

Insurance-Associated Disparities in Hospitalization Outcomes of Michigan Children

Thomas H. Peterson, MPH, Tom Peterson, MD, Carl Armon, MSPH, and James Todd, MD

Objective To investigate whether children in Michigan with private insurance have better hospitalization-related outcomes than those with public or no insurance.

Study design Population-based hospitalization rates were calculated for newborns and children aged <18 years in Michigan for the years 2001-2006 and stratified by age, disease grouping, and health insurance status using inpatient records from the Michigan Inpatient Database and population estimates from the US Census Current Population Survey.

Results Michigan children with public/no insurance had significantly higher overall hospital admission rates and admission rates for ambulatory-sensitive conditions, and were more likely to be admitted through the emergency room, compared with those with private health insurance. Similarly, newborns with public/no insurance had significantly higher rates of hospitalization-related outcomes. Hospital charges per child were higher in the public/no insurance population, translating to potential excess charges of between \$309.8 and \$401.8 million in 2006.

Conclusions There are disparities in health outcomes and charges between Michigan children and newborns with public/no insurance and those with private health insurance, presenting a significant opportunity to improve the efficiency and efficacy of care. (*J Pediatr* 2011;158:313-8).

In 2005, ambulatory care-sensitive conditions represented 7 of the 20 leading causes of hospitalization in Michigan and >20% of all hospitalizations for children aged <18 years.¹ This percentage has risen progressively over the past 15 years, as has the percentage of Michigan children enrolled in Medicaid managed care (MMC) programs.² The state of Michigan has aggressively enrolled Medicaid-eligible children in statewide Health Maintenance Organizations, resulting in one of the lowest percentages of uninsured children in the United States.^{3,4} Concurrently, physician reimbursement for children with Michigan Medicaid remained low (55%-61% of Medicare rates in 2004/2005).⁵ With hospital, teaching, and federally qualified health clinics providing a safety net for the ever-expanding population. Although insurance can be an important enabling factor for the use of health services, its presence alone is hardly a guarantee of appropriate use or receipt of high-quality care, especially with disadvantaged children.^{6,7}

A previous study has documented the higher morbidity, mortality, and hospital charges in children with public or no insurance compared with those with private health insurance in Colorado,⁸ a state whose Medicaid population was primarily unassigned fee for service during the study.⁹⁻¹¹ We performed a similar type of analysis, adding newborn comparisons, in a state with a much different Medicaid population to examine whether there is state-by-state variation in these rates and to evaluate the role of type of delivery of Medicaid services in influencing these health outcomes.

Methods

This retrospective ecological study compared population-based hospitalization rates for children in Michigan aged <18 years over the years 2001-2006 based on health insurance coverage. Hospitalization rates were determined using complete numerator data from the all-patient Michigan Inpatient Database (MIDB)¹² obtained from the Michigan Health and Hospital Association and denominator data based on insured population estimates obtained from the Current Population Survey (CPS) of the US Census.³ Only cases with age missing were excluded. Diagnostic categories used for comparison of the pediatric age populations were created using major diagnostic categories (MDCs) and *International Classification of Diseases, Ninth Revision (ICD-9)*

APR-DRG	All-patient refined diagnosis-related grouping
CPS	Current Population Survey
DRG	Diagnosis-related group
ED	Emergency Department
HEDIS	Health Plan Employer Data and Information Set
ICD-9	<i>International Classification of Diseases, Ninth Revision</i>
MDC	Major diagnostic category
MIDB	Michigan Inpatient Database
MMC	Medicaid managed care

From the Department of Quality Helen DeVos Children's Hospital, Grand Rapids, MI (Thomas H. Peterson, Tom Peterson); Department of Healthier Communities, Spectrum Health, Grand Rapids, MI (Tom Peterson); First Steps Kent, Grand Rapids, MI (Thomas H. Peterson); Department of Epidemiology, Children's Hospital, Aurora, CO (C.A., J.T.); Departments of Pediatrics and Microbiology, University of Colorado School of Medicine, CO (J.T.); and Department of Epidemiology, Colorado School of Public Health, Aurora, CO (J.T.)

The authors declare no conflict of interest.

0022-3476/\$ - see front matter. Copyright © 2011 Mosby Inc. All rights reserved. 10.1016/j.jpeds.2010.08.002

diagnostic/procedural codes as described previously.⁸ Additional categories were created for the newborn population (Table I; available at www.jpeds.com). All primary and secondary diagnoses/procedural codes were included for classification in these diagnostic categories.

Denominator estimates of health insurance coverage for the pediatric population were obtained from the CPS produced by the US Census Bureau.³ Coverage was estimated for children aged <18 years for the years 2001-2006 grouped as private insurance and public/no insurance (the total number of children aged <18 years who did not have private health insurance at any time during the given year). Denominator estimates for the pediatric population included all children aged 0-17 years. Denominator insurance data for the newborn population was determined from the MIDB as the total number of births within each insurance category during the given year, as determined from the inpatient database.

Pediatric hospitalization rates were estimated for children aged <18 years, excluding pregnancies (MDC 14) and newborns/neonates (MDC 15). Newborn hospitalization rates were determined separately using cases categorized as MDC 15 and were further defined by the presence of the ICD-9 live birth codes (V30-V39) as the primary diagnosis, admission source, and disposition. Newborns with a live birth code or with an admission source from another institution were assumed to be first admissions, and all others were assumed to be readmissions. All populations were grouped by admission year and included only patients with Michigan zip codes. Given the lack of patient identifiers in the MIDB, we were unable to adjust for recurring admissions of the same individual. Health insurance coverage for both newborn and pediatric hospitalization was grouped as "private" and "public/no" (Appendix; available at www.jpeds.com). The public/no group was a combined group based on previous analysis⁸ showing that treating the public or no insurance population as two separate populations inherently overestimates the hospitalization rate of those with public insurance, due primarily to hospitals' ability to retroactively qualify noninsured patients to Medicaid coverage on hospital admission without the possibility of making a similar adjustment for the denominator.

HEDIS Data

Measurements used to gauge health plan performance for immunization and asthma care were taken from the Health Plan Employer Data and Information Set (HEDIS) report for 2006¹³ produced for the Michigan Department of Community Health and compared with the estimated hospital admission rates for asthma and vaccine-preventable diseases.

Outcome Variables

In the pediatric population, hospitalization rates were calculated for all hospitalizations, hospitalizations via the emergency department, high-severity hospitalizations (ie, those with an all-patient refined diagnosis-related grouping [APR-DRG] severity score >2), chronic disease, and

ambulatory-care sensitive conditions such as asthma, diabetes, psychiatric disease, vaccine-preventable disease (excluding influenza), and appendicitis associated with a ruptured appendix or peritonitis. In the newborn population, poor health outcomes included low birth weight (<2500 g), very low birth weight (<1500 g), prematurity (gestation <37 weeks), respiratory distress syndrome, intraventricular hemorrhage, bronchopulmonary dysplasia, sepsis, perinatal jaundice, hypoglycemia, and hospitalization with high APR-DRG severity (subset score >2) or risk of mortality (subset score >1). Neonate readmissions within 28 days were considered admissions and coded with MDC 15 (newborns/neonates) that did not have an ICD-9 live birth code as their primary diagnosis or hospital transfer recorded as the source of admission.

Hospital charges were estimated for the most current year (2006) only. Because hospitals are not required to report hospital charges to the MIDB, data on charges were available for only 59.3% of pediatric admissions and only 56.2% of newborn hospitalizations in 2006. To estimate pediatric hospital charges for the entire population, a sample was created by stratifying all hospitalizations by zip code. Individuals with charges reported in zip codes with a high proportion of charges reported (>80% of all hospitalizations) comprised the sample (private: n = 7394 [19.8% of total]; public/no: n = 4854 [18.8% of total]). Linear regression analysis measuring the breakdown (%) of admissions by MDC in the sample population compared with the total population in each insurance-based category was performed to validate the use of this sample in extrapolating charges to the entire population (private: $R^2 = 0.985$; public/no: $R^2 = 0.988$). We assumed that some small area variation could not be accounted for. Estimated total charges were used to determine average charge per child in each insurance category; this difference, multiplied by total number of children in each population, yielded the potential excess charge difference.

Data Analysis

Numerator data were taken from the MIDB and grouped based on illness category. Rates were calculated for those with private insurance and those with public/no insurance for each year between 2001 and 2006 and compared using a paired-sample *t* test for comparing differences between paired means. Rate ratios between the two insurance-based populations were calculated over the years 2001-2006. Because the CPS methodology might underestimate public health insurance coverage denominators for children based on either inaccurate reporting recall or shifts from private to public/no categories during the year, rate ratios for pediatric hospitalizations were secondarily adjusted to account for denominator shifts that might increase public/no coverage estimates by 20% with a commensurate decrease in private coverage.¹⁴ Newborn denominators did not require adjustment, because they were calculated based on actual births.

Download English Version:

<https://daneshyari.com/en/article/6225630>

Download Persian Version:

<https://daneshyari.com/article/6225630>

[Daneshyari.com](https://daneshyari.com)