



H·CUP

HEALTHCARE COST AND UTILIZATION PROJECT

fact
book **4**

Care of Children and Adolescents in U.S. Hospitals





Care of Children and Adolescents in U.S. Hospitals



Pamela L. Owens, Ph.D. ■ Joseph Thompson, M.D., M.P.H.

Anne Elixhauser, Ph.D. ■ Kevin Ryan, J.D., R.N.



FACTS ON:

- **DIAGNOSES**
- **PROCEDURES**
- **LENGTH OF STAY**
- **CHARGES**
- **INSURANCE COVERAGE**

AHRQ Publication No. 04-0004
October 2003

Suggested Citation

Owens PL, Thompson J, Elixhauser A, Ryan K. *Care of Children and Adolescents in U.S. Hospitals*. Rockville (MD): Agency for Healthcare Research and Quality; 2003. HCUP Fact Book No. 4; AHRQ Publication No. 04-0004. ISBN 1-58763-137-7.

Acknowledgments

Thanks to Suzanne Worth at Social and Scientific Systems for her invaluable assistance in statistical programming, to Michael Keane and Minsun Kang for their help in summarizing the findings, and to The Madison Design Group for their work in design and layout of this Fact Book. Special thanks to the National Association of Children's Hospitals and Related Institutions (NACHRI) for their help in creating the Kids' Inpatient Database which forms the basis for this Fact Book and the Stanford University-University of California Evidence-based Practice Center for their work in developing the AHRQ Quality Indicators.

HCUP Fact Book Series

1. **Hospitalization in the United States, 1997 (Pub. No. 00-0031)**
2. **Procedures in U.S. Hospitals, 1997 (Pub. No. 01-0016)**
3. **Care of Women in U.S. Hospitals, 2000 (Pub. No. 02-0044)**
4. **Care of Children and Adolescents in U.S. Hospitals, 2003 (Pub. No. 04-0004)**

Previously published HCUP Fact Books are available online (<http://www.ahrq.gov/data/hcup/datahcup.htm#Recent>), and from the AHRQ Publications Clearinghouse. To order by telephone, please call 800-358-9295 with the title and publication number.

P. Owens and A. Elixhauser are with the Agency for Healthcare Research and Quality (AHRQ) in the Center for Delivery, Organization, and Markets. J. Thompson was at AHRQ and K. Ryan was at the University of Arkansas Medical Sciences (UAMS) during the initial preparation of this Fact Book. Both are currently at UAMS.



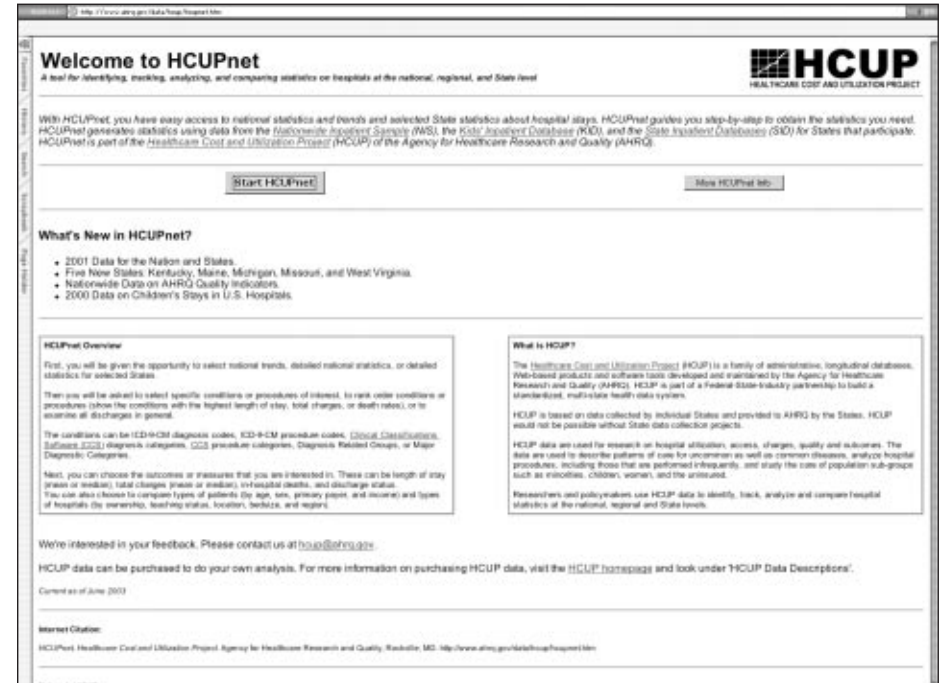
Foreword

The mission of the Agency for Healthcare Research and Quality (AHRQ) is to improve the quality, safety, efficiency, and effectiveness of health care for all Americans. To help fulfill this mission, AHRQ develops a number of databases, including the powerful Healthcare Cost and Utilization Project (HCUP). HCUP is a Federal-State-Industry partnership designed to build a standardized, multi-State health data system; HCUP features databases, software tools, and statistical reports to inform policy makers, health system leaders, and researchers.

For data to be useful, they must be disseminated in a timely, accessible way. To meet this objective, AHRQ launched HCUPnet, an interactive, Internet-based tool for identifying, tracking, analyzing, and comparing statistics on hospital utilization, outcomes, and charges (<http://www.ahrq.gov/data/hcup/hcupnet.htm>). Menu-driven HCUPnet guides users in tailoring specific queries about hospital care online; with a click of a button, users receive answers within seconds.

In addition, AHRQ produces the HCUP Fact Books to highlight statistics about hospital care in the United States in an easy-to-use, readily accessible format. Each Fact Book provides national information about specific aspects of hospital care — the single largest component of our health care dollar. The national estimates are benchmarks against which States could compare their own data. The first Fact Book featured an overview of hospital stays in the United States and types of conditions treated, the second Fact Book described the procedures performed in U.S. hospitals, and the third Fact Book focused on hospital care for women.

This Fact Book examines hospital care for children using one of the newest HCUP databases made publicly available — the Kids' Inpatient Database (KID). The KID is the first database devoted specifically to the study of hospital stays for children. Prior to development of the KID, no research database had sufficient numbers of cases to allow in-depth analysis of children's hospitalizations. The creation of the KID has enabled studies of why children and adolescents are hospitalized, what types of procedures children receive, who is billed for children's



hospital stays, disparities in outcomes and use of services, and a host of other topics.

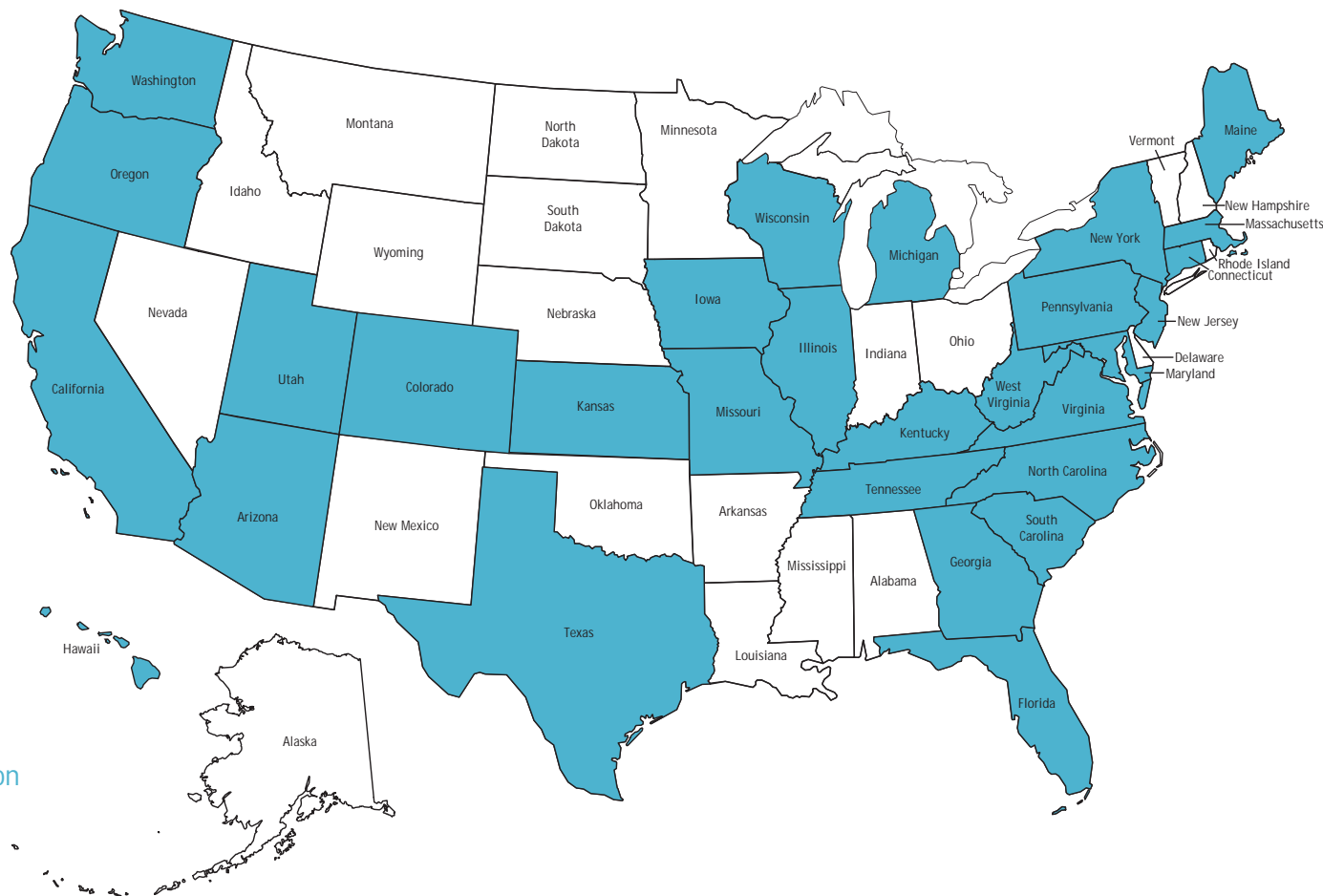
We invite you to tell us how you are using this Fact Book and other HCUP data and tools and to share suggestions on how HCUP products might be enhanced to further meet your needs. Please email us at hcup@ahrq.gov or send a letter to the address below.

Irene Fraser, Ph.D.
Director
Center for Delivery, Organization, and Markets
Agency for Healthcare Research and Quality
540 Gaither Road
Rockville, MD 20850

Contributors

Without the following State partners, the Healthcare Cost and Utilization Project (HCUP) and the 2000 Kids' Inpatient Database (KID)* would not be possible:

- * **Arizona** Department of Health Services
- * **California** Office of Statewide Health Planning and Development
- * **Colorado** Health and Hospital Association
- * **Connecticut** Integrated Health Information (Chime, Inc.)
- * **Florida** Agency for Health Care Administration
- * **Georgia:** An Association of Hospitals & Health Systems (GHA)
- * **Hawaii** Health Information Corporation
- * **Illinois** Health Care Cost Containment Council
- * **Iowa** Hospital Association
- * **Kansas** Hospital Association
- * **Kentucky** Department for Public Health
- * **Maine** Health Data Organization
- * **Maryland** Health Services Cost Review Commission
- * **Massachusetts** Division of Health Care Finance and Policy
- * **Michigan** Health & Hospital Association
- * **Missouri** Hospital Industry Data Institute
- * **New Jersey** Department of Health and Senior Services
- * **New York** State Department of Health
- * **North Carolina** Department of Health and Human Services



- * **Oregon** Association of Hospitals and Health Systems and Office of Oregon Health Policy and Research
- * **Pennsylvania** Health Care Cost Containment Council
- * **South Carolina** State Budget and Control Board
- * **Tennessee** Hospital Association
- * **Texas** Health Care Information Council
- * **Utah** Department of Health
- * **Virginia** Health Information
- * **Washington** State Department of Health
- * **West Virginia** Health Care Authority
- * **Wisconsin** Department of Health and Family Services

Table of Contents



Foreword	iii
Contributors	iv
Table of Contents	1
Introduction	2
Executive Summary	3
Why are children and adolescents hospitalized?	8
At what ages are children most likely to be hospitalized?	9
How do children get admitted to the hospital?	13
What are the reasons for children’s hospital stays?	16
What procedures do children receive in the hospital?	27
How long do children stay in the hospital?	31
How expensive are children’s hospital stays?	35
How does children’s resource use compare with adults?	38
Who is billed for children’s hospital stays?	40
What happens when children are discharged from the hospital?	47
Source of data for the report	50
Methods	51
For more information	52

Introduction

Americans had 36 million hospital stays in 2000 and about 18 percent of these stays were for children and adolescents 17 years and younger. This Fact Book presents an overview of the care of children and adolescents in U.S. hospitals, providing insight into the types of conditions for which children are hospitalized, the types of procedures they receive, who is billed for the stays, the resource use associated with children's hospital stays, and where children are discharged to when they leave the hospital.

The Fact Book begins with an overview of hospital care for children overall and, to put this care into perspective, compares information about children to information about adults' hospital stays. It then provides more detailed information for three major subgroups of pediatric hospital stays: (1) **neonatal stays** — newborns and infants 30 days and younger, (2) stays for other **pediatric illness** — admissions for children and adolescents not related to neonatal and maternal conditions, and (3) stays for **adolescent pregnancy** and delivery — admissions for maternal care.

Data on children come from the 2000 Kids' Inpatient Database (KID), a database maintained and disseminated by the Agency for Healthcare Research and Quality (AHRQ), as part of the Healthcare Cost and Utilization Project (HCUP). The KID — a stratified probability sample of pediatric discharges for all participating hospitals — is the only database specifically developed to allow in-depth studies on children's hospitalizations. Because of its tremendous size (2.5 million records), the 2000 KID can provide information on relatively uncommon diagnoses and procedures, as well as on subpopulations such as specified age groups or diagnostic subgroups.

Information on adult stays in this Fact Book comes from the 2000 Nationwide Inpatient Sample (NIS), a sample of U.S. community hospitals drawn and weighted to provide national estimates. Both databases are uniquely suited to providing a comprehensive picture of hospital care in the U.S. Both databases cover all patients discharged



from hospitals, including the uninsured, those covered by public payers such as Medicaid, and those with private insurance. Both provide information on total hospital charges for all patients. Both the KID and the NIS include short-term, non-Federal, community hospitals. General and specialty hospitals such as pediatric, obstetrics-gynecology, short-term rehabilitation, and oncology hospitals are included. Long-term, psychiatric, and substance abuse hospitals are excluded.

This report examines why children and adolescents are hospitalized, what happens to children and adolescents in hospitals, who is billed for children's hospital stays, and what happens when children are discharged.

Executive Summary

This Fact Book examines hospital care for children age 0 to 17 years old in the U.S. and divides children's stays into three groups —

- **neonatal conditions**
(stays for newborns and infants 30 days of age or less)
- **pediatric illness**
(stays for ill children and adolescents over 30 days of age)
- **adolescent pregnancy**
(stays during which the patient was pregnant or gave birth)

WHY ARE CHILDREN AND ADOLESCENTS HOSPITALIZED?

- Almost two-thirds of all childhood hospital stays are for newborns and neonates (babies up to 30 days old); the vast majority of these stays (nearly 95 percent) are for the birth of infants in the hospital.
- About a third of pediatric hospital stays are for pediatric illnesses besides neonatal care and adolescent pregnancy.
- Adolescent pregnancy accounts for 3 percent of all pediatric hospitalizations or nearly 9 percent of non-neonatal hospitalizations.

AT WHAT AGES ARE CHILDREN MOST LIKELY TO BE HOSPITALIZED?

- In 2000, children and adolescents accounted for 6.3 million hospital stays or 18 percent of all stays; adults accounted for approximately 30.0 million hospital stays, about 82 percent of all stays.
- Children younger than 1 year comprise only 1 percent of the U.S. population, but they account for nearly 13 percent of all hospital stays. The vast majority of these stays are newborn infants.

- Children and adolescents 1 to 17 years old represent 24 percent of the population, but they account for only 5 percent of hospital stays.
- From age 14 to 16, the number of hospital admissions for pregnancy approximately triples each year, up to 77,100 hospital stays for pregnant 16 year olds. Nearly 2 percent of all adolescent girls age 13 to 17 deliver each year compared to about 10 percent of women 18 to 34 years old.

HOW DO CHILDREN GET ADMITTED TO THE HOSPITAL?

- Excluding neonates and adolescent pregnancy, 45 percent of admissions for pediatric illness are routine, non-emergency admissions and 44 percent are through the emergency department (ED) — numbers that are very similar to those for adults.
- Compared with children from high income areas, children from low income areas admitted to the hospital are more likely to enter the hospital through the ED. Excluding neonates and pregnant adolescents, over half of children's admissions from low income areas are through the ED — 25 percent more than from higher income areas.

WHAT ARE THE REASONS FOR CHILDREN'S HOSPITAL STAYS?

- Over two-thirds of all babies (about 71 percent) are born and discharged from the hospital without any clinical problems or complicating diagnoses.
- Five of the top 10 most common diagnoses for neonates are for either respiratory problems or infections.
- The most common neonatal conditions that require extension of the newborn hospital stay or return to the hospital are conditions associated with bilirubin metabolism (hemolytic jaundice),

Summary

prematurity (including respiratory distress), respiratory problems, infections, and birth defects.

- Respiratory conditions are the most common reason for non-neonatal, non-maternal hospitalizations among children (pediatric illness). Pneumonia, asthma, and acute bronchitis account for 1 in 5 hospitalizations for pediatric illness. Asthma and pneumonia remain among the top 10 reasons for hospitalizations among all pediatric age groups.
- Infectious disease is another common reason for hospitalizations for pediatric illness throughout childhood. Infections account for 6 of the top 10 diagnoses for infants, 6 of the top 10 diagnoses for 1 to 2 year olds, and 5 of the top 10 diagnoses for 3 to 5 year olds.
- Asthma is the most common reason for hospitalizations among 3 to 5 year olds and 6 to 12 year olds.
- About 7 percent, or 1 in 14 pediatric hospital stays are for mental disorders. Affective disorders (primarily depression) are one of the top 10 reasons for hospitalization among children with illness, accounting for over 74,000 hospital stays in 2000. By age 13 to 17, affective disorders are the most common cause of hospitalization for children for non-neonatal or non-pregnancy related conditions.
- For 13 to 17 year olds, injuries, including leg injuries, medication poisonings and head injuries, are among the top reasons for hospital stays.
- Some potential patient safety problems are more common among children — complications of anesthesia reactions and iatrogenic pneumothorax. Some events are more common among adults — postoperative hemorrhage or hematoma and postoperative thromboembolism — but significant rates are seen among children.
- The highest rates of obstetrical trauma are seen among girls age 10 to 17, compared with older women giving birth. Compared with women age 25 to 34, adolescents age 10 to 17 are about 35 percent

more likely to experience some obstetrical trauma (e.g., perineal lacerations) during deliveries without instrument assistance.

- Pregnant adolescents hospitalized without delivery are more likely to be diagnosed with early or threatened labor or urinary tract infections than older pregnant women.
- Compared with older women, adolescent deliveries are more likely to have diagnoses of early or threatened labor, hypertension complicating pregnancy, and excess amniotic fluid.

WHAT PROCEDURES DO CHILDREN RECEIVE IN THE HOSPITAL?

- Circumcision is performed on about 59 percent of all male newborns and 86 percent of all male newborns without a complicating diagnosis.
- Approximately 6 percent of all neonates are intubated and put on a respirator at some point during their stay, making this the third most common procedure performed on neonates.
- The most common diagnostic procedure among neonates — spinal tap, which is used to rule out neonatal meningitis — is performed on nearly 2 percent of all neonates.
- Appendectomy is the most common surgical procedure performed on children and adolescents in the hospital for non-neonatal or non-pregnancy related conditions, occurring over 238 times per day.
- The likelihood of delivering by Cesarean section (C-section) increases with the age of the mother. About 14 percent of adolescent deliveries are by C-section, while 18 percent of women age 18 to 24, 24 percent of women age 25 to 34, and 32 percent of women age 35 to 44 deliver their babies in this manner.

HOW LONG DO CHILDREN STAY IN THE HOSPITAL?

- On average, children's stays in the hospital are 29 percent shorter than adult stays.
- Three of the top 10 diagnoses with the longest length of stay are conditions originating in the newborn period: prematurity, respiratory distress, and cardiac and circulatory birth defects.
- The average length of stay for a newborn with some type of complication is nearly 7 days — this is nearly 5 days longer than for newborns without complications.

HOW EXPENSIVE ARE CHILDREN'S HOSPITAL STAYS?

- The average total charge for children's hospital stays is half that of adult stays. This is due, in part, to the shorter length of stay for children and lower intensity of services. The average charge per day for children's stays in the hospital is about 30 percent of daily charges for adult stays.
- The average total charge for hospitalizations for pediatric illness is about \$11,000, approaching the average total charge for adult stays (\$15,000).
- Total charges for complicated newborn stays average \$13,600, compared to \$1,700 for an uncomplicated newborn stay.
- The most expensive condition nationally is also the most common reason for children's stays in the hospital — being born. Nationally, over \$17 billion dollars are charged for newborn hospital stays, most of which are uncomplicated.
- Conditions identified in the neonatal period are among the most expensive diagnoses for all children — prematurity, cardiac and circulatory birth defects, birth defects, respiratory distress syndrome and other neonatal respiratory problems, accounting for \$4.6 billion

in charges or 10 percent of the total dollars spent on hospital stays for children and adolescents.

- Three respiratory problems — pneumonia, acute bronchitis, and asthma — are responsible for nearly \$3 billion in charges or nearly 7 percent of the total U.S. health care bill for children and adolescents.

WHAT PERCENTAGE OF HOSPITAL RESOURCE USE IS ATTRIBUTABLE TO CHILDREN COMPARED WITH ADULTS?

- Care for children and adolescents accounts for about 18 percent of all hospital stays, about 13 percent of all days in the hospital, and about 9 percent of total hospital charges.
- Newborns and neonates account for about 8 percent of all days in the hospital. Pediatric illnesses account for about 5 percent of all hospital days. Adolescent pregnancies account for less than 1 percent of all hospital days.

WHO IS BILLED FOR CHILDREN'S HOSPITAL STAYS?

- About 39 percent of children's hospitalizations are billed to Medicaid compared with only 17 percent of adult stays.
- For both children and adults admitted to the hospital in 2000, 5 percent of hospital stays were uninsured. This is similar to the percent of hospital stays that were uninsured in 1997.
- Medicaid is billed for about one-third of uncomplicated newborn stays compared with 58 percent billed to private insurance, but for babies readmitted to the hospital, similar proportions of hospital stays are billed to Medicaid (47 percent) and private insurance (46 percent). Thus, Medicaid bears a larger burden of complicated newborn and neonatal care than private insurance.

Summary

- Over two-thirds of all adolescent admissions for pregnancy or childbirth are billed to State Medicaid programs and one-fourth are billed to private insurance. Conversely, only one-fourth of hospital stays for pregnant 25 to 34 year olds are billed to Medicaid and about two-thirds are billed to private health insurance. Medicaid bears a larger burden of care for pregnant adolescents than private insurance.
- Private insurance is billed for 56 percent of routine hospital admissions, while Medicaid is billed for 37 percent. In contrast, nearly equal percentages of hospital admissions through the ED are billed to private insurers as to Medicaid.
- Children and adolescents enrolled in Medicaid are 3 times more likely to be admitted for two ambulatory care sensitive conditions — asthma and gastroenteritis — than are privately insured children. These are conditions for which timely access to quality outpatient care potentially can prevent the need for hospitalization.
- Under age 3, 4 to 5 out of 1,000 children are admitted for asthma. Among children 6 to 12, 1 out of 1,000 children are admitted to the hospital for asthma.
- Pregnant adolescents with no health insurance coverage are the least likely to deliver by C-section, which raises the question about the influence of insurance status on choice of procedures.

WHAT HAPPENS WHEN CHILDREN ARE DISCHARGED FROM THE HOSPITAL?

- Less than one half of one percent of children's hospital admissions end in death compared to nearly 3 percent of adult hospital admissions.
- Overall, about 17,100 neonates in 2000 died in hospitals within 30 days of birth. While death is extremely rare for newborns without

complications, over 1 percent of newborns with a complicating diagnosis die during their newborn hospitalization.

- Compared to children, adults are nearly 3 times more likely to be discharged to home health care and 18 times more likely to be discharged to long-term care. Because the demand for post-hospital specialized care can be relatively infrequent for children, high quality post-hospital pediatric care may be limited in many areas.



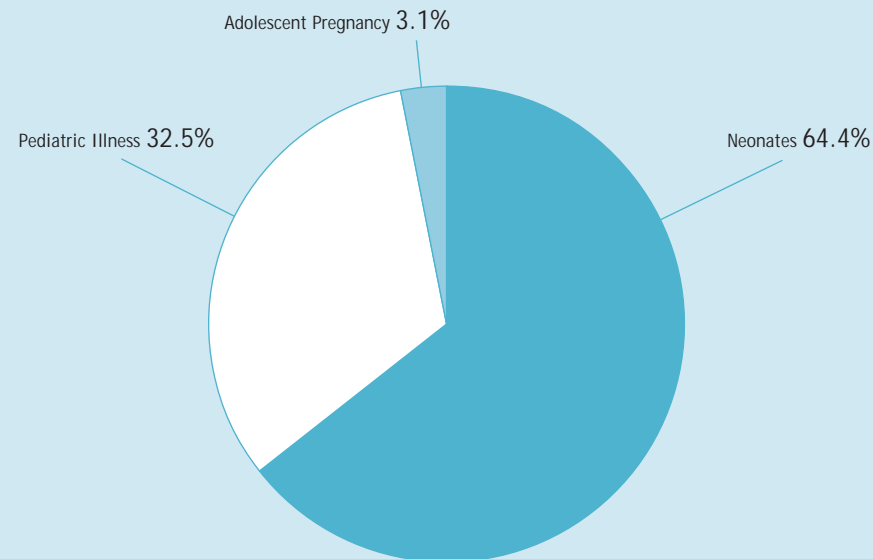
Care of Children and Adolescents in U.S. Hospitals

Why are children and adolescents hospitalized?



- Hospital stays for children and adolescents (0 to 17 years old) can be divided into 3 groups — **neonatal conditions** (stays for newborns and infants 30 days of age or less), **pediatric illness** (stays for ill children and adolescents over 30 days of age), and **adolescent pregnancy** (stays during which the patient was pregnant or gave birth).
- Almost two-thirds of all childhood hospitalizations are for neonatal conditions; the vast majority of these stays (approximately 95 percent) are for the birth of infants in the hospital.
- About a third of hospital stays for children are for pediatric illnesses besides neonatal care and adolescent pregnancy.
- Adolescent pregnancy is an important reason for hospitalizations before 18 years of age — adolescent pregnancy accounts for 3 percent of all pediatric hospitalizations or nearly 9 percent of non-neonatal hospitalizations.

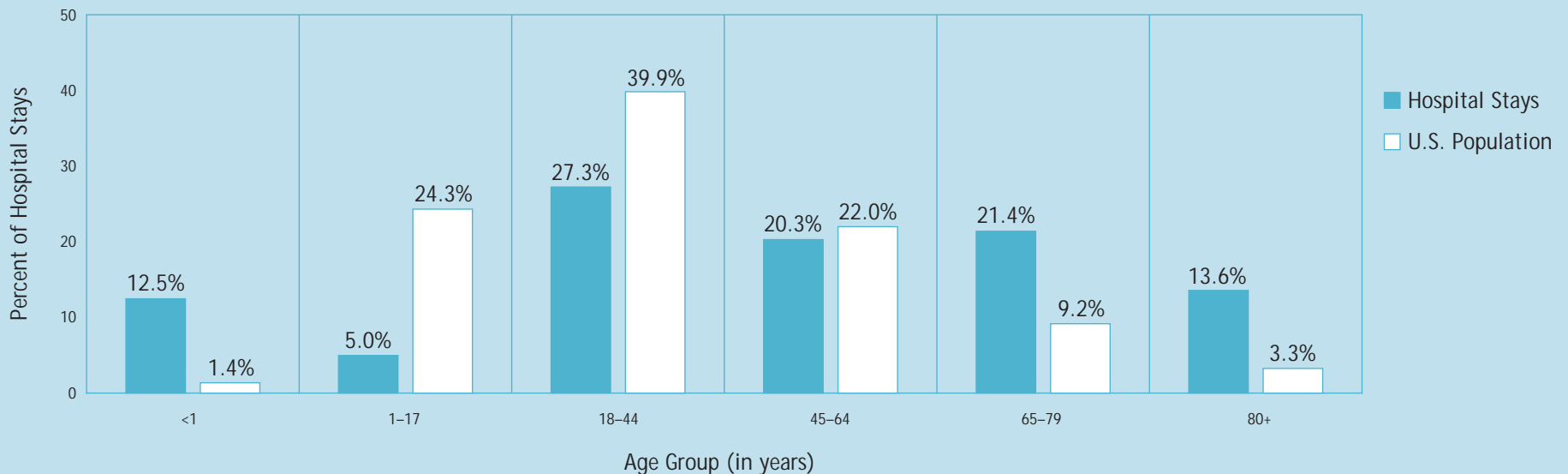
Children's Hospital Stays, by Type



How old are patients in U.S. hospitals?

- In 2000, children and adolescents accounted for 6.3 million hospital stays (18 percent); adults accounted for approximately 30.0 million hospital stays (82 percent).
- Children younger than 1 year comprise only 1 percent of the U.S. population, but they account for approximately 13 percent of all hospital stays. The vast majority of these stays are newborn infants.
- Children and adolescents 1 to 17 years old represent 24 percent of the population, but they account for only 5 percent of hospital stays.
- People between 18 and 44 years old represent nearly 40 percent of the population in the U.S., yet this group comprises only about one fourth of all hospital stays.
- Adults 65 years and older represent only about 13 percent of the total U.S. population, but they account for well over 1 in 3 of all hospital stays (35 percent).

Hospital Stays and U.S. Population, by Age

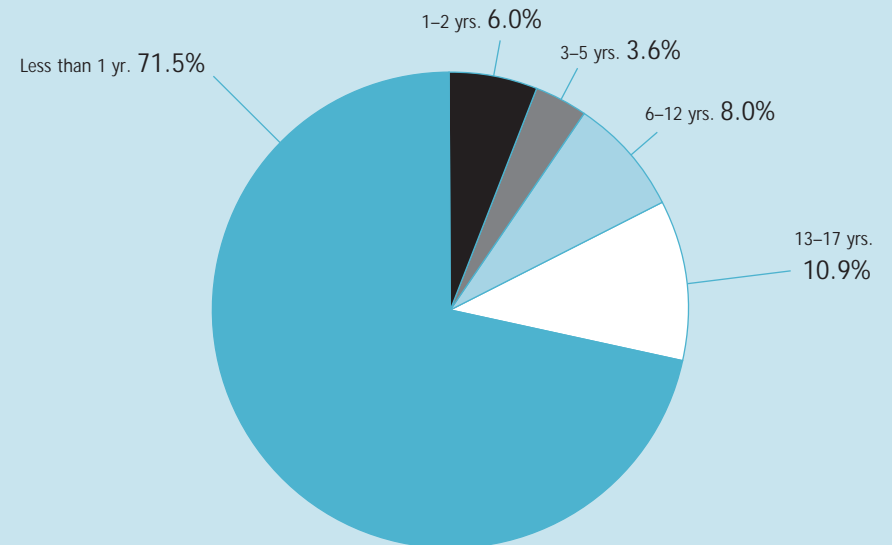


At what ages are children most likely to be hospitalized?

- Of all pediatric discharges from U.S. hospitals, most are for neonates, 30 days of age or younger (72 percent). Discharges for this group alone outnumber discharges for all other pediatric age groups combined by almost 3 to 1.
- Neonates account for 7 times more hospital stays than any other pediatric age group.
- The next closest age group — a distant second — is children 13 to 17 years of age who account for 11 percent of hospital stays for children and adolescents.



Percentage of Children's Hospital Stays, by Age Group

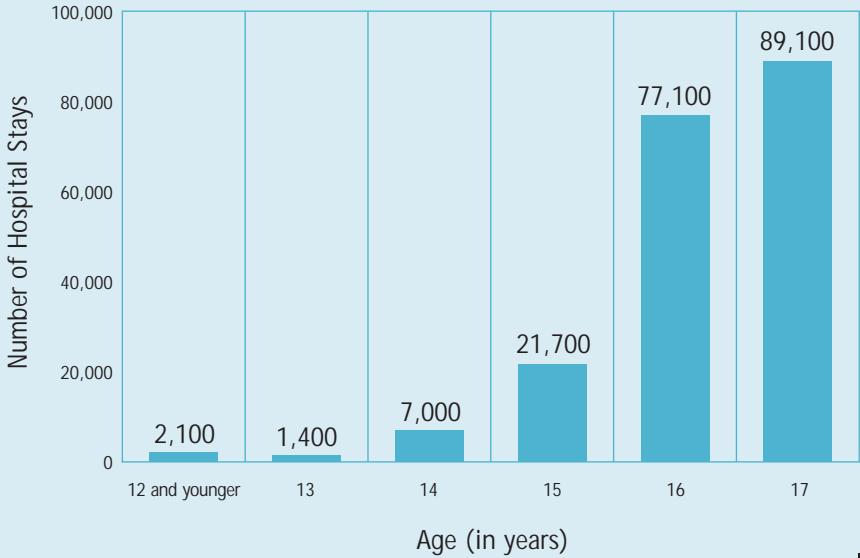


At what age are adolescents admitted to the hospital for pregnancy and delivery?

- By the teen years, pregnancy becomes a significant reason for hospitalization for adolescent girls. There are approximately 20 hospital stays for pregnancy or childbirth per 1,000 13 to 17 year old girls in the U.S.
- About 2,100 hospital admissions for pregnancy and childbirth were for children 12 years and younger.
- From age 14 to 16, the number of hospital admissions for pregnancy approximately triples with each year of age.



Hospital Stays for Pregnant Adolescents, by Age

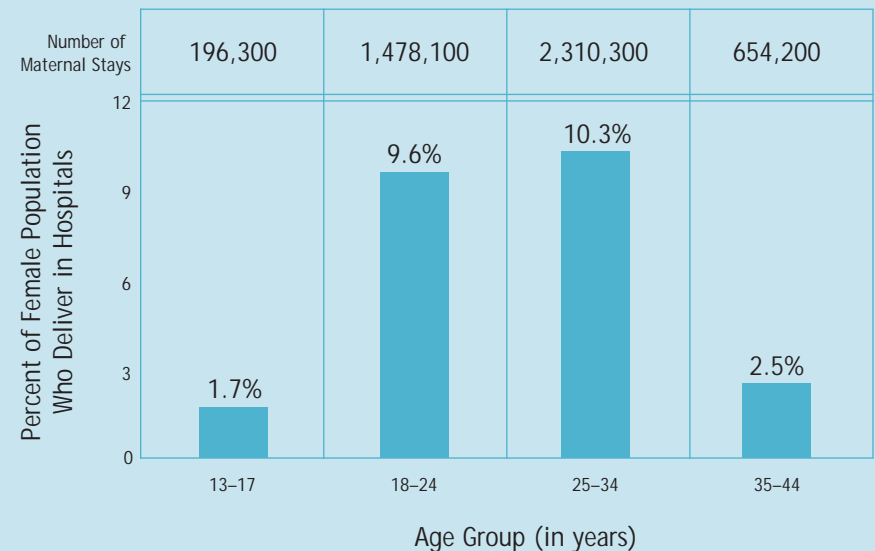


How do admission rates for pregnancy and delivery among females 17 and younger compare with those of older women?



- Compared with adolescent hospital stays for pregnancy and delivery, there are about 8 times as many hospital stays for pregnancy and delivery for women age 18 to 24 and about 12 times as many stays for women age 25 to 34.
- Nearly 2 percent of all adolescent girls age 13 to 17 deliver each year compared to about 10 percent of women age 18 to 34. The annual delivery rate for adolescent girls age 13 to 17 is only slightly lower than the annual delivery rate of women age 35 to 44 (about 2.5 percent).

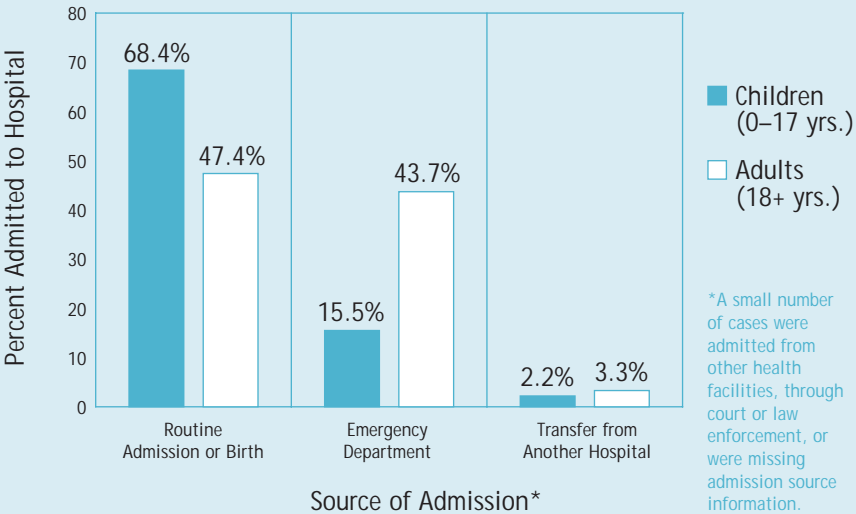
Number of Maternal Hospital Stays and Delivery Rates, by Age



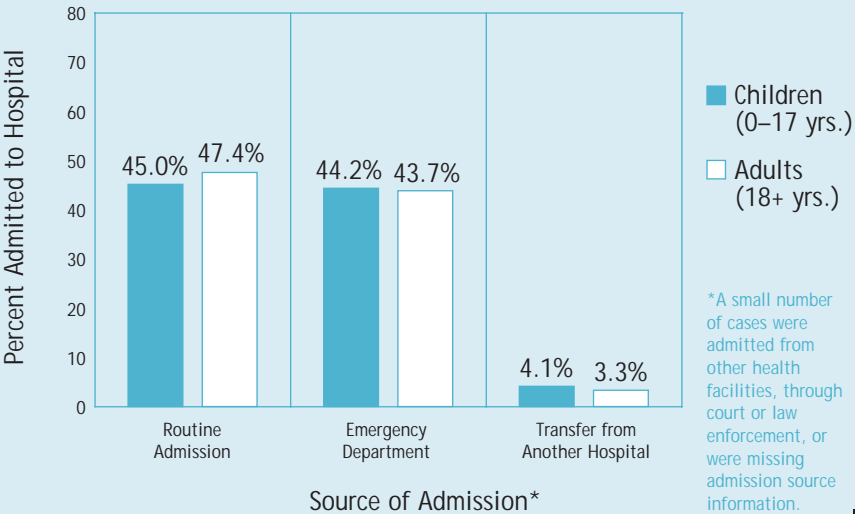
How do children get admitted to the hospital compared with adults?

- More than 2 out of 3 hospital admissions for children are classified as routine, non-emergency admissions compared with less than half of adult admissions. Most children’s admissions are babies born in the hospital.
- Excluding neonates and adolescent pregnancy, 45 percent of admissions for pediatric illness are routine and 44 percent are through the emergency department — numbers that are very similar to those for adults.

Hospital Stays by Source of Admission, including Neonates and Maternal Cases



Hospital Stays by Source of Admission, excluding Neonates and Maternal Cases

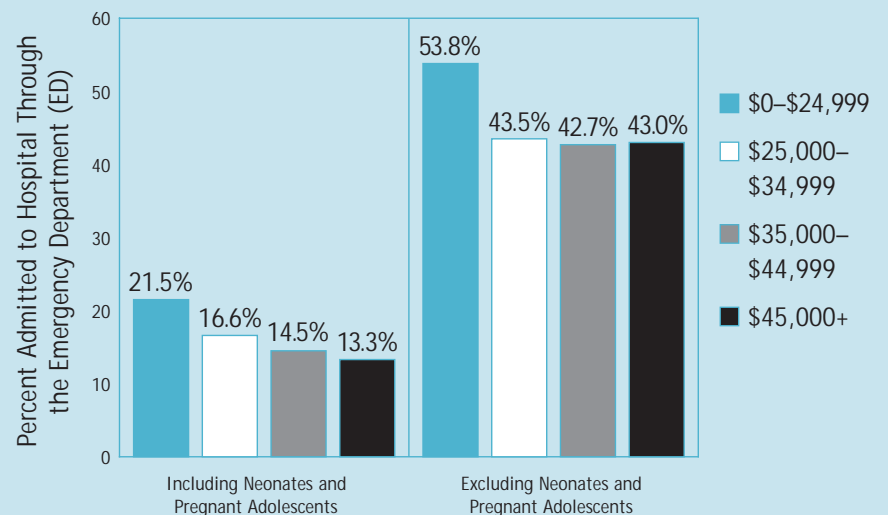


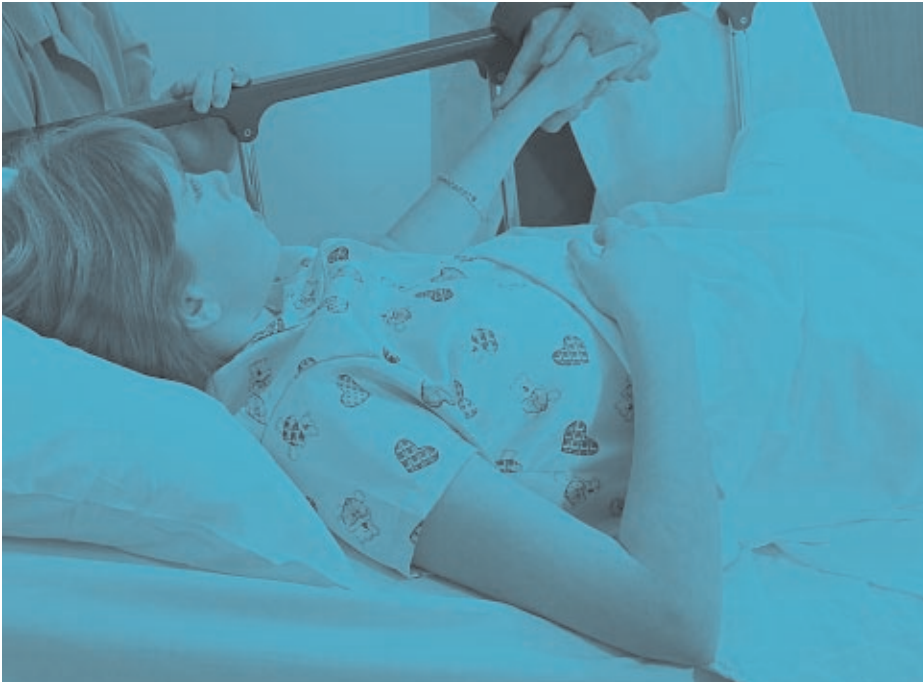
What is the relationship between household income and admission to the hospital through the emergency department?

- Children and adolescents from low income areas admitted to the hospital are more likely to enter the hospital through the emergency department (ED) compared with children and adolescents from higher income areas.
- Nearly one-fourth of all hospital admissions for children and adolescents from low income areas (median household income less than \$25,000) are through the ED. As area-level household income increases, admission rates through the ED decrease.
- Excluding neonates and pregnant adolescents, over half of hospital admissions for children and adolescents from low income areas (household income less than \$25,000) are through the ED — 25 percent higher than children from higher income areas.



Household Income and Hospital Admissions Through the Emergency Department





What are the most common reasons for hospital stays among neonates?

- Neonates are infants 30 days of age or less. The overwhelming majority (95 percent) of hospitalizations in the neonatal period are for newborn infants.
- The most common neonatal conditions that require extension of the newborn hospital stay or return to the hospital are conditions associated with bilirubin metabolism (hemolytic jaundice), prematurity (including respiratory distress), respiratory problems, infections, and congenital anomalies.
- Five of the top 10 most common diagnoses for neonates are for either respiratory problems or infections.

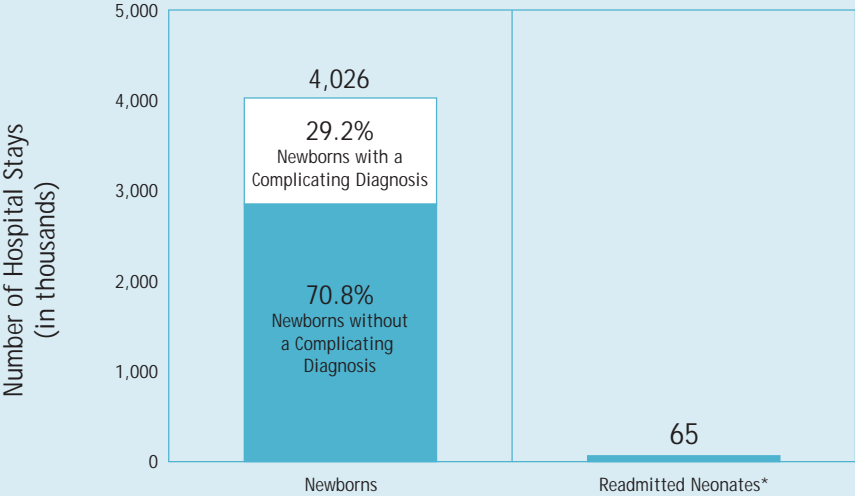
MOST COMMON PRINCIPAL DIAGNOSES	TOTAL NUMBER OF HOSPITAL STAYS (in thousands)	PERCENT OF HOSPITAL STAYS FOR ALL NEONATES
Newborn infants	3,899	95.3
Hemolytic jaundice and perinatal jaundice	32	0.8
Prematurity, low birth weight, and fetal growth retardation	23	0.6
Post-birth respiratory problems not elsewhere classified	13	0.3
Perinatal infections not elsewhere classified	11	0.3
Respiratory distress in infancy	11	0.3
Acute bronchitis	8	0.2
Cardiac and circulatory birth defects	8	0.2
Digestive birth defects	6	0.2
Newborn transitory tachypnea (rapid breathing)	5	0.1

How do newborns compare with infants admitted to the hospital after birth?

- A vast majority of hospitalizations for babies 30 days old or younger are newborns, born during that hospital stay. Only 2 percent of all hospitalizations in the first 30 days of life represent infants coming back to the hospital for some complication, such as jaundice and bronchitis.
- Over two-thirds of all babies (about 71 percent) are born and discharged from the hospital without any clinical problems or complicating diagnoses.



Hospital Stays for Newborn and Readmitted Neonates



* Readmitted neonates are babies 30 days or younger without a diagnosis for being born during that hospital stay, thus are likely to have been readmitted to the hospital.

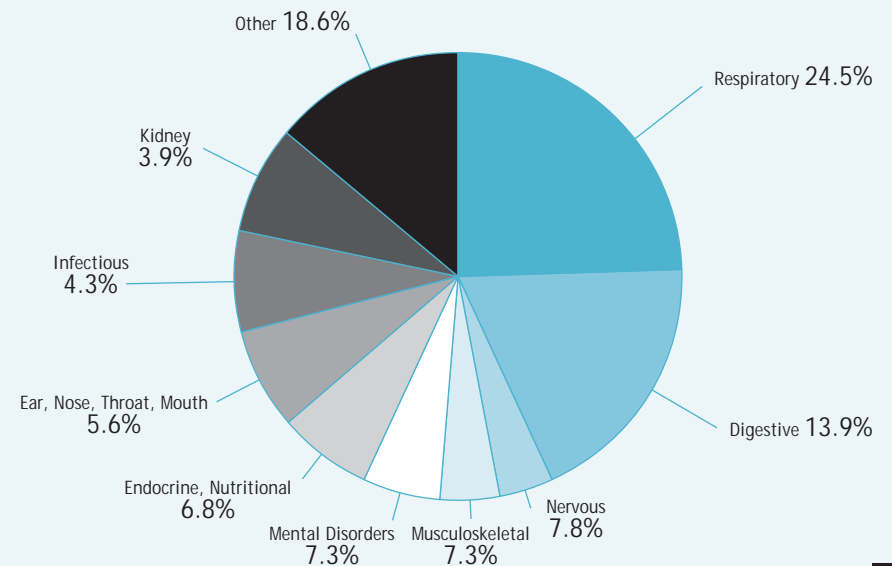
What are the most common pediatric illnesses*, by body system?



- Respiratory conditions, including asthma, pneumonia, and bronchitis, are the most common illnesses associated with pediatric hospitalizations.
- Digestive illnesses, including gastroenteritis, are the second most common pediatric conditions.
- About 7 percent, or 1 in 14 pediatric hospital stays are for mental disorders.

*Excludes neonates and pregnant adolescents.

Pediatric Illnesses, by Body System



What are the most common specific reasons for hospitalization among children and adolescents* admitted for illness?

- Three of the top 10 diagnoses in children and adolescents are respiratory diseases — pneumonia, asthma, and bronchitis.
- Pneumonia accounts for 8 percent and asthma accounts for 7 percent of all stays for pediatric illness.
- Affective disorders (primarily depression) are one of the top 10 reasons for hospitalization among children and adolescents with illness, accounting for 74,000 hospital stays in 2000.

*Excludes neonates and pregnant adolescents.

MOST COMMON PRINCIPAL DIAGNOSES	TOTAL NUMBER OF HOSPITAL STAYS (in thousands)	PERCENT OF HOSPITAL STAYS FOR CHILDREN AND ADOLESCENTS*
Pneumonia	161	7.8
Asthma	152	7.4
Acute bronchitis	137	6.7
Fluid and electrolyte disorders	88	4.3
Appendicitis	77	3.7
Affective disorders (primarily depression)	74	3.6
Epilepsy, convulsions	57	2.8
Urinary tract infections	48	2.3
Intestinal infections	47	2.3
Noninfectious gastroenteritis	42	2.1

What are the most common reasons for hospitalization for pediatric illness* by age group, compared with adults**?



- Infectious disease dominates the most common reasons for hospitalizations for pediatric illness throughout early childhood. Infections account for:
 - 6 of the top 10 diagnoses for infants.
 - 6 of the top 10 diagnoses for 1 to 2 year olds.
 - 5 of the top 10 diagnoses for 3 to 5 year olds.
- Respiratory diseases — asthma and pneumonia — are among the top 10 reasons for hospitalizations among all pediatric age groups in the hospital for illness.
- For children in the 3 to 5 and 6 to 12 age groups, asthma is the most common reason for hospitalization.
- Pneumonia is the most common reason for hospitalization among children 1 to 2 years. It is the second most common reason for hospitalization for children less than 1 year old and children 3 to 5 years old.

- Appendicitis is the second most common reason for hospitalization for children and adolescents 6 to 17 years old.
- In 2000, over 70,000 children's hospitalizations were for affective and other mental disorders. By age 13 to 17, affective disorders are the most common cause of hospitalization.
- For adolescents 13 to 17, injuries, including leg fractures, medication poisonings and head injuries, are among the most common reasons for hospitalization.
- While pneumonia and affective disorders rank in the top 10 for both pediatric and adult hospitalizations, most of the other diagnostic categories do not overlap, demonstrating the unique nature of hospital care for children.

*Excludes neonates and pregnant adolescents.

**Excludes women with maternal conditions.

What are the reasons for children's hospital stays?

MOST COMMON PRINCIPAL DIAGNOSES	CHILDREN*					ADULTS**
	< 1 YR	1–2 YRS	3–5 YRS	6–12 YRS	13–17 YRS	18+ YRS
Number of hospital stays (in thousands)						
Fever of unknown origin	13					
Acute bronchitis	105	26				
Viral infections	16	8				
Urinary tract infections	18		5			
Intestinal infections	15	16	6			
Other upper respiratory infections	15	14	6			
Noninfectious gastroenteritis	12	13	6			
Fluid and electrolyte disorders	23	32	14	13		
Asthma	16	44	29	48	15	
Pneumonia	44	55	25	27	9	1,095
Epilepsy, convulsions		17	9	14		
Skin infections		7		11		
Fracture of upper limb			5	14		
Maintenance chemotherapy, radiotherapy			5	14	10	
Appendicitis				40	31	
Fracture of lower limb				11	15	
Affective disorders (primarily depression)				16	58	586
Other mental disorders					26	
Poisoning by medications and drugs					13	
Diabetes mellitus with complications					12	
Head (intracranial) injuries					12	
Hardening of the arteries (atherosclerosis)						1,360
Congestive heart failure						1,023
Chest pain						792
Heart attack (myocardial infarction)						768
Irregular heartbeat (cardiac dysrhythmias)						647
Chronic obstructive pulmonary disease						614
Intervertebral disc disorders, back pain						585
Stroke (cerebrovascular disease)						578

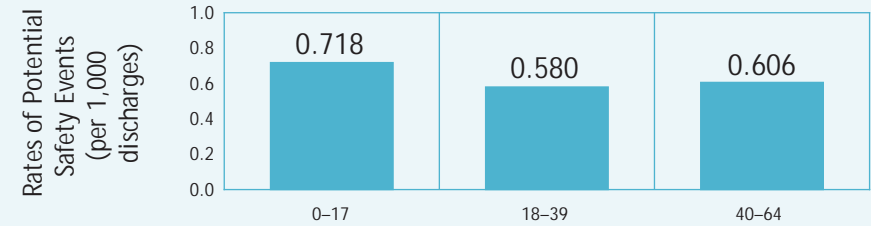
*Excludes neonates and pregnant adolescents. **Excludes women with maternal conditions.

How are hospitalized infants and children affected by potential patient safety problems* compared with adults?

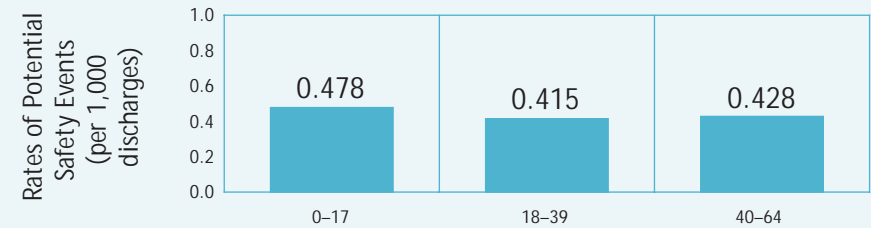
- One measure of the quality of hospital care for children and adolescents is the rate of patient safety events. Potential patient safety problems can be identified using hospital data and the AHRQ Patient Safety Indicators (PSIs).
- The rates of potential patient safety problems for children (excluding newborns and maternal cases) are comparable to rates for adults. Some potential patient safety problems are more common among children, for example, complications of anesthesia reactions and iatrogenic pneumothorax. Some events are more common among adults — postoperative hemorrhage or hematoma and postoperative thromboembolism — but significant rates are seen among children.

*The Agency for Healthcare Research and Quality (AHRQ) through the Stanford University-University of California Evidence-base Practice Center has developed a set of Patient Safety Indicators (PSIs) that can be used with the pediatric population. Additional information on current AHRQ PSIs and software can be found at: <http://www.qualityindicators.ahrq.gov/data/hcup/psi.htm>.

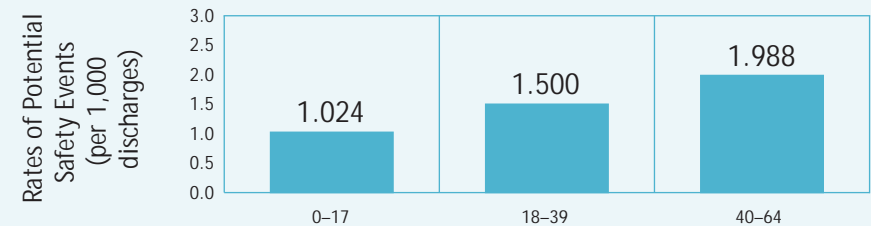
Rates of Complications of Anesthesia, by Age



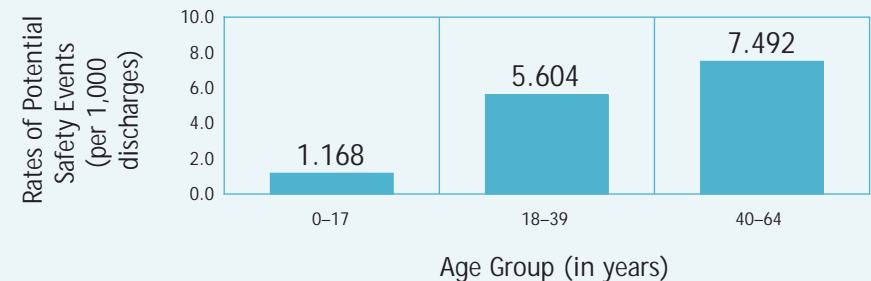
Rates of Iatrogenic Pneumothorax, by Age



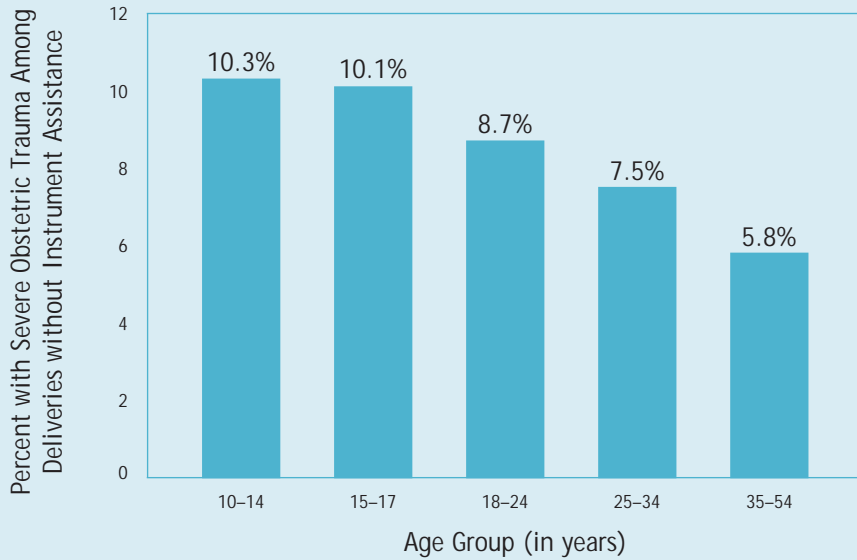
Rates of Postoperative Hemorrhage or Hematoma, by Age



Rates of Postoperative Pulmonary Embolus or Deep Vein Thrombosis, by Age



Rates of Severe Obstetric Lacerations and Trauma, by Age



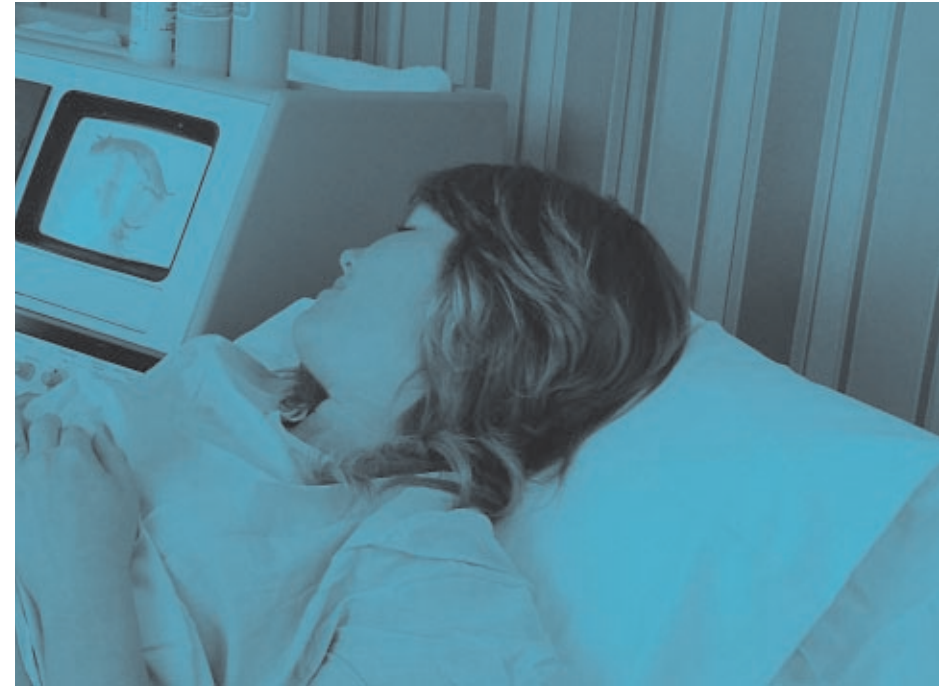
- The highest rates of severe obstetrical lacerations and trauma (e.g., lacerations of vagina, rectum and bladder) are seen among girls age 10 to 17, compared with older women giving birth. Compared with women age 25 to 34, adolescents 10 to 17 are about 35 percent more likely to experience severe obstetrical lacerations and trauma.



What are the most common reasons for pregnancy-related hospital stays, when no delivery occurs?



MOST COMMON PRINCIPAL DIAGNOSES	13-17 YRS	18-24 YRS	25-34 YRS	35-44 YRS
	Percent of hospital stays for pregnant females			
Early or threatened labor	23.6	21.9	18.5	12.7
Urinary tract infection complicating pregnancy	13.8	9.5	4.3	2.0
Spontaneous abortion	5.2	4.1	4.1	5.9
Hypertension complicating pregnancy, childbirth, and the puerperium	4.2	4.5	5.5	6.8
Severe vomiting (hyperemesis) with metabolic disturbance	3.2	4.1	3.4	
Missed abortion	2.7	2.4	3.2	4.6
Ectopic pregnancy	2.3	3.7	7.1	9.2
Hemorrhage during pregnancy, abruptio placenta, placenta previa	2.2	2.9	4.0	5.2
Induced abortion	2.1			2.2
Excess amniotic fluid and other problems of amniotic cavity	2.1			
Diabetes or abnormal glucose tolerance complicating pregnancy and childbirth		2.2	3.4	4.5
Mild vomiting		2.8	2.5	
Incompetence of cervix				2.0



- Some pregnant girls and women are admitted to the hospital for treatment of complications of pregnancy and no delivery occurs during that stay, because the complication has been successfully treated or early labor has been prevented.
- Pregnant adolescents hospitalized without delivery are more likely to be diagnosed with early or threatened labor and urinary tract infection than their older counterparts.
- Conversely, older women who are admitted for pregnancy but do not deliver are more likely to be diagnosed with hypertension, ectopic pregnancy, hemorrhage, and diabetes than are younger women.
- Nearly 24 percent of adolescents admitted for pregnancy without delivery are in the hospital because of early or threatened labor, compared with about 19 percent among women 25 to 34 and 13 percent among women 35 to 44.

- Ectopic pregnancy (in which the fetus grows outside the uterus) occurs in only 2 percent of adolescent hospital stays, compared with 7 percent of pregnancy stays for women 25 to 34 and 9 percent of pregnancy stays for women 35 to 44.
- Similarly, 2 percent of pregnancy admissions for adolescents are for hemorrhage during pregnancy, compared with 4 percent among women 25 to 34 and 5 percent among women 35 to 44.

What are the most common reasons for pregnancy-related hospital stays during which a baby is delivered?

- Trauma to the perineum and vulva includes damage from tearing the tissue around the vagina during labor and can result from instruments used during labor or a tear during delivery. Roughly equal percentages (approximately 20 percent) of deliveries among women under 34 years experience this condition.
- Compared with older women, adolescent deliveries are more likely to have diagnoses of early or threatened labor, hypertension complicating pregnancy, and excess amniotic fluid.
- Conversely, adolescent deliveries are less likely to be diagnosed with malposition of the fetus, and previous C-section.

MOST COMMON PRINCIPAL DIAGNOSES	13–17 YRS	18–24 YRS	25–34 YRS	35–44 YRS
	Percent of hospital stays for deliveries			
Trauma to perineum and vulva	20.5	19.7	20.8	18.6
Normal delivery without complications	13.3	15.0	11.7	6.6
Hypertension complicating pregnancy, childbirth, and the puerperium	6.2	4.6	4.0	4.4
Umbilical cord complication	6.0	7.0	6.9	5.5
Abnormal fetal heart rate	5.8	5.1	4.9	5.1
Fetal distress and abnormal forces of labor	5.7	6.1	6.1	5.6
Early or threatened labor	5.6	3.9		
Excess amniotic fluid and other problems of amniotic cavity	4.9	4.6	4.5	4.3
Malposition, malpresentation	3.1	3.5	4.7	5.5
Fetopelvic disproportion, obstruction	2.9		3.3	3.0
Previous Cesarean section (C-section)		5.0	9.1	12.6

What are the most common procedures received by neonates?

- Male circumcision is performed on about 30 percent of all births, making this elective procedure the most common one for all neonates. About 59 percent of all male newborns and 86 percent of all male newborns without a complicating diagnosis receive a circumcision.
- Prophylactic vaccinations and inoculations, primarily hepatitis B vaccinations, are the second most common procedure.
- Approximately 6 percent of all newborns are intubated at some point during their neonatal course, making this the third most common procedure performed on neonates.
- The most common diagnostic procedure among neonates — spinal tap, which is used to rule out neonatal meningitis — is performed on nearly 2 percent of all neonates.

MOST COMMON ALL-LISTED PROCEDURES	TOTAL NUMBER OF HOSPITAL STAYS (in thousands)	PERCENT OF HOSPITAL STAYS FOR ALL NEONATES
Circumcision	1,216	29.7
Prophylactic vaccinations and inoculations	454	11.1
Respiratory intubation and mechanical ventilation	243	5.9
Other vascular catheterization, not heart	152	3.7
Phototherapy of the newborn	130	3.2
Diagnosis and treatment of eye and ear problems	94	2.3
Diagnostic spinal tap	61	1.5
Tube feeding (intravenous or intestinal)	51	1.2
Respiratory therapy	41	1.0
Blood transfusion	27	0.7

What procedures do children receive in the hospital?



What are the most common procedures performed for pediatric illness*?

- The most common procedures performed on children and adolescents are diagnostic and supportive procedures including spinal taps (used to rule out meningitis) and respiratory therapy treatments (used for conditions such as asthma, pneumonia, and bronchitis).
- Appendectomy is the most common surgical procedure performed on non-neonatal, non-maternal children and adolescents, occurring over 238 times per day in the U.S.

*Excludes neonates and pregnant adolescents.

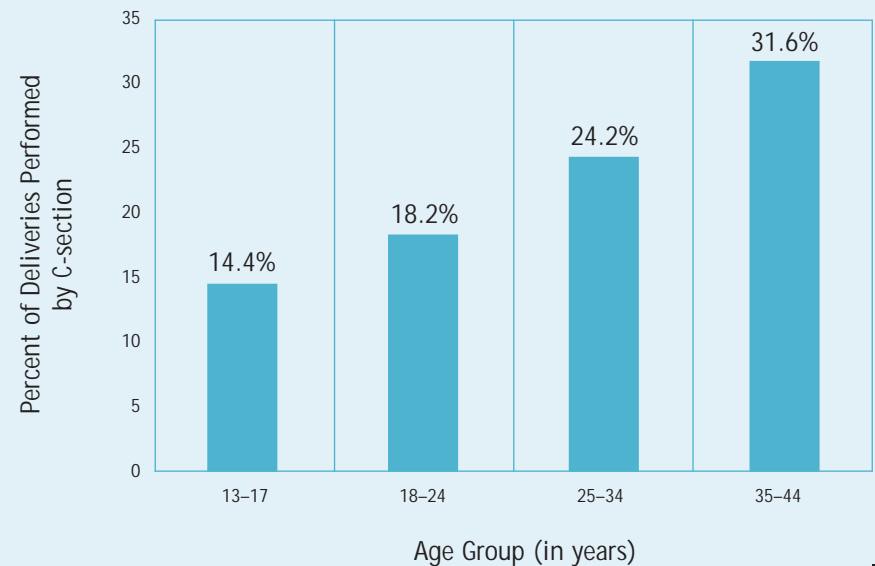
MOST COMMON ALL-LISTED PROCEDURES	TOTAL NUMBER OF HOSPITAL STAYS (in thousands)	PERCENT OF HOSPITAL STAYS FOR PEDIATRIC ILLNESS*
Diagnostic spinal tap	90	4.3
Appendectomy	87	4.2
Respiratory intubation and mechanical ventilation	74	3.6
Respiratory therapy	69	3.4
Other vascular catheterization, not heart	58	2.8
Blood transfusion	56	2.7
Cancer chemotherapy	49	2.4
Antibiotics	45	2.2
Other therapeutic procedures on muscles and tendons	34	1.6
Computerized axial tomography (CT) scan of head	26	1.3

How do adolescent C-section rates compare with those for older women?

- The likelihood of delivering by Cesarean section (C-section) increases with the age of the mother. About 14 percent of adolescent deliveries are by C-section, while 18 percent of women 18 to 24, 24 percent of women 25 to 34, and 32 percent of women 35 to 44 deliver their babies in this manner.



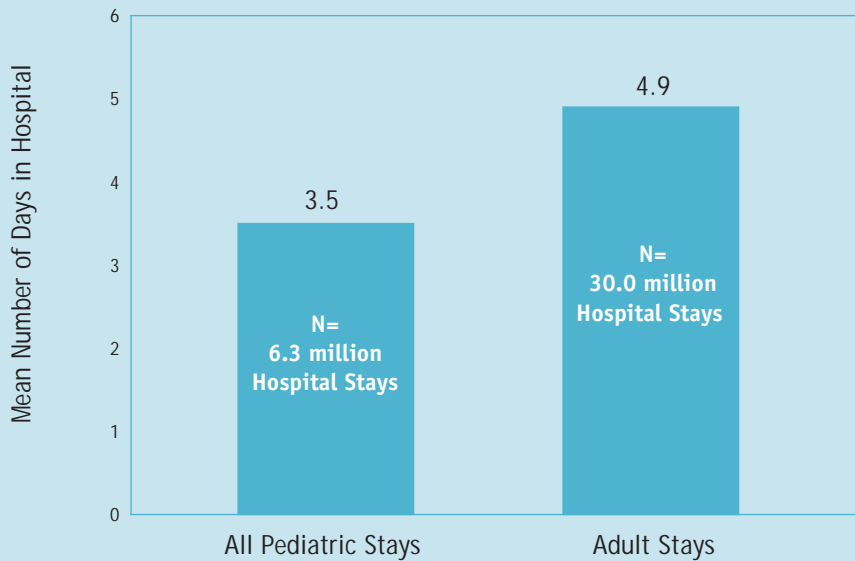
C-section Rates, by Age



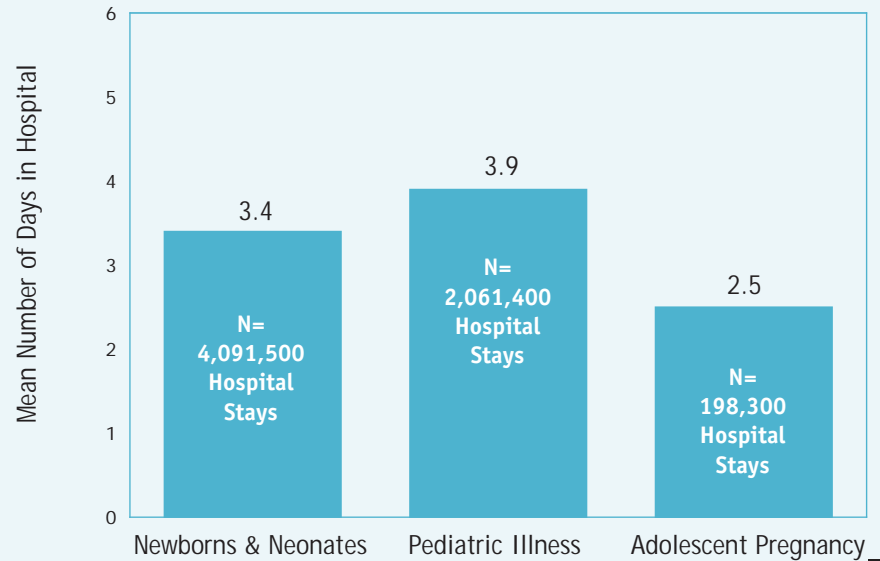
How does length of stay for children differ from adults?

- On average, children’s stays in the hospital are 29 percent shorter than adult stays.
- Newborns and neonates stayed in the hospital an average of 3.4 days.
- Children admitted for pediatric illness have the longest mean length of stay for all pediatric subgroups at 3.9 days.
- Pregnant adolescents have the shortest mean length of stay at 2.5 days.

Length of Hospitalization



Length of Hospitalization, Pediatric Subgroups



How long do children stay in the hospital?



Which diagnoses have the longest lengths of stay for all children?

- Three of the top 10 diagnoses with the longest lengths of stay are related to mental health: pre-adult mental disorders, anxiety and personality disorders, and affective disorders. (These discharges are from short-term hospitals, excluding long stay, psychiatric, and drug abuse treatment facilities.)
- Three of the top 10 diagnoses with the longest length of stay are conditions originating in the newborn period: prematurity, respiratory distress, and cardiac and circulatory birth defects.

MOST COMMON PRINCIPAL DIAGNOSES*	MEAN LENGTH OF STAY (in days)	TOTAL NUMBER OF HOSPITAL STAYS (in thousands)
Prematurity, low birth weight, and fetal growth retardation	23.3	25
Respiratory distress in infancy	23.3	11
Leukemia	14.7	7
Respiratory failure	11.3	6
Pre-adult mental disorders	9.7	17
Cardiac and circulatory birth defects	9.3	32
Aspiration pneumonitis	9.2	6
Anxiety and personality disorders	9.1	12
Affective disorders (primarily depression)	7.5	75
Complications of device, implant, or graft	6.7	28

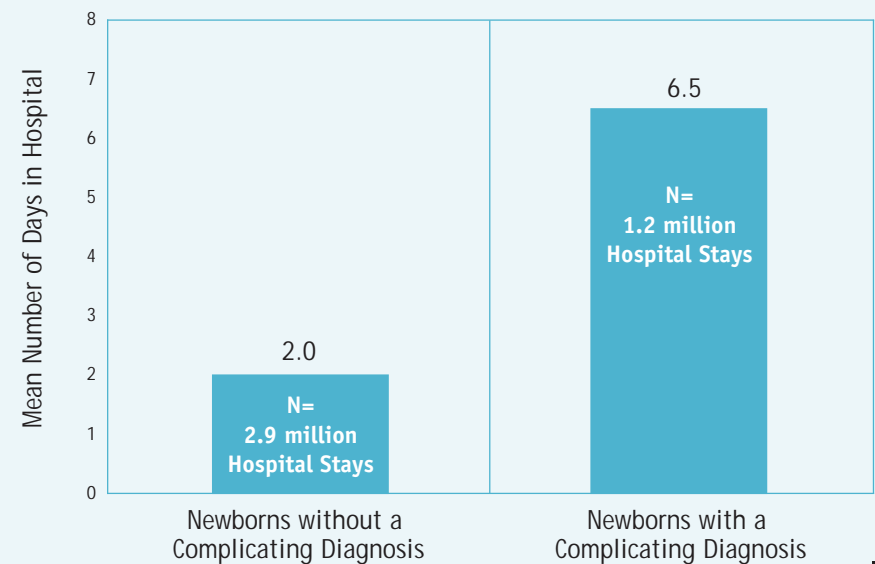
*Conditions with at least 3,000 cases.

How long are newborn hospital stays?



- The average length of stay for a newborn with a complicating diagnosis is nearly 7 days, compared with 2 days for newborns without a complicating diagnosis.
- Newborns who have some type of complicating diagnosis account for about 60 percent of all hospital days for newborns.

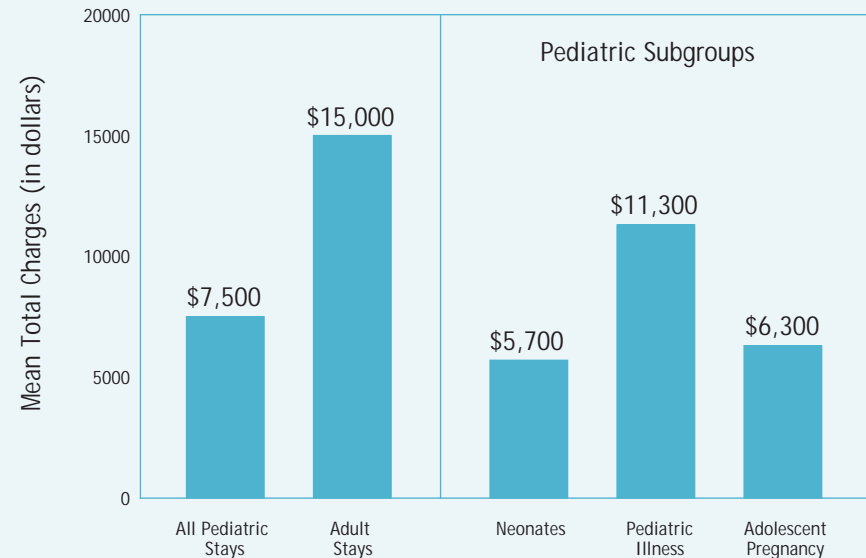
Length of Newborn Hospitalization



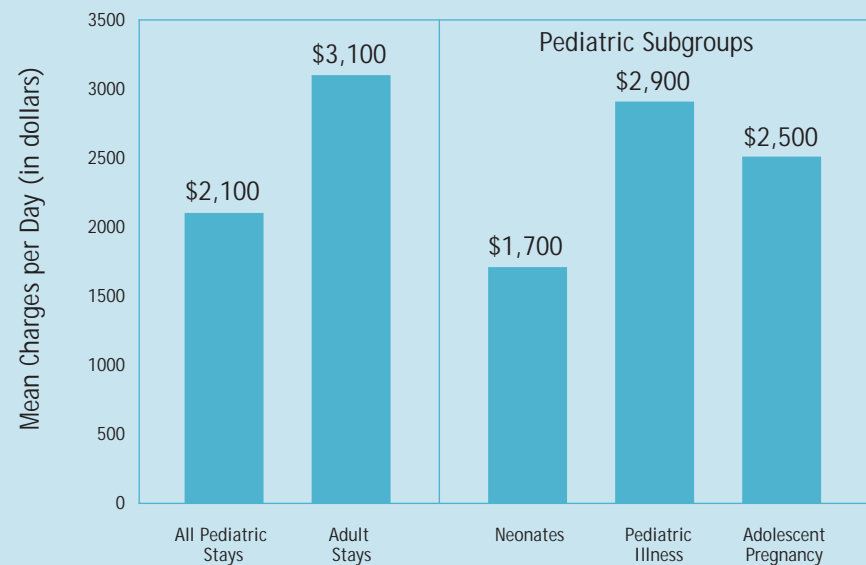
How expensive are hospital stays for children compared with adults?

- The average total charge for hospital stays for children is half that of adult stays, due to the shorter length of stay and lower intensity of services for children.
- Average total charges for a neonatal hospitalization are comparable to the average total charges for an adolescent pregnancy hospital stay.
- Average total charges for hospitalization for a pediatric illness are approximately twice the charges for either neonatal or adolescent pregnancy — over \$11,000 — approaching the average charge of hospital stays for adults.
- The average charge per day for a child's stay in the hospital is about 30 percent of the charge per day for an adult stay. However, the charge per day for pediatric illness (\$2,900) is nearly the same as charges for adult stays (\$3,100).

Charges for Hospitalization



Charges per Day in the Hospital

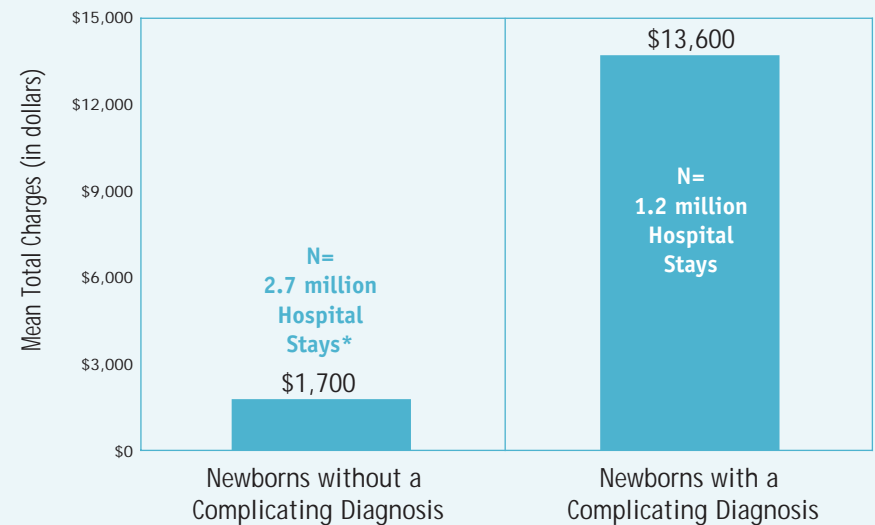


How expensive are hospital stays for newborns?

- The average charge for a complicated newborn hospital stay is \$13,600, compared with \$1,700 for an uncomplicated newborn stay.
- Charges for complicated newborn stays average about \$2,000 per day compared to \$900 per day for normal newborn stays.



Charges for Newborn Hospitalization



*Number of total hospital stays reflects total number of records with total charge information.

What are the most expensive diagnoses for children and adolescents?

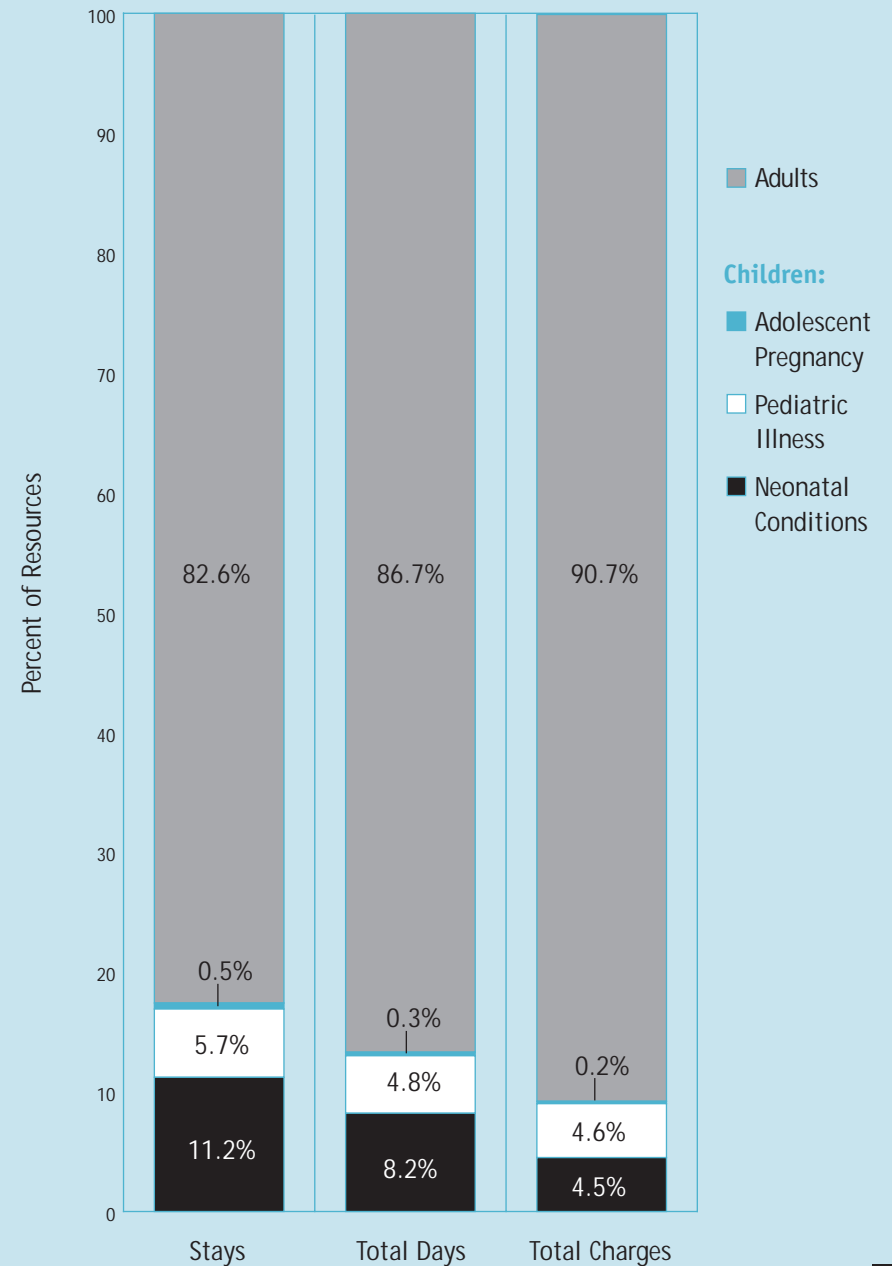
- The most expensive condition nationally is also the most common reason for children's stays in the hospital — being born. Nationally, over \$17 billion dollars are charged for newborn hospital stays, most of which are uncomplicated.
- Conditions identified in the neonatal period are among the most expensive diagnoses for all children — prematurity, cardiac and circulatory birth defects, birth defects, respiratory distress syndrome and other neonatal respiratory problems, accounting for \$4.6 billion in charges or 10 percent of the total dollars spent on hospital stays for children and adolescents.
- Three respiratory problems — pneumonia, acute bronchitis and asthma — are responsible for nearly \$3 billion in charges or nearly 7 percent of the total U.S. health care bill for children and adolescents.

PRINCIPAL DIAGNOSES	AGGREGATE TOTAL CHARGES (the "National Bill")	TOTAL NUMBER OF DISCHARGES (in thousands)
ALL HOSPITAL STAYS FOR CHILDREN	\$45,954,444,000	6,351
Newborn infants	\$17,176,271,000	3,900
Cardiac and circulatory birth defects	\$1,903,720,000	32
Prematurity, low birth weight, and fetal growth retardation	\$1,361,222,000	25
Pneumonia	\$1,320,473,000	164
Acute bronchitis	\$880,280,000	145
Asthma	\$835,006,000	152
Appendicitis	\$818,484,000	77
Complication of device, implant or graft	\$742,858,000	28
Respiratory distress syndrome	\$725,686,000	11
Other neonatal respiratory problems	\$669,076,000	26

What percentage of hospital resource use is attributable to children compared with adults?

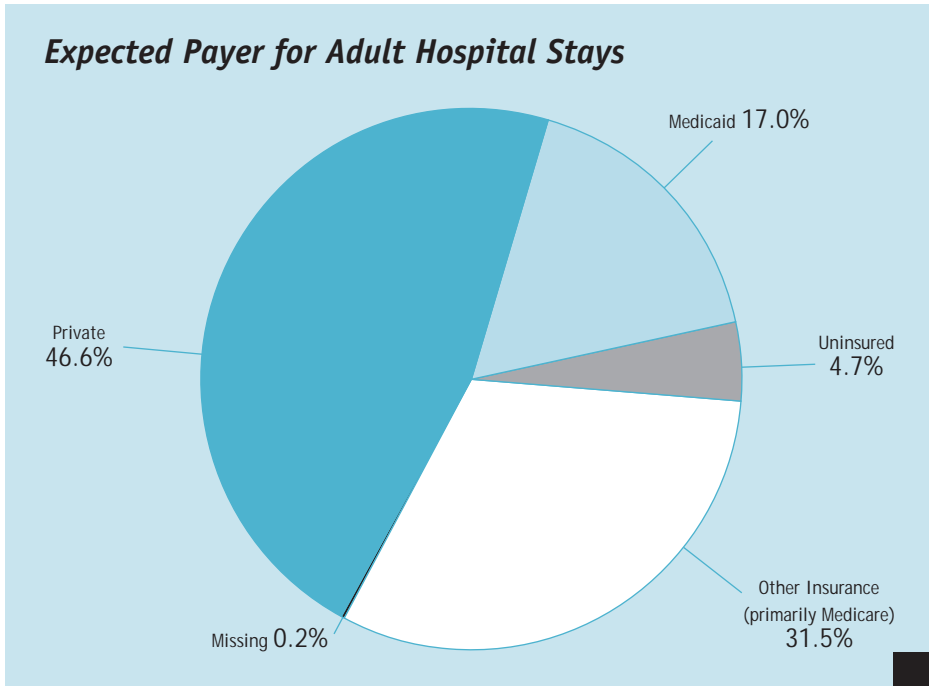
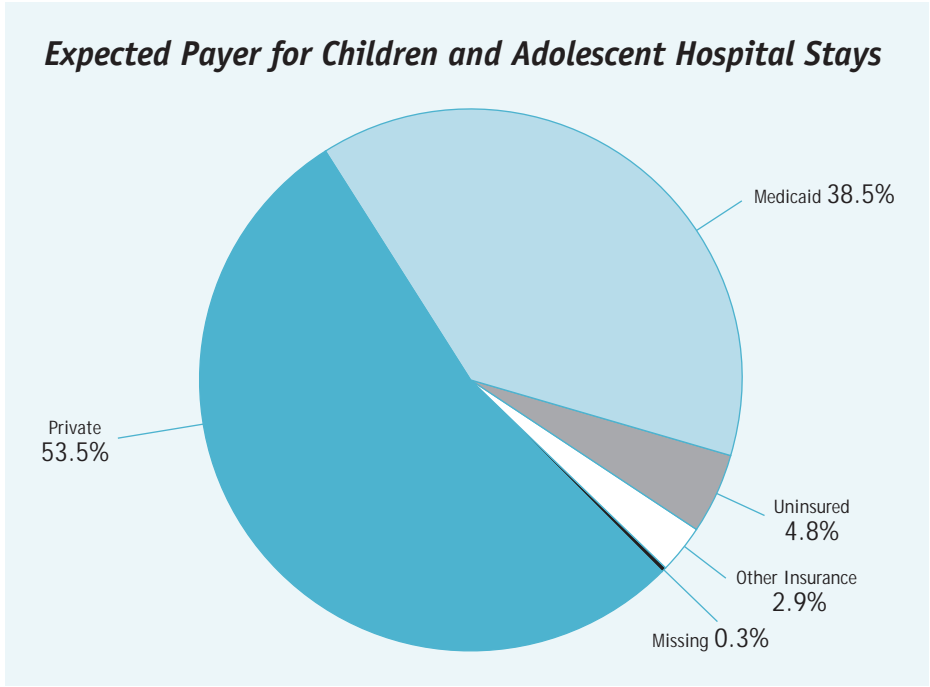
- Care for children and adolescents accounts for about 18 percent of all hospital stays, about 13 percent of all days in the hospital, and about 9 percent of total hospital charges.
- Newborns and neonates account for about 8 percent of all days in the hospital. Pediatric illness accounts for about 5 percent of all hospital days. Adolescent pregnancy accounts for less than 1 percent of all hospital days.
- Among all children and adolescents, neonatal conditions account for 48.7 percent of hospital charges, pediatric illnesses account for 48.8 percent, and adolescent pregnancies accounts for less than 3 percent.
- In total, children use 10 to 20 percent of all hospital resources compared to the 80 to 90 percent used by adults, as measured by hospital stays, length of hospitalization, and total charges.

Total Hospital Resource Use





Who is billed for children's hospital stays? How does this compare to adult stays?



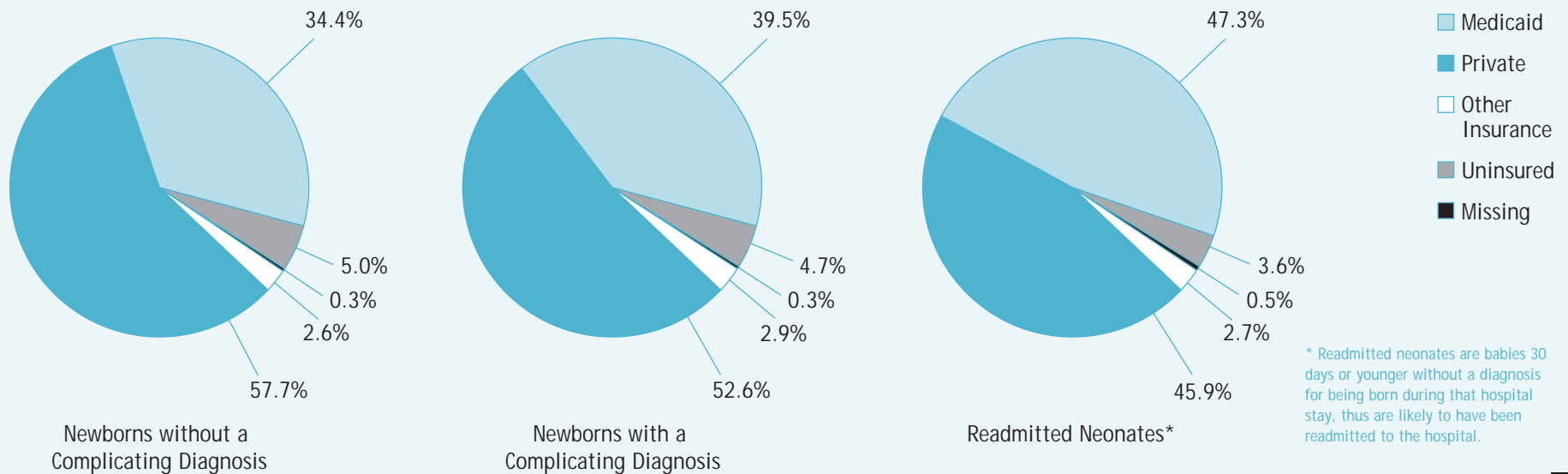
- About half of both pediatric and adult patients have private health care coverage: 54 percent of children and adolescents in the hospital are privately insured while 47 percent of adults are privately insured.
- About 39 percent of children's hospitalizations are billed to Medicaid — a joint State and Federal Government program.
- Nearly half of adult stays are billed to some type of government program — 17 percent of adult stays are billed to Medicaid and 32 percent of adult stays are billed to the Federal Medicare program.
- For both children and adults admitted to the hospital in 2000, nearly 5 percent of hospital stays were uninsured. This is similar to the percent of hospital stays that were uninsured in 1997.*

*Discharge data, such as HCUP, do not provide the details on enrollment in State Children's Health Insurance Programs (SCHIP).

Who is billed for neonatal hospital stays?

- About 34 percent of *uncomplicated* newborn hospital stays are billed to Medicaid, while nearly 58 percent are billed to private insurance.
- Nearly 40 percent of *complicated* newborn stays are billed to Medicaid, while the share billed to private insurance is over 52 percent.
- For neonates readmitted in the first 30 days of life, the share billed to Medicaid is similar to private insurance. About 47 percent of all babies readmitted to the hospital are covered by Medicaid and 46 percent are covered by private insurance. Thus, Medicaid bears a larger burden of complicated newborn and neonatal care than private insurance.

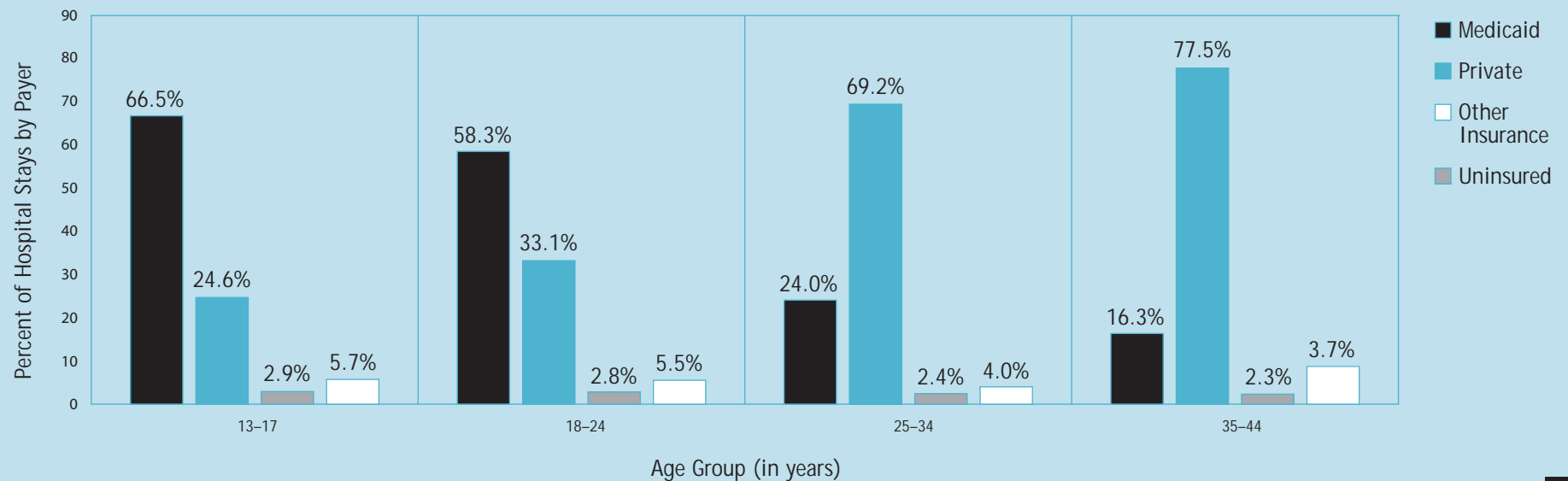
Expected Payer for Neonatal Hospital Stays



Who is billed for pregnancy-related hospital stays for adolescents, compared with older women?

- Over two-thirds of all adolescent admissions for pregnancy or childbirth are billed to State Medicaid programs. Private insurers are billed for one-fourth of these adolescent pregnancy stays and approximately 6 percent are uninsured.
- Conversely, only one-fourth of hospital stays for pregnant women 25 to 34 are billed to Medicaid and over two-thirds are billed to private health insurance. Four percent of stays for maternal cases in this age group are uninsured.
- Thus, compared with women 25 to 34, Medicaid bears a much larger burden of care for pregnant adolescents than private insurance.

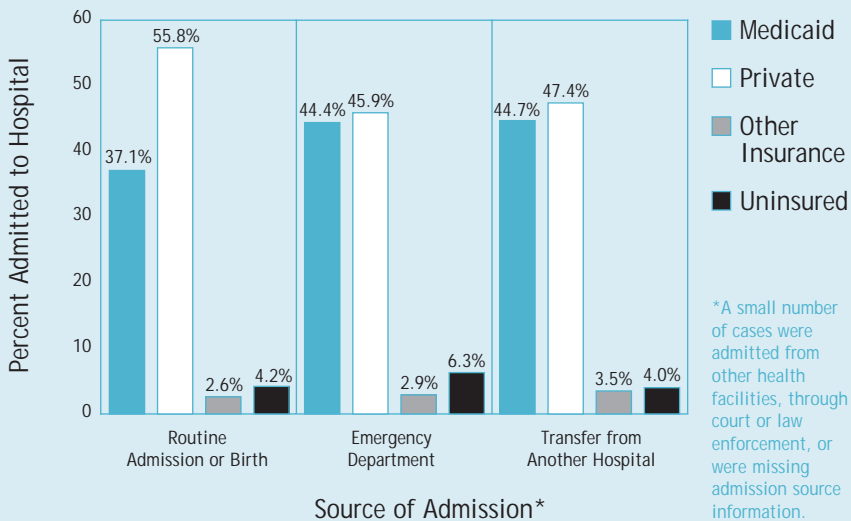
Expected Payer for Pregnancy-Related Hospital Stays



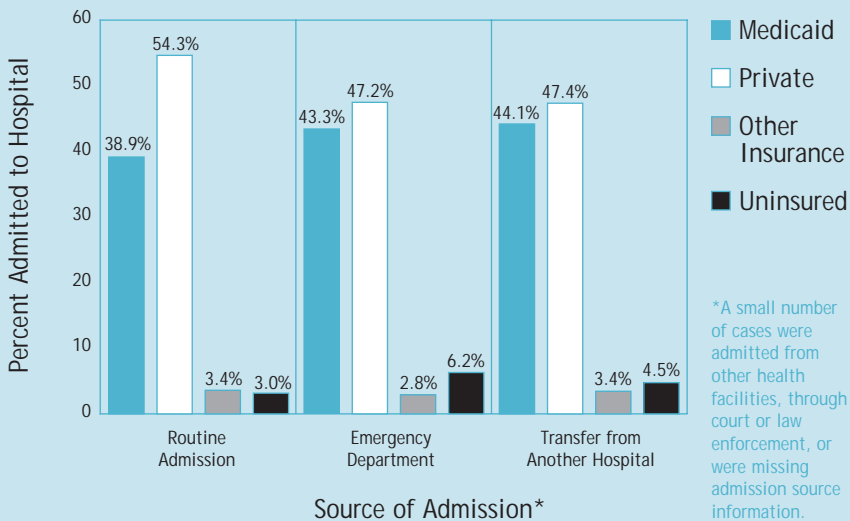
Who is billed for children's hospital stays, by source of admission?

- Private insurance is billed for the majority of routine hospital admissions for children (56 percent). Medicaid covers over one-third of routine hospital admissions for children (37 percent).
- In contrast, approximately half of admissions that begin in the emergency department or another hospital are billed to private insurers and half are billed to Medicaid.

Expected Payer by Source of Admission, including Neonates and Maternal Cases



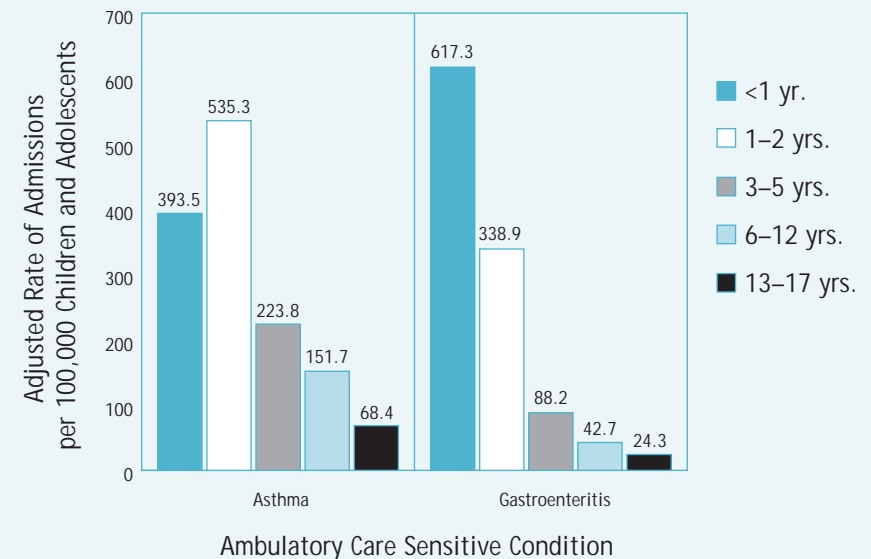
Expected Payer by Source of Admission, excluding Neonates and Maternal Cases



Who is billed for ambulatory care sensitive conditions*?

*Excludes neonates and pregnant adolescents.

Rates of Ambulatory Care Sensitive Conditions, by Age

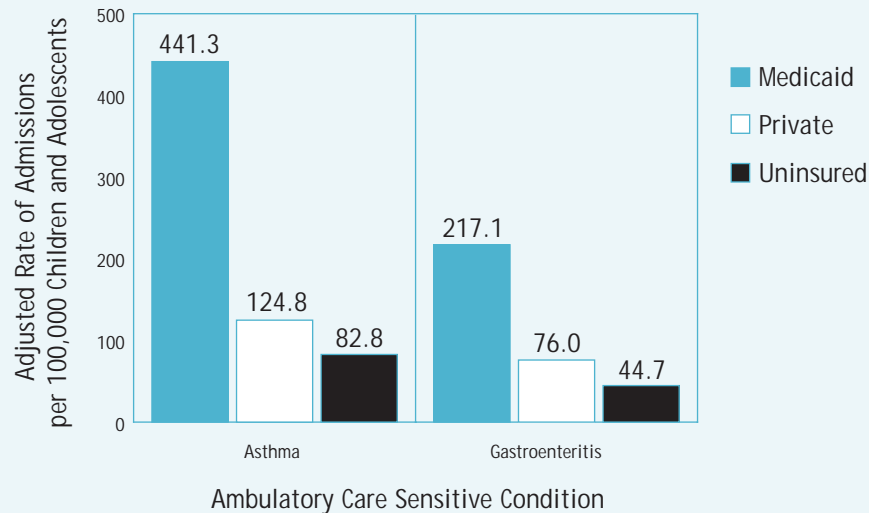


Ambulatory care sensitive (ACS) conditions are conditions for which timely access to quality outpatient care can potentially prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease. The Agency for Healthcare Research and Quality (AHRQ) through the Stanford University-University of California Evidence-based Practice Center has developed Prevention Quality Indicators (PQIs)** to identify ambulatory care sensitive conditions, including several pediatric-specific conditions — asthma and gastroenteritis.

- Children and adolescents of all ages were admitted to the hospital for ACS conditions, including asthma and gastroenteritis.
- Asthma is a common reason for children's hospital admission that is potentially preventable. In fact, 4 to 5 out of 1,000 children under age 3 were admitted for asthma in 2000. The hospital admission rate for asthma decreases among older children, but admissions are still high with 1 out of 1,000 6 to 12 year olds being admitted for asthma.



Rates of Ambulatory Care Sensitive Conditions, by Expected Payer



- Gastroenteritis is the most common ACS condition for infants less than 1 year old, being responsible for over 600 admissions per 100,000 children. This suggests that access to good outpatient services and early attention to gastroenteritis could prevent many hospitalizations of infants.
- Children and adolescents enrolled in Medicaid are 3 times more likely to be admitted for asthma and gastroenteritis than privately insured children and adolescents and 5 times more likely to be admitted for these potentially preventable conditions than uninsured children and adolescents. Thus, children and adolescents enrolled in Medicaid disproportionately require inpatient care for conditions that could be treated on an outpatient basis.

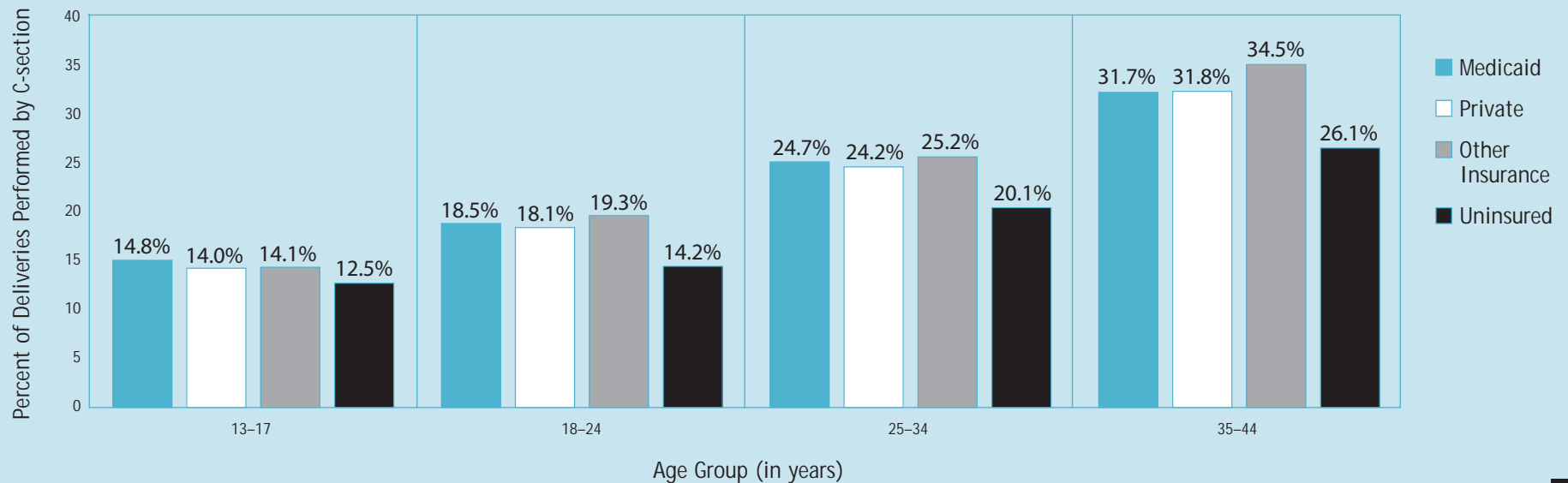
**The AHRQ POIs were designed to be used with readily available hospital administrative data. While national level statistics are presented in this Fact Book, they can be used to identify unmet health care needs in the community, monitor how well complications from a number of common conditions are being avoided in the outpatient setting, and compare performance of local health care systems across communities. More information on POIs can be found at <http://www.qualityindicators.ahrq.gov/data/hcup/prevqi.htm>.



Who is billed for C-section deliveries?

- Similar to older women age 18 to 34, pregnant adolescents covered by Medicaid are slightly more likely to deliver their babies by Cesarean section (C-section) than those with private insurance.
- Pregnant adolescents with no health insurance coverage are the least likely to deliver by C-section, which raises the question about the influence of insurance status on choice of procedures.

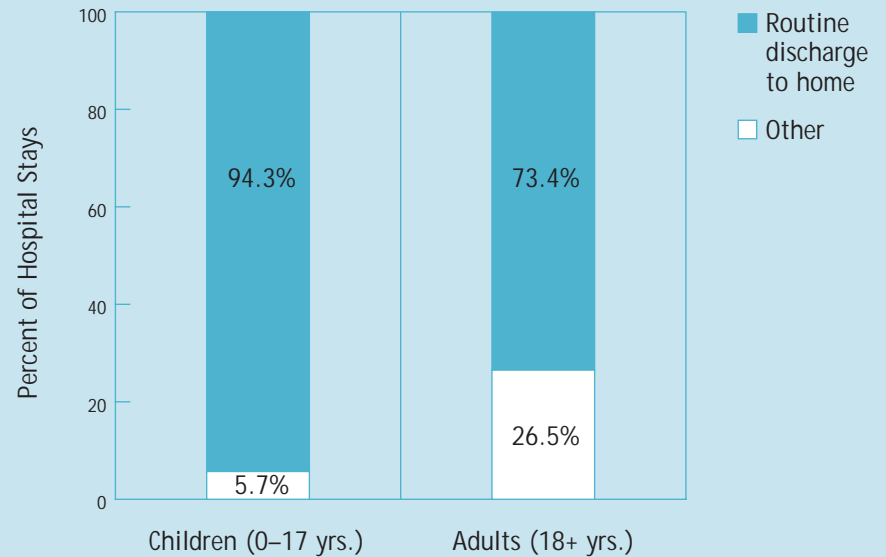
Expected Payer for C-section Deliveries, by Age



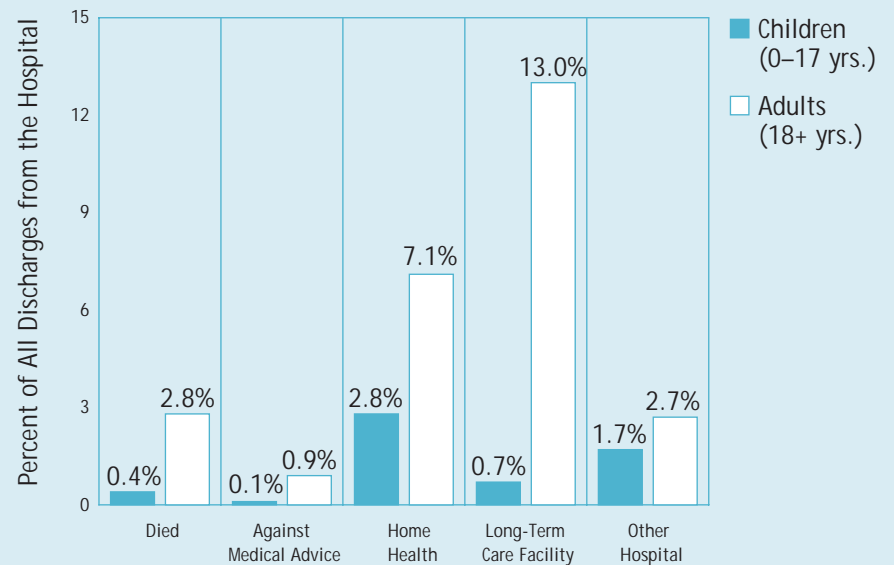
What is the discharge status of children compared with adults?

- Most discharges for children (94 percent) and adults (73 percent) are routine, that is, they are discharged to their homes without additional special medical care.
- Less than half of 1 percent of children’s hospital stays end in death compared to nearly 3 percent of adult hospital stays.
- Compared to children, adults are nearly 3 times more likely to be discharged to home health care and 18 times more likely to be discharged to a long-term care facility, such as a skilled nursing facility or rehabilitation center.
- Nationwide, 47,000 discharges require pediatric long-term care compared to 3.9 million adult long-term care placements. Similarly, 178,000 discharges for children require home health services compared to 2.1 million for adults.

Discharge Status



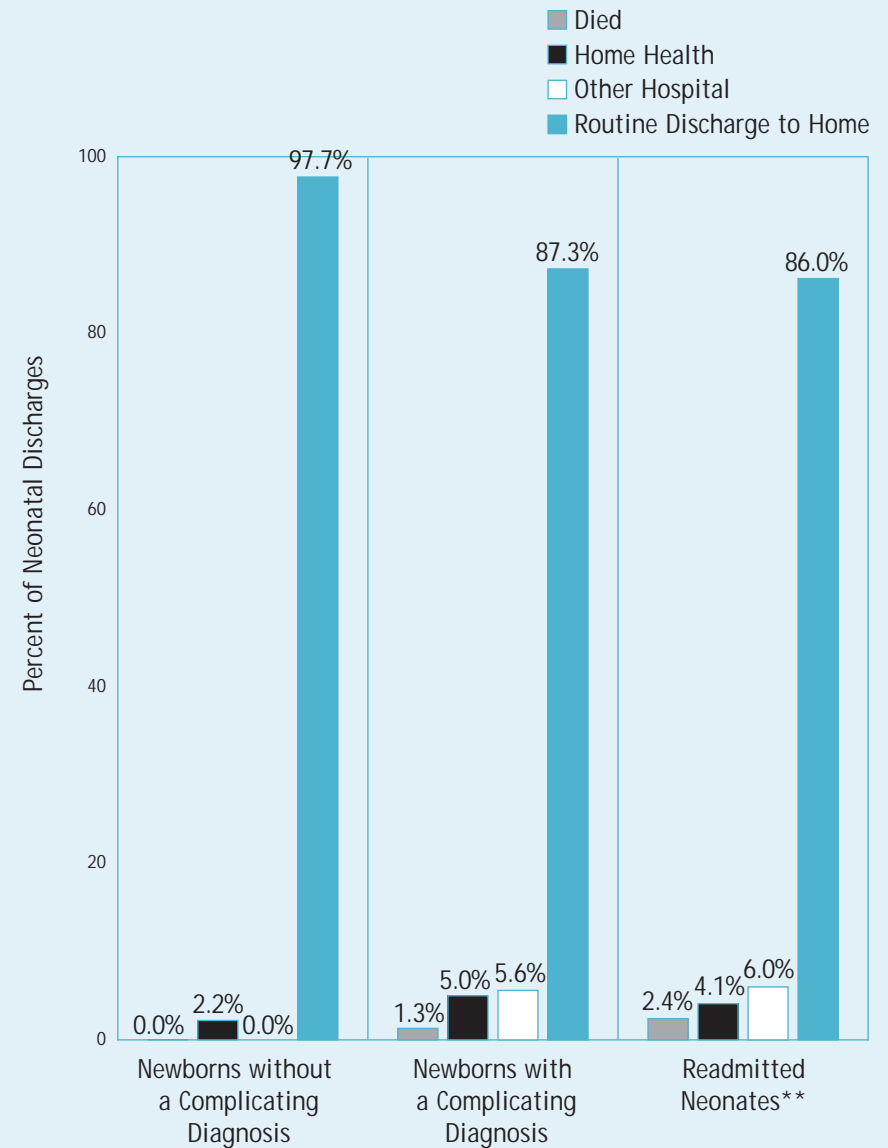
Discharge Status Other than “Home”



What is the discharge status of neonates?

- About 2 percent of newborns without a complicating diagnosis have home health assistance in the post-partum period compared with about 5 percent of newborns with a complicating diagnosis and 4 percent of readmitted neonates.
- Six percent of newborns with a complicating diagnosis and readmitted neonates are transferred to another hospital.
- Overall, about 17,100 neonates in 2000 died in hospitals within 30 days of birth. While death is extremely rare for newborns without complications, over 1 percent of newborns with a complicating diagnosis and over 2 percent of readmitted neonates died during their stay.

Discharge Status of Neonates*



*A small number of cases were discharged to a long-term care facility, against medical advice or were missing discharge information.

** Readmitted neonates are babies 30 days or younger without a diagnosis for being born during that hospital stay, thus are likely to have been readmitted to the hospital.

Source of Data for This Report

The data presented in this report are drawn from the Healthcare Cost and Utilization Project (HCUP), a Federal-State-Industry partnership to build a multi-state health care data system. This partnership is sponsored by the Agency for Healthcare Research and Quality (AHRQ) and is managed by staff in AHRQ's Center for Delivery, Organization and Markets. HCUP is based on data collected by individual State data partners and provided to AHRQ by the State data partners. HCUP would not be possible without State data collection projects and their partnership with AHRQ.

For 2000, 29 State data organizations contributed their data to AHRQ where all data are edited and transformed into a uniform format. The uniform data in HCUP databases make possible comparative studies of health care services and the use and cost of hospital care, including:

- the effects of market forces on hospitals and the care they provide,
- variations in medical practice,
- the effectiveness of medical technology and treatments, and
- use of services by special populations.

HCUP includes short-term, non-Federal, community hospitals (general and specialty hospitals such as pediatric, obstetrics-gynecology, short-term rehabilitation, and oncology hospitals are included). Long-term care and psychiatric hospitals are excluded as are substance abuse treatment facilities.

HCUP includes several sets of inpatient databases for health services research. The 2000 State Inpatient Databases (SID) covers inpatient care in community hospitals, as defined by the American Hospital Association (AHA), in 29 States and include nearly 80 percent of all

hospital discharges in the U.S. The 2000 Nationwide Inpatient Sample (NIS) includes all discharges from a sample of about 1,000 hospitals drawn from the SID, selected to approximate a national sample. The 2000 Kids' Inpatient Database (KID) is a sample of discharges for children and adolescents, 20 years and younger, drawn from the SID developed from 27 State data organizations.

This report is based on data from the 2000 KID and the 2000 NIS. The KID is a stratified probability sample of pediatric discharges which includes 10 percent of all uncomplicated in-hospital births and 80 percent of other pediatric discharges from all hospitals in the sampling frame. The KID was designed to enable studies of relatively uncommon conditions and procedures among children and adolescents and provides the capacity for weighted national estimates. Sampling weights are based on key hospital characteristics: region, ownership and control, rural or urban location, teaching status, size of the hospital, and whether the hospital is a children's hospital, as defined by the National Association of Children's Hospitals and Related Institutions (NACHRI). The subset of data from the 2000 KID used in this Fact Book includes 2.0 million discharge records for children 17 years and younger that were weighted to represent all pediatric discharges for children in this age range in the U.S. (6.3 million discharges). The 2000 NIS was used to provide comparisons with the adult population (18 years and older). The NIS approximates a 20-percent sample of U.S. community hospitals. The 2000 NIS includes information from 6.1 million discharges that were weighted to obtain estimates that represent the total number of inpatient hospital discharges in the U.S. (30 million discharges).

Methods

The Clinical Classifications Software (CCS), developed by AHRQ, has been used throughout this Fact Book to aggregate diagnosis and procedure codes into a limited number of categories. Diagnoses and procedures recorded on hospital discharge records are coded using the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM), Fifth Edition*. Although ICD-9-CM may be used to provide descriptive statistics, aggregating similar diagnoses or procedures into clinically meaningful categories, such as the CCS, can be more helpful. For some CCS categories, details are provided using individual ICD-9-CM procedure codes. More information on CCS can be downloaded from AHRQ's website (www.ahrq.gov/data/hcup).

The groupings for children's hospital stays were based on age, gender, principal (or first-listed) CCS categories, diagnostic related group (DRG) codes, and major diagnostic category (MDC) codes. Hospital records for neonatal conditions were identified as those with DRG codes 385-391, MDC code 15, or age calculated as less than or equal to 30 days. Hospital records for pediatric illness were identified as those with a calculated age greater than or equal to 31 days and a principal diagnoses unrelated to neonatal and maternal conditions. Hospital records for maternal conditions were identified as those with a CCS code between 176-196, MDC code 14, and a recorded gender of female.

Frequencies and rankings of diagnoses are based on the principal diagnosis. Frequencies and rankings of procedures are based on all-listed procedures, that is, all procedures listed on the discharge record. The unit of analysis is the inpatient stay, rather than the patient. All discharges from the KID and the NIS have been weighted to produce national estimates.

Total charges in HCUP data are the amount the hospital charged or billed for the entire hospital stay and do not reflect charges for individual procedures. Charges do not necessarily reflect reimbursements or the costs of actually producing the service



(and are generally higher than costs). Hospital charges do not include professional (physician) fees. Charge data were present for 98 percent of all discharges.

Because the 2000 KID is limited to inpatient hospital data, conditions treated in outpatient settings or procedures performed in outpatient or ambulatory care settings are not reflected here.

For More Information

More information regarding HCUP data is available at www.ahrq.gov/data/hcup, as well as on the HCUP User Support Web site at www.hcup-us.ahrq.gov. More information on the AHRQ Quality Indicators is available at <http://www.qualityindicators.ahrq.gov/>.

Additional descriptive statistics can be viewed through HCUPnet (<http://www.ahrq.gov/data/hcup/hcupnet.htm>), a Web-based tool providing easy access to information on hospital stays.

KID DATA CURRENTLY AVAILABLE INCLUDE:

2000

1997

NIS DATA CURRENTLY AVAILABLE INCLUDE:

2001

2000

1999 (PB 2002-500020)

1998 (PB 2001-500092)

Release 6, 1997 (PB 2000-500006)

Release 5, 1996 (PB 99-500480)

Release 4, 1995 (PB 98-500440)

Release 3, 1994 (PB 97-500433)

Release 2, 1993 (PB 96-501325)

Release 1, 1988-1992 (PB 95-503710)

NIS and KID data can be purchased for research through the HCUP Central Distributor sponsored by AHRQ: Social and Scientific Systems, Inc., telephone: 866-556-4287 (toll-free), fax: 301-628-3201 or e-mail: hcup@s-3.com.

Price of the NIS data is \$322 for Release 1; \$160 per year for 1993 to 1999; and \$200 for 2000 and 2001. Price of the KID data is \$220 for each year. All prices may be higher for customers outside the United States, Canada, and Mexico.

AHRQ is always looking for ways in which AHRQ-funded research, products, and tools have changed people's lives, influenced clinical practice, improved policies, and affected patient outcomes. Impact case studies describe AHRQ research findings in action. These case studies have been used in testimony, budget documents, and speeches. If you are aware of any impact AHRQ-funded research or products, such as HCUP, have had on health care policy, clinical practice, or patient outcomes, please let us know.

Healthcare Cost and Utilization Project (HCUP)
Agency for Healthcare Research and Quality
Center for Delivery, Organization, and Markets
Phone: (866) 290-HCUP
E-mail: HCUP@AHRQ.gov



AHRQ Publication No. 04-0004

October 2003

ISBN 1-58763-137-7

U.S. Department of Health and Human Services
Agency for Healthcare Research and Quality
540 Gaither Road
Rockville, MD 20850
www.ahrq.gov