



H·CUP
HEALTHCARE COST AND UTILIZATION PROJECT

**HCUP SOFTWARE TOOLS
AND DATA REPORTS**

2012

HCUP SOFTWARE TOOLS AND DATA REPORTS

The Agency for Healthcare Research and Quality (AHRQ) disseminates software tools, supplemental files, and reports to improve the ease of use and value of the databases. AHRQ develops and maintains software tools for use with HCUP and other administrative data. The tools are updated annually and are available for download, free of charge. AHRQ also provides supplemental files containing measures created exclusively for use with the HCUP databases. Information about publicly available software tools and supplemental files is available on the HCUP User Support Website (HCUP-US) at http://www.hcup-us.ahrq.gov/tools_software.jsp. AHRQ also creates various tools and reports for the exclusive use of HCUP Partners, including HCUP data quality reports and State-specific tables and files. To acquire this Partner-oriented information, contact HCUP User Support at 1-866-290-HCUP or Judy Parlato at Judy.Parlato@ThomsonReuters.com.

In addition, AHRQ produces several series reports based on HCUP data – the HCUP Facts and Figures, Methods Series Reports, Statistical Briefs, and Database Reports. These reports are an important means of communicating and disseminating information from HCUP. The reports describe HCUP data and research; present statistics, analyses, and findings; and provide special technical analyses. All the publications are available on the “Reports” page of the HCUP-US Website (<http://www.hcup-us.ahrq.gov/reports.jsp>).

This section summarizes HCUP software tools and data products designed for the public and additional tables, files, and activities developed exclusively for HCUP Partners.

HCUP SOFTWARE TOOLS

AHRQ Quality Indicators

On an annual basis, HCUP data are used to update and enhance the AHRQ Quality Indicators (QIs) and their supporting tools. The AHRQ QIs include four sets of indicators, or modules, that focus on potentially preventable hospital admissions, inpatient care, patient safety, and pediatric care. The AHRQ QIs measure quality associated with care that occurs in an outpatient or an inpatient setting. All four modules rely solely on hospital inpatient administrative data. AHRQ QIs may be used with hospital administrative data to highlight potential quality concerns, to identify areas that need further investigation, and to track changes over time. Methods and software for the AHRQ QIs can be downloaded from the AHRQ Quality Indicators Website at <http://www.qualityindicators.ahrq.gov/>.

Chronic Condition Indicator

The Chronic Condition Indicator (CCI) provides users with an easy way to categorize *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM) diagnosis codes into one of two categories: chronic or not chronic. The tool can also assign ICD-9-CM diagnosis codes into one of 18 body system categories. For more information, and to download the CCI, please visit the HCUP-US Website at <http://www.hcup-us.ahrq.gov/toolssoftware/chronic/chronic.jsp>.

Clinical Classifications Software for ICD-9-CM

Clinical Classifications Software (CCS) provides a method for classifying the ICD-9-CM diagnoses or procedures into clinically meaningful categories, which can be used for a variety of

aggregate statistical reports. For more information about CCS and the downloadable software, please visit the CCS section of the HCUP-US Website at <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>.

Clinical Classification Software for ICD-10

The Clinical Classifications Software (CCS) for ICD-10 is a diagnosis categorization scheme based on the *International Statistical Classification of Disease and Related Health Problems, 10th Revision* (ICD-10). ICD-10 codes are collapsed into a smaller number of clinically meaningful categories that are sometimes more useful for presenting descriptive statistics than are individual ICD-10-CM codes. ICD-10 has been used to report mortality data in the U.S. since 1999. For more information about the CCS for ICD-10, please visit the HCUP-US Website at http://www.hcup-us.ahrq.gov/toolssoftware/icd_10/ccs_icd_10.jsp.

Clinical Classifications Software for Mental Health and Substance Abuse

The Clinical Classifications Software for Mental Health and Substance Abuse (CCS-MHSA) defines variables that identify general and specific categories for mental health and substance abuse-related conditions. The CCS-MHSA uses the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* as its starting point, and, in general, follows the categorization of mental health and substance abuse conditions and code assignments outlined in the DSM-IV. Additional ICD-9-CM diagnoses from hospital discharge records were included in the CCS-MHSA categories based on expert review. As of fiscal year 2008, the mental health categories from the CCS-MHSA have been incorporated into the CCS for ICD-9-CM, replacing the previous CCS categories for mental health and substance abuse. The CCS-MHSA software is no longer updated as a stand-alone tool; however, a special archival version of the single-level CCS for diagnoses is available for users that contains the original CCS format for mental health conditions (65-75), and applies it to the latest ICD-9-CM codes. For more information about the CCS-MHSA, and to access the downloadable software, please visit the HCUP-US Website at <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>.

Clinical Classifications Software for Services and Procedures

The Clinical Classifications Software for Services and Procedures (CCS-Services and Procedures) provides a method for classifying Current Procedural Terminology (CPT) codes and Healthcare Common Procedure Coding System (HCPCS) codes into clinically meaningful procedure categories. The procedure categories are identical to the CCS, with the addition of specific categories unique to professional service and supply codes in CPT/HCPCS. CPT is a proprietary coding system developed by the American Medical Association for coding services provided by health care professionals. Users must agree to a license to use the CCS-Services and Procedures before accessing the software. For more information about the CCS-Services and Procedures and instructions for downloading and completing the license agreement, please visit the HCUP-US Website at http://www.hcup-us.ahrq.gov/toolssoftware/ccs_svcsproc/ccssvcproc.jsp.

Comorbidity Software

The Comorbidity Software assigns variables that identify comorbidities in hospital discharge records, using diagnoses reported within the ICD-9-CM coding system. The software is useful in assessing and controlling for severity of illness. It defines indicators for the presence of co-existing conditions such as diabetes, hypertension, congestive heart failure, and chronic

pulmonary disease. Secondary diagnoses are used to identify a condition, and then Diagnosis Related Groups (DRGs) are employed to determine if the condition is a comorbidity. For more information, and to download the AHRQ Comorbidity Software, please visit the Comorbidity Software section of the HCUP-US Website at <http://www.hcup-us.ahrq.gov/toolssoftware/comorbidity/comorbidity.jsp>.

HCUPnet

HCUPnet – available at <http://hcupnet.ahrq.gov> – is a free, online query system based on HCUP data from the NIS, KID, SID, SEDD, and NEDS. HCUPnet provides instant access to statistics from the largest set of all-payer health care databases that are publicly available. Users can generate tables and graphs on national and regional statistics and trends for community hospitals in the U.S. In addition, State-level data are available for those States that have agreed to participate in HCUPnet. HCUPnet relies on pre-run aggregate statistical tables and does not provide access to encounter-level data. These databases and HCUPnet would not be possible without the Partner organizations that provide data to HCUP.

MONAHRQ: Input Your Data—Output Your Website

MONAHRQ (My Own Network, Powered by AHRQ) is a desktop software tool that AHRQ developed to enable data organizations – such as State and local data organizations, regional reporting collaboratives, hospitals, and health plans – to input their own data and quickly generate a health care reporting Website ready for use by consumers, policymakers, or other decisionmakers. The site can provide information on hospital quality, hospital utilization and costs, local rates of procedures and conditions, and preventable hospitalizations in local areas.

To use MONAHRQ, an organization downloads the software and loads its data locally. MONAHRQ can use hospital administrative data and/or measure results from the CMS Hospital Compare Website. Next, the organization selects customization options and generates a Website. The organization hosts the Website itself. For more information about MONAHRQ, including links to publicly accessible Websites generated using MONAHRQ, please visit the main MONAHRQ Website at <http://www.monahrq.ahrq.gov/>.

Procedure Classes

The Procedure Classes provide users with an easy way to categorize procedure codes into one of four broad categories: Minor Diagnostic, Minor Therapeutic, Major Diagnostic, and Major Therapeutic.

Procedure codes for this tool are based on *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM). The ICD-9-CM consists of approximately 3,900 procedure codes. For more information about the Procedure Classes and related downloadable software, please visit the HCUP-US Website at <http://www.hcup-us.ahrq.gov/toolssoftware/procedure/procedure.jsp>.

Utilization Flags

The Utilization Flag software creates 30 data elements that reveal additional information about the use of health care services by combining information from UB-04 revenue codes and ICD-9-CM procedure codes to create flags, or indicators, of utilization. Use of procedures and services such as ICU, CCU, NICU, and specific diagnostic tests and therapies can be assessed with

these Utilization Flags. The software tool allows researchers to identify critical hospital services (e.g., intensive care unit, operating room, units of blood) that influence resource use and services that can be identified using either ICD-9-CM codes or revenue codes (such as blood transfusions, MRIs, and mental health and substance abuse services). By combining information from UB-04 revenue codes and ICD-9-CM procedure codes, it is possible to obtain a more complete picture of utilization of services rendered in health care settings, such as hospitals, emergency departments, and ambulatory surgery centers. For more information about the HCUP Utilization Flags, please visit the HCUP-US Website at http://www.hcup-us.ahrq.gov/toolssoftware/util_flags/utilflag.jsp.

HCUP SUPPLEMENTAL FILES

American Hospital Association (AHA) Linkage Files

The AHA Linkage Files are hospital-level files that contain a small number of data elements that allow researchers to link hospital identifiers on the HCUP State databases to the American Hospital Association Annual Survey Databases (Health Forum, LLC © 2011). Linkage is only possible in States that allow the release of hospital identities. For more information about the HCUP AHA Linkage Files, please visit the HCUP-US Website at http://www.hcup-us.ahrq.gov/db/state/ahalinkage/aha_linkage.jsp.

Cost-to-Charge Ratio Files

The HCUP Cost-to-Charge Ratio (CCR) Files are used to estimate the resource cost of inpatient care and its variation across hospitals and conditions. The files are designed to supplement the data elements in the HCUP inpatient databases. The HCUP Nationwide Inpatient Sample (NIS), State Inpatient Databases (SID), and Kids' Inpatient Database (KID) contain data on total charges for each hospital in the databases. This charge information represents the amount hospitals bill for services, but it does not reflect how much hospital services actually cost or the specific amounts that hospitals receive in payment. In some cases, users may be interested in observing how hospital charges translate into actual costs.

The HCUP Cost-to-Charge Ratio Files enable this conversion. Each file contains hospital-specific cost-to-charge ratios based on all-payer inpatient costs for nearly every hospital in the corresponding NIS, SID, and KID databases. Cost information was obtained from the hospital accounting reports collected by the Centers for Medicare & Medicaid Services (CMS). Some imputations for missing values were necessary.

In a special study conducted with the 2009 HCUP data, HCUP created more accurate cost estimates by CCS or by MS-DRG for all usable cases in a set of 34 States where hospitals are asked to provide detailed charges on the discharge summaries. The cost estimates, based on department-specific costs and charges within hospitals, are more accurate than using hospital-wide cost-to-charge ratios. This is because hospitals strategically tend to increase the charges over cost for particular services, especially the services in some ancillary departments. The methods report with accompanying adjustment factors by CCS and MS-DRG, a description of methods, and the results of the work and how they can be used more widely, are available on the HCUP-US Website as HCUP Methods Series Report #2011-04: http://www.hcup-us.ahrq.gov/reports/methods/2011_04.pdf.

Hospital Market Structure Files

The HCUP Hospital Market Structure (HMS) Files broadly characterize the intensity of competition that an individual hospital may be facing under various market definitions. Creation of the HMS Files was spurred by a need for better and more readily available measures of hospital markets. This file was designed to be used exclusively with the HCUP inpatient databases. Hospital market definitions were based on hospital locations, and in some cases, patient ZIP Codes. The competition measures were created according to the four most common methods of defining hospital market areas (i.e., geopolitical boundaries, fixed radius, variable radius, and patient flow) and the two most frequently used methods of capturing the intensity of competition within a market area (i.e., the number of hospitals and the Herfindahl-Hirschman Index (HHI)). Researchers can link information on the HMS Files to the corresponding NIS, KID, or SID hospitals to perform empirical analyses examining the effects of hospital competition on the cost, access, and quality of hospital services. For more information about the HMS Files, please visit the HCUP-US Website at <http://www.hcup-us.ahrq.gov/toolssoftware/hms/hms.jsp>.

Kids' Inpatient Database Trends (KID-Trends) File

The KID-Trends File is a discharge-level file that provides KID data users with trend weights consistently defined between 1997 and later years. For more information about the HCUP KID-Trends File, please visit the HCUP-US Website at <http://www.hcup-us.ahrq.gov/db/nation/kid/kidrends.jsp>.

Nationwide Inpatient Sample Trends (NIS-Trends) Files

The NIS-Trends Files are discharge-level files that provide the NIS data user with both the trend weights and data elements that are consistently defined across data years. The purpose of the NIS-Trends Files is to ease the burden on researchers conducting longitudinal analyses involving 1988-1997 and later years. For more information about the HCUP NIS-Trends Files, please visit the HCUP-US Website at <http://www.hcup-us.ahrq.gov/db/nation/nis/nistrends.jsp>.

Nationwide Inpatient Sample (NIS) Hospital Ownership Files

The NIS Hospital Ownership Files are hospital-level files designed to facilitate analysis of the NIS by hospital ownership categories. These HCUP supplemental files allow the user to identify the following three types of hospitals in the 1998-2007 NIS: government, nonfederal; private, non-profit; and private, investor-owned. For more information about the HCUP NIS Hospital Ownership Files, please visit the HCUP-US Website at <http://www.hcup-us.ahrq.gov/db/nation/nis/nisownership.jsp>.

HCUP Supplemental Variables for Revisit Analyses

The HCUP Revisit Analyses Variables can be used to track sequential visits for a patient within a State, and across facilities and hospital settings (inpatient, emergency department, ambulatory surgery), while adhering to strict privacy guidelines. These HCUP variables contain the following: Synthetic person-level identifiers that have been verified against the patient's date of birth and gender and examined for completeness and a timing variable that can be used to determine the days between hospital events for an individual. Actual dates (admission, discharge, or birth) are not part of the variables and are not needed.

HCUP Revisit Analyses Variables are designed to be used exclusively with the HCUP SID, SASD, and SEDD. These variables are unique within State and facilitate tracking across data years and settings. Starting in 2009, the revisit variables are stored in the Core file of the SID, SASD, or SEDD. For more information visit the HCUP-US Website at <http://hcup-us.ahrq.gov/toolssoftware/revisit/revisit.jsp>.

PARTNER-EXCLUSIVE TABLES, FILES, AND ACTIVITIES

Border Crossing Overview Tables and Graphs

The Border Crossing Overview provides a close examination of the flow of patients into and out of HCUP States and the costs associated with these hospitalizations. The graphs show distributions by gender, age, and payer. These tables and graphs are exclusively available to HCUP Partners. For previous years, AHRQ provided similar Patient State of Residence Files, showing discharge counts by patient State of residence using the HCUP SID and SEDD. The Border Crossing and Patient State of Residence files are available on the Partners section of HCUP-US at <http://www.hcup-us.ahrq.gov/partner/tools.jsp>.

Race Data Quality Tables

The HCUP race-ethnicity data quality feedback files for 2007-2009 are exclusively available to HCUP Partners. These tables include hospital-specific information on the reporting of patient race-ethnicity for inpatient and emergency department data, using five criteria for identifying hospitals with suspect race-ethnicity coding. These files are not available online; Partners may contact AHRQ via e-mail at hcup@ahrq.gov or by phone at 1-866-290-HCUP to acquire their State file.

State-Specific Hospital Cost Report Files

State-Specific Hospital Cost Report Files (SSHCRF) are exclusively available to HCUP Partners. These State-specific files provide Partners with detailed cost tables for each hospital in their respective State, using data extracted from the 2003 CMS Hospital Cost Reports. Each SSHCRF was created to provide background and cost information to facilitate analyses and reporting on comparative hospital financial performance. These files are not available online; Partners may contact AHRQ via e-mail at hcup@ahrq.gov or by phone at 1-866-290-HCUP to acquire their State file. To assist in the use of the SSHCRF, an Implementation Guide is available on the HCUP-US Website at <http://www.hcup-us.ahrq.gov/partner/tools.jsp>.

State Uses of Hospital Discharge Databases to Reduce Racial and Ethnic Disparities

This case study report prepared by the National Association for State Health Policy (NASHP) highlights five leading Partners that support statewide disparities activities using race/ethnicity data (California, Florida, Massachusetts, Rhode Island, and Wisconsin). It also describes noteworthy activity in four additional Partner States where non-Partner organizations are using discharge data for activities related to health disparities (Connecticut, Georgia, New Jersey, and South Carolina). In addition to being found on the HCUP Partner page noted above, the report is accessible to the public at http://www.hcup-us.ahrq.gov/reports/r_e_disparities.jsp.

Activities Summary for the HCUP Workgroup on Analyzing State Discharge Data on Race/Ethnicity

This document briefly describes the key activities conducted under a workgroup convened in 2009 and 2010: three informational webinars, the distribution of suspect race coding reports to each Partner, development of the Case Study report on applications of race/ethnicity data (referred to above), and updating of the Partner page for the race/ethnicity workgroup. The activities summary is accessible on the HCUP-US Website at http://www.hcup-us.ahrq.gov/partner/race/collection_analysis.jsp. This page also provides links to other materials developed during the workgroup and to informative Web references for assisting in the coding, collection, and analysis of race and ethnicity data.

HCUP DATA REPORTS

HCUP Facts and Figures

HCUP Facts and Figures was added to the collection of HCUP series reports in 2007 and provides an annual overview of national statistics on hospital stays from the most recent NIS release, with trends data from as far back as 1993. The Facts and Figures was designed as an Internet-based series that presents summary statistics on a variety of topics, with new reports provided shortly after the NIS is released each year. Each report consists primarily of tables and graphics with minimal text. The fifth annual edition of HCUP Facts and Figures, completed in November 2011, highlights the rich potential of HCUP by providing targeted analysis of important trends in hospital care organized around high-interest topics, such as hospital and discharge characteristics, diagnoses, procedures, and costs. In addition to providing updates on many topics presented in previously published HCUP Fact Books, Statistical Briefs, and HCUP Facts and Figures, this year's report presents a special section that details hospital care for women's health. The HCUP Facts and Figures reports are available in the Reports section of the HCUP-US Website at <http://www.hcup-us.ahrq.gov/reports.jsp>.

HCUP Methods Series

Each year HCUP conducts a number of research projects that provide methodological information on the HCUP databases and software tools. Some of these studies are released as part of the HCUP Methods Series. In 2011, HCUP released the following reports in this series:

- Methodological Issues when Studying Readmissions and Revisits using Hospital Administrative Data
- Evaluation of the State Ambulatory Surgery Databases, Available through the HCUP Central Distributor, 2008
- Special Study on the Meaning of the First-Listed Diagnosis on Emergency Department and Ambulatory Surgery Records
- Tools for More Accurate Inpatient Cost Estimates with HCUP Databases, 2009
- The Case for the Present-on-Admission (POA) Indicator: Update 2011
- Methods Applying AHRQ Quality Indicators to Healthcare Cost and Utilization Project (HCUP) Data for the Ninth (2011) NHQR and NHDR Report

- Evaluation of the State Ambulatory Surgery Databases, Available through the HCUP Central Distributor, 2009

HCUP Methods Series Reports can be accessed in the Reports section of the HCUP-US Website at <http://www.hcup-us.ahrq.gov/reports/methods.jsp>.

Topical Reports

HCUP Topical Reports provide information on specific issues using HCUP databases. In 2011, HCUP released two reports that addressed utilization and spending for hospital-related treatment of mental and substance use disorders and information on approaches for reducing disparities:

- A Severity-of-Illness Classification for Mental and Substance-Use Disorders for Use with Hospital Administrative Data
- State Documentation of Racial and Ethnic Health Disparities to Inform Strategic Action

HCUP Research Spotlights

This Web-based feature showcases several recent articles selected from more than 1,700 peer-reviewed journal publications that use HCUP data, software tools, supplemental files, or other products. The articles are chosen because they contain research that has the capacity to impact healthcare policy, practice, and future research. The Research Spotlights page is updated quarterly with new articles. The HCUP Research Spotlights is available in the Reports section of the HCUP-US Website at <http://hcup-us.ahrq.gov/reports/spotlights.jsp>.

HCUP Statistical Briefs

The HCUP Statistical Briefs are short, focused reports that present simple, descriptive statistics based on HCUP data, including topics related to hospital utilization and expenditures for specific conditions or populations. The Statistical Briefs are useful to a wide variety of audiences, including policy analysts, decisionmakers, media personnel, and others in need of summary facts and figures on current health care issues.

During 2011, HCUP Statistical Briefs were developed on a variety of topics based on data readily available to the public on HCUPnet. Some reports include more in-depth analyses using the NIS; however, the Statistical Briefs are intended to make statistical findings accessible and reproducible. HCUP plans regular release of additional reports on topics of interest. All of the HCUP Statistical Briefs are available as Internet-based publications on the HCUP-US Website at <https://www.hcup-us.ahrq.gov/reports/statbriefs/statbriefs.jsp>.

A total of 20 HCUP Statistical Briefs were published in 2011:

- #123 Components of Growth in Inpatient Hospital Costs, 1997–2009
- #122 Septicemia in U.S. Hospitals, 2009
- #121 Readmissions for Chronic Obstructive Pulmonary Disease, 2008
- #120 An Update on Hospitalizations for Eating Disorders, 1999 to 2009
- #119 Emergency Department Visits for Injuries Caused by Air and Paintball Guns, 2008
- #118 Hospital Stays for Children, 2009

- #117 State Variation in Inpatient Hospitalizations for Mental Health and Substance Abuse Conditions, 2002-2008
- #116 Emergency Department Visits in Rural and Non-Rural Community Hospitals, 2008
- #115 All-Cause Readmissions by Payer and Age, 2008
- #114 Sports Related Concussions, 2008
- #113 Complicating Conditions of Pregnancy and Childbirth, 2008
- #112 Emergency Department Visits Related to Eye Injuries, 2008
- #111 Headaches in U.S. Hospitals and Emergency Departments, 2008
- #110 Hospitalizations Related to Childbirth, 2008
- #109 Medication-Related Adverse Outcomes in U.S. Hospitals and Emergency Departments, 2008
- #108 Uninsured Hospital Stays, 2008
- #107 The National Hospital Bill: The Most Expensive Conditions by Payer, 2008
- #106 Overview of Hospitalizations among Patients with COPD, 2008
- #105 Emergency Department Visits and Inpatient Stays Related to Back Problems, 2008
- #104 A Severity-of-Illness Classification for Mental and Substance-Use Disorders for Use with Hospital Administrative Data

For additional information about any of these tools or data products, please contact either of the following individuals:

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