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STATISTICAL BRIEF #155

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Emergency Department Transfers to Acute Care Facilities, 2009

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Introduction

The Emergency Medicine Treatment and Labor Act (EMTALA), passed by Congress in 1986, mandates that hospitals conduct a medical screening exam for all patients presenting for care in the emergency department (ED) regardless of their citizenship, legal status, or ability to pay.¹ Hospitals vary widely in the services they offer to care for patients with acute and chronic medical problems. When a hospital does not have the ability or capacity to handle a patient's condition, the decision often is made to transfer the patient to another acute care hospital.

Reasons for transfer are based on the patient's clinical needs and the hospital's available services and resources.² Patients often are moved to specialty centers or to hospitals capable of providing higher levels of care that are not available in the original hospital.³ Transfer may be based on available specialty coverage; studies have shown increasingly sparse coverage for some specialties.^{4,5} In most cases, hospitals with specialized capabilities are obligated to accept transfers from hospitals that lack the capability to treat emergency medical conditions.

This Statistical Brief presents national estimates from the Healthcare Cost and Utilization Project (HCUP) on ED visits in 2009 and focuses on transfers out of EDs to other acute care hospitals. Patient factors such as age, sex, and primary expected payer, as well as hospital factors such as trauma level, teaching status, and ownership are examined with respect to patient disposition at discharge from the ED. We compare the distribution of ED transfers to other dispositions, including admission to the hospital and treatment and release from the ED. Transferred patients may have more in common with admitted patients than treat-and-release patients because they need a higher

Highlights

- Approximately 1.5% of ED encounters resulted in transfer to another acute care facility.
- Medicare patients were more likely to be transferred from the ED to another hospital compared to all other payer groups.
- Patients with emergent conditions and those requiring specialty care had higher rates of transfer.
- Very young children had relatively high transfer rates; 1.9% of patients younger than 1 year were transferred, and several of the high-transfer diagnostic categories were birth related.
- Elderly patients were nearly twice as likely to be transferred as the overall average.
- Rates of transfer were higher for ED encounters from rural areas.
- ED encounters leading to transfer were more common from non-trauma, non-teaching, and public hospitals.

¹ Bitterman RA. Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA). PL 99-272. Title IX, Section 9121, 100 Stat 167 (1986).

² American College of Chest Physicians. Providing Emergency Care Under Federal Law: EMTALA. Dallas: American College of Emergency Physicians; 2001.

³ One recent study found that only 53% of hospitals admitted pediatric patients, only 25% of EDs had access 24 hours and 7 days a week to a board certified pediatric emergency medicine attending physician, and only 6% had all recommended pediatric emergency supplies. See Middleton KR, Burt CW. Availability of pediatric services and equipment in emergency departments: United States, 2002–2003. *Adv Data*. 2006 Feb 28;(367):1–16.

⁴ A survey of neurosurgeons showed decreasing trauma call coverage because of higher medico-legal risk, conflict with elective practice, time requirements, and perceived inadequate compensation. See Cohn SM, Price MA, Stewart RM, et al. A crisis in the delivery of care to patients with brain injuries in South Texas. *J Trauma*. 2007 Apr; 62(4):962–3.

⁵ Esposito TJ, Reed RL 2nd, Gamelli RL, et al. Neurosurgical coverage: essential, desired, or irrelevant for good patient care and trauma center status. *Ann Surg*. 2005 Sep;242(3):364–70; discussion 370–4.

level of care prior to discharge. It is important to note that not all transferred patients are admitted after being evaluated in the receiving hospital's ED; however, it was not possible to examine this issue in the current analysis. Several specific diagnostic categories also are explored, particularly with respect to rates of transfer. All differences between estimates noted in the text are statistically significant at the 0.05 level or better.

Findings

General findings

In 2009, there were an estimated 128,885,040 ED encounters. Most ED encounters (82.8 percent) resulted in treatment and release (routine discharge), but 15.7 percent were admitted to the same hospital (table 1). Approximately 1.5 percent of ED encounters resulted in transfer to another short-term acute care hospital.

Patient factors

ED encounters resulting in transfer differed from encounters resulting in admission and treatment and release. In particular, children younger than 1 year had relatively high transfer rates, which may be related to a lack of ED or inpatient providers with experience caring for children with problems that require more complex care. Also, patients aged 65 years and older were transferred at nearly twice the rate of the overall average (2.7 percent compared to 1.5 percent).

The disposition of encounters also differed by the patient's primary expected payer. Encounters by patients covered by Medicare were more likely to be transferred (2.5 percent) compared to encounters by patients with other types of insurance. However, encounters by patients without insurance had the lowest likelihood of transfer (0.8 percent) and admission (7.1 percent).

Encounters by patients from rural areas had the highest transfer rate (3.0 percent)—three times higher than the transfer rate for patients from large central metropolitan areas.

Table 1. Characteristics of emergency department encounters by disposition type, 2009¹

	Transferred from ED to another acute care hospital	Admitted to the hospital from the original ED	Treated and released from the ED
Total number (% of all ED encounters)	1,877,017 (1.5)	19,592,546 (15.7)	103,075,990 (82.8)
Patient's sex (%)			
Male	1.8	16.2	82.0
Female	1.3	15.4	83.3
Patient's age (%)			
< 1	1.9	7.2	90.9
1–17	1.3	3.4	95.3
18–44	1.0	8.1	90.9
45–64	1.8	21.1	77.1
65–84	2.7	40.2	57.1
85+	2.7	45.6	51.7
Primary insurance (%)			
Medicare	2.5	39.3	58.2
Medicaid	1.1	10.0	88.9
Private	1.5	11.2	87.3
Uninsured	0.8	7.1	92.1
Other	1.6	10.3	88.1
Patient's residence (%):			
Large central metropolitan	1.0	18.4	80.6
Large fringe metropolitan (suburbs)	1.2	17.6	81.2
Medium and small metropolitan	1.2	14.4	84.4
Micropolitan / noncore (rural)	3.0	12.3	84.7

¹Three percent of encounters were excluded from the tables in this study; they included encounters where patients died in the ED, left against medical advice, or were transferred to another nonacute care institution (nursing home, rehabilitation center, or home health care).

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2009

Transfer rates varied significantly by condition. Table 2 lists the 25 most common first-listed diagnostic categories by total number of ED encounters and their associated rates of transfer (percentage of ED encounters within the diagnostic category that had a disposition of transfer to another acute care hospital). Only five of these diagnostic categories had transfer rates higher than the overall average transfer rate of 1.5 percent. These conditions—nonspecific chest pain (3.1 percent), other lower respiratory tract disease (2.3 percent), pneumonia (4.1 percent), fever of unknown origin (1.7 percent), and fracture of the upper limb (1.7 percent)—are highlighted in the table.

Table 2. Most common first-listed diagnoses seen in the emergency department, 2009

Rank	Diagnostic category*	Encounters (n)	Encounters (% of n)	Transfer rate (%)
1	Upper respiratory infections (other than tonsillitis and bronchitis)	6,474,077	5.0	0.1
2	Sprains and strains	6,000,259	4.7	0.1
3	Superficial injury, contusion	5,854,225	4.5	0.3
4	Abdominal pain	4,982,788	3.9	1.2
5	Nonspecific chest pain	4,078,681	3.2	3.1
6	Spondylosis, intervertebral disc disorders, other back problems	3,473,163	2.7	0.4
7	Skin and subcutaneous tissue infections	3,215,750	2.4	0.8
8	Open wounds of extremities	3,132,265	2.4	0.7
9	Other injuries and conditions due to external causes	2,986,051	2.3	1.4
10	Headache, including migraine	2,956,124	2.3	0.4
11	Urinary tract infections	2,955,885	2.3	0.8
12	Open wounds of head, neck, and trunk	2,514,355	2.0	1.0
13	Other lower respiratory disease**	2,105,268	1.6	2.3
14	Viral infections	2,065,792	1.6	0.2
15	Otitis media and related conditions	2,050,648	1.6	0.1
16	Connective tissue disease other than systemic lupus erythematosus	2,007,883	1.6	0.0
17	Asthma	1,970,813	1.5	1.0
18	Chronic obstructive pulmonary disease (COPD) and bronchiectasis	1,970,786	1.5	1.5
19	Disorders of teeth and jaw	1,902,822	1.5	0.2
20	Pneumonia	1,861,301	1.4	4.1
21	Fever of unknown origin	1,832,415	1.4	1.7
22	Fracture of upper limb	1,813,213	1.4	1.7
23	Acute bronchitis	1,689,858	1.3	0.6
24	Complications of pregnancy other than abortion or ectopic pregnancy	1,686,450	1.3	0.8
25	Nausea and vomiting	1,666,884	1.3	0.9

*Using AHRQ's Clinical Classifications Software (CCS).

** The vast majority of these cases involved nonspecific International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes for shortness of breath, respiratory abnormalities not elsewhere classified, cough, and painful respiration.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2009

Table 3 lists the 25 first-listed diagnostic categories with the highest transfer rates. All of the diagnostic categories listed in Table 3 had transfer rates that were higher than five percent. Most of the high-transfer conditions listed in Table 3 are time-sensitive, emergent conditions requiring higher levels of care such as stroke, cardiovascular, and neurosurgical emergencies. Mental illness constituted nearly 25 percent of the encounters among the diagnostic categories listed in Table 3. Although neonatal emergencies and delivery complications represented a smaller absolute number of encounters, they had high rates of transfer.

Table 3. First-listed diagnoses with highest transfer rates from the ED

Rank	Diagnostic category*	Encounters (n)	Transfer rate (%)
1	Shock	3,286	21.2
2	Intrauterine hypoxia / birth asphyxia	363	20.3
3	Live born	4,158	18.6
4	Respiratory distress syndrome (of newborn)	414	16.5
5	Aortic, peripheral or visceral artery aneurysm	38,612	16.5
6	Suicide and intentional self injury	100,039	14.9
7	Paralysis	12,383	14.9
8	Acute myocardial infarction	524,111	12.4
9	Short gestation, low birth weight, and fetal growth retardation	430	12.2
10	Acute cerebrovascular disease	579,417	12.1
11	Aortic or peripheral arterial embolism or thrombosis	21,765	10.9
12	Spinal cord injury	14,600	10.5
13	Coma, stupor, and brain damage	96,910	10.0
14	Coronary atherosclerosis and other heart disease	525,783	9.7
15	Femur neck fracture	311,779	8.4
16	Chronic renal failure	62,188	8.3
17	Neoplasm of unspecified nature or uncertain behavior	32,727	6.6
18	Hematologic conditions other than anemia, diseases of white blood cells, and coagulation and hemorrhagic disorders	5,000	6.4
19	Schizophrenia and other psychotic disorders	588,393	6.3
20	Poisoning by psychotropic agents	176,259	6.1
21	Digestive congenital anomalies	13,228	6.1
22	Conduction disorders	51,530	6.0
23	Personality disorders	18,442	5.8
24	Diseases of white blood cells	62,016	5.5
25	Intracranial injury	674,953	5.5

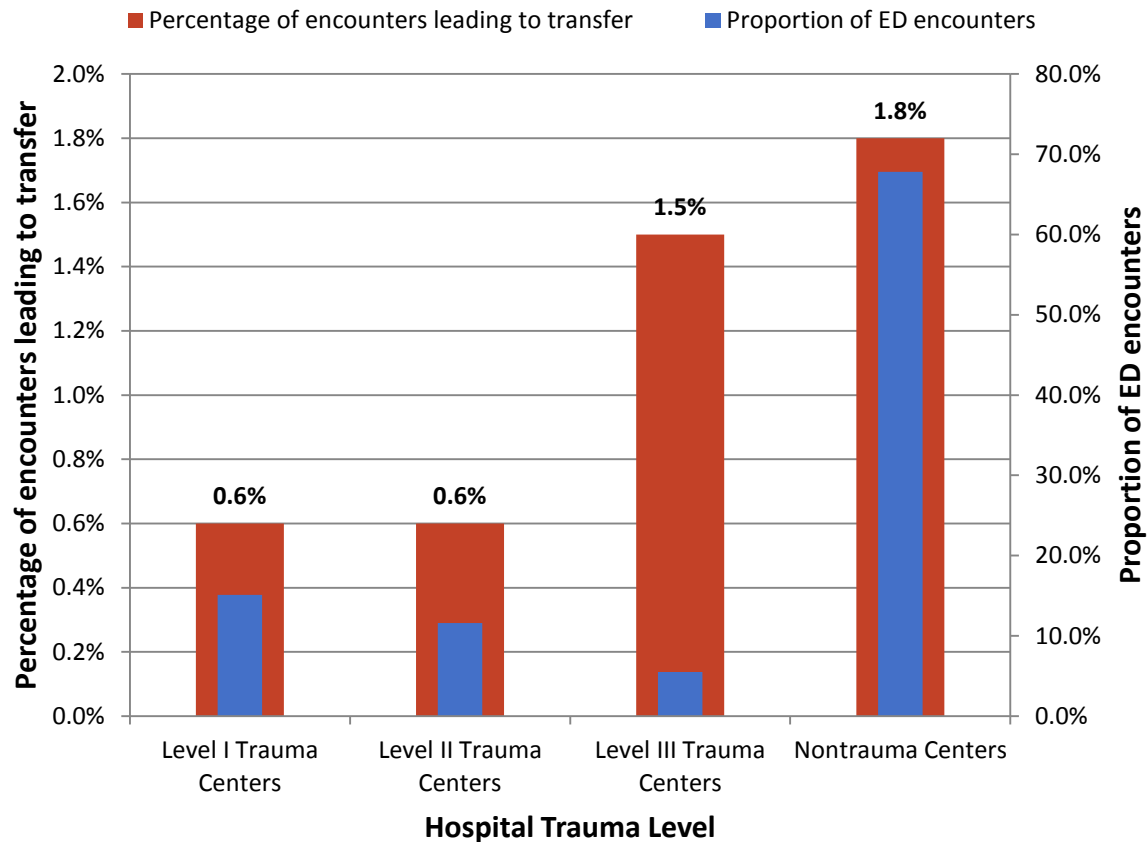
*Using AHRQ's Clinical Classifications Software (CCS).

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2009.

Hospital factors

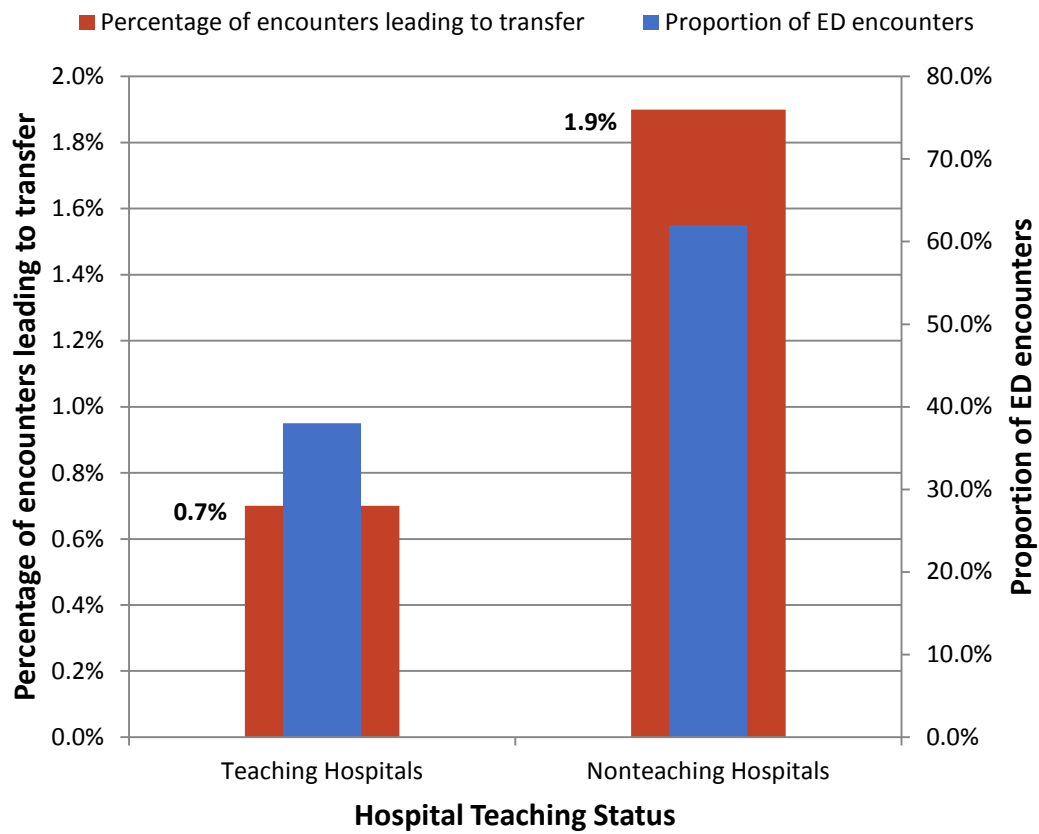
Hospital characteristics also appear to be associated with ED disposition decisions. The overall transfer rate across all hospitals was 1.5 percent, but some hospital categories had disproportionately higher rates of transfer. As can be seen in figures 1–3, nontrauma hospitals transferred 1.8 percent of encounters, nonteaching hospitals transferred 1.9 percent, and public hospitals transferred 1.9 percent. Rates of transfer also were higher in Level III compared to Level I and Level II trauma hospitals; Level I hospitals are capable of providing the highest level of care to trauma patients. This disparity in transfer rates is likely because nontrauma, nonteaching, and public hospitals have a lower concentration of resources including specialists and advanced diagnostic and therapeutic modalities.

Figure 1. Rates of transfer and proportion of total ED encounters by hospital trauma level, 2009



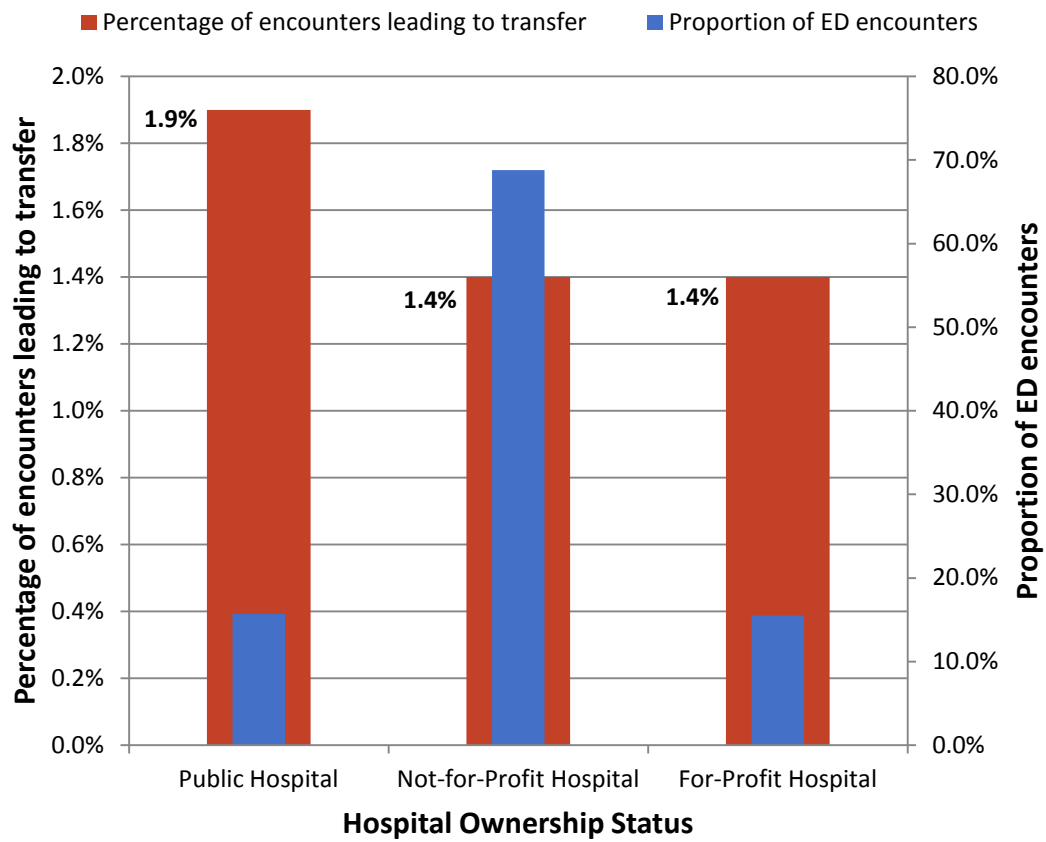
Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2009

Figure 2. Rates of transfer and proportion of total ED encounters by hospital teaching status, 2009



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2009

Figure 3. Rates of transfer and proportion of total ED encounters by hospital ownership status, 2009



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2009

Data Source

The estimates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) 2009 Nationwide Emergency Department Sample (NEDS).

Definitions

Diagnoses, ICD-9-CM, and Clinical Classifications Software (CCS)

On inpatient records, the *principal diagnosis* is that condition established after study to be chiefly responsible for the patient's admission to the hospital. On outpatient ED records, the *first-listed diagnosis* is the "code for the diagnosis, condition, problem or other reason for encounter/visit shown in the medical record to be chiefly responsible for the services provided."⁶ This analysis uses the principal diagnosis on inpatient records and the first-listed diagnosis on outpatient ED records.

ICD-9-CM is the International Classification of Diseases, Ninth Revision, Clinical Modification, which assigns numeric codes to diagnoses. There are approximately 14,000 ICD-9-CM diagnosis codes.

CCS categorizes ICD-9-CM diagnoses into a manageable number of clinically meaningful categories.⁷ This "clinical grouper" makes it easier to quickly understand patterns of diagnoses. CCS categories identified as "Other" typically are not reported; these categories include miscellaneous, otherwise unclassifiable diagnoses that may be difficult to interpret as a group.

Types of hospitals included in HCUP

HCUP is based on data from community hospitals, defined as short-term, non-Federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). HCUP data include obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical hospitals. Excluded are long-term care, rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. Community hospitals included in the NEDS have hospital-based emergency departments and no more than 90 percent of their ED visits resulting in admission.

Unit of analysis

The unit of analysis is the hospital discharge (i.e., the hospital stay), not a person or patient. This means that a person who is admitted to the hospital multiple times in one year will be counted each time as a separate "discharge" from the hospital.

Location of patients' residence

Place of residence is based on the urban-rural classification scheme for U.S. counties developed by the National Center for Health Statistics (NCHS):

- Large Central Metropolitan: Central counties of metropolitan areas with 1 million or more residents
- Large Fringe Metropolitan: Fringe counties of metropolitan areas with 1 million or more residents
- Medium Metropolitan: Counties in metropolitan areas of 250,000–999,999 residents
- Small Metropolitan: Counties in metropolitan areas of 50,000–249,999 residents
- Micropolitan: Nonmetropolitan counties, i.e., a nonmetropolitan county with an area of 10,000 or more residents
- Noncore: Nonmetropolitan and nonmicropolitan counties.

Payer

Payer is the expected primary payer for the hospital stay. To make coding uniform across all HCUP data sources, payer combines detailed categories into more general groups:

- Medicare: includes patients covered by fee-for-service and managed care Medicare

⁶ Centers for Disease Control and Prevention. ICD-9-CM Official Guidelines for Coding and Reporting.

These guidelines were created on 08/05/2010 and are effective as of 10/01/2010.

http://www.cdc.gov/nchs/icd/icd9cm_addenda_guidelines.htm#guidelines. Accessed April 20, 2013.

⁷ HCUP Clinical Classifications Software (CCS). Healthcare Cost and Utilization Project (HCUP). U.S. Agency for Healthcare Research and Quality, Rockville, MD. Updated March 2013. <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>. Accessed April 20, 2013.

- Medicaid: includes patients covered by fee-for-service and managed care Medicaid. Patients covered by the State Children's Health Insurance Program (SCHIP) may be included here. Because most State data do not identify SCHIP patients specifically, it is not possible to present this information separately.
- Private Insurance: includes Blue Cross, commercial carriers, and private health maintenance organizations (HMOs) and preferred provider organizations (PPOs)
- Other: includes Worker's Compensation, TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs
- Uninsured: includes an insurance status of "self-pay" and "no charge."

When more than one payer is listed for a hospital discharge, the first-listed payer is used.

About HCUP

HCUP is a family of powerful health care databases, software tools, and products for advancing research. Sponsored by the Agency for Healthcare Research and Quality (AHRQ), HCUP includes the largest all-payer encounter-level collection of longitudinal health care data (inpatient, ambulatory surgery, and emergency department) in the United States, beginning in 1988. HCUP is a Federal-State-Industry Partnership that brings together the data collection efforts of many organizations—such as State data organizations, hospital associations, private data organizations, and the Federal government—to create a national information resource.

HCUP would not be possible without the contributions of the following data collection Partners from across the United States:

Alaska State Hospital and Nursing Home Association
Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health and Hospitals
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Center for Health Information and Analysis
Michigan Health & Hospital Association
Minnesota Hospital Association
Mississippi Department of Health
Missouri Hospital Industry Data Institute
Montana MHA - An Association of Montana Health Care Providers
Nebraska Hospital Association
Nevada Department of Health and Human Services
New Hampshire Department of Health & Human Services
New Jersey Department of Health
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota (data provided by the Minnesota Hospital Association)
Ohio Hospital Association
Oklahoma State Department of Health

Oregon Association of Hospitals and Health Systems
Oregon Health Policy and Research
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina Budget & Control Board
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems
Virginia Health Information
Washington State Department of Health
West Virginia Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

About the NEDS

The HCUP Nationwide Emergency Department Database (NEDS) is a unique and powerful database that yields national estimates of emergency department (ED) visits. The NEDS was constructed using records from both the HCUP State Emergency Department Databases (SEDD) and the State Inpatient Databases (SID). The SEDD capture information on ED visits that do not result in an admission (i.e., treat-and-release visits and transfers to another hospital); the SID contain information on patients initially seen in the emergency room and then admitted to the same hospital. The NEDS was created to enable analyses of ED utilization patterns and support public health professionals, administrators, policymakers, and clinicians in their decisionmaking regarding this critical source of care. The NEDS is produced annually beginning in 2006.

For More Information

For more information about HCUP, visit <http://www.hcup-us.ahrq.gov/>.

For additional HCUP statistics, visit HCUPnet, our interactive query system, at <http://hcupnet.ahrq.gov/>.

For information on other hospitalizations in the United States, download HCUP Facts and Figures: Statistics on Hospital-Based Care in the United States in 2009, located at <http://www.hcup-us.ahrq.gov/reports.jsp>.

For a detailed description of HCUP, more information on the design of the NEDS, and methods to calculate estimates, please refer to the following publications:

Introduction to the HCUP Nationwide Emergency Department Sample, 2010. Online. November 2012. U.S. Agency for Healthcare Research and Quality.
<http://hcup-us.ahrq.gov/db/nation/neds/NEDS2010Introductionv3.pdf>. Accessed March 13, 2013.

Houchens R, Elixhauser A. Final Report on Calculating Nationwide Inpatient Sample (NIS) Variances, 2001. HCUP Methods Series Report #2003-2. Online. June 2005 (revised June 6, 2005). U.S. Agency for Healthcare Research and Quality.
<http://www.hcup-us.ahrq.gov/reports/CalculatingNISVariances200106092005.pdf>. Accessed March 13, 2013.

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AHRQ welcomes questions and comments from readers of this publication who are interested in obtaining more information about access, cost, use, financing, and quality of health care in the United States. We also invite you to tell us how you are using this Statistical Brief and other HCUP data and tools, and to share suggestions on how HCUP products might be enhanced to further meet your needs. Please e-mail us at hcup@ahrq.gov or send a letter to the address below:

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