HEALTHCARE COST AND UTILIZATION PROJECT — HCUP
A FEDERAL-STATE-INDUSTRY PARTNERSHIP IN HEALTH DATA
Sponsored by the Agency for Healthcare Research and Quality — AHRQ

INTRODUCTION TO

THE AHRQ HCUP NATIONAL INPATIENT SAMPLE (NIS) 2023

These pages provide only an introduction to the 2023 AHRQ HCUP NIS.

For full documentation and notification of changes,
visit the AHRQ HCUP User Support (HCUP-US) website at
https://hcup-us.ahrq.gov.

Please read all documentation carefully.

Issued December 2025

AHRQ NIS data available through
AHRQ HCUP Central Distributor Online Reporting System (CDORS) at
https://cdors.ahrq.gov/

AHRQ NIS documentation available through
AHRQ HCUP User Support (HCUP-US) website at
https://hcup-us.ahrq.gov/

AHRQ NIS technical support available via
Email: hcup@ahrq.gov

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AHRQ HCUP NATIONAL INPATIENT SAMPLE (NIS)
SUMMARY OF DATA USE RESTRICTIONS

******* REMINDER *******

All users of the AHRQ HCUP NIS must take the online AHRQ HCUP Data Use Agreement (DUA) Training Course, and read and sign a Data Use Agreement for the AHRQ HCUP Nationwide databases. Details and links may be found on the following page.

Authorized users of AHRQ HCUP data agree to the following restrictions:[a]

- Will not use the data for any purpose other than research, analysis, and aggregate statistical reporting.
- Will not re-release any data to unauthorized users.
- Will not redistribute HCUP data by posting on any website or publishing in any other publicly accessible online repository. If a journal or publication requests access to data or analytic files, will cite restrictions on data sharing in the Data Use Agreement and direct them to AHRQ HCUP (https://hcup-us.ahrq.gov) for more information on accessing HCUP data.
- Will not identify or attempt to identify any individual, including by the use of vulnerability analysis or penetration testing. Methods that could be used to identify individuals directly or indirectly shall not be disclosed or published.
- Will not report any statistics where the number of observations (i.e., individual discharge records) in any given cell of tabulated data is less than or equal to 10 (≤10).
- Will not publish information that could identify individual establishments (e.g., hospitals) and will not contact establishments.
- Will not use the data concerning individual establishments for commercial or competitive purposes affecting establishments, or to determine rights, benefits, or privileges of establishments.
- Will not use the data for criminal and civil litigation, including expert witness testimony or for law enforcement activities.
- Will not use data elements from the proprietary severity adjustment software packages (e.g., 3M™ APR-DRGs) for any commercial purpose or to disassemble, decompile, or otherwise reverse engineer the proprietary software.
- Will acknowledge in reports that data from the "Agency for Healthcare Research and Quality Healthcare Cost and Utilization Project (HCUP)" were used, including names of the specific databases used for analysis.[b]

Any violation of the limitations in the AHRQ HCUP Data Use Agreement is punishable under Federal law by a fine, up to five years in prison, or both. Violations may also be subject to penalties under State statutes.

[a] This is a summary of key terms of the Data Use Agreement for Nationwide Databases; please refer to the DUA for full terms and conditions.
[b] Suggested citations for the HCUP databases are provided in the Requirements for Publishing with HCUP Data available at https://hcup-us.ahrq.gov/db/publishing.jsp.

AHRQ HCUP DATA USE AGREEMENT REQUIREMENTS

All HCUP data users, including data purchasers and collaborators, must complete the online AHRQ HCUP Data Use Agreement (DUA) Training Tool, and read and sign the AHRQ HCUP Data Use Agreement for Nationwide databases.

When placing an order through the AHRQ HCUP Central Distributor Online Reporting System (CDORS), you will be prompted to enter the AHRQ HCUP DUA Training Course completion certification code and electronically sign the AHRQ HCUP DUA for Nationwide databases. Please note, you will be required to agree to the DUA requirements for each purchase and each project being considered, but the DUA training course and full DUA only needs to be completed every two years.

The online **AHRQ HCUP Data Use Agreement (DUA) Training Course** is available at: https://hcup-us.ahrq.gov/tech_assist/dua.jsp.

The **AHRQ HCUP Data Use Agreement (DUA) for the Nationwide Database** is available at: https://hcup-us.ahrq.gov/team/NationwideDUA.jsp.

AHRQ HCUP CONTACT INFORMATION

HCUP User Support

Information about the content of the AHRQ HCUP databases is available on the HCUP User Support (HCUP-US) website at https://hcup-us.ahrq.gov.

If you have questions, please review the HCUP Frequently Asked Questions located at https://hcup-us.ahrq.gov/tech_assist/faq.jsp.

If you need further technical assistance, please contact the HCUP User Support team via email at hcup@ahrq.gov.

HCUP Central Distributor

If you have questions specific to the purchase or re-use of the data, please contact the HCUP Central Distributor team via email at HCUP-RequestData@ahrq.gov.

We would like to receive your feedback on the HCUP data products.
Please send user feedback to hcup@ahrq.gov.

WHAT'S NEW IN THE 2023 AGENCY FOR HEALTHCARE RESEARCH AND QUALITY (AHRQ) NATIONAL INPATIENT SAMPLE (NIS)?

- Because of a change in the states available to participate in the 2023 NIS and a need to produce accurate national estimates, the following modifications have been made to the data elements included in the NIS:
    - Remove information identifying the Census region and division of the hospital:
        - Remove the data elements that identified Census region (HOSP_REGION) and Census division (HOSP_DIVISION).
        - Revise the coding of the data elements for the stratum (NIS_STRATUM), hospital identifier (HOSP_NIS), and record identifier (KEY_NIS) to remove the information identifying Census division.
    - Remove collapsed categories for hospital characteristics:
        - In prior years of the NIS, categories for hospital location and teaching status (HOSP_LOCTEACH), ownership (H_CONTRL), and hospital bedsize (HOSP_BEDSIZE) are collapsed for some hospitals. Removing geographic information for hospitals in 2023 obviates the need for these collapsed categories.
    - Limit the information released on patient characteristics:
        - Remove the data element identifying the patient's race and ethnicity (RACE).
        - Replace the data element identifying the detailed metro status designation of the county of the patient's residence (PL_NCHS) with a new consolidated data element that distinguishes only two categories: metropolitan and non-metropolitan (PL_NCHS2).
    - The data element for total hospital charge (TOTCHG) is replaced by the data element (TOTCHG_2023) that includes an adjusted total hospital charge that accounts for the hospital charges of discharges in missing states.
- Changes to the Diagnosis and Procedure Groups file:
    - Add data elements derived from the Chronic Condition Indicator Refined (CCIR) for ICD-10-CM v2025.1.
    - Use v2025.1 for all HCUP software tools included in the Diagnosis and Procedures Group file.
- For more information on NIS data elements, see the Appendix III: Data Elements.
- Please note that these modifications to the 2023 NIS data elements may make comparisons of some estimates across years more difficult.

UNDERSTANDING THE AHRQ NIS

- This document, *Introduction to the AHRQ HCUP National Inpatient Sample (NIS), 2023*, summarizes the content of the NIS and describes the development of the NIS sample and weights.
- In-depth documentation for the NIS is available on the HCUP User Support (HCUP-US) website (https://hcup-us.ahrq.gov/db/nation/nis/nisdbdocumentation.jsp). Please refer to detailed documentation before using the data, including descriptions of available data elements.
- Important considerations for data analysis are provided along with references to detailed reports available on the HCUP-US website at https://hcup-us.ahrq.gov/reports/methods.jsp.

HEALTHCARE COST AND UTILIZATION PROJECT — HCUP
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The Agency for Healthcare Research and Quality (AHRQ) and the staff of the Healthcare Cost and Utilization Project (HCUP) thank users for purchasing the AHRQ HCUP National Inpatient Sample (NIS).

AHRQ HCUP National Inpatient Sample (NIS)

ABSTRACT

The National Inpatient Sample (NIS) is part of the Healthcare Cost and Utilization Project (HCUP), sponsored by the Agency for Healthcare Research and Quality (AHRQ).

The NIS is a database of inpatient stays, regardless of expected payer of hospital care, derived from billing data submitted by hospitals to statewide data organizations across the U.S. These inpatient data include clinical and resource use information typically available from discharge abstracts. Researchers and policymakers use the NIS to make national estimates of hospital utilization, cost, quality, and outcomes.

The 2023 NIS is a sample of billing or discharge records from the State Inpatient Databases (SID), which include all inpatient data that are currently contributed to HCUP. The 2023 NIS sampling frame includes data from 46 statewide data organizations (45 States plus the District of Columbia), covering 85 percent of the U.S. population (Appendix I, Figure 1) and including 86 percent of discharges from U.S. community hospitals (Appendix I, Table 3). Community hospitals are non-federal, acute care hospitals. A list of the 46 statewide data organizations participating in the NIS and a summary of NIS States, hospitals, and discharges by year are provided in Appendix 1 (Table 1 and Table 2). The NIS includes weights for calculating national estimates.

Key features of the most recent NIS (2023) include:

- The 2023 NIS is drawn from all available SID, covering 85 percent of the U.S. population.
- The NIS approximates a 20-percent ***stratified sample of discharges*** from community hospitals in the U.S., excluding rehabilitation and long-term acute care hospitals.
- The large sample size of the NIS enables analyses of rare conditions, uncommon treatments, and special patient populations.
- The NIS includes information on hospital characteristics such as teaching status, urban/rural location, ownership, and hospital bedsize.
- The NIS includes demographic data such as patient age, sex, community income quartile, and urbanicity of the county of the patient's residence.
- The data elements included in the NIS are designed to protect patient and hospital confidentiality.

Appendix III provides a list of data elements in the 2023 NIS. Although some modifications have been made to the data elements included in the 2023 NIS, no changes have been made to the sample design.

The 2023 NIS is designed to produce national estimates of inpatient utilization, access, cost, quality, and outcomes. The following analyses are not possible using the 2023 NIS:

- Analyses by geographic areas such as ZIP Code of the hospital or patient residence, county of the hospital or patient residence, state of the hospital or patient residence, Census division, or Census region.
- Analyses requiring the identification of hospitals.
- Analyses by the patient's race and ethnicity.
- Analyses of the urbanicity of the county of the hospital or county of the patient residence requiring more detail than the distinction of metropolitan and non-metropolitan.

These analyses can be done using the HCUP SID, available through the HCUP Central Distributor.

NIS releases for data years 1988 through 2023 are available for purchase online through the AHRQ HCUP Central Distributor Online Reporting System (CDORS). All HCUP data users, including data purchasers and collaborators, must complete the online AHRQ HCUP Data Use Agreement Training Tool, and must read and sign the AHRQ HCUP Data Use Agreement for Nationwide Databases.

For more information on the NIS, please visit the AHRQ-sponsored HCUP-US website at https://hcup-us.ahrq.gov/db/nation/nis/nisdbdocumentation.jsp.

INTRODUCTION TO THE AHRQ HCUP NATIONAL INPATIENT SAMPLE (NIS)

Overview of 2023 AHRQ HCUP NIS Data

The Agency for Healthcare Research and Quality (AHRQ) National Inpatient Sample (NIS) contains all-payer data on hospital inpatient stays from States participating in the Healthcare Cost and Utilization Project (HCUP).

The NIS contains clinical and resource use information included in a typical discharge abstract. The 2023 NIS is a database of 6.7 million systematically sampled billing or discharge records submitted by hospitals to statewide data organizations across the U.S.

Because of the change in the participating states relative to prior years of the NIS (i.e., CA, NV and VT are not available), changes have been made to the following 2023 NIS data elements.

- Remove information identifying the Census region and division of the hospital:
    - Remove the data elements that identified Census region (HOSP_REGION) and Census division (HOSP_DIVISION).
    - Revise the coding of the data elements for the stratum (NIS_STRATUM), hospital identifier (HOSP_NIS), and record identifier (KEY_NIS) to remove the information identifying Census division.
- Remove collapsed categories for hospital characteristics:
    - In prior years of the NIS, categories for hospital location and teaching status (HOSP_LOCTEACH), ownership (H_CONTRL), and hospital bedsize (HOSP_BEDSIZE) are collapsed for some hospitals. Removing geographic information for hospitals in 2023 obviates these collapsed categories.
- Limit the information released on patient characteristics:
    - Remove the data element identifying the patient's race and ethnicity (RACE).
    - Replace the data element identifying the detailed metro status designation of the county of the patient's residence (PL_NCHS) with a new consolidated data element that distinguishes only two categories: metropolitan and non-metropolitan (PL_NCHS2).
- Adjust the total hospital charges to account for the hospital charges for discharges in the missing states:
    - Total hospital charge for discharges from states included in the 2023 NIS are inflated to adjust for total hospital charge for discharges in missing states (AL, CA, ID, NV, and VT).
    - The adjustment is made within groups of discharges identified by the Medicare-Severity Diagnosis Related Group (MS-DRG), patient age, and sex.
    - The adjustment is based on the change in average hospital charge between data years 2021 and 2022, assuming no change in volume from data year 2022.
    - The adjustment is benchmarked against external data sources such as the aggregate total hospital charge for Medicare-certified institutional providers from the Healthcare Cost Report Information System.
    - The data element TOTCHG is replaced by the data element with the adjusted total hospital charge (TOTCHG_2023).

Types of Hospitals Included in the 2023 NIS

The NIS is a sample of discharges from U.S. community hospitals, defined as "all non-Federal, short-term, general, and other specialty hospitals, excluding hospital units of institutions."[1] Included among community hospitals are specialty hospitals such as obstetrics-gynecology, ear-nose-throat, orthopedic, and pediatric institutions. Also included are public hospitals and academic medical centers. Excluded are community hospitals that are rehabilitation and long-term acute care facilities.

Sample Design for the 2023 NIS

For the 2023 NIS, the universe of U.S. community hospitals is divided into strata using five hospital characteristics: ownership/control, hospital bedsize, teaching status, urban/rural location, and the four Census regions.

A 20-percent systematic sampling of discharges is used to construct the database. The systematic sample is a self-weighted sample design similar to simple random sampling, but it is more efficient. It ensures that the sample is representative of the population on the following critical factors used for sampling:

- Census region of hospital
- hospital ownership
- urban-rural location of hospital
- hospital teaching status
- number of beds in the hospital
- de-identifier hospital identifier
- Medicare-Severity Diagnosis Related Group (MS-DRG) for the hospital stay
- admission month of the hospital stay.

Weighted Estimates

To facilitate the production of national estimates, discharge weights are provided, along with information necessary to calculate the variance of estimates. More information on using the discharge weights for generating national estimates and studying trends is provided under **How to Use the NIS for Data Analysis**. Also, refer to the *Checklist for Working with the NIS* (**https://hcup-us.ahrq.gov/db/nation/nis/nischecklist.jsp**) to verify adherence to data use, methodology, and reporting requirements.

NIS Data Sources, Hospitals, and Inpatient Stays

The 2023 NIS is a sample of billing or discharge records from the State Inpatient Databases (SID), which include all inpatient data currently contributing to HCUP. The 2023 NIS sampling frame includes data from 46 statewide data organizations (45 States plus the District of Columbia), covering 85 percent of the U.S. population (Appendix I, Figure 1) and including 86 percent of discharges from U.S. community hospitals (Appendix I, Table 3). A list of the 46 HCUP Partner organizations participating in the NIS and a summary of NIS States, hospitals, and discharges by year are provided in Appendix 1 (Table 1 and Table 2). The NIS includes weights for calculating national estimates.

[1] See the AHA "community hospital designation" at https://www.aha.org/statistics/fast-facts-us-hospitals.

Partner Restrictions

Some HCUP Partners that contributed data to the NIS imposed restrictions on the release of certain data elements or on the number and types of hospitals that could be included in the database. Because of confidentiality laws, some data sources are prohibited from providing HCUP with discharge records that indicated specific medical conditions and procedures, specifically HIV/AIDS, behavioral health, and abortion. Detailed information on these State-specific restrictions is available in Appendix II.

File Structure of the NIS

Each release of the NIS includes:

- Data in fixed-width ASCII format
- From approximately 7 million inpatient records per year
- Discharge-level weights to calculate national estimates for discharges
- NIS Documentation and tools – including file specifications, programs for loading the ASCII data into SAS® and SPSS®, and value labels. Beginning with 2004, code is also provided for loading the NIS ASCII files into Stata®.

The NIS Database is distributed as fixed-width ASCII-formatted data files delivered via secure digital download through the AHRQ HCUP Central Distributor Online Reporting System (CDORS). The files are compressed and encrypted with 7-Zip©. **Users will need the password provided to the original data purchaser through the HCUP Central Distributor.**

The NIS product is downloaded in a single zipped file for each year, which contains several data-related compressed files and accompanying documentation. The NIS contains three discharge-level files and one hospital-level file:

NIS Discharge-level Files

The unique NIS record number (KEY_NIS) provides the linkage between the discharge-level files.

- **Core File** is a single file containing commonly used data elements (e.g., age, primary expected payer, discharge status, ICD-10-CM/PCS codes, total charges).
- **Severity File** is a single file containing additional data elements to aid in identifying the severity of the condition for a specific discharge.
- **Diagnosis and Procedure Groups File** is a single file containing additional information on the ICD-10-CM diagnoses and ICD-10-PCS procedures that is created by the Agency for Healthcare Research and Quality (AHRQ) software tools.

NIS Hospital-level Files

- **Hospital File** is a single file containing information on hospital characteristics.

The NIS hospital number (HOSP_NIS) provides the linkage between the NIS Core File and the Hospital File. The HOSP_NIS values are reassigned each year, so they cannot be used to link hospitals across years.

On the HCUP-US website, NIS users can access complete file documentation, including data element notes, file layouts, summary statistics, and related technical reports. Similarly, users can also download SAS, SPSS, and Stata load programs from this website. Available online documentation and supporting files are detailed in Appendix I, Table 4.

NIS Data Elements

All releases of the NIS contain two types of data: inpatient stay records and hospital information with weights to calculate national estimates. Appendix III identifies the data elements in each NIS file:

- Table 1 for the Core File (record = inpatient stay)
- Table 2 for the Hospital File (record = hospital)
- Table 3 for the Severity File (record = inpatient stay)
- Table 4 for the Diagnosis and Procedure Groups File (record = inpatient stay).

Not all data elements in the NIS are uniformly coded or available across all States. The tables in Appendix III include a list of data elements in each file type. Please refer to the NIS documentation located on the HCUP-US website (https://hcup-us.ahrq.gov) for comprehensive information about data elements and the files.

Getting Started

Computer Specifications Required for Using the NIS

To load and analyze the NIS data on a computer, users will need the following:

- A hard drive with at least 77 gigabytes of space available
- A third-party zip utility such as ZIP Reader, 7-Zip©, SecureZIP®, WinZip®, or Stuffit Expander®
- SAS®, SPSS®, Stata® or similar analysis software.

Decompressing the NIS Files

To extract the data files from the compressed download file, follow these steps:

1) Create a directory for the NIS on your hard drive.
2) Unzip the compressed NIS product file into the new directory using a third-party zip utility. This will create four compressed, encrypted data-related files in the new directory. You will be prompted to enter the encryption password (sent separately by email) to decrypt the file.

   Please note that attempts to unzip encrypted files using the built-in zip utility in Windows® (Windows Explorer) or Macintosh® (Archive Utility) will produce an error message warning of incorrect password and/or file or folder errors. The solution is to use a third-party zip utility.

   Third-party zip utilities are available from the following reputable vendors on their official websites.

   - ZIP Reader (Windows) (free download offered by the PKWARE corporation)
   - 7-Zip© (Windows) (free download offered by 7-Zip)
   - SecureZIP® for Mac or Windows (free evaluation and licensed/fee software offered by the PKWARE corporation)

- WinZip (Windows) (evaluation and fee versions offered by the WinZip corporation)
- Stuffit Expander® (Mac) (free evaluation and licensed/fee software offered by Smith Micro corporation)

3) Unzip each of the compressed, encrypted data-related files using the same password and third-party zip utility method. This will place the data-related ASCII files in this same directory by default.

Downloading and Running the Load Programs

Programs to load the data into SAS, SPSS, or Stata, are available on the HCUP User Support website (HCUP-US). To download and run the load programs, follow these steps:

1) Go to the NIS Database Documentation page on HCUP-US at https://hcup-us.ahrq.gov/db/nation/nis/nisdbdocumentation.jsp.
2) Go to the "File Specifications and Load Programs" section on this page.
3) Click on "Nationwide SAS Load Programs", "Nationwide SPSS Load Programs", or "Nationwide Stata Load Programs" to go to the corresponding Load Programs page.
4) Select the data year (2023) and the database ("NIS") from the drop-down lists on this page and select "Find". **The load programs are specific to the data year.** Alternatively, you may select "NIS Load All Years" to obtain a zipped file with all load programs for multiple years at once.
5) Save the load programs you need. The load program for the 2023 NIS Core File is found under the link "SAS NIS 2023 Core File" in the list generated by selecting "2023" and "NIS." Save the load programs into the same directory as the NIS ASCII files on your computer.
6) Edit and run the load programs as appropriate for your computing environment to create the analysis files. For example, modify the directory paths to point to the location of your input and output files.

NIS Documentation

Year-specific NIS documentation files on the HCUP-US website (https://hcup-us.ahrq.gov) provide important resources for the user. Refer to these resources to understand the structure and content of the NIS and to aid in using the database.

- To locate the NIS documentation on HCUP-US, choose "HCUP Databases" from the home page (https://hcup-us.ahrq.gov). The first section under Nationwide HCUP Databases is specific to the NIS.

Table 4 in Appendix I details both the NIS related reports and the comprehensive NIS database documentation available on HCUP-US.

HCUP Online Tutorials

For additional assistance, AHRQ has created the HCUP Online Tutorial Series, a series of free, interactive courses which provide training on technical methods for conducting research with HCUP data. Topics include an HCUP Overview Course and these tutorials:

The Load and Check HCUP Data tutorial provides instructions on how to unzip (decompress) HCUP data, save it on your computer, and load the data into a standard statistical software package. This tutorial also describes how to verify that the data have loaded correctly.

The HCUP Sampling Design tutorial is designed to help users learn how to account for sample design in their work with HCUP national (nationwide) databases.

The Producing National HCUP Estimates tutorial is designed to help users understand how the three national (nationwide) databases – the NIS, Nationwide Emergency Department Sample (NEDS), and Kids' Inpatient Database (KID) – can be used to produce national and regional estimates.

The Calculating Standard Errors tutorial shows how to accurately determine the precision of the estimates produced from the HCUP nationwide databases. Users will learn two methods for calculating standard errors for estimates produced from the HCUP national (nationwide) databases.

The HCUP Multi-year Analysis tutorial presents solutions that may be necessary when conducting analyses that span multiple years of HCUP data.

The HCUP Software Tools Tutorial provides instructions on how to apply the AHRQ software tools to HCUP or other administrative databases.

New tutorials are added periodically, and existing tutorials are updated when necessary. The Online Tutorial Series is located on the HCUP-US website at https://hcup-us.ahrq.gov/tech_assist/tutorials.jsp.

HOW TO USE THE 2023 NIS FOR DATA ANALYSIS

This section provides a brief synopsis of special considerations when using the 2023 NIS. Before reporting findings using the NIS, you should refer to the *Checklist for Working with the NIS* (https://hcup-us.ahrq.gov/db/nation/nis/nischecklist.jsp) to verify adherence to data use, methodology, and reporting requirements.

AHRQ HCUP Data Use Agreement

If anyone other than the original purchaser uses the NIS data, be sure to have them read and sign a AHRQ HCUP Data Use Agreement, after viewing the online AHRQ HCUP Data Use Agreement Training Tool available on the HCUP-US website (https://hcup-us.ahrq.gov). A copy of the signed Data Use Agreements must be submitted to the AHRQ HCUP Central Distributor through the Central Distributor Online Reporting System (CDORS) website (https://cdors.ahrq.gov).

Choosing Data Elements for Analysis

For all data elements you plan to use in your analysis, first perform descriptive statistics and examine the range of values, including the number of missing cases. Summary statistics for the entire NIS are provided on the Summary Statistics page of the HCUP-US website. Performing descriptive statistics by hospital can be helpful in detecting hospital-specific data anomalies.

Not all data elements in the NIS are provided by each hospital. These data elements are provided on the NIS because they can be valuable for research purposes, but they should be used cautiously. For example, some hospitals may not report total hospital charge on all discharges (TOTCHG_2023 in data year 2023) or may report unusually extreme values for some discharges. National estimates on total hospital charge should be interpreted and reported with caveats.

Differences exist across the State data sources in the collection of information that could not be accounted for during HCUP processing to make the data uniform. For example, the most reliable way to identify ED admissions in the HCUP databases is to use the data element HCUP_ED, which considers all possible evidence of ED services.

Although the 2023 NIS contains up to 40 diagnoses and 25 procedures, the maximum number of diagnoses and procedures reported in the SID varies across states. Some SID include as fewer diagnoses and procedures, and others include more.

Medicare-Severity Diagnosis Related Groups

The Medicare-Severity Diagnosis Related Group (DRG) appropriate for the date of discharge is assigned by the Medicare DRG Grouper algorithm during HCUP processing and stored in the HCUP data element DRG. The Medicare DRG Grouper version is fiscal year specific, so the NIS includes DRGs assigned with one version of the software from January to September and another version for discharges in October to December. The version of the DRG software is indicated in the HCUP data element DRGVER.

Missing Values

Missing data values can compromise the quality of estimates. If the outcome for discharges with missing values is different from the outcome for discharges with valid values, then sample estimates for that outcome will be biased and inaccurately represent the discharge population. For example, some Partner organizations do not provide HCUP with the information needed to determine the urbanicity or community level income quartile of the county of the patient's residence for discharges related to mental health disorders. Detailed information on these State-specific restrictions is available in Appendix II.
There are several techniques available to help assess and overcome this missing data bias.[2] Descriptions of such data preparation and adjustment are outside the scope of this report; however, it is recommended that researchers evaluate and adjust for missing data, if necessary. For details, see the report, *Missing Data Methods for the NIS and the SID*, available on the HCUP-US website.

Hospital Volume Estimates

Although the 2023 NIS is a sample of discharges from all HCUP hospitals, approximating a 20 percent sample of the target universe of hospital discharges, individual hospital sampling rates vary considerably depending on which stratum the hospitals are in and how well hospitals are represented in the sampling frame. If a stratum is under-represented in the sampling frame, it

[2] See, for example, van Buuren, S. (2012). *Flexible Imputation of Missing Data.* CRC Press, Boca Raton, FL.

will be oversampled to achieve the target sample size. Because information on the rate at which discharges are sampled from each hospital is not provided, users cannot reliably estimate individual hospital volumes using the 2023 NIS. However, users could estimate percentages of discharges (e.g., percentage of Medicare discharges) for a hospital equal to the percentage of discharges observed in the sample for the hospital.

Calculating National Estimates

To produce national estimates, you MUST use the discharge weights. Use the discharge weight (DISCWT) to project discharges in the NIS Core Files to the discharges from all U.S. community hospitals, excluding rehabilitation and long-term acute care (LTAC) facilities.

Because the NIS is a stratified sample, proper statistical techniques must be used to calculate standard errors and confidence intervals. For detailed instructions, refer to the special report Calculating National Inpatient Sample Variances for Data Years 2012 and Later on the HCUP-US website. Additional guidance to ensure the correct calculation of variance estimates is provided in the Addendum.

When creating national estimates, it is recommended to check your estimates against other data sources, if available.

To ensure that you are using the weights appropriately and calculating estimates and variances accurately, check your estimates against HCUPnet, the free online query system (https://datatools.ahrq.gov/hcupnet). HCUPnet is a web-based query tool for identifying, tracking, analyzing, and comparing statistics on hospitals at the national, regional, and State level. HCUPnet offers easy access to national statistics and trends and selected State statistics about hospital stays. HCUPnet generates statistics using the NIS, KID, NRD, NEDS, SID, and SEDD for those States that have agreed to participate. In addition, HCUPnet provides Quick Statistics – ready-to-use tables on commonly requested information.

Calculating National Estimates of Total Charge and Cost

The total charges reported on NIS discharge records represent the amount a hospital billed for the hospital stay; total costs reflect the expenses incurred in the production of hospital services, such as wages, supplies, and utility costs. Because of a change in the states available to participate in the 2023 NIS and a need to produce accurate national estimates, the data element for total charges included in prior years of the NIS (TOTCHG) is replaced with the data element TOTCHG_2023, which provides adjusted total charges. The adjustment is based on the change in average national hospital charge between data years 2021 and 2022, assuming no change in volume from data year 2022. The adjustment is made within domains defined by the Medicare-Severity Diagnosis Related Group (MS-DRG), patient age, and sex.

Caution should be used when comparing 2023 total charges and cost to prior years. Weighted estimates within some characteristics (e.g., age, urban/rural location, expected payer) may have been impacted by lack of information from discharges in states that are included in prior years of the NIS.

To estimate the national average and aggregate total hospital charges using the 2023 NIS, use the data element TOTCHG_2023 with the discharge weight (DISCWT). To estimate the national average and aggregate total hospital costs using the 2023 NIS, use the data element TOTCHG_2023, the NIS Cost-to-Charge Ratio (CCR_NIS), and the discharge weight

(DISCWT). The CCR_NIS is available in the separate file cc2023NIS.csv. First, merge the CCR_NIS onto the NIS Core file by the hospital identifier HOSP_NIS. For each discharge, multiple TOTCHG_2023 by CCR_NIS (TOTCHG_2023 × CCR_NIS) to estimate the total hospital cost for that discharge. Next, weight the data using DISCWT when calculating average or aggregate total hospital cost. Information on the development of the HCUP CCRs for inpatient data is available online at HCUP Cost-to-Charge Ratios for Inpatient Files.

For standard errors and confidence interval of the weighted average and aggregate total hospital charges and costs, see the sections of this document on Variance Calculations and Computer Software for Variance Calculations. No modifications are needed to these recommendations because of the adjustment to total charges.

Studying Trends

The NIS is available yearly, beginning with 1988, allowing analysis of trends over time. Analyses of time trends using the HCUP NIS are recommended from 1993 forward because earlier samples are drawn from only 8 to 11 States, covering less than 50 percent of the hospital discharge population.

When studying trends over time using the NIS, be aware that the sampling frame for the NIS changes almost annually (i.e., more States have been added or removed over time). Estimates from earlier years of the NIS may be subject to more sampling bias than later years of the NIS. In addition, there can be changes to data elements and data content that need to be considered when trending across data years.

Studying Readmissions

The NIS contains discharge-level records, not patient-level records. This means that individual patients who are hospitalized multiple times in one year may be present in the NIS multiple times. There is no uniform patient identifier available that allows a patient-level analysis with the NIS. This will be especially important to remember for certain conditions for which patients may be hospitalized multiple times in a single year. Researchers wishing to examine readmissions should use either the Nationwide Readmissions Database (NRD), or the State Inpatient Databases (SID) and accompanying Revisit Files which allow identification of readmissions for individual patients. See the Databases documentation on the HCUP-US website for more information.

Variance Calculations

It may be important for researchers to calculate a measure of precision for some estimates based on the NIS sample data. Variance estimates must consider both the sampling design and the form of the statistic. A stratified systematic sample of discharges is drawn from a sorted list of discharges comprising *all* discharges in the sampling frame. **To accurately calculate variances from the NIS, you must use appropriate statistical software and techniques.** For details, see the special report, *Calculating National Inpatient Sample (NIS) Variances for Data Years 2012 and Later*, available on the HCUP-US website. Additional guidance to ensure the correct calculation of variance estimates is provided in the Addendum.

If discharges inside the sampling frame are similar to discharges outside the frame, the sample of discharges can be treated as if they are randomly selected from the entire universe of discharges within each stratum. Although the NIS is no longer a cluster sample, discharges are

still clustered by hospitals. Therefore, hospitals (HOSP_NIS) should be treated as clusters when calculating statistics. Standard formulas for a stratified, single-stage cluster sample without replacement should still be used to calculate statistics and their variances in most applications.

A multitude of statistics can be estimated from the NIS data. Several computer programs are listed below that calculate statistics and their variances from sample survey data. Some of these programs use general methods of variance calculations (e.g., the jackknife and balanced half-sample replications) that account for the sampling design. However, it may be desirable to calculate variances using formulas specifically developed for some statistics.

These variance calculations are based on finite-sample theory, which is an appropriate method for obtaining cross-sectional, national estimates of outcomes. According to finite-sample theory, the intent of the estimation process is to obtain estimates that are precise representations of the national population at a specific point in time. In the context of the NIS, any estimates that attempt to accurately describe characteristics and interrelationships among hospitals and discharges during a specific year should be governed by finite-sample theory. Examples of this would be estimates of expenditure and utilization patterns.

Alternatively, in the study of hypothetical population outcomes not limited to a specific point in time, the concept of a “superpopulation” may be useful. Analysts may be less interested in specific characteristics from the finite population (and time period) from which the *sample* is drawn than they are in hypothetical characteristics of a conceptual "superpopulation" from which any particular finite *population* in a given year might have been drawn. According to this superpopulation model, the national population in a given year is only a snapshot in time of the possible interrelationships among hospital and discharge characteristics. In a given year, all possible interactions between such characteristics may not have been observed, but analysts may wish to predict or simulate interrelationships that may occur in the future.

Under the finite-population model, the variances of estimates approach zero as the sampling fraction approaches one. This is the case because the population is fixed at that point in time, and because the estimate is for a fixed characteristic as it existed when sampled. This contrasts with the superpopulation model, which adopts a stochastic viewpoint rather than a deterministic viewpoint. That is, the national discharge population in a particular year is viewed as a random sample that resulted from a specific set of random events drawn from an underlying superpopulation of similar random events that might have occurred. For example, the outcome of a particular hospitalization might differ depending on admission timing, hospital staffing during the stay, and so on. Different methods are used for calculating variances under the two sample theories. The choice of an appropriate method for calculating variances for nationwide estimates depends on the type of measure and the intent of the estimation process.

Computer Software for Variance Calculations

The discharge weights are useful for producing discharge-level statistics for analyses that use the *discharge* as the unit of analysis. The discharge weights may be used to estimate national population statistics.

In most cases, computer programs are readily available to perform these calculations. Several statistical programming packages allow weighted analyses.[3] For example, nearly all SAS

[3] Carlson BL, Johnson AE, Cohen SB. “An Evaluation of the Use of Personal Computers for Variance Estimation with Complex Survey Data.” *Journal of Official Statistics*, vol. 9, no. 4, 1993: 795-814.

procedures incorporate weights. In addition, several statistical analysis programs have been developed to specifically calculate statistics and their standard errors from survey data. Version eight or later of SAS contains procedures (PROC SURVEYMEANS and PROC SURVEYREG) for calculating statistics based on specific sampling designs. Stata and SUDAAN are two other common statistical software packages that perform calculations for numerous statistics arising from the stratified, single-stage cluster sampling design. Examples of the use of SAS and Stata to calculate NIS variances are presented in the special report *Calculating National Inpatient Sample (NIS) Variances for Data Years 2012 and Later*, available on the HCUP-US website. Additional guidance to ensure the correct calculation of variance estimates is provided in the Addendum. For an excellent review of programs to calculate statistics from survey data, visit the following website: www.hcp.med.harvard.edu/statistics/survey-soft/.

The NIS database includes a Hospital File with data elements required by these programs to calculate finite population statistics. The file includes hospital identifiers (Primary Sampling Units or PSUs), stratification data elements, and stratum-specific totals for the numbers of discharges and hospitals so that finite-population corrections can be applied to variance estimates.

In addition to these subroutines, standard errors can be estimated by validation and cross-validation techniques. Given that a very large number of observations will be available for most analyses, it may be feasible to set aside a part of the data for validation purposes. Standard errors and confidence intervals can then be calculated from the validation data.

If the analytic file is too small to set aside a large validation sample, cross-validation techniques may be used. For example, ten-fold cross-validation would split the data into ten subsets of equal size. The estimation would take place in ten iterations. In each iteration, the outcome of interest is predicted for one-tenth of the observations by an estimate based on a model fit to the other nine-tenths of the observations. Unbiased estimates of error variance are then obtained by comparing the actual values to the predicted values obtained in this manner.

SAMPLING PROCEDURE

The NIS Hospital Universe

Each year, the AHA's Health Forum administers the AHA Annual Survey of Hospitals. The purpose of the survey is to collect utilization, financial, service, and personnel information on each of the nation's hospitals. The survey's overall response rate averages approximately 85 percent each year, which is high for a voluntary survey given its length and the size of the universe (about 6,000 hospitals). For hospitals that do not respond, the AHA imputes items based on prior-year information, so that data are available for all hospitals in the universe.

The hospital universe is defined by all hospitals that are open during any part of the calendar year and are designated as community hospitals in the AHA Annual Survey. For purposes of the NIS, the definition of a *community hospital* is that used by the AHA: "all nonfederal short-term general and other specialty hospitals, excluding hospital units of institutions." Consequently, Veterans Affairs hospitals and other Federal hospitals are excluded. In the 2023 NIS, rehabilitation hospitals and long-term acute care hospitals that are considered community hospitals by the AHA are also excluded.

The universe count of discharges within each stratum is estimated using the actual count of discharges contained in the HCUP State Inpatient Databases (SID). The AHA counts are used

only for hospitals in the universe that do not appear in HCUP data coming from the statewide data organizations. The identification of a hospital entity is based on the data provided by the HCUP Partner for the SID. For most hospitals, the SID hospital identifiers are in one-to-one correspondence with the AHA hospital identifiers. However, there are instances in which the AHA hospital identifier corresponded to two or more hospitals in the SID that have common ownership within a hospital system. In these cases, the number of beds reported by the AHA is split between the individual hospitals based on discharge volume. For more information on how hospitals in the data set are mapped to hospitals as defined by the AHA, refer to the special report, *HCUP Hospital Identifiers*. For a list of all data sources, refer Table 1 in Appendix I.

Stratification Data Elements

The stratification data elements for the 2023 NIS are defined as follows:

1. *Census Region* – Northeast, Midwest, South, and West. This is an important stratification data element because practice patterns have been shown to vary substantially by region. For example, lengths of stay tend to be longer in East Coast hospitals than in West Coast hospitals. The NIS States by Census region are shown in Figure 1 of Appendix I.

2. *Control – government non-Federal (public), private not-for-profit (voluntary), and private investor-owned (proprietary)*. Depending on their control, hospitals tend to have different missions and different responses to government regulations and policies. Hospitals are stratified as public, voluntary, and proprietary. When necessary, strata are combined so that a minimum of two hospitals are included in each stratum.

3. *Location – urban or rural.* Government payment policies for hospital services often differ according to this designation. Also, rural hospitals are generally smaller and offer fewer services than urban hospitals. Hospitals with a CBSA type of *Metropolitan* are categorized as urban, while hospitals with a CBSA type of *Micropolitan* or *Rural* are designated as rural.

4. *Teaching Status – teaching or non-teaching.* The missions of teaching hospitals differ from non-teaching hospitals. In addition, financial considerations differ between these two hospital groups. Currently, the Medicare Diagnosis Related Group (DRG) payments are uniformly higher to teaching hospitals. A hospital is considered to be a teaching hospital if it met any one of the following three criteria: (See Appendix IV for details.)

    - Residency training approval by the Accreditation Council for Graduate Medical Education (ACGME)
    - Membership in the Council of Teaching Hospitals (COTH)
    - A ratio of full-time equivalent interns and residents to beds of .25 or higher

5. *Hospital Bedsize – small, medium, and large.* Hospital bedsize categories are based on the number of hospital beds and were specific to the hospital's region, location, and teaching status, as shown in Table 5 in Appendix I. The bed size cutoff points were chosen so that approximately one-third of the hospitals (in data year 1998) in each region, location, and teaching status combination would fall within each hospital bedsize category (small, medium, or large). Different cutoff points are used for rural, urban non-teaching, and urban teaching hospitals because hospitals in those categories tend to be small, medium, and large, respectively. For example, a medium-sized teaching hospital would be considered a rather large rural hospital. Further, the size distribution is different among regions for each of the urban/teaching categories. For example, teaching hospitals tend to be smaller in the

West than they are in the South. Using differing cutoff points in this manner avoids strata containing small numbers of hospitals.

No distinction is made by teaching status among rural hospitals, because rural teaching hospitals are rare. For example, in 2023, rural teaching hospitals comprised about 6.5 percent of the total hospital universe. Hospital bedsize categories are defined within location and teaching status because they would otherwise have been redundant. Rural hospitals tend to be small; urban non-teaching hospitals tend to be medium-sized; and urban teaching hospitals tend to be large. Yet it is important to recognize gradations of size within these types of hospitals. For example, in serving rural discharges, the role of "large" rural hospitals (particularly rural referral centers) often differs from the role of "small" rural hospitals.

To further ensure geographic representativeness of the sample, implicit stratification data elements included de-identified hospital number, Medicare-Severity Diagnosis Related Group (DRG), and admission month. The discharges are sorted according to these data elements prior to systematic random sampling.

Design Considerations for the 2023 NIS

For the 2023 NIS, a systematic sampling design that selects approximately 20 percent of the target universe of discharges is used to construct the database. The systematic sample is a self-weighted sample design similar to simple random sampling, but it is more efficient. It ensures that the sample is representative of the population on the following critical factors: hospital factors (Census region, ownership, urban-rural location, teaching status, number of beds, de-identified hospital number) and patient factors (DRG, admission month). Within each stratum all discharges are sorted in the following order on patient-level “control” variables: encrypted hospital ID, DRG, admission month, and a random number.

It should be possible, for example, to estimate DRG-specific average lengths of stay across all U.S. hospitals using weighted average lengths of stay, based on averages or regression coefficients calculated from the NIS. Ideally, relationships among outcomes and their correlates estimated from the NIS should accurately represent all U.S. hospitals. It is advisable to verify your estimates against other data sources, especially for specific patient populations (e.g., organ transplant recipients).

Overview of the Sampling Procedure

The strata for the 2023 NIS systematic sampling design include Census region, ownership, urban-rural location, teaching status, and hospital bedsize. Within each hospital, discharges are sorted by their DRG and their admission month. This sorting ensures that the NIS sample will be representative on these factors.

Next, within each stratum, a number of discharges proportionate to the number of discharges in the universe are selected systematically from the sorted list. For example, if the sampling frame is equal to the universe and 20 percent of the universe is required, then every fifth discharge would be selected from the sorted list of discharges, beginning with a randomly selected start at discharge number 1, 2, 3, 4, or 5 on the list.

To ensure a self-weighted sample that has 20 percent of the universe within each stratum represented, sampling rates would vary for each stratum, depending on the proportion of the population of discharges covered by the discharges in the sampling frame. Thus, the sampling

rate would not always be 20 percent for each stratum. For strata that are missing more discharges, the sampling rate would be higher to ensure that the number of sampled discharges would equal 20 percent of the universe.

WEIGHTS

To obtain nationwide estimates, discharge weights are developed to extrapolate NIS sample discharges to the discharge universe. NIS discharge weights are calculated by dividing the number of universe discharges by the number of sampled discharges within each NIS stratum. The universe count of discharges is estimated within each stratum using the actual count of discharges contained in the State Inpatient Databases (SID). The only exceptions are for strata with HCUP hospitals that, according to the AHA files, are open for the entire year but contributed less than a full year of data to HCUP. For those hospitals, the number of observed discharges is *adjusted* by a factor of 12 ÷ M, where M is the number of months for which the hospital contributed discharges to the SID. For example, when a hospital contributed only six months of discharge data to HCUP, the *adjusted* number of discharges is double the observed number. For non-HCUP hospitals in the universe, adjusted AHA discharge estimates are calculated by multiplying the AHA admissions plus births volume by the overall ratio of HCUP discharges to AHA volumes for HCUP hospitals in the Census division.

The discharge weights are constant for all discharges within a stratum, where the stratum is defined by hospital characteristics: Census region, rural/urban location, hospital bedsize, teaching status, and ownership. Each discharge weight is essentially equal to the number of target universe discharges that each sampled discharge represents in its stratum. Discharge weights to the universe are calculated as follows: Within stratum *s*, each NIS sample discharge's universe weight is calculated as:

$DW_s(\text{universe}) = DN_s(\text{universe}) \div DN_s(\text{sample})$

where DW_s(universe) is the discharge weight; DN_s(universe) represented the number of discharges from community hospitals in the universe within stratum *s*; and DN_s(sample) is the number of discharges selected for the NIS. Thus, each discharge's weight (DISCWT) is equal to the number of universe discharges it represents in stratum *s* during that year.[4] Because 20 percent of the universe discharges in each stratum are sampled, the discharge weights are near five.

[4] Although discharge characteristics (DRG and admission month) are implicit stratification elements for sampling, they do not play a role in weighting.

APPENDIX I: TABLES AND FIGURES

Table 1. HCUP Partner Organizations Contributing Data to the 2023 NIS

State	Data Organization
AK	Alaska Department of Health
AR	Arkansas Department of Health
AZ	Arizona Department of Health Services
CO	Colorado Hospital Association
CT	Connecticut Hospital Association
DC	District of Columbia Hospital Association
DE	Delaware Division of Public Health
FL	Florida Agency for Health Care Administration
GA	Georgia Hospital Association
HI	(Hawaii) Laulima Data Alliance
IA	Iowa Hospital Association
IL	Illinois Department of Public Health
IN	Indiana Hospital Association
KS	Kansas Hospital Association
KY	Kentucky Cabinet for Health and Family Services
LA	Louisiana Department of Health
MA	Massachusetts Center for Health Information and Analysis
MD	Maryland Health Services Cost Review Commission
ME	Maine Health Data Organization
MI	Michigan Health & Hospital Association
MN	Minnesota Hospital Association
MO	Missouri Hospital Industry Data Institute
MS	Mississippi Department of Health
MT	Montana Hospital Association

State	Data Organization
NC	North Carolina Department of Health and Human Services
ND	North Dakota (data provided by the Minnesota Hospital Association)
NE	Nebraska Hospital Association
NH	New Hampshire Department of Health & Human Services
NJ	New Jersey Department of Health
NM	New Mexico Department of Health
NY	New York State Department of Health
OH	Ohio Hospital Association
OK	Oklahoma State Department of Health
OR	Oregon Association of Hospitals and Health Systems
PA	Pennsylvania Health Care Cost Containment Council
RI	Rhode Island Department of Health
SC	South Carolina Revenue and Fiscal Affairs Office
SD	South Dakota Association of Healthcare Organizations
TN	Tennessee Hospital Association
TX	Texas Department of State Health Services
UT	Utah Department of Health
VA	Virginia Health Information
WA	Washington State Department of Health
WI	Wisconsin Department of Health Services
WV	West Virginia Department of Health and Human Resources
WY	Wyoming Hospital Association

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Table 2. Summary of NIS States, Hospitals, and Inpatient Stays, 1988-2023

Year	Data Sources	Number of States	Number of Hospitals	Number of Discharges in the NIS, Unweighted	Number of Discharges in the NIS, Weighted	Number of Discharges in the NIS, Weighted with Trend Weight
2023	AK AR AZ CO CT DC DE FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NY OH OK OR PA RI SC SD TN TX UT VA WA WI WV WY	46	4,179	6,739,190	33,695,974	
2022	AK AR AZ CA CO CT DC DE FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	48	4,544	6,578,372	32,891,849	
2021	AK AR AZ CA CO CT DC DE FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	48	4,558	6,666,817	33,334,053	
2020	AK AR AZ CA CO CT DC DE FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	49	4,580	6,471,165	32,355,827	
2019	AK AR AZ CA CO CT DC DE FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	49	4,568	7,083,805	35,419,023	
2018	AK AR AZ CA CO CT DC DE FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	48	4,550	7,105,498	35,527,481	
2017	AK AR AZ CA CO CT DC DE FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	48	4,584	7,159,694	35,798,453	
2016	AK AR AZ CA CO CT DC FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	47	4,575	7,135,090	35,675,421	
2015	AK AR AZ CA CO CT DC FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	47	4,573	7,153,989	35,769,942	

Year	Data Sources	Number of States	Number of Hospitals	Number of Discharges in the NIS, Unweighted	Number of Discharges in the NIS, Weighted	Number of Discharges in the NIS, Weighted with Trend Weight
2014	AR AZ CA CO CT DC FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MT NC ND NE NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	45	4,411	7,071,762	35,358,818	
2013	AR AZ CA CO CT DC FL GA HI IA IL IN KS KY LA MA MD MI MN MO MT NC ND NE NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	44	4,363	7,119,563	35,597,792	
2012	AK AR AZ CA CO CT FL GA HI IA IL IN KS KY LA MA MD MI MN MO MT NC ND NE NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	44	4,378	7,296,968	36,484,846	
2011	AK AR AZ CA CO CT FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MS MT NC ND NE NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	46	1,049	8,023,590	38,590,733	36,962,415
2010	AK AR AZ CA CO CT FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MS MT NC NE NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	45	1,051	7,800,441	39,008,298	37,352,013
2009	AR AZ CA CO CT FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO MT NC NE NH NJ NM NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	44	1,050	7,810,762	39,434,956	37,734,584
2008	AR AZ CA CO CT FL GA HI IA IL IN KS KY LA MA MD ME MI MN MO NC NE NH NJ NV NY OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY	42	1,056	8,158,381	39,885,120	38,210,889
2007	AR AZ CA CO CT FL GA HI IA IL IN KS KY MA MD ME MI MN MO NC NE NH NJ NV NY OH OK OR RI SC SD TN TX UT VA VT WA WI WV WY	40	1,044	8,043,415	39,541,948	38,155,908
2006	AR AZ CA CO CT FL GA HI IA IL IN KS KY MA MD MI MN MO NC NE NH NJ NV NY OH OK OR RI SC SD TN TX UT VA VT WA WI WV	38	1,045	8,074,825	39,450,216	38,076,556
2005	AR AZ CA CO CT FL GA HI IA IL IN KS KY MA MD MI MN MO NC NE NH NJ NV NY OH OK OR RI SC SD TN TX UT VT WA WI WV	37	1,054	7,995,048	39,163,834	37,843,039

Year	Data Sources	Number of States	Number of Hospitals	Number of Discharges in the NIS, Unweighted	Number of Discharges in the NIS, Weighted	Number of Discharges in the NIS, Weighted with Trend Weight
2004	AR AZ CA CO CT FL GA HI IA IL IN KS KY MA MD MI MN MO NC NE NH NJ NV NY OH OR RI SC SD TN TX UT VA VT WA WI WV	37	1,004	8,004,571	38,661,786	37,496,978
2003	AZ CA CO CT FL GA HI IA IL IN KS KY MA MD MI MN MO NC NE NH NJ NV NY OH OR PA RI SC SD TN TX UT VA VT WA WI WV	37	994	7,977,728	38,220,659	37,074,605
2002	CA CO CT FL GA HI IA IL KS KY MA MD ME MI MN MO NC NE NJ NV NY OH OR PA RI SC SD TN TX UT VA VT WA WI WV	35	995	7,853,982	37,804,021	36,523,831
2001	AZ CA CO CT FL GA HI IA IL KS KY MA MD ME MI MN MO NC NE NJ NY OR PA RI SC TN TX UT VA VT WA WI WV	33	986	7,452,727	37,187,641	36,093,550
2000	AZ CA CO CT FL GA HI IA IL KS KY MA MD ME MO NC NJ NY OR PA SC TN TX UT VA WA WI WV	28	994	7,450,992	36,417,565	35,300,425
1999	AZ CA CO CT FL GA HI IA IL KS MA MD ME MO NJ NY OR PA SC TN UT VA WA WI	24	984	7,198,929	35,467,673	34,440,994
1998	AZ CA CO CT FL GA HI IA IL KS MA MD MO NJ NY OR PA SC TN UT WA WI	22	984	6,827,350	34,874,001	33,923,632
1997	AZ CA CO CT FL GA HI IA IL KS MA MD MO NJ NY OR PA SC TN UT WA WI	22	1,012	7,148,420	35,408,207	33,232,257
1996	AZ CA CO CT FL IA IL KS MA MD MO NJ NY OR PA SC TN WA WI	19	906	6,542,069	34,874,386	33,386,097
1995	AZ CA CO CT FL IA IL KS MA MD MO NJ NY OR PA SC TN WA WI	19	938	6,714,935	34,791,998	33,647,121
1994	AZ CA CO CT FL IA IL KS MA MD NJ NY OR PA SC WA WI	17	904	6,385,011	34,622,203	33,149,768
1993	AZ CA CO CT FL IA IL KS MA MD NJ NY OR PA SC WA WI	17	913	6,538,976	34,715,985	33,736,753
1992	AZ CA CO FL IA IL MA NJ PA WA WI	11	856	6,195,744	35,011,385	
1991	AZ CA CO FL IA IL MA NJ PA WA WI	11	859	6,156,188	35,036,492	
1990	AZ CA CO FL IA IL MA NJ PA WA WI	11	871	6,268,515	35,215,397	
1989	AZ CA CO FL IA IL MA NJ PA WA WI	11	882	6,110,064	35,104,645	
1988	CA CO FL IA IL MA NJ WA	8	759	5,265,756	35,171,448	

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Table 3. Number of Hospitals and Discharges in 2023 Universe, Frame, and NIS, by Census Region

	Universe		Frame		NIS		
Census Region*	Hospitals	Discharges	Hospitals	Discharges	Hospitals	Discharges	Weighted Discharges
Northeast	602	5,967,758	581	5,887,370	580	1,193,552	5,967,758
Midwest	1,419	7,207,498	1359	7,132,546	1,355	1,441,498	7,207,498
South	1,898	13,792,526	1,763	13,090,830	1,758	2,758,503	13,792,526
West	926	6,728,192	488	2,836,359	486	1,345,637	6,728,192
Total	**4,845**	**33,695,974**	**4,191**	**28,947,105**	**4,179**	**6,739,190**	**33,695,974**

*The data element indicating Census region (HOSP_REGION) is not included in the 2023 NIS.

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Table 4. AHRQ HCUP NIS Related Reports and Database Documentation Available on HCUP-US

Description of the NIS Database

- NIS Overview
  - HCUP Partners in the NIS
- Introduction to the NIS, 2023 – *this document*
- NIS Related Reports
  Links to HCUP-US page with various NIS-related reports such as the following:
  - Design of the Nationwide Inpatient Sample for 1988 to 2005.
  - Changes in NIS Sampling and Weighting Strategy for 1998
  - Updated Calculating NIS Variance Reports
  - NIS Trends Report
  - Missing Data Methods Report
  - 2012 NIS Redesign Report
  - NIS Comparison Reports (available for years in which the NIS sample changed)
  - HCUP Data Quality Reports for 1988-2023
  - HCUP E-Code Evaluation Report
- Checklist for Working With the NIS

Restrictions on the Use

- Data Use Agreement Training
- Data Use Agreement for the NIS
- Requirements for Publishing with HCUP data

File Specifications and Load Programs

- NIS File Specifications
- Nationwide SAS Load Programs
- Nationwide SPSS Load Programs
- Nationwide Stata Load Programs

Data Elements

- NIS Description of Data Elements – details uniform coding and State-specific idiosyncrasies
- NIS Summary Statistics – lists means and frequencies on nearly all data elements

ICD-10-CM/PCS Data Included in the NIS Starting With 2015

- NIS Changes Beginning Data Year 2016
- Caution: 2015 NIS includes ICD-9-CM and ICD-10-CM/PCS
  - 2015 NIS Revised File Structure and New Data Elements
- Additional ICD-10-CM/PCS Resources
- HCUP Software Tools Tutorial

Information on the Redesign of the NIS in 2012

- 2012 NIS Redesign Report
- Trend Weights for the 1993-2011 NIS for Consistent Estimates with the Redesigned NIS

Known Data Issues

- Why the NIS should not be used to make State-level estimates
- Information on corrections to the NIS data sets

NIS Supplemental Files

- Cost-to-Charge Ratio files
- Hospital Market Structure (HMS) files
- 1993-2011 NIS Supplemental Discharge-Level Files
- NIS Ownership Files

HCUP Tools: Labels and Formats

- Format Programs
  - Labels file for multiple versions of Diagnosis Related Groups (DRGs) and Major Diagnostic Categories (MDCs)
  - NIS SAS format library program to create value labels
  - HCUP Diagnosis and Procedure Groups Formats Program - formats to label DX_PR_Groups including CCS data elements
  - NIS ICD-9-CM formats to label ICD-9-CM diagnoses and procedures
  - NIS ICD-10-CM formats to label ICD-10-CM/PCS diagnoses and procedures
  - NIS Severity formats to label severity data elements

• Frequencies by Diagnosis and Procedure Codes – Excel files with discharge counts by clinical categories
• Prior to Data Year 2012
  ○ Availability of AHA Hospital Identifiers
  ○ Why the NIS should not be used to make State-level estimates		

Additional Resources for Data Elements • NIS Severity Measures – provides detailed documentation on the different types of measures • HCUP Quality Control Procedures – describes procedures used to assess data quality • HCUP Coding Practices – describes how HCUP data elements are coded • HCUP Hospital Identifiers – explains data elements that characterize individual hospitals		**Obtaining HCUP Data** • Purchase HCUP data from the HCUP Central Distributor (https://cdors.ahrq.gov)

Table 5. Hospital Bedsize Categories (in Number of Beds), by Census Region*

Location and Teaching Status	Hospital Bed Size		
	Small	Medium	Large
NORTHEAST			
Rural	1-49	50-99	100+
Urban, non-teaching	1-124	125-199	200+
Urban, teaching	1-249	250-424	425+
MIDWEST			
Rural	1-29	30-49	50+
Urban, non-teaching	1-74	75-174	175+
Urban, teaching	1-249	250-374	375+
SOUTH			
Rural	1-39	40-74	75+
Urban, non-teaching	1-99	100-199	200+
Urban, teaching	1-249	250-449	450+
WEST			
Rural	1-24	25-44	45+
Urban, non-teaching	1-99	100-174	175+
Urban, teaching	1-199	200-324	325+

* Census region is used to determine the bed size category, but the data element indicating Census region (HOSP_REGION) is not included in the 2023 NIS.

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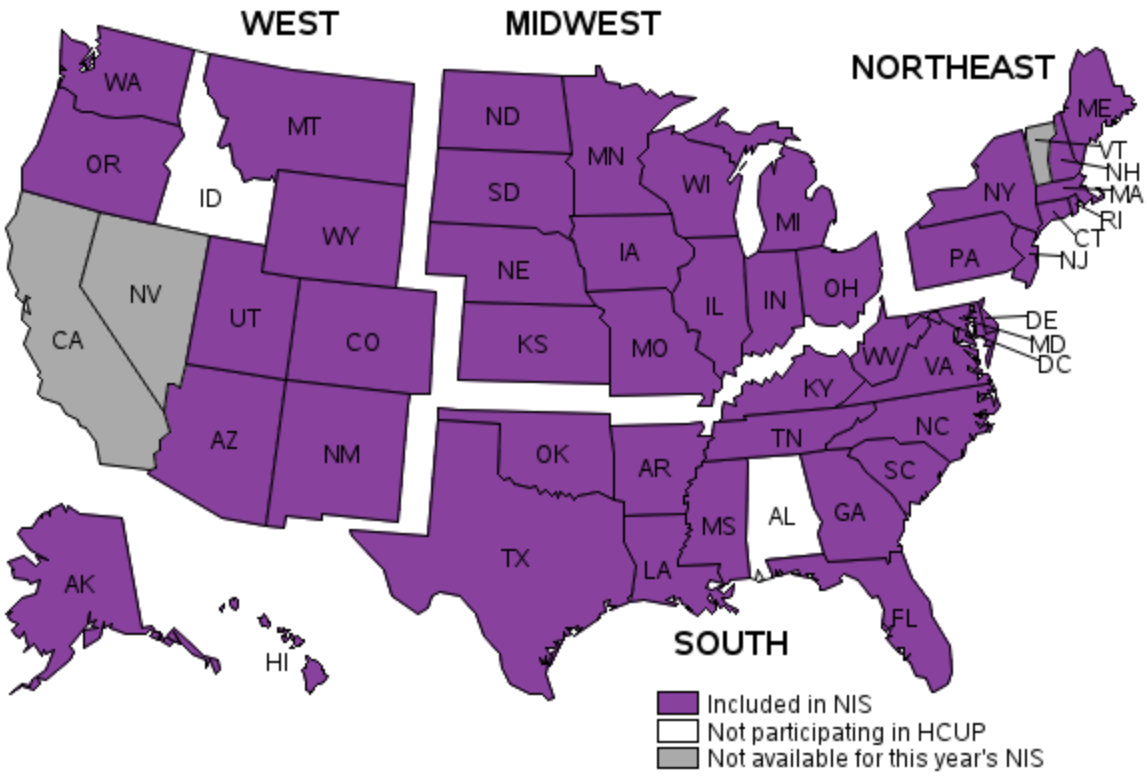
Figure 1: HCUP States and the District of Columbia included in the 2023 NIS



Data from HCUP Partner organizations in California, Nevada, and Vermont are not available for the 2023 NIS.
Represented populations from states included in the NIS vary by Census region: 44.0 percent of the population in the West, 100 percent of the population in the Midwest, 96.1 percent of the population in the South, and 98.9 percent of the population in the Northeast. The data element indicating Census region (HOSP_REGION) is not included in the 2023 NIS.

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APPENDIX II: STATE-SPECIFIC RESTRICTIONS

The table below enumerates the types of restrictions applied to the AHRQ HCUP National Inpatient Sample. Restrictions include the following types:

- Confidentiality of records
    - Restricted release of age in years
    - Restricted release of medical misadventure or adverse reaction cause codes
    - Restricted release of information for inpatient stays related to mental health
- Missing discharges

Confidentiality of Records

• Restricted release of age in years
  ○ Ages (AGE) over 89 are aggregated into a single category of 90 years or older in the HCUP nationwide databases starting in data year 2012.
 	
  ○ At least one Partner required ages in years (AGE) to be set to the midpoints of age ranges.
 	
• Restricted release of medical misadventure or adverse reaction cause codes
  ○ At least one Partner prohibits the release of medical misadventure or adverse reaction cause codes; therefore, these diagnoses may be underreported.
 	
• At least one Partner restricts the release of select information for inpatient stays related to mental health. Mental health diagnosis codes are reported on inpatient stays, but these records will have a higher percentage of missing values for the following data elements than other conditions: patient location (PL_NCHS2), national income quartile of the patient's residence (ZIPINC_QRTL), admission month (AMONTH), discharge quarter (DQTR), and length of stay (LOS).

Missing Discharges
• At least one Partner prohibits the release of abortion discharges. • At least one Partner prohibits the release of discharge records for patients with HIV diagnoses. • At least one Partner prohibits the release of Alternate Level of Care (SNF / Swing Bed Skilled) discharges.

APPENDIX III: DATA ELEMENTS IN THE 2023 AHRQ HCUP NATIONAL INPATIENT SAMPLE (NIS)

Table 1: Data Elements in the 2023 NIS Inpatient Core File

For prior years, refer to the NIS Description of Data Elements page on the HCUP-US website or to previous versions of the NIS Introduction.

Type of Data Element	HCUP Name	Coding Notes
Admission information		
Admission day	AWEEKEND	Admission on weekend: (0) admission on Monday-Friday, (1) admission on Saturday-Sunday
Admission month	AMONTH	Admission month coded from (1) January to (12) December
Transferred into hospital	TRAN_IN	Transfer In Indicator: (0) not a transfer, (1) transferred in from a different acute care hospital [ATYPE NE 4 & (ASOURCE=2 or POO=4)], (2) transferred in from another type of health facility [ATYPE NE 4 & (ASOURCE=3 or POO=5, 6, D, E, F)]
Indicator of emergency department service	HCUP_ED	Indicator that discharge record includes evidence of emergency department (ED) services: (0) Record does not meet any HCUP Emergency Department criteria, (1) Emergency Department revenue code on record, (2) Positive Emergency Department charge (when revenue center codes are not available), (3) Emergency Department CPT procedure code on record, (4) Admission source of ED, (5) State-defined ED record; no ED charges available
Admission type	ELECTIVE	Indicates elective admission: (1) elective, (0) non-elective admission
Patient demographic and location information		
Age at admission	AGE	Age in years coded 0-124 years
	AGE_NEONATE	Neonatal age (first 28 days after birth) indicator: (0) non-neonatal age (1) neonatal age
Sex of patient	FEMALE	Indicates gender for NIS beginning in 1998: (0) male, (1) female
Race of patient	RACE	***Not available in the 2023 NIS.***

Type of Data Element	HCUP Name	Coding Notes
Location of patient's residence	PL_NCHS2	Patient Location: NCHS Urban-Rural Code. This is a two-category urban-rural classification scheme for U.S. counties that is like the data element PL_NCHS that is available in the 2013-2022 NIS: (21) Metropolitan counties (consistent with PL_NCHS values 1-4 for large central, large fringe, medium, and small metropolitan areas, respectively) (22) Non-metropolitan counties (consistent with PL_NCHS values 5 and 6 for micropolitan and rural counties, respectively)
Median household income for patient's ZIP Code	ZIPINC_QRTL	Median household income quartiles for patient's ZIP Code: (1) 0-25th; (2) 26th-50th (median); (3) 51st to 75th; and (4) 76th to 100th. Specific thresholds change by year and can be found at https://hcup-us.ahrq.gov/db/vars/zipinc_qrtl/nisnote.jsp
Payer information		
Primary expected payer	PAY1	Expected primary payer, uniform: (1) Medicare, (2) Medicaid, (3) private including HMO, (4) self-pay, (5) no charge, (6) other
Diagnosis and procedure information		
ICD-10-CM diagnoses	I10_DX1 – I10_DX40	ICD-10-CM diagnoses, principal and secondary, with external cause of morbidity codes at the end of the array
	I10_NDX	Number of ICD-10-CM diagnoses coded on the record

Type of Data Element	HCUP Name	Coding Notes
ICD-10-PCS procedures	I10_PR1 – I10_PR25	ICD-10-PCS procedures, principal and secondary
	I10_NPR	Number of ICD-10-PCS procedures coded on the record
	PRDAY1	Number of days from admission to principal procedure
	PRDAY2 – PRDAY25	Number of days from admission to secondary procedures
Indicators	I10_BIRTH	ICD-10-CM birth indicator
	I10_DELIVERY	ICD-10-CM delivery indicator
	I10_INJURY	Injury ICD-10-CM diagnosis reported on record
	I10_MULTINJURY	Multiple ICD-10-CM injuries reported on record
	I10_SERVICELINE	ICD-10-CM/PCS hospital service line indicator
	PCLASS_ORPROC	ICD-10-PCS major operating room procedure indicator
DRG information		
Diagnosis Related Group (DRG)	DRG	DRG in use on discharge date (based on ICD-10-CM/PCS codes)
	DRG_NoPOA	DRG in use on discharge date, calculated without Present on Admission (POA) indicators (based on ICD-10-CM/PCS codes)
	DRGVER	Grouper version in use on discharge date
Major Diagnostic Category (MDC)	MDC	MDC in use on discharge date (based on ICD-10-CM/PCS codes)
	MDC_NoPOA	MDC in use on discharge date, calculated without Present on Admission (POA) indicators (based on ICD-10-CM/PCS codes)
Resource use information		
Total charges	TOTCHG_2023	Total hospital charges, adjusted for national estimates. *Prior to data year 2023, total charges are included in the data element TOTCHG.*
Length of stay	LOS	Length of stay, edited
Discharge information		
Discharge quarter	DQTR	Coded: (1) First quarter, Jan - Mar, (2) Second quarter, Apr - Jun, (3) Third quarter, Jul - Sep, (4) Fourth quarter, Oct - Dec

Type of Data Element	HCUP Name	Coding Notes
Discharge year	YEAR	Calendar year
Disposition of patient (discharge status)	DIED	Indicates in-hospital death: (0) did not die during hospitalization, (1) died during hospitalization
	DISPUNIFORM	Disposition of patient, uniform coding used beginning in 1998: (1) routine, (2) transfer to short-term hospital, (5) other transfers, including skilled nursing facility, intermediate care, and another type of facility, (6) home health care, (7) against medical advice, (20) died in hospital, (99) discharged alive, destination unknown
	TRAN_OUT	Transfer Out Indicator: (0) not a transfer, (1) transferred out to a different acute care hospital, (2) transferred out to another type of health facility

Weights (to calculate national estimates)

Discharge weights	DISCWT	Discharge weight on Core File and Hospital File for NIS beginning in 1998.

Hospital information

Hospital identifiers (encrypted)	HOSP_NIS	NIS hospital number (links to Hospital File; does not link to previous years). *Starting in data year 2023, information on Census division is excluded. From data years 2012-2022, the first digit of HOSP_NIS identified the Census division.*
Hospital location	HOSP_DIVISION	***Not available in the 2023 NIS.***
Hospital stratifier	NIS_STRATUM	Stratum used to sample hospitals. *Starting in data year 2023, the coding of NIS_STRATUM is a sequential number. Prior to data year 2023, the digits in NIS_STRATUM included information geographic division/region, control, location/teaching status, and hospital bedsize.*

Linkage Data Element

Record identifier, synthetic	KEY_NIS	Unique record number (links the Core file to other NIS discharge-level files). *Starting in data year 2023, information on Census division is excluded. From data years 2012-2022, the first digit of KEY_NIS identified the Census division.*

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Table 2: Data Elements in the 2023 NIS Hospital File

For prior years, refer to the NIS Description of Data Elements page on the HCUP-US website or to previous versions of the NIS Introduction.

Type of Data Element	HCUP Name	Coding Notes
Discharge counts	N_DISC_U	Number of universe discharges in the stratum
	S_DISC_U	Number of sampled discharges in the sampling stratum (NIS_STRATUM or STRATUM)
	TOTAL_DISC	Total number of discharges from this hospital in the NIS
Discharge weights	DISCWT	Discharge weight used in the NIS beginning in 1998.
Discharge Year	YEAR	Discharge year
	N_HOSP_U	Number of universe hospitals in the stratum
	S_HOSP_U	Number of sampled hospitals in the stratum (NIS_STRATUM or STRATUM)
Hospital identifiers	HOSP_NIS	NIS hospital number (links to Hospital File; does not link to previous years). *Starting in data year 2023, information on Census division is excluded. From data years 2012-2022, the first digit of HOSP_NIS identified the Census division.*
Hospital characteristics	HOSP_BEDSIZE	Hospital bedsize category based on number of beds (STRATA): (1) small, (2) medium, (3) large
	H_CONTRL	Control/ownership of hospital: (1) government, nonfederal, (2) private, non-profit, (3) private, investor-own
	HOSP_ LOCTEACH	Location/teaching status of hospital (STRATA): (1) rural, (2) urban non-teaching, (3) urban teaching
	HOSP_REGION	***Not available in the 2023 NIS.***
	HOSP_DIVISION	***Not available in the 2023 NIS.***
	NIS_STRATUM	Stratum used to sample hospitals beginning in 1998. *Starting in data year 2023, the coding is a sequential number. Prior to data year 2023, the digits in NIS_STRATUM included information on geographic division/region, control, location/teaching status, and hospital bedsize.*

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Table 3: Data Elements in the 2023 NIS Severity File

For prior years, refer to the NIS Description of Data Elements page on the HCUP-US website or to previous versions of the NIS Introduction.

Type of Data Element	HCUP Name	Coding Notes
All Patient Refined DRG (3M)	APRDRG	All Patient Refined DRG
	APRDRG_Risk_ Mortality	Risk of Mortality Subclass: (0) No class specified, (1) Minor likelihood of dying, (2) Moderate likelihood of dying, (3) Major likelihood of dying, (4) Extreme likelihood of dying
	APRDRG_ Severity	Severity of Illness Subclass: (0) No class specified, (1) Minor loss of function (includes cases with no comorbidity or complications), (2) Moderate loss of function, (3) Major loss of function, (4) Extreme loss of function
Linkage Data Elements	HOSP_NIS	NIS hospital number (links to Hospital File; does not link to previous years). *Starting in data year 2023, information on Census division is excluded. From data years 2012-2022, the first digit of HOSP_NIS identified the Census division.*
	KEY_NIS	Unique record number (links to other NIS discharge-level files). *Starting in data year 2023, information on Census division is excluded. From data years 2012-2022, the first digit of KEY_NIS identified the Census division.*

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Table 4: Data Elements in the 2023 NIS Diagnosis and Procedure Groups File

The Diagnosis and Procedure Groups file is available from 2005 to 2015; and is available again beginning with 2018 data, when data elements derived from the Clinical Classifications Software Refined (CCSR) for ICD-10-CM diagnoses are added. Beginning with data year 2019, data elements derived from the Elixhauser Comorbidity Software Refined for ICD-10-CM, the CCSR for ICD-10-PCS procedures, and Procedure Classes Refined for ICD-10-CM are also available in this file. Beginning with data year 2023, data elements derived from the Chronic Conditions Indicator Refined for ICD-10-CM are available. This file is not available from 2016-2017 because the ICD-10-CM/PCS versions of the AHRQ tools were still under development. For prior years, refer to the NIS Description of Data Elements page on the HCUP-US website or to previous versions of the NIS Introduction.

Chronic Condition Indicator Refined (CCIR)	CCIRn[a]	Indication that a diagnosis is a chronic condition or not a chronic condition, identified by the AHRQ CCIR for ICD-10-CM diagnosis codes
	CCIR_VERSION	Version of CCIR for ICD-10-CM diagnoses
Comorbidity Measure Refined (CMR)	CMR_aaa[b]	Comorbidity measures (aaa) identified by the AHRQ Elixhauser Comorbidity Software Refined for ICD-10-CM diagnosis codes
	CMR_VERSION	Version of the Elixhauser Comorbidity Measure Refined for ICD-10-CM
Clinical Classifications Software Refined (CCSR) Category	DXCCSR_aaannn[c]	Indication that at least one ICD-10-CM diagnosis on the record is included in CCSR aaannn
	DXCCSR_DEFAULT_DX1	Default Clinical Classifications Software Refined (CCSR) for principal diagnosis
	DXCCSR_VERSION	Version of CCSR for ICD-10-CM diagnoses
	PRCCSR_aaannn[d]	Indication that at least one ICD-10-PCS procedure code on the record is included in CCSR aaannn
	PRCCSR_VERSION	Version of the CCSR for ICD-10-PCS procedures
Procedure Classes Refined	PCLASSn	Procedure Classes Refined for ICD-10-PCS procedures
	PCLASS_VERSION	Version of the Procedure Classes Refined for ICD-10-PCS procedures
Linkage Data Elements	HOSP_NIS	NIS hospital number (links to Hospital Weights file; does not link to previous years). *Starting in data year 2023, information on Census division is excluded. From data years 2012-2022, the first digit of HOSP_NIS identified the Census division.*
	KEY_NIS	Unique record number (links to other NIS discharge-level files). *Starting in data year 2023, information on Census division is excluded. From data years 2012-2022, the first digit of KEY_NIS identified the Census division.*

Abbreviations: AHRQ, Agency for Healthcare Research and Quality; CCSR, Clinical Classifications

Software Refined; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM/PCS, International Classification of Diseases, Tenth Revision, Clinical Modification/Procedure Coding System; NIS, National Inpatient Sample.

[a] Where n denotes the position of the CCIR within the array.

[b] Where aaa denotes the specific comorbidity measure.

[c] Where aaa denotes the body system and nnn denotes the CCSR number within the body system.

[d] Where aaa denotes the clinical domain and nnn denotes the CCSR number within the clinical domain.

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APPENDIX IV: TEACHING HOSPITAL INDICATOR ASSIGNMENT

The following data elements from the American Hospital Association Annual Survey Database™ are used to assign the NIS Teaching Hospital Indicator:

AHA Data Element Name = Description [HCUP Data Element Name].

BDH	= Number of short-term hospital beds [B001H].
BDTOT	= Number of total facility beds [B001].
FTRES	= Number of full-time employees: interns & residents (medical & dental) [E125].
PTRES	= Number of part-time employees: interns & residents (medical & dental) [E225].
MAPP8	= Council of Teaching Hospitals (COTH) indicator [A101].
MAPP3	= Residency training approval by the Accreditation Council for Graduate Medical Education (ACGME) [A102].

Beginning with the 1998 NIS, the following SAS code is used to assign the teaching hospital status indicator, HOSP_TEACH:

```
/*******************************************************/
/* FIRST ESTABLISH SHORT-TERM BEDS DEFINITION */
/*******************************************************/
IF BDH NE . THEN BEDTEMP = BDH ;    /* SHORT TERM BEDS */
ELSE IF BDH =. THEN BEDTEMP = BDTOT ; /* TOTAL BEDS PROXY */
/*******************************************************/
/* ESTABLISH IRB NEEDED FOR TEACHING STATUS */
/* BASED ON F-T P-T RESIDENT INTERN STATUS */
/*******************************************************/
IRB = (FTRES + .5*PTRES) / BEDTEMP ;
/*******************************************************/
/* CREATE TEACHING STATUS DATA ELEMENT */
/*******************************************************/
IF (MAPP8 EQ 1) OR (MAPP3 EQ 1) THEN HOSP_TEACH = 1 ;
ELSE IF (IRB GE 0.25) THEN HOSP_TEACH = 1 ;
ELSE HOSP_TEACH = 0 ;
```

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