Findings Brief
NC Rural Health Research Program

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Changes in the Provision of Health Care Services by Rural Critical Access Hospitals and Prospective Payment System Hospitals in 2009 compared to 2017

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BACKGROUND

As rural hospitals continue to struggle financially across the U.S., hospital administrators must make decisions regarding the type and mix of services to offer at their hospitals. Rural hospital experts have previously proposed a set of essential health care services that should be locally provided in rural communities, including primary care, emergency services, mental and behavioral health services, home health care services, maternal and obstetric care, dental care, and transportation.[1,2] However, the type of service lines offered by a hospital may vary based on several factors, including (1) service profitability,[3] (2) provider supply and workforce availability,[4] (3) market competitors,[5] and (4) system affiliation.[6]

Rural hospitals in particular face numerous challenges maintaining financial viability and providing adequate health care services. Rural providers tend to serve patient populations that are older, sicker, and more likely to be living in poverty.[7] Consequently, rural health care facilities have larger shares of payment from Medicare and Medicaid[8] along with higher levels of uncompensated care,[9] resulting in lower or no payments per patient for provided services. In light of this, the federal government created the special Medicare payment classification system in the 1980s and 1990s to aid rural hospitals and allow certain qualifying facilities, such as Critical Access Hospitals (CAHs), to be paid under different reimbursement models.[10] However, many rural CAHs, as well as rural Prospective Payment System (PPS) hospitals, are still financially vulnerable. From 2005 to 2021, rural CAHs and PPS hospitals represented 73 and 64 of the 180 rural hospital closures, respectively.[11] Additionally, from 2016 to 2018, median total margins declined in rural CAHs,[12] and in 2019, 7.0% of rural CAHs and 19.3% of rural PPS hospitals were predicted to be at a high risk of financial distress[13] (and subsequently closure). The financial performance of rural hospitals may affect the type of services that are available to local community members. For example, research by Chen et al. suggests that hospitals with poorer financial performance will restrict less profitable service lines.[3] Therefore, rural communities with financially distressed hospitals may be at a disproportionately high risk of losing access to a number of essential (but unprofitable) hospital-provided health care services.

KEY FINDINGS

- Of the 29 services considered, most increased by 2017. Twenty-three services increased among rural Critical Access Hospitals (CAHs), and 21 increased among rural Prospective Payment System (PPS) hospitals.
- One service remained the same among rural CAHs (assisted living), and three services remained the same among rural PPS hospitals (assisted living, emergency department, and adult general medicine/surgery). These also changed very little among rural CAHs. See details in Figure 1.
- The percentage of hospitals offering four service specialties—birthing/postpartum services, medical/surgical intensive care, obstetrics, and skilled nursing—declined in both rural CAHs and rural PPS hospitals when comparing 2009 to 2017.
- In addition to the aforementioned services, rural CAHs were less likely to offer adult general medicine/surgery and home health services in 2017 than they were in 2009.
- Rural PPS hospitals were less likely to offer pediatric general medicine/surgery in 2017 than in 2009.

A previous study by Knocke et al. found reductions in the percentage of rural hospitals offering several important service lines, such as skilled nursing, obstetrics, labor and delivery, and home health.[14] However, changes in the provision of rural health care services by payment classification have yet to be explored. **The purpose of this brief is to explore changes in the availability and provision of different health care services among rural CAHs and PPS hospitals in 2009 compared to 2017**.

METHODS

We analyzed data regarding the availability of different health care services from the American Hospital Association (AHA) Annual Survey Database™. The AHA Annual Survey Database™ includes data from more than 6,000 hospitals across the U.S.[15] For our sample, we included only hospitals that were open in both 2009 and 2017 and responded for each service in 2009 and 2017. We also restricted our data sample to include only hospitals classified as rural using the rural definition outlined by the Fiscal Year (FY) 2021 Federal Office of Rural Health Policy (FORHP). According to FORHP, an area qualifies as rural if it (1) is located outside a Metropolitan Statistical Area (MSA), (2) has a Rural-Urban Commuting Area (RUCA) code of 4-10, or (3) has a RUCA code of 2 OR 3 AND is at least 400 square miles AND has a maximum population density of 35 people per square mile.[16,17] As the goal of our study was to assess changes in the provision of health care services among rural CAHs and PPS hospitals, rural hospitals with other Medicare payment classifications, such as Medicare-Dependent Hospitals (MDHs), Sole Community Hospitals (SCHs), and Rural Referral Centers (RRCs) were excluded from our analysis. After identifying our sample, we tabulated the number of rural CAHs and PPS hospitals in each of the following categories for 29 services: 1) didn't offer the service in either 2009 or 2017, 2) offered the service in both 2009 and 2017, 3) didn't offer the service in 2009, but did in 2017, 4) offered the service in 2009, but did not in 2017. Samples sizes varied by service. A complete list of services and sample sizes can be found in the Appendix .

RESULTS

To illustrate the change in the percentage of CAHs and PPS hospitals offering each service in 2009 compared to 2017, we built a dumbbell plot (See Figure 1 on the next page). In the dumbbell plot, the green dot represents the percentage of hospitals offering the service in 2009, and the yellow dot represents the offering percentage in 2017. The black line between the two dots denotes the percentage point change in the percentage of hospitals offering the service in 2009 compared to 2017. Dots with a red border represent categories of services that declined between those two points in time (that is, the yellow dot lies to the left of the green dot). Numerical values are shown in the Appendix (Table A1).

Maintained, Added, and Reduced Services

Our results show that for most health care services, the percentage of offering CAHs and PPS hospitals increased in 2017 compared to 2009. Table 1 shows the number of services that were added, reduced, or maintained, and Table 2 shows the specific services that declined.

Table 1. Number of Services That Were Added, Reduced, or Maintained When Comparing 2009 to 2017

Rural Hospital Type	Service Increase	Service Decrease	Services Maintained	Total Service Number
CAH	23	5	1	29
PPS	21	5	3	29

Figure 1. Service Changes in Rural CAH and PPS Hospitals in 2009 compared to 2017

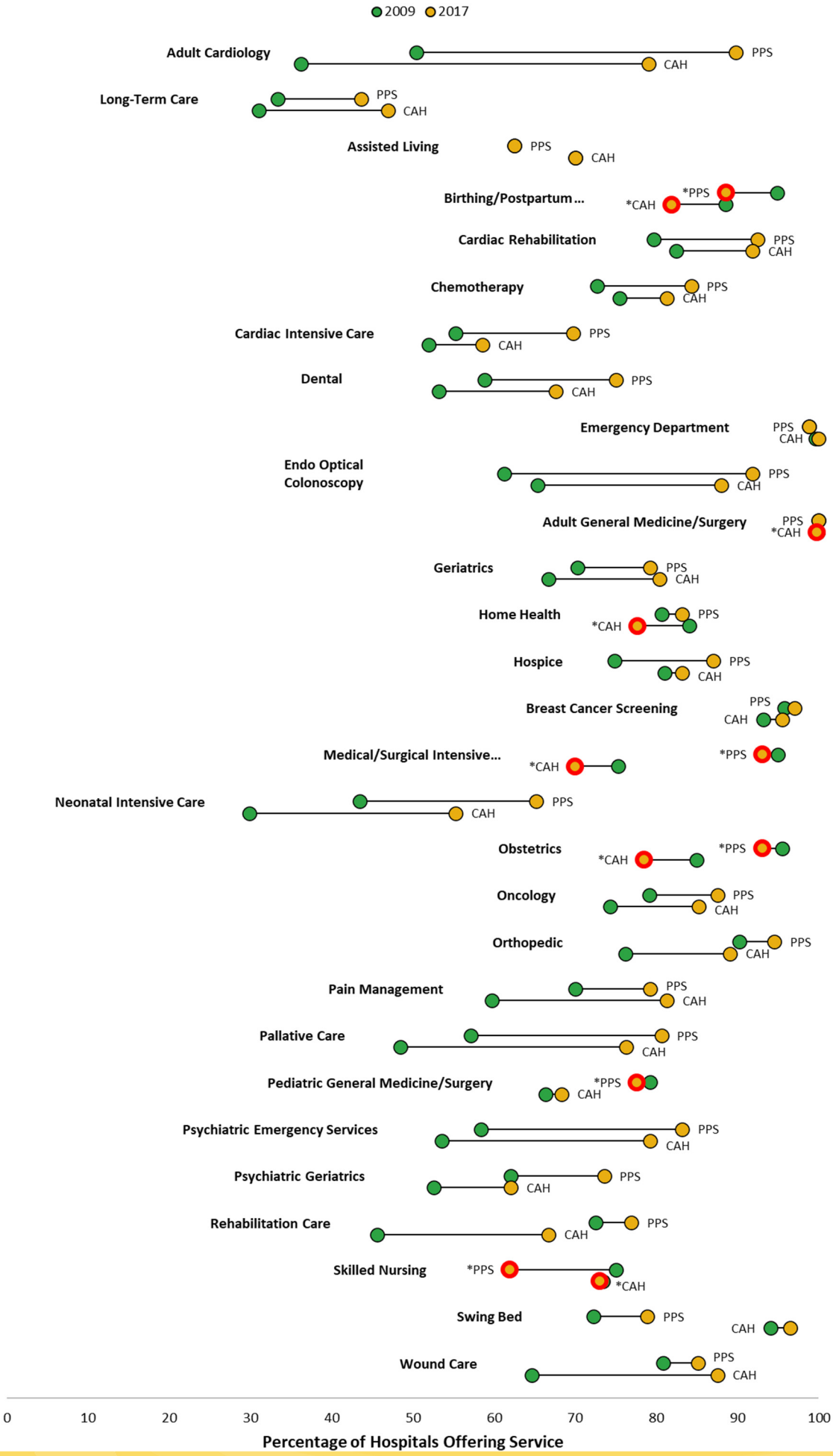

Table 2. Services That Declined in Rural CAHs and PPS Hospitals in 2017 Compared to 2009

Services that declined in rural **CAHs**	• Adult general medicine/surgery • Home health
Services that declined in rural **PPS hospitals**	• Pediatric general medicine/surgery
Services that declined in rural **CAHs and PPS hospitals**	• Birth/postpartum services • Medical/surgical intensive care • Obstetrics • Skilled nursing

Our analysis shows that service additions and reductions generally aligned between rural CAHs and PPS hospitals. We only found differences in the directional trends of rural CAHs and PPS hospitals for three services: adult general medicine/surgery (small), home health, and pediatric general medicine/surgery.

DISCUSSION

Our AHA survey findings revealed that CAHs and PPS hospitals overall have seen increases in most services. Of concern are the reductions in some services, such as birthing/postpartum services, adult general medicine/surgery, home health, medical/surgical intensive care, obstetrics, and skilled nursing among CAHs and reductions in birthing/ postpartum services, medical/surgical intensive care, obstetrics, pediatric general medicine/surgery, and skilled nursing among rural PPS hospitals. Some reduced services, such as obstetrics, home health, and surgery, are considered essential health care services in rural communities.[1,2] However, our AHA analysis shows increases (or no changes) in the percentage of rural CAHs and PPS hospitals offering a number of other services that are also considered essential, including emergency department services, dental care, and rehabilitation care. Additional research evaluating why these services have increased among CAHs and PPS hospitals may help in identifying more effective payment models for declining services.

Interestingly, only four services declined among both rural CAHs and PPS hospitals: birthing/postpartum services, obstetrics, medical/surgical intensive care, and skilled nursing. Our findings regarding obstetrical and birthing services are consistent with existing literature showing an decline in maternal health services in rural communities.[18] Factors such as (1) poor service profitability, (2) declining patient volume, and (3) a small provider workforce have all been identified as reasons for lost obstetrical services in rural hospitals.[19] The reduction in obstetrical services is troubling as declining access to obstetric care in rural hospitals is associated with poor birth outcomes, such as preterm births.[20]

In addition to obstetric and birthing services, our findings revealed reductions in skilled nursing services among both rural CAHs and PPS hospitals, as well as reductions in home health services among rural CAHs. These findings correspond with the results from a previous study by Knocke et al. showing a decline in home health and skilled nursing services by rural hospitals.[14] As our study was restricted to rural CAH and PPS hospitals only, it will be important for future investigations to analyze changes in the provision of home health and skilled nursing services among rural hospitals with *other* special Medicare payment classifications, such as MDHs, RRCs, and SCHs. Moreover, in light of the aging population in rural communities,[21] the reduction in home health and skilled nursing services among some rural hospitals is worrisome, and underscores a need for additional research assessing the role and availability of post-acute and long-term care services in rural communities. It would also be valuable to study the impact of service increases on hospital financial stability and community health in rural areas. For example, our findings demonstrate increases in services such as adult cardiology, palliative care, and psychiatric emergency care among rural CAHs and PPS hospitals. The expansion of these service-lines in rural communities underscores a need for additional research examining the potential benefit of these services (i.e., financial benefit, community need, etc.). In addition, increases in palliative care, emergency psych care, and psycho-geriatrics may have been important from a community service perspective.

Limitations

Our study has some limitations. First, several respondents in the AHA survey did not respond to all questions, resulting in missing data and a smaller and potentially unrepresentative sample. As such, we recommend interpreting the results

with caution. Second, the AHA Annual Survey Database™ allowed respondents to select one of four responses for each service when listing whether the service was offered in their hospital. These options included: (1) "Owned or provided by my hospital or its subsidiary," (2) "Provided by my health system (in my local community)", (3) "Provided through a formal contractual arrangement or joint venture with another provider that is not in my system (in my local community)", or (4) "Do not provide".[15] However, survey respondents may have differing perspectives on what is considered as a provided service (i.e., offered weekly, always available, etc.). Third, some services present within the broader local community (but not at the hospital) may be not captured in this study as they are not affiliated with the local hospital. Fourth, our study does not consider what a meaningful degree of service change is. For example, adult general medicine/surgery declined by 0.1 percentage-points among CAHs, while skilled nursing services decreased by 13.1 percentage-points among PPS hospitals. Although the direction of these changes is the same, the magnitude suggests that these two declines are not comparable. Therefore, future researchers should consider what is and is not a meaningful and noteworthy degree of change in service provision. Finally, our analysis was limited to include only CAHs and PPS hospitals located in rural areas. Other payment classifications, such as MDHs, SCHs, and RRCs were excluded, indicating that these findings cannot be generalized to all rural communities and hospitals.

CONCLUSIONS AND FUTURE RESEARCH

Our study provides greater understanding regarding the availability and accessibility of certain CAH and PPS hospital services in rural communities. Future research should continue to explore ways to support rural hospitals in maintaining access to essential health care services for rural patients. Although this study does not incorporate any information on the demographic or market-level characteristics of the surrounding communities, these components also play an important role in CEO decision-making processes regarding the mix of services offered. Therefore, future research should also examine the extent to which community needs assessments match the local service offerings in hospitals.

APPENDIX

Table A1. Percent of Rural CAHs and PPS Offering Select Services

Services	Rural Hospital Type	Total Reported 2009 + 2017 (N*)	Number Reported in 2009 (N)	Number Reported in 2017 (N)	2009 (%)	2017 (%)	Percentage-Point Change, 2009 compared to 2017
Adult Cardiology	PPS	127	64	114	50.4	89.8	39.4
	CAH	447	162	353	36.2	79.0	42.7
Long-Term Care	PPS	39	13	17	33.3	43.6	10.3
	CAH	145	45	68	31.0	46.9	15.9
Assisted Living	PPS	24	15	15	62.5	62.5	0.0
	CAH	180	126	126	70.0	70.0	0.0
Birthing	**PPS**	**157**	**149**	**139**	**94.9**	**88.5**	**-6.4**
	CAH	**453**	**401**	**371**	**88.5**	**81.9**	**-6.6**
Cardiac Rehabilitation	PPS	133	106	123	79.7	92.5	12.8
	CAH	574	473	527	82.4	91.8	9.4
Chemotherapy	PPS	121	88	102	72.7	84.3	11.6
	CAH	460	347	374	75.4	81.3	5.9
Cardiac Intensive Care	PPS	76	42	53	55.3	69.7	14.5
	CAH	210	109	123	51.9	58.6	6.7
Dental	PPS	68	40	51	58.8	75.0	16.2
	CAH	327	174	221	53.2	67.6	14.4
Emergency Department	PPS	171	169	169	98.8	98.8	0.0
	CAH	819	816	819	99.6	100.0	0.4

*Sample sizes vary by service

Table A1 (continued). **Percent of Rural CAHs and PPS Offering Select Services**

Services	Rural Hospital Type	Total Reported 2009 + 2017 (N*)	Number Reported in 2009 (N)	Number Reported in 2017 (N)	2009 (%)	2017 (%)	Percentage-Point Change, 2009 compared to 2017
Endo Optical Colonoscopy	PPS	160	98	147	61.3	91.9	30.6
	CAH	659	431	580	65.4	88.0	22.6
Adult General Medicine/Surgery	PPS	174	174	174	100.0	100.0	0.0
	CAH	**819**	**818**	**817**	**99.9**	**99.8**	**-0.1**
Geriatric	PPS	101	71	80	70.3	79.2	8.9
	CAH	433	289	348	66.7	80.4	13.6
Home Health	PPS	119	96	99	80.7	83.2	2.5
	CAH	**564**	**474**	**438**	**84.0**	**77.7**	**-6.4**
Hospice	PPS	131	98	114	74.8	87.0	12.2
	CAH	601	487	500	81.0	83.2	2.2
Breast Cancer Screening	PPS	166	159	161	95.8	97.0	1.2
	CAH	733	683	700	93.2	95.5	2.3
Medical/Surgical Intensive Care	**PPS**	**158**	**150**	**147**	**94.9**	**93.0**	**-1.9**
	CAH	**433**	**326**	**303**	**75.3**	**70.0**	**-5.3**
Neonatal Intensive Care	PPS	46	20	30	43.5	65.2	21.7
	CAH	134	40	74	29.9	55.2	25.4
Obstetrics	**PPS**	**157**	**150**	**146**	**95.5**	**93.0**	**-2.5**
	CAH	**465**	**395**	**365**	**84.9**	**78.5**	**-6.5**
Oncology	PPS	120	95	105	79.2	87.5	8.3
	CAH	459	341	391	74.3	85.2	10.9
Orthopedic	PPS	164	148	155	90.2	94.5	4.3
	CAH	622	474	554	76.2	89.1	12.9
Pain Management	PPS	130	91	103	70.0	79.2	9.2
	CAH	502	300	408	59.8	81.3	21.5
Palliative Care	PPS	98	56	79	57.1	80.6	23.5
	CAH	363	176	277	48.5	76.3	27.8
Pediatric General Medicine/ Surgery	**PPS**	**125**	**99**	**97**	**79.2**	**77.6**	**-1.6**
	CAH	464	308	317	66.4	68.3	1.9
Psychiatric Emergency Services	PPS	89	52	74	58.4	83.1	24.7
	CAH	366	196	290	53.6	79.2	25.7
Psychiatric Geriatric	PPS	87	54	64	62.1	73.6	11.5
	CAH	316	166	196	52.5	62.0	9.5
Rehabilitation Care	PPS	91	66	70	72.5	76.9	4.4
	CAH	351	160	234	45.6	66.7	21.1
Skilled Nursing	**PPS**	**84**	**63**	**52**	**75.0**	**61.9**	**-13.1**
	CAH	**511**	**375**	**373**	**73.4**	**73.0**	**-0.4**
Swing Bed	PPS	90	65	71	72.2	78.9	6.7
	CAH	795	748	767	94.1	96.5	2.4
Wound Care	PPS	141	114	120	80.9	85.1	4.3
	CAH	647	418	566	64.6	87.5	22.9

*Sample sizes vary by service

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