

## Ambulatory Care Sensitive Condition Hospitalizations Among Rural Children

### Key Findings

- Pediatric hospitalization rates for specific ambulatory care sensitive conditions (ACSCs) vary significantly across states, even after adjusting for rurality, poverty, uninsurance, and physician supply.
- In all six states combined, asthma, diabetes short-term complications, gastroenteritis, and urinary tract infection hospitalization rates for children living in rural areas are significantly higher than for urban areas.
- Analyzing ACSC hospitalization rates by condition, rather than for a group of conditions as many previous studies have done, is important because rates vary significantly by condition.
- Medicaid is the primary expected payer for a higher percentage of ACSC hospitalizations in rural areas than in urban areas.
- The study results and the literature indicate that a range of interventions may decrease rates of pediatric ACSC hospitalizations, improving the quality of pediatric health care and the overall health status of children. Examples include efforts to increase health insurance coverage for children, expand use of evidence-based guidelines, minimize children's asthma triggers such as parental smoking, and implement patient education and case management services for children with diabetes or asthma and their families.

## Background and Purpose of the Study

Ambulatory care sensitive conditions (ACSCs) are conditions for which inpatient hospital admissions could potentially be avoided through better outpatient care. Most studies of ACSC hospitalizations among children have focused primarily on urban populations.

Using hospital inpatient discharge data from six states, this study examined the relationships between children's inpatient hospitalizations for ACSCs, rural residence, poverty, health insurance, and physician supply. Admission rates for five conditions were examined: asthma, diabetes short-term complications, gastroenteritis, urinary tract infection and perforated appendix.

Based on the child's county of residence, pediatric admissions were assigned to one of three geographic categories: metropolitan, micropolitan or non-core. The micropolitan and non-core categories together comprise all rural areas.<sup>a</sup>

## Results

Condition-specific hospitalization rates for children vary considerably, suggesting that it is important to analyze rates by condition, rather than examining combined rates for a group of conditions as many previous studies of ACSC hospitalizations have done.

For all conditions except perforated appendix, hospitalization rates for children living in micropolitan and non-core areas in all six states combined are significantly higher than for urban areas. For gastroenteritis and urinary tract infection, hospitalization rates for non-core areas also are significantly higher than for micropolitan areas.

Many of the significant differences in hospitalization rates for specific conditions across states persisted after adjusting for rurality, poverty, uninsurance, and physician supply. Future research should attempt to determine the unmeasured factors contributing to these state differences.

Medicaid is the primary expected payer for a higher percentage of pediatric ACSC hospitalizations in rural areas than in urban areas. Medicaid is the expected payer for half of ACSC hospitalizations in both micropolitan and non-core areas, compared to 41 percent in urban areas. Private insurance is the expected payer for over half of ACSC hospitalizations in urban areas, and only 40 percent of micropolitan and non-core areas.

<sup>1</sup>The Office of Management and Budget defines a micropolitan area as a non-metropolitan central county with at least 10,000 persons; outlying counties are included if commuting to the central county is 25% or higher, or if 25% of the employment in the outlying county is made up of commuters from the central county. Noncore counties are the remaining non-metropolitan counties that have no urban cluster of 10,000 or more residents.

## Policy Implications

Identifying potential outpatient care problems based on higher ACSC hospital admission rates is a first step to implementing interventions to improve the quality of care for rural children. The results of this study suggest that a range of interventions may decrease rates of pediatric ACSC hospitalizations, improving the quality of pediatric health care and the overall health status of children.

Broad-based interventions supported by the study findings on uninsurance and ACSC hospitalizations include efforts to increase health insurance coverage for children, especially rural children who are less likely to be insured. The study findings regarding poverty rates support efforts to improve the socioeconomic status and living conditions of children. Similarly, the results with regard to physician supply and ACSC rates lend additional support to efforts to increase the supply of primary care providers in underserved rural areas.

Although this study could not specifically address issues of appropriateness of care, the literature indicates that the quality of care for potential ACSC conditions such as asthma, diabetes, gastroenteritis, and urinary tract infection can be improved by expanding use of evidence-based guidelines for appropriate treatment.<sup>1-3</sup> For the two chronic health conditions addressed in this study, asthma and diabetes, additional interventions supported by the literature include programs implemented by health care providers, public and private health insurers, schools, and local public health agencies to screen and identify children at risk of medical complications, reduce risk factors when possible, and increase compliance with treatment regimens. Examples include programs to help parents of children with asthma stop smoking and to minimize children's home environmental asthma triggers; and patient education and case management services for children with diabetes or asthma and their families.<sup>4-6</sup>

## About the Study

The project used hospital inpatient discharge data from six states and the Agency for Health Care Research and Quality (AHRQ) Pediatric Quality Indicators, a set of measures that can be used with hospital inpatient discharge data to assess the quality of pediatric healthcare.<sup>7</sup> The six states in the analysis were Florida, Iowa, Kentucky, North Carolina, Oregon, and Washington. These states were selected for their geographic diversity, the presence of significant rural populations, and because they allow researchers access to patient-level county and zip code data that permit classification of patient residence by degree of rurality. Four years of data (2001-2004) were used for the analysis.

## References

- <sup>1</sup> Homer, C., Szilagyi, P., Rodewald, L., Bloom, S., Greenspan, P., Yazdgerdi, S., Leventhal, J., Finkelstein, D. and Perrin, J. Does quality of care affect rates of hospitalization for childhood asthma? *Pediatrics*, 98:18-23, 1996.
- <sup>2</sup> Centers for Disease Control and Prevention. Managing acute gastroenteritis among children: Oral rehydration, maintenance and nutritional therapy. *Morbidity and Mortality Weekly Report*. Vol. 52, No. RR-16, November 21, 2003.
- <sup>3</sup> Silverstein J., Klingensmith G., Copeland K., Plotnick L., Kaufman F.k Laffel L., Deeb, L., Grey, M., Anderson, B., Holzmeister, L., and Clark, N. American Diabetes Association. Care of children and adolescents with type 1 diabetes: a statement of the American Diabetes Association. *Diabetes Care* 28(1):186-212, 2005.
- <sup>4</sup> Winikhoff J., Hillis, V., Palfrey, J., Perrin, J., and Rigotti, N. A smoking cessation intervention for parents of children who are hospitalized for respiratory illness: the stop tobacco outreach program. *Pediatrics* 111(1):140-5, 2003.
- <sup>5</sup> Primomo, J., Johnston, S., DiBiase, F., Nodolf, J. and Noren, L. Evaluation of a community-based outreach worker program for children with asthma. *Public Health Nursing* 23(3): 234-241, 2006.
- <sup>6</sup> Svoren, B., Butler, D., Levine, B., Anderson, B., and Laffel, L. Reducing acute adverse outcomes in youths with type 1 diabetes: a randomized, controlled trial. *Pediatrics* 112(4):914-22, 2003.
- <sup>7</sup> Agency for Healthcare Research and Quality (AHRQ). *Pediatric Quality Indicators Overview*. AHRQ Quality Indicators. AHRQ: Rockville, MD, February 2006. Available at: [http://www.qualityindicators.ahrq.gov/pdi\\_overview.htm](http://www.qualityindicators.ahrq.gov/pdi_overview.htm)

The information in this policy brief is based on Upper Midwest Rural Health Research Center Working Paper #4: Ambulatory Care Sensitive Condition Hospitalizations Among Rural Children by Michelle Casey, MS, University of Minnesota and Alana Knudson, PhD, University of North Dakota.

*Support for this Policy Brief was provided by the Office of Rural Health Policy, Health Resources and Services Administration, PHS Grant No. 5U1CRH03717-02-00.*

For more information, contact: Michelle Casey, (612) 626-6252, [mcasey@umn.edu](mailto:mcasey@umn.edu) or Alana Knudson, (701) 777-4205, [aknudson@medicine.nodak.edu](mailto:aknudson@medicine.nodak.edu).

## Partners

Ira Moscovice, PhD, Director  
 University of Minnesota  
 Rural Health Research Center  
 School of Public Health  
 2221 University Ave SE, Suite 112  
 Minneapolis, MN 55414  
 Phone: (612) 624-6151  
<http://www.hsr.umn.edu/rhrc>

Mary Wakefield, PhD, Deputy Director  
 University of North Dakota  
 Center for Rural Health  
 School of Medicine & Health Sciences  
 501 N. Columbia Road Stop 9037  
 Grand Forks, ND 58202-9037  
 Phone: (701) 777-3848  
<http://medicine.nodak.edu/crh>