HEALTHCARE COST AND UTILIZATION PROJECT

Agency for Healthcare Research and Quality

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Emergency Department Visits for Dental-Related Conditions, 2009

Krystle Seu, M.H.A., Kendall K. Hall, M.D., M.S, Ernest Moy, M.D.

Introduction

Tooth decay is one of the most prevalent chronic diseases worldwide and the most common medical condition among children in the United States.[1, 2, 3] People are susceptible to dental-related conditions throughout their lifetimes,[4] and most oral diseases tend to be progressive and cumulative without intervention.[4] Therefore, untreated tooth decay could result in loss of teeth and difficulty eating, and it can even lead to death.[6] The cost of dental visits in the emergency department (ED) is high. For example, dental visits to the ED totaled $23 million in Georgia in 2007 and nearly $88 million in Florida in 2010.[5]

This Statistical Brief presents nationwide data from the Healthcare Cost and Utilization Project (HCUP) on ED visits for treatment of dental-related conditions in 2009. Patient characteristics of ED visits for dental care are described, and dental visits that resulted in a hospital admission are compared to treat-and-release ED visits. Patient demographics (sex, age, patient residence, and community income level), primary expected payer, patient-to-dentist ratios, and the most common dental conditions are described. Figures highlight differences that were statistically significant. All differences between subgroup estimates noted in the text are statistically significant at the 0.05 probability level or better.

Highlights

- In 2009, over 900,000 emergency department (ED) visits and nearly 13,000 hospital inpatient stays were related to dental conditions. Between 2006 and 2009, the incidence of ED visits for patients seeking dental treatment increased by 16 percent, rising from 874,000 to 936,432 visits.
- Dental caries (cavities) was the first-listed diagnosis for 42 percent of the ED visits. Dental abscess was the principal diagnosis for 63 percent of the inpatient stays.
- Persons aged 18–44 years accounted for nearly 62 percent of dental-related ED visits (611 per 100,000 population).
- Dental-related ED visit rates were more than twice in rural areas than in large metropolitan areas.
- Dental-related ED visits were four times higher among patients from the lowest income communities than for patients in the highest income communities.
- For individuals utilizing the ED for dental conditions, the major payer for hospitalized patients was Medicaid, followed by private insurance. Nearly half (42 percent) of treat-and-release patients seen for dental conditions in the ED were uninsured.
- Use of the ED for dental conditions increased as the ratio of patients to dentists increased from <1500:1 (216 per 100,000) to 5000:1 (437 per 100,000), indicating that poorer access to dental care providers was related to increased use of EDs for dental conditions.

[1] Peres, K. G., Peres, M. A., Araujo, C. L., & Menezes, A. M. (2009). Social and dental status along the life course and oral health impacts. *BioMed Central* , 1–10.
[2] National Institute of Dental and Craniofacial Research. (2000). *Oral health in America: A Report of the Surgeon General.* Rockville: U.S. Department of Health and Human Services.
[3] Selwitz, RH; Ismail, AI; & Pitts, NB. (2007) Dental caries. Lancet. 369(9555):51–9.
[4] World Health Organization. "Priority Action Areas," *Oral Health,* 2012, http://www.who.int/oral_health/action/groups/en/index1.html.
[5] Institute of Medicine. (2011) *Advancing Oral Health in America*. Washington, DC: National Academy of Sciences. Available at http://www.iom.edu/~/media/Files/Report%20Files/2011/Advancing-Oral-Health-in-America/Advancing%20Oral%20Health%202011%20Report%20Brief.pdf.
[6] The Pew Center on States. (2011) *The State of Children's Dental Health: Making Coverage Matter*. Washington, DC: The Pew Charitable Trusts. Available at http://www.pewstates.org/uploadedFiles/PCS_Assets/2011/The_State_of_Childrens_Dental_health.pdf.

Findings

Overall population
Table 1 contains demographic statistics for dental-related conditions in the ED. In 2009, there were 936,482 ED visits with dental conditions as a first-listed diagnosis—up from 874,000 in 2006. For the vast majority (98 percent) of these ED visits, patients were treated and released; only 2 percent resulted in hospitalization.

There were 305 ED visits per 100,000 population in 2009. On average, there were 2,566 ED visits related to dental conditions every day, of which 35 resulted in hospital admission.

Table 1. Dental-related conditions in the emergency department, U.S., 2009

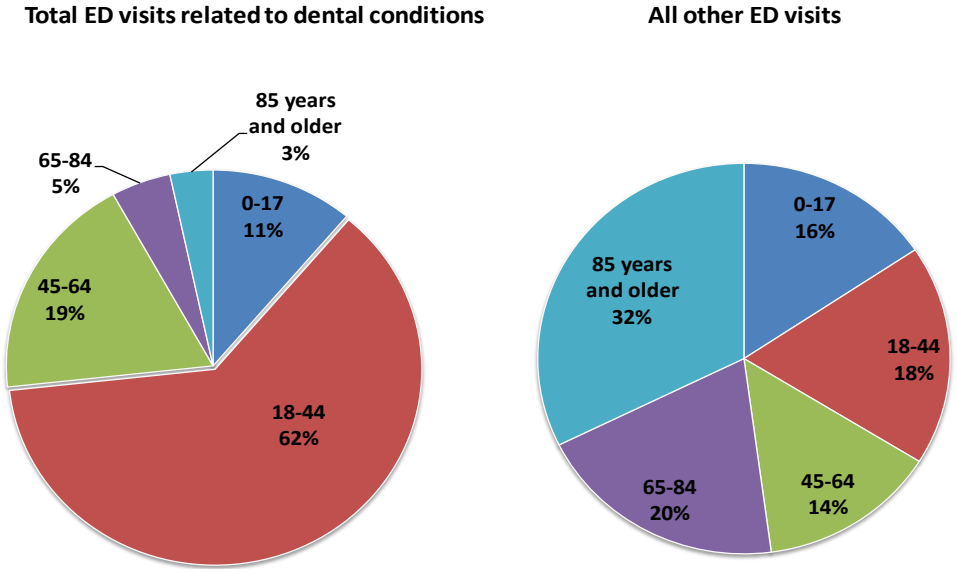
	ED visits related to dental conditions			All other ED visits
	Total ED visits	Treat-and-release ED visits	Hospital admissions from the ED	
Number of ED visits	936,482	923,720	12,762	127,795,823
	Rate per 100,000 population			
ED visits	305	301	4.2	41,706
Patient sex				
Males	304	300	4.2	37,957
Females	306	302	4.1	45,238
Age group				
0–17	110	108	2.7	38,225
18–44	611	605	5.7	44,664
45–64	184	180	3.8	34,435
65–84	46	43	3.1	48,589
85 years and older	33	29	3.9	79,118
Patient residence				
Large metropolitan areas–at least one million residents	217	213	3.9	37,447
Small metropolitan areas–less than one million residents	369	365	4.7	43,541
Micropolitan	478	474	4.9	50,196
Not metropolitan or micropolitan (rural)	480	476	4.3	55,901
Community income level				
1–lowest	452	448	4.7	52,892
2–low	387	381	5.8	46,749
3–moderate	238	235	3.3	35,668
4–highest	111	109	2.2	27,146
Ratio of patients to dentists				
<1500 (desirable)	216	212	4.2	NA
1500–2000	326	321	5.3	NA
2000–3000	336	333	2.9	NA
3000–4000 (poor)	447	443	3.6	NA
>4000/1 (HPSA)*	382	379	3.1	NA

Source: AHRQ, Center for Delivery, Organization and Markets, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2009
*HPSA = Health Provider Shortage Area
Due to rounding, total ED visits may not equal the sum of treat-and-release visits plus hospital admissions from the ED.

Dental-related ED visits compared to all other ED visits by sex and age
Table 1 shows that males and females had similar ED visit and hospitalization rates for dental conditions.

About 62 percent of patients with dental-related ED visits were 18–44 years old (figure 1). Persons in this age group had the majority of ED visits for dental-related conditions among those who were treated and released and those who were hospitalized from the ED.

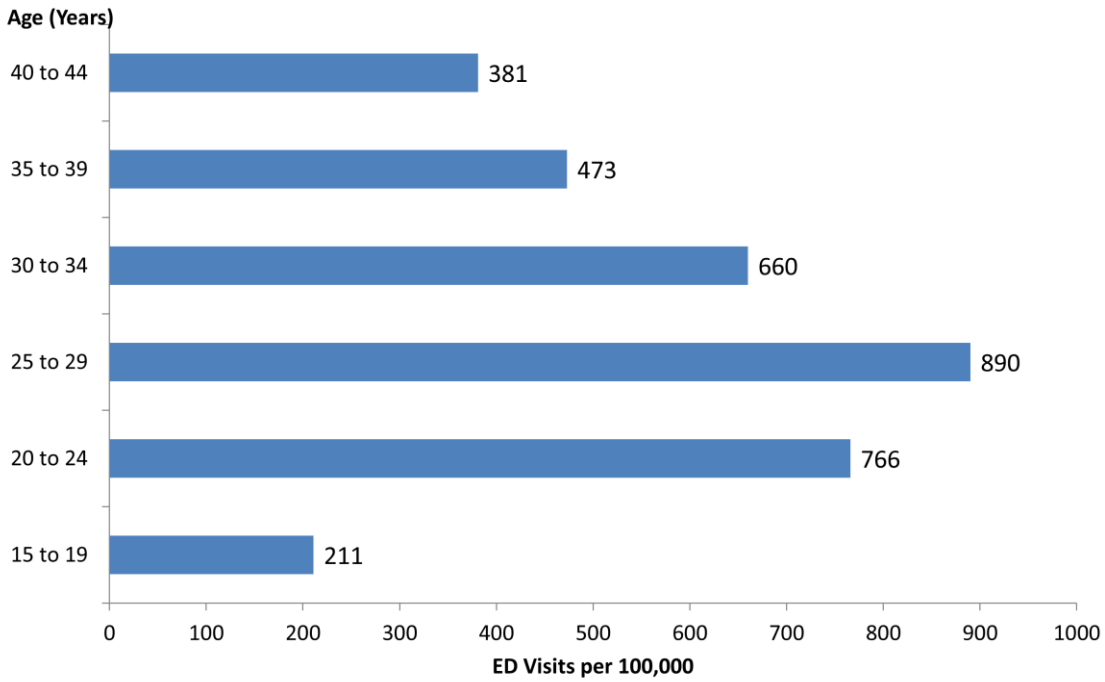
Figure 1. ED visits for dental conditions compared to all other ED visits, by age, 2009



Source: AHRQ, Center for Delivery, Organization and Markets, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2009

Figure 2 further examines the age composition of dental-related ED visits for patients 15–44 years old. Those who were 25–29 years old had the highest rate of ED utilization for dental conditions (890 per 100,000 persons), followed by those who were 20–24 years old (766 per 100,000 persons) and 30–34 years old (660 per 100,000 persons).

Figure 2. Dental-related ED visits for 15–44 year olds, rate per 100,000 population, 2009

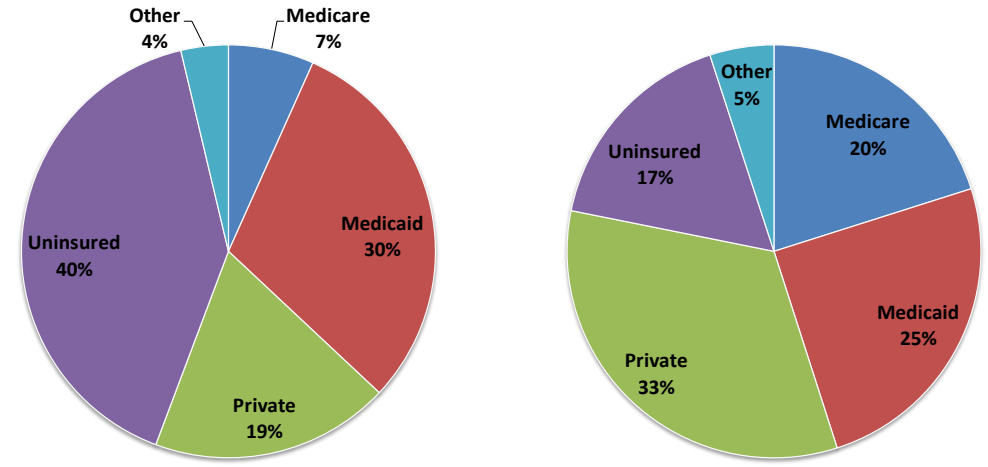


Source: AHRQ, Center for Delivery, Organization and Markets, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2009

ED visits and inpatient stays related to dental issues by payer

Figure 3 Illustrates the payer mix of dental-related ED visits compared to all other ED visits. Most ED visits for dental-related conditions were covered by Medicaid (30 percent) or were uninsured (40 percent).

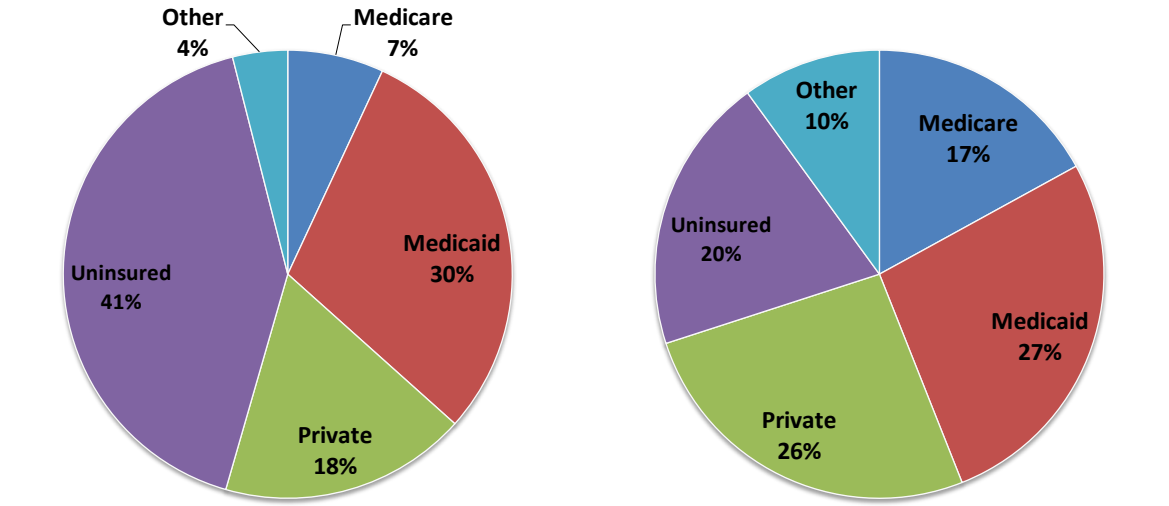
Figure 3. Expected pay source for dental-related ED visits compared to all other ED visits, 2009



Source: AHRQ, Center for Delivery, Organization and Markets, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2009

Figure 4 compares the expected pay source for treat-and-release ED visits for dental conditions to ED visits that resulted in a hospital admission. Figure 4 shows that 41 percent of dental-related treat-and-release ED visits were uninsured. Among the visits resulting in hospital admission, the most common payer was Medicaid (27 percent), followed by private insurance (26 percent), while 20 percent were uninsured.

Figure 4. Expected payer for ED patients admitted into the hospital compared to those who were discharged with dental-related conditions, 2009



Source: AHRQ, Center for Delivery, Organization and Markets, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2009

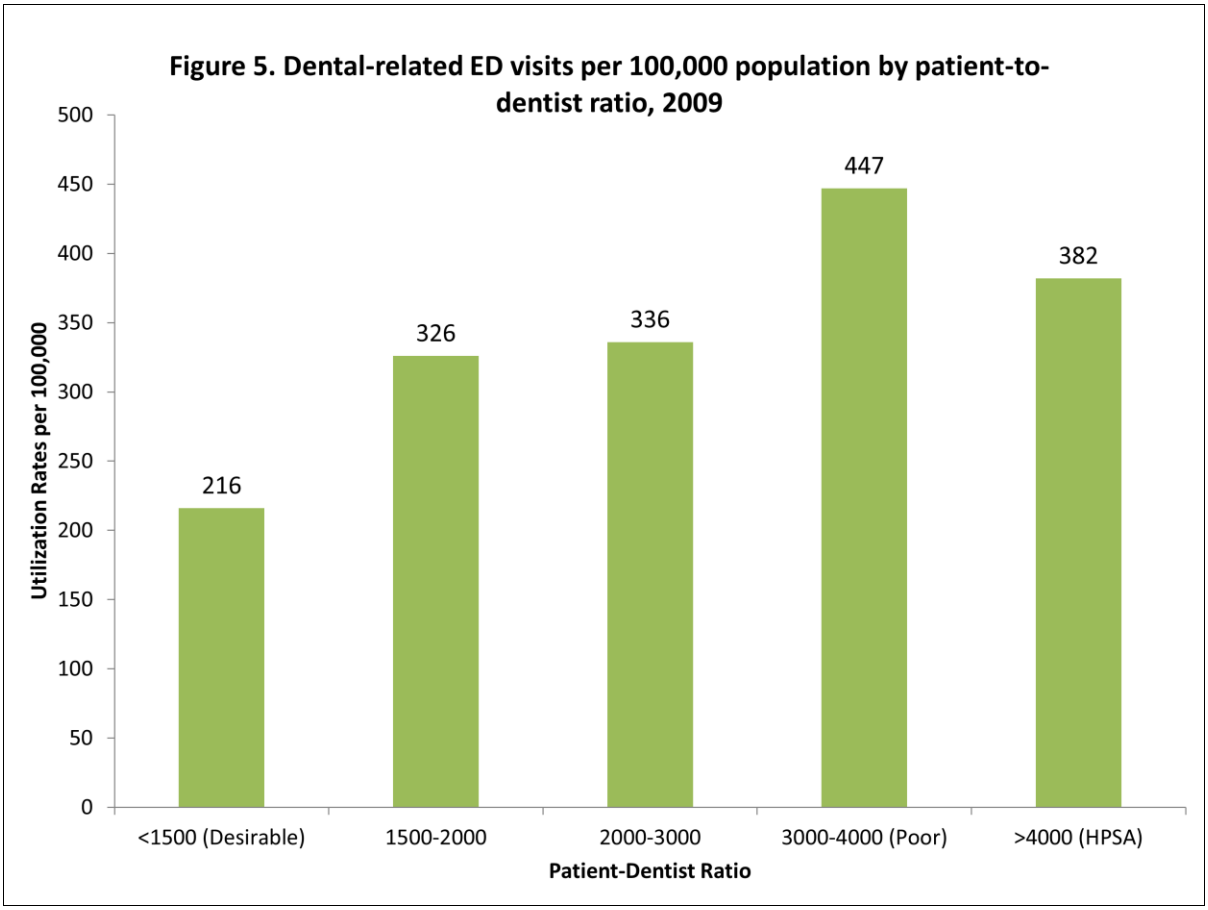
Dental-related ED visits compared to all other ED visits, by community income level

Patients residing in communities with the lowest income levels had the highest number of visits to the ED for dental conditions, as shown in table 1. Furthermore, the number of dental-related ED visits decreased as community income level increased. Compared to the highest income communities, dental-related ED visits were four times higher among patients from the lowest income communities.

ED visits and inpatient stays related to dental problems by patient residence

Table 1 shows that dental-related ED visits were more common in rural areas than in urban areas. There were 480 dental-related ED visits per 100,000 in rural areas—more than twice as high as in the largest urban areas (217 dental-related ED visits per 100,000).

Total dental-related ED visits by availability of dental-care providers
Figure 5 shows generally higher rates of dental-related ED visits in areas with more patients per dentist. For example, in areas with 3000–4000 patients per dentist, there were 447 dental-related ED visits per 100,000 population, compared to 216 dental-related ED visits in areas with the most dentists (<1500 patients per dentist).



Source: AHRQ, Center for Delivery, Organization and Markets, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2009
HPSA = Health Provider Shortage Area

Dental-related conditions seen in the ED
Table 2 shows the top five dental-related diagnoses made in the ED. Dental caries (cavities) were the most frequently listed dental condition (41.8 percent). This diagnosis was followed closely by dental abscess (37.4 percent), an infection that typically originates from dental caries. Table 3 compares the diagnoses for dental-related treat-and-release visits to those from ED visits that resulted in a hospital admission. Abscess was more common among patients admitted to the hospital, comprising 63.0 percent of this group.

Table 2. The top five most common dental conditions seen in the ED, U.S., 2009

Principal or first-listed diagnosis	Number of visits	Percentage
Dental caries	389,600	41.8
Abscess	349,000	37.4
Periodontitis	95,400	10.2
Gingival disorders	49,700	5.3
Disorders of development & eruption	27,300	2.9

Source: AHRQ, Center for Delivery, Organization and Markets, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2009

Table 3. The top five dental conditions for treat-and-release ED visits and those that resulted in hospital admission, U.S., 2009

Treat-and-release visits	Principal or first-listed diagnosis	Number of visits	Percentage
	Dental caries	387,600	42.0
	Abscess	341,200	37.0
	Periodontitis	93,300	10.0
	Gingival disorders	49,200	5.0
	Disorders of development & eruption	27,200	3.0
	Total	**920,800**	**100.0**
Visits that result in hospital admission			
	Abscess	7,800	63.0
	Dental caries	2,000	16.0
	Periodontitis	2,000	16.0
	Gingival disorders	400	3.0
	Disorders of development & eruption	100	1.0
	Total	**12,500**	**100.0**

Source: AHRQ, Center for Delivery, Organization and Markets, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2009

Data Source

The estimates in this Statistical Brief are based upon data from the HCUP 2009 NEDS. Supplemental sources included data from the U.S. Census Bureau, Population Division, Annual Estimates of the Population for the United States, Regions, and Divisions and U.S. Census Bureau, Current Population Reports, P60-226, Coverage by Type of Health Insurance and Claritas Population Estimates, 2009. Data on Health Provider Shortage Areas was derived from the Area Resource File (ARF) made available through the Health Resources and Services Administration (HRSA): http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/dentalhpsaoverview.html.

Definitions

Diagnoses, ICD-9-CM, and Clinical Classifications Software (CCS)
The *principal diagnosis* is that condition established after study to be chiefly responsible for the patient's admission to the hospital. The *first-listed diagnosis* for the ED visit may not be the principal diagnosis; it may just be the first-listed diagnosis on the record.

ICD-9-CM is the International Classification of Diseases, Ninth Revision, Clinical Modification, which assigns numeric codes to diagnoses. There are about 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" are typically not reported; these categories include miscellaneous, otherwise unclassifiable diagnoses that may be difficult to interpret as a group.

Case definition
The ICD-9-CM codes defining dental conditions include diagnosis codes in the following range: ICD-9-CM 520-523.9.

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. However, if a patient received long-term care, rehabilitation, or treatment for psychiatric or chemical dependency conditions in a community hospital, the discharge record for that stay will be included in the NIS.

Unit of analysis
The unit of analysis is the ED visit or hospital discharge, not a person or patient. This means that a person who is seen in the ED or admitted to the hospital multiple times in one year will be counted each time as a separate ED visit or "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 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
– Non-core: Nonmetropolitan and nonmicropolitan counties.

Median community-level income
Median community-level income is the median household income of the patient's ZIP Code of residence. The cut-offs for the quartile designation are determined using ZIP Code demographic data obtained from Claritas. The income quartile is missing for homeless and foreign patients.

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 fee-for-service and managed care Medicare patients

[7] HCUP Clinical Classifications Software (CCS). Healthcare Cost and Utilization Project (HCUP). U.S. Agency for Healthcare Research and Quality, Rockville, MD. Available at http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp. Updated March 2012. (Accessed November 15, 2012).

- Medicaid: includes fee-for-service and managed care Medicaid patients. 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 HMOs and 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 Health Policy Commission
New York State Department of Health
North Carolina Department of Health and Human Services
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 decision making regarding this critical source of care. The NEDS is produced annually beginning in 2006.

About HCUPnet

HCUPnet is an online query system that offers instant access to the largest set of all-payer health care databases publicly available. HCUPnet has an easy step-by-step query system, allowing for tables and graphs to be generated on national and regional statistics, as well as trends for community hospitals in the United States. HCUPnet generates statistics using data from HCUP's Nationwide Inpatient Sample (NIS), the Kids' Inpatient Database (KID), the Nationwide Emergency Department Sample (NEDS), the State Inpatient Databases (SID), and the State Emergency Department Databases (SEDD).

For More Information

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, and more information on the design of the NEDS, please refer to the following publication:

Introduction to the HCUP Nationwide Emergency Department Sample, 2009. Online. September 2011. U.S. Agency for Healthcare Research and Quality. Available at http://hcup-us.ahrq.gov/db/nation/neds/NEDS2009Introductionv3.pdf. (Accessed March 15, 2012).

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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 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