The Healthcare Cost and Utilization Project (HCUP)

An In-Depth Exploration of the HCUP Database: Nationwide Emergency Department Sample (NEDS)

Agency for Healthcare Research and Quality

Webinar ✦ December 2020
Webinar Overview

• Discuss the HCUP project and the making of HCUP data
• Introduce the HCUP Nationwide Emergency Department Sample (NEDS)
• Describe how you can use the NEDS using three use cases:
  ► ED visits for all injuries
  ► ED visits and admissions for potentially preventable hospital visits
  ► ED visits for seasonal illnesses
• Compare NEDS to HCUPnet results
• Review the NEDS checklist
• Access the HCUP User Support (HCUP-US) website
What is HCUP?

HCUP is a comprehensive set of publicly available all-payer healthcare data (including self-pay and those billed as ‘no charge’)

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

HCUP Databases

- SID
- SEDD
- SASD
- NEDS
- NIS
- KID
- NRD
- NASS

Online Tools

Analytics

User Support
What is the Agency for Healthcare Research and Quality (AHRQ)?

The Agency for Healthcare Research and Quality (AHRQ) is a federal agency under the Department of Health and Human Services.
<table>
<thead>
<tr>
<th>State</th>
<th>Data Partner</th>
</tr>
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<tr>
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<td>Department of Health and Social Services</td>
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<td>California</td>
<td>Office of Statewide Health Planning and Development</td>
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<td>Colorado</td>
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<td>Agency for Health Care Administration</td>
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<td>Maryland</td>
<td>Health Services Cost Review Commission</td>
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<td>Center for Health Information and Analysis</td>
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<td>Health &amp; Hospital Association</td>
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<td>Minnesota</td>
<td>Hospital Association (provides data for Minnesota and North Dakota)</td>
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<td>Mississippi</td>
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<td>Missouri</td>
<td>Hospital Industry Data Institute</td>
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<td>North Dakota</td>
<td>(data provided by the Minnesota Hospital Association)</td>
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<td>Health Care Cost Containment Council</td>
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<td>Association of Healthcare Organizations</td>
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<td>Department of Health and Human Resources, West Virginia Health Care Authority</td>
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<td>Department of Health Services</td>
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<tr>
<td>Wyoming</td>
<td>Hospital Association</td>
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</table>
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

Scheduled or Emergent Visit to the Hospital

- Reception
- Admit
- Provide Care
- Discharge

Patient Perspective

- Patient Record
- Patient Record
- Discharge Summary

Data Perspective

- Medical Coder
- Billing Dept

Bill Generated
The Making of HCUP Data

Patient enters hospital

Billing record created

States store data in varying formats

AHRQ standardizes data to create uniform HCUP databases

Hospital sends billing data and any additional data elements to data organizations
HCUP State-Specific Databases

Inpatient State-Specific Databases

State Inpatient Databases (SID)

Outpatient State-Specific Databases

State Ambulatory Surgery & Services Databases (SASD)

State Emergency Department Databases (SEDD)
HCUP Nationwide Databases

Inpatient Nationwide Databases
- National Inpatient Sample (NIS)
- Kids’ Inpatient Database (KID)
- Nationwide Readmissions Database (NRD)

Outpatient Nationwide Databases
- Nationwide Emergency Department Sample (NEDS)
- Nationwide Ambulatory Surgery Sample (NASS)
Webinar Overview

- Discuss the HCUP project and the making of HCUP data
- **Introduce the HCUP Nationwide Emergency Department Sample (NEDS)**
- Describe how you can use the NEDS using three use cases:
  - ED visits for all injuries
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  - ED visits for seasonal illnesses
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- Review the NEDS checklist
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Nationwide Emergency Department Sample (NEDS)

• Generates national and regional estimates of emergency department utilization, access, and quality

• Derived from HCUP State databases:
  ► State Emergency Department Databases (SEDD): Capture information on ED encounters that do not result in an admission
  
  ► State Inpatient Databases (SID): Contain information on patients initially seen in the ED and then admitted to the same hospital
NEDS Sample Design

- **SEDD**
  - Treat-and-Release ED Visits

- **SID**
  - Admitted ED Visits

**Sampling Strata**
- U.S. Region
- Urban/Rural Location
- Teaching Status
- Ownership/Control
- Trauma center
  *State not included*

~ 84% of ED visits are treat-and-release

~ 16% of ED visits result in a hospital stay

20% stratified sample of hospital-owned EDs
Weighting the NEDS to Produce National Estimates

• The NEDS must be weighted to produce national and regional estimates of ED visits

• The NEDS must be weighted to produce national and regional *hospital* estimates
What Data Elements Are Included in the NEDS?

Data Elements:

- Patient demographics (e.g., age, sex)
- Diagnoses & procedures
- Expected payment source
- Length of stay for the inpatient stay
- Patient location: urban/rural
- Discharge status
- Injury indicators
- Trauma level
- Total charges
  - Total charges for ED services (TOTCHG_ED)
  - Total charges for ED and inpatient services (TOTCHG_IP)
Data Elements New to the 2018 NEDS

• The 2018 NEDS is now available through the HCUP Central Distributor
  ► The 2006-2017 NEDS are also available

• New data elements in 2018 include:
  ► Indicators of mechanism and intent of the injury based on ICD-10-CM diagnoses
  ► Clinical Classifications Software Refined (CCSR) for ICD-10-CM diagnoses
The CCSR for ICD-10-CM diagnoses is organized across 21 body systems, which generally follow the structure of the ICD-10-CM diagnosis chapters.

Diagnosis codes are no longer assigned to mutually exclusive categories.

However, a mutually exclusive categorization scheme is available for the first-listed diagnosis code.
CCSR for ICD-10-CM
Diagnoses in the 2018 NEDS

• The 2018 NEDS includes three types of data elements located in the Diagnosis and Procedure Groups File
  - I10_DXCCSR_DEFAULT_DX1: Default CCSR for principal/first-listed ICD-10-CM diagnosis
  - I10_DXCCSR_AAAnnn: Indication that at least one ICD-10-CM diagnosis on the record is included in the CCSR category AAAnnn
    - There are over 500 CCSR categories
  - I10_DXCCSR_VERSION: Version of CCSR for ICD-10-CM
The 2018 NEDS contains 5 files:

- **Core File**
  - Patient demographics, diagnoses, expected payer, disposition from the ED, etc.

- **Supplemental ED File**
  - Information specific to the ED treatment (e.g., procedures)

- **Supplemental IP File**
  - Information specific to the inpatient stay (e.g., MS-DRG, procedures, disposition from the inpatient stay)

- **Hospital Weights File**
  - Hospital weights and attributes (e.g., level of trauma center, urban/rural designation)

- **Diagnosis and Procedure Groups File**
  - CCSR for ICD-10-CM diagnoses
What Data Elements Are Not Included in the HCUP Databases?

The NEDS does not include:

- State identifiers
- Geographic information for the patient or hospital
  - ZIP Code, county, city
- Unmasked hospital identifiers
  - The hospital identifiers in the NEDS do not directly identify hospitals but allow users to identify records that are associated with the same hospital-owned ED
- Patient race
Total Charges in the NEDS

- Total charges for ED services (TOTCHG_ED)
  - Includes the total charges for ED visits that did not result in an inpatient admission (from the SEDD)
  - Includes the total charges for the ED visits that resulted in an inpatient admission (from the SID)
  - Not all States provide ED charge information, resulting in about 13% of NEDS records missing ED charges

- Total charges for ED and inpatient services (TOTCHG_IP)
  - Includes the total charges for the inpatient stay, including the ED charges (from the SID)
Trauma Level

• The NEDS includes hospital trauma level information based on information from the Trauma Information Exchange Program (TIEP) database

• Trauma center levels in the NEDS are as follows:
  ► Level I: Comprehensive resources; are able to care for the most severely injured; provide leadership in education and research
  ► Level II: Comprehensive resources; are able to care for the most severely injured
  ► Level III: Prompt assessment and resuscitation, emergency surgery and the ability to transfer to a Level I or II trauma center.
Summary of the 2018 NEDS

• Unweighted, the 2018 NEDS contains data for 35.8 million ED visits
  ► Includes data from 36 States and the District of Columbia
    – These geographically dispersed States account for 82.8 percent of the total U.S. population and 82.2 percent of the all ED visits in the U.S.
  ► The 20% sample includes 990 hospital-owned EDs

• Weighted, it represents 143 million ED visits at over 4,500 hospital-owned EDs in the United States
Trends in ED Visits Using the NEDS, 2006-2018
Trends in Overall ED Visits by Age, 2006-2018

The chart above illustrates the trends in the total number of ED visits by age group from 2006 to 2018. The chart uses colored bars to represent different age groups:

- Purple: <5 years
- Blue: 5-17 years
- Green: 18-34 years
- Orange: 35-64 years
- Light Blue: 65+ years

The bars show the number of ED visits in millions for each year, with the following trends observed:

- In 2006, the highest number of visits was in the 65+ age group, followed by the 35-64 and 18-34 age groups.
- A gradual increase in visits is observed across all age groups from 2006 to 2018.
- The 65+ age group consistently has the highest number of visits, followed by the 35-64 and 18-34 age groups.
- The 5-17 and <5 age groups have the lowest number of visits, with minimal fluctuation over the years.
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Identify ED Visits Related to Injury in the NEDS

- Injury records identified by first-listed ICD-10-CM diagnosis

- Beginning in data year 2017, the NEDS includes two injury indicators for ICD-10-CM diagnoses:
  - I10_Injury
  - I10_Multinjury

- Beginning in data year 2018, the NEDS also includes 15 injury mechanism and intent indicators for ICD-10-CM diagnoses
ED Visits for All Injuries by Trauma Level and Patient Location, 2018

- Large Metropolitan
- Medium Metropolitan
- Small Metropolitan
- Non Metropolitan

<table>
<thead>
<tr>
<th>Trauma Level</th>
<th>Large Metropolitan</th>
<th>Medium Metropolitan</th>
<th>Small Metropolitan</th>
<th>Non Metropolitan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level I/II</td>
<td>57</td>
<td>23</td>
<td>16</td>
<td>25</td>
</tr>
<tr>
<td>Level III</td>
<td>11</td>
<td>19</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>Non-Trauma</td>
<td>6</td>
<td></td>
<td></td>
<td>25</td>
</tr>
</tbody>
</table>
ED Visits for All Injuries by Trauma Level and Hospital Region, 2018

- **Trauma Level I/II**
  - Northeast: 19%
  - Midwest: 30%
  - South: 33%
  - West: 18%

- **Trauma Level III**
  - Northeast: 9%
  - Midwest: 26%
  - South: 44%
  - West: 22%

- **Non-Trauma**
  - Northeast: 20%
  - Midwest: 19%
  - South: 42%
  - West: 20%
Traumatic brain injury (TBI) was defined using the following CCSR categories:
- INJ008: Traumatic brain injury; concussion, initial encounter
- INJ045: Traumatic brain injury; concussion, subsequent encounter

Identified ED visits that resulted in an inpatient admission and ED visits that did not result in an inpatient admission
- Data element: HCUPFile
ED Visits for Acute TBI by Age, 2018

- ED visits that resulted in a hospital admission
- ED visits that did not result in a hospital admission

<table>
<thead>
<tr>
<th>Age</th>
<th>Percentage of ED Visits</th>
<th>Hospital Admission</th>
<th>No Hospital Admission</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>82%</td>
<td>18%</td>
<td>62%</td>
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<tr>
<td>5-17</td>
<td>94%</td>
<td>6%</td>
<td>88%</td>
</tr>
<tr>
<td>18-34</td>
<td>85%</td>
<td>15%</td>
<td>85%</td>
</tr>
<tr>
<td>35-64</td>
<td>72%</td>
<td>28%</td>
<td>72%</td>
</tr>
<tr>
<td>65+</td>
<td>48%</td>
<td>52%</td>
<td>48%</td>
</tr>
</tbody>
</table>
ED Visits for Acute TBI by Primary Expected Payer, 2018

- Medicare: 50% admitted, 50% not admitted
- Medicaid: 19% admitted, 81% not admitted
- Private insurance: 17% admitted, 83% not admitted
- Self-pay/No Charge: 18% admitted, 82% not admitted
- Other: 18% admitted, 82% not admitted
TBI-related ED Visits by Head Injury Type, 2018

Percentage of ED Visits

- Cerebral hemorrhage
- TBI, mild to severe
- Concussion, uncomplicated

ED visits that did not result in a hospital admission

ED visits that resulted in a hospital admission
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Define Heart Failure and Asthma Conditions

- Identified using the AHRQ Quality Indicators (QI)
  - Prevention Quality Indicators (PQI)
    - Population-based indicators that capture all cases of potentially preventable hospital visits that occur in a given population (in a community or region) either during a hospitalization or in a subsequent hospitalization.
  - Heart failure: PQI 08
  - Adult asthma: PQI 15
Admissions with a principal diagnosis of heart failure per 100,000 population, ages 18 and older

- Excludes cardiac procedure admissions, obstetric admissions, and transfers from other institutions.

Numerator: Discharges, for patients ages 18 and older, with a principal ICD-10-CM diagnosis code of heart failure

Denominator: Population ages 18 years and older
Calculating Variance in the NEDS

• Special consideration is needed when calculating estimates of variance
  ► Need to use statistical software that can account for the sampling design of the NEDS
    − Stratified sample of hospital-owned EDs
    − Sampled data that needs to be weighted
    − Cluster of ED visits within EDs

• Users should reference the HCUP Methods Series Report, *Calculating Nationwide Inpatient Sample (NIS) Variances for 2011 and Earlier*
Asthma in Young Adults PQI 15

- Admissions with a principal diagnosis of asthma per 100,000 population, ages 18-39 years
  - Excludes admissions with an indication of cystic fibrosis or anomalies of the respiratory system, obstetric admissions, and transfers from other institutions
- Numerator: Discharges, for patients ages 18-39, with a principal ICD-10-CM diagnosis code for asthma
- Denominator: Population ages 18-39 years
ED Visits for Asthma in Young Adults by Hospital Region, 2017

- **Northeast**: 468 ED visits per 100,000 population for ED visits that resulted in a hospital admission, 396 ED visits per 100,000 population for ED visits that did not result in a hospital admission.
- **Midwest**: 28 ED visits per 100,000 population for ED visits that resulted in a hospital admission, 354 ED visits per 100,000 population for ED visits that did not result in a hospital admission.
- **South**: 42 ED visits per 100,000 population for ED visits that resulted in a hospital admission, 20 ED visits per 100,000 population for ED visits that did not result in a hospital admission.
- **West**: 278 ED visits per 100,000 population for ED visits that resulted in a hospital admission.
ED Visits for Asthma in Young Adults by Sex, 2017

- ED visits that resulted in a hospital admission:
  - Male: 19
  - Female: 39

- ED visits that did not result in a hospital admission:
  - Male: 300
  - Female: 428

ED Visits per 100,000 population
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  ► ED visits and admissions for potentially preventable hospital visits
  ► **ED visits for seasonal illnesses**
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Identify Seasonal Illnesses

- For this analysis, we looked at influenza-related ED visits by discharge quarter across three years
- Influenza-related illnesses were defined using all-listed ICD-10-CM diagnosis codes
Influenza-Related ED Visits by Year and Discharge Quarter, 2016-2018

Number of Overall ED Visits (in thousands)

Year and Discharge Quarter

2016 Q1 2016 Q2 2016 Q3 2016 Q4 2017 Q1 2017 Q2 2017 Q3 2017 Q4 2018 Q1 2018 Q2 2018 Q3 2018 Q4
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Statistics Using the NEDS Are Available on HCUPnet

- HCUPnet is a free online query system
- It allows users to generate tables of outcomes by diagnoses and procedures
- Statistics utilizing the NEDS from 2006 through 2016 are currently available
- Users can generate simple queries or can confirm results match runs using the full NEDS database
How Does HCUPnet Work?

• Step 1: What kind of statistics are you looking for?
• Step 2: Choose how you would like to analyze the data
• Step 3: Create your analysis
• Step 4: View and update your results in real time
• Step 5: View your results in detailed graphs and maps
• Step 6: Export your results for future use
How Does HCUPnet Work?
Analysis Setup (Steps 1 and 2)

Analysis Setup

Choose how you would like to analyze data.

- Descriptive Statistics
- Trends
- Rank Order

Choose a year.
- 2016

Do you want data on a specific diagnosis or procedure?
- Yes
- No

Choose how you want to classify diagnoses or procedures.

When a large number of diagnosis codes, procedure codes, or states are selected, queries may take a long time to process. To reduce processing time, select fewer codes and/or states.

- Diagnoses--ICD-10-CM Codes (ICD10)
## Results from the Influenza Query on HCUPnet

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<th></th>
<th>All ED visits</th>
<th>Discharged from the ED</th>
<th>ED visits with admission to the same hospital</th>
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<td>Number</td>
<td>Rate</td>
<td>Number</td>
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<tr>
<td>Total number of visits: N</td>
<td>686,435</td>
<td>212.4</td>
<td>630,332</td>
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<td>Rate of Visits per 100,000 persons</td>
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<td>Rate of Visits per 100,000 persons</td>
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<td>Total number of visits: N</td>
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<td>Rate of Visits per 100,000 persons</td>
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<td>Rate of Visits per 100,000 persons</td>
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<td>Capability</td>
<td>HCUPnet Can Produce...</td>
<td>HCUP Databases Can Produce...</td>
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<tr>
<td>Simple statistics</td>
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<tr>
<td>More complicated queries</td>
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<td>✓</td>
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<td>Sample size calculations</td>
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<td>Trends analyses</td>
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<td>Multivariate analyses</td>
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<td>Rank order of diagnoses and procedures</td>
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<td>Z-test calculator for significance testing</td>
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<tr>
<td>Validation of results obtained from the HCUP databases</td>
<td>✓</td>
<td>X</td>
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</tbody>
</table>
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## Working with the NEDS: Checklist

<table>
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<th>Important items to remember when working with the NEDS</th>
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<th>Not available or not permitted</th>
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<td>Unit of analysis</td>
<td>ED visit</td>
<td>Individual patient</td>
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<td>Level of analysis</td>
<td>Nationwide estimates; Facility volume</td>
<td>State-level estimates; Physician-level estimates; Readmissions</td>
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<td>Reportable level</td>
<td>Greater than 10</td>
<td>Less than or equal to 10; Ensure hospitals and individuals cannot be identified directly or indirectly</td>
</tr>
</tbody>
</table>
Important Aspects to Remember When Working with the NEDS

- There are differences in information collected on records for ED patients that are not admitted (SEDD records) and for patients admitted into the hospital directly from the ED (SID records).
- For patients who were directly admitted to the same hospital through the ED, it is not possible to identify whether a procedure was performed in the ED or as part of the inpatient stay.
- Use the hospital weight to weight sampled hospitals to all community hospitals or the discharge weight to weight sampled discharges to the discharges from community hospitals.
Webinar Overview

• Discuss the HCUP project and the making of HCUP data
• Introduce the HCUP Nationwide Emergency Department Sample (NEDS)
• Describe how you can use the NEDS using three use cases:
  ► ED visits for all injuries
  ► ED visits and admissions for potentially preventable hospital visits
  ► ED visits for seasonal illnesses
• Compare NEDS to HCUPnet results
• Review the NEDS checklist
• Access the HCUP User Support (HCUP-US) website
The NEDS is Available for Purchase Through the Central Distributor

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NEDS</td>
<td>Students</td>
<td>$200</td>
<td>$200</td>
<td>$150</td>
<td>$150</td>
<td>$150</td>
<td>$75</td>
<td>$75</td>
</tr>
<tr>
<td>NEDS</td>
<td>All Others</td>
<td>$1,000</td>
<td>$1,000</td>
<td>$750</td>
<td>$750</td>
<td>$500</td>
<td>$500</td>
<td>$500</td>
</tr>
</tbody>
</table>
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
NEDS Database Documentation

The Nationwide Emergency Department Sample (NEDS) produces national estimates about emergency department (ED) visits across the most distinctive features of the NEDS is its large sample size, which allows for analysis across hospital types and the study of

The links below provide detailed documentation for the NEDS, from a high-level Overview to all the detailed specifications, restrict

Description of NEDS Database

- NEDS Overview
  - HCUP Partners in the NEDS
- Introduction to the NEDS
  - 2018 (PDF file, 825 KB; HTML)
  - Prior Years
- NEDS Related Reports
  - Prior Years
  - Checklist for Working With the NEDS

Restrictions on Use

- HCUP Data Use Agreement Training
- Data Use Agreement for the Nationwide Databases (PDF file, 85 KB; HTML)
- Requirements for Publishing with HCUP Data

File Specifications and Load Programs

- NEDS File Specifications
The NEDS is Used in Many Applications

- Statistical Briefs
- Methods Series Reports
- Findings-At-A-Glance
- HCUP Publications
Using HCUP Technical Assistance

Technical Assistance Team

- Responds to inquiries about HCUP data, products, and tools
- Collects user feedback and suggestions for improvement

E-mail: hcup@ahrq.gov
Join the HCUP Email List

- HCUP Newsletter, published quarterly
  - User Tech Tips
  - Upcoming Events
- New Data Releases
- New Reports

https://subscriptions.ahrq.gov/accounts/USAHRQ/subscriber/new
Healthcare Cost and Utilization Project (HCUP)
Questions/Comments?

Time for Questions and/or Comments

E-mail: 
hcup@ahrq.gov
Appendix. Injury ICD-10-CM Diagnosis Codes

Injury records identified by first-listed diagnosis

<table>
<thead>
<tr>
<th>ICD-10-CM</th>
</tr>
</thead>
<tbody>
<tr>
<td>All codes starting with S</td>
</tr>
<tr>
<td>Codes starting with T07-T34</td>
</tr>
<tr>
<td>Codes starting with T36 –T50 with a 6th character of 1, 2, 3, or 4 (Exceptions: T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9 with a 5th character of 1, 2, 3, or 4)</td>
</tr>
<tr>
<td>Codes starting with T51-T65</td>
</tr>
<tr>
<td>Codes starting with T66-T76</td>
</tr>
<tr>
<td>Codes starting with T79</td>
</tr>
<tr>
<td>Codes T84.01 and T84.02 (added May 2018)</td>
</tr>
<tr>
<td>Codes O9A.2-O9A.5</td>
</tr>
</tbody>
</table>

All injuries are identified. Injuries severity CANNOT be identified under ICD-10-CM
Appendix. Types of Traumatic Brain Injury

Types of traumatic brain injury were identified by the following values for the first through fifth digits of the ICD-10-CM codes in the TBI-related CCSR categories. If multiple codes were present, the following hierarchy was used to assign the record to only one category.

- **Cerebral hemorrhage**
  - S064X: Epidural
  - S065X: Subdural
  - S066X: Subarachnoid
  - S0634, S0635, S0636: Intracerebral hemorrhage

- **TBI, mild to severe**
  - S0631, S0632, or S0633: Contusion and laceration of cerebrum
  - S0637, S0638: Contusion, laceration, or hemorrhage of cerebellum or brainstem
  - S062X: Diffuse traumatic brain injury
  - S0630: Focal traumatic brain injury
  - S0681 or S0682: Injury of blood vessels of head or carotid artery
  - S061X: Traumatic cerebral edema
  - S0689 or S069X: Other intracranial injury

- **Concussion, uncomplicated**
  - S060X: Concussion
## Appendix. Heart Failure
### ICD-10-CM Diagnosis Codes

- AHRQ QI™ ICD-10-CM/PCS Specification v2020: PQI 08 Heart Failure Admission Rate
  - [www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov)

<table>
<thead>
<tr>
<th>ICD-10-CM/PCS Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I0981</td>
<td>Rheumatic heart failure</td>
</tr>
<tr>
<td>I5041</td>
<td>Acute combined systolic (congestive) and diastolic (congestive) heart failure</td>
</tr>
<tr>
<td>I110</td>
<td>Hypertensive heart disease with heart failure</td>
</tr>
<tr>
<td>I5042</td>
<td>Chronic combined systolic (congestive) and diastolic (congestive) heart failure</td>
</tr>
<tr>
<td>I130</td>
<td>Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease</td>
</tr>
<tr>
<td>I5043</td>
<td>Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure</td>
</tr>
<tr>
<td>I132</td>
<td>Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease</td>
</tr>
<tr>
<td>I50810</td>
<td>Right heart failure, unspecified</td>
</tr>
<tr>
<td>I501</td>
<td>Left ventricular failure, unspecified</td>
</tr>
<tr>
<td>I50811</td>
<td>Acute right heart failure</td>
</tr>
<tr>
<td>I5020</td>
<td>Unspecified systolic (congestive) heart failure</td>
</tr>
<tr>
<td>I50812</td>
<td>Chronic right heart failure</td>
</tr>
<tr>
<td>I5021</td>
<td>Acute systolic (congestive) heart failure</td>
</tr>
<tr>
<td>I50813</td>
<td>Acute on chronic right heart failure</td>
</tr>
<tr>
<td>I5022</td>
<td>Chronic systolic (congestive) heart failure</td>
</tr>
<tr>
<td>I50814</td>
<td>Right heart failure due to left heart failure</td>
</tr>
<tr>
<td>I5023</td>
<td>Acute on chronic systolic (congestive) heart failure</td>
</tr>
<tr>
<td>I5082</td>
<td>Biventricular heart failure</td>
</tr>
<tr>
<td>I5030</td>
<td>Unspecified diastolic (congestive) heart failure</td>
</tr>
<tr>
<td>I5083</td>
<td>High output heart failure</td>
</tr>
<tr>
<td>I5031</td>
<td>Acute diastolic (congestive) heart failure</td>
</tr>
<tr>
<td>I5084</td>
<td>End stage heart failure</td>
</tr>
<tr>
<td>I5032</td>
<td>Chronic diastolic (congestive) heart failure</td>
</tr>
<tr>
<td>I5089</td>
<td>Other heart failure</td>
</tr>
<tr>
<td>I5033</td>
<td>Acute on chronic diastolic (congestive) heart failure</td>
</tr>
<tr>
<td>I509</td>
<td>Heart failure, unspecified</td>
</tr>
<tr>
<td>I5040</td>
<td>Unspecified combined systolic (congestive) and diastolic (congestive) heart failure</td>
</tr>
</tbody>
</table>
### Appendix. Asthma ICD-10-CM Diagnosis Codes

- AHRQ QI™ ICD-10-CM/PCS Specification v2020: PQI 15 Asthma in Younger Adults Admission Rate
  - [www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov)

<table>
<thead>
<tr>
<th>ICD-10-CM/PCS Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J4521</td>
<td>Mild intermittent asthma with (acute) exacerbation</td>
</tr>
<tr>
<td>J4552</td>
<td>Severe persistent asthma with status asthmaticus</td>
</tr>
<tr>
<td>J4522</td>
<td>Mild intermittent asthma with status asthmaticus</td>
</tr>
<tr>
<td>J45901</td>
<td>Unspecified asthma with (acute) exacerbation</td>
</tr>
<tr>
<td>J4531</td>
<td>Mild persistent asthma with (acute) exacerbation</td>
</tr>
<tr>
<td>J45902</td>
<td>Unspecified asthma with status asthmaticus</td>
</tr>
<tr>
<td>J4532</td>
<td>Mild persistent asthma with status asthmaticus</td>
</tr>
<tr>
<td>J45990</td>
<td>Exercise induced bronchospasm</td>
</tr>
<tr>
<td>J4541</td>
<td>Moderate persistent asthma with (acute) exacerbation</td>
</tr>
<tr>
<td>J45991</td>
<td>Cough variant asthma</td>
</tr>
<tr>
<td>J4542</td>
<td>Moderate persistent asthma with status asthmaticus</td>
</tr>
<tr>
<td>J45998</td>
<td>Other asthma</td>
</tr>
<tr>
<td>J4551</td>
<td>Severe persistent asthma with (acute) exacerbation</td>
</tr>
</tbody>
</table>
# Appendix. Influenza

ICD-10-CM Diagnosis Codes

<table>
<thead>
<tr>
<th>ICD-10-CM code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J09.X1</td>
<td>Influenza due to identified novel influenza A virus with pneumonia</td>
</tr>
<tr>
<td>J09.X2</td>
<td>Influenza due to identified novel influenza A virus with other respiratory manifestations</td>
</tr>
<tr>
<td>J09.X3</td>
<td>Influenza due to identified novel influenza A virus with gastrointestinal manifestations</td>
</tr>
<tr>
<td>J09.X9</td>
<td>Influenza due to identified novel influenza A virus with other manifestations</td>
</tr>
<tr>
<td>J10.00</td>
<td>Influenza due to other identified influenza virus with unspecified type of pneumonia</td>
</tr>
<tr>
<td>J10.01</td>
<td>Influenza due to other identified influenza virus with the same other identified influenza virus pneumonia</td>
</tr>
<tr>
<td>J10.08</td>
<td>Influenza due to other identified influenza virus with other specified pneumonia</td>
</tr>
<tr>
<td>J10.1</td>
<td>Influenza due to other identified influenza virus with other respiratory manifestations</td>
</tr>
<tr>
<td>J10.2</td>
<td>Influenza due to other identified influenza virus with gastrointestinal manifestations</td>
</tr>
<tr>
<td>J10.81</td>
<td>Influenza due to other identified influenza virus with encephalopathy</td>
</tr>
<tr>
<td>J10.82</td>
<td>Influenza due to other identified influenza virus with myocarditis</td>
</tr>
<tr>
<td>J10.83</td>
<td>Influenza due to other identified influenza virus with otitis media</td>
</tr>
<tr>
<td>J10.89</td>
<td>Influenza due to other identified influenza virus with other manifestations</td>
</tr>
<tr>
<td>J11.00</td>
<td>Influenza due to unidentified influenza virus with unspecified type of pneumonia</td>
</tr>
<tr>
<td>J11.08</td>
<td>Influenza due to unidentified influenza virus with specified pneumonia</td>
</tr>
<tr>
<td>J11.1</td>
<td>Influenza due to unidentified influenza virus with other respiratory manifestations</td>
</tr>
<tr>
<td>J11.2</td>
<td>Influenza due to unidentified influenza virus with gastrointestinal manifestations</td>
</tr>
<tr>
<td>J11.81</td>
<td>Influenza due to unidentified influenza virus with encephalopathy</td>
</tr>
<tr>
<td>J11.82</td>
<td>Influenza due to unidentified influenza virus with myocarditis</td>
</tr>
<tr>
<td>J11.83</td>
<td>Influenza due to unidentified influenza virus with otitis media</td>
</tr>
<tr>
<td>J11.89</td>
<td>Influenza due to unidentified influenza virus with other manifestations</td>
</tr>
</tbody>
</table>