

CESAREAN SECTION RATES IN RURAL HOSPITALS

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EXECUTIVE SUMMARY

Childbirth by cesarean section (c-section) is major abdominal surgery that carries risk to both mother and baby. There are reasons to suggest that c-section rates at rural hospitals might be different than c-section rates at urban hospitals. The diffusion of best practices, such as the safe delivery of infants by vaginal births to women with previous deliveries by c-section (VBAC), may be slower in rural communities, resulting in higher c-section rates at rural hospitals. There may also be non-medical reasons for an increased rate in rural facilities, particularly small hospitals. For example, lack of surgical coverage on weekends could lead to scheduled c-sections in anticipation of problems necessitating surgical intervention.

This study examines delivery patterns in rural hospitals and compares the c-section rate in rural hospitals to that in urban hospitals using the Nationwide Inpatient Sample (NIS). Findings include:

- ◆ Rural hospitals were less likely than urban hospitals to provide any type of delivery services (70% v. 76%). However, smaller rural hospitals were much more likely to provide delivery services than were their smaller urban counterparts.
- ◆ Overall c-section rates were higher, though only slightly, in rural hospitals compared to urban hospitals (25.3% vs 24.9%.) When urban hospitals were categorized as teaching or non-teaching, the rate in the urban non-teaching hospitals was identical to the rural rate.
- ◆ Rural hospitals had a higher c-section rate on weekdays than did urban hospitals and a lower rate on weekends.
- ◆ Comparing rural and urban hospitals of similar sizes, c-section rates were generally higher in the rural hospitals with statistically significant differences in three of five size categories. The difference between rural and urban rates ranged from 0.1 to 5.8 percentage points with the largest difference noted for the smallest hospitals (<10 average daily census).
- ◆ Overall VBAC rates varied significantly—the rate for urban teaching hospitals was 25.5% compared to 20% in urban non-teaching hospitals and 17.8% in rural hospitals.

BACKGROUND

National cesarean section rates as reported by the Centers for Disease Control and Prevention (CDC) reached 25% of births in 1988 (Obstetrics, 2002).¹ Public outcry (as evidenced by lay press articles, insurer activity and hospital based physician review committees) and concern about unnecessary surgery led to initiatives to address the issue of inappropriate cesarean surgeries and the rates began to slowly decline in the early 1990s, reaching a low of 20.7% in 1996. In recent years, the rate has increased again, reaching 24.4% in 2001, and hitting an all-time high of 26.1% in 2002.

The national c-section rate, as reported by the CDC, is an overall rate for deliveries in all U.S. hospitals regardless of hospital type. However, there is variation in c-section rates by region and state, with some of the highest rates in southern states (CDC, 2001).² C-section rates are not reported regularly for rural areas throughout the United States. Yet measuring and understanding rural differences in delivery methods is important for monitoring the quality of obstetric care and making policy decisions on resources and staffing.

RESULTS

Cesarean section rates by hospital size and location

Overall cesarean section rates were higher, though only slightly, in rural hospitals compared to urban hospitals, with rates of 25.3% and 24.9% respectively. The rate in rural hospitals was identical to that of urban non-teaching hospitals (25.3%) but higher than that calculated for urban teaching centers (24.6%), though the differences were not statistically significant. When the hospitals were grouped according to their average daily census (ADC), statistically significant differences in the cesarean section rates emerged. Overall, the smallest hospitals had the lowest rate (22.0%) and the largest institutions had the highest (26.0%). When rural and urban hospitals of similar sizes were compared, cesarean section rates were generally higher in the rural hospitals, with statistically significant differences in

three of the five ADC categories that included both rural and urban hospitals. The difference between rural and urban rates ranged from 0.1 to 5.8 percentage points with the largest difference noted for the smallest hospitals (<10 ADC.) Cesarean section rates also varied by geographic regions. For all hospitals, rates were lowest in the Midwest (22.7%) and highest in the South (27.0%). The only statistically significant difference in rates between urban and rural hospitals in a given region was in the South, where rates were higher in rural hospitals than they were in urban hospitals.

Table 1: Cesarean Section Rate in Urban and Rural Hospitals, All Hospitals and by Average Daily Census

	Overall	Rural	Urban
All Hospitals	25.0%	25.3%	24.9%
By ADC			
<10	22.0%	23.1%*	17.3%
10-24	23.5%	24.3%	22.1%
25-49	23.8%	24.9%*	22.4%
50-99	24.9%	24.8%	24.9%
100-249	24.5%	27.7%*	24.2%
250-499	26.1%	NA	26.1%
500+	26.0%	NA	26.0%
By Region			
Northeast	25.4%	23.4%	25.6%
Midwest	22.7%	24.1%	22.4%
South	27.0%	27.4%*	26.9%
West	23.7%	23.0%	23.8%

Source: Authors' calculations from Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality, 2001 Nationwide Inpatient Sample.

Cesarean section rates by day of occurrence

Since a planned cesarean section is most likely to be scheduled on a weekday, c-sections that occur on the weekends are more likely to represent emergency procedures. The overall weekday cesarean section rate in the NIS was 26.8%, compared to the weekend rate of 18.0%. Rural hospitals had a higher c-section rate on weekdays than did urban hospitals and a lower rate than urban hospitals on weekends, but no differences were statistically significant. The weekend rate for both rural and urban hospitals is closer to the 15.0% goal set by Healthy People 2000 than is the overall cesarean section rate.

Table 2: Weekday versus Weekend Cesarean Section Rates All Hospitals and by Average Daily Census

	Weekday		Weekend	
	Rural	Urban	Rural	Urban
All Hospitals	27.1%	26.7%	17.5%	18.1%
By ADC				
<10	25.2%*	18.0%	14.8%	14.2%
10-24	26.1%	23.9%	16.3%	14.9%
25-49	26.8%*	23.8%	16.9%	16.4%
50-99	26.6%	26.6%	17.4%	17.8%
100-249	29.6%*	25.9%	20.0%**	17.7%
250-499	NA	28.0%	NA	18.7%
500+	NA	27.7%	NA	19.5%

*Difference Between Urban and Rural Weekday Rates is significant at $p < .05$
**Difference Between Urban and Rural Weekend Rates is significant at $p < .05$.

Source: Authors' calculations from Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality, 2001 Nationwide Inpatient Sample.

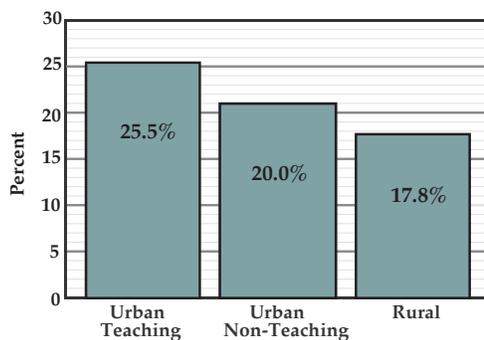
Cesarean section rates by source of payment

C-section rates varied significantly by the patient's source of payment. Patients with private insurance had the highest overall rate (26.4%) while the rate for Medicaid patients was lower (23.2%). Ninety-three percent (93%) of all deliveries were covered by private health insurance or Medicaid. The lowest cesarean rate (20.0%) was noted for those patients classified as self-pay, i.e., those with no health insurance. The c-section rate for the three percent of patients classified as "other" was 25.2%. Only the Medicaid c-section rates varied significantly between urban and rural hospitals with a rural rate of 24.4% compared to 23.0% for Medicaid births in urban hospitals.

VBAC rates

To more fully understand the possible contributors to the observed higher c-section rates in rural hospitals, VBAC rates were compared across hospital categories. VBAC rates varied significantly among the three hospital types: the rate for urban teaching hospitals was 25.5%, compared to 20% in urban non-teaching hospitals, and only 17.8% in rural hospitals, with all differences statistically significant. Of interest, the VBAC rate in the smallest rural hospitals (ADC<10) was higher than that in larger (ADC 100-249) rural hospitals: 21.5% compared to 15.9%.

Table 3: Vaginal Birth After C-Section (VBAC) Rates, among Women by Location of Delivery Hospital



Source: Author's calculations from Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality, 2001 Nationwide Inpatient Sample.

CONCLUSIONS

The cesarean section rate for rural hospitals was well above the 10-15% recommended by the World Health Organization (WHO). Women who delivered babies in rural hospitals had cesarean sections at a rate that was also higher than their urban counterparts, although the difference in rates was small. However, the fact that a difference did exist, along with the significantly lower VBAC rate in rural facilities suggests that more information is needed to determine the appropriateness of these surgical procedures in a rural setting.

Whatever the underlying reasons, the finding that women who deliver at rural hospitals have higher c-section rates is important for those concerned with the provision of health care in rural settings as well as for rural residents. Surgery carries risk for both mother and baby. Surgical deliveries are also more expensive than vaginal deliveries and cost is a consideration for rural hospitals that may be operating close to the margin. A better understanding of the medical, health care system, professional and personal factors that contribute to c-sections in rural hospitals would inform changes in policy. It may be that a large portion of c-sections in rural hospitals are medically justified. However, absent such a comprehensive review, providers in rural hospitals can still monitor their own procedures and policies to assure that pregnant women they serve receive the most appropriate care, whether it be at their rural hospital or at another hospital better suited to the needs of mother and baby.

DATA

Data for this study come from the 2001 Nationwide Inpatient Sample (NIS), part of the Healthcare Cost and Utilization Project (HCUP) within the Agency for Healthcare Research and Quality. In this study, hospitals in a Metropolitan Statistical Area (MSA) are referred to as urban hospitals and those not in an MSA are rural hospitals. A hospital's average daily census was used to categorize facilities according to volume of patient discharges. Nationwide rates were calculated using software that accounts for the complex survey design of the NIS. All reported percentages are weighted. More information on the sample and study methods can be found at:

www.shepscenter.unc.edu/research_programs/rural_program.html

References:

- ¹ Obstetrics: U.S. cesarean births rapidly rising. Medical letter on the CDC and FDA, July 7, 2002.
- ² Menacker F, Curtin SC. Trends in Cesarean Birth and Vaginal Birth After Previous Cesarean, 1991-99. National Vital Statistics Reports. Center for Disease Control. 49:13, December 27, 2001.

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