

## **Trends in the Provision of Surgery by Rural Hospitals**

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### **OVERVIEW**

Surgery is an important health service in rural communities. In addition to providing routine surgical services, surgeons also serve as backup for other medical specialties such as obstetrics and are essential for the treatment of many emergency and trauma patients. Surgery provision also affects the financial viability of local hospitals and the economic well-being of rural communities. For many rural hospitals, surgery is an important source of revenue and a major contributor to profitability.<sup>1</sup> This findings brief describes trends in the provision of surgery by rural hospitals.

### **Key Findings:**

- **The number of rural hospitals that did not provide surgery increased between 2001 and 2008.**
- **Between 2001 and 2008, hospitals located in metropolitan and micropolitan locations were more likely to provide surgery than hospitals located in non-core based statistical area (non-CBSA) counties (those counties that were not metropolitan or micropolitan).**
- **In 2008, most of the rural hospitals that reported no surgery charges were Critical Access Hospitals (CAHs). Across rural hospitals, CAHs had the lowest percent of their total charges attributable to surgery. More than one half of the total surgery charges for all rural hospitals were reported by Rural Referral Centers.**
- **The provision of surgical services may have migrated from rural hospitals with relatively lower or no surgery volume to hospitals with relatively higher surgery volume.**

### **DATA AND METHODS**

The financial data for this analysis were drawn from hospital cost reports for 2001 to 2008 from the Centers for Medicare and Medicaid Services' Healthcare Cost Reporting Information System (HCRIS). Charges were used as the measure of a hospital's level of surgical activity. A rural hospital was considered to provide surgery if its surgery charges were greater than zero. Due to the large bed size differences among rural hospitals, we measured the provision of surgery as a percent of all charges; this yields a measure of hospital's relative use of surgery. "Surgical activity" was defined as total surgery charges (operating room charges plus recovery room charges, regardless of the specific procedure) divided by total hospital charges. For this study, rural hospitals are defined as all hospitals located in micropolitan and non-core based statistical area counties, and all non-Prospective Payment System hospitals (including Critical Access Hospitals, Medicare Dependent Hospitals, and Sole Community Hospitals) located in metropolitan counties.

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<sup>1</sup>Resnick AS, Corrigan D, Mullen JL, Kaiser LR. Surgeon contribution to hospital bottom line: not all are created equal. *Ann Surg.* 2005;242(4):530-7.

Hospital surgical activity was stratified by:

- Location: metropolitan, micropolitan or non-core based statistical area counties.
- Relative volume of surgical activity: 0%, 0-5% (but more than 0), 5-10% and > 10%.
- Medicare Payment Classification: CAH, Rural Prospective Payment System Hospital, Rural Referral Center, Sole Community Hospital, and transition hospital. The transition hospital category was used for the year when a facility converted from one Medicare Payment Classification to another (e.g., Rural Prospective Payment to Sole Community Hospital).

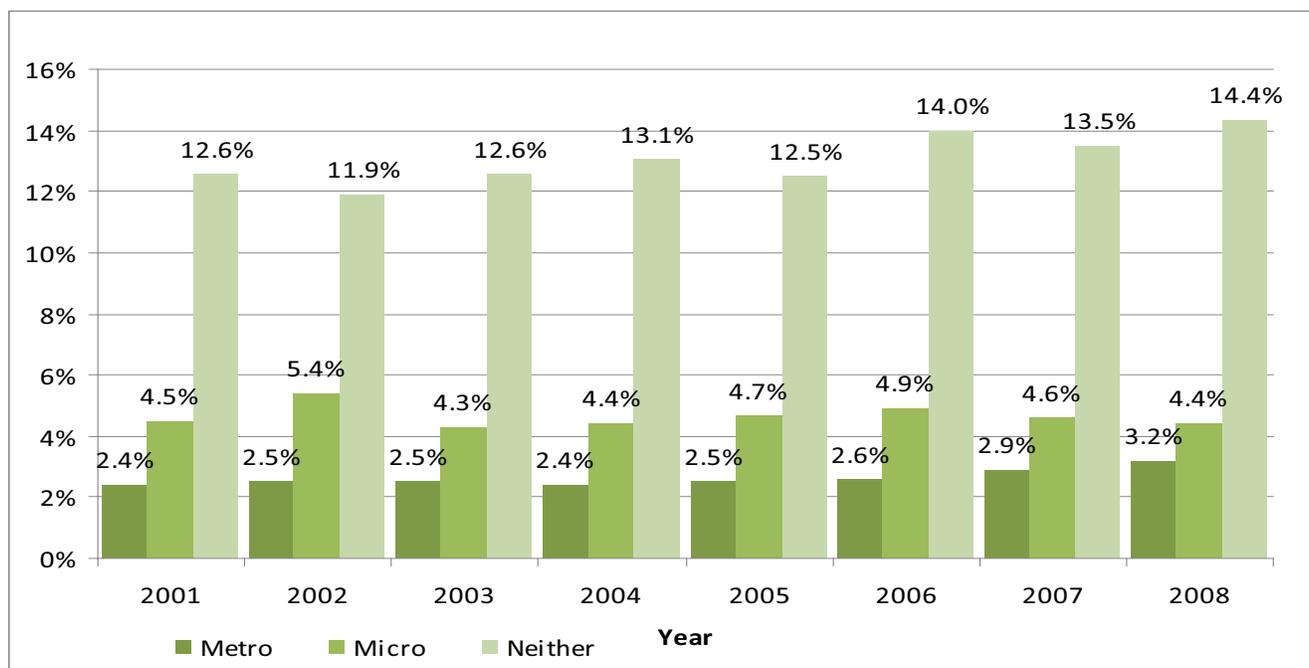
## RESULTS

Access to surgical services is the focus of this brief; therefore, we focus on the percent of hospitals NOT providing surgical services for ease of interpretation.

### *Provision of Surgery by Hospital Location*

Figure 1 shows the percent of all hospitals with no surgery charges between 2001 and 2008 by location. For the entire period, the percent with no surgical activity was substantially higher among hospitals located in non-CBSAs (shown on graph as Neither) compared to hospitals located in micropolitan and metropolitan areas. In 2008, 14.4% of hospitals in non-CBSAs reported no surgery charges, up from 12.6% in 2001. In contrast, only 3.2% of hospitals in metropolitan areas reported no surgery charges in 2008, up from 2.4% in 2001.

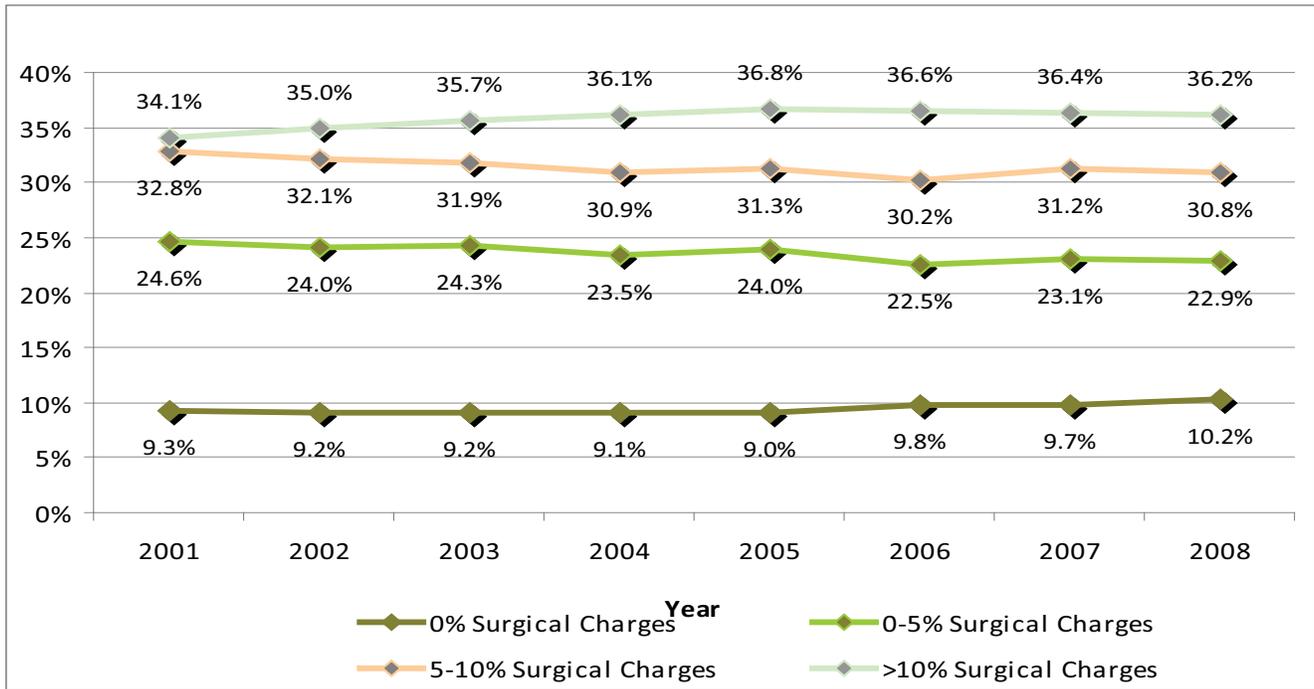
**Figure 1. Percent of All Hospitals With No Surgery Charges by Location, From 2001 to 2008.**



### *Provision of Surgery by Relative Volume*

Figure 2 shows the percent of rural hospitals in each relative volume group. In 2008, 36.2% of all rural hospitals reported surgical activity greater than 10% percent, up from 34.1% in 2001. Similarly, the percent reporting no surgery charges increased from 2001 (9.3%) to 2008 (10.2%). In contrast, the percent of all rural hospitals reporting surgical activity levels between 5-10% and 0-5% fell between 2001 and 2008 (from 32.8% to 30.8%, and from 24.6% to 22.9%, respectively.)

**Figure 2. Percent of Rural Hospitals by Surgical Activity Category, From 2001 to 2008**



***Provision of Surgery by Medicare Payment Classification***

Table 1 shows that 242 (10.1%) of the 2,406 hospitals in our study reported no surgery charges; of these 196 (81%) were CAHs. Fifteen percent of all CAHs reported no surgery charges. In contrast, there were NO Rural Referral Centers that did not report surgical activity.

**Table 1. Percent of Rural Hospitals With No Surgery Charges in 2008 by Medicare Payment Classification**

MEDICARE PAYMENT CLASSIFICATION	NUMBER OF HOSPITALS WITH NO SURGERY CHARGES	TOTAL NUMBER OF HOSPITALS	PERCENT OF HOSPITALS WITH NO SURGERY CHARGES
<b>Critical Access Hospital</b>	196	1,306	15.0%
<b>Medicare Dependent Hospital</b>	14	145	9.7%
<b>Rural Prospective Payment Hospital</b>	17	279	6.1%
<b>Rural Referral Center</b>	0	296	0.0%
<b>Sole Community Hospital</b>	15	350	4.3%
<b>Transition Hospital</b>	0	30	0.0%
<b>TOTAL</b>	242	2,406	10.1%

The average level of surgical activity (total surgical charges / total hospital charges) for all 2,406 rural hospitals in 2008 was 11.7% (Table 2). CAHs reported the lowest (9.0%) and Rural Referral Centers reported the highest level of average surgical activity; consistent with the higher level of complexity of care provided by the hospital. CAHs as a group also had the lowest average surgery charges per hospital at \$2.4 million with Rural Referral Centers having the highest average at \$42.9 million per hospital. More than one half (\$12.8 billion) of the total surgery charges for all rural hospitals (\$25.0 billion) were reported by Rural Referral Centers.

**Table 2. Surgery Charges and Total Hospital Charges in 2008 by Medicare Payment Classification**

MEDICARE PAYMENT CLASSIFICATION	NUMBER	AVERAGE SURGERY CHARGES PER RURAL HOSPITAL	TOTAL SURGERY CHARGES FOR ALL RURAL HOSPITALS	TOTAL HOSPITALS CHARGES	SURGICAL ACTIVITY
	(a)	(b) (c ÷ a)	(c)	(d)	(e) (c ÷ d)
<b>Critical Access Hospital</b>	1,306	\$2,400,000	\$3,070,000,000	\$34,300,000,000	9.0%
<b>Medicare Dependent Hospital</b>	145	\$7,400,000	\$1,070,000,000	\$10,200,000,000	10.5%
<b>Rural Prospective Payment Hospital</b>	279	\$11,800,000	\$3,290,000,000	\$27,900,000,000	11.8%
<b>Rural Referral Center</b>	296	\$42,900,000	\$12,800,000,000	\$99,800,000,000	12.7%
<b>Sole Community Hospital</b>	350	\$11,900,000	\$4,170,000,000	\$36,000,000,000	11.6%
<b>Transition Hospital</b>	30	\$23,300,000	\$699,000,000	\$5,790,000,000	12.1%
<b>Total</b>	2,406	\$99,600,000	\$25,000,000,000	\$214,000,000,000	11.7%

## CONCLUSIONS

Surgery is an important service provided by many rural hospitals. Examining the provision of surgical services by rural hospitals over eight years (2001-2008) we found the overall percent of rural hospitals that did not provide surgery has increased. Further, there was an increase in the percent of rural hospitals that reported relatively higher surgery volume and a decrease in the percent that reported relatively lower surgery volume. Thus, provision of surgical services may have migrated from rural hospitals with relatively lower or no surgery volume to hospitals with relatively higher surgery volume. We also found that a substantially larger percentage of hospitals located in non-CBSAs did not provide surgery compared to hospitals located in metropolitan and micropolitan locations. This may be due to both the limited demand for services and availability of human and capital resources necessary to provide these services. Finally, most of the rural hospitals reporting no surgery charges were Critical Access Hospitals. CAHs as a group also had the lowest average level of surgical activity compared to other rural hospitals. More than one half of the total surgery charges for all rural hospitals were reported by Rural Referral Centers.

The provision of surgery depends on many factors, including the recruitment of rural surgeons, rural general surgery training programs, Medicare and Medicaid reimbursements, market size and share, and the propensity of patients to bypass rural hospitals for some services. Some of these factors are under a hospital's direct control while many are not. Findings of this study reflect the combined influence of these various factors. Despite recent evidence that surgical rates among Medicare beneficiaries in 2006 were slightly higher among rural populations<sup>2</sup>, continuation of the trends identified in this brief may potentially lead to barriers in access to surgical services. Provider shortages and the consolidation of hospital services occurring in many areas (leading to greater centralization of surgery in larger organizations) could also reduce access to surgery for people who live in rural communities, although the concentration in fewer hospitals may lead to improved quality. It will be important to monitor the effect that changes in rates of surgery provision have on the stability of rural hospitals and on the well-being of the communities they serve.

<sup>2</sup>Francis, M. L., Scaife, S. L., & Zahnd, W. E. Rural-Urban Differences in Surgical Procedures for Medicare Beneficiaries. *Arch Surg.* 2011;146(5):579-583.



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