

Birth Risk Factors and Hospitalization for Medicaid Infants

A number of prenatal risk factors are associated with adverse health outcomes for infants. One of the consequences of adverse health outcomes can be increased hospitalizations, as well as associated health care costs, for infants exposed to these risk factors.

Data and Methods

North Dakota resident birth certificates with Medicaid listed as the source of payment for the birth for calendar years 1999 through 2001 (n=5,106) were linked with Medicaid UB92 inpatient hospitalization claims from Data Probe. Of the 5,106 Medicaid births in North Dakota, 47 infants died within the first year of life. Three of these infants who were hospitalized prior to their deaths were eliminated from the analysis – leaving a total of 5,059 birth records with matching inpatient hospitalization claims. All inpatient hospital claims for the newborn delivery and duplicate admission dates for the same individual were eliminated.

Number of Hospitalizations

The claims file and the birth certificate file were linked based on the infant's name, date of birth, gender, race and county of residence. Of the 1,142 inpatient hospital claims, 765 (67%) were linked to Medicaid birth certificates. The 765 hospitalizations (within the infant's first year) were to 615 individual patients.

Birth and Maternal Risk Factors

Eight birth risk factors were analyzed to assess association between any of the risk factors and hospitalization of the infant. The risk factors were low birth weight (fewer than 2,500 grams), prematurity (fewer than 37 weeks gestation), first trimester prenatal care, mother's education (less than 12th grade), mother's age (younger than 20), mother's marital status, congenital anomalies and maternal tobacco use. In addition, four maternal medical risk factors (anemia, gestational diabetes, pregnancy-associated hypertension and pre-eclampsia) also were analyzed. Relative risk statistics and 95 percent confidence intervals were calculated for each of the risk factors. Six of the risk

factors were found to be associated with subsequent infant hospitalization. (Figure 1)

Congenital anomalies, gestational age less than 37 weeks, maternal tobacco use, mother's



education less than 12th grade and maternal anemia all were found to be significantly associated with hospitalizations in infants. The confidence interval for the relative risk of gestational diabetes and infant hospitalization did not meet the criteria of statistical significance.

Although only 53 of the Medicaid infants were born with a congenital anomaly, more than one-half (51%) of them were hospitalized within a year of their births. Also, a higher percentage of infants were hospitalized who were born prematurely to mothers who had

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anemia or used tobacco during their pregnancy or who had less than a 12th grade education. (Figure 2)

Summary

About one in eight infants whose birth was paid for by Medicaid during 1999 through 2001 was hospitalized within a year of birth.

Congenital anomalies, prematurity, maternal tobacco use, mother’s education less than grade 12 and maternal anemia were risk factors found to be significantly associated with hospitalizations in infants.

Babies born prematurely and with congenital anomalies accounted

for a disproportionate share of the hospitalizations.

Conclusion

Interventions that could reduce the number of premature births and birth defects in the Medicaid population could be expected to reduce subsequent hospitalizations and associated costs to the Medicaid program.

Figure 1: Relative Risk of Birth Risk Factors and Medicaid Infant Inpatient Hospitalization

Risk Factor	RR	95% CI
Congenital anomalies	2.86	2.08-3.92
Gestational age <37 weeks	1.80	1.47-2.21
Maternal anemia	1.64	1.13-2.39
Mother’s education <grade 12	1.42	1.22-1.66
Gestational diabetes	1.33	0.90-1.94
Maternal tobacco use	1.18	1.02-1.37

Figure 2: Percentage of Infants Hospitalized by Presence of Risk Factor

Risk Factor	Yes	No
Congenital anomalies	50.9%	13.4%
Gestational age <37 weeks	20.5%	11.4%
Maternal prenatal anemia	19.7%	12.0%
Mother’s education <grade 12	15.6%	10.8%
Maternal prenatal tobacco use	13.4%	11.3%

North Dakota Medicaid Children With Asthma

According to the 1997 National Health Interview Survey, poor children and children with Medicaid or another public health insurance coverage are more likely to have ever been told they have asthma and to have had an asthma attack than



children who are not poor or children who have private health insurance.

The North Dakota Department of Health conducted a study of data from 1998 through 2000 to estimate the prevalence of asthma in children enrolled in the North Dakota

Medicaid program and to examine service utilization and medication patterns for these children.

Methods

The study population was Medicaid children younger than 18 during calendar years 1998 through 2000 who were diagnosed with asthma (ICD9 493-493.9). Data sets were created from inpatient and outpatient health-care claims, as well as pharmacy claims for medications commonly prescribed for asthma.

The data sets were linked based upon the child’s Medicaid recipient number. The linked file contained demographic characteristics for the child, health-care utilization information such as emergency room use and inpatient hospitalization, and prescription information for asthma medications.

Results

Nearly 46,000 children were identified as enrolled in Medicaid at any time during the three-year period. Of those, nearly 3,800 (8.3%) were found to have a diagnosis of asthma on a health-care claim form.

American Indian children (12.4%) were nearly twice as likely to have an asthma diagnosis as white children (6.7%). The percentage was slightly higher for males compared to females and for young children compared to older children.

Of the 3,792 children diagnosed with asthma, about 9 percent had visited the emergency room (ER) and 5 percent were hospitalized because of their asthma (asthma diagnosis listed as primary ER or inpatient diagnosis). Although American Indian children were more likely to have an asthma diagnosis, they were

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less likely than white children to seek care in the ER or be hospitalized for their asthma. (Figure 3)

Medications commonly prescribed for the treatment of asthma were grouped into categories of controller medications and rescue medications. For more than one-half (54%) of the children diagnosed with asthma, no pharmacy claim was found for any of the selected asthma medications. Twenty-one percent of children were prescribed rescue medications alone, and 11 percent controller medications alone. Only 16 percent had prescriptions for both controller and rescue medications – the optimum medication management strategy.

Medicaid children with at least one emergency room visit or inpatient hospitalization due to their asthma were more likely to have been given prescriptions for both controller and rescue medications. It is possible that many of the children with the most severe asthma are prescribed appropriate medications but still need to access emergency and inpatient care. (Figure 4)

Summary

- Between 1998 and 2000, about 3,700 (8%) of children in the North Dakota Medicaid program were diagnosed with asthma.

- About 9 percent of these children visited the emergency room and 5 percent were hospitalized due to their asthma sometime during the three-year period.
- American Indian children had a higher rate of asthma than did white children but were less likely to visit an emergency room or be hospitalized.
- Fewer than one-half of the children with asthma had a pharmacy claim for any of an identified list of medications commonly used to treat or control asthma.

Conclusions

- Outpatient procedure codes from Medicaid claims forms and the prescription of asthma medications are not good predictors of asthma management as measured by emergency room visits and inpatient hospitalizations.
- Medication management alone is not sufficient to reduce emergency

Figure 3: Percentage of North Dakota Children With Asthma Diagnosis, ER Visit and Hospitalization by Race, Gender and Age

	Asthma Diagnosis	ER Visit	Inpatient Hospital
American Indian	12.4%	6.8%	4.6%
White	6.7%	10.1%	5.9%
Female	7.2%	8.6%	4.4%
Male	9.3%	9.2%	6.0%
Age 6-17	7.5%	9.2%	3.9%
Age 0-5	9.0%	8.8%	6.1%
Overall	8.3%	8.9%	5.0%

Figure 4: Percentage of Medicaid Children With Asthma by Service Utilization Type and Medication Category

	No Meds	Rescue Alone	Control W/Resc.	Control Alone
ER Visit	29%	24%	34%	12%
Inpatient Hosp.	23%	18%	52%	7%
No ER or Hosp.	54%	21%	16%	11%

visits and hospitalizations among children with asthma; a prescription for a medication does not ensure the medication will be used properly.

- Proper education, including the use of asthma action plans, is needed to complement outpatient care and medication management to ensure optimum care for children who have asthma.

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