with CAH financial performance. On average, system affiliation was associated with stronger financial performance. Thus, CAH executives and state Flex programs seek-

ing to benchmark CAH financial performance using CAHMPAS should be mindful of affiliation status as a potential driver of financial outcomes in addition to existing peer group factors including net patient revenue, operation of a long-term care unit, operation of a rural health clinic, and government ownership. Results of the regression analyses show the average size of differences in CAHMPAS measures between system-affiliated and non-system affiliated CAHs in 2018. In addition, state Flex programs may wish to explore the specific ways in which system affiliation enhances CAH financial performance in order to identify potential best-practices that might be shared with other non-affiliated CAHs.

While in general, this study showed that ownership by a health system is associated with stronger CAH financial performance, other studies have suggested potential downsides of affiliation such as loss of local services including on-site access to imaging, obstetric services, and primary care departments, and fewer hospital employees. These losses may be attributed to reduction of duplicative services or equipment that was not cost efficient to maintain.² Thus, CAHs considering affiliation as a strategy for accessing capital or strengthening financial outcomes should be careful to understand the strategic goals and objectives of a merger or acquisition. This study was not able to assess the association of other types of affiliation, such as management services organizations (MSOs), group purchasing agreements, and networks and alliances, with CAH financial performance; however, it is possible that these types of agreements may also hold promise for positively impacting CAH financial outcomes. Given the increasing trend in system affiliation among CAHs, future research should consider additional questions such as the effect of for-profit versus not-for-profit ownership, impact on readiness to engage in value-based purchasing or other alternative payment models, effects on hospital employees, and factors that make CAHs attractive to potential buyers.



APPENDIX

APPENDIX TABLE 1: Data Fields Used to Determine Affiliation

Medicare Cost Report

Rows 140-143 on Worksheet S-2 (Part I):

140	Are there any related organization or home office costs as defined in CMS Pub. 15-1, chapter 10? Enter “Y” for yes or “N” for no in column 1. 140 If yes, and home office costs are claimed, enter in column 2 the home office chain number. (see instructions)		
If this facility is part of a chain organization, enter on lines 141 through 143 the name and address of the home office and enter the home office contractor name and contractor number			
141	Name	Contractor’s name	Contractor’s number
142	Street	P.O. Box	
143	City	State	Zip code

AHA Annual Survey

Section A, 1-4	Dates for merging
Section A & B	System variable “sysname” from AHA member data



APPENDIX TABLE 2: Summary statistics

Variables	No System Affiliation (Medians)	System Affiliation (Medians)	P-Value
Observations	778	582	
Government-Owned	441 (56.7%)	93 (16.0%)	<0.001
Net Patient Revenue			
Less than \$10 Million	179 (23.0%)	88 (15.1%)	<0.001
\$10- 20 Million	246 (31.6%)	170 (29.2%)	
Over \$20 Million	353 (45.4%)	324 (55.7%)	
Census Region			
Northeast	39 (5.0%)	39 (6.7%)	<0.001
Midwest	331 (42.5%)	323 (55.5%)	
South	205 (26.3%)	138 (23.7%)	
West	203 (26.1%)	82 (14.1%)	
Operate Long Term Care Unit	191 (24.6%)	108 (18.6%)	0.008
Operate Rural Health Clinic	563 (72.4%)	307 (52.7%)	<0.001
Operating Margin	-0.01	0.026	<0.001
Total Margin	0.009	0.035	<0.001
Cash Flow Margin	0.042	0.078	<0.001
Return on Equity	0.034	0.07	<0.001
Current Ratio	2.551	2.374	0.024
Days Cash on Hand	90.975	43.308	<0.001
Days in Net Accounts Receivable	53.036	47.909	<0.001
Equity Financing	0.554	0.674	<0.001
Debt Service Coverage	3.182	4.562	<0.001
Long-Term Debt to Capitalization	0.343	0.246	<0.001
Outpatient Revenues to Total Revenues	0.784	0.81	<0.001
Patient Deductions	0.428	0.485	<0.001
Medicare Inpatient Payer Mix	0.738	0.69	<0.001
Medicare Outpatient Payer Mix	0.38	0.359	<0.001
Medicare Outpatient Cost to Charge	0.459	0.399	<0.001
Average Age of Plant	12.091	10.508	<0.001
FTEs per Adjusted Occupied Bed	6.14	5	<0.001
Average Salary per FTE	\$58,236.17	\$62,590.93	<0.001
Average Daily Census Swing-SNF Beds	1.573	1.471	0.12
Average Daily Census Acute Beds	2.536	2.664	0.025
Days in Gross Accounts Receivable	54.053	42.167	<0.001
Uncompensated Care	0.036	0.043	<0.001
Medicaid Payer Mix	0.125	0.142	0.01



APPENDIX TABLE 3: Multivariate Analysis (Table 1: Multivariate Analysis)

Category	Financial Indicator	System Affiliation Coefficient	System affiliated CAHs
Profitability	Cash Flow Margin	0.021**	Higher
	Operating Margin	0.034***	Higher
	Return on Equity	0.023	Higher
	Total Margin	0.022**	Higher
Liquidity	Current Ratio	0.574	Higher
	Days Cash on Hand	-16.78	Lower
	Days in Gross Accounts Receivable	-8.878***	Lower
	Days in Net Accounts Receivable	-5.526***	Lower
Capital Structure	Debt Service Coverage	18.98***	Higher
	Equity Financing	0.055***	Higher
	Long-Term Debt to Capitalization	-0.052**	Lower
Outpatient	Medicare Outpatient Cost to Charge	-0.05***	Lower
	Medicare Outpatient Payer Mix	-0.005	Lower
	Outpatient Revenues to Total Revenues	0.021**	Higher
Inpatient	Average Daily Census Acute Beds	-0.192	Lower
	Average Daily Census Swing-SNF Beds	-0.015	Lower
	Medicare Inpatient Payer Mix	-0.01	Lower
Labor	Average Salary per FTE	\$1,842**	Higher
	FTEs per Adjusted Occupied Bed	-1.004***	Lower
Other	Average Age of Plant	-1.486**	Lower
	Medicaid Payer Mix	-0.001	Lower
	Patient Deductions	0.041***	Higher
	Uncompensated Care	0.015***	Higher

Notes: *p<0.05, **p<0.01, ***p<0.001; Statistically significant results shown in **bold**.



APPENDIX TABLE 4: Full Multivariate Analysis Regression Results

Category	Financial Indicator	System Affiliation	Net Patient Revenue		Government Owned	Operate Long Term Care Unit	Operate Rural Health Clinic	Constant	N
			\$10 - 20 Million	Over \$20 Million					
Profitability	Cash Flow Margin	0.021**	0.060***	0.090***	-0.025**	-0.025**	-0.005	-0.011	1352
	Operating Margin	0.034***	0.063***	0.092***	-0.028***	-0.023*	0.001	-0.073***	1354
	Return on Equity	0.023	0.02	0.033	-0.014	-0.001	-0.002	0.018	1126
	Total Margin	0.022**	0.024**	0.045***	-0.003	-0.005	0.003	-0.024*	1353
Liquidity	Current Ratio	0.574	-1.001*	-0.341	0.432	-0.196	-0.317	3.956***	1294
	Days Cash on Hand	-16.78	21.01	44.97***	29.45***	-14.16	-28.27***	104.0***	1285
	Days in Gross Accounts Receivable	-8.878***	-10.98***	-18.38***	6.337**	-2.434	2.761	66.07***	1334
	Days in Net Accounts Receivable	-5.526***	-3.421	-5.586**	0.289	-2.255	0.152	61.71***	1325
Capital Structure	Debt Service Coverage	18.98***	-6.347	-18.01*	-1.28	-7.469	5.146	26.19**	849
	Equity Financing	0.055***	-0.076***	-0.060**	-0.067***	0.004	-0.013	0.638***	1154
	Long-Term Debt to Capitalization	-0.052**	0.066*	0.069**	0.081***	-0.015	-0.007	0.291***	1016
Outpatient	Medicare Outpatient Cost to Charge	-0.050***	-0.176***	-0.241***	0.048***	0.038**	-0.023*	0.648***	1357
	Medicare Outpatient Payer Mix	-0.005	-0.034***	-0.053***	0.004	0.014*	0.038***	0.384***	1360
	Outpatient Revenues to Total Revenues	0.021**	0.045***	0.059***	0.001	-0.128***	0.025***	0.729***	1356
Inpatient	Average Daily Census Acute Beds	-0.192	1.257***	4.816***	-0.629***	-0.770***	-0.014	1.454***	1358
	Average Daily Census Swing-SNF Beds	-0.015	1.295***	1.025***	0.151	0.108	0.021	1.285***	1360
	Medicare Inpatient Payer Mix	-0.01	-0.066***	-0.184***	0.021*	0.046***	0.051***	0.766***	1358
Labor	Average Salary per FTE	\$1,842**	\$2,323*	\$10,035***	\$-2,398***	\$-4,974***	\$-890	\$57,209***	\$1,335
	FTEs per Adjusted Occupied Bed	-1.004***	-1.218***	-0.868**	0.417	5.286***	-0.040	6.854***	1326
Other	Average Age of Plant	-1.486**	-0.223	-0.965	0.823	2.968***	-0.200	13.36***	1210
	Medicaid Payer Mix	-0.001	0.033***	0.047***	-0.001	-0.001	-0.003	0.117***	1331
	Patient Deductions	0.041***	0.110***	0.162***	-0.030**	-0.084***	-0.021*	0.356***	1323
	Uncompensated Care	0.015***	-0.001	-0.019***	0.002	-0.022***	-0.003	0.065***	1355

Notes: *p<0.05, **p<0.01, ***p<0.001; statistically significant results shown in **bold**.



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