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

INTRODUCTION TO

THE HCUP NATIONWIDE INPATIENT SAMPLE (NIS)

2009

These pages provide only an introduction to the NIS package.

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

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HCUP NATIONWIDE INPATIENT SAMPLE (NIS)
SUMMARY OF DATA USE LIMITATIONS

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

All users of the NIS must take the on-line Data Use Agreement (DUA) training session, sign a Data Use Agreement, and send a copy to AHRQ.[†]

Authorized users of HCUP data agree to the following limitations:[‡]

- Will not use the data for any purpose other than research or aggregate statistical reporting.
- Will not re-release any data to unauthorized users.
- Will not identify or attempt to identify any individual. **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.**
- Will not link HCUP data to data from another source that identifies individuals.
- Will not report information that could identify individual establishments (e.g., hospitals).
- Will not use the data concerning individual establishments for commercial or competitive purposes involving those establishments.
- Will not use the data to determine rights, benefits, or privileges of individual establishments.
- Will not identify or attempt to identify any establishment when its identity has been concealed on the database.
- Will not contact establishments included in the data.
- Will not attribute to data contributors any conclusions drawn from the data.
- Will not use data elements from the proprietary severity adjustment software packages (3M APR-DRGs, HSS APS-DRGs, and Thomson Reuters Disease Staging) for any commercial purpose or to disassemble, decompile, or otherwise reverse engineer the proprietary software.
- Must acknowledge the "Healthcare Cost and Utilization Project (HCUP)," as described in the Data Use Agreement, in reports.

Any violation of the limitations in the Data Use Agreement is punishable under Federal law by a fine of up to $10,000 and up to 5 years in prison. Violations may also be subject to penalties under State statutes.

[†] The on-line Data Use Agreement training session and the Data Use Agreement are available on the HCUP User Support (HCUP-US) Website at http://www.hcup-us.ahrq.gov.
[‡] Specific provisions are detailed in the Data Use Agreement for Nationwide Inpatient Sample.

HCUP CONTACT INFORMATION

The NIS Data Use Agreement Training Tool and the Data Use Agreement are available on the AHRQ-sponsored HCUP User Support (HCUP-US) Website:

http://www.hcup-us.ahrq.gov

After completing the on-line training tool, please submit signed data use agreements to HCUP at:

Agency for Healthcare Research and Quality
Healthcare Cost and Utilization Project (HCUP)
540 Gaither Road, 5th Floor
Rockville, Maryland 20850

Phone: (866) 290-HCUP (4287)
Fax: (301) 427-1430
Website: http://www.ahrq.gov/data/hcup/

For technical assistance:

Visit the HCUP-US Website at

http://www.hcup-us.ahrq.gov

Or for issues related to reading and loading the files contact the HCUP Central Distributor at

Phone: (866) 556-4287 (toll-free between the hours of 9 a.m. and 5 p.m. (ET). If the HCUP Central Distributor is not immediately available, please leave a message on voice mail, and your call will be returned within one business day.)

Fax: (866) 792-5313
E-mail: HCUPDistributor@ahrq.gov

For other issues send an e-mail to HCUP User Support at

hcup@ahrq.gov

WHAT'S NEW IN THE 2009 NATIONWIDE INPATIENT SAMPLE (NIS)?

- The 2009 NIS contains two additional states: New Mexico and Montana.
- The following data elements were added to the Core File beginning with the 2009 NIS:
    - Ten additional secondary diagnoses for a total of 25 diagnoses
    - Ten additional secondary Clinical Classifications Software (CCS) diagnosis categories
    - Major Diagnosic Category (MDC) in use on discharge date, calculated without Present on Admission (POA) indicators (MDC_NoPOA). MDC_NoPOA and the Diagnosis Related Group (DRG) calculated without POA indicators (DRG_NoPOA) are useful because the lack of POA flags from many states prevents the assignment of the standard MDC and DRG for a few DRGs involving Hospital Acquired Conditions (HAC).
- The following data elements were added to the Diagnosis and Procedure Groups (DX_PR_GRPS) File beginning with the 2009 NIS:
    - Multi-level CCS categories for the principal diagnosis and the first listed E-code and procedure.
    - Ten additional Chronic Condition Indicators
    - Ten additional Chronic Condition Body System Indicators
- Georgia and Illinois provide race/ethnicity data for the first time for data year 2009. In addition, Iowa improved their race/ethnicity data in 2009 by capturing information about the Hispanic population.
- The 2009 NIS is distributed on a single DVD-ROM instead of two CD-ROMs.

UNDERSTANDING THE NIS
This document, Introduction to the NIS, 2009, summarizes the content of the NIS and describes the development of the NIS sample and weights. Cumulative information for all previous years is included to provide a longitudinal view of the database. Important considerations for data analysis are provided along with references to detailed reports. In-depth documentation for the NIS is available on the HCUP User Support (HCUP-US) Website (www.hcup-us.ahrq.gov).

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The Agency for Healthcare Research and Quality and the staff of the Healthcare Cost and Utilization Project (HCUP) thank you for purchasing the HCUP Nationwide Inpatient Sample (NIS).

HCUP Nationwide Inpatient Sample (NIS)

ABSTRACT

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

The NIS is a database of hospital inpatient stays. Researchers and policy makers use the NIS to identify, track, and analyze national trends in health care utilization, access, charges, quality, and outcomes.

The NIS is the largest all-payer inpatient care database that is publicly available in the United States, containing data from 5 to 8 million hospital stays from about 1,000 hospitals sampled to approximate a 20-percent stratified sample of U.S. community hospitals. The NIS is drawn from those States participating in HCUP; for 2009, these states comprise 96 percent of the U.S. population. Weights are provided to calculate national estimates. See Table 1 in Appendix I for a list of the statewide data organizations participating in the NIS. The number of sample hospitals and discharges by State and year are available in Table 2 in Appendix I.

The NIS is available yearly, beginning with 1988, allowing analysis of trends over time. (Analyses of time trends are recommended from 1993 forward. For NIS data 1997 and earlier, revised weights should be used to make estimates comparable to later data. Refer to NIS Trends Weights Files and the report, Using the HCUP Nationwide Inpatient Sample to Estimate Trends, available on the HCUP User Support (HCUP-US) Website, for details.)

The NIS is the only national hospital database with charge information on all patients, regardless of payer, including persons covered by Medicare, Medicaid, private insurance, and the uninsured. For Medicare, the NIS includes Medicare Advantage patients, a population that is missing from Medicare claims data but that comprises as much as 20 percent of Medicare beneficiaries. The NIS' large sample size enables analyses of rare conditions, such as specific types of cancer; uncommon treatments, such as organ transplantation; and special patient populations, such as the uninsured.

Inpatient stay records in the NIS include clinical and resource use information typically available from discharge abstracts. Hospital and discharge weights are provided for producing national estimates. The NIS can be linked to hospital-level data from the American Hospital Association (AHA) Annual Survey Database (Health Forum, LLC © 2010) and county-level data from the Bureau of Health Professions' Area Resource File, except in those States that do not allow the

release of hospital identifiers. In 2009, 18 of the 44 states do not include the hospital name and 17 of these do not include the AHA hospital identifier. Thus 43% of hospitals in the NIS do not include AHA hospital identifiers and cannot be linked to other data sources at the hospital level.

Beginning in 1998, the NIS differs from previous NIS releases: some data elements were dropped; some were added; for some data elements, the coding was changed; and the sampling and weighting strategy was revised to improve the representativeness of the data. (See the report, *Changes in the NIS Sampling and Weighting Strategy for 1998*, available on the HCUP-US Website, which describes these changes.) Periodically, new data elements are added to the NIS and some are dropped; see Appendix III for a summary of data elements and when they are effective.

Access to the NIS is open to users who sign data use agreements. Uses are limited to research and aggregate statistical reporting.

For more information on the NIS, please visit the AHRQ-sponsored HCUP-US Website at http://www.hcup-us.ahrq.gov.

INTRODUCTION TO THE HCUP NATIONWIDE INPATIENT SAMPLE (NIS)

Overview of NIS Data

The Nationwide Inpatient Sample (NIS) contains all-payer data on hospital inpatient stays from States participating in the Healthcare Cost and Utilization Project (HCUP). Each year of the NIS provides information on approximately 5 million to 8 million inpatient stays from about 1,000 hospitals. All discharges from sampled hospitals are included in the NIS database.

The NIS contains clinical and resource use information included in a typical discharge abstract. The NIS can be linked directly to hospital-level data from the American Hospital Association (AHA) Annual Survey Database (Health Forum, LLC © 2010) and to county-level data from the Health Resources and Services Administration Bureau of Health Professions' Area Resource File (ARF), except in those States that do not allow the release of hospital identifiers.

The NIS is designed to approximate a 20-percent sample of U.S. community hospitals, defined by the AHA to be "all non-Federal, short-term, general, and other specialty hospitals, excluding hospital units of institutions." Included among community hospitals are specialty hospitals such as obstetrics-gynecology, ear-nose-throat, short-term rehabilitation, orthopedic, and pediatric institutions. Also included are public hospitals and academic medical centers. Starting in 2005, the AHA included long term acute care facilities in the definition of community hospitals, therefore such facilities are included in the NIS sampling frame. These facilities provide acute care services to patients who need long term hospitalization (stays of more than 25 days). Excluded from the NIS are short-term rehabilitation hospitals (beginning with 1998 data), long-term non-acute care hospitals, psychiatric hospitals, and alcoholism/chemical dependency treatment facilities.

This universe of U.S. community hospitals is divided into strata using five hospital characteristics: ownership/control, bed size, teaching status, urban/rural location, and U.S. region.

The NIS is a stratified probability sample of hospitals in the frame, with sampling probabilities proportional to the number of U.S. community hospitals in each stratum. The frame is limited by the availability of inpatient data from the data sources currently participating in HCUP.

In order to improve the representativeness of the NIS, the sampling and weighting strategy was modified beginning with the 1998 data. The full description of this process can be found in the special report on *Changes in NIS Sampling and Weighting Strategy for 1998.* This report is available on the AHRQ-sponsored HCUP-US Website at http://www.hcup-us.ahrq.gov. To facilitate the production of national estimates, both hospital and discharge weights are provided, along with information necessary to calculate the variance of estimates. Detailed information on the design of the NIS prior to 2006 is available in the year-specific special reports on *Design of the Nationwide Inpatient Sample* found on the HCUP-US Website (http://hcup-us.ahrq.gov/db/nation/nis/nisrelatedreports.jsp). Starting with the 2006 NIS, the information on the design of the NIS was incorporated into this report.

The NIS is available yearly, beginning with 1988, allowing analysis of trends over time. (Analyses of time trends are recommended from 1993 forward. For NIS data 1997 and earlier, revised weights should be used to make estimates comparable to later data. Refer to NIS Trends Weights Files and the report, Using the HCUP Nationwide Inpatient Sample to Estimate Trends, available on the HCUP User Support (HCUP-US) Website, for details.)

See Table 3 in Appendix I for a summary of NIS releases. Each release of the NIS includes:

- Data in fixed-width ASCII format on DVD or CD-ROM (prior to 2009).
- Patient-level hospital discharge abstract data for 100% of discharges from a sample of hospitals in participating States.
- 5 million to 8 million inpatient records per year.
- 800-1,100 hospitals per year.
- Two 10% subsamples of discharges from all NIS hospitals (only available prior to the 2005 NIS).
- Discharge-level weights to calculate national estimates for discharges.
- Hospital Weights File to produce national estimates for hospitals and to link the NIS to data from the AHA Annual Survey Database (Health Forum, LLC © 2010)
- NIS Documentation and tools – including file specifications, programs for loading the ASCII data into SAS and SPSS, and value labels. Beginning in 2005, code is also provided for loading the NIS ASCII file into Stata.

NIS Data Sources, Hospitals, and Inpatient Stays

Table 4 in Appendix I contains a summary of the data sources, number of hospitals, and number of unweighted and weighted inpatient stays in NIS data.

State-Specific Restrictions

Some data sources 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 were 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.

Contents of DVD

The NIS is distributed as fixed-width ASCII formatted data files compressed with WinZip®. Previously it was distributed on two CD-ROMs, but beginning with the 2009 NIS, it is distributed on a single DVD. It includes the following files:

Inpatient Core File: This inpatient discharge-level file contains data for all the discharges from a sample of hospitals in participating States. The unit of observation is an *inpatient stay record*. Refer to Table 1 in Appendix III for a list of data elements in the Inpatient Core File. This file is available in all years of the NIS.

Hospital Weights File: This hospital-level file contains one observation for each hospital included in the NIS and contains weights and variance estimation data elements, as well as linkage data elements. The unit of observation is the *hospital*. The HCUP hospital identifier (HOSPID) provides the linkage between the NIS Inpatient Core files and the Hospital Weights file. A list of data elements in the Hospital Weights File is provided in Table 2 of Appendix III. This file is available in all years of the NIS.

Disease Severity Measures File: This discharge-level file contains information from four different sets of disease severity measures. Information from the severity file is to be used in conjunction with the Inpatient Core file. The unit of observation is an *inpatient stay record*. The HCUP unique record identifier (KEY) provides the linkage between the Core files and the Disease Severity Measures file. Refer to Table 3 in Appendix III for a list of data elements in the Severity Measures file. This file is available beginning with the 2002 NIS.

Diagnosis and Procedure Groups File: This discharge-level file contains data elements from AHRQ software tools designed to facilitate the use of the ICD-9-CM diagnostic and procedure information in the HCUP databases. The unit of observation is an *inpatient stay record*. The HCUP unique record identifier (KEY) provides the linkage between the Core file and the Diagnosis and Procedure Groups file. Table 4 in Appendix III contains a list of data elements in the Diagnosis and Procedure Groups file. This file is available beginning with the 2005 NIS.

On the HCUP-US Website (http://www.hcup-us.ahrq.gov), NIS purchasers can access complete file documentation, including data element notes, file layouts, summary statistics, and related technical reports. Similarly, purchasers can also download SAS, SPSS, and Stata load programs. Available online documentation and supporting files are detailed in Appendix I, Table 5.

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 Inpatient Core files (record = inpatient stay)
- Table 2 for the Hospital Weights files (record = hospital)
- Table 3 for the Disease Severity Measures files (record = inpatient stay)
- Table 4 for the Diagnosis and Procedure Groups files (record = inpatient stay).

Not all data elements in the NIS are uniformly coded or available across all States. The tables in Appendix III are not complete documentation for the data. Please refer to the NIS documentation located on the HCUP-US Website (http://www.hcup-us.ahrq.gov) for comprehensive information about data elements and the files.

Getting Started

In order to load and analyze the NIS data on a computer, you will need the following:

- A DVD drive
- A hard drive with 15 gigabytes of space available
- SAS, SPSS, Stata or similar analysis software.

Copying and Decompressing the ASCII Files

To copy and decompress the data from the DVD, follow these steps:

1) Create a directory for the NIS on your hard drive.
2) Unzip each ASCII file from the DVD, saving it into the new directory using WinZip® or a similar utility. (Evaluation versions of WinZip may be downloaded from the WinZip Website at www.winzip.com.)

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 http://www.hcup-us.ahrq.gov/db/nation/nis/nisdbdocumentation.jsp.
2) Go to the "Load Programs" section on this page.
3) Click on "SAS Load Programs", "SPSS Load Programs", or "STATA Load Programs" to go to the corresponding Load Programs page.
4) Select and download the load programs you need. The load programs are specific to the data year. For example, the load program for the 2009 NIS Core file is linked to "Core File" under "2009 NIS". Save the load programs into the same directory as the NIS ASCII files on your computer.
5) Edit and run the load programs as appropriate for your environment to load and save the analysis files. For example, add directory paths for the input and output files if needed.

NIS Documentation

NIS documentation files on the HCUP-US Website (http://www.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 (http://www.hcup-us.ahrq.gov). The first section under Nationwide HCUP Databases is specific to the NIS.

Table 5 in Appendix I details both the NIS related reports and the comprehensive NIS database documentation available on HCUP-US.

HCUP On-Line 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 nationwide databases.
The Producing National HCUP Estimates tutorial is designed to help users understand how the three nationwide databases – the NIS, NEDS, and 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 nationwide databases.

New tutorial are added periodically. The Online Tutorial Series is located on the HCUP-US Website at http://hcup-us.ahrq.gov/tech_assist/tutorials.jsp.

HOW TO USE THE NIS FOR DATA ANALYSIS

This section provides a brief synopsis of special considerations when using the NIS. For more details, refer to the comprehensive documentation on the HCUP-US Website (http://www.hcup-us.ahrq.gov).

- If anyone other than the original purchaser uses the NIS data, be sure to have them read and sign a Data Use Agreement, after viewing the on-line Data Use Agreement Training Tool available on the HCUP-US Website (http://www.hcup-us.ahrq.gov). A copy of the signed Data Use Agreements must be sent to AHRQ. See page 2 for the mailing address.

- 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 State Inpatient Databases (SID) (http://www.hcup-us.ahrq.gov/sidoverview.jsp) and accompanying Revisit Files which allow identification of readmissions for individual patients (http://www.hcup-us.ahrq.gov/toolssoftware/revisit/revisit.jsp).

Calculating National Estimates

- To produce national estimates, use one of the following discharge weights to weight discharges in the NIS Core files to the discharges from all U.S. community, non-rehabilitation hospitals. The name of the discharge weight data element depends on the

year of data and the type of analysis. **In order to produce national estimates, you MUST use discharge weights.**

NIS Year	Name of Discharge Weight on the **Core File** to Use for Creating Nationwide Estimates	Name of Discharge Weight on the **10% Subsample Core File** to Use for Creating Nationwide Estimates
2005 forward	• DISCWT for all analyses	• *The 10% Subsample Core File was discontinued with the 2005 NIS.*
2001-2004	• DISCWT for all analyses	• DISCWT10 for all analyses
2000	• DISCWT to create nationwide estimates for all analyses except those that involve total charges. • DISCWTCHARGE to create nationwide estimates of total charges.	• DISCWT10 to create nationwide estimates for all analyses, except those that involve total charges. • DISCWTCHARGE10 to create nationwide estimates of total charges.
1998-1999	• DISCWT for all analyses	• DISCWT10 for all analyses
1988-1997	• DISCWT_U for all analyses	• D10CWT_U for all analyses

- 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 Nationwide Inpatient Sample Variances* on the HCUP-US Website.

- The NIS Comparison Report assesses the accuracy of NIS estimates. The updated report for the current NIS will be posted on the HCUP-US Website (www.hcup-us.ahrq.gov) as soon as it is completed.

- When creating national estimates, it is a good idea to check your estimates against other data sources, if available. For example, the National Hospital Discharge Survey (http://www.cdc.gov/nchs/nhds.htm) can provide benchmarks against which to check your national estimates for hospitalizations with more than 5,000 discharges.

- 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 (http://www.hcupnet.ahrq.gov). 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, and SID for those States that have agreed to participate. In addition, HCUPnet provides Quick Statistics – ready-to-use tables on commonly requested information – as well as national statistics based on the AHRQ Quality Indicators.

Studying Trends

- 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 over time). Estimates from earlier years of the NIS may be subject to more sampling bias than later years of the NIS. In order to facilitate analysis of trends using multiple years of NIS data, an alternate set of NIS discharge and hospital weights for the 1988-1997 HCUP NIS were developed. These alternate weights were calculated in the same way as the weights for the 1998 and later years of the NIS. The report *Using the HCUP Nationwide Inpatient Sample to Estimate Trends* includes details regarding the alternate weights and other recommendations for trends analysis. Both the NIS trends report and the alternate weights are available on the HCUP-US Website under Methods Series (http://www.hcup-us.ahrq.gov/reports/methods.jsp).

- To ease the burden on researchers conducting analyses that span multiple years, NIS trends supplemental files (NIS-Trends) are available through the HCUP Central Distributor. The NIS-Trends annual files contain the alternate trend weights for data prior to 1997, in addition to renamed, recoded, and new data elements consistent with the later years of the NIS. More information on these files is available on the HCUP-US Website under NIS database documentation (http://www.hcup-us.ahrq.gov/db/nation/nis/nisdbdocumentation.jsp).

- Short-term rehabilitation hospitals are included in the 1988-1997 NIS, but are excluded from the NIS beginning in 1998. Patients treated in short-term rehabilitation hospitals tend to have lower mortality rates and longer lengths of stay than patients in other community hospitals. The elimination of rehabilitation hospitals may impact trends but the effect is likely small since only about 3% of community hospitals are short-term rehabilitation hospitals and not all State data sources included these hospitals. The NIS-Trends weights account for this change in NIS sampling.

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 (http://www.hcup-us.ahrq.gov/db/nation/nis/nissummstats.jsp). When you detect anomalies (such as large numbers of missing cases), perform descriptive statistics by State for that data element to detect if there are State-specific differences. 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 State data source. These data elements are provided on the NIS because they can be valuable for research purposes but they should be used cautiously. For example, RACE is missing for a number of States; thus, national estimates using RACE should be interpreted and reported with caveats. Check the documentation and run frequencies by State to identify if a data element is not available in one or more States.

- 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. Be sure to read State-specific notes for each data element that you use in your analysis – this information can be found on the Description of Data Elements page on the HCUP-US Website (http://www.hcup-us.ahrq.gov/db/nation/nis/nisdde.jsp).

- Data elements with "_X" suffixes contain State-specific coding (i.e., these data elements are provided by the data sources and have not been altered in any way). For some data elements (e.g., LOS_X and TOTCHG_X) this means that no edit checks have been applied. For other data elements (e.g., PAY1_X), the coding is specific to each State and may not be comparable to any other State.

Hospital-Level Data Elements

- Note that specific hospital identifiers, including the AHA identifier, are not available for 43% of hospitals in the NIS because certain states do not release hospital identifiers. This means that for those hospitals, you will not be able to link the NIS to outside data sources that require hospital-specific identifiers. However, there are hospital-level data elements for nearly all hospitals in the NIS that allow you to study certain hospital characteristics including ownership/control, teaching status, rural/urban location, bedsize, and Census region of the country.

- The sampling strategy for the NIS was redesigned in 1998 and one stratifier (hospital ownership) was redefined to reduce the number of ownership strata in some regions. This redefinition resulted in collapsed ownership categories that were useful in addressing the requirements of some HCUP Partners to protect the confidentiality of hospitals, but they were not as informative as the original data element. Thus beginning with the 1998 NIS, the data element H_CONTRL was replaced by the HOSP_CONTROL (collapsed) data element.

  To facilitate analyses by hospital ownership, the data element containing hospital ownership categories without any collapsing (H_CONTRL) was restored to the Hospital File beginning with the 2008 NIS. The H_CONTRL data element contains the following three hospital ownership categories:

  1 - Government, nonfederal
  2 - Private, non-profit
  3 - Private, invest-own

  Note, however, that H_CONTRL is set to missing in a few instances to satisfy HCUP Partner requirements.

  The H_CONTRL values for 1998-2007 NIS hospitals are now available in the supplemental NIS Hospital Ownership File on HCUP-US at http://www.hcup-us.ahrq.gov/db/nation/nis/nisownership.jsp.

- New hospital-level data elements were added to the NIS hospital file beginning in 2007. These data elements, which are listed in Table 2 of Appendix III, are derived from the AHA Annual Survey Database (Health Forum, LLC © 2010). While these data elements enable a greater breadth of analysis, certain limitations apply.

1. Some of the new data elements pertain to nurse staffing at hospitals, which is reported as a total for the hospital/facility. Therefore, it is possible that some hospitals may also have included counts from nursing homes.
2. The adjusted patient days are based on inpatient days with an adjustment made for outpatient activities, calculated as: Inpatient days * (1 + Outpatient Revenue / Inpatient Revenue).
3. Data for hospitals that do not complete the AHA Annual Survey are missing from the new data elements.

A detailed description of the data elements is available on HCUP-US. Note that some HCUP states do not allow the release of this information.

Constructing Patient Population Characteristics

- Summary data elements that provide insight into the patient population can be constructed at the hospital level using HOSPID and the data elements already present in the NIS. Suggested summary data elements include:
    - Percentage of Hispanic discharges
    - Percentage of black discharges
    - Percentage of non-white discharges
    - Percentage of pediatric discharges
    - Percentage of discharges for adults age 65 and older
    - Percentage of discharges with an expected primary payer of Medicare
    - Percentage of discharges with an expected primary payer of Medicaid
    - Percentage of discharges with an expected primary payer of private insurance
    - Percentage of uninsured discharges (expected primary payer of self-pay and no charge)
    - Percentage of discharges with no comorbidities
    - Percentage of discharges with one or two comorbidities
    - Percentage of discharges with three or more comorbidities

ICD-9-CM Diagnosis and Procedure Codes

- ICD-9-CM diagnosis and procedure codes provide valuable insights into the reasons for hospitalization and what procedures patients receive, but these codes need to be carefully used and interpreted. ICD-9-CM codes change every October as new codes are introduced and some codes are retired. See the "Conversion Table" at http://www.cdc.gov/nchs/icd/icd9cm.htm which shows ICD-9-CM code changes over time. **It is critical to check all ICD-9-CM code used for analysis to ensure the codes are in effect during the time period studied.**

- Although the NIS contains up to 25 diagnoses (15 prior to the 2009 NIS) and 15 procedures, the number of diagnoses and procedures varies by State. Some States provide as many as 31 diagnoses and procedures or more, while other States provide as few as 9 diagnoses and 6 procedures. Because very few cases have more than 25 diagnoses or 15 procedures, the diagnosis and procedure vectors were truncated to save space in the NIS data files. Two data elements are provided which tell you exactly how many diagnoses and procedures

were on the original records (NDX and NPR). See the notes on diagnoses (http://www.hcup-us.ahrq.gov/db/vars/dxn/nisnote.jsp) and procedures (http://www.hcup-us.ahrq.gov/db/vars/_prn/nisnote.jsp) on the HCUP-US Web site to view the number of diagnosis and procedure fields provided by each state.

- The collection and reporting of external cause of injury (E codes) varies greatly across States. Some States have laws or mandates for the collection of E codes; others do not. Some States do not require hospitals to report E codes in the range E870-E879 - "misadventures to patients during surgical and medical care" - which means that these occurrences will be underreported. Be sure to read the State-specific notes on diagnoses for more details; this information can be found on the Description of Data Elements page on the HCUP-US Website (http://www.hcup-us.ahrq.gov/db/nation/nis/nisdde.jsp).

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, race is missing on 15% of discharges in the 2009 NIS because some hospitals and HCUP State Partners do not supply it. (The percentage of missing race values was higher in previous years.) Therefore race-specific estimates may be biased. This is especially true for estimates of discharge totals by race. Another set of data elements that are missing are hospital identifiers, which allow you to link to other datasets with the AHA hospital identifier. In 2009, about 43% of hospitals were missing specific identifiers.

There are several techniques available to help overcome this bias. One strategy is to use imputation to replace missing values with acceptable values. Another strategy is to use sample weight adjustments to compensate for missing values.[1] 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.

On the other hand, if the cases with and without missing values are assumed to be similar with respect to their outcomes, no adjustment may be necessary for estimates of means and rates. This is because the non-missing cases would be representative of the missing cases. However, some adjustment may still be necessary for the estimates of totals. Sums of data elements (such as aggregate charges) containing missing values would be incomplete because cases with missing values would be omitted from the calculations.

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 take into account both the sampling design and the form of the statistic. The sampling design consisted of a stratified, single-stage cluster sample. A stratified random sample of hospitals (clusters) was drawn and then *all* discharges were included from each selected hospital. **To accurately calculate variances from the NIS, you must use appropriate statistical software and techniques.** For details, see the special report, *Calculating Nationwide Inpatient Sample Variances*. This report is available on the HCUP-US Website at http://www.hcup-us.ahrq.gov/db/nation/nis/nisrelatedreports.jsp.

If hospitals inside the frame are similar to hospitals outside the frame, the sample hospitals can

be treated as if they were randomly selected from the entire universe of hospitals within each stratum. Standard formulas for a stratified, single-stage cluster sample without replacement could 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 take into account 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, nationwide estimates of outcomes. According to finite-sample theory, the intent of the estimation process is to obtain estimates that are precise representations of the nationwide 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 or hospital market factors.

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* was 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 nationwide population in a given year is only a snapshot in time of the possible interrelationships among hospital, market, 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 defined at that point in time, and because the estimate is for a characteristic as it existed when sampled. This is in contrast to the superpopulation model, which adopts a stochastic viewpoint rather than a deterministic viewpoint. That is, the nationwide population in a particular year is viewed as a random sample of some underlying superpopulation over time. 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 hospital weights are useful for producing hospital-level statistics for analyses that use the *hospital* as the unit of analysis, while 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 nationwide population statistics.

In most cases, computer programs are readily available to perform these calculations. Several statistical programming packages allow weighted analyses.[2] For example, nearly all SAS 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, SUDAAN, and STATA to calculate NIS variances are presented in the special report, *Calculating Nationwide Inpatient Sample Variances*. This report is available on the HCUP-US Website at http://www.hcup-us.ahrq.gov/db/nation/nis/nisrelatedreports.jsp. For an excellent review of programs to calculate statistics from survey data, visit the following Website: http://www.hcp.med.harvard.edu/statistics/survey-soft/.

The NIS database includes a Hospital Weights 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.

Finally, it should be noted that a large array of hospital-level data elements are available for the entire universe of hospitals, including those outside the sampling frame. For instance, the data elements from the AHA surveys and from the Medicare Cost Reports are available for nearly all hospitals in the U.S., although hospital identifiers are suppressed in the NIS for a number of States. For these States it will not be possible to link to outside hospital-level data sources. To the extent that hospital-level outcomes correlate with these data elements, they may be used to sharpen regional and nationwide estimates.

As a simple example, the number of Cesarean sections performed in each hospital would be correlated with their total number of deliveries. The figure for Cesarean sections must be obtained from discharge data, but the number of deliveries is available from AHA data. Thus, if a regression model can be fit predicting this procedure from deliveries based on the NIS data, that regression model can then be used to obtain hospital-specific estimates of the number of Cesarean sections for all hospitals in the AHA universe.

Longitudinal Analyses

Hospitals that continue in the NIS for multiple consecutive years are a subset of the hospitals in the NIS for any one of those years. Consequently, longitudinal analyses of hospital-level outcomes may be biased, if they are based on any subset of NIS hospitals limited to continuous NIS membership. In particular, such subsets would tend to contain fewer hospitals that opened, closed, split, merged, or changed strata. Further, the sample weights were developed as annual, cross-sectional weights, rather than longitudinal weights. Therefore, different weights might be required, depending on the statistical methods employed by the analyst.

One approach to consider in hospital-level longitudinal analyses is to use repeated-measure models that allow hospitals to have missing values for some years. However, the data are not actually missing for some hospitals, such as those that closed during the study period. In any case, the analyses may be more efficient (e.g., produce more precise estimates) if they account for the potential correlation between repeated measures on the same hospital over time, yet incorporate data from all hospitals in the sample during the study period.

Discharge Subsamples

Prior to the 2005 NIS, two non-overlapping 10% subsamples of NIS discharges were provided each year for analytic purposes. Beginning with the 2005 NIS, 10% subsamples are no longer provided. However, users may still draw their own subsamples, if desired.
One use of 10% subsamples would be to validate models and obtain unbiased estimates of standard errors. That is, one subsample may be used to estimate statistical models, while the other subsample may be used to test the fit of those models on new data. This is a very important analytical step, particularly in exploratory studies, where one runs the risk of fitting noise in the data.

It is well known that the percentage of variance explained by a regression, R^2, is generally overestimated by the data used to fit a model. The regression model could be estimated from the first subsample and then applied to the second subsample. The squared correlation between the actual and predicted value in the second subsample is an unbiased estimate of the model's true explanatory power when applied to new data.

SAMPLING OF HOSPITALS

Sampling of Hospitals Included in the NIS

The NIS Hospital Universe

The hospital universe is defined as all hospitals located in the U.S. that are open during any part of the calendar year and designated as community hospitals in the AHA Annual Survey Database (Health Forum, LLC © 2010). The AHA defines community hospitals as follows: "All non-Federal, short-term, general, and other specialty hospitals, excluding hospital units of institutions." Starting in 2005, the AHA included long term acute care facilities in the definition of community hospitals. These facilities provide acute care services to patients who need long term hospitalization (stays of more than 25 days). Consequently, Veterans Hospitals and other Federal facilities (Department of Defense and Indian Health Service) are excluded. Beginning with the 1998 NIS, we excluded short-term rehabilitation hospitals from the universe because the type of care provided and the characteristics of the discharges from these facilities were markedly different from other short-term hospitals. Figure 1 in Appendix I displays the number of universe hospitals for each year based on the AHA Annual Survey Database (Health Forum, LLC © 2010).

For more information on how hospitals in the data set were mapped to hospitals as defined by the AHA, refer to the special report, *HCUP Hospital Identifiers*. For a list of all data sources, refer to Table 1 in Appendix I. Detailed information on the design of the NIS prior to 2006 is available in the year-specific special reports on *Design of the Nationwide Inpatient Sample*

found on the HCUP-US Website. Starting with the 2006 NIS, the design information was incorporated into this report.

Hospital Merges, Splits, and Closures

All U.S. hospital entities designated as community hospitals in the AHA hospital file, except short-term rehabilitation hospitals, were included in the hospital universe. Therefore, when two or more community hospitals merged to create a new community hospital, the original hospitals and the newly-formed hospital were all considered separate hospital entities in the universe during the year they merged. Similarly, if a community hospital split, the original hospital and all newly-created community hospitals were treated as separate entities in the universe during the year this occurred. Finally, community hospitals that closed during a given year were included in the hospital universe, as long as they were in operation during some part of the calendar year.

Stratification Data Elements

Given the increase in the number of contributing States, the NIS team evaluated and revised the sampling and weighting strategy for 1998 and subsequent data years, in order to best represent the U.S. This included changes to the definitions of the strata data elements, the exclusion of rehabilitation hospitals from the NIS hospital universe, and a change to the calculation of hospital universe discharges for the weights. A full description of this process can be found in the special report on Changes in NIS Sampling and Weighting Strategy for 1998. This report is available on the HCUP-US Website at http://www.hcup-us.ahrq.gov/db/nation/nis/nisrelatedreports.jsp. (A description of the sampling procedures and definitions of strata data elements used from 1988 through 1997 can be found in the special report: *Design of the HCUP Nationwide Inpatient Sample, 1997*. This report is also available on the HCUP-US Website.)

The NIS sampling strata were defined based on five hospital characteristics contained in the AHA hospital files. Beginning with the 1998 NIS, the stratification data elements were defined as follows:

1. *Geographic Region – Northeast, Midwest, West, and South*. 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. Figure 2 highlights the NIS States by region, and Table 6 lists the States that comprise each region. Both can be found in 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. When there were enough hospitals of each type to allow it, we stratified hospitals as public, voluntary, and proprietary. We used this stratification for Southern rural, Southern urban non-teaching, and Western urban non-teaching hospitals. For smaller strata – the Midwestern rural and Western rural hospitals – we used a collapsed stratification of public versus private, with the voluntary and proprietary hospitals combined to form a single “private” category. For all other combinations of region, location, and teaching status, no stratification based on control was advisable, given the number of hospitals in these cells.

3. *Location – urban or rural.* Government payment policies often differ according to this designation. Also, rural hospitals are generally smaller and offer fewer services than urban hospitals. Beginning with the 2004 NIS, we changed the classification of urban or rural hospital location for the sampling strata to use the newer Core Based Statistical Area (CBSA) codes, rather than the older Metropolitan Statistical Area (MSA) codes. The CBSA groups are based on 2000 Census data, whereas the MSA groups were based on 1990 Census data. Also, the criteria for classifying the counties differ. For more information on the difference between CBSAs and MSAs, refer to the U.S. Census Bureau Website (http://www.census.gov/population/www/metroareas/metroarea.html).

   Previously, we classified hospitals in a MSA as urban hospitals, while we classified hospitals outside a MSA as rural hospitals. Beginning with the 2004 NIS, we categorized hospitals with a CBSA type of *Metropolitan* or *Division* as urban, while we designated hospitals with a CBSA type of *Micropolitan* or *Rural* as rural. This change contributed to a slight decline in the number of hospitals that were classified as rural and a corresponding increase in the number of hospitals categorized as urban. For the 2003 NIS, 44.9% of hospitals in the AHA universe were classified as rural hospitals; for 2004, only 41.3% of AHA universe hospitals were classified 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. Prior to the 1998 NIS, we considered a hospital to be a teaching hospital if it had any residents or interns and met one of the following two criteria:

   - Residency training approval by the Accreditation Council for Graduate Medical Education (ACGME)
   - Membership in the Council of Teaching Hospitals (COTH).

   Beginning with the 1998 NIS, we considered a hospital to be a teaching hospital if it met any one of the following three criteria:

   - 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.[3]

5. *Bed Size – small, medium, and large.* Bed size categories were based on the number of hospital beds and were specific to the hospital's region, location, and teaching status, as shown in Table 7 in Appendix I. We chose the bed size cutoff points so that approximately one-third of the hospitals in a given region, location, and teaching status combination would fall within each bed size category (small, medium, or large). We used different cutoff points 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.

   We did not split rural hospitals according to teaching status, because rural teaching hospitals were rare. For example, in 2009, rural teaching hospitals comprised less than 2% of the total hospital universe. We defined the bed size categories 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 was 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, implicit stratification data elements included State and three-digit ZIP Code (the first three digits of the hospital's five-digit ZIP Code). The hospitals were sorted according to these data elements prior to systematic random sampling. Detailed information on the design of the NIS prior to 2006 is available in the year-specific special reports on *Design of the Nationwide Inpatient Sample* found on the HCUP-US Website. Starting with the 2006 NIS, the design information was incorporated into this report.

Hospital Sampling Frame

The *universe* of hospitals was established as all community hospitals located in the U.S. with the exception, beginning in 1998, of short-term rehabilitation hospitals. However, some hospitals do not supply data to HCUP. Therefore, we constructed the NIS *sampling frame* from the subset of universe hospitals that released their discharge data to AHRQ for research use. The number of State Partners contributing data to the NIS has expanded over the years, as shown in Table 2 of Appendix I. As a result, the number of hospitals included in the NIS sampling frame has also increased over the years, as depicted in Figure 3, also in Appendix I.

The list of the entire frame of hospitals was composed of all AHA community hospitals in each of the frame States *that could be matched to the discharge data provided to HCUP*. If an AHA community hospital could not be matched to the discharge data provided by the data source, it was eliminated from the sampling frame (but not from the target universe).

Figure 4 in Appendix I illustrates the number of hospitals in the universe, frame, and sample and the percentage of universe hospitals in the frame for each State in the sampling frame for 2009. In most cases, the difference between the universe and the frame represents the difference in the number of community, non-rehabilitation hospitals in the 2009 AHA Annual Survey Database (Health Forum, LLC © 2010) and the hospitals for which data were supplied to HCUP

that could be matched to the AHA data.

The largest discrepancy between HCUP data and AHA data is in Texas. As is evident in Figure 4 (Appendix I). Certain Texas State-licensed hospitals are exempt from statutory reporting requirements. Exempt hospitals include:

- Hospitals that do not seek insurance payment or government reimbursement
- Rural providers.

The Texas statute that exempts rural providers from the requirement to submit data defines a hospital as a rural provider if it:

(I) Is located in a county that:

(A) Has a population estimated by the United States Bureau of the Census to be not more than 35,000 as of July 1 of the most recent year for which county population estimates have been published; or

(B) Has a population of more than 35,000, but does not have more than 100 licensed hospital beds and is not located in an area that is delineated as an urbanized area by the United States Bureau of the Census; and

(II) Is not a State-owned hospital or a hospital that is managed or directly or indirectly owned by an individual, association, partnership, corporation, or other legal entity that owns or manages one or more other hospitals.

These exemptions apply primarily to smaller rural public hospitals and, as a result, these facilities are less likely to be included in the sampling frame than other Texas hospitals. While the number of hospitals omitted appears sizable, those available for the NIS include over 96% of inpatient discharges from Texas universe hospitals because excluded hospitals tend to have relatively few discharges.

Similar to Texas, because smaller Louisiana hospitals are not required to submit data to the Louisiana Department of Health and Hospitals, a significant portion of Louisiana hospitals are omitted from the sampling frame. However, because excluded hospitals tend to have relatively few discharges, those available for the NIS include over 91% of inpatient discharges from Louisiana universe hospitals.

Refer to Table 8 of Appendix I for a full list of the number of hospitals, and discharges included in the 2009 AHA universe, frame, and NIS by State. Fewer hospitals may be in a State's frame than in the universe because data is not always received from every hospital and hospitals are sometimes excluded because of State requirements.

Hospital Sample Design

Design Considerations

The NIS is a stratified probability sample of hospitals in the frame, with sampling probabilities calculated to select 20% of the universe of U.S. community, non-rehabilitation hospitals contained in each stratum. This sample size was determined by AHRQ based on their experience with similar research databases. The overall design objective was to select a sample of hospitals that accurately represents the target universe, which includes hospitals outside the

frame (i.e., having zero probability of selection). Moreover, this sample was to be geographically dispersed, yet drawn only from data supplied by HCUP Partners.

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, if available, because not all States contribute data to the NIS. Table 2 in Appendix I lists the number of NIS States, hospitals, and discharges by year. For example, the National Hospital Discharge Survey (http://www.cdc.gov/nchs/nhds.htm) can provide benchmarks against which to check your national estimates for hospitalizations with more than 5,000 cases.

The *NIS Comparison Report* assesses the accuracy of NIS estimates by providing a comparison of the NIS with other data sources. The most recent report is available on the HCUP-US Website (http://www.hcup-us.ahrq.gov/db/nation/nis/nisrelatedreports.jsp).

The NIS team considered alternative stratified sampling allocation schemes. However, allocation proportional to the number of hospitals was preferred for several reasons:

- AHRQ researchers wanted a simple, easily understood sampling methodology. The concept that the NIS sample could represent a "miniaturization" of the hospital universe was appealing. There were, however, obvious geographic limitations imposed by data availability.

- AHRQ statisticians considered other optimal allocation schemes, including sampling hospitals with probabilities proportional to size (number of discharges). They ultimately concluded that sampling with probability proportional to the number of hospitals was preferable. While this approach was admittedly less efficient, the extremely large sample sizes yield reliable estimates. Furthermore, because the data are to be used for purposes other than producing nationwide estimates, (e.g., regression modeling), it is critical that all hospital types, including small hospitals, are adequately represented.

Overview of the Sampling Procedure

To further ensure accurate geographic representation, we implicitly stratified the hospitals by State and three-digit ZIP Code (the first three digits of the hospital's five-digit ZIP Code). This was accomplished by sorting by three-digit ZIP Code within each stratum prior to drawing a systematic random sample of hospitals.

After stratifying the universe of hospitals, we sorted hospitals by stratum, the three-digit ZIP Code within each stratum, and by a random number within each three-digit ZIP Code. These sorts ensured further geographic generalizability of hospitals within the frame States, as well as random ordering of hospitals within three-digit ZIP Codes. Generally, three-digit ZIP Codes that are proximal in value are geographically near one another within a State. Furthermore, the U.S. Postal Service locates regional mail distribution centers at the three-digit level. Thus, the boundaries tend to be a compromise between geographic size and population size.

We then drew a systematic random sample of up to 20% of the total number of U.S. hospitals within each stratum. If too few frame hospitals appeared in a cell, we selected all frame hospitals for the NIS, subject to sampling restrictions specified by States. To simplify variance

calculations, we drew at least two hospitals from each stratum. If fewer than two frame hospitals were available in a stratum, we merged it with an "adjacent" cell containing hospitals with similar characteristics.

Subsamples

Prior to the 2005 NIS, we drew two non-overlapping 10% subsamples of discharges from the NIS file for each year. The subsamples were selected by drawing every tenth discharge, starting with two different starting points (randomly selected between 1 and 10). Having a different starting point for each of the two subsamples guaranteed that they would not overlap. Discharges were sampled so that 10% of each hospital's discharges in each quarter were selected for each of the subsamples. The two samples could be combined to form a single, generalizable 20% subsample of discharges. Beginning with the 2005 NIS, 10% subsamples are no longer provided. However, users may still draw their own subsamples, if desired.

Change to Hospital Sampling Procedure Beginning with the 1998 NIS

Beginning with the 1998 NIS sampling procedures, all frame hospitals within a stratum have an equal probability of selection for the sample, regardless of whether they appeared in prior NIS samples. This deviates from the procedure used for earlier samples, which maximized the longitudinal component of the NIS series.

Further description of the sampling procedures for earlier releases of the NIS can be found in the special report: *Design of the HCUP Nationwide Inpatient Sample, 1997*. This report is available on the HCUP-US Website at http://www.hcup-us.ahrq.gov/db/nation/nis/nisrelatedreports.jsp. For a description of the development of the new sample design for 1998 and subsequent data years, see the special report: *Changes in NIS Sampling and Weighting Strategy for 1998.* This report is available on the HCUP-US Website.

Zero-Weight Hospitals

Beginning with the 1993 NIS, the NIS samples no longer contain zero-weight hospitals. For a description of zero-weight hospitals in the 1988-1992 samples, refer to the special report: *Design of the HCUP Nationwide Inpatient Sample, Release 1*. This report is available on the HCUP-US Website at http://www.hcup-us.ahrq.gov/db/nation/nis/nisrelatedreports.jsp.

Final Hospital Sample

In Appendix I, we present three figures describing the final hospital sample. Figure 5 depicts the numbers of hospitals sampled each year, while Figure 6 presents the numbers of discharges in each year of the NIS. The number of discharges in the sample may vary slightly depending on the hospitals selected for the NIS in any given year. For the 1988-1992 NIS, zero-weight hospitals were maintained to provide a longitudinal sample. Therefore, two figures exist for each of these years: one number for the regular NIS sample and another number for the total sample.

Figure 7 displays the weighted number of discharges sampled each year. Note that this number decreased from 35,408,207 in 1997 to 34,874,001 in 1998, a difference of 534,206 (1.5%). This slight decline is associated with two changes to the 1998 NIS design: the exclusion of community, rehabilitation hospitals from the hospital universe, and a change to the calculation of hospital universe discharges for the weights. Prior to 1998, we calculated discharges as the

sum of total facility admissions (AHA data element ADMTOT), which includes long-term care admissions, plus births (AHA data element BIRTHS) reported for each U.S. community hospital in the AHA Annual Survey Database (Health Forum, LLC © 2010).

Beginning in 1998, we calculate discharges as the sum of hospital admissions (AHA data element ADMH) plus births for each U.S. community, non-rehabilitation hospital. This number is more consistent with the number of discharges we receive from the State data sources. We also substitute total facility admissions, if the number of hospital admissions is missing. Without these changes, the weighted number of discharges for 1998 would have been 35,622,743. The exclusion of community, rehabilitation hospitals reduced the number of universe hospitals by 177 and the number of weighted discharges by 214,490. The change in the calculation of discharges reduced the weighted number of discharges by 534,252.

The small decline in both the number of discharges in the sample and the weighted number of discharges for 2009 is not related to any change in the sampling or weighting strategy. The reduction in the number of discharges is consistent with the information from the AHA Annual Survey of Hospitals.

Figure 8 presents a summary of the 2009 NIS hospital sample by geographic region and the number of:

- Universe hospitals (Universe)
- Frame hospitals (Frame)
- Sampled hospitals (Sample)
- Target hospitals (Target = 20% of the universe)
- Surplus hospitals (Surplus = Sample – Target).

Figure 9 summarizes the estimated U.S. population by geographic region. For each region, the figure reveals:

- The estimated U.S. population
- The estimated population of States in the 2009 NIS
- The percentage of estimated U.S. population included in NIS States.

Figure 10 depicts the number of discharges in the 2009 sample for each State.

Special consideration was needed to handle the Massachusetts data in the 2006 and the 2007 NIS. Fourth quarter data from sampled hospitals in Massachusetts were unavailable for inclusion in the 2006 and the 2007 NIS. To account for the missing quarter of data, we sampled one fourth of the Massachusetts NIS discharges from the first three quarters and modified the records to represent the fourth quarter. To ensure a representative sample, we sorted the Massachusetts NIS discharges by hospital, discharge quarter, Clinical Classifications Software (CCS) diagnosis group for the principal diagnosis, gender, age, and a random number before selecting every fourth record. The following describes the adjustments made to the selected Massachusetts NIS records:

1. We relabeled the discharge quarter (DQTR) to four and saved the original discharge quarter in a new data element (DQTR_X).

2. We adjusted the admission month (AMONTH) by the number of months corresponding to the change in the discharge quarter.
3. We adjusted the total charges (TOTCHG and TOTCHG_X) using quarter-specific adjustment factors calculated as the mean total charges in the fourth quarter for all Northeastern NIS States (excluding Massachusetts) divided by the mean total charges in the first, second, or third quarter for all Northeastern NIS States (excluding Massachusetts).

We then adjusted the discharge weights for the Massachusetts records to appropriately account for the shifting of quarter one through three discharges to quarter four.

SAMPLE WEIGHTS

To obtain nationwide estimates, we developed discharge weights using the AHA universe as the standard. These were developed separately for hospital- and discharge-level analyses. Hospital-level weights were developed to extrapolate NIS sample hospitals to the hospital universe. Similarly, discharge-level weights were developed to extrapolate NIS sample discharges to the discharge universe.

Hospital Weights

Hospital weights to the universe were calculated by post-stratification. For each year, hospitals were stratified on the same data elements that were used for sampling: geographic region, urban/rural location, teaching status, bed size, and control. The strata that were collapsed for sampling were also collapsed for sample weight calculations. Within each stratum *s*, each NIS sample hospital's universe weight was calculated as:

$W_s(\text{universe}) = N_s(\text{universe}) \div N_s(\text{sample})$

where W_s(universe) was the hospital universe weight, and N_s(universe) and N_s(sample) were the number of community hospitals within stratum *s* in the universe and sample, respectively. Thus, each hospital's universe weight (HOSPWT) is equal to the number of universe hospitals it represents during that year. Because 20% of the hospitals in each stratum were sampled when possible, the hospital weights are usually near five.

Discharge Weights

The calculations for discharge-level sampling weights were similar to the calculations for hospital-level sampling weights. The discharge weights are usually constant for all discharges within a stratum. The only exceptions are for strata with sample hospitals that, according to the AHA files, were open for the entire year but contributed less than a full year of data to the NIS. For those hospitals, we *adjusted* the number of observed discharges by a factor of 4 ÷ Q, where Q was the number of calendar quarters for which the hospital contributed discharges to the NIS. For example, when a sample hospital contributed only two quarters of discharge data to the NIS, the *adjusted* number of discharges was double the observed number. This adjustment was performed only for weighting purposes. The NIS data set includes only the actual (unadjusted) number of observed discharges.

With that minor adjustment, each discharge weight is essentially equal to the number of AHA universe discharges that each sampled discharge represents in its stratum. This calculation was possible because the number of total discharges was available for every hospital in the universe from the AHA files. Each universe hospital's AHA discharge total was calculated as the sum of newborns and hospital discharges.

Discharge weights to the universe were calculated by post-stratification. Hospitals were stratified just as they were for universe hospital weight calculations. Within stratum *s*, for hospital *i*, each NIS sample discharge's universe weight was calculated as:

$DW_{is}(\text{universe}) = [DN_s(\text{universe}) \div ADN_s(\text{sample})] * (4 \div Q_i)$

where DW_{is}(universe) was the discharge weight; DN_s(universe) represented the number of discharges from community hospitals in the universe within stratum *s*; ADN_s(sample) was the

number of *adjusted* discharges from sample hospitals selected for the NIS; and Q_i represented the number of quarters of discharge data contributed by hospital *i* to the NIS (usually $Q_i = 4$). Thus, each discharge's weight (DISCWT) is equal to the number of universe discharges it represents in stratum *s* during that year. Because all discharges from 20% of the hospitals in each stratum were sampled when possible, the discharge weights are usually near five.

Appendix I: Tables and Figures

Table 1: 2009 Data Sources

State	Data Organization
AR	Arkansas Department of Health
AZ	Arizona Department of Health Services
CA	Office of Statewide Health Planning & Development
CO	Colorado Hospital Association
CT	Connecticut Hospital Association
FL	Florida Agency for Health Care Administration
GA	Georgia Hospital Association
HI	Hawaii Health Information Corporation
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 and Hospitals
MA	Division of Health Care Finance and Policy
MD	Health Services Cost Review Commission
ME	Maine Health Data Organization
MI	Michigan Health & Hospital Association
MN	Minnesota Hospital Association
MO	Hospital Industry Data Institute
MT	MHA - An Association of Montana Health Care Providers
NC	North Carolina Department of Health and Human Services
NE	Nebraska Hospital Association

State	Data Organization
NH	New Hampshire Department of Health & Human Services
NJ	New Jersey Department of Health & Senior Services
NM	New Mexico Health Policy Commission
NV	Nevada Department of Health and Human Services
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 State Budget & Control Board
SD	South Dakota Association of Healthcare Organizations
TN	Tennessee Hospital Association
TX	Texas Department of State Health Services
UT	Utah Department of Health
VT	Vermont Association of Hospitals and Health Systems
VA	Virginia Health Information
WA	Washington State Department of Health
WI	Wisconsin Department of Health Services
WV	West Virginia Health Care Authority
WY	Wyoming Hospital Association

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Table 2: Number of NIS States, Hospitals, and Discharges, by Year

Calendar Year	States in the Frame	Number of States	Sample Hospitals	Sample Discharges
1988	California, Colorado, Florida, Iowa, Illinois, Massachusetts, New Jersey, and Washington	8	758	5,265,756
1989	Added Arizona, Pennsylvania, and Wisconsin	11	875	6,110,064
1990	No new additions	11	861	6,268,515
1991	No new additions	11	847	6,156,188
1992	No new additions	11	838	6,195,744
1993	Added Connecticut, Kansas, Maryland, New York, Oregon, and South Carolina	17	913	6,538,976
1994	No new additions	17	904	6,385,011
1995	Added Missouri and Tennessee	19	938	6,714,935
1996	No new additions	19	906	6,542,069
1997	Added Georgia, Hawaii, and Utah	22	1012	7,148,420
1998	No new additions	22	984	6,827,350
1999	Added Maine and Virginia	24	984	7,198,929
2000	Added Kentucky, North Carolina, Texas, and West Virginia	28	994	7,450,992
2001	Added Michigan, Minnesota, Nebraska, Rhode Island, and Vermont	33	986	7,452,727
2002	Added Nevada, Ohio, and South Dakota; Dropped Arizona	35	995	7,853,982
2003	Added Arizona, Indiana, and New Hampshire; Dropped Maine	37	994	7,977,728
2004	Added Arkansas; Dropped Pennsylvania	37	1,004	8,004,571
2005	Added Oklahoma; Dropped Virginia	37	1,054	7,995,048
2006	Added Virginia	38	1,045	8,074,825
2007	Added Maine and Wyoming	40	1,044	8,043,415
2008	Added Louisiana and Pennsylvania	42	1,056	8,158,381
2009	Added Montana and New Mexico	44	1,050	7,810,762

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Table 3. Summary of NIS Releases

Data from	Media/Format Options	Structure of Releases
1988-1992 • 8 States in 1988 • 11 States in 1989-1992	On CD-ROM, In ASCII format	5 years of data in a 6-CD set, compressed files Two 10% subsamples of discharges for each year
1993 • 17 states 1994 • 17 states 1995 • 19 states 1996 • 19 states 1997 • 22 states 1998 • 22 states 1999 • 24 states 2000 • 28 states 2001 • 33 states	On CD-ROM, In ASCII format	1 year of data in a 2-CD set, compressed files Two 10% subsamples of discharges for each year
2002 • 35 states 2003 • 37 states 2004 • 37 states	On CD-ROM, In ASCII format	1 year of data in a 2-CD set, compressed files Two 10% subsamples of discharges for each year A companion file with four different sets of severity measures

Data from	Media/Format Options	Structure of Releases
2005 • 37 states 2006 • 38 states 2007 • 40 states 2008 • 42 states	On CD-ROM, In ASCII format	1 year of data in a 2-CD set, compressed files A companion file with four different sets of severity measures, and also diagnosis and procedure groups
2009 • 44 states	On DVD-ROM In ASCII format	1 year of data on a DVD-ROM, compressed files A companion file with four different sets of severity measures, and also diagnosis and procedure groups

Table 4. Summary of NIS Data Sources, Hospitals, and Inpatient Stays, 1988-2009

Year	Data Sources	Number of Hospitals	Number of Discharges in the NIS, Unweighted	Number of Discharges in the NIS, Weighted for National Estimates
1988	CA CO FL IL IA MA NJ WA	759	5,265,756	35,171,448
1989	AZ CA CO FL IL IA MA NJ PA WA WI *(Added AZ, PA, WI)*	882	6,110,064	35,104,645
1990	AZ CA CO FL IL IA MA NJ PA WA WI *(No change)*	871	6,268,515	35,215,397
1991	AZ CA CO FL IL IA MA NJ PA WA WI *(No change)*	859	6,156,188	35,036,492
1992	AZ CA CO FL IL IA MA NJ PA WA WI *(No change)*	856	6,195,744	35,011,385
1993	AZ CA CO CT FL IL IA KS MD MA NJ NY OR PA SC WA WI *(Added CT, KS, MD, NY, OR, SC)*	913	6,538,976	34,714,530
1994	AZ CA CO CT FL IL IA KS MD MA NJ NY OR PA SC WA WI *(No change)*	904	6,385,011	34,622,203
1995	AZ CA CO CT FL IL IA KS MD MA MO NJ NY OR PA SC TN WA WI *(Added MO, TN)*	938	6,714,935	34,791,998
1996	AZ CA CO CT FL IL IA KS MD MA MO NJ NY OR PA SC TN WA WI *(No change)*	906	6,542,069	34,874,386
1997	AZ CA CO CT FL GA HI IL IA KS MD MA MO NJ NY OR PA SC TN UT WA WI *(Added GA, HI, UT)*	1,012	7,148,420	35,408,207
1998	AZ CA CO CT FL GA HI IL IA KS MD MA MO NJ NY OR PA SC TN UT WA WI *(No change)*	984	6,827,350	34,874,001
1999	AZ CA CO CT FL GA HI IL IA KS MD MA ME MO NJ NY OR PA SC TN UT VA WA WI *(Added ME, VA)*	984	7,198,929	35,467,673
2000	AZ CA CO CT FL GA HI IL IA KS KY MD MA ME MO NC NJ NY OR PA SC TN TX UT VA WA WI WV *(Added KY, NC, TX, WV)*	994	7,450,992	36,417,565

Year	Data Sources	Number of Hospitals	Number of Discharges in the NIS, Unweighted	Number of Discharges in the NIS, Weighted for National Estimates
2001	AZ CA CO CT FL GA HI IL IA KS KY MD MA ME MI MN MO NC NE NJ NY OR PA RI SC TN TX UT VA VT WA WI WV *(Added MI, MN, NE, RI, VT)*	986	7,452,727	37,187,641
2002	CA CO CT FL GA HI IL IA KS KY MD MA ME MI MN MO NC NE NJ NY NV OH OR PA RI SC SD TN TX UT VA VT WA WI WV *(Added NV, OH, SD; AZ data were not available)*	995	7,853,982	37,804,021
2003	AZ CA CO CT FL GA HI IL IN IA KS KY MD MA MI MN MO NC NE NH NJ NY NV OH OR PA RI SC SD TN TX UT VA VT WA WI WV *(Added AZ, IN, NH; ME data were not available)*	994	7,977,728	38,220,659
2004	AR AZ CA CO CT FL GA HI IL IN IA KS KY MD MA MI MN MO NC NE NH NJ NY NV OH OR RI SC SD TN TX UT VA VT WA WI WV *(Added AR; PA data were not available)*	1,004	8,004,571	38,661,786
2005	AR AZ CA CO CT FL GA HI IL IN IA KS KY MD MA MI MN MO NC NE NH NJ NY NV OH OK OR RI SC SD TN TX UT VT WA WI WV *(Added OK; VA data were not available)*	1,054	7,995,048	39,163,834
2006	AR AZ CA CO CT FL GA HI IL IN IA KS KY MD MA MI MN MO NC NE NH NJ NY NV OH OK OR RI SC SD TN TX UT VA VT WA WI WV *(Added VA)*	1,045	8,074,825	39,450,216
2007	AR AZ CA CO CT FL GA HI IL IN IA KS KY MD MA ME MI MN MO NC NE NH NJ NY NV OH OK OR RI SC SD TN TX UT VA VT WA WI WV WY *(Added ME and WY)*	1,044	8,043,415	39,541,948
2008	AR AZ CA CO CT FL GA HI IL IN IA KS LA KY MD MA ME MI MN MO NC NE NH NJ NY NV OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY *(Added LA and PA)*	1,056	8,158,381	39,885,120

Year	Data Sources	Number of Hospitals	Number of Discharges in the NIS, Unweighted	Number of Discharges in the NIS, Weighted for National Estimates
2009	AR AZ CA CO CT FL GA HI IL IN IA KS LA KY MD MA ME MI MN MO MT NC NE NH NJ NM NY NV OH OK OR PA RI SC SD TN TX UT VA VT WA WI WV WY *(Added NM and MT)*	1,050	7,810,762	39,434,956

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Table 5. NIS Related Reports and Database Documentation Available on HCUP-US

Restrictions on the Use of the NIS
- Data Use Agreement for the NIS

Description of the NIS Files
- Introduction to the NIS, 2009 – *this document*
- HCUP Quality Control Procedures – describes procedures used to assess data quality
- File Specifications – details data file names, number of records, record length, and record layout
- Sources of NIS Data, NIS Data Elements, and State-Specific Restrictions *(included in this document beginning in 2006)* – identifies the NIS data sources and restrictions on sampling and the release of data elements

Availability of Data Elements
- Availability of NIS data elements from 1988-2009

Description of Data Elements in the NIS
- Description of Data Elements – details uniform coding and state-specific idiosyncrasies
- Summary Statistics – lists means and frequencies on nearly all data elements
- NIS Severity Measures – provides detailed documentation on the different types of measures
- HCUP Coding Practices – describes how HCUP data elements are coded
- HCUP Hospital Identifiers – explains data elements that characterize individual hospitals

Corrections to the NIS
- Information on corrections to the NIS data sets
- Link to NIS Trends Weights Files

Load Programs

Programs to load the ASCII data files into statistical software:
- SAS
- SPSS
- Stata

HCUP Tools: Labels and Formats
- Overview of Clinical Classifications Software (CCS), a categorization scheme that groups ICD-9-CM diagnosis and procedure codes into mutually exclusive categories
- Labels file for CCS categories
- Labels file for multiple versions of Diagnosis Related Groups (DRGs) and Major Diagnostic Categories (MDCs)
- NIS SAS format library program to create value labels
- NIS ICD-9-CM formats to label ICD-9-CM diagnoses and procedures
- NIS Severity formats to label severity data elements

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 (*included in this document beginning in 2006*)
- Changes in NIS Sampling and Weighting Strategy for 1998
- Calculating Nationwide Inpatient Sample Variances
- Using the HCUP Nationwide Inpatient Sample to Estimate Trends
- NIS Comparison Reports (available for years in which the NIS sample changed)
- HCUP Data Quality Reports for 1988-2009
- HCUP E-Code Evaluation Report

HCUP Supplemental Files
- Cost-to-Charge Ratio files
- Hospital Market Structure (HMS) files
- NIS Trends Supplemental files

SAS File Information
- File Information for all states and years

Figure 1: Hospital Universe, by Year[4]

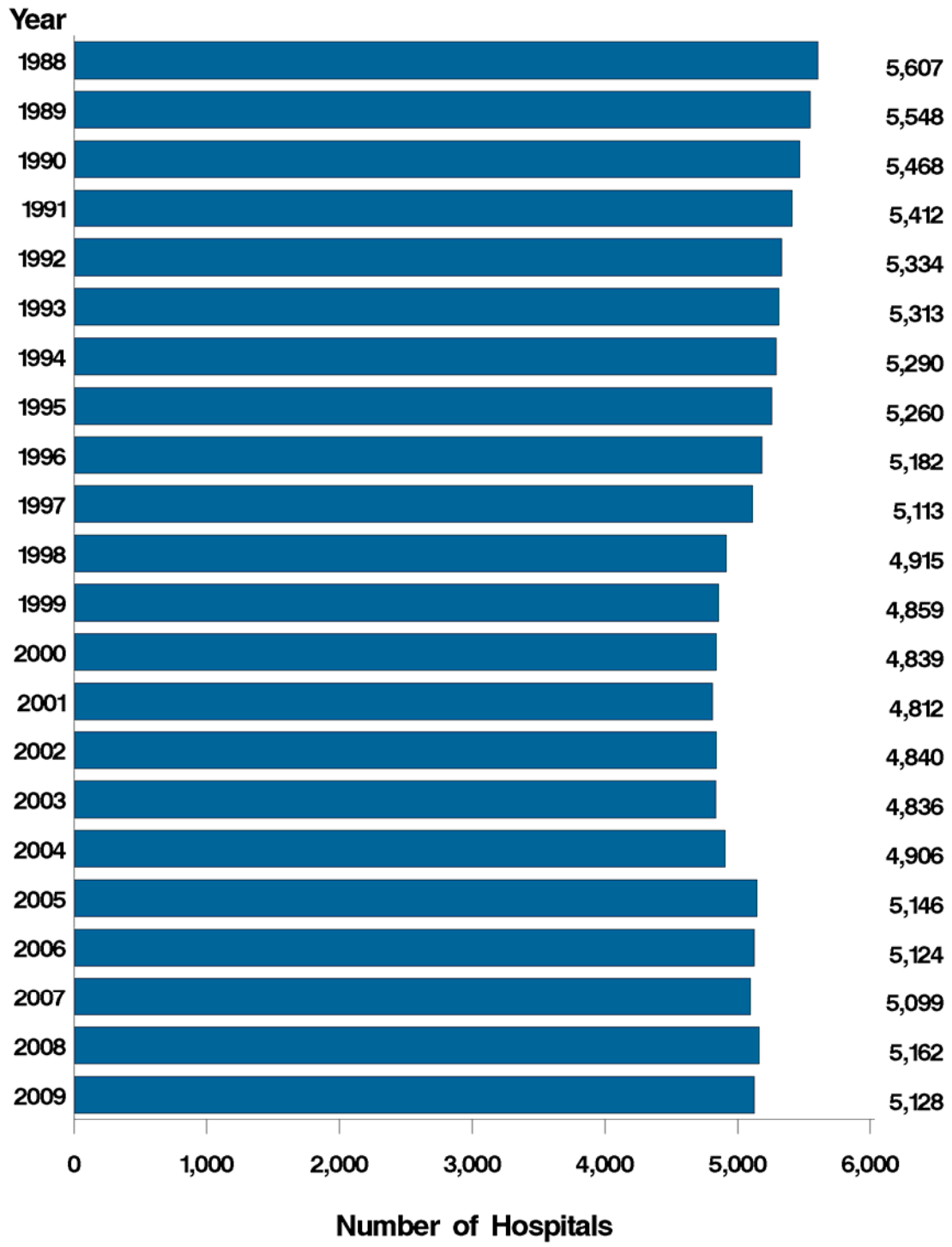

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Figure 2: NIS States, by Region

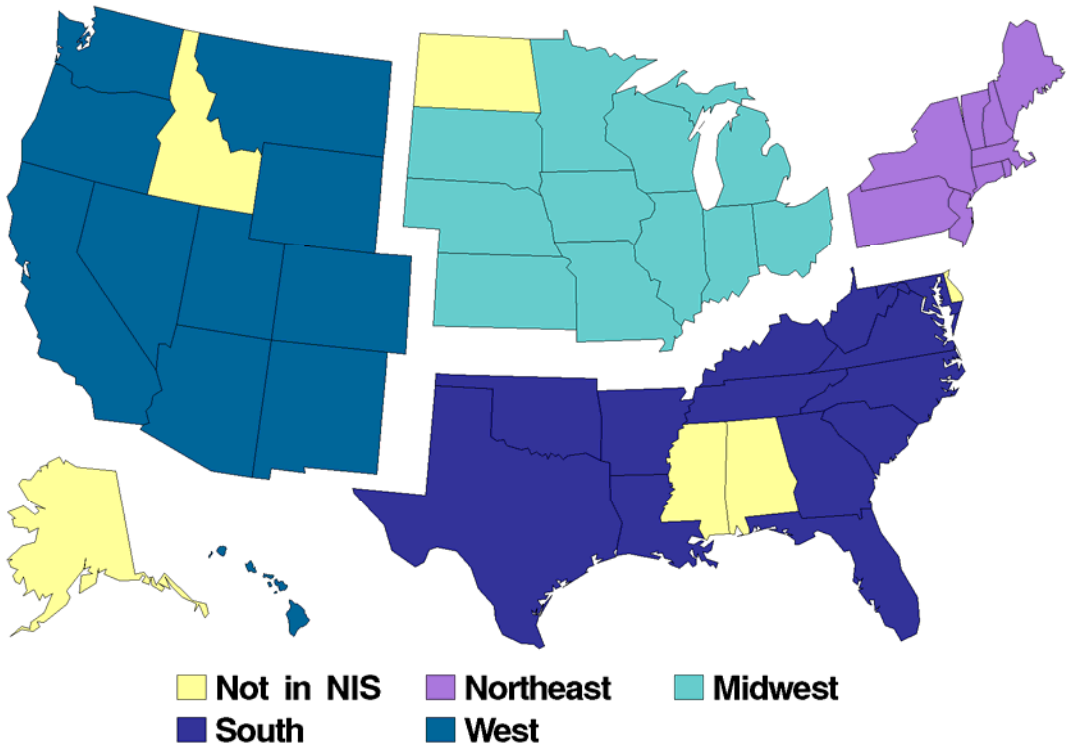

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Table 6: All States, by Region

Region	States
1: Northeast	Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont.
2: Midwest	Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin.
3: South	Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia.
4: West	Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

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Table 7: Bed Size Categories, by 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+

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Figure 3: NIS Hospital Sampling Frame, by Year

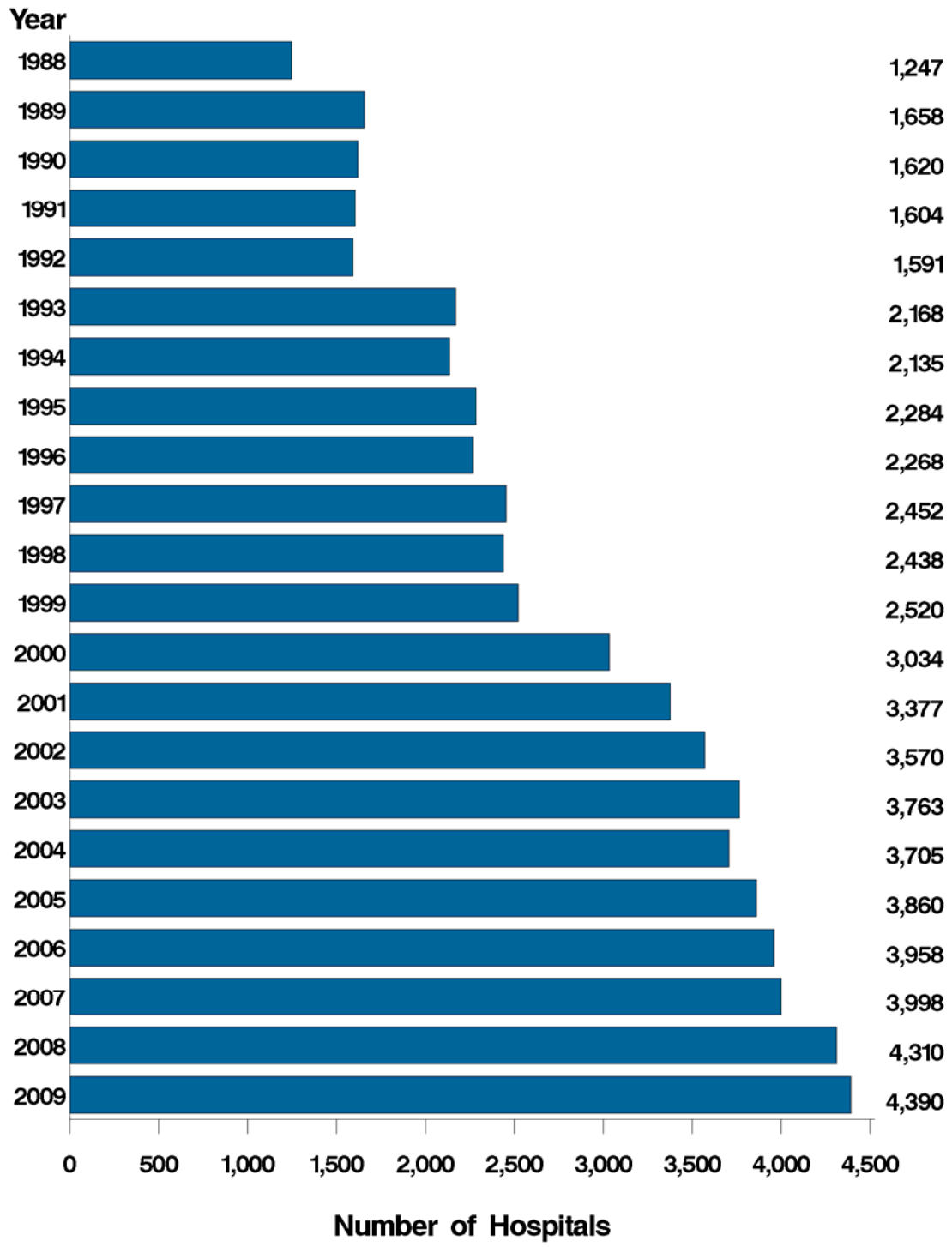

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Figure 4: Number of Hospitals in the 2009 Universe, Frame, and Sample for Frame States

Part A: Arkansas – Indiana

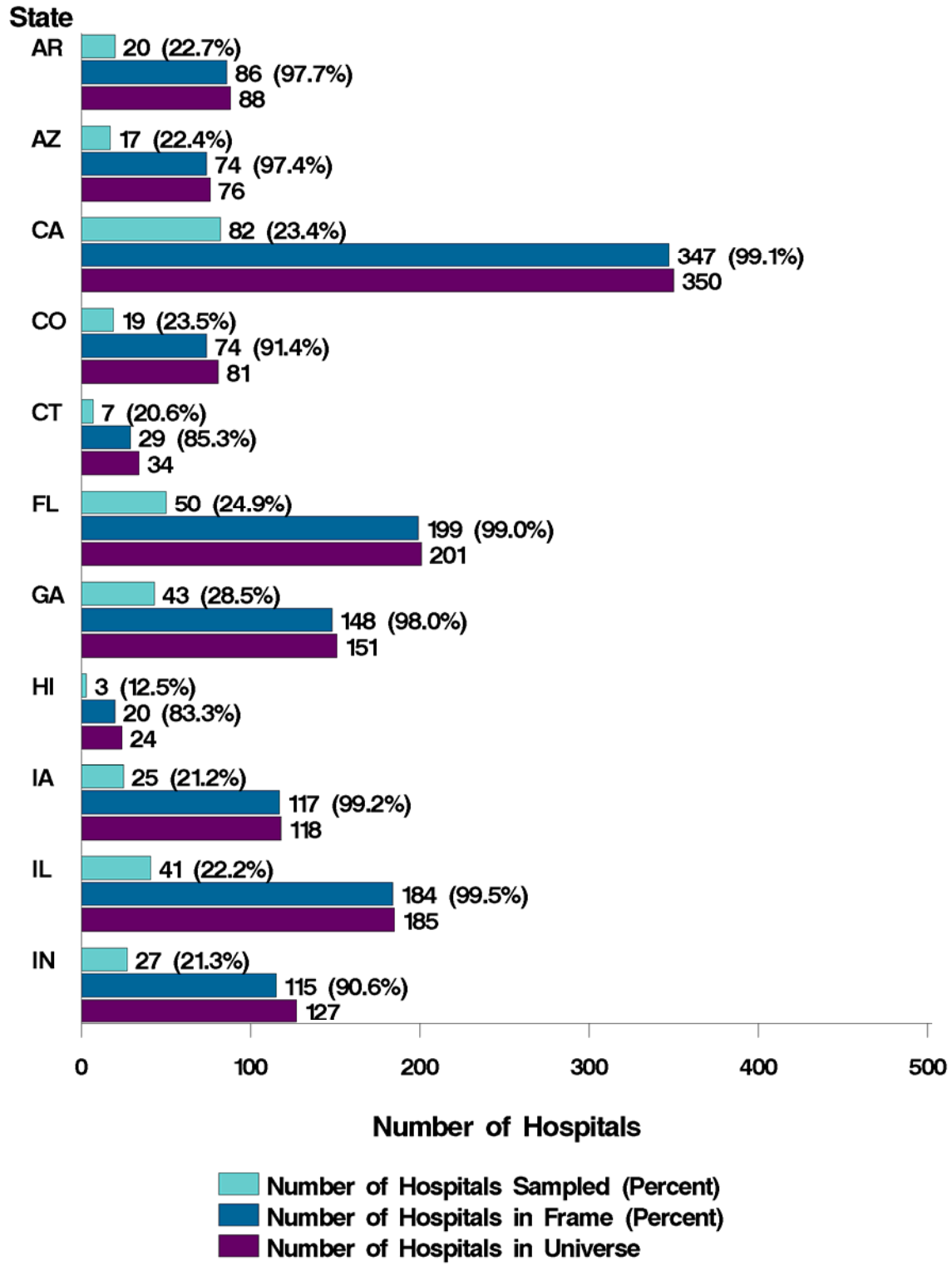

Figure 4: Number of Hospitals in the 2009 Universe, Frame, and Sample for Frame States

Part B: Kansas – North Carolina

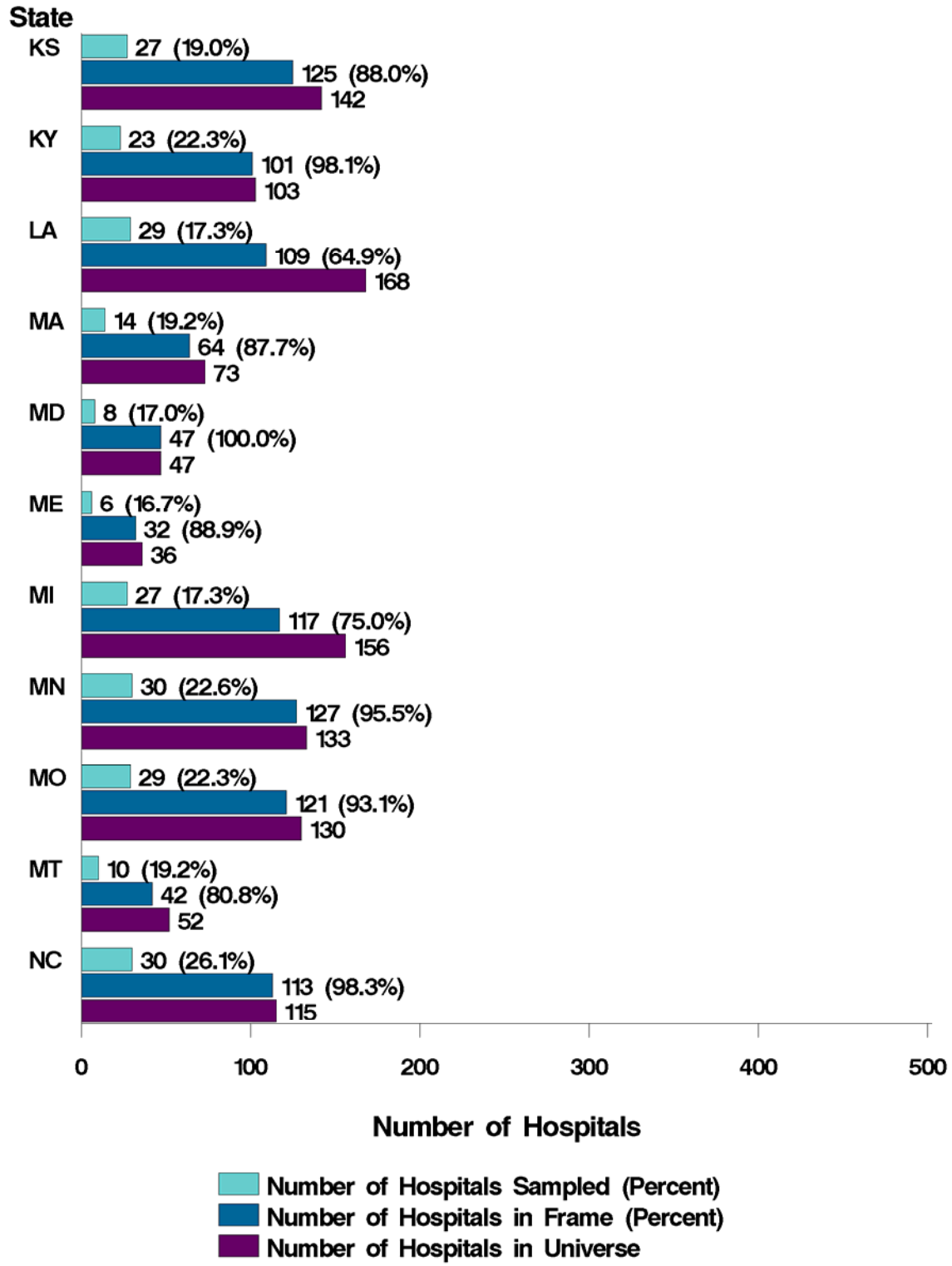

Figure 4: Number of Hospitals in the 2009 Universe, Frame, and Sample for Frame States

Part C: Nebraska – Rhode Island

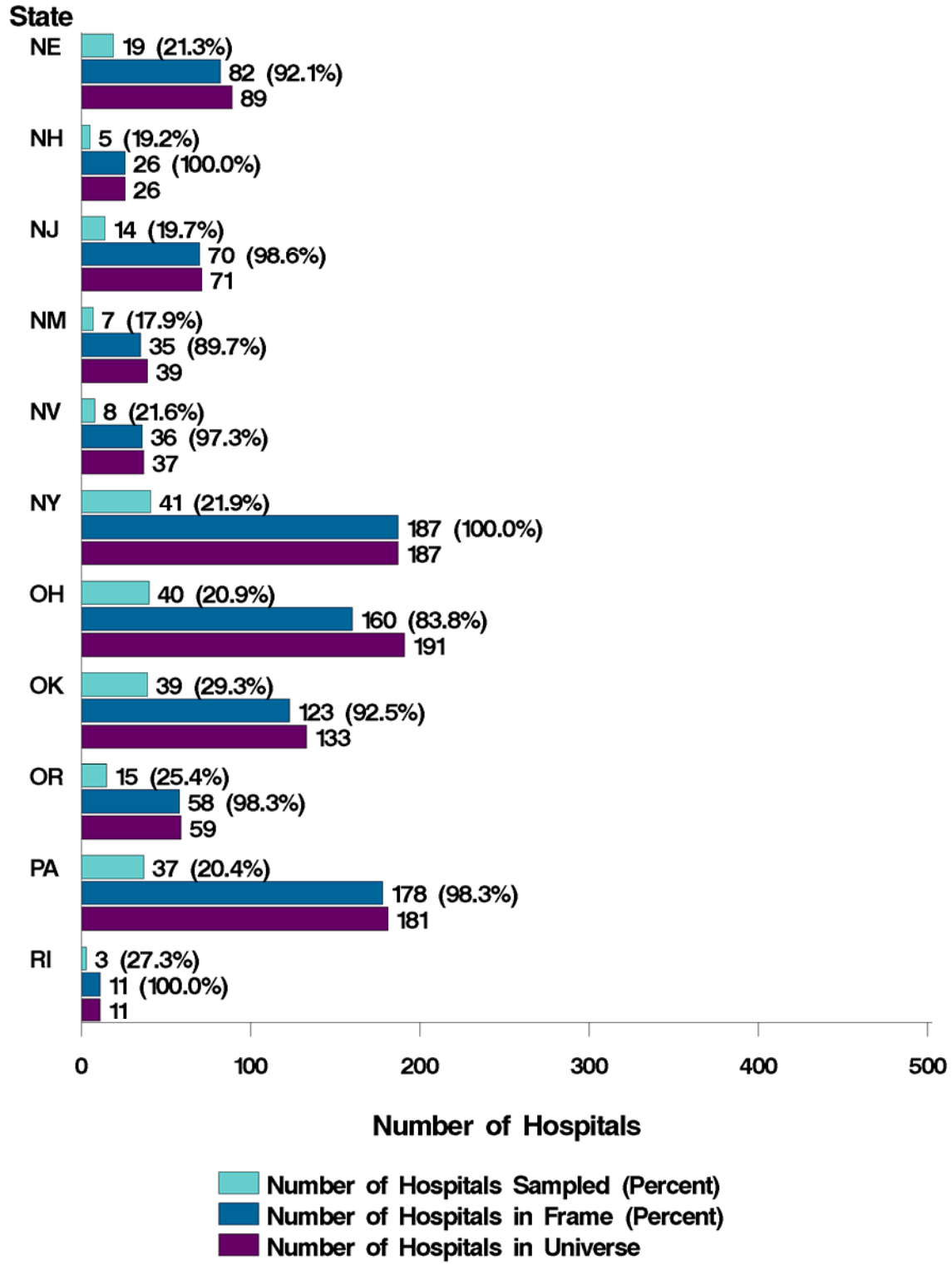

Figure 4: Number of Hospitals in the 2009 Universe, Frame, and Sample for Frame States

Part D: South Carolina – Wyoming

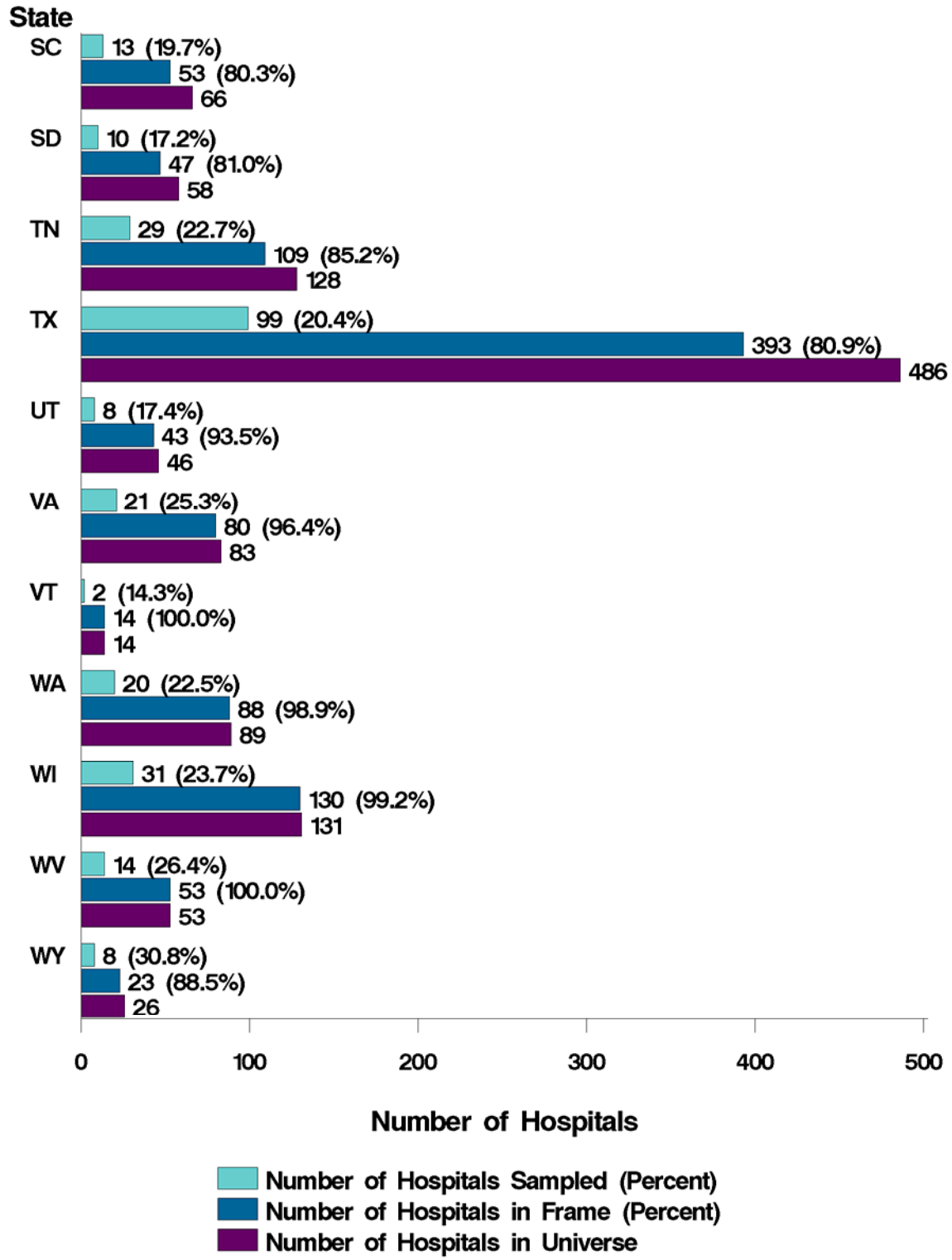

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Table 8: Number of Hospitals and Discharges in 2009 AHA Universe, Frame, and NIS, by State

Number of Hospitals and Discharges in 2009 AHA Universe, Frame, and NIS, by State

State	AHA		Frame		NIS		
	Hospitals	Discharges	Hospitals	Discharges	Hospitals	Discharges	Weighted Discharges
Non-NIS States	334	1,770,421	0	0	0	0	0
Arizona	76	807,765	74	778,259	17	140,894	685,556
Arkansas	88	418,197	86	397,989	20	82,524	428,744
California	350	3,951,394	347	3,858,856	82	901,279	4,325,433
Colorado	81	508,064	74	484,707	19	156,401	728,694
Connecticut	34	445,506	29	428,021	7	98,266	526,881
Florida	201	2,638,379	199	2,549,132	50	670,080	3,390,281
Georgia	151	1,086,555	148	1,058,371	43	269,146	1,344,582
Hawaii	24	119,206	20	94,532	3	6,712	35,134
Illinois	185	1,699,263	184	1,630,925	41	364,160	1,856,905
Indiana	127	825,609	115	786,089	27	188,850	954,454
Iowa	118	388,287	117	348,142	25	64,231	318,532
Kansas	142	364,391	125	331,520	27	64,830	319,477
Kentucky	103	636,294	101	623,309	23	146,772	747,019
Louisiana	168	737,376	109	580,777	29	107,695	546,237
Maine	36	160,419	32	78,601	6	12,472	65,883
Maryland	47	776,403	47	767,921	8	148,423	749,834
Massachusetts	73	879,945	64	844,948	14	133,087	704,454
Michigan	156	1,327,020	117	933,986	27	178,485	888,910
Minnesota	133	687,926	127	565,150	30	121,238	601,893
Missouri	130	902,346	121	881,195	29	198,586	1,007,699
Montana	52	111,473	42	102,050	10	23,754	128,417
Nebraska	89	235,584	82	164,802	19	45,187	224,389
Nevada	37	296,058	36	293,531	8	69,276	361,382
New Hampshire	26	133,136	26	127,211	5	41,564	187,847
New Jersey	71	1,175,760	70	1,110,425	14	226,033	1,203,081
New Mexico	39	211,386	35	163,082	7	20,469	93,764
New York	187	2,749,912	187	2,598,322	41	540,878	2,924,354
North Carolina	115	1,147,716	113	1,114,952	30	300,636	1,514,419
Ohio	191	1,663,083	160	1,611,394	40	425,216	2,116,207
Oklahoma	133	514,346	123	463,488	39	153,430	753,767

Number of Hospitals and Discharges in 2009 AHA Universe, Frame, and NIS, by State

State	AHA		Frame		NIS		
	Hospitals	Discharges	Hospitals	Discharges	Hospitals	Discharges	Weighted Discharges
Oregon	59	391,238	58	374,261	15	103,204	506,581
Pennsylvania	181	1,923,806	178	1,851,202	37	359,292	1,883,556
Rhode Island	11	138,576	11	136,323	3	28,303	148,482
South Carolina	66	577,150	53	460,132	13	88,263	449,046
South Dakota	58	114,916	47	76,900	10	10,238	48,682
Tennessee	128	915,433	109	812,682	29	163,242	816,271
Texas	486	3,078,618	393	2,784,103	99	592,091	2,983,644
Utah	46	279,129	43	265,093	8	30,613	137,045
Vermont	14	56,378	14	53,535	2	3,516	18,900
Virginia	83	878,520	80	845,142	21	230,905	1,143,213
Washington	89	682,327	88	646,178	20	107,166	536,700
West Virginia	53	291,280	53	283,023	14	53,488	279,243
Wisconsin	131	679,421	130	626,284	31	127,838	652,114
Wyoming	26	58,944	23	32,884	8	12,029	97,252
Total	5,128	39,434,956	4,390	35,019,429	1,050	7,810,762	39,434,956

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Figure 5: Number of Hospitals Sampled, by Year

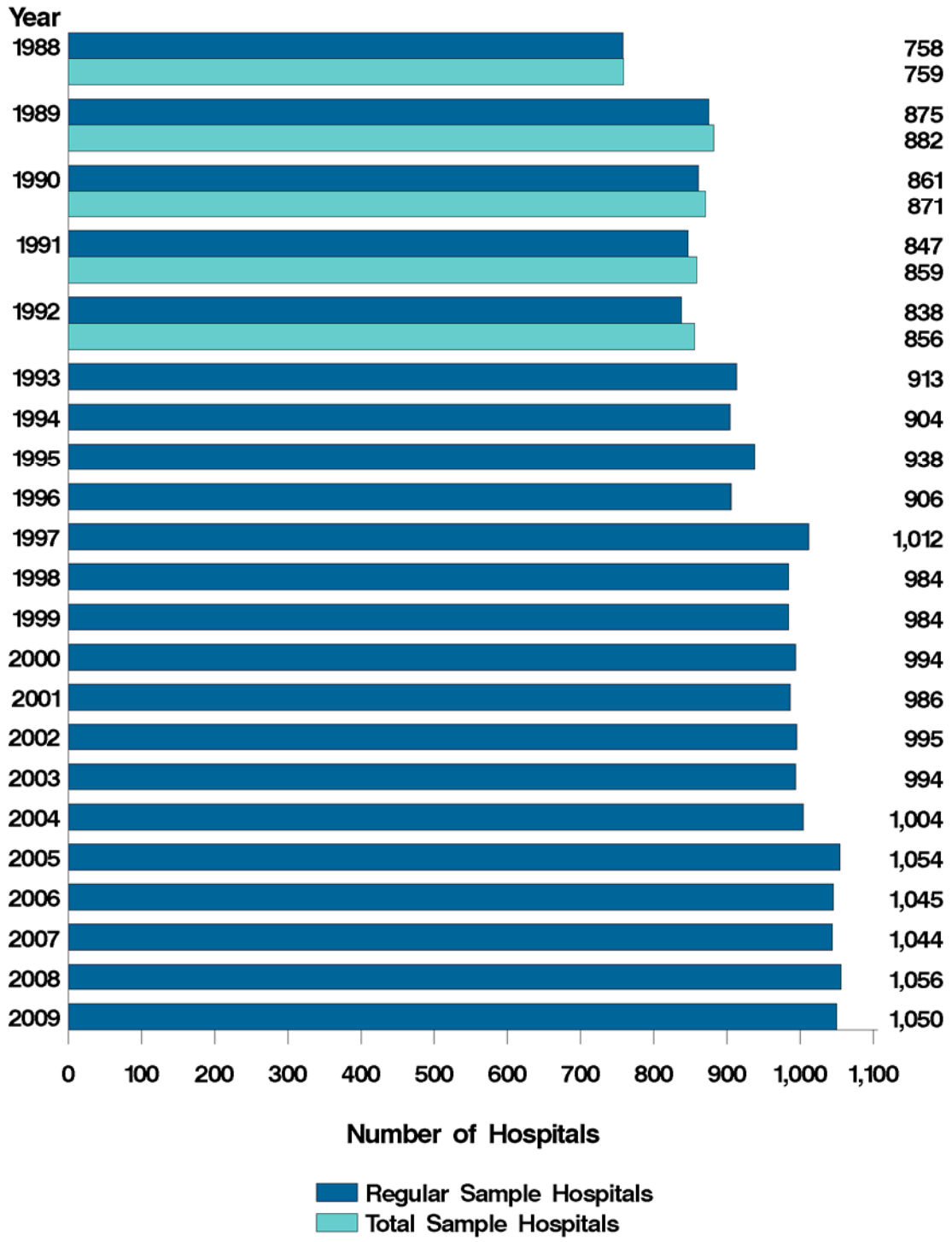

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Figure 6: Number of NIS Discharges, Unweighted, by Year

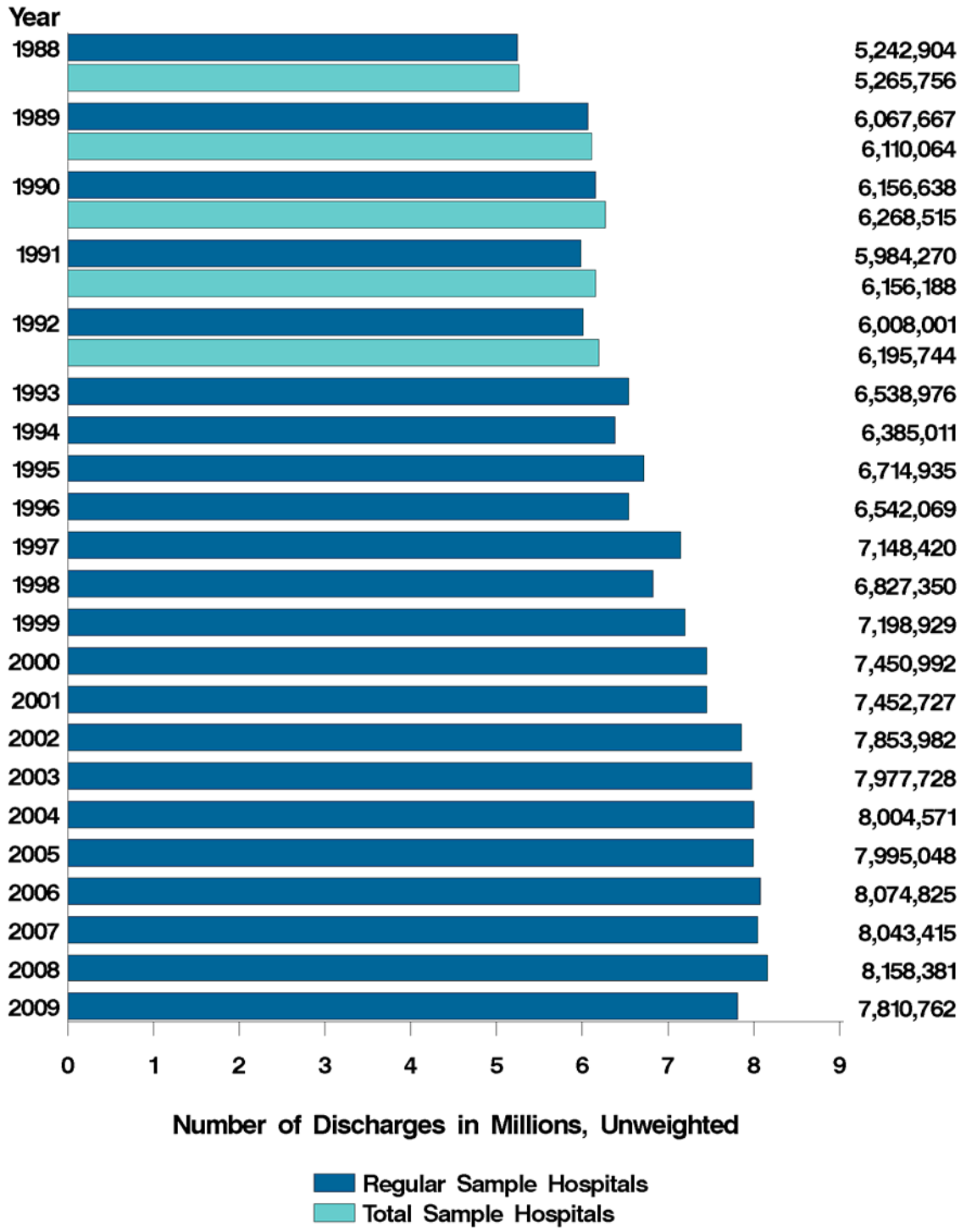

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Figure 7: Number of NIS Discharges, Weighted, by Year

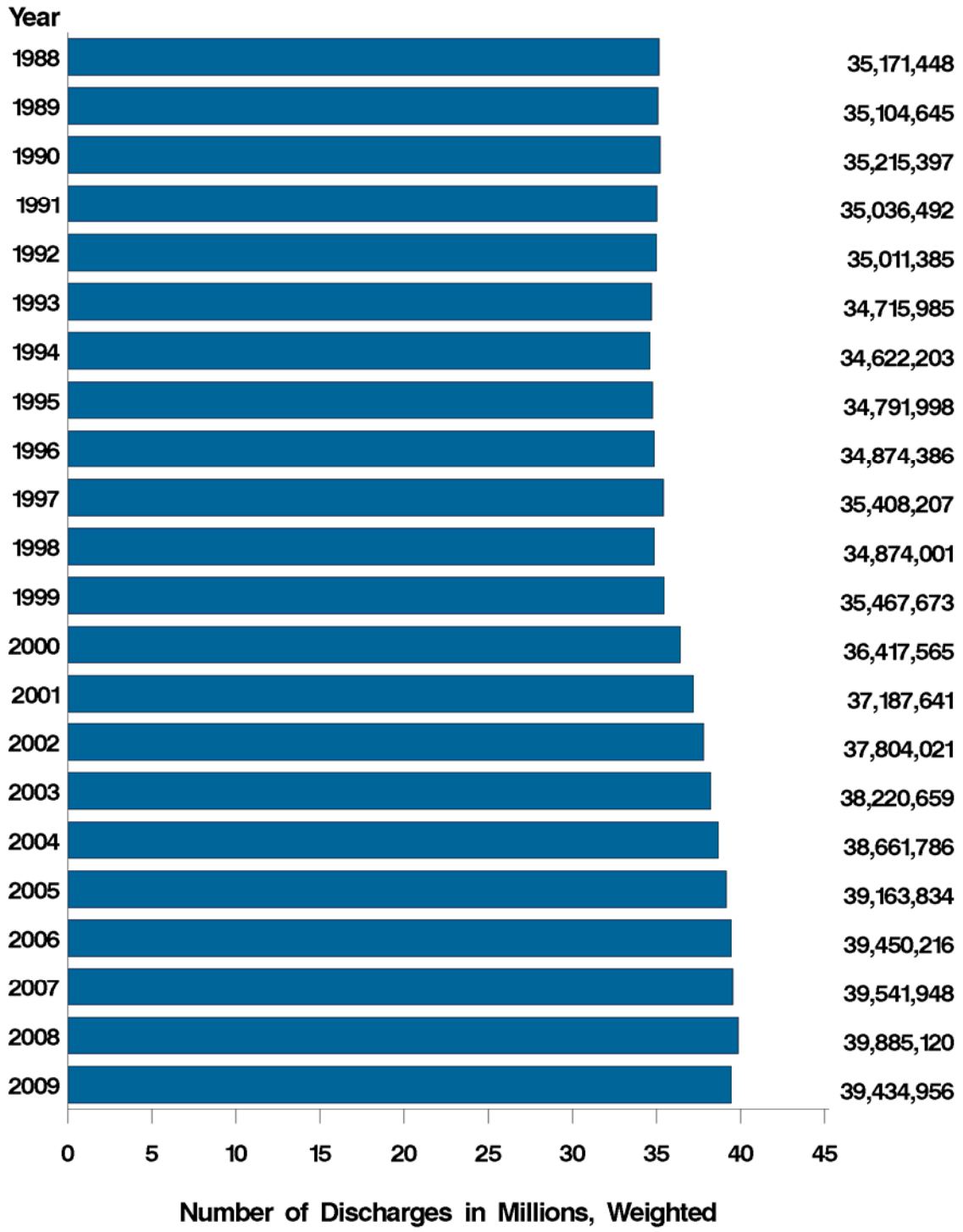

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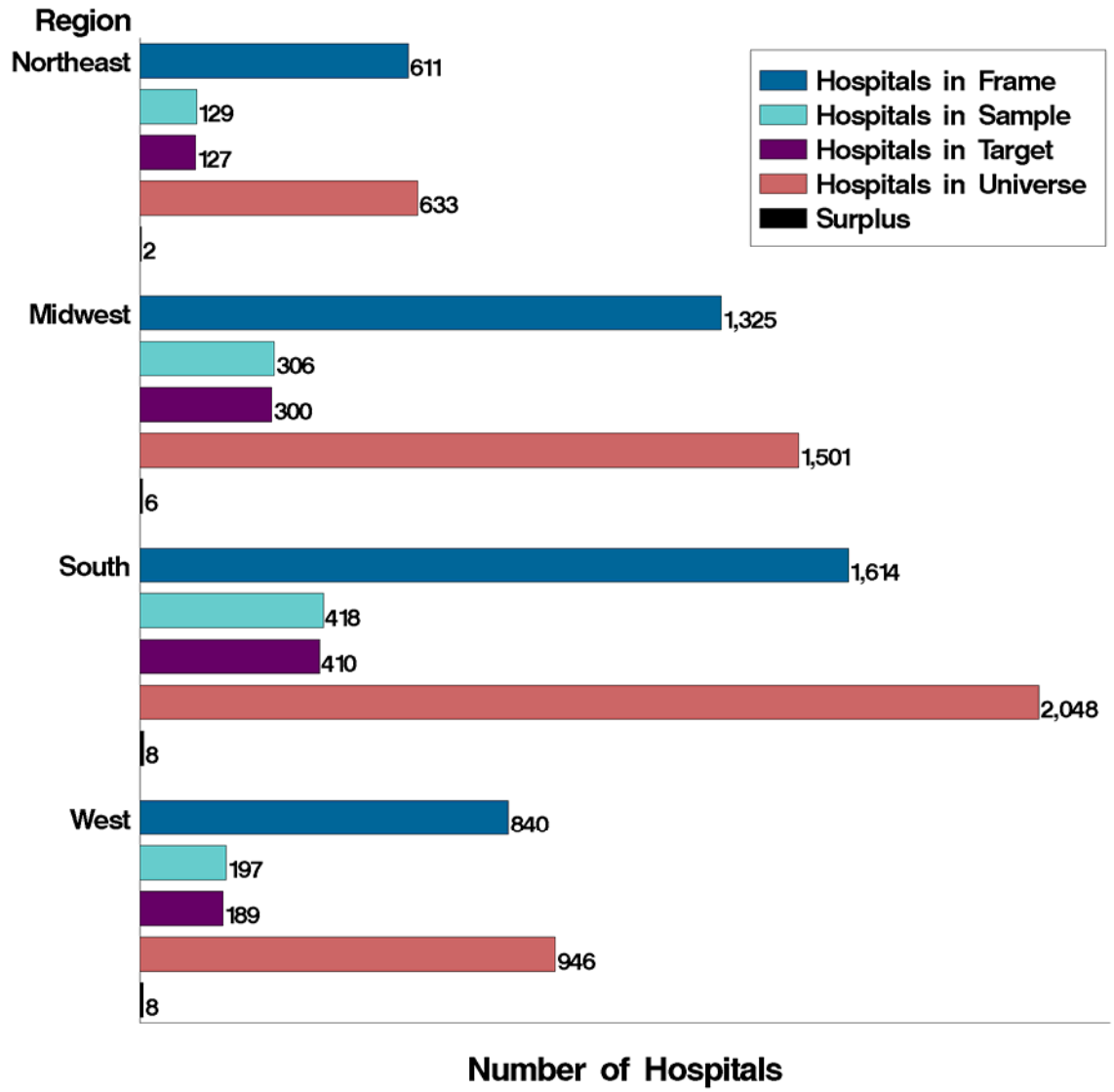
Figure 8: Number of Hospitals in the 2009 Universe, Frame, Sample, Target, and Surplus[1], by Region



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[1] The surplus is the difference between the actual number of hospitals sampled and the sample target.

Figure 9: Percentage of U.S. Population in the 2009 NIS States, by Region
Calculated using the estimated U.S. population on July 1, 2009.[5]

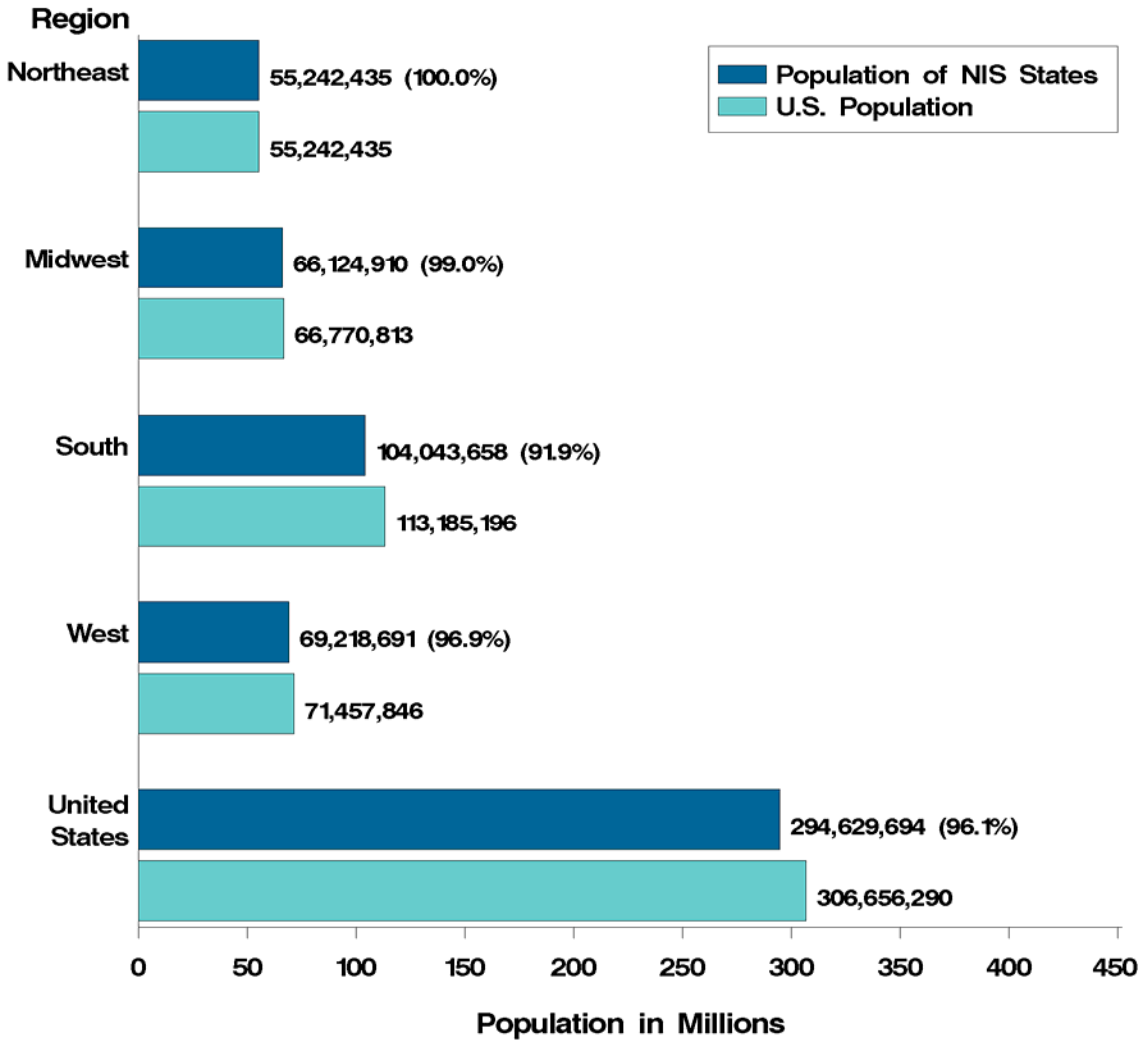

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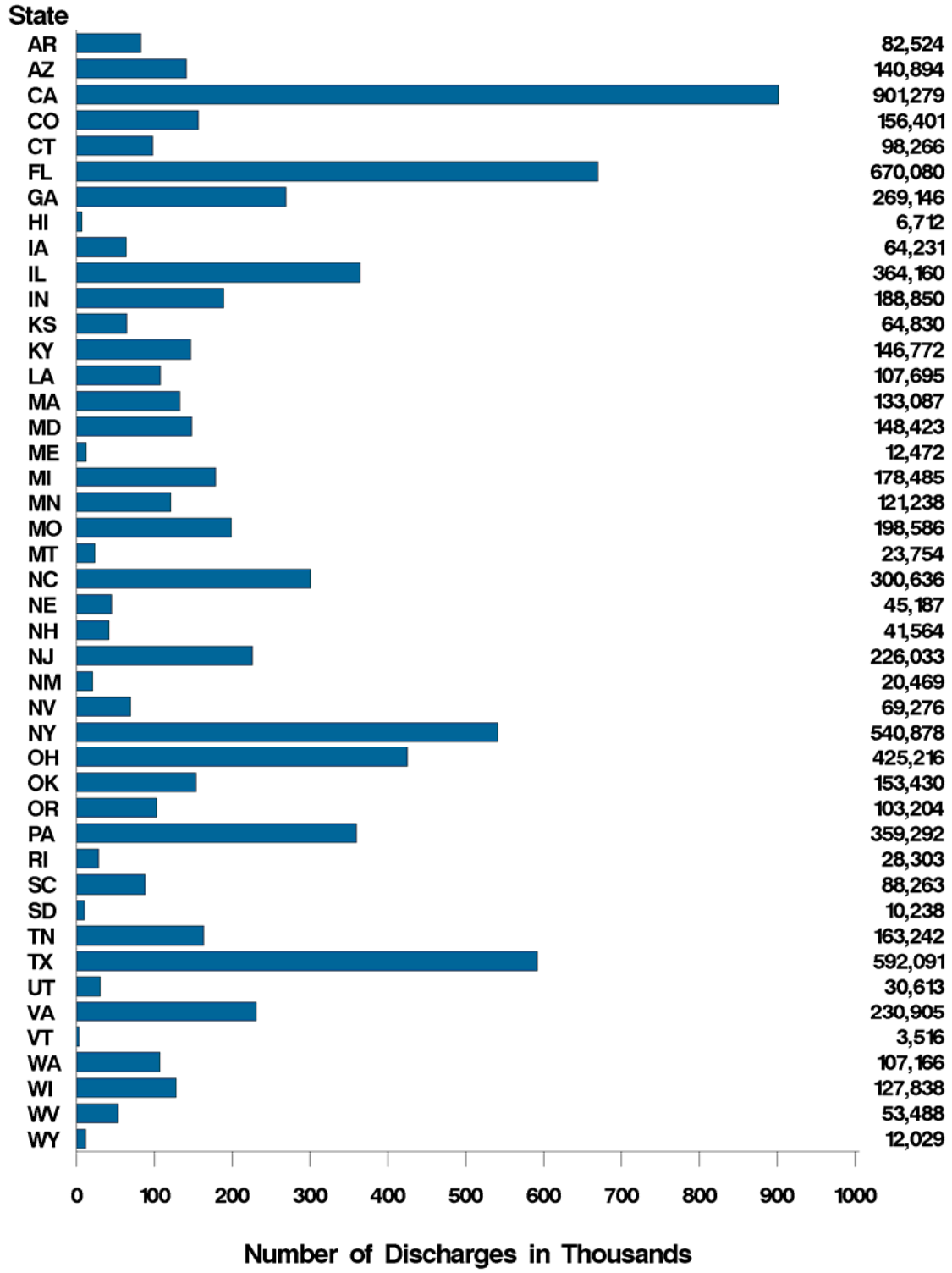
Figure 10: Number of Discharges in the 2009 NIS, by State



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Appendix II: State-Specific Restrictions

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

- Confidentiality of hospitals
    - Restricted identification of hospitals
    - Restricted hospital structural characteristics
    - Limitation on sampling
    - Restricted release of stratifiers
- Confidentiality of records
    - Restricted release of age in years, or age in days
    - Other restrictions
- Confidentiality of physicians
- Missing discharges.

For each restriction type the data sources are listed alphabetically by State. Only data sources that have restrictions are included. Data sources that do not have restrictions are not included.

Confidentiality of Hospitals - Restricted Identification of Hospitals

The following data sources required that hospitals not be identified in the NIS:

- AR: Arkansas Department of Health & Human Services
- GA: GHA: An Association of Hospitals & Health Systems
- HI: Hawaii Health Information Corporation
- IN: Indiana Hospital & Health Association
- KS: Kansas Hospital Association
- LA: Louisiana Department of Health and Hospitals
- ME: Maine Health Data Organization
- MI: Michigan Health & Hospital Association
- MO: Missouri Hospital Industry Data Institute
- NE: Nebraska Hospital Association
- NM: New Mexico Health Policy Commission
- OH: Ohio Hospital Association
- OK: Oklahoma State Department of Health
- SC: South Carolina State Budget & Control Board
- SD: South Dakota Association of Healthcare Organizations
- TN: Tennessee Hospital Association
- TX: Texas Department of State Health Services
- WY: Wyoming Hospital Association

In these States the following data elements are set to missing for all hospitals:

- IDNUMBER, AHA hospital identifier without leading 6*
- AHAID, AHA hospital identifier with leading 6*
- HOSPNAME, hospital name
- HOSPCITY, hospital city
- HOSPADDR, hospital address
- HOSPZIP, hospital ZIP Code
- DSHOSPID, data source hospital identifier*
- HOSPSTCO, hospital State, modified county FIPS code*
- HFIPSSTCO, hospital State, unmodified county FIPS code*

*Available in AR.

Confidentiality of Hospitals - Restricted Hospital Structural Characteristics

The following data sources restricted the identification of hospital structural characteristics:

- CO: Colorado Hospital Association
- CT: Connecticut Hospital Association
- GA: GHA: An Association of Hospitals & Health Systems
- SC: South Carolina State Budget & Control Board

In these States the following data elements are set to missing for all hospitals:

- HOSP_MHSMEMBER, Multi-hospital system membership*
- HOSP_MHSCLUSTER, System cluster code*
- HOSP_RNPCT, Percentage of RNs among nurses (RNs and LPNs)
- HOSP_RNFTEAPD, RN FTEs per 1000 adjusted patient days
- HOSP_LPNFTEAPD, LPN FTEs per 1000 adjusted inpatient days
- HOSP_NAFTEAPD, Nurse aides per 1000 adjusted inpatient days
- HOSP_OPSURGPCT, Percentage of all surgeries performed in the outpatient setting.**

*Available in GA.
** Available in GA and SC.

Confidentiality of Hospitals - Limitation on Sampling

Limitations on sampling were required for the following data sources:

- MI: Michigan Health & Hospital Association
  - Reporting of total charge is limited in the Michigan data. Twenty-nine of 146 hospitals were dropped from the sampling frame because they did not report any total charges. These hospitals were fairly evenly distributed by hospital type. There were no sampling strata in the State containing only hospitals without total charges.

- SC: South Carolina State Budget & Control Board
  - Two hospitals were dropped from the sampling frame to meet additional South Carolina confidentiality requirements.

Some States limit the hospitals that can be included in the NIS. The following data sources requested that hospitals be dropped from the sampling frame whenever there were fewer than two hospitals in a sampling stratum. For more details about the number of hospitals included in the AHA Universe, Frame, and NIS for each NIS State, refer to Table 8 in Appendix I.

- GA: GHA: An Association of Hospitals & Health Systems
- HI: Hawaii Health Information Corporation
- IN: Indiana Hospital & Health Association
- KS: Kansas Hospital Association
- LA: Louisiana Department of Health and Hospitals
- ME: Maine Health Data Organization
- MI: Michigan Health & Hospital Association
- MO: Missouri Hospital Industry Data Institute
- NE: Nebraska Hospital Association
- NM: New Mexico Health Policy Commission
- OH: Ohio Hospital Association
- OK: Oklahoma State Department of Health
- SC: South Carolina State Budget & Control Board
- SD: South Dakota Association of Healthcare Organizations
- TN: Tennessee Hospital Association
- TX: Texas Department of State Health Services
- WY: Wyoming Hospital Association

Confidentiality of Hospitals - Restricted Release of Stratifiers

Stratifier data elements were restricted for the following data sources to further ensure hospital confidentiality in the NIS:

- GA: GHA: An Association of Hospitals & Health Systems
- HI: Hawaii Health Information Corporation
- IN: Indiana Hospital & Health Association
- KS: Kansas Hospital Association
- LA: Louisiana Department of Health and Hospitals
- ME: Maine Health Data Organization
- MI: Michigan Health & Hospital Association
- MO: Missouri Hospital Industry Data Institute
- NE: Nebraska Hospital Association
- NM: New Mexico Health Policy Commission
- OH: Ohio Hospital Association
- OK: Oklahoma State Department of Health
- SC: South Carolina State Budget & Control Board
- SD: South Dakota Association of Healthcare Organizations
- TN: Tennessee Hospital Association
- TX: Texas Department of State Health Services
- WY: Wyoming Hospital Association

For the above States, stratifier data elements were set to missing if the cell, as defined by the data elements below, had fewer than two hospitals in the universe of the State's hospitals:

- H_CONTRL, control/ownership of hospital, without collapsing
- HOSP_CONTROL, control/ownership of hospital
- HOSP_LOCATION, location (urban/rural) of hospital
- HOSP_TEACH, teaching status of hospital
- HOSP_BEDSIZE, bed size of hospital
- HOSP_LOCTEACH, location/teaching status of hospital
- HOSP_MHSMEMBER, hospital is part of multiple hospital system
- HOSP_MHSCLUSTER, AHA multiple hospital system cluster code

Confidentiality of Records - Restricted Release of Age in Years, Age in Days

The following data sources restrict or limit the release of age:

- CA: Office of Statewide Health Planning & Development
  - Age in days (AGEDAY) and age in years (AGE) are suppressed for some records. In some cases, AGE is set to the midpoint of the age category.

- FL: Florida Agency for Health Care Administration
  - Age in days (AGEDAY) is set to missing on all records

- MA: Division of Health Care Finance and Policy
  - Age in days (AGEDAY) is set to missing on all records

- ME: Maine Health Data Organization
  - Age in days, (AGEDAY) is set to missing on all records
  - Age in years (AGE) is set to midpoints of five-year ranges as follows:

Maine Restriction on AGE for General Patient Population

Age Range	New value of AGE
under 1 year	0
1-4	2
5-9	7
10-14	12
15-19	17
20-24	22
25-29	27
30-34	32
35-39	37
40-44	42
45-49	47
50-54	52
55-59	57
60-64	62
65-69	67
70-74	72
75-79	77
80-84	82
85 years & over	87
unknown	Missing (.)

- NH: New Hampshire Department of Health & Human Services
  - Age in days (AGEDAY) is set to missing on all records

- SC: South Carolina State Budget & Control Board
  - Age in days (AGEDAY) is set to missing on all records

- TX: Texas Department of State Health Services
  - Age in days (AGEDAY) is set to missing on all records
  - Age in years (AGE) is set to the midpoints of age ranges defined by the

data source. There were 22 age groups for the general patient population and 5 age groups for the HIV or alcohol/drug use patients. The age groups are shown below:

- Texas Restriction on AGE for General Patient Population other than HIV or Drug/Alcohol Use Patients

Age Range	New value of AGE
0	0
1-4	2
5-9	7
10-14	12
15-17	16
18-19	19
20-24	22
25-29	27
30-34	32
35-39	37
40-44	42
45-49	47
50-54	52
55-59	57
60-64	62
65-69	67
70-74	72
75-79	77
80-84	82
85-89	87
90 and above	90

Texas Restriction on AGE for HIV or Drug/Alcohol Use Patients

Age Range	New value of AGE
0	0
1-17	8
18-44	31
45-64	54
65-74	69
75 and above	75

The HIV or drug/alcohol use patients were identified by any principal or secondary diagnosis code on the record having the first four characters equal to one of the values in the following list: '2910', '2911', '2912', '2913', '2914', '2915', '2918', '2919', '2920', '2921', '2922', '2928', '2929', '3030', '3039', '3040', '3041', '3042', '3043', '3044', '3045', '3046', '3047', '3048','3049', '3050', '3052', '3053', '3054', '3055', '3056', '3057', '3058', '3059', '7903', 'V08', and '042 '.

Confidentiality of Records – Other Restrictions

The following data sources restrict or limit the release of data elements for patient confidentiality:

- CA: Office of Statewide Health Planning & Development
  - Admission month (AMONTH), gender (FEMALE), and race (RACE) are suppressed for some records.

- FL: Florida Agency for Health Care Administration
  - Admission month (AMONTH) is set to missing on all records

- MA: Division of Health Care Finance and Policy
  - NCHS-defined Patient Urban-Rural Codes (PL_NCHS2006) is set to missing on all records

- ME: Maine Health Data Organization
  - The following data elements are suppressed:
    - Admission Source, UB-92 standard coding (ASOURCEUB92)
    - Admission Source, as received from source (ASOURCE_X)
    - Disposition of patient, UB04 standard coding (DISPUB04)
    - Length of stay, as received from source (LOS_X)
    - Primary expected payer, as received from source (PAY1_X)
    - Secondary expected payer, as received from source (PAY2_X)
    - Point of origin for admission or visit,UB-04 standard coding (PointOfOriginUB04)
    - Point of origin for admission or visit, as received from source (PointOfOrigin_X)
    - Total Charges, as received from source (TOTCHG_X)

Confidentiality of Physicians

The following data sources restrict the release of physician identifiers:

- CT: Connecticut Hospital Association
- MA: Division of Health Care Finance and Policy
- NC: North Carolina Department of Health and Human Services
- UT: Utah Department of Health
- VT: Vermont Association of Hospitals and Health Systems
- WV: West Virginia Health Care Authority

In these states the following data elements are set to missing for all records:

- MDNUM1_R/MDNUM2_R (beginning in 2003)
- MDNUM1_S/MDNUM2_S (2001 to 2002)
- MDID_S/SURGID_S (prior to 2001)

Missing Discharges

The following data sources may be missing discharge records for specific populations of patients:

- IA: Iowa Hospital Association
  - Beginning in data year 2001, the Iowa Hospital Association prohibits the release of two types of discharges: HIV infections (defined by MDC of 25) and behavioral health including chemical dependency care or psychiatric care (defined by a service code of BHV). These discharges were not included in the source file provided to HCUP and were therefore not included in the NIS.

- NE: Nebraska Hospital Association
  - The Nebraska Hospital Association prohibits the release of discharge records for patients with HIV diagnoses. These discharges were not included in the source file provided to HCUP and were therefore not included in the NIS.

- NY: New York State Department of Health
  - Beginning with data year 2008, the New York State Department of Health masks the hospital identifiers on abortion records. As a result, these records are not included in the NIS.

Appendix III: Data Elements

Table 1. Data Elements in the NIS Inpatient Core Files

Data elements that are *italicized* are not included in the 2009 NIS Inpatient Core files, but are only available in previous years' files.

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
Admission day of week or weekend	AWEEKEND	1998-2009	Admission on weekend: (0) admission on Monday-Friday, (1) admission on Saturday-Sunday	
	ADAYWK	*1988-1997*	*Admission day of week: (1) Sunday, (2) Monday, (3) Tuesday, (4) Wednesday, etc.*	
Admission month	AMONTH	1988-2009	Admission month coded from (1) January to (12) December	FL
Admission source	ASOURCE	1988-2009	Admission source, uniform coding: (1) ER, (2) another hospital, (3) another facility including long-term care, (4) court/law enforcement, (5) routine/birth/other	AZ, CT, FL, GA, HI, IA, KS, KY, ME, MI, MN, MO, MT, NC, NE, NM, OK, OR, PA, RI, SC, SD, TN, TX, UT, VT, WA, WI, WY
	ASOURCE_X	1998-2009	Admission source, as received from data source using State-specific coding	AZ, CT, FL, GA, HI, IA, KS, KY, ME, MI, MN, MO, MT, NC, NE, NM, OK, OR, PA, RI, SC, SD, TN, TX, UT, VT, WA, WI, WY

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
	ASOURCEUB92	2003-2009	Admission source (UB-92 standard coding). For newborn admissions (ATYPE = 4): (1) normal newborn, (2) premature delivery, (3) sick baby, (4) extramural birth; For non-newborn admissions (ATYPE NE 4): (1) physician referral, (2) clinic referral, (3) HMO referral, (4) transfer from a hospital, (5) transfer from a skilled nursing facility, (6) transfer from a another health care facility, (7) emergency room, (8) court/law enforcement, (A) transfer from a critical access hospital, (B) transfer from another home health agency, (C) readmission to same home health agency, (D) transfer from one distinct unit of the hospital to another distinct unit of the same hospital resulting in a separate claim to the payer, (E) transfer from ambulatory surgery center, (F) transfer from hospice and under hospice plan	AZ, CA, CT, FL, GA, HI, IA, KS, KY, MD, ME, MI, MN, MO, MT, NC, NE, NM, OK, OR, PA, RI, SC, SD, TN, TX, UT, VT, WA, WI, WY
	POINTOFORIGIN_X	2009	Point of origin for admission or visit, as received from source	CA, MA, MD, ME, NH
	POINTOFORIGIN_UB04	2007-2009	Point of origin for admission or visit, UB-04 standard coding. For newborn admission (ATYPE = 4): (5) Born inside this hospital, (6) Born outside of this hospital; For non-newborn admissions (ATYPE NE 4): (1) Non-health care facility point of origin, (2) Clinic, (4) Transfer from a hospital (different facility), (5) Transfer from a skilled Nursing Facility (SNF) or Intermediate Care Facility (ICF), (6) Transfer from another health care facility, (7) Emergency room, (8) Court/law enforcement, (B) Transfer from another Home Health Agency, (C) Readmission to Same Home Health Agency, (D) Transfer from one distinct unit of the hospital to another distinct unit of the same hospital resulting in a separate claim to the payer, (E) Transfer from ambulatory surgery center, (F) Transfer from hospice and is under a hospice plan of care or enrolled in a hospice program	CA, MA, MD, ME, NH

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
	TRAN_IN	2008-2009	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)]	
Admission type	ATYPE	1988-2009	Admission type, uniform coding: (1) emergency, (2) urgent, (3) elective, (4) newborn, (5) Delivery (coded in 1988-1997 data only), (5) trauma center beginning in 2003 data, (6) other	CA
	ELECTIVE	2002-2009	Indicates elective admission: (1) elective, (0) non-elective admission	
Age at admission	AGE	1988-2009	Age in years coded 0-124 years	
	AGEDAY	1988-2009	Age in days coded 0-365 only when the age in years is less than 1	FL, MA, ME, NH, SC, TX
Chronic Conditions	NCHRONIC	2008-2009	Number of chronic conditions	
Clinical Classifications Software (CCS) category	DXCCS1 – DXCCS25	1998-2009	CCS category for all diagnoses for NIS beginning in 1998. Beginning in 2009, the diagnosis array was increased from 15 to 25.	
	DCCHPR1	*1988-1997*	*CCS category for principal diagnosis for NIS prior to 1998. CCS was formerly called the Clinical Classifications for Health Policy Research (CCHPR).*	
	PRCCS1 - PRCCS15	1998-2009	CCS category for all procedures for NIS beginning in 1998	
	PCCHPR1	*1988-1997*	*CCS category for principal procedure for NIS prior to 1998. CCS was formerly called the Clinical Classifications for Health Policy Research (CCHPR).*	
Data source information	*DSNUM*	*1988-1997*	*Data source number*	
	DSTYPE	*1988-1997*	*Data source type: (1) State data organization, (2) Hospital association, (3) Consortia*	
Diagnosis information	DX1 – DX25	1988-2009	Diagnoses, principal and secondary (ICD-9-CM). Beginning in 2003, the diagnosis array does not include any external cause of injury codes. These codes have been stored in a separate array ECODEn. Beginning in 2009, the diagnosis array was increased from 15 to 25.	
	NDX	1988-2009	Number of diagnoses coded on the original record	
	DSNDX	*1988-1997*	*Number of diagnosis fields provided by the data source*	

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
	DXSYS	*1988-1997*	*Diagnosis coding system (ICD-9-CM)*	
	DXV1 - DXV15	*1988-1997*	*Diagnosis validity flags*	
Diagnosis Related Group (DRG)	DRG	1988-2009	DRG in use on discharge date	
	DRG_NoPOA	2008-2009	DRG in use on discharge date, calculated without Present On Admission (POA) indicators	
	DRGVER	1988-2009	Grouper version in use on discharge date	
	DRG10	*1988-1999*	*DRG Version 10 (effective October 1992 - September 1993)*	
	DRG18	*1998-2005*	*DRG Version 18 (effective October 2000 - September 2001)*	
	DRG24	2006-2009	DRG Version 24 (effective October 2006 - September 2007)	
Discharge quarter	DQTR	1988-2009	Coded: (1) First quarter, Jan - Mar, (2) Second quarter, Apr - Jun, (3) Third quarter, Jul - Sep, (4) Fourth quarter, Oct - Dec	
	DQTR_X	2006-2009	Discharge quarter, as received from data source	
Discharge weights (Weights for 1988-1993 are on Hospital Weights file)	DISCWT	1998-2009	Discharge weight on Core file and Hospital Weights file for NIS beginning in 1998. In all data years except 2000, this weight is used to create national estimates for all analyses. In 2000 only, this weight is used to create national estimates for all analyses, excluding those that involve total charges.	
	DISCWT_U	*1993-1997*	*Discharge weight on Core file and Hospital Weights file for NIS prior to 1998*	
	DISCWTcharge	*2000*	*Discharge weight for national estimates of total charges. In 2000 only, this weight is used to create national estimates for analyses that involve total charges.*	
	DISCWT10	*1998-2004*	*Discharge weight on 10% subsample Core file for NIS from 1998 to 2004. In all data years except 2000, this weight is used to create national estimates for all analyses. In 2000 only, this weight is used to create national estimates for all analyses, excluding those that involve total charges.*	
	D10CWT_U	*1993-1997*	*Discharge weight on 10% subsample Core file for NIS prior to 1998*	

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
	DISCWTcharge10	*2000*	*Discharge weight for national estimates of total charges on 10% subsample file. In 2000 only, this weight is used to create national estimates for analyses that involve total charges.*	
Discharge year	YEAR	1988-2009		
Disposition of patient (discharge status)	*DISP*	*1988-1997*	*Disposition of patient, uniform coding used prior to 1998: (1) routine, (2) short-term hospital, (3) skilled nursing facility, (4) intermediate care facility, (5) another type of facility, (6) home health care, (7) against medical advice, (20) died*	
	DIED	1988-2009	Indicates in-hospital death: (0) did not die during hospitalization, (1) died during hospitalization	
	DISPUB92	*1998-2006*	*Disposition of patient, UB-92 coding: (1) routine, (2) short-term hospital, (3) skilled nursing facility, (4) intermediate care, (5) another type of facility, (6) home health care, (7) against medical advice, (8) home IV provider,(20) died in hospital, (40) died at home, (41) died in a medical facility, (42) died, place unknown, (43) alive, Federal health facility, (50) Hospice, home, (51) Hospice, medical facility, (61) hospital-based Medicare approved swing bed , (62) another rehabilitation facility, (63) long-term care hospital, (64) certified nursing facility, (65) psychiatric hospital, (66) critical access hospital (71) another institution for outpatient services, (72) this institution for outpatient services, (99) discharged alive, destination unknown*	

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
	DISPUB04	2006-2009	Disposition of patient, UB04 standard coding: (1)Discharged to Home or Self Care (Routine Discharge), (2) Discharged/transferred to a Short-Term Hospital for Inpatient Care, (3) Discharged/transferred to a Skilled Nursing Facility (SNF), (4) Discharged/transferred to an Intermediate Care Facility (ICF), (5) Discharged/transferred to a Designated Cancer Center or Children's Hospital (Effective 10/1/07), (5) Discharged/transferred to another type of institution not defined elsewhere (Effective prior to 10/1/07), (6) Discharged/transferred to Home under care of Organized Home Health Service Organization, (7) Left Against Medical Advice or Discontinued Care, (8) home IV provider, (9) Admitted as an inpatient to this hospital - valid only on outpatient data, (20) Expired, (40) Expired at home, (41) Expired in a Medical Facility, (42) Expired - place unknown, (43) Discharged/transferred to a Federal Health Care Facility, (50) Hospice – Home, (51) Hospice - Medical Facility , (61) Discharged/transferred to a Hospital-Based Medicare approved Swing Bed, (62) Discharged/transferred to an Inpatient Rehabilitation Facility (IRF) including Rehabilitation Distinct part unit of a hospital, (63) Discharged/transferred to a Medicare certified Long Term Care Hospital (LTCH), (64) Discharged/transferred to a Nursing Facility certified by Medicaid, but not certified by Medicare, (65) Discharged/transferred to a Psychiatric Hospital or Psychiatric distinct part unit of a hospital, (66) Discharged/transferred to a Critical Access Hospital (CAH), (70) Discharged/transferred to another type of institution not defined elsewhere (Effective 10/1/07), (71) Another institution for outpatient services, (72) This institution for outpatient services, (99) Discharged alive, destination unknown	CA, MD, ME

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
	DISPUNIFORM	1998-2009	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	
External causes of injury and poisoning	ECODE1 - ECODE4	2003-2009	External cause of injury and poisoning code, primary and secondary (ICD-9-CM). Beginning in 2003, external cause of injury codes are stored in a separate array ECODEn from the diagnosis codes in the array DXn. Prior to 2003, these codes are contained in the diagnosis array (DXn).	
	E_CCS1 - E_CCS4	2003-2009	CCS category for the external cause of injury and poisoning codes	
	NECODE	2003-2009	Number of external cause of injury codes on the original record. A maximum of 4 codes are retained on the NIS.	
Gender of patient	FEMALE	1998-2009	Indicates gender for NIS beginning in 1998: (0) male, (1) female	
	SEX	*1988-1997*	*Indicates gender for NIS prior to 1998: (1) male, (2) female*	
Hospital information	DSHOSPID	1988-2009	Hospital number as received from the data source	GA, HI, IN, KS, LA, ME, MI, MO, NE, NM, OH, OK, SC, SD, TN, TX, WY
	HOSPID	1988-2009	HCUP hospital number (links to Hospital Weights file)	
	HOSPST	1988-2009	State postal code for the hospital (e.g., AZ for Arizona)	
	HOSPSTCO	*1988-2002*	*Modified Federal Information Processing Standards (FIPS) State/county code for the hospital links to Area Resource File (available from the Bureau of Health Professions, Health Resources and Services Administration). Beginning in 2003, this data element is available only on the Hospital Weights file.*	
	NIS_STRATUM	1998-2009	Stratum used to sample hospitals, based on geographic region, control, location/teaching status, and bed size. Stratum information is also contained in the Hospital Weights file.	

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
Indicates Emergency Department service	HCUP_ED	2007-2009	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	
Indicates in-hospital birth	HOSPBRTH	2006-2009	Indicator that discharge record includes diagnosis of birth that occurred in the hospital: (0) Not an in-hospital birth, (1) In-hospital birth	
Length of stay	LOS	1988-2009	Length of stay, edited	
	LOS_X	1988-2009	Length of stay, as received from data source	ME
Location of the patient	*PL_UR_CAT4*	*2003-2006*	*Urban–rural designation for patient's county of residence: (1) large metropolitan, (2) small metropolitan, (3) micropolitan, (4) non-metropolitan or micropolitan*	
	PL_NCHS2006	2007-2009	Patient Location: NCHS Urban-Rural Code (V2006). This is a six-category urban-rural classification scheme for U.S. counties: (1) "Central" counties of metro areas of >=1 million population,(2) "Fringe" counties of metro areas of >=1 million population,(3) Counties in metro areas of 250,000-999,999 population,(4) Counties in metro areas of 50,000-249,999 population,(5) Micropolitan counties,(6) Not metropolitan or micropolitan counties	MA
Major Diagnosis Category (MDC)	MDC	1988-2009	MDC in use on discharge date	
	MDC_noPOA	2009	MDC in use on discharge date, calculated without Present on Admission (POA) indicators	
	MDC10	*1988-1999*	*MDC Version 10 (effective October 1992 - September 1993)*	
	MDC18	*1998-2005*	*MDC Version 18 (effective October 2000 - September 2001)*	
	MDC24	2006-2009	MDC Version 24 (effective October 2006 - September 2007)	

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
Median household income for patient's ZIP Code	ZIPINC_QRTL	2003-2009	Median household income quartiles for patient's ZIP Code. For 2008, the median income quartiles are defined as: (1) $1 - $38,999; (2) $39,000 - $47,999; (3) $48,000 - 62,999; and (4) $63,000 or more.	
	ZIPINC	*1998-2002*	*Median household income category in files beginning in 1998: (1) $1-$24,999, (2) $25,000-$34,999, (3) $35,000-$44,999, (4) $45,000 and above*	
	ZIPINC4	*1988-1997*	*Median household income category in files prior to 1998: (1) $1-$25,000, (2) $25,001-$30,000, (3) $30,001-$35,000, (4) $35,001 and above*	
	ZIPINC8	*1988-1997*	*Median household income category in files prior to 1998: (1) $1-$15,000, (2) $15,001-$20,000, (3) $20,001-$25,000, (4) $25,001-$30,000, (5) $30,001-$35,000, (6) $35,001-$40,000, (7) $40,001-$45,000, (8) $45,001 or more*	
Neonatal/ maternal flag	NEOMAT	1988-2009	Assigned from diagnoses and procedure codes: (0) not maternal or neonatal, (1) maternal diagnosis or procedure, (2) neonatal diagnosis, (3) maternal and neonatal on same record	
Payer information	PAY1	1988-2009	Expected primary payer, uniform: (1) Medicare, (2) Medicaid, (3) private including HMO, (4) self-pay, (5) no charge, (6) other	
	PAY1_N	*1988-1997*	*Expected primary payer, nonuniform: (1) Medicare, (2) Medicaid, (3) Blue Cross, Blue Cross PPO, (4) commercial, PPO, (5) HMO, PHP, etc., (6) self-pay, (7) no charge, (8) Title V, (9) Worker's Compensation, (10) CHAMPUS, CHAMPVA, (11) other government, (12) other*	
	PAY1_X	1998-2009	Expected primary payer, as received from the data source	ME
	PAY2	1988-2009	Expected secondary payer, uniform: (1) Medicare, (2) Medicaid, (3) private including HMO, (4) self-pay, (5) no charge, (6) other	AZ, CA, CO, FL, HI, IA, NH, OH, OK, RI, SD, VA

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
	PAY2_N	*1988-1997*	*Expected secondary payer, nonuniform: (1) Medicare, (2) Medicaid, (3) Blue Cross, Blue Cross PPO, (4) commercial, PPO, (5) HMO, PHP, etc., (6) self-pay, (7) no charge, (8) Title V, (9) Worker's Compensation, (10) CHAMPUS, CHAMPVA, (11) other government, (12) other*	
	PAY2_X	1998-2009	Expected secondary payer, as received from the data source	AZ, CA, CO, FL, HI, IA, ME, NH, OH, OK, RI, SD, VA
Physician identifiers, synthetic	*MDID_S*	*1988-2000*	*Synthetic attending physician number in files prior to 2001*	
	MDNUM1_R	2003-2009	Re-identified attending physician number in files starting in 2003	CA, CT, HI, IL, IN, LA, MA, NC, OH, OK, UT, VT, WI, WV
	MDNUM1_S	*2001-2002*	*Synthetic attending physician number in files beginning in 2001 and discontinued in 2003*	
	SURGID_S	*1988-2000*	*Synthetic primary surgeon number in files prior to 2001*	
	MDNUM2_R	2003-2009	Re-identified secondary physician number in files starting in 2003	CA, CT, HI, IL, IN, LA, MA, NC, OH, OK, UT, VT, WI, WV
	MDNUM2_S	*2001-2002*	*Synthetic secondary physician number in files beginning in 2001 and discontinued in 2003*	
Procedure information	PR1 - PR15	1988-2009	Procedures, principal and secondary (ICD-9-CM)	
	NPR	1988-2009	Number of procedures coded on the original record	
	ORPROC	2009	Major operating room procedure indicator: (0) no major operating room procedure, (1) major operating room procedure	
	DSNPR	*1988-1997*	*Number of procedure fields in this data source*	
	PRSYS	*1988-1997*	*Procedure system (1) ICD-9-CM, (2) CPT-4, (3) HCPCS/CPT-4*	
	PRV1 -PRV15	*1988-1997*	*Procedure validity flag: (0) Indicates a valid and consistent procedure code, (1) Indicates an invalid code for the discharge date*	

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
	PRDAY1	1988-2009	Number of days from admission to principal procedure.	OH, OK, UT, WV
	PRDAY2 - PRDAY15	1998-2009	Number of days from admission to secondary procedures	CO, IN, OH, OK, UT, VA, WI, WV
Race of patient	RACE	1988-2009	Race, uniform coding: (1) white, (2) black, (3) Hispanic, (4) Asian or Pacific Islander, (5) Native American, (6) other	MN, NC, OH, WV
Record identifier, synthetic	KEY	1998-2009	Unique record number for file beginning in 1998	
	SEQ	*1988-1997*	*Unique record number for NIS prior to 1998*	
	SEQ_SID	*1994-1997*	*Unique record number for NIS and SID prior to 1998*	
	PROCESS	*1988-1997*	*Processing number for NIS prior to 1998*	
Total charges	TOTCHG	1988-2009	Total charges, edited	
	TOTCHG_X	1988-2009	Total charges, as received from data source	ME

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Table 2. Data Elements in the NIS Hospital Weights Files

Data elements that are *italicized* are not included in the 2008 NIS Hospital Weights File, but are only available in previous years' files.

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
Discharge counts	N_DISC_U	1988-2009	Number of AHA universe discharges in the stratum	
	S_DISC_U	1988-2009	Number of sampled discharges in the sampling stratum (NIS_STRATUM or STRATUM)	
	S_DISC_S	*1988-1997*	*Number of sampled discharges in the stratum STRAT_ST*	
	N_DISC_F	*1988-1997*	*Number of frame discharges in the stratum*	
	N_DISC_S	*1988-1997*	*Number of State's discharges in the stratum*	
	TOTAL_DISC	1998-2009	Total number of discharges from this hospital in the NIS	
	TOTDSCHG	*1988-1997*	*Total number of discharges from this hospital in the NIS*	
Discharge weights	DISCWT	1998-2009	Discharge weight used in the NIS beginning in 1998. In all data years except 2000, this weight is used to create national estimates for all analyses. In 2000 only, this weight is used to create national estimates for all analyses, excluding those that involve total charges.	
	DISCWT_U	*1988-1997*	*Discharge weights used in the NIS prior to 1998.*	
	DISCWT_F	*1988-1997*	*Discharge weights to the sample frame are available only in 1988-1997*	
	DISCWT_S	*1988-1997*	*Discharge weights to the State are available only in 1988-1997*	
	DISCWTcharge	*2000*	*Discharge weight for national estimates of total charges for 2000 only.*	
Discharge Year	YEAR	1988-2009	Discharge year	
Hospital counts	*N_HOSP_F*	*1988-1997*	*Number of frame hospitals in the stratum*	
	N_HOSP_S	*1988-1997*	*Number of State's hospitals in the stratum*	
	N_HOSP_U	1988-2009	Number of AHA universe hospitals in the stratum	
	S_HOSP_S	*1988-1997*	*Number of sampled hospitals in STRAT_ST*	
	S_HOSP_U	1988-2009	Number of sampled hospitals in the stratum (NIS_STRATUM or STRATUM)	
Hospital identifiers	HOSPID	1988-2009	HCUP hospital number (links to Inpatient Core files)	
	AHAID	1988-2009	AHA hospital identifier that matches AHA Annual Survey Database (not available for all States)	GA, HI, IN, KS, LA, ME, MI, MO, NE, NM, OH, OK, SC, SD, TN, TX, WY

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
	IDNUMBER	1988-2009	AHA hospital identifier without the leading 6 (not available for all States)	GA, HI, IN, KS, LA, ME, MI, MO, NE, NM, OH, OK, SC, SD, TN, TX, WY
	HOSPNAME	1993-2009	Hospital name from AHA Annual Survey Database (not available for all States)	AR, GA, HI, IN, KS, LA, ME, MI, MO, NE, NM, OH, OK, SC, SD, TN, TX, WY
Hospital location	HOSPADDR	1993-2009	Hospital address from AHA Annual Survey Database (not available for all States)	AR, GA, HI, IN, KS, LA, ME, MI, MO, NE, NM, OH, OK, SC, SD, TN, TX, WY
	HOSPCITY	1993-2009	Hospital city from AHA Annual Survey Database (not available for all States)	AR, GA, HI, IN, KS, LA, ME, MI, MO, NE, NM, OH, OK, SC, SD, TN, TX, WY
	HOSPST	1988-2009	Hospital State postal code for hospital (e.g., AZ for Arizona)	
	HOSPSTCO	2002-2009	Modified Federal Information Processing Standards (FIPS) State/county code	GA, HI, IN, KS, LA, ME, MI, MO, NE, NM, OH, OK, SC, SD, TN, TX, WY
	HFIPSSTCO	2005-2009	Unmodified Federal Information Processing Standards (FIPS) State/county code for the hospital. Links to the Area Resource File (available from the Bureau of Health Professions, Health Resources and Services Administration)	GA, HI, IN, KS, LA, ME, MI, MO, NE, NM, OH, OK, SC, SD, TN, TX, WY
	HOSPZIP	1993-2009	Hospital ZIP Code from AHA Annual Survey Database (not available for all States)	AR, GA, HI, IN, KS, LA, ME, MI, MO, NE, NM, OH, OK, SC, SD, TN, TX, WY
Hospital characteristics	HOSP_BEDSIZE	1998-2009	Bed size of hospital (STRATA): (1) small, (2) medium, (3) large	
	H_BEDSZ	*1993-1997*	*Bed size of hospital: (1) small, (2) medium, (3) large*	

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
	ST_BEDSZ	*1988-1992*	*Bed size of hospital: (1) small, (2) medium, (3) large*	
	HOSP_CONTROL	1998-2009	Control/ownership of hospital, collapsed (STRATA): (0) government or private, collapsed category, (1) government, nonfederal, public, (2) private, non-profit, voluntary, (3) private, invest-own, (4) private, collapsed category	
	H_CONTRL	1993-1997, 2008-2009	Control/ownership of hospital: (1) government, nonfederal (2) private, non-profit (3) private, investor-own	
	ST_OWNER	*1988-1992*	*Control/ownership of hospital: (1) public (2) private, non-profit (3) private for profit*	
	HOSP_ LOCATION	1998-2009	Location: (0) rural, (1) urban	
	H_LOC	*1993-1997*	*Location: (0) rural, (1) urban*	
	HOSP_ LOCTEACH	1998-2009	Location/teaching status of hospital (STRATA): (1) rural, (2) urban non-teaching, (3) urban teaching	
	HOSP_ MHSMEMBER	2007-2009	Multi-hospital system membership: (0) non-member, (1) member	CO, CT, SC
	HOSP_ MHSCLUSTER	2007-2009	Multi-hospital system cluster code: (1) centralized health system, (2) centralized physician/insurance health system, (3) moderately centralized health system, (4) decentralized health system, (5) independent hospital system, (6) unassigned	CO, CT, SC
	HOSP_RNPCT	2007-2009	Percentage of RNs among all nurses (RNs and LPNs)	CO, CT, GA, SC
	HOSP_ RNFTEAPD	2007-2009	RN FTEs per 1000 adjusted inpatient days	CO, CT, GA, SC
	HOSP_ LPNFTEAPD	2007-2009	LPN FTEs per 1000 adjusted inpatient days	CO, CT, GA, SC
	HOSP_ NAFTEAPD	2007-2009	Nurse aides per 1000 adjusted inpatient days	CO, CT, GA, SC
	HOSP_ OPSURGPCT	2007-2009	Percentage of all surgeries performed in outpatient setting	CO, CT
	H_LOCTCH	*1993-1997*	*Location/teaching status of hospital: (1) rural, (2) urban non-teaching, (3) urban teaching*	
	LOCTEACH	*1988-1992*	*Location/teaching status of hospital: (1) rural, (2) urban non-teaching, (3) urban teaching*	
	HOSP_REGION	1998-2009	Region of hospital (STRATA): (1) Northeast, (2) Midwest, (3) South, (4) West	
	H_REGION	*1993-1997*	*Region of hospital: (1) Northeast, (2) Midwest, (3) South, (4) West*	
	ST_REG	*1988-1992*	*Region of hospital: (1) Northeast, (2) Midwest, (3) South, (4) West*	

Type of Data Element	HCUP Name	Years Available	Coding Notes	Unavailable in 2009 for:
	HOSP_TEACH	1998-2009	Teaching status of hospital: (0) non-teaching, (1) teaching	
	H_TCH	*1993-1997*	*Teaching status of hospital: (0) non-teaching, (1) teaching*	
	NIS_STRATUM	1998-2009	Stratum used to sample hospitals beginning in 1998; includes geographic region, control, location/teaching status, and bed size	
	STRATUM	*1988-1997*	*Stratum used to sample hospitals prior to 1998; includes geographic region, control, location/teaching status, and bed size*	
	STRAT_ST	*1988-1997*	*Stratum for State-specific weights*	
Hospital weights	HOSPWT	1998-2009	Weight to hospitals in AHA universe (i.e., total U.S.) beginning in 1998	
	HOSPWT_U	*1988-1997*	*Weight to hospitals in AHA universe (i.e., total U.S.) prior to 1998*	
	HOSPWT_F	*1988-1997*	*Weight to hospitals in the sample frame*	
	HOSPWT_S	*1988-1997*	*Weight to hospitals in the State*	

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Table 3. Data Elements in the NIS Disease Severity Measures Files

All data elements listed below are available for all States in the 2009 NIS Disease Severity Measures files.

Type of Data Element	HCUP Name	Years Available	Coding Notes
AHRQ Comorbidity Software (AHRQ)	CM_AIDS	2002-2009	AHRQ comorbidity measure: Acquired immune deficiency syndrome : (0) Comorbidity is not present, (1) Comorbidity is present
	CM_ALCOHOL	2002-2009	AHRQ comorbidity measure: Alcohol abuse: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_ANEMDEF	2002-2009	AHRQ comorbidity measure: Deficiency anemias : (0) Comorbidity is not present, (1) Comorbidity is present
	CM_ARTH	2002-2009	AHRQ comorbidity measure: Rheumatoid arthritis/collagen vascular diseases : (0) Comorbidity is not present, (1) Comorbidity is present
	CM_BLDLOSS	2002-2009	AHRQ comorbidity measure: Chronic blood loss anemia: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_CHF	2002-2009	AHRQ comorbidity measure: Congestive heart failure: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_CHRNLUNG	2002-2009	AHRQ comorbidity measure: Chronic pulmonary disease: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_COAG	2002-2009	AHRQ comorbidity measure: Coagulopathy: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_DEPRESS	2002-2009	AHRQ comorbidity measure: Depression: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_DM	2002-2009	AHRQ comorbidity measure: Diabetes, uncomplicated: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_DMCX	2002-2009	AHRQ comorbidity measure: Diabetes with chronic complications: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_DRUG	2002-2009	AHRQ comorbidity measure: Drug abuse: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_HTN_C	2002-2009	AHRQ comorbidity measure: Hypertension, (combine uncomplicated and complicated): (0) Comorbidity is not present, (1) Comorbidity is present
	CM_HYPOTHY	2002-2009	AHRQ comorbidity measure: Hypothyroidism: (0) Comorbidity is not present, (1) Comorbidity is present

Type of Data Element	HCUP Name	Years Available	Coding Notes
	CM_LIVER	2002-2009	AHRQ comorbidity measure: Liver disease: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_LYMPH	2002-2009	AHRQ comorbidity measure: Lymphoma : (0) Comorbidity is not present, (1) Comorbidity is present
	CM_LYTES	2002-2009	AHRQ comorbidity measure: Fluid and electrolyte disorders: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_METS	2002-2009	AHRQ comorbidity measure: Metastatic cancer: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_NEURO	2002-2009	AHRQ comorbidity measure: Other neurological disorders: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_OBESE	2002-2009	AHRQ comorbidity measure: Obesity: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_PARA	2002-2009	AHRQ comorbidity measure: Paralysis: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_PERIVASC	2002-2009	AHRQ comorbidity measure: Peripheral vascular disorders: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_PSYCH	2002-2009	AHRQ comorbidity measure: Psychoses: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_PULMCIRC	2002-2009	AHRQ comorbidity measure: Pulmonary circulation disorders: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_RENLFAIL	2002-2009	AHRQ comorbidity measure: Renal failure: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_TUMOR	2002-2009	AHRQ comorbidity measure: Solid tumor without metastasis : (0) Comorbidity is not present, (1) Comorbidity is present
	CM_ULCER	2002-2009	AHRQ comorbidity measure: Peptic ulcer disease excluding bleeding: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_VALVE	2002-2009	AHRQ comorbidity measure: Valvular disease: (0) Comorbidity is not present, (1) Comorbidity is present
	CM_WGHTLOSS	2002-2009	AHRQ comorbidity measure: Weight loss: (0) Comorbidity is not present, (1) Comorbidity is present

Type of Data Element	HCUP Name	Years Available	Coding Notes
All Patient Refined DRG (3M)	APRDRG	2002-2009	All Patient Refined DRG
	APRDRG_Risk_ Mortality	2002-2009	All Patient Refined DRG: 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	2002-2009	All Patient Refined DRG: 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
All-Payer Severity-adjusted DRG (HSS, Inc.)	APSDRG	2002-2009	All-Payer Severity-adjusted DRG
	APSDRG_ Mortality_Weight	2002-2009	All-Payer Severity-adjusted DRG: Mortality Weight
	APSDRG_LOS_ Weight	2002-2009	All-Payer Severity-adjusted DRG: Length of Stay Weight
	APSDRG_Charge _Weight	2002-2009	All-Payer Severity-adjusted DRG: Charge Weight
Disease Staging (Medstat)	DS_DX_ Category1	2002-2009	Disease Staging: Principal Disease Category
	DS_Stage1	2002-2009	Disease Staging: Stage of Principal Disease Category
	DS_LOS_Level	*2002-2007*	*Disease Staging: Length of Stay Level: (1) Very low (less than 5% of patients),(2) Low (5 - 25% of patients),(3) Medium (25 - 75% of patients),(4) High (75 - 95% of patients),(5) Very high (greater than 95% of patients)*
	DS_LOS_Scale	*2002-2007*	*Disease Staging: Length of Stay Scale*
	DS_Mrt_Level	*2002-2007*	*Disease Staging: Mortality Level: (0) Extremely low - excluded from percentile calculation (mortality probability less than .0001), (1) Very low (less than 5% of patients), (2) Low (5 - 25% of patients), (3) Medium (25 - 75% of patients), (4) High (75 - 95% of patients), (5) Very high (greater than 95% of patients)*
	DS_Mrt_Scale	*2002-2007*	*Disease Staging: Mortality Scale*
	DS_RD_Level	*2002-2007*	*Disease Staging: Resource Demand Level : (1) Very low (less than 5% of patients),(2) Low (5 - 25% of patients),(3) Medium (25 - 75% of patients),(4) High (75 - 95% of patients),(5) Very high (greater than 95% of patients)*
	DS_RD_Scale	*2002-2007*	*Disease Staging: Resource Demand Scale*
Linkage Data Elements	HOSPID	2002-2009	HCUP hospital identification number
	KEY	2002-2009	HCUP record identifier

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Table 4. Data Elements in the NIS Diagnosis and Procedure Groups Files

All data elements listed below are available for all States in the 2009 NIS Diagnosis and Procedure Groups files.

Type of Data Element	HCUP Name	Years Available	Coding Notes
Clinical Classifications Software category for Mental Health and Substance Abuse (CCS-MHSA)	*CCSMGN1 – CCSMGN15*	*2005-2006*	*CCS-MHSA general category for all diagnoses*
	CCSMSP1 – CCSMSP15	*2005-2006*	*CCS-MHSA specific category for all diagnoses*
	ECCSMGN1 – ECCSMGN4	*2005-2006*	*CCS-MHSA general category for all external cause of injury codes*
Chronic Condition Indicator	CHRON1 – CHRON25	2005-2009	Chronic condition indicator for all diagnoses: (0) non-chronic condition, (1) chronic condition. Beginning in 2009, the diagnosis array was increased from 15 to 25.
	CHRONB1 – CHRONB25	2005-2009	Chronic condition indicator body system for all diagnoses: (1) Infectious and parasitic disease, (2) Neoplasms, (3) Endocrine, nutritional, and metabolic diseases and immunity disorders, (4) Diseases of blood and blood-forming organs, (5) Mental disorders, (6) Diseases of the nervous system and sense organs, (7) Diseases of the circulatory system, (8) Diseases of the respiratory system, (9) Diseases of the digestive system, (10) Diseases of the genitourinary system, (11) Complications of pregnancy, childbirth, and the puerperium, (12) Diseases of the skin and subcutaneous tissue, (13) Diseases of the musculoskeletal system, (14) Congenital anomalies, (15) Certain conditions originating in the perinatal period, (16) Symptoms, signs, and ill-defined conditions, (17) Injury and poisoning, (18) Factors influencing health status and contact with health services. Beginning in 2009, the diagnosis array was increased from 15 to 25.
Multi-Level Clinical Classifications Software (CCS) Category	DXMCCS1	2009	Multi-level clinical classification software (CCS) for principal diagnosis. Four levels for diagnoses presenting both the general groupings and very specific conditions
	E_MCCS1	2009	Multi-level clinical classification software (CCS) for first listed E Code. Four levels for E codes presenting both the general groupings and very specific conditions
	PRMCCS1	2009	Multi-level clinical classification software (CCS) for principal procedure. Three levels for procedures presenting both the general groupings and very specific conditions
Procedure Class	PCLASS1 – PCLASS15	2005-2009	Procedure Class for all procedures: (1) Minor Diagnostic, (2) Minor Therapeutic, (3) Major Diagnostic, (4) Major Therapeutic

Linkage Data Elements	HOSPID	2002-2009	HCUP hospital identification number
	KEY	2002-2009	HCUP record identifier

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ENDNOTES

[1] Refer to Chapter 10 in Foreman, EK, *Survey Sampling Principles*. New York: Dekker, 1991.

[2] 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.

[3] We used the following American Hospital Association Annual Survey Database (Health Forum, LLC © 2010) data elements 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].

Prior to the 1998 NIS, we used the following SAS code to assign the NIS teaching hospital status indicator, H_TCH:

```
/* FIRST ESTABLISH SHORT-TERM BEDS DEFINITION */
IF BDH NE . THEN BEDTEMP = BDH ;      /* SHORT TERM BEDS */
ELSE IF BDH =. THEN BEDTEMP=BDTOT ;   /* TOTAL BEDS PROXY */

/*****************************************************/
/* NEXT ESTABLISH TEACHING STATUS BASED ON F-T & P-T */
/* RESIDENT/INTERN STATUS FOR HOSPITALS. */
/*****************************************************/
RESINT = (FTRES + .5*PTRES)/BEDTEMP ;
IF RESINT > 0 & (MAPP3=1 OR MAPP8=1) THEN H_TCH=1; /*1=TEACHING */
ELSE H_TCH=0 ;                                     /* 0=NONTEACHING */
```

Beginning with the 1998 NIS, we used the following SAS code 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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[4] Most AHA Annual Survey Database files do not cover a January-to-December period for every hospital. The numbers of hospitals for 1988-1991 are based on adjusted versions of the files which we created by apportioning the data from adjacent survey files across calendar years. The numbers of hospitals for later years are based on the unadjusted AHA Annual Survey Database files.

[5] Table 1: Preliminary Annual Estimates of the Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2010 (NST-PEST2010-01). Source: Population Division, U.S. Census Bureau. Release Date: February 2011.