Presentation Objectives
Part I

• Project Overview
• AHRQ and HCUP Partners
• The Making of HCUP Data
• HCUP State Databases
• HCUP Nationwide Databases
• How to Obtain HCUP Databases & Access HCUP Resources
What is HCUP?

HCUP is a comprehensive set of publicly available all-payer health care data.

Includes multi-year inpatient and outpatient data based on hospital billing records.

HCUP Databases
- SID
- SEDD
- SASD
- NEDS
- NIS
- KID
- NRD

Online Tools

Analytics

User Support

Federal-State-Private Partnership
HCUP Answers Questions

- Use of hospital, ED, and ambulatory surgery services
- Expected payer (all are included) of services
- Age, race and area of residence of patients
- Geography (county, State, national)
- Clinical detail
  - Conditions/comorbidities and procedures
  - Outcomes of care
- Cost of care
- Care for a patient across time** (revisits/readmissions)
- Access, quality, patient safety
- Trends over time in all of the above
### Costs of care

Between 2005 and 2014, the inflation-adjusted mean cost per inpatient stay increased by 12.7 percent, from $9,500 to $10,900 (2005 and 2014 NIS & HCUP Fast Stats, Stat Brief #225).

### Patient safety

Half of patients with community-acquired Methicillin-resistant Staphylococcus aureus (MRSA) in California had a diagnosis of cellulitis or skin ulcers. Among patients with hospital-acquired MRSA, the largest proportion (38 percent) were diagnosed with pneumonia. (2013 SID, Stat Brief #212)

### Access to care

From 2000 to 2015, the share of Medicaid among nonneonatal, nonmaternal inpatient stays for those aged 18–44 years and 45–64 years increased by 74 percent and 68 percent, respectively (2000-2015 NIS, Stat Brief #235).

### Readmissions

In 2014, 14 percent of inpatient stays were readmitted within 30 days. More than one-third of these readmissions occurred within 7 days, reflecting a 7-day readmission rate of 5 percent (2014 NRD, Stat Brief #230).
### Quality of Care

From 2010 to 2014, the rate of stays involving an adverse drug event (ADE) increased the most for ADEs caused by smooth muscle and respiratory drugs (up 24 percent) and decreased the most for ADEs caused by cardiovascular drugs (down 18 percent). (2010 and 2014 SID, Stat Brief #234)

### Geographic variation

The mean rate of Cesarean section (C-Section) among total and low-risk deliveries was higher for hospitals in the Northeast and South compared with those in the Midwest and West. (2013 SID, Stat Brief #211)

### Trends in practice

C-section, knee arthroplasty, hip replacement, and percutaneous coronary angioplasty (PTCA) were among the five most common operating room (OR) procedures (along with circumcision) and the five OR procedures with the highest aggregate hospital costs (along with spinal fusion). (2014 NIS, Stat Brief #233)

### Opioid-related stays

Nationally, from 2010 to 2015, the share of opioid-related inpatient stays and emergency department (ED) visits shifted away from private payers and no insurance and toward public payers (Medicare and Medicaid) (2010 and 2015 NIS & NEDS & HCUP Fast Stats, Stat Brief #239).
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The Agency for Healthcare Research and Quality (AHRQ) is a federal agency under the Department of Health and Human Services.
AHRQ’s Mission

• To produce evidence to make health care
  – safer
  – higher quality
  – more accessible
  – equitable
  – affordable

• To work with HHS and other partners to make sure that the evidence is understood and used
The HCUP Partnership
<table>
<thead>
<tr>
<th>State</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>Department of Health and Social Services</td>
</tr>
<tr>
<td>Alaska</td>
<td>State Hospital and Nursing Home Association</td>
</tr>
<tr>
<td>Arizona</td>
<td>Department of Health Services</td>
</tr>
<tr>
<td>Arkansas</td>
<td>Department of Health</td>
</tr>
<tr>
<td>California</td>
<td>Office of Statewide Health Planning and Development</td>
</tr>
<tr>
<td>Colorado</td>
<td>Hospital Association</td>
</tr>
<tr>
<td>Connecticut</td>
<td>Hospital Association</td>
</tr>
<tr>
<td>Delaware</td>
<td>Health Statistics Center &amp; Office of Vital Statistics</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>Hospital Association</td>
</tr>
<tr>
<td>Florida</td>
<td>Agency for Health Care Administration</td>
</tr>
<tr>
<td>Georgia</td>
<td>Hospital Association</td>
</tr>
<tr>
<td>Hawaii</td>
<td>Health Information Corporation</td>
</tr>
<tr>
<td>Illinois</td>
<td>Department of Public Health</td>
</tr>
<tr>
<td>Indiana</td>
<td>Hospital Association</td>
</tr>
<tr>
<td>Iowa</td>
<td>Hospital Association</td>
</tr>
<tr>
<td>Kansas</td>
<td>Hospital Association</td>
</tr>
<tr>
<td>Kentucky</td>
<td>Cabinet for Health and Family Services</td>
</tr>
<tr>
<td>Louisiana</td>
<td>Department of Health</td>
</tr>
<tr>
<td>Maine</td>
<td>Health Data Organization</td>
</tr>
<tr>
<td>Maryland</td>
<td>Health Services Cost Review Commission</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Center for Health Information and Analysis</td>
</tr>
<tr>
<td>Michigan</td>
<td>Health &amp; Hospital Association</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Hospital Association (provides data for Minnesota and North Dakota)</td>
</tr>
<tr>
<td>Mississippi</td>
<td>Department of Health</td>
</tr>
<tr>
<td>Missouri</td>
<td>Hospital Industry Data Institute</td>
</tr>
<tr>
<td>Montana</td>
<td>Hospital Association</td>
</tr>
<tr>
<td>Nebraska</td>
<td>Hospital Association</td>
</tr>
<tr>
<td>Nevada</td>
<td>Department of Health and Human Services</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>Department of Health &amp; Human Services</td>
</tr>
<tr>
<td>New Jersey</td>
<td>Department of Health</td>
</tr>
<tr>
<td>New Mexico</td>
<td>Department of Health</td>
</tr>
<tr>
<td>New York</td>
<td>State Department of Health</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Department of Health and Human Services</td>
</tr>
<tr>
<td>North Dakota</td>
<td>(data provided by the Minnesota Hospital Association)</td>
</tr>
<tr>
<td>Ohio</td>
<td>Hospital Association</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>State Department of Health</td>
</tr>
<tr>
<td>Oregon</td>
<td>Healthy Authority</td>
</tr>
<tr>
<td>Oregon</td>
<td>Association of Hospitals and Health Systems</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>Health Care Cost Containment Council</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>Department of Health</td>
</tr>
<tr>
<td>South Carolina</td>
<td>Revenue and Fiscal Affairs Office</td>
</tr>
<tr>
<td>South Dakota</td>
<td>Association of Healthcare Organizations</td>
</tr>
<tr>
<td>Tennessee</td>
<td>Hospital Association</td>
</tr>
<tr>
<td>Texas</td>
<td>Department of State Health Services</td>
</tr>
<tr>
<td>Utah</td>
<td>Department of Health</td>
</tr>
<tr>
<td>Vermont</td>
<td>Association of Hospitals and Health Systems</td>
</tr>
<tr>
<td>Virginia</td>
<td>Health Information</td>
</tr>
<tr>
<td>Washington</td>
<td>State Department of Health</td>
</tr>
<tr>
<td>West Virginia</td>
<td>Health Care Authority</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>Department of Health Services</td>
</tr>
<tr>
<td>Wyoming</td>
<td>Hospital Association</td>
</tr>
</tbody>
</table>
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The Foundation of HCUP
Data is Hospital Billing Data

Demographic Data

Diagnoses

Procedures

Charges

UB-04
CMS 1500
From Patient Hospital Visit to Administrative Record

- ED Visit
- Scheduled Admission
- Transfer

- Reception
- Admit
- Provide Care
- Discharge

- Patient Record
- Patient Record
- Discharge Summary

- Medical Coder
- Billing Dept

Patient Perspective
Data Perspective

Bill Generated
The Making of HCUP Data

Patient enters hospital

States store data in varying formats

Billing record created

AHRQ standardizes data to create uniform HCUP databases

Hospital sends billing data and any additional data elements to data organizations
The HCUP Data Process

• State data are mapped to a standardized HCUP format which allows for consistent data elements and values for comparison across States

• Additional data elements are available:
  
  ► Value-added variables – injury indicators, chronic condition indicators, procedure class
  
  ► Hospital characteristics – teaching status, ownership/control, bed size
  
  ► Diagnostic related groups and severity measures –
    
    o AHRQ’s Clinical Classifications Software (CCS)
    
    o 3M’s All Patient Refined DRGs (APR-DRGs)

• Quality checks are performed
Hospitals in the U.S.

- 88% of hospitals in the U.S. are Community Hospitals
- 12% Non-Community Hospitals (Federal (DoD/VA/IHS), Non-Federal Psychiatric, Non-Federal Long Term Care, etc.)

Source: American Hospital Association (AHA) Annual Survey (FY 2016)
www.aha.org/statistics/fast-facts-us-hospitals
What Are Community Hospitals?

American Hospital Association Definition:
Non-Federal, short-term, general, and other specialty hospitals, excluding hospital units of other institutions (e.g., prisons)

<table>
<thead>
<tr>
<th>Included</th>
<th>Excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-specialty general hospitals</td>
<td>Long-term care</td>
</tr>
<tr>
<td>OB-GYN</td>
<td>Psychiatric</td>
</tr>
<tr>
<td>ENT</td>
<td>Alcoholism/Chemical dependency</td>
</tr>
<tr>
<td>Orthopedic</td>
<td>Rehabilitation</td>
</tr>
<tr>
<td>Pediatric</td>
<td>DoD / VA / IHS</td>
</tr>
<tr>
<td>Public</td>
<td></td>
</tr>
<tr>
<td>Academic medical centers</td>
<td></td>
</tr>
</tbody>
</table>
What Are Community Hospitals?

- HCUP generally does not receive data from non-community hospitals, such as Psychiatric facilities.
- However, if a patient is treated for a mental health condition in a community hospital, their information is included.

<table>
<thead>
<tr>
<th>Most Frequent Principal Diagnosis</th>
<th>Rate of Discharges per 100,000 Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Liveborn</td>
<td>1,188.2</td>
</tr>
<tr>
<td>2. Septicemia (except in labor)</td>
<td>548.8</td>
</tr>
<tr>
<td>3. Osteoarthritis</td>
<td>337.2</td>
</tr>
<tr>
<td>4. Congestive Heart Failure; nonhypertensive</td>
<td>294.9</td>
</tr>
<tr>
<td>5. Pneumonia (except that caused by tuberculosis or sexually transmitted disease)</td>
<td>275.1</td>
</tr>
<tr>
<td>6. Mood disorders</td>
<td>266.2</td>
</tr>
<tr>
<td>7. Cardiac dysrhythmias</td>
<td>211.0</td>
</tr>
</tbody>
</table>

Source: HCUPnet, Weighted national estimates from the 2015 National Inpatient Sample
HCUP has Seven Types of Databases

- **Three State-Specific Databases**
  - State Inpatient Databases (SID)
  - State Ambulatory Surgery & Services Databases (SASD)
  - State Emergency Department Databases (SEDD)

- **Four Nationwide Databases**
  - National Inpatient Sample (NIS)
  - Kids’ Inpatient Database (KID)
  - Nationwide Emergency Department Sample (NEDS)
  - Nationwide Readmissions Database (NRD)
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<table>
<thead>
<tr>
<th>Database Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Inpatient Databases (SID)</td>
<td>All inpatient U.S. community hospital discharge data (including those admissions that started in the ED) from participating HCUP States</td>
</tr>
<tr>
<td>State Ambulatory Surgery &amp; Services Databases (SASD)</td>
<td>Ambulatory surgery data (hospital-owned and some nonhospital-owned facilities) and other outpatient services from participating HCUP States</td>
</tr>
<tr>
<td>State Emergency Department Databases (SEDD)</td>
<td>Emergency department data (treat-and-release) from participating HCUP States</td>
</tr>
</tbody>
</table>
What Data Elements are Included in the HCUP Databases?

Data Elements:

• Patient demographics (e.g., age, sex, and, for some States, race)
• Diagnoses & procedures
• Expected payment source
• Length of stay
• Admission and discharge status
• Point of origin
• Total charges
Some Data Elements Vary by State

- Race/Ethnicity
- Patient county
- Patient ZIP Code
- Severity of illness
- Birthweight
- Procedure date (days from admission to procedure)
- Health plan details
- Additional expected payers
- Detailed charges
- Patient identifiers (encrypted)
- Physician identifiers (encrypted)
- Physician specialty
- Hospital identifier (unencrypted)
## Example: Payer Detail Varies by State

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>Medicare</td>
<td>1</td>
<td>Medicare</td>
</tr>
<tr>
<td>011</td>
<td>Medicare (HMO)</td>
<td>2</td>
<td>Medicaid</td>
</tr>
<tr>
<td>012</td>
<td>Medicare (Managed care - Other)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>013</td>
<td>Medicare (fee for service)</td>
<td></td>
<td>Private insurance</td>
</tr>
<tr>
<td>020</td>
<td>Medi-Cal</td>
<td>3</td>
<td>Self-pay</td>
</tr>
<tr>
<td>021</td>
<td>Medi-Cal (HMO)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>022</td>
<td>Medi-Cal (Managed care - Other)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>023</td>
<td>Medi-Cal (fee for service)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>030</td>
<td>Private Coverage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>031</td>
<td>Private Coverage (HMO)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>032</td>
<td>Private Coverage (Managed care - Other)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>033</td>
<td>Private Coverage (fee for service)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08n, where n=0-3</td>
<td>Self-pay</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>--</td>
<td>--</td>
<td>5</td>
<td>No charge</td>
</tr>
</tbody>
</table>
### Example: Race Detail Varies by State

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>White</td>
<td>1</td>
<td>White</td>
</tr>
<tr>
<td>2</td>
<td>Black</td>
<td>2</td>
<td>Black</td>
</tr>
<tr>
<td>3</td>
<td>Hispanic</td>
<td>3</td>
<td>Hispanic</td>
</tr>
<tr>
<td>4</td>
<td>Hawaiian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Chinese</td>
<td>4</td>
<td>Asian or Pacific Islander</td>
</tr>
<tr>
<td>6</td>
<td>Filipino</td>
<td>5</td>
<td>Native American</td>
</tr>
<tr>
<td>7</td>
<td>Japanese</td>
<td>6</td>
<td>Other</td>
</tr>
<tr>
<td>8</td>
<td>Other Asian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Other Pacific Islander</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Native American</td>
<td>11</td>
<td>Mixed or Other</td>
</tr>
<tr>
<td>11</td>
<td>Mixed or Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
HCUP Files vs. Partner Files

- HCUP State Files vs. Data Files received directly from the State Partners

<table>
<thead>
<tr>
<th>HCUP State Files</th>
<th>HCUP Partner-Provided Files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subset of data elements</td>
<td>All data elements</td>
</tr>
<tr>
<td>Value-added data elements available</td>
<td>May not have same value-added elements available</td>
</tr>
<tr>
<td>Uniformly coded across the States</td>
<td>Not uniformly coded across states</td>
</tr>
<tr>
<td>Standard data quality checks</td>
<td>Variability in quality checks by state</td>
</tr>
<tr>
<td>Lag time</td>
<td>More timely</td>
</tr>
</tbody>
</table>
### 2015 State and Nationwide Databases: Revised Structure

#### ICD-10-CM/PCS implementation

<table>
<thead>
<tr>
<th>Q1-Q3 2015</th>
<th>Q4 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 to Q3 contain ICD-9-CM Codes</td>
<td>Q4 contain ICD-10-CM/PCS codes</td>
</tr>
</tbody>
</table>

- File structure changed in 2015 to separate Q1-Q3 and Q4 data
  - **State databases:** all file types have records split into Q1-Q3 and Q4 files
  - **Nationwide databases:** only file types containing DX/PR related variables are split into Q1-Q3 and Q4 files
- AHRQ-created resources help users with transition:
  - [2015 HCUP State Databases: Change in Structure and Data Elements Caused by Transition to ICD-10-CM/PCS](https://www.hcup-us.ahrq.gov/reports/speeches/2015-StateHCUPICD10CM/PCSChanges.pdf) (PDF)
  - [2015 HCUP Nationwide Databases: Change in Structure in Data Elements](https://www.hcup-us.ahrq.gov/reports/speeches/2015-NationwideHCUPICD10CM/PCSChanges.pdf) (PDFs specific to NIS, NEDS, and NRD)
Partners Releasing Databases through HCUP Central Distributor

- Arizona
- Arkansas
- California
- Colorado
- District of Columbia
- Florida
- Georgia
- Hawaii
- Iowa
- Kansas
- Kentucky
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Nebraska
- Nevada
- New Jersey
- New Mexico
- New York
- North Carolina
- Oregon
- Rhode Island
- South Carolina
- South Dakota
- Utah
- Vermont
- Washington
- West Virginia
- Wisconsin

Remember: Not all States participate in all years and for all databases
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<table>
<thead>
<tr>
<th>Database</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>National (Nationwide) Inpatient Sample (NIS)</td>
<td>Inpatient discharge data for a sample of discharges from all hospitals in SID</td>
</tr>
<tr>
<td>Kids’ Inpatient Database (KID)</td>
<td>Pediatric inpatient hospital discharge data from a sample of pediatric discharges in SID</td>
</tr>
<tr>
<td>Nationwide Emergency Department Sample (NEDS)</td>
<td>Emergency department data (treat and release &amp; admitted) from a sample of hospitals in SID and SEDD</td>
</tr>
<tr>
<td>Nationwide Readmissions Database (NRD)</td>
<td>Inpatient discharge data from all hospitals for SID with verified patient linkage numbers</td>
</tr>
</tbody>
</table>
Many Potential Applications of HCUP National Databases

- National and regional estimates
- Utilization, charges, and outcomes
- Utilization of health services by priority populations
- Hospital care for rare conditions
- Quality of care and patient safety
- Impact of health policy changes
- Access to care
### Comparison of the HCUP Inpatient Databases

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>States</td>
<td>46 States + DC</td>
<td>46 States + DC</td>
<td>44</td>
<td>27</td>
</tr>
<tr>
<td>Hospitals</td>
<td>4,600</td>
<td>4,500</td>
<td>4,200</td>
<td>2,300</td>
</tr>
<tr>
<td>Inpatient discharges</td>
<td>34 million</td>
<td>7 million</td>
<td>3 million</td>
<td>17 million</td>
</tr>
<tr>
<td>Derived From</td>
<td>--</td>
<td>SID</td>
<td>SID</td>
<td>SID</td>
</tr>
</tbody>
</table>

**Uses**

- **States**
  - Examine *State and local market area* statistics on health care utilization, access, quality, patient safety, etc. Readmission analyses possible in some States.

- **NIS**
  - Generate **national and regional** estimates of health care utilization, access, quality, patient safety, etc.

- **KID**
  - Generate **national and regional pediatric** estimates of health care statistics.

- **NRD**
  - Generate **national estimates** of all-cause and condition-specific readmissions.
## State and Nationwide Database Size – Outpatient Data

<table>
<thead>
<tr>
<th></th>
<th>Emergency Department Data</th>
<th>Ambulatory Surgery and Services Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>3,300</td>
<td>953</td>
</tr>
<tr>
<td>Records</td>
<td>93 million</td>
<td>31 million</td>
</tr>
<tr>
<td>Derived From</td>
<td>–</td>
<td>SID &amp; SEDD</td>
</tr>
<tr>
<td><strong>Includes</strong></td>
<td>All ED visits in a given State that do not result in an admission</td>
<td>Sample of hospital-based EDs with ED admissions and ED outpatient visits</td>
</tr>
</tbody>
</table>
NIS is a Stratified Sample of Discharges from the SID

<table>
<thead>
<tr>
<th>State Inpatient Databases (SID)</th>
<th>Stratified Sample of Discharges</th>
<th>National Inpatient Sample (NIS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>~ 5,500 hospitals</td>
<td>*State not included in the stratum</td>
<td>~ 4,500 hospitals</td>
</tr>
<tr>
<td>~ 34 M records</td>
<td></td>
<td>~ 7 M records</td>
</tr>
</tbody>
</table>

**Strata**
- Ownership/Control
- Bed Size
- Teaching Status
- Urban/Rural Location
- U.S. Census Division

Within strata sort by hospital, DRG, and admission month and select 1 in 5 records

Statistics listed from 2015 data year.
## Comparing SID with NIS

<table>
<thead>
<tr>
<th>Comparison</th>
<th>SID</th>
<th>NIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linkage to AHA Annual Survey Data</td>
<td>Yes, for some States</td>
<td>Only 2011 and prior years</td>
</tr>
<tr>
<td>Revisit analyses</td>
<td>Yes, for some States</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Uniformity of coding</td>
<td>State-specific data elements and detailed coding</td>
<td>Common data elements and HCUP uniform coding</td>
</tr>
<tr>
<td>Level of analysis available</td>
<td>State, local market area, and community statistics</td>
<td>Generate national and regional estimates</td>
</tr>
</tbody>
</table>
KID is a Stratified Sample of Discharges from the SID

**State Inpatient Databases (SID)**
- ~ 4,380 hospitals
- ~ 34.3M records

**Strata**
- Uncomplicated Births
- Complicated Births
- Pediatric Non-Births

**Stratified Sample of Discharges**
- *State not included in the stratum
- 10% uncomplicated births
- 80% pediatric discharges

**Kids' Inpatient Database (KID)**
- ~ 4,000 hospitals
- ~ 3M records

Statistics listed from 2012 data year
Historically, the KID has been produced every three years beginning in 1997 and currently through 2012.

Given that hospital discharge data for 2015 contains a mix of ICD-9-CM and ICD-10-CM/PCS data, the next KID will be available for the 2016 data year and will be comprised of ICD-10-CM/PCS data only.

This decision was made due to the complexities of analyzing a mixed coded data year.
~ 77% of ED visits are treat-and-release

~ 14% of ED visits result in a hospital stay

Statistics listed from 2015 data year
NEDS is a Stratified Sample of Hospitals from the SEDD and SID

State Inpatient Databases (SID)
State Emergency Department Databases (SEDD)

Strata
- U.S. Region
- Urban/Rural Location
- Teaching Status
- Ownership/Control
- Trauma center

Stratified Sample of Hospitals
*State not included in the stratum

Nationwide Emergency Department Sample (NEDS)
~ 950 hospitals
~ 31M ED visits

Statistics listed from 2015 data year
NRD is Constructed from SID with Verified Patient Linkage Numbers

State Inpatient Databases (SID)

Hospital and Patient Exclusions

**Strata**
- U.S. Region
- Urban/Rural Location
- Teaching Status
- Size
- Ownership/Control
- Patient Characteristics (age and sex)

All Discharges (after exclusions)

Nationwide Readmissions Database (NRD)

~ 2K hospitals
~ 17M records

Statistics listed from 2015 data year
NIS, NEDS, KID, NRD: Must be Weighted to Produce National and Regional Estimates
NEDS: Must be Weighted to Produce National and Regional Estimates
# What Types of Care Are and Are Not Captured by HCUP?

<table>
<thead>
<tr>
<th>Included in HCUP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inpatient Care</strong></td>
</tr>
<tr>
<td>State Inpatient Databases (SID)</td>
</tr>
<tr>
<td>National (Nationwide) Inpatient Sample (NIS)</td>
</tr>
<tr>
<td>Kids’ Inpatient Database (KID)</td>
</tr>
<tr>
<td>Nationwide Readmissions Database (NRD)</td>
</tr>
<tr>
<td><strong>Emergency Department</strong></td>
</tr>
<tr>
<td>State Emergency Department Databases (SEDD)</td>
</tr>
<tr>
<td>Nationwide Emergency Department Sample (NEDS)</td>
</tr>
<tr>
<td><strong>Ambulatory Surgery &amp; Services</strong></td>
</tr>
<tr>
<td>State Ambulatory Surgery &amp; Services Databases (SASD)</td>
</tr>
<tr>
<td><strong>Other Non-Emergent Outpatient Services</strong></td>
</tr>
<tr>
<td>State Ambulatory Surgery &amp; Services Databases (SASD)</td>
</tr>
</tbody>
</table>

## Not Included in HCUP

- Physician office visits
- Pharmacy
- Labs/Radiology
Some Limitations Can be Addressed by Linking to Other Databases

HCUP State Databases

- American Hospital Association (AHA) Annual Survey
- Health Resources and Services Administration’s (HRSA) Area Health Resource File (AHRF)
- Zip Code Files from Census or Vendor
- Medicare Cost Reports
- Trauma Information Exchange Program (TIEP)
## HCUP Key Design Features

<table>
<thead>
<tr>
<th>HCUP is…</th>
<th>HCUP is NOT…</th>
</tr>
</thead>
<tbody>
<tr>
<td>A family of discharge databases for health care encounters</td>
<td>A survey</td>
</tr>
<tr>
<td>All payer, including the uninsured</td>
<td>Specific to a single payer, e.g. Medicare</td>
</tr>
<tr>
<td>Hospital, ambulatory surgery and services, emergency department data</td>
<td>Office visits, pharmacy, laboratory, radiology</td>
</tr>
<tr>
<td>All hospital discharges</td>
<td>Hospital claims</td>
</tr>
<tr>
<td>Accessible multiple ways: raw data, regular reports, online</td>
<td>Only a database – it includes additional tools and resources</td>
</tr>
</tbody>
</table>
### Benefits

- Large number of records
- Uniformity in coding
- Regular, routine collection
- Ease of access
- All payers, including the uninsured
- Available at local, state, regional, and national level
- Supplemental files available to facilitate research

### Limitations

- Limited clinical details
- Lack reimbursed claims information
- Does not include all hospital types (e.g., VA and DoD)
- Does not show complete episode of care
- No data on individuals outside of the hospital system
- Cannot link national databases to external sources
- Differences in coding across hospitals
Summary

- Seven types of HCUP databases
- Databases are based on administrative hospital data: inpatient, emergency department, and ambulatory surgery and services
- Available for multiple years
  - Nationwide
    - NEDS (2006-2015)
    - NRD (2010-2015)
  - State
    - SID (1990-2016)
    - SASD (1997-2016)
    - SEDD (1999-2016)
- Can look at breadth of health care issues
- Can be linked to external files

Find out more on HCUP-US!

www.hcup-us.ahrq.gov/
Presentation Objectives
Part I

• Project Overview
• HCUP Partners
• The Making of HCUP Data
• HCUP State Databases
• HCUP Nationwide Databases
• How to Obtain HCUP Data & Access HCUP Resources
The HCUP Database Process

- Processed data sent to HCUP Partners

- State Databases become available to public through the HCUP Central Distributor

- Nationwide Databases become available for download through the HCUP Central Distributor
How to Purchase HCUP Data

➢ Visit the HCUP Central Distributor.
➢ The Central Distributor provides one stop shopping for purchasing many of the State Databases, as well as the Nationwide Databases.
➢ Not all data elements are available from every Partner Organization, and not all Partner Organizations make their data available through the Central Distributor.
➢ Some Partner Organizations may place additional restrictions on the sale of their data.

HCUP Central Distributor
www.hcup-us.ahrq.gov/tech_assist/centdist.jsp
Step 1: Take Data Use Agreement (DUA) online training:  
www.hcup-us.ahrq.gov/tech_assist/dua.jsp

Step 2: Login or register for an account:  
www.hcup-us.ahrq.gov/tech_assist/centdist.jsp

Step 3: Create your profile under “My Account”

Step 4: Submit online order and complete further instructions listed on the “Thank You” page

Step 5: Download Nationwide Databases online or receive delivery of State Databases through the mail.

For assistance, contact the HCUP Central Distributor:
  ► Phone: 866-556-HCUP (4287) toll free
  ► Email: HCUPDistributor@ahrq.gov
Purpose of the Course:

► Emphasize the importance of data protection

► Reduce the risk of inadvertent violations

► Describe your individual responsibility when using HCUP data

Takes 15 minutes to Complete

www.hcups-ahrq.gov/tech_assist/dua.jsp
Pricing Information
Per Data Year

Nationwide Databases (NIS, KID, NEDS, NRD)
- **NIS**: $625 beginning 2016, student price $125
- **KID**: $350 beginning 2009, student price $50
- **NEDS**: $750 beginning 2014, student price $150
- **NRD**: $1,000 beginning 2015, student price $200

State Databases (SID, SASD, SEDD)
- Varies by state, database, year, and type of applicant
- $50 - $3,200

Funds for State data sales returned to HCUP Partners
# Software Requirements of Working with the Full HCUP Files

<table>
<thead>
<tr>
<th>Software Package</th>
<th>Load Programs</th>
<th>Format Programs</th>
<th>Example Statistical Coding</th>
<th>HCUP Tools Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAS</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Stata</strong></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>SPSS</strong></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>SUDAAN</strong></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**MS Excel and Access are NOT GOOD Options!**
• Find detailed information on HCUP databases, tools, and products
• Access HCUPnet, HCUP Fast Stats, the Central Distributor, Online Tutorials, and more
• Find comprehensive list of HCUP-related publications and database reports
• Access technical assistance

Visit us at www.hcup-us.ahrq.gov
HCUP-US for Database Documentation

**Nationwide HCUP Databases**

HCUP's National (Nationwide) databases can be used to identify, track, and analyze national trends in health care utilization, access, charges, quality, and outcomes.

- **National (Nationwide) Inpatient Sample (NIS)**
  - [NIS Database Documentation](#)

- **Kids' Inpatient Database (KID)**
  - [KID Database Documentation](#)

- **Nationwide Emergency Department Sample (NEDS)**
  - [NEDS Database Documentation](#)

- **Nationwide Readmissions Database (NRD)**
  - [NRD Database Documentation](#)

**State-Specific HCUP Databases**

HCUP's State-specific databases can be used to investigate State-specific and multi-State trends in health care utilization, access, charges, quality, and outcomes.

- **State Inpatient Databases (SID)**
  - [SID Database Documentation](#)

- **State Ambulatory Surgery and Services Databases (SASD)**
  - [SASD Database Documentation](#)

- **State Emergency Department Databases (SEDD)**
  - [SEDD Database Documentation](#)

[www.hcup-us.ahrq.gov/databases.jsp](http://www.hcup-us.ahrq.gov/databases.jsp)
• Tools & Software
• Supplemental Files
• HCUPnet Overview
• HCUP Fast Stats
• Publications and Publication Search
• How to Access HCUP Resources
Value-Added Clinical and Quality Measurement Tools

- Clinical Classifications Software (CCS)*^  
- Procedure Classes*^  
- Chronic Condition Indicator*^  
- Elixhauser Comorbidity Software*^  
- Utilization Flags*^  
- Surgery Flags*  
- AHRQ Quality Indicators^  
  - Prevention Quality Indicators  
  - Inpatient Quality Indicators  
  - Patient Safety Indicators  
  - Pediatric Quality Indicators  

*Available on most HCUP databases through September 30, 2015  
^Available for ICD-9-CM and ICD-10-CM/PCS
Clinical Classifications Software (CCS) for ICD-9-CM

• Clusters diagnosis and procedure codes into categories
  ▶ > 14,000 diagnoses codes → 285 categories
  ▶ > 3,900 procedure codes → 231 categories
• Useful for presenting descriptive statistics and understanding patterns

ICD-9-CM Codes

0031 0202 0223 0362
0380 0381 03810 03811
03819 0382 0383 03840
03841 03842 03843
03844 03849 0388 0389
0545 449 7907
0700 0701 0702 07020
07021 07022 07023 0703
07030 07031 07032
07033 0704 07041 07042
07043 07044 07049

CCS Categories

CCS 2: Septicemia
CCS 6: Hepatitis
Clinical Classifications Software (CCS) Versions

- **CCS for ICD-9-CM**
  - Single-level & Multi-level
  - Valid through FY 2015

- **Beta CCS for ICD-10-CM/PCS**
  - Single-level & first and second multi-level categories only
  - Valid through FY 2018

- **CCS for Mortality Reporting**
  - Codes are valid through December 2009

- **CCS for Services and Procedures**
  - Classifies CPT/HCPCS codes
  - Valid through December 2018
Procedure Classes

- Groups procedure codes into one of four categories
  - Beta Procedure Classes for ICD-10-PCS
    - Valid through FY 2018
    - More than 71,900 procedure codes!
  - Procedure Classes for ICD-9-CM
    - Valid through FY 2015
    - Approximately 4,000 procedure codes
- Major procedures defined as OR procedures (DRGs)

### Procedure Categories

<table>
<thead>
<tr>
<th></th>
<th>Minor Diagnostic</th>
<th>Ex: Electrocardiogram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Minor Therapeutic</td>
<td>Ex: Pacemaker</td>
</tr>
<tr>
<td>2</td>
<td>Major Diagnostic</td>
<td>Ex: Pericardial Biopsy</td>
</tr>
<tr>
<td>3</td>
<td>Major Therapeutic</td>
<td>Ex: CABG</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chronic Condition Indicator (CCI)

Group diagnosis codes into Chronic or Non-Chronic Categories

- Beta CCI for ICD-10-CM diagnoses codes valid through FY 2018
- CCI for ICD-9-CM diagnoses codes valid through FY 2015

Condition Categories

1. **Chronic**
   - Ex: Diabetes
2. **Non-Chronic**
   - Ex: Food Poisoning
Elixhauser Comorbidity Software

- Creates indicator flags for 29 major comorbidities
  - Elixhauser Comorbidity Software Version 3.7 for ICD-9-CM diagnoses codes valid through FY 2015
  - Beta Elixhauser Comorbidity Software Version 2018.1 for ICD-10-CM diagnoses codes valid through FY 2018

ICD-10-CM or ICD-9-CM Codes, DRGs on Administrative Data →

Comorbidity Variables

- Valvular disease
- Pulm circ disorders
- Peripheral vascular dx
- Hypertension
- Paralysis
- Liver disease …
• Two indices based on Elixhauser Comorbidity Software now available on HCUP-US
  ► Applies weights to inpatient records and creates the two indices for the software –
    » One for **In-hospital mortality** and
    » One for **Readmission**
  ► The resulting index score(s) can be used in analyses in place of the 29 individual measures.

• Elixhauser Comorbidity Version 3.7 is available for ICD-9-CM data only
Utilization Flags

- Reveals additional information about the use of healthcare services
- Primarily uses UB-04 revenue codes, augmented with ICD-9-CM and ICD-10-PCS procedure codes
- Two versions available:
  - Utilization Flags for ICD-9-CM valid through December 2014
  - Utilization Flags for ICD-10-PCS valid through FY 2018
There are not ICD-9-CM codes and ICD-10 PCS codes for all services. Concern exists that some diagnostic procedures may be under-reported.

<table>
<thead>
<tr>
<th>Utilization Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accommodation</strong></td>
</tr>
<tr>
<td>Intensive Care Unit (ICU)</td>
</tr>
<tr>
<td>Newborn Level II</td>
</tr>
<tr>
<td>Newborn Level IV</td>
</tr>
<tr>
<td><strong>Cardiac Services</strong></td>
</tr>
<tr>
<td>Cardiac Catheterization Lab</td>
</tr>
<tr>
<td>Echocardiogram</td>
</tr>
<tr>
<td><strong>Imaging and Diagnostic Tests</strong></td>
</tr>
<tr>
<td>Computed Tomography (CT) Scan</td>
</tr>
<tr>
<td>Electroencephalogram (EEG)</td>
</tr>
<tr>
<td>Magnetic Resonance Technology (MRT)</td>
</tr>
<tr>
<td><strong>Devices</strong></td>
</tr>
<tr>
<td>Pacemaker</td>
</tr>
<tr>
<td><strong>Therapeutic Services</strong></td>
</tr>
<tr>
<td>Lithotripsy</td>
</tr>
<tr>
<td>Physical Therapy</td>
</tr>
<tr>
<td>Therapeutic Radiology and Chemotherapy</td>
</tr>
<tr>
<td>Speech-Language Pathology</td>
</tr>
<tr>
<td>Mental Health and Substance Abuse</td>
</tr>
</tbody>
</table>
Surgery Flags

• Identifies encounters for surgical procedures in ICD-9-CM or CPT-based inpatient and ambulatory surgery data

• Valid for codes through December 2015

1. Narrow
   • Invasive therapeutic surgical procedure involving incision, excision, manipulation, or suturing of tissue that penetrates or breaks the skin
   • Typically requires use of an operating room
   • Requires regional anesthesia, general anesthesia, or sedation to control pain

2. Broad
   • Includes all narrowly defined surgical procedures as well as a broader group of diagnostic and less invasive therapeutic surgeries

3. Neither Broad nor Narrow
   • Ex: Use of endoscopes for diagnostic purposes only and for which nothing was removed
Use of HCUP Tools with ICD-10-CM/PCS Data

• Users are advised to visit the HCUP-US Tools & Software page regularly to ensure they have the most recent version of the HCUP tools downloaded and applied to their data.

  www.hcup-us.ahrq.gov/tools_software.jsp

• For the 2015 HCUP State Databases, users should use caution with the tools-based data elements present on the Q4 data.

• A new HCUP Tools Loading Tutorial is available to assist users in the download and use of HCUP Tools.
• Create measures of health care quality using inpatient administrative data

  ► 4 Quality Indicator modules:
  1. Prevention Quality Indicators (PQIs)
  2. Inpatient Quality Indicators (IQIs)
  3. Patient Safety Indicators (PSIs)
  4. Pediatric Indicators (PDIs)
Presentation Objectives
Part II

• Tools & Software
• Supplemental Files
• HCUPnet Overview
• HCUP Fast Stats
• Publications and Publication Search
• How to Access HCUP Resources
HCUP Supplemental Files Can Only be Applied to HCUP Databases

- Cost-to-Charge Ratio (CCR) Files
- Hospital Market Structure (HMS) Files
- Supplemental Variables for Revisit Analyses
- Trend Weights Files (NIS & KID)
- American Hospital Association (AHA) Linkage Files
Charges vs. Costs

• **Charges**: What the hospital charged for care (includes charge BEFORE discount)

• **Costs**: What it cost the hospital to provide the care

HCUP Databases include **CHARGE** information. **COST** information can be estimated by applying the cost-to-charge ratio supplemental file to the data of select databases.
Enable conversion of charge data to cost data on the SID, NIS, KID, and NRD

**Cost-to-Charge Ratio (CCR) Files**

- Hospital-Level Data
- Apply Ratios
- Convert Total Charges to Costs
Hospital Market Structure (HMS) Files

- Contain various measures of hospital market competition
- Allow users to broadly characterize the intensity of competition that hospitals face
  > Using various definitions of market area
HCUP Supplemental Variables for Revisit Analyses

• Allows linkage across settings and time
  ► Hospital readmissions
  ► ED visits following hospital discharge
  ► Inpatient hospitalizations following ambulatory surgery visits

• Adheres to strict privacy guidelines
HCUP Supplemental Variables for Revisit Analyses

• There are two HCUP supplemental variables:

  1. Synthetic person-level identifier (VisitLink)
     o Verified against the patient’s date of birth and sex
     o Examined for completeness

  2. Timing variable determines the number of days between events for an individual (DaysToEvent)
     o Without the use of actual dates

• HCUP revisit variables are to be used exclusively with the SID, SASD, and SEDD (not Nationwide Databases) for States with encrypted patient identifiers

• Revisit Variables are only available in one nationwide HCUP database – the Nationwide Readmissions Database (NRD) (NRD_VisitLink and NRD_DaysToEvent)

• Select national revisit statistics are also available on HCUPnet
• **Trend Weights Files (NIS & KID)**
  – Discharge-level files that provide trend weights and data elements that are consistently defined across data years

• **AHA Linkage Files**
  – Enable researchers to link hospital identifiers in some State Databases to the AHA Annual Survey Databases

[www.hcup-us.ahrq.gov/tools_software.jsp](http://www.hcup-us.ahrq.gov/tools_software.jsp)
Presentation Objectives
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HAARPnet: Quick, Free Access to HCUP Data

- Free online query system
- Users generate tables and figures of outcomes by diagnoses and procedures
- Data can be cross-classified by patient and hospital characteristics
- Can produce county-level statistical maps
- Recently redesigned

www.hcupnet.ahrq.gov/
HCUPnet Can Answer a Variety of Questions

• What percentage of hospitalizations for children are uninsured, by State?
• What are the most expensive conditions treated in U.S. hospitals?
• What is the trend in hospitalizations for depression?
• Will there be a sufficient number of cases to do my analysis?
• How do my estimates and calculations compare with HCUPnet (validation)?
Examples of What HCUPnet Provides …

<table>
<thead>
<tr>
<th>Step-by-step queries on:</th>
<th>Specialized queries by:</th>
<th>Ready-to-use statistics on:</th>
</tr>
</thead>
</table>
| Hospital inpatient data (SID, NIS, KID, NRD) | • Overall inpatient stays  
  • Select conditions or procedures | • Trends in inpatient stays  
  • Related conditions and procedures  
  • Readmissions (NRD) |
| Emergency department (ED) data (SID, SEDD, NEDS) | • Overall ED visits  
  • Select conditions or procedures | • Trends in ED visits  
  • Percent of patients admitted versus discharged from the ED (i.e., treat-and-release) |
| Ambulatory surgery (AS) data (SASD) | • Overall AS encounters  
  • Select conditions or procedures | • Percent of cases treated in the inpatient versus AS settings |
| Community-level statistics | • County-level, regional, or U.S.-Mexico border State statistics | • Inpatient stays for alcohol and other drugs |
How does HCUPnet Work?

• Step 1: What kind of data are you looking for?
• Step 2: Do you want information on a specific diagnosis or procedure?
• Step 3: Create your analysis
• Step 4: View and update your data results in real time
• Step 5: View your results in detailed graphs and maps
• Step 6: Export your data for future use
### HCUPnet Versus Full HCUP Databases

<table>
<thead>
<tr>
<th>Capability</th>
<th>HCUPnet Can Produce...</th>
<th>HCUP Databases Can Produce...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple statistics</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>More complicated queries</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Sample size calculations</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Trends analyses</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Multivariate analyses</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Rank order of diagnoses and procedures</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Z-test calculator for significance testing</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Validation of results obtained from the HCUP databases</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
Presentation Objectives
Part II

• Tools & Software
• Supplemental Files
• HCUPnet Overview
• HCUP Fast Stats
• Publications and Publication Search
• How to Access HCUP Resources
• HCUP Fast Stats provides easy access to the latest HCUP-based statistics for health information topics.

• Uses visual statistical displays in stand-alone graphs, trend figures, or simple tables to convey complex information at a glance.

• Information will be updated regularly (quarterly or annually, as newer data become available).

www.hcup-us.ahrq.gov/faststats/landing.jsp
State Trends in Inpatient Stays by Payer

Click map to select one of the identified States, or select from list and click Select: [Arizona] Select

*Medicaid expansion State Information is available for labeled States.
A tutorial for [State Trends in Inpatient Stays by Payer] is available.
State Trends in Emergency Department Visits by Payer

Click map to select one of the identified States, or select from list and click Select: Arizona

Information is available for labeled States.
• Includes information on trends in inpatient stays, the most common diagnoses for inpatient stays, and the most common operations during inpatient stays.
Opioid-Related Hospital Use, provides information on opioid-related inpatient stays and ED visits overall and by age group, sex, community-level income, and rural/urban location. Trends are presented graphically as population-based rates for the U.S. and by State.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), National ( Nationwide) Inpatient Sample (NIS), 2008-2015 (all available data as of 12/11/2017). Inpatient stays include those admitted through the emergency department.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2008-2015 (all available data as of 12/11/2017). Emergency department visits exclude those for patients admitted to the hospital.
Presentation Objectives
Part II

• Tools & Software
• Supplemental Files
• HCUPnet Overview
• HCUP Fast Stats
• Publications and Publication Search
• How to Access HCUP Resources
• Statistical Briefs

• Methods Series Reports
**Statistical Brief Topics**

**Healthcare Cost and Utilization Project**

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**February 2016**

**Inpatient Stays Involving Atrial Fibrillation, 1998–2014**

Eliabeth Kato, M.D., M.R.P., Guyen Ngo-Mackinger, M.D., M.P.H., Kathryn R. Fangar, Ph.D., M.P.H., Kimberly W. MacDermid, Ph.D., and Alme Strobacher, Ph.D.

**Introduction**

Atrial fibrillation, an abnormal heart rhythm or “arrhythmia” in which the upper chambers of the heart contract irregularly and inefficiently, affects 2.7 to 4.1 million Americans and is the most common type of heart arrhythmia. Atrial fibrillation occurs when underlying heart disease (such as ischemic heart disease, valve heart disease, cardiomyopathy, or heart failure) damages the tissue of the atria and disrupts its ability to contract regularly. Symptoms include palpitations (fluttering sensation in the chest), dizziness, shortness of breath, syncope (fainting), and fatigue. Not everyone with atrial fibrillation has symptoms, and some may be unaware that they have an arrhythmia.

Atrial fibrillation is strongly associated with increasing age (affecting 0.2 percent of people under 55 years of age but 10 percent of those over 85 years old), obesity, and diabetes.1 These risk factors are becoming increasingly relevant in the United States, where the population in aging.1,2 The obesity epidemic is growing,1,2 and the prevalence of diabetes is rising.3 Other risk factors include previous cardiovascular disease, surgery, smoking, prior stroke, sleep apnea, alcohol use, and hyperthyroidism.

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**March 2016**

**Hospital Emergency Department Age and Payor, 2008–2015**

J. Zaynab Kassa, Ph.D., and My Ph.D.

**Highlights**

- The rate of ED visits per 100,000 population reached a 10-year high in 2015 for all age groups and increased 15 percent for patients aged 65–69 years (20 percent, from 2000).
- The proportion of ED visits that resulted in hospital admission decreased for all age groups from 2006 to 2015.
- For patients aged under 18 years, the share of ED visits with Medicare as the primary payer rose from 45 percent in 2006 to 57 percent in 2015.
- The share of Medicaid among ED visits for those aged 18–44 and 45–64 years rose with average annual increases of 11 and 14 percent, respectively, from 2012 to 2015.
- For patients aged under 18 years, the share of ED visits with Medicare as the primary payer rose from 45 percent in 2006 to 57 percent in 2015.

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**February 2016**

**Patient Safety and Adverse Events, 2011 and 2014**

Pamela L. Owens, Ph.D., Rhone Umcangco, Ph.D., Margaret L. Barnett, M.S., Kevin C. Heslin, Ph.D., and Brian J. Moore, Ph.D.

**Introduction**

Improving patient safety and the quality of health care is a national priority in the United States. In 1999, the Institute of Medicine reported that 44,000 to 98,000 Americans die each year as a result of medical errors.7 More recently, at least one author has suggested that estimates of harm are much higher.8 The majority of these errors are a result of systemic problems rather than poor performance of individual clinicians. In the test 25 years, national initiatives have taken place to reduce the number of patients harmed as a result of a process of care. However, medical errors are a serious issue, and efforts to reduce them continue to draw attention and resources across the health care system. Therefore, it is important to assess progress made in patient safety and reveal where gaps remain.

One way to assess patient safety and adverse events is by using the Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicators (PSIs). These indicators provide a measure of potentially preventable complications of adult medical and surgical hospital care. The PSIs focus on adverse events during the hospital stay such as pressure ulcers, complications associated with surgery (such as hemorrhage or herniation, respiratory failure, or intracranial hemorrhage), and falling and patient safety overall (composite of the patient safety events). Rates vary by hospital and across time, with evidence demonstrating that

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**Notes and References**


Methodological information on the HCUP databases and software tools
HCUP Statistical Briefs
Statistical Briefs are simple, descriptive reports on a variety of specific health-care related issues. A full list is available by topic and chronological order. The most recent briefs are:

- Trends in Hospital Emergency Department Visits by Age and Payer, 2006-2015
- Patient Safety and Adverse Events, 2011 and 2014

HCUP Methods Series
Methods Series reports, organized by topic and chronological order, feature a broad array of methodological information on the HCUP databases and software tools. The most recent reports are:

- Population Denominator Data for Use with the HCUP Databases (Updated with 2016 Population Data) (PDF file, 477 KB)
- Appendix A Population Data Tables (in ZIP format for downloading)
- User Guide: An Examination of Expected Payer Coding In HCUP Databases (Updated for 2015 HCUP Data) (PDF file, 391 KB)
- Supplements 1-3 (PDF file, 578 KB)

Information About Using HCUP Data
HCUP Nationwide Database Reports
These reports are specific to the design and content of the HCUP nationwide databases.

- National (Nationwide) Inpatient Sample (NIS)
- Kids' Inpatient Database (KID)
- Nationwide Emergency Department Sample (NEDS)
- Nationwide Readmissions Database (NRD)

HCUP State Database Reports
These reports are specific to the design and content of the HCUP state databases.

- State Inpatient Databases (SID)
- State Ambulatory Surgery and Services Databases (SASSD)
- State Emergency Department Databases (SEDD)

Publications and Additional Topics
HCUP Publications
These links provide access to lists of publications, resources, and descriptions of research activities that are based on HCUP data, software products, and tools.

- Search for HCUP publications
- Research Spotlights on recent peer-reviewed journal articles
- Review comprehensive list of AHRQ publications

HCUP Archive
This archive features a broad array of information based on HCUP databases and other related reports.

- HCUP Projections (2012-2016)
- The Value of Hospital Discharge Data (PDF file, 554 KB) (Posted May 2005)
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The HCUP FAQs provide answers to commonly asked questions about HCUP databases, software tools, supplemental files, and other products.

HCUP Databases
The HCUP Databases page provides detailed database overviews, information on obtaining the databases, and additional resources and documentation to assist you in using the databases. Visit the Purchase HCUP Data page for additional information on obtaining HCUP databases.

HCUP Publishing Requirements
For information on publishing with HCUP data, please review the HCUP publishing requirements.

HCUP Virtual Exhibit Booth
The HCUP Virtual Exhibit Booth provides educational overview materials typically offered for conference attendees at HCUP informational booths.

HCUP Index
To search for an HCUP topic, please review the Index.

HCUP Training & Tutorials

HCUP Overview Course
To learn more about HCUP, take the interactive, modular HCUP Overview Course (approximately 90 minutes) that provides information about HCUP data, software tools, and products. The course covers the features, capabilities, and potential uses of HCUP resources.

HCUP Data Use Agreement Training Tool
All purchasers and users of HCUP data must complete the HCUP Data Use Agreement (DUA) Training Course (approximately 15 minutes) and sign an HCUP DUA before using the data. The DUA is a legally binding agreement with AHRQ that defines how you can use HCUP data.

HCUP On-line Tutorial Series
To learn more about concepts essential to conducting effective research with HCUP, refer to the interactive, modular HCUP On-line Tutorial Series. The courses are designed to answer technical questions you may have related to HCUP data and products.

⭐ Checklist for Working With HCUP Databases
The Checklist for Working With the NIS reviews best practices and solutions for common errors. Many of the principles and resources also apply to other HCUP databases.

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