

Policy Brief

National Rural Hospital Charges Due to Ambulatory Care Sensitive Conditions

Li-Wu Chen, PhD, Wanqing Zhang, MEd, MD, Junfeng Sun, PhD, Keith J. Mueller, PhD

Purpose

In this policy brief, we estimate and document the national magnitude of charges associated with hospitalizations due to ambulatory care sensitive conditions (ACSCs) in rural hospitals. The brief also reports this type of charge by hospital size. This research will inform policy makers about the magnitude of rural preventable hospitalizations and the associated potential savings in hospital resource utilization.

Key Findings

- Estimated total charges of \$9.5 billion were associated with hospitalizations due to ACSCs in rural hospitals nationwide in 2002, some portion of which may be recoverable savings if rural patients receive timely and effective primary care.
- For each dollar of hospital inpatient charge incurred in the nation's rural hospitals, 18 cents was associated with hospitalizations due to ACSCs.
- Fourteen percent of the nation's ACSC hospital charges in rural areas were for uninsured and Medicaid patients.
- Small rural hospitals spend a greater portion of their financial resources in caring for patients with ACSCs than do medium and large rural hospitals. For each dollar of hospital inpatient charge incurred in the smallest rural hospitals of the nation, about 30 cents was associated with ACSCs, while the corresponding figures for medium and large rural hospitals were 23 cents and 16 cents, respectively.

- Critical Access Hospitals (CAHs) spend a greater portion of their financial resources in caring for patients with ACSCs than do non-CAHs. For each dollar of hospital inpatient charge incurred in CAHs, about 29 cents was associated with ACSCs, while only 17 cents was associated with ACSCs in non-CAHs.

Background

ACSCs are “the diagnoses for which timely and effective outpatient care can help to reduce the risks of hospitalization by either preventing the onset of an illness or condition, controlling an acute episodic illness or condition (such as bacterial pneumonia), or managing a chronic disease or condition (such as asthma and hypertension)” (Billings et al., 1993, p. 163). Because hospitalizations due to ACSCs may be prevented, hospital expenditures associated with the treatment of ACSCs could be unnecessary health care spending. In addition, community hospitals are important safety net providers, and ACSC-related hospital expenditures in those hospitals could reflect the consequences of population uninsurance and underinsurance. Therefore, hospitalizations due to ACSCs have financial as well as health-related implications for communities. Research about such hospitalizations can contribute to the assessment of access to and quality of primary health care systems across local communities.

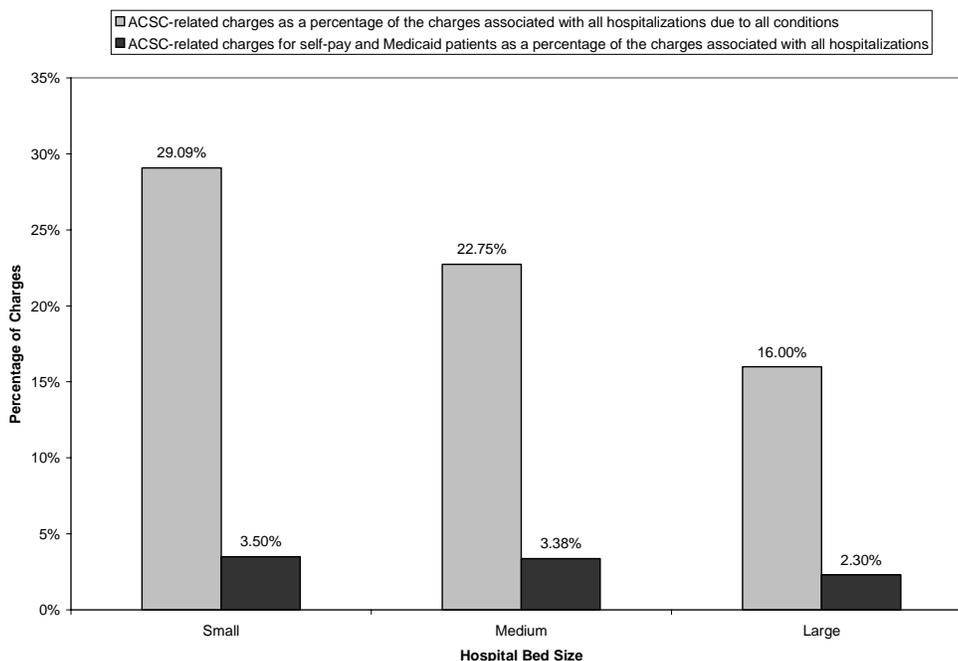
Data and Method

We used data from the 2002 Nationwide Inpatient Sample (NIS) of the Healthcare Cost and Utilization Project (HCUP), which was established and is maintained by the Agency for Healthcare Research and Quality (AHRQ). Representing about 20% of U.S. community hospitals, the NIS is the largest hospital inpatient care database in the United States. Because the NIS is a stratified probability hospital sample based on geographic region, urban/rural location, teaching status, ownership, and bed size, it is nationally representative.

We created a nationally representative sample of rural hospitals from the 2002 NIS. After excluding hospitals with missing information, 442 rural hospitals were available for this analysis. We used AHRQ's Prevention Quality Indicators to identify 16 ACSCs based on ICD-9-CM diagnosis and procedure codes (see Appendix A). For these 16 ACSCs, we created three outcome measures at the hospital level for our study: (1) total charges (\$)¹ for all ACSC-related hospitalizations, (2) ACSC-related charges as a percentage

of the charges associated with all hospitalizations due to all types of conditions (i.e., both ACSCs and non-ACSCs), and (3) ACSC-related charges for self-pay and Medicaid patients as a percentage of the charges associated with all hospitalizations. The first two measures indicate the financial resource utilization by rural hospitals for providing possibly preventable inpatient care. The third measure, with a focus on self-pay and Medicaid patients, reflects a financial burden for rural hospitals as a result of uninsurance and underinsurance in their communities. We applied the statistical weights, obtained from the NIS data set, to the sample of rural hospitals to obtain national estimates. Unlike most previous ACSC studies, this study used total charges for hospital stays instead of hospitalization rate due to ACSCs. Using total charge data has two advantages. First, charge information not only reflects the frequency of encounter (which is also indicated by hospitalization rate), but captures the intensity of resource use. As a result, charge data more completely portray the utilization of hospital inpatient services due to ACSCs. Second, the financial implications of charge data are important to policy makers in that charge data may reflect the potential medical savings if patients

Figure 1. Proportion of ACSC-Related Hospital Charges for All Patients and for Self-Pay and Medicaid Patients by Hospital Bed Size, for Rural Hospitals in the United States, 2002



Data source: 2002 Nationwide Inpatient Sample of the Healthcare Cost and Utilization Project.

¹ We used charges as a proxy for resources consumed by the hospital, realizing they may overestimate actual costs.

receive timely and effective primary care. Charge data are also important to hospital administrators, as they indicate how much of their hospital resources are allocated to treating ACSC patients.

Findings

National ACSC-Related Hospitalization Charges in Rural Hospitals

More than \$52 billion of hospital inpatient charges were accrued in rural hospitals in the United States in 2002. Of that \$52 billion, an estimated \$9.5 billion (18%) was associated with hospitalizations due to ACSCs in rural hospitals. Because ACSC-related hospitalizations may be avoided if patients receive timely and effective primary care, the potential national savings could be up to \$9.5 billion in hospital inpatient charges. The data also show that over \$1.3 billion of these possibly preventable hospital charges were attributed to either self-pay or Medicaid patients in rural areas. In other words, about 14% of the preventable hospital inpatient charges in rural America can be attributed to the rural residents who are uninsured, underinsured, or Medicaid enrollees.

ACSC-Related Hospital Inpatient Charges by Hospital Bed Size

Figure 1 shows the ACSC-related charges as a percentage of the charges associated with all hospitalizations due to all conditions, and the ACSC-related charges for self-pay and Medicaid patients as a percentage of the charges associated with all hospitalizations by bed size for rural hospitals (see Appendix B). Small rural hospitals had the highest proportion of ACSC-related hospital charges, followed by medium and large hospitals. Specifically, for each dollar of hospital inpatient charge incurred in the smallest rural hospitals of the nation, about 30 cents was associated with ACSCs and thus potentially preventable. The corresponding figures for medium and large rural hospitals were 23 cents and 16 cents, respectively. Because small rural hospitals are more likely to be located in more remote rural areas, this result is consistent with the conventional observation that residents of remote rural areas have less access to timely and effective primary care than do residents of other areas. We also analyzed the data based on CAH status

and found a similar result. For each dollar of hospital inpatient charge incurred in CAHs, about 29 cents (almost one-third) was associated with ACSCs, while only 17 cents was associated with ACSCs in non-CAHs. Regarding the proportion of ACSC-related hospital charges for self-pay and Medicaid patients, the data demonstrate the same pattern, with small rural hospitals having the highest rate (3.50%), followed by medium (3.38%) and large (2.30%) rural hospitals.

Conclusion

This research suggests that the potential national saving in rural hospital inpatient expenditure could be up to \$9.5 billion if rural patients receive timely and effective primary health care and if charges closely mirror actual costs. For each dollar of hospital inpatient charge incurred in the nation's rural hospitals, 18 cents was associated with hospitalizations due to ACSCs. The proportion of financial resources utilized to care for patients with possibly preventable hospitalizations is greatest for small rural hospitals, followed by medium and large rural hospitals. CAHs, which are usually the smallest hospitals, located in remote areas, spend a greater portion of their financial resources in caring for ACSC patients than do other rural hospitals. This finding should be taken into consideration when policy makers determine payments for CAHs. In addition, this finding suggests that CAH administrators will want to be active in sustaining high quality primary care services in their communities.

Acknowledgments

The authors thank Sue Nardie for her help with proofreading and editing this brief and acknowledge the Healthcare Cost and Utilization Project for supplying the data for analysis. The authors also thank John Sheehan, an advisor to the RUPRI Center, for his insightful comments about the brief.

References

Billings J, Zeitel L, Lukomnik J, Carey T, Blank A, & Newman L. (1993). Impact of socioeconomic status on hospital use in New York City. *Health Affairs*, 12(1), 162-173.

Appendix A: Sixteen Hospitalizations Due to Ambulatory Care Sensitive Conditions

Preventable Hospitalization

- 1 Diabetes short-term complication admission
- 2 Perforated appendix admission
- 3 Diabetes long-term complication admission
- 4 Pediatric asthma admission
- 5 Chronic obstructive pulmonary disease admission
- 6 Pediatric gastroenteritis admission
- 7 Hypertension admission
- 8 Congestive heart failure admission
- 9 Low birth weight
- 10 Dehydration admission
- 11 Bacterial pneumonia admission
- 12 Urinary tract infection admission
- 13 Angina admission without procedure
- 14 Uncontrolled diabetes admission
- 15 Adult asthma admission
- 16 Lower-extremity amputation among patients with diabetes

Source: Agency for Healthcare Research and Quality, Prevention Quality Indicators.

Appendix B: Definitions of Hospital Bed Size by U.S. Region

Location and Teaching Status	Hospital Bed Size		
	Small	Medium	Large
NORTHEAST			
Rural	1-49	50-99	100+
Urban, nonteaching	1-124	125-199	200+
Urban, teaching	1-249	250-424	425+
MIDWEST			
Rural	1-29	30-49	50+
Urban, nonteaching	1-74	75-174	175+
Urban, teaching	1-249	250-374	375+
SOUTH			
Rural	1-39	40-74	75+
Urban, nonteaching	1-99	100-199	200+
Urban, teaching	1-249	250-449	450+
WEST			
Rural	1-24	25-44	45+
Urban, nonteaching	1-99	100-174	175+
Urban, teaching	1-199	200-324	325+

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project.

Note: The criterion for bed size varies by region.

Funded by the Federal Office of Rural Health Policy, Health Resources and Services Administration, U.S. Department of Health and Human Services (Grant #1U1C RH03718)