MAINTAIN AND EXPAND
THE HEALTHCARE COST AND UTILIZATION PROJECT (HCUP)
Contract No. HHSA-290-2006-00009-C

DRAFT HCUP TRANSITIONS PLANS

DELIVERABLES 1830.19, 1830.23, 1830.25 AND 1830.31

THIS IS A REFERENCE DOCUMENT FOR AHRQ HCUP

RFP # 12-10001 AND IS AN ADAPTION OF THE ORIGINAL

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DRAFT HCUP TRANSITION PLANS OVERVIEW

The Agency for Healthcare Research and Quality (AHRQ) has tasked Thomson Reuters with the development of transition plans should the Healthcare Cost and Utilization Project (HCUP) holdings need to be transferred to AHRQ or a subsequent contractor at the close of Project Year 6 (September 26, 2012). Thomson Reuters understands and assumes that transition activities, if employed, would take place during a two-month project close-out and transition period to overlap with any new contract with the goal of transferring HCUP processes and procedures smoothly and with minimal disruption to the project and HCUP data users.

Transition plans for critical HCUP processes, procedures, and tasks requiring ongoing operations are drafted within this document for AHRQ's consideration. They include:

- HCUP Data Inventory, Processing, and Status: The processes and procedures implemented for producing HCUP data are documented. We have provided a current accounting of data files, format, and program output as well as a table showing the processing status of the HCUP State databases as of January 20, 2012. In addition, a proposed plan for transitioning HCUP files is included.

- HCUP Source Data and Derivative Files: Thomson Reuters takes specific actions to ensure the security of source data and derivative files. These practices are outlined, and a plan to securely transition source data is proposed.

- HCUP Central Distributor: A draft plan and timeline for transition of all activities performed by the HCUP Central Distributor are outlined.

- HCUP Technical Assistance: We have included a proposed plan for transitioning technical assistance and support currently provided to HCUP data users by Thomson Reuters.

- HCUP-US Web Site: Steps for transitioning the HCUP-US Web site are provided along with the current technical specifications for the Web site.

Each transition plan envisions two possible scenarios:

"Transition A" assumes that Thomson Reuters is selected as the contractor for the next HCUP contract. As the long-time prime contractor for the project, we would draw on our experience to smoothly continue all HCUP processes, procedures, and project tasks as prescribed in the new contract statement of work.

"Transition B" assumes that Thomson Reuters is not the prime contractor for the next HCUP contract. The plans proposed in this document focus on this scenario and the steps that Thomson Reuters would take to transition project holdings and tasks to either AHRQ or a new contractor.

The plans included in this document are drafts. Thomson Reuters will update these plans as directed by AHRQ and create final versions toward the close of Project Year 6.

DRAFT DATA INVENTORY, PROCESSING, AND STATUS TRANSITION PLAN

Processes and Procedures for Producing HCUP Data

Introduction

The Healthcare Cost and Utilization Project (HCUP) State databases are annual, State-specific files that share a common structure and common data elements. During development, they are subjected to a common set of edits. The databases include comprehensive discharge-level clinical, resource, and demographic information on all patients, regardless of payer, including persons covered by Medicare, Medicaid, private insurance, and the uninsured. The uniform format of the HCUP State databases facilitates multi-State comparisons and analyses. There are three types of HCUP State databases:

- State Inpatient Databases (SID)

- State Ambulatory Surgery Databases (SASD)

- State Emergency Department Databases (SEDD).

Data from the SID are used as the basis for the HCUP Nationwide Inpatient Sample (NIS) and the Kids' Inpatient Database (KID). Data from the SID and SEDD are used as the basis for the Nationwide Emergency Department Sample (NEDS).

The *State Inpatient Databases (SID)* are a collection of State-specific inpatient databases created from data provided by data organizations in participating States. When considered together, the SID encompasses more than 95 percent of all hospitals' discharges in the United States. Some States include discharges from specialty hospitals, such as acute psychiatric hospitals.

The *State Ambulatory Surgery Databases (SASD)* are a collection of State-specific outpatient databases that capture surgeries performed on the same day in which patients are admitted and discharged. All of the databases include discharge records from hospital-affiliated ambulatory surgery sites. Some contain the universe of ambulatory surgery encounter records for that State, including records from both hospital-owned and freestanding surgery centers.

The *State Emergency Department Databases (SEDD)* capture emergency department encounters from data organizations in participating States. The SEDD include administrative data from hospital-affiliated emergency department sites.

The *Nationwide Inpatient Sample (NIS)* is the largest all-payer inpatient care database in the United States. The NIS contains data on all discharges from about 1,000 hospitals located throughout the country, approximating a 20 percent stratified sample of community non-rehabilitation hospitals in the United States. NIS data are available annually from 1988.

The *Kids' Inpatient Database (KID)* is a database of hospital inpatient stays for children. It is the only all-payer inpatient care database for children in the United States and is produced every three years.

The *Nationwide Emergency Department Sample (NEDS)* includes data on emergency department visits from a nationwide sample of almost 1,000 hospital-based emergency departments. The NEDS is the largest all-payer ED database in the United States. It captures

information on ED visits in which the patient was treated-and-released from the ED, transferred to another hospital, admitted to the same hospital for inpatient treatment, or died in the ED.

The following sections detail the process and procedures for producing the HCUP State databases and the nationwide databases (NIS, KID, and NEDS). SAS® is used for all HCUP data processing. Because of the uniform format of the HCUP State databases, the procedures for creating the SID, SASD, and SEDD are identical. In many cases, the SASD and SEDD are developed simultaneously because the source data files include both outpatient data types.

Building the HCUP State Databases

The structure of the HCUP State databases has evolved over time. Starting with the 1998 data, the structure is unified so that the State databases are more flexible, easier to data process and document, and still adhere to all data confidentiality and security requirements. The structure of the HCUP State databases needs to be flexible because the content and layouts of the data provided by the HCUP State Partners change periodically. Being flexible allows State-specific innovations to be incorporated into the coding and availability of data elements. Unifying the database design allows the project to handle multiple types of data in very similar formats. For example, Connecticut provides inpatient, ambulatory surgery, and emergency department data in the same format. This approach also makes adding or modifying HCUP variables relatively simple because changes are made to one master program, but affect every data type. Furthermore, presenting data in the same format simplifies documentation because the description of standard HCUP coding will be identical across all HCUP databases.

After the data are received, building the HCUP State databases is a multi-step process consisting of four key steps performed by a Partner Liaison, a Analyst, a Programmer, and Project Coordinators.

- Receive the source data files.

- Examine the data and decide how to load it and map it into the HCUP uniform format according to the specifications – the Processing Specifications and Preprocessing.

- Create the HCUP SAS files utilizing a large collection of SAS macros that are executed based on State-specific macros flags – the SAS Master Processor.

- Prepare data and documentation deliverables.

Each step in this process is described below.

STEP 1: RECEIVE THE SOURCE DATA FILES

Upon receipt of data, the HCUP Partner Liaison checks the data into the HCUP Automated Library (HAL), using the HAL Data Check-in Form.

The procedures for handling the source data include the following:

- Upon initiation of a new record, HAL auto-generates a unique Tracking ID Number (TIDN). Each individual CD/DVD receives a unique TIDN. Additionally, the HCUP Partner Liaison assigns a VOLSER (CD/DVD name including the State, data type, and year) to each individual CD/DVD, which is input into the corresponding entry in HAL. Additional information such as data year(s), data type, file names, and comments are entered.

- After the HCUP Partner Liaison completes data check-in, including loading the electronic files onto the HCUP Processing Server, HAL automatically generates and sends an e-mail to the appropriate State Team and the HCUP Data Coordinator to confirm that the data is available.

- The number of records in the file on the server is compared to the record count provided by the State.

- The first 100-500 records are examined to ascertain if there are gross errors in the data file. This includes identifying a blank file, an unreadable data set, or a record layout that is shorter or longer than expected.

The procedures for handling the source documentation include the following:

- Original documentation is placed on the LAN in a State specific folder according to the applicable data year. Additionally, a copy of the documentation is loaded to Alfresco and the HCUP Wiki.

- Copies of documentation are inserted into the State-specific processing binder and distributed to AHRQ.

If there is a problem with either the source data or the documentation, the HCUP Partner Liaison is asked to contact the State to obtain additional information and/or replacement data. Steps for data check-in are repeated when the replacement data is received. The time that it takes to resolve a problem can vary greatly. If the Partner has corrected data immediately available, then a replacement file is usually received in a couple of days. If the Partner needs to get additional information from hospitals or has limitations on how quickly they can recreate the data file, then replacement data can take one to two months.

STEP 2: PROCESSING SPECIFICATIONS AND PREPROCESSING

After the source data are checked in and verified as readable, the Analyst creates instructions for the Programmer explaining how to load the data elements and process the source data files into a uniform HCUP format. The Analyst uses the source documentation as well as processing instructions from previous years processing to begin writing the programming specifications. The Analyst notes any changes to the file structure such as:

- new or discontinued data elements

- changed coding practices

- missing or unusually low discharge counts for any data element.

The next step is for the Programmer to load the source data into SAS using the Preprocess.sas program. The Programmer uses the latest version of the Preprocess.sas program found on one of the HCUP application servers. The processing specifications are referenced at this time in case any special handling is required during the SAS load. The Programmer ensures that the SAS input statement loads the correct variables from the correct positions, using the correct SAS informats and variable types. If the source data is provided in SAS, then the programmer writes SAS code to rename the data elements to HCUP standards.

The Preprocess.sas program reports summary means and frequencies on certain data elements. It also checks the loaded data elements against a database of restrictions requested by the HCUP partners (the Data Element Library (DEL)). If any data anomalies are found, such

as data elements with strange values, the Programmer works with the Analyst to either document or investigate the problem. Any differences between the data and the specifications are also discussed at this time. If the Programmer encounters any data elements that the Partner does not allow, or there are required data elements missing, the Analyst is notified in order to investigate and make corrections.

STEP 3: SAS MASTER PROCESSOR

To ensure uniformity across States and data types, a master SAS processor program (the *Master Processor*) was developed with numerous, shared macro routines that were written to accommodate the different scenarios for recoding State data into a uniform format. For example, the routine to recode the reported date of birth into the HCUP variable DOB accommodates either dates with four-digit birth years or dates with two-digit birth years, with or without an indicator for birth century. When a new type of recode is necessary, the Master Processor is updated accordingly. This ensures that any other State that may need the same type of recode is treated uniformly.

The Master Processor program is an extremely complex program composed of three distinct components. These components include:

- The Driver Program, which provides the overall organizing structure of the program, the input and output locations, and the calls to bring together the other program components.

- The Parameter File, which contains the State-specific program components including some absolute macro variables that cannot be set by the main processor code and code segments to translate source data into standard HCUP coding.

- The HCUP-specific SAS Macros, which are centrally managed, shared code providing the majority of data transformation, validation, and reporting functions.

This structure was developed with maximum flexibility to allow for variations in source data while affording consistency and efficiency by using standard code from a central repository.

It should be noted that each year AHRQ reviews a list of proposed changes to the Master Processor. The list is a compilation of suggestions and contains an estimate of the level of effort. AHRQ decides which of the updates should be funded. In addition to this annual update to the Master Processor, AHRQ may periodically request additions and/or changes.

The Programmer updates the State's Parameter File, guided by instructions found in the Programming Specifications. Programmers are no longer required to set a long list of macro variable flags for each data element provided in the Parameter file. The current processing software sets the macro flags automatically by detecting standard HCUP input variables loaded during the preprocessing step. Programmers still update a small number of macros used to describe specific values or attributes of the input data. Finally, State-specific recode macros found in the processing specs are also added or updated in the Parameter file. For example, the r_zip macro is updated to recode source ZIP Code values for "homeless" and "foreign" to the appropriate uniform HCUP value of "H" for "homeless" and "F" for "Foreign," respectively.

After updating the Parameter File, the Programmer also adapts the standard driver program that reads the State-specific Parameter File and provides direction for executing the SAS macros.

The Programmer runs the Processor and checks to make sure there are no errors in the SAS log or in the many reports created by the processor. Such reports include:

- An inventory of the data elements in the file (SAS Proc Contents)
- A "Mini" Exception Report listing the HCUP edit checks and the number and percentage of records that failed the edits for the current and previous year
- An enumeration of the hospitals and the number of discharges by month
- A sample print of records.

The Master Processor automatically creates self-extracting, compressed (ZIP) files of the data for delivery at this stage.

At this stage, the Programmer informs the Analyst that the processing run is ready for a technical review, and the Analyst contacts one of the Programmers from another team to do this review. This is known as the processing review, where the reviewing programmer follows a series of instructions on how to quality check the SAS code using an online form found in the HAL tracking system. The programming specifications and the SAS programs are usually used by the reviewer at this stage. The HAL system provides checklists for the reviewer to look at such things as:

- Make sure the files are loaded into SAS correctly during preprocessing.
- Make sure all recode instructions in the processing specs are followed exactly.
- Make sure the observation counts found on the final output files are correct.
- Make sure there are no SAS errors in the SAS log.
- Make sure the output data look reasonable and complete.

When the reviewer is satisfied that the SAS code follows the instructions correctly, HAL is updated and the processing run is documented as having "passed." An automated e-mail is sent to the team at this point and the Analyst can now run the Data Review process.

The Analyst looks at the output data from the processing run. To assist in the review of the data, that Analyst will reference the various summary reports created by the Master Processor, as well as a checklist of items in the HAL Analyst Review section for the State:

- *Summary Statistics*, lists means and frequencies on all variables.
- *The Exceptions Report*, lists critical input and output data elements for discharges that fail an edit check. To ensure that a range of exception records can be examined, no more than five discharges from a hospital are displayed.
- *The Review Aid*, compares this year's data to last year's data and documents differences in the distribution and presence of data elements.

By reviewing these reports together, the Data Analyst ensures that HCUP processing is consistent and accurate. Once this is done, and the Data Analyst has updated the Analyst Review portion of the HAL checklist, the Analyst Review is "passed."

An automated e-mail message is sent to the processing team at this point. The Partner Liaison then performs the Data Review, a check that ensures that variables found on the output data files are allowed by the Partner. The Partner Liaison compares the Partner Memorandum of

Agreement (MOA) to the SAS Proc Contents of the HCUP output data files to complete this step. When the Liaison is satisfied that the data are allowed by the Partner, he/she updates the HAL system and passes the review. An automated e-mail is sent out to the team notifying them of the status.

The Analyst takes one final look at the files and any MOA notes made by the Liaison. The Analyst repeats the process the Liaison just performed above in what is known as the Final Review. The Analyst then passes the review in the HAL tracking system. Processing is now complete and an automated e-mail is sent to the Project Coordinators to begin delivery procedures.

For inpatient data only, a special Rotavirus program is run to extract discharges of interest: children with diagnoses of diarrhea and intussusception. These files are provided separately to AHRQ for use in collaboration with researchers from the National Institute of Allergy and Infectious Diseases.

STEP 4: PREPARE DATA AND DOCUMENTATION DELIVERABLES

The ZIP files of the password-protected SAS HCUP State databases are copied onto DVDs for delivery to AHRQ by a Project Coordinator. DVD names and contents are tracked in the Catalog of Deliverable CDs Excel document. Documentation for the HCUP State databases is posted on HCUP-US by a Project Coordinator and can be displayed across States within a data year or across years within a State. Documentation includes the following:

- File Composition – information pulled from the Recruitment database on the data organization that supplied the data to HCUP, the type of hospitals included in the State database, and the exclusion of records during HCUP processing.

- Description of Data Elements – information extracted from the Processing Specifications concerning State-specific idiosyncrasies.

- Summary Statistics – generated by SAS and stored in PDF format.

- Data Processing Programs – copies of the State- and year-specific Parameter Files and any special State-specific subprograms.

- File Information – generated by SAS and including filenames, passwords, the number of records, and the number of observations.

HCUP Processing Flowchart

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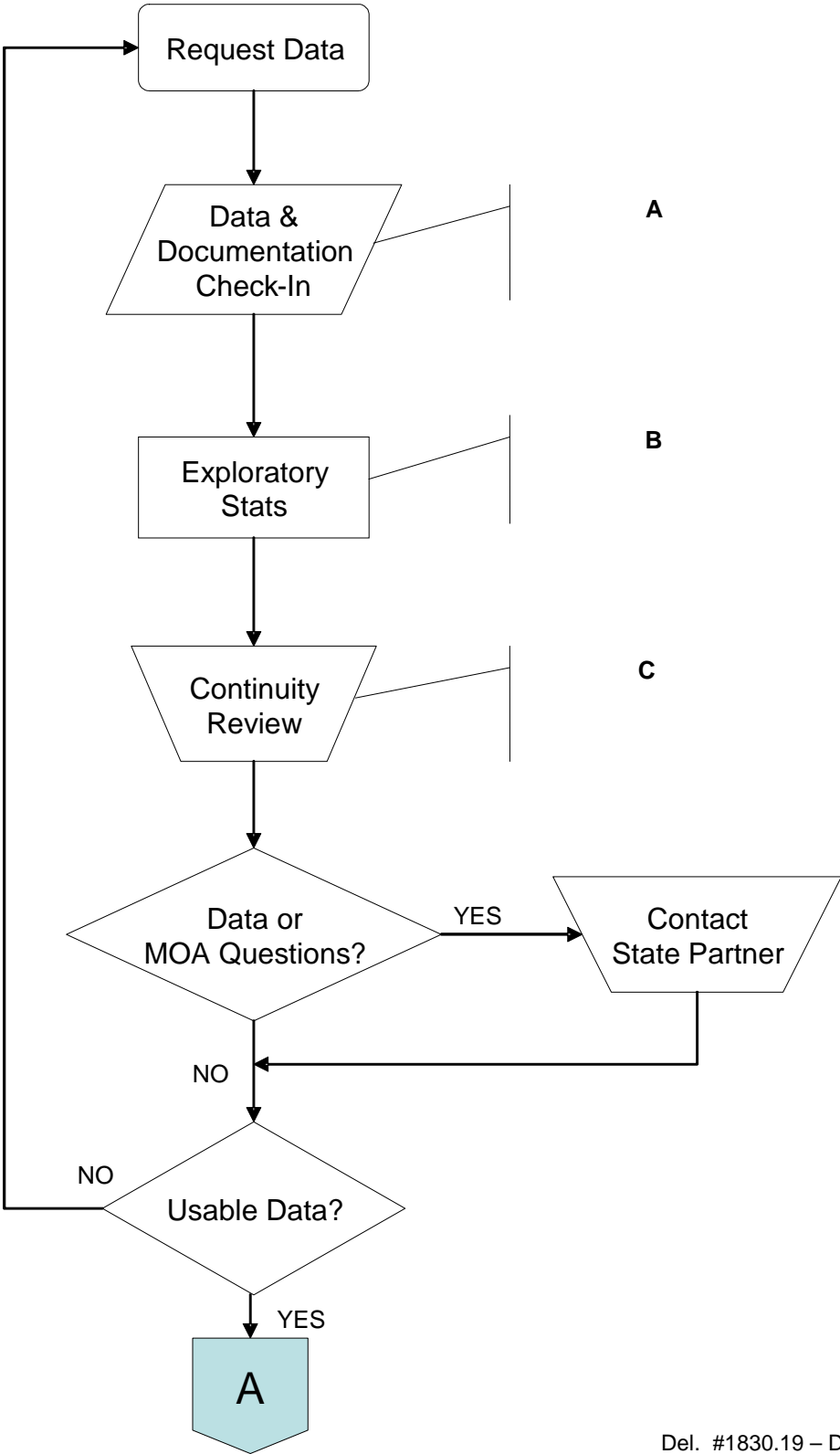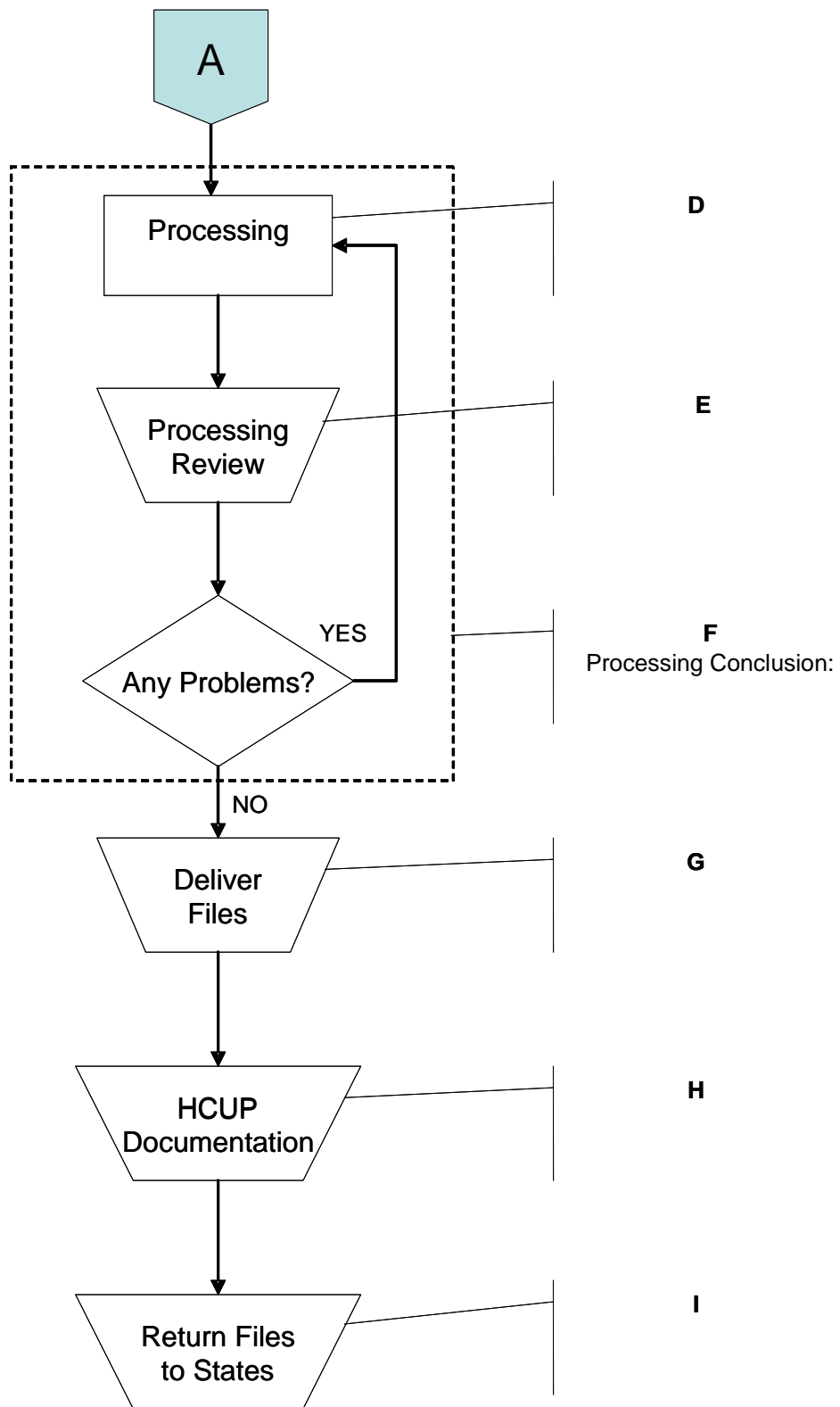
<u>Building the Nationwide Inpatient Sample</u>

Building the Nationwide Inpatient Sample (NIS) is a multi-step process consisting of four key components:

- Developing the sampling frame and selecting the sample from available State data

- Extracting the appropriate data from the HCUP SID into one nationwide database

- Creating weights for calculating national estimates from the database

- Delivering the HCUP database to AHRQ.

Following is a general description of each step. A copy of the 2009 NIS Logistics that details the specific procedures followed to create the 2009 NIS is provided as a separate document.

STEP 1: DEVELOP THE SAMPLING FRAME AND SELECT THE SAMPLE

The universe of hospitals for the NIS is defined as all U.S. hospitals that are designated as community, non-rehabilitation hospitals[1] in the American Hospital Association's (AHA) Annual Survey Database. The AHA defines community hospitals as "all non-Federal short-term general and other specialty hospitals, excluding hospital units of institutions." The universe of U.S. community, non-rehabilitation hospitals is divided into strata using five hospital characteristics:

- Geographic Region – Northeast, Midwest, West, and South

- Control – government non-Federal, private not-for-profit, and private investor-owned

- Teaching Status – teaching or non-teaching

- Location – urban or rural

- Bed size – small, medium, and large. Bed size categories are based on hospital beds and are specific to the hospital's region, location (urban or rural), and teaching status.

Beginning with the 1998 NIS, the stratification design was updated with revised definitions of teaching hospitals, bed size ranges, and ownership/control.

The NIS sampling frame is constructed from the subset of community, non-rehabilitation hospitals in States that participate in HCUP. State-specific restrictions sometimes limit the sampling frame. For example, Illinois' restriction stipulating that no more than 40 percent of their data appear in any discharge quarter of the NIS impacts the sampling frame in the Midwest. As State participation increases, the size of the sampling frame also increases.

The NIS is a stratified probability sample of hospitals in the frame, with sampling probabilities calculated to select 20 percent of the universe contained in each stratum.

Work begins on sampling about three to four months prior to the expected date of completion. The decision on which States will be able to contribute data to the NIS greatly affects the sampling strategy. In some cases, HCUP States are dropped from the NIS sampling frame because the inpatient database will not be available in adequate time or because key data elements, such as charges, are not available for a given year.

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[1]From 1988-1997, community rehabilitation hospitals are included in the NIS. Beginning with the 1998 NIS, community rehabilitation hospitals are excluded.

STEP 2: EXTRACT THE DATA FROM THE HCUP STATE INPATIENT DATABASES INTO ONE NATIONWIDE DATABASE

All discharge records from the sampled hospitals are extracted from the SID into one nationwide database. For each State, the following sequence occurs:

- Records are selected from sampled community hospitals.

- Variables that are available in the SID, but not included in the NIS, are removed from the file.

- Variables that are only available in the NIS (e.g., elective versus non-elective admission) are added.

- Diagnosis and procedure arrays are truncated or padded with blanks so that all States have 25 diagnoses and 15 procedures.

- State-specific restrictions are applied.

- The nationwide files are sorted by the HCUP hospital identifier (HOSPID) and discharge quarter (DQTR).

State-specific restrictions sometimes limit the coding of variables. To ensure the confidentiality of hospitals, some States request that any variable that might be used to identify a hospital be set to *missing* in the NIS. This includes the hospital identifier provided by the State data organization, the hospital identifier used by the American Hospital Association, and the hospital's State county FIPS code. To ensure the confidentiality of patients or physicians, other States require specific data elements be set to *missing* for all NIS discharges from their State.

STEP 3: CREATE THE NIS WEIGHTS FILE

The NIS Weights File contains stratum variables and sample weights that can be used to obtain national estimates. Sample weights are developed separately for hospital- and discharge-level analyses. Hospital-level weights are developed to weight NIS sample hospitals to the universe of AHA community, non-rehabilitation hospitals. Similarly, discharge-level weights are developed to weight NIS sample discharges to the universe of AHA community, non-rehabilitation discharges. Weights are created based on AHA's Annual Survey data and are adjusted for missing quarters of discharge data.

STEP 4: CREATE DELIVERABLE NIS FILES

The NIS data files are stored in SAS format for intramural use at AHRQ and exported into ASCII format for restricted access public release. Copies of the SAS and ASCII files are provided to AHRQ on CD-ROM.

Building the Kids' Inpatient Database

Building the Kids' Inpatient Database (KID) is a multi-step process consisting of four key components:

- Developing the sampling frame

- Extracting the appropriate sample data from the HCUP SID into one nationwide database

- Creating weights for calculating national estimates from the database

- Delivering the HCUP database to AHRQ.

Following is a general description of each step. The 2009 KID Logistics that details the specific procedures followed to create the 2009 KID is provided as a separate document.

STEP 1: DEVELOP THE SAMPLING FRAME

The universe of hospitals for the KID is defined as all U.S. hospitals that are designated as community, non-rehabilitation hospitals[2] in the American Hospital Association's (AHA) Annual Survey Database. The AHA defines community hospitals as "all non-Federal short-term general and other specialty hospitals, excluding hospital units of institutions." The universe of U.S. community, non-rehabilitation hospitals is divided into strata using five hospital characteristics:

- Geographic Region – Northeast, Midwest, West, and South
- Control – government non-Federal, private not-for-profit, and private investor-owned
- Teaching Status – teaching or non-teaching
- Location – urban or rural
- Bed size – small, medium, and large. Bed size categories are based on hospital beds and are specific to the hospital's region, location (urban or rural), and teaching status.

Beginning with the 2000 KID, the stratification design was updated with revised definitions of teaching hospitals, bed size ranges, and ownership/control.

The KID sampling frame is constructed from the subset of community, non-rehabilitation hospitals in States that participate in HCUP. State-specific restrictions sometimes limit the sampling frame. For example, Illinois' restriction stipulating that no more than 40 percent of their data appear in any discharge quarter of the KID impacts the sampling frame in the Midwest. As State participation increases, the size of the sampling frame also increases.

Work begins on sampling about three to four months prior to the expected date of completion. The decision on which States will be able to contribute data to the KID greatly affects the sampling strategy. In some cases, HCUP States are dropped from the KID sampling frame because the inpatient database will not be available in adequate time or because key data elements, such as charges, are not available for a given year.

STEP 2: EXTRACT THE SAMPLE DATA FROM THE HCUP STATE INPATIENT DATABASES INTO ONE NATIONWIDE DATABASE

The KID includes a stratified sample of pediatric discharges from all hospitals in the sampling frame. It includes a 10% stratified sample of uncomplicated births and an 80% stratified sample of other pediatric discharges. Beginning with the 2000 KID, pediatric discharges were defined as having an age at admission of 20 or less. (The 1997 KID included discharges with an admission age of 18 or less.) Discharges with missing, invalid, or inconsistent ages are excluded. The sampled discharge records are extracted from the SID into one nationwide database. For each State, the following sequence occurs:

- Sampled records are selected from the SID.

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[2]For 1997, community rehabilitation hospitals are included in the KID. Beginning with the 2000 KID, community rehabilitation hospitals are excluded.

- Variables that are available in the SID, but not included in the NIS, are removed from the file.

- Variables that are only available in the KID (e.g., elective versus non-elective admission) are added.

- Diagnosis and procedure arrays are truncated or padded with blanks so that all States have 25 diagnoses and 15 procedures.

- State-specific restrictions are applied.

- The nationwide files are sorted by the HCUP hospital identifier (HOSPID) and discharge quarter (DQTR).

State-specific restrictions sometimes limit the coding of variables. To ensure the confidentiality of hospitals, some States request that any variable that might be used to identify a hospital be set to *missing* in the KID. This includes the hospital identifier provided by the State data organization, the hospital identifier used by the American Hospital Association, and the hospital's State county FIPS code. To ensure the confidentiality of patients or physicians, other States require specific data elements be set to *missing* for all KID discharges from their State.

STEP 3: CREATE THE KID WEIGHTS FILE

The KID Weights File contains stratum variables and sample weights that can be used to obtain national estimates. Sample weights are developed separately for hospital- and discharge-level analyses. Hospital-level weights are developed to weight KID sample hospitals to the universe of AHA community, non-rehabilitation hospitals. Similarly, discharge-level weights are developed to weight KID sample discharges to the universe of AHA community, non-rehabilitation discharges. Weights are created based on AHA's Annual Survey data and are adjusted for missing quarters of discharge data.

STEP 4: CREATE DELIVERABLE KID FILES

The KID data files are stored in SAS format for intramural use at AHRQ and exported into ASCII format for restricted access public release. Copies of the SAS and ASCII files are provided to AHRQ on CD-ROM.

Building the Nationwide Emergency Department Sample

Building the Nationwide Emergency Department Sample (NEDS) is a multi-step process consisting of four key components:

- Identifying trauma hospitals

- Extracting the appropriate data from the HCUP SEDD and SID into one multi-State ED database

- Developing the sampling frame and selecting the sample from available State data

- Creating weights for calculating national estimates from the database

- Delivering the HCUP database to AHRQ.

Following is a general description of each step. The 2009 NEDS Logistics that details the specific procedures followed to create the 2009 NEDS is provided as a separate document.

STEP 1: IDENTIFY TRAUMA HOSPITALS

For the NEDS, trauma centers treating adults and children are identified through the Trauma Information Exchange Program database (TIEP), a national inventory of trauma centers in the U.S. Information is collected by the American Trauma Society and the Johns Hopkins Center for Injury Research and Policy and funded by the Centers for Disease Control and Prevention. Hospital name and address with the AHA identifier are used to match trauma centers listed in TIEP to HCUP. TIEP does not consistently include information on trauma centers within children's hospital, so information from TIEP, American College of Surgeons' Committee on Trauma (ACS/COT) and State-specific Web sites on trauma certification are used to identify trauma centers within children's hospitals and their associated trauma levels.

STEP 2: EXTRACT THE DATA FROM THE HCUP STATE EMERGENCY DEPARTMENT DATABASES AND STATE INPATIENT DATABASES INTO ONE MULTI-STATE EMERGENCY DEPARTMENT DATABASE

All records from the SEDD and ED admissions (identified by HCUP_ED > 0) from the SID from the same set of States are extracted from the SID into one multi-State ED database. For each State, the following sequence occurs:

- Variables that are available in the SEDD and SID, but not included in the NEDS, are removed from the file.

- Variables that are only available in the NEDS (e.g., type of ED event, disposition from the ED) are added.

- Diagnosis and procedure arrays and related variables such as Clinical Classification Software (CCS) are truncated or padded with blanks so that all States have 15 diagnoses, 15 ICD-9-CM procedures, and 15 CPT procedures.

State-specific restrictions on data elements are minimal on the NEDS because the database was designed to not identify hospitals or States.

STEP 3: DEVELOP THE SAMPLING FRAME AND SELECT THE SAMPLE

The universe of hospital-based EDs for the NEDS is defined as all U.S. hospital-based EDs in community, non-rehabilitation hospitals in the American Hospital Association's (AHA) Annual Survey Database. The universe of U.S. community, non-rehabilitation hospitals is divided into strata using five hospital characteristics:

- Geographic Region – Northeast, Midwest, West, and South

- Trauma designation – Trauma level I, II, or III

- Location – large metropolitan, small metropolitan, micropolitan, and non-urban residual

- Teaching Status – teaching or non-teaching within metropolitan areas

- Control – government non-Federal, private not-for-profit, and private investor-owned.

The NEDS sampling frame is constructed from the subset of hospital-based EDs in States that provide inpatient and treat-and-release ED data to HCUP. As State participation increases, the size of the sampling frame also increases.

The NEDS is a stratified probability sample of hospital-based EDs in the frame, with sampling probabilities calculated to select 20 percent of the universe contained in each stratum. Work

begins on sampling about two to three months prior to the expected date of completion. The time frame is shorter than the NIS because there are economies from using AHA and SID summary files developed during the creation of the NIS.

For confidentiality of hospitals, if there is a "unique" hospital-based ED in a State, it is excluded from the NEDS sampling frame. "Unique" is defined as the only ED in the State universe for a stratum. For example, if there is only one rural, non-teaching, trauma level III hospital-based ED in a State, then it is excluded from the sampling frame. The NEDS contains all of the ED visits (treat-and-release and admitted) for the sample of hospital-based EDs selected.

STEP 4: CREATE THE NEDS WEIGHTS FILE

The NEDS Weights File contains stratum variables and sample weights that can be used to obtain national estimates. Sample weights are developed separately for ED- and discharge-level analyses. ED-level weights are developed to weight NEDS sample EDs to the universe of AHA hospital-based EDs. Similarly, discharge-level weights are developed to weight NEDS sample discharges to the universe of AHA hospital-based ED events. Weights are created based on AHA's Annual Survey data and are adjusted for missing quarters of data.

STEP 5: CREATE DELIVERABLE NEDS FILES

The NEDS data files are stored in SAS format for intramural use at AHRQ and exported into comma-delimited version (CSV) format for restricted access public release. Copies of the SAS and CSV files are provided to AHRQ on DVD.

The following sections provide additional detail about the process and procedures for producing the HCUP State databases, the NIS, the KID, and the NEDS.

Quality Control Procedures for Comparing Data Elements Received From States Against State MOA

This section describes the quality control procedures employed to compare supplied data to the list of data elements States agree to send to HCUP. This comparison will ensure that HCUP receives all of the data elements expected from each Partner State, that there is follow-up if data elements are missing from the supplied files, and that clarification on the use of the data is obtained from Partners if additional data elements (not listed in the agreements) are included on supplied data.

AHRQ executes a Memorandum of Agreement (MOA) with each Partner organization that indicates data elements that will be supplied to HCUP. In older versions of the MOA, Partners crossed out and initialed standard data element lists for inpatient, ambulatory surgery, and emergency department data, which were attached to the HCUP MOA. In the newer "short form" MOA, Partners only list restricted data elements. Using the MOA, the expected data elements for each HCUP database are entered into the Web-based Data Element Library (DEL). This database tracks the start and stop year for every HCUP data element for every HCUP Partner in every HCUP database. DEL can be used to view which States release which data elements (HTML and PDF versions) and can also be used to download electronic copies of the data element lists in Excel format. The electronic copies are then used for an automated check of data elements included in the HCUP intramural and Central Distributor (CD) databases. These checks are described below.

INTRAMURAL STATE DATABASES – PRIOR TO RECEIVING DATA

- Liaisons request new data elements for the upcoming data year, if appropriate.

    a. If Partner indicates they will provide new data elements, liaison will add Start Dates to DEL.

INTRAMURAL STATE DATABASES – DATA RECEIVED

- Upon receipt of State-level inpatient or outpatient data, Liaisons download the DEL Excel file. Data elements with a Start Date and no Stop Date (data elements approved through the previous year) are to be included in the intramural files.

Analysts generate a "MOA Check" report which compares the DEL list to the provided data file:

    a. Error 1: Data elements in the Partner file but not active in DEL.

    b. Error 2: Data elements in DEL but not in the Partner file.

Resolution for Error 1: If a data element is in the file and not active in DEL (no Start Date: or Start Date and Stop Date):

    a. Liaison and Analyst determine if Partner permission is required to receive the data element.

    b. Liaison will notify team if permission is obtained or denied.

        i. If Partner permission is obtained (or no permission is necessary), the start date for the data element is added to DEL.

        ii. If Partner permission is denied, the data element is not loaded into the HCUP intramural file.

Resolution for Error 2: If a data element is active in DEL but not on the file (Start Date and no Stop Date) and approved on MOA:

    a. Liaison and Analyst determine if Partner should be contacted to request replacement data.

    b. If Partner indicates they will no longer provide the data element, Liaison will add Stop Date to DEL and document in Wiki Decision Log.

INTRAMURAL STATE DATABASES – FINAL FILES

- Liaisons perform a final and last check of the data elements on the processed intramural State databases versus the data elements listed in DEL.

HCUP CENTRAL DISTRIBUTOR (CD) STATE DATABASES

- Central Distributor letters are sent to Partners showing the new intramural data elements each year and requesting permission to release in the Central Distributor version.

    a. If the Partner approves a new data element, the liaison will enter the Start Date into DEL and notify the HCUP Central Distributor Task Lead to double check it.

For a new Partner, a list of data elements that are contained in the intramural databases will be generated by DEL. That list will be sent to the Partner to select which data elements will be released on the Central Distributor databases.

Analysts perform a final check of the data elements on the Central Distributor databases versus the data elements listed in DEL.

Risks

This system will only work to the extent that a fully executed MOA is completed before source data files are received. Three of the four new States for the 2000 data year provided data files before their MOAs were fully executed, in most cases returning the signed MOA with their data shipment. If data is processed without an executed MOA, then there is the risk that the HCUP data files will include data elements that are subsequently restricted from inclusion by the data organization. It is advisable to hold the processing of such files until the data acquisition team has completed the MOAs.

HCUP Master Processor

Thomson Reuters maintains a catalog of HCUP Master Processing Programs, Macros, Include files, and Formats. Upon direction from AHRQ, this catalog can be provided to AHRQ or a new contractor to facilitate a transition.

<u>HCUP Quality Control Procedures</u>

This section describes the procedures used to assess data quality for each data source participating in HCUP.

QUALITY CONTROL PHILOSOPHY

Edit procedures were applied to HCUP data. Editing followed explicit rules:

- Make the data usable without extensive further editing.

- Confirm that data values are valid, internally consistent, and consistent with established norms, when feasible.

- Use some edit procedures to set questionable and inconsistent values to inconsistent (.C or negative 6-filled). Use other edit procedures only to tabulate edit failures. Use the latter to evaluate whether systematic problems exist.

- Never "fix" or impute data. Set invalid or inconsistent values to special missing values. This preserves the Analyst's ability to investigate data anomalies.

- Some data elements are more important than others because:

    o   they are coded more reliably because they relate to reimbursement; and

    o   without these data elements, a discharge record is not useful for most analytic purposes.

    Therefore, values of these data elements should be retained even in the presence of conflicting information. In order of importance, these data elements are:

    1. Discharge date (and within discharge date: year, month, and day)

    2. Admission date

    3. Principal diagnosis

    (Note: dates are not released on the HCUP databases, but these variables are used to create and verify other data elements such as length of stay and age.)

- Tabulate instances of edit failures and use these to assess data quality for each data source.

QUALITY REVIEW

The following statistics were reviewed by an independent contractor for each year and data source (or for each different layout if the source changed file layouts during the year):

- For all numeric data elements - means, number of missing and no-missing values, minimum, and maximum.

- For all categorical and some continuous data elements - frequency distributions.

- For closely related data elements (e.g., admission source compared to admission type) - cross frequencies.

AUTOMATED QUALITY CONTROL PROCEDURES

The following procedures were applied to each discharge record:

- To assess validity of values –

  For numeric data:

    o Verify numeric data as numeric.

    o Check the range against legal values documented by the data source.

    o Check the range against standard norms (e.g., length of stay is a non-negative value; age in years is between 0 and 124, the maximum allowed by the DRG grouper).

    o Check the values against the maximum allowed for the data element (e.g., birth weight less than 20 pounds).

  For character data:

    o Verify against norms, when feasible (e.g., diagnosis codes and procedure codes).

- To assess internal consistency -

  Compare values of related data elements (e.g., a procedure of hysterectomy should appear with a sex of female; admission date should occur before discharge date).

  If an inconsistency involves a critical data element (such as discharge date, admission date, or principal diagnosis), retain the critical data element according to the established hierarchy. For example:

    o If discharge date falls before admission date, retain discharge date and set admission date and length of stay to inconsistent (.C or negative 6-filled).

    o If discharge date is invalid (e.g., February 30), retain discharge quarter and discharge year.

- To assess consistency with established norms –

  Compare values to an established norm (e.g., maternal diagnoses should occur with an age between 10 and 55 years).

INTRODUCTION

To ensure a smooth transition of HCUP processes and services at the end of the current HCUP contract in September 2012, this section addresses Thomson Reuters plan specific to final HCUP data files, formats, data they were created from, final program output, documentation, and final supporting databases. As noted previously, this plan includes two options:

- "Transition A" assumes that Thomson Reuters is selected as the contractor for the next HCUP contract.

- "Transition B" assumes that Thomson Reuters is not the prime contractor for the next HCUP contract.

TRANSITION A: THOMSON REUTERS IS CONTRACTOR ON SUBSEQUENT CONTRACT

Should the new contract be awarded to Thomson Reuters, staff will resume the development of HCUP databases in accordance with the new scope of work. Continuity of data processing will be maintained as Thomson Reuters has already established procedures for efficiently and securely acquiring, processing, documenting, and storing project files.

TRANSITION B: THOMSON REUTERS IS NOT THE HCUP CONTRACTOR

Following are Thomson Reuters recommendations for the secure transfer of HCUP data files in the event that the succeeding HCUP contract is awarded to a different contractor. Files include:

- HCUP final data files, formats, final program output, documentation, and supporting databases (collectively referred to as "files"), and

- Source data, including both electronic and physical media.

We have three goals to facilitate an efficient and secure transfer process:

- Reduce the number of HCUP files.

- Destroy source media.

- Limit the number of source data files to be transferred.

Thomson Reuters maintains a vast number as well as different types of project files. Currently over 500,000 HCUP files are stored on servers at Thomson Reuters Santa Barbara, CA office. Categorizations and types of project files are described earlier in this document to facilitate decisions about which files should be transferred and which should be deleted at the close of the contract. We suggest making three copies of all files that are selected for transfer utilizing Thomson Reuters current tape back-up system and CA ARCserve Backup software, version 12.5. Thomson Reuters would plan to securely send one copy of the files to a new contractor, one copy to AHRQ, and would retain one copy should the new contractor or AHRQ require a replacement copy of the files. If not needed, Thomson Reuters would delete the third copy at the close of the two-month transition period. In order to receive and read the files, the new contractor would need the same or compatible backup software and hardware to read a LTO tape drive.

Because of security considerations, we suggest transferring only the minimum necessary source data. Thomson Reuters currently holds source data back to 2008. We recommend

destroying all 2008 and 2009 source data and transferring only 2010 source data as well as the portion of 2011 data received to date. It is expected that not all 2011 data will have been received by the time the transition would occur. Recommended steps for the transfer of source data specifically are outlined in the "Source Data" section of this document. This plan addresses the transfer of all other files.

Thomson Reuters performs incremental backups of project files on HCUP servers in the Santa Barbara office nightly and full back-ups are performed weekly and monthly. Additional back-ups are stored offsite for disaster recovery purposes. These backups include all HCUP data and program files, excluding source data. We recommend destroying all file back-ups rather than transferring them.

The HCUP-US Web site serves as the electronic documentation system for final work products, which include contractual deliverables stored on the password-protected side of the Web site and work products that are stored on the publicly accessible side of the Web site. A separate transition plan, included within this document, has been developed for transfer of the documentation files stored on the HCUP-US Web site.

This plan does not include transition of other Web-based applications developed by Thomson Reuters over the course of the current HCUP contract including the HCUP Automated Library (HAL), the HCUP Wiki, and Alfresco. These applications, which are used internally for interim work products, would not be appropriate for transfer. We assume a new contractor would utilize their own internal systems.

We propose to trim and ultimately destroy all hard copy documentation. All hard copy project documents will have already been provided to AHRQ or they will not be relevant under a new contract.

To efficiently and securely transfer HCUP files to a new contractor, Thomson Reuters would follow specific procedures. These procedures as well as our assumptions are outlined below.

- The transfer of project files will occur within the first month of the two-month transition period to allow adequate time for the transfer and confirmation of receipt. Per direction from AHRQ, we would transfer the files to AHRQ directly or to a designated recipient at the new contractor.

- Project files stored on servers in Thomson Reuters Santa Barbara office will be copied to approximately 12 tapes, which will be encrypted and shipped to the new contractor or AHRQ. The shipment will be tracked, and Thomson Reuters will request that the recipient confirm receipt of the tapes. We will provide AHRQ or the new contractor with the password by an alternate method of communication.

- Thomson Reuters will destroy all back-up copies of project files.

- Following transfer and confirmation of receipt of the project files, Thomson Reuters will provide a memo to AHRQ certifying the final disposition of data holdings.

The specific responsibilities of each organization are as follows:

- *AHRQ:* Provide direction to Thomson Reuters regarding the preferred recipient for the project files (AHRQ or new contractor).

- *Thomson Reuters:* Copy project files for transfer to tapes, which will be encrypted for security. Ship the tapes to the designated recipient with tracking. Separately, provide the password to the designated recipient. Destroy back-ups of project files. Deliver a

memo to AHRQ certifying the final disposition of data holdings after files have been transferred to the appropriate recipient and receipt confirmed.

- *New Contractor:* If AHRQ prefers that the project files be transferred to the new contractor, provide contact information for the designated recipient. Confirm receipt of tapes and ability to successfully extract files.

(The rest of this section intentionally left blank.)

Procedures for Securing Source Data
                                                                              and Derivative Files

DRAFT HCUP CENTRAL DISTRIBUTOR TRANSITION PLAN

Introduction

Described in this section are the steps necessary to transition the HCUP Central Distributor at the end of the current HCUP contract in September 2012. It is intended to serve as a draft plan and will be refined after the contractor for the new HCUP contract is announced.

Before we can discuss how to transition the Central Distributor, it is important to understand its components. A brief description of the services, equipment, and materials that Social & Scientific Systems, Inc. (SSS) provides to operate the Central Distributor follows. Each of these components of Central Distributor operations will need to be addressed during closeout of the current contract and transition to a new contract.

1. Communications

SSS currently maintains a toll-free telephone number, a toll-free fax number, a fax machine, and an e-mail address exclusively for Central Distributor business. An ordering and payment Web site is under development and is currently scheduled to be deployed in June 2012.

2. Master Files

Currently on file at SSS are:

- More than 1,000 master CDs and DVDs containing data and documentation for databases released through the Central Distributor.

- Electronic copies of and labels for the master CDs and DVDs. These electronic files are on the hard drive of the stand-alone CD/DVD duplicator/printer.

- A data delivery log.

- Letters of transmittal from Thomson Reuters.

- Electronic masters for binder covers and spines, flyers, database Introductions and Data Use Agreements (DUAs), and CD/DVD place holders.

3. Inventory

SSS currently retains the following materials:

- Copies of data and documentation CDs and DVDs ready to be shipped.

- Assembled binders and components of binders (binders, covers and spines, flyers, database Introductions and DUAs, CD/DVD sleeves, and CD/DVD place holders).

- Blank CDs and DVDs.

- Ink cartridges.

- Supply carts (three).

4. Inquiries

SSS has received approximately 3,300 recordable general and data support inquiries during the current contract. Recordable inquiries are those in which the customer provides at least his or her name. SSS has also received numerous telephone inquiries from people who did not

identify themselves. No record of these phone calls was kept, so they are not included in the monthly counts.

Records of inquiries from identifiable individuals are stored in three places—the electronic tracking system, e-mail folders, and binders.

The electronic tracking system contains one record for each recordable inquiry received during the month. The project e-mail folders maintained by SSS contain all e-mail inquiries and responses. The binders contain copies of the e-mails and notes from recordable telephone inquiries.

5. Applications and Data Use Agreements

Currently on file at SSS are:

- Central Distributor applications and DUAs.

- Shared DUAs (DUAs submitted by individuals who are sharing data purchased by another person).

- Complimentary copy DUAs (DUAs submitted by people who have received complimentary copies of NIS, KID or NEDS).

- PDF versions of DUAs.

- NTIS DUAs.

6. Electronic Tracking System and Ad Hoc Requests

Currently on file at SSS are:

- The installed version of the tracking system, which is used in daily operations to store information on products, orders, shipments, and inquiries.

- Backup and delivered copies of the tracking system on CDs.

- Excel spreadsheets produced by queries of the system in response to ad hoc requests.

- A tracking system manual.

7. Activity Report and Partner Checks

Currently on file at SSS are:

- Paper and electronic copies of the monthly activity report to Partners.

- Copies of monthly and replacement checks issued to Partners.

- Copies of letters of transmittal.

8. SID/SASD/SEDD Documentation

SSS maintains electronic versions of current and discontinued database Introductions and data element tables.

9. Application Kits

Currently on file at SSS are electronic versions of current and discontinued application kits.

10. Financial Statements

SSS tracks customer payments received and disbursements against the payments in the electronic tracking system and the SSS accounting system. SSS maintains four separate accounting modules for customer payments: State reimbursements, NIS self-supporting, KID self-supporting, and NEDS self-supporting.

11. HCUP Central Distributor Ordering Web Site

SSS is in the process of creating secure Web site for submitting data applications. The Web site will include easy-to-maintain catalogs and prices for all the databases available from the HCUP Central Distributor. The Web site will offer secure online payment via credit card or electronic check and will also provide instructions for applicants who prefer to mail in a check, submit a purchase order, or pay via wire transfer (ACH) payment. SSS will host and maintain the Web site after the Authority to Operate (ATO) has been obtained.

Closeout Procedures

Regardless of whether Thomson Reuters remains the prime contractor or the project is transitioned to a new contractor, it is necessary to specify closeout procedures that will conclude the current contract. To document the status of the Central Distributor task at the close of the contract, Thomson Reuters will provide the following information to AHRQ:

- A copy of the Central Distributor Tracking System and system manual.

A list of products noting the 2010 updates that have not been completed, as well as the States and data types available for the State databases. These lists will be provided in the form of Excel tables. One table will be submitted for each data type (SID, SASD, and SEDD), while the NIS, KID, NEDS, and supplemental file information will be combined into one Excel table.

A file documenting the status of Central Distributor amendments. This file will note outstanding amendments and, if known, the reasons why the amendment has not been returned. This information will also be provided in the form of an Excel table, which will convey information regarding the latest contact with the Partner.

Final statements regarding customer payment accounts.

To successfully conclude the existing contract, SSS will document the status of every major component of Central Distributor operations and provide this information to Thomson Reuters and AHRQ, as directed.

- **Master Files:** SSS will close the data delivery log for the existing contract when the final Central Distributor database for the current contract has been released. According to the preliminary Central Distributor Release Schedule for 2012 this will occur in July, 2012. A copy of the closed log will be delivered to Thomson Reuters.

- **Inventory:** SSS will conduct an inventory and formally report what is in stock as of close of business on the last day of the current contract.

- **Inquiries:** SSS will enter into the electronic tracking system all recordable inquiries received through close of business on the last day of the current contract or earlier, if directed to do so by AHRQ. A copy of the tracking system through that date will be delivered to both AHRQ and Thomson Reuters. The current contract's e-mail folders will be closed and archived on the same date. A copy of these folders will be delivered to

AHRQ, if requested. The hard copies will be disposed of (e.g., shredded) as AHRQ directs.

- **Applications and Data Use Agreements (DUAs):** SSS will enter into the electronic tracking system all applications, shared DUAs, and complimentary copy DUAs received through close of business on the last day of the current contract, or earlier if directed to do so by AHRQ. SSS will create PDF versions of the DUAs in accordance with the current specifications for the DUA Management task. SSS will transfer the hard copies of the DUAs and a copy of the PDF files to AHRQ. To document the status of the Central Distributor applications and DUAs at the close of the contract, SSS will deliver to Thomson Reuters a copy of the tracking system and a list of applications on file. SSS will archive, transfer, or destroy all applications as instructed by AHRQ.

- **Electronic Tracking System and Ad Hoc Requests:** SSS will deliver copies of the tracking system and tracking system manual to Thomson Reuters. Tracking system backups and deliverables will be archived or destroyed, as directed by AHRQ. Excel spreadsheets produced in response to ad hoc requests will also be dealt with as AHRQ directs.

- **Activity Report and Partner Checks:** SSS will archive, transfer, or destroy paper and electronic copies of the activity reports, as instructed by AHRQ. Copies of checks issued to Partners will remain on file at SSS.

- **Application Kits and SID/SASD/SEDD Documentation:** SSS will archive, transfer, or delete electronic versions of current and discontinued application kits and documentation, as directed by Thomson Reuters.

- **Financial Statements:** Preliminary financial statements for review will be prepared by a date that is mutually agreed upon during the transition. Final financial statements will be submitted with SSS' final invoice for the current contract.

- **HCUP Central Distributor Ordering Web site:** SSS will provide a summary of the status of the C&A application process and OMB approval process. SSS will also provide a copy of the Web site as it exists on the last day of the contract if asked to do so.

Transition A: Thomson Reuters is Contractor on Subsequent HCUP Contract

Should Thomson Reuters remain the prime contractor, we will continue existing Central Distributor operations without interruption.

Any new procedures instituted by the new contract will be phased in without disrupting operations, unless otherwise directed by the contract.

Transition B: Thomson Reuters is not the Contractor for Subsequent HCUP Contract

It is understood that transition to a new contractor should be carried out with minimal disruption of service to the public and completed as soon as possible after the initial date selected by the Project Officer or the current contract's end date of September 26, 2012.

To maintain continuity of Central Distributor operations, we recommend that the transfer be carried out in two distinct phases.

During Phase I, SSS will continue routine operations, including:

- Hosting and maintaining the HCUP Central Distributor Ordering Web site

- Accepting inquiries, applications, and payments, including via the ordering Web site
- Assembling and shipping binders
- Entering data into the electronic tracking system
- Preparing and mailing the activity report and State reimbursement checks to HCUP Partners
- Processing DUAs.

During Phase II, SSS will cease operations and concentrate solely on transitioning activities to the new contractor, including:

- Transferring the ordering Web site and electronic tracking system
- Redirecting contacts
- Answering questions
- Transferring project materials as directed by AHRQ.

It is assumed that the new contractor will assume full responsibility for daily operations on a mutually agreed upon date and that there will be two months of funded overlap between the two contractors so that coordination and technical support can continue while maintaining customer service. The current contract includes an option for a two-month transition period scheduled for 12/26/2012–2/26/2013.

Because monthly reimbursement of HCUP State Partners for data purchases is a central component of Central Distributor operations, we suggests that Phase I be scheduled to end on the last day of a month. For example, if the two-month transition period were to start as scheduled on December 26, 2012, then SSS suggests that Phase I be scheduled for December 26, 2012 to January 31, 2013. Phase II would then begin February 1, 2013 and end on or about February 26, 2013. This strategy would allow SSS to process all the customer payments received through December 31, 2012 and also prepare the December 2012 activity report and State reimbursement checks. It is expected that the new contractor will assume final responsibility for Central Distributor operations by February 26, 2013 at the latest.

Below is an outline of the steps necessary to ensure a smooth transition of the contract, including proposed roles for AHRQ, Thomson Reuters, SSS, and the new contractor.

Step 1: Notify the Public

In coordination with AHRQ and Thomson Reuters, SSS will prepare materials to notify the public of the change in proprietor during Phase I. The new contractor's contact information and Central Distributor start-up date will be provided on the ordering Web site, on a flyer included in all binders, and in a notice attached to all outgoing Central Distributor e-mail. It is assumed that AHRQ will post the same information on the HCUP User Support Web site and in the *HCUP e-News*.

Responsibilities of the four organizations for Step 1 include the following:

- *AHRQ:* Review and approve transition notification materials.
- *Thomson Reuters:* Prepare the notices for the HCUP User Support Web site and *HCUP e-News*. Review and approve the Central Distributor Web site notification, flyer, and e-mail notice.

- *SSS:* Prepare notices for the ordering Web site, transition notification flyer, and e-mail notice.

- *New Contractor:* Provide contact information and start-up date.

Step 2: Transfer Data, Documentation, and Binder Master Files

Data and documentation master files, which reside on CDs and DVDs, can be transferred to the new contractor during Phase I of the transition without disrupting Central Distributor operations. This seamless operation is possible because the files are complete as soon as the final master file is delivered to SSS under the current contract. For example, the preliminary plan for 2012 schedules the final release of data under the current contract for July 2012. Under this schedule, SSS can easily pack and ship the master files and a copy of the electronic files during Phase I. However, electronic copies of master files that are used to create CDs and DVDs for customers cannot be deleted until Phase II, after the SSS Central Distributor ceases operation.

SSS will coordinate with Thomson Reuters and AHRQ to maintain the security and confidentiality of all master files. For example, we will expect approval from AHRQ before transferring data for which the new contractor needs to have signed data use agreements. Following approval, SSS will pack and ship the master CDs and DVDs to the destination designated by AHRQ. Additionally, if the new contractor can use the electronic images and CD/DVD labels, SSS will copy them to appropriate media and ship them. SSS will also provide a log (Excel and hard copy) of the CDs and DVDs and files transferred. Further, SSS will transfer or dispose of the letters of transmittal as directed by AHRQ and Thomson Reuters. Finally, SSS will delete all electronic files in Phase II after ceasing Central Distributor operations.

Binder master files will be transferred early in the transition process so that the new contractor will have time to establish a product inventory before assuming responsibility for filling orders. Materials to be provided include: Adobe Illustrator, Word, and PowerPoint files for binder covers and spines; flyers, database Introductions and DUAs, and CD/DVD place holders. The hard copy inventory cannot be transferred until Phase II, after SSS has stopped filling orders. We suggest that electronic files and sample binders be delivered by the close of business on the tenth business day of Phase I. This will allow the new contractor the remaining business days of Phase I to prepare inventory for the first few weeks of Phase II.

Responsibilities of the four organizations for Step 2 include the following:

- *AHRQ:* Confirm that the new contractor has signed the Data Use Agreements and authorize SSS to transfer files to the new contractor by a specific date.

- *Thomson Reuters:* Provide the new contractor with Microsoft Word copies of master documentation files such as the Application Kits, Data Use Agreements and Introductions. Thomson Reuters will also inform AHRQ when the task has been completed.

- *SSS:* In Phase I, SSS will pack the data and documentation CDs and DVDs, copy the electronic files to appropriate media, assemble sample binders, ship all materials to the new contractor, and submit a transmittal log and shipping information to Thomson Reuters. In Phase II, SSS will delete all electronic files after creating the CDs for any remaining orders received in Phase I. SSS will also submit a notification of completion and a log of deleted files to Thomson Reuters.

- *New Contractor:* Identify the individual who is to receive the files, provide the shipping address and account information, and confirm receipt of all the files.

Step 3: Transfer the HCUP Central Distributor Ordering Web Site, Electronic Tracking System, Telephone, Fax, and E-mail

3.1: HCUP CENTRAL DISTRIBUTOR ORDERING WEB SITE

During Phase I, SSS and Thomson Reuters will summarize the status of the OMB clearance and C&A application processes for the ordering Web site and will provide this information to AHRQ and the new contractor. Upon direction from AHRQ, it is anticipated that the following steps will be taken:

- SSS will stop accepting applications and deactivate the Web site's "ordering" (e-commerce) functions. The home page of the SSS version of the site will inform users as to when those functions will again become operational.
- If requested, SSS will transfer the data from the SSS hosted version of the ordering Web site's live databases to the new contractor for installation in their environment.
- SSS will arrange to transition the URL from the SSS IP address to the new IP address. This will likely require posting a notice on the home page of the site warning users that the site itself it may not be available for 24-48 hours. The transition is accomplished by releasing the URL back to the issuing authority and having the new contractor "grab" the URL once it is released. The AHRQ ISSO would likely have to approve the transfer.
- SSS will deactivate (if desired) its account with the payment gateway provider and/or the credit card merchant accounts.

3.2: TRANSFER THE ELECTRONIC TRACKING SYSTEM, OPEN INQUIRIES, OPEN APPLICATIONS, AND OPEN AD HOC REQUESTS

The HCUP Central Distributor Electronic Tracking System records information about customers' inquiries and applications. Early in Phase I, the new contractor will be provided with a copy of the tracking system and documentation. This will allow the new staff to become familiar with how the database works. SSS will continue to accept inquiries and applications through close of business on the last business day of Phase I. Data entry will be completed by close of business on the second business day of Phase II. A final copy of the tracking system and documentation for all open inquiries and applications will be delivered to the new organization by close of business on the fifth business day of Phase II. Under this schedule, the new contractor will assume responsibility for inquiries and applications on the first business day of Phase II, but will begin data entry on the sixth business day after receiving the tracking system. SSS will process payments and finish filling orders in Phase II.

We assume that by Phase II of the transition, only those applications and DUAs received during Phase I will remain on file at SSS. The following tasks will be accomplished during this second phase:

- Process payments and fill orders for applications received through close of business on the last business day of Phase I.

- Create PDF versions of DUAs received during the transition and deliver hard copies, PDFs, and updated cumulative transmittal log to AHRQ.

- Transfer or dispose of the applications, as directed by AHRQ.

Ad Hoc requests are requests from AHRQ or Thomson Reuters for information from the tracking system that is not provided by the standard reports. A SSS Access database programmer writes the queries necessary to produce the requested information, and the results are usually delivered as an Excel spreadsheet. SSS will accept ad hoc requests through close of business on the last day of Phase I and will fulfill the requests by the close of business on the fifth day of Phase II. After that time, the tracking system will have been transferred to the new contractor, and SSS expects that ad hoc requests will also be directed to the new contractor. SSS can answer questions about the system throughout the transition period as part of new contractor orientation and training.

Responsibilities of the four organizations for Step 3.2 include the following:

- *AHRQ:* Authorize SSS to transfer the electronic tracking system to the new contractor by a specific date approximately five business days after the start of Phase II.

- *Thomson Reuters*: Inform AHRQ when transfer of the tracking system has been completed.

- *SSS:* In Phase I, process inquiries, applications, and ad hoc requests as usual. Provide the new contractor with a working copy of the tracking system. Schedule delivery of the final tracking system, open inquiries, open applications, and open ad hoc queries to the new contractor. In Phase II, complete data entry and transfer the tracking system to the new contractor. Notify Thomson Reuters when transfer of the tracking system has been completed.

- *New Contractor:* Identify the individual who is to receive the tracking system, provide the shipping address and account information, receive and test the system, and confirm that the system is up and running.

3.3: TRANSFER TELEPHONE, FAX AND E-MAIL

SSS will make every effort to transfer the current Central Distributor toll-free telephone and fax numbers by the first business day of Phase II. If a transfer is not possible, the new contractor will have to establish new telephone and fax numbers.

The current Central Distributor e-mail address, HCUPDistributor@ahrq.gov, is maintained by AHRQ and automatically routed to the SSS Central Distributor e-mail address: hcup@s-3.com. In Phase II, after AHRQ has successfully redirected the e-mail received by HCUPDistributor@ahrq.gov to the new contractor, SSS will redirect mail received at hcup@s-3.com to HCUPDistributor@ahrq.gov. Responsibilities of the four organizations for Step 3.3 include the following:

- *AHRQ:* Reroute e-mail received at HCUPDistributor@ahrq.gov to the new contractor.

- *Thomson Reuters:* Inform SSS when the transfer has been completed.

- *SSS:* Transfer the telephone and fax numbers to the new contractor. Redirect e-mail received at hcup@s-3.com to HCUPDistributor@ahrq.gov. Pack and ship the fax machine to the new contractor. SSS will notify Thomson Reuters when the transfer has been completed.

- *New Contractor:* Identify the staff responsible for telephone service and coordinate with SSS to schedule the transfers. If transfers are not possible, establish new toll-free

telephone and fax numbers dedicated to Central Distributor business. Establish an e-mail address dedicated to Central Distributor business. Confirm that the telephone and fax lines are up and running and that e-mail is being received.

Step 4: Transfer Inventory

SSS will pack and ship the inventory to the new contractor by the close of business on the tenth business day of Phase II.

Responsibilities of the four organizations for Step 4 include the following:

- *AHRQ:* None.

- *Thomson Reuters:* Receive the transmittal log and inform AHRQ when the transfer has been completed.

- *SSS:* Pack and ship the inventory. Submit notification of completion and the transmittal log to Thomson Reuters.

- *New Contractor:* Identify the individual who will receive the inventory, provide the shipping address and account, and confirm receipt of all materials.

Step 5: Issue Final Activity Report and Partner Checks

Because SSS accepts payments from customers and disburses funds to the HCUP State Partners every month for the preceding month's revenues, SSS recommends that Phase I be scheduled to end on the last business day of the month.

SSS will stop accepting purchase orders two months before the end of the current contract. It will accept applications accompanied by a check or credit card authorization for the full amount due through the close of business on the last business day of Phase I.

In Phase I, SSS will prepare the activity report and the State reimbursement checks for the month prior to the month in which Phase I started. In Phase II, SSS will prepare the activity report and the State reimbursement checks for the month prior to the month in which Phase II started.

Responsibilities of the four organizations for Step 5 include the following:

- *AHRQ:* Review and approve the activity reports and cover letters. Receive copies of the activity reports and the State reimbursement checks.

- *Thomson Reuters*: Receive copies of the activity reports and the State reimbursement checks.

- *SSS:* Prepare and deliver the activity reports and State reimbursement checks.

- *New Contractor:* TBD.

Step 6: Issue Final Financial Statements for Customer Payment Accounts

It is presumed that final financial statements for customer payment accounts will report activity that took place during the transition period, as statements for activity prior to the transition period will have been issued during closeout. Preliminary statements for review and discussion can be prepared by the 15th of the month in Phase II. However, it is highly unlikely that these statements will include all the costs, because items such as shipping costs always take at least

a month to finalize. Therefore, the final statements will be issued with the final SSS invoice for the transition period.

Step 7: Archive, Delete, and/or Transfer All Remaining Materials

SSS will archive, delete, and/or transfer all remaining Central Distributor materials received or generated during the transition, in accordance with AHRQ's preferences.

Included will be the data (in electronic form) from the databases associated with the ordering Web site which will contain records for all applications ever made via the Web site. The physical disks on which the Web site resided will then go through an industry standard process for having all data removed and destroyed.

Additional materials will include applications, data use agreements, and inquiries; activity reports and copies of State reimbursement checks; e-mail; and electronic copies of documents. SSS does not anticipate updating any application kits during the transition period.

Responsibilities of the four organizations for Step 7 include the following:

- *AHRQ:* Decide how all materials should be handled.

- *Thomson Reuters:* Inform AHRQ when the task has been completed.

- *SSS:* Archive, delete, and/or transfer materials as directed. Provide notification of completion and all pertinent logs to Thomson Reuters.

- *New Contractor:* TBD.

Training of New Contractor

SSS will answer questions from the new contractor about any aspect of Central Distributor operations, including the ordering Web site. The actual training provided will be tailored to the contractor's needs.

Transition Plan Schedule

As previously mentioned, SSS suggests that Phase I be scheduled to end on the last day of a month, tentatively January 31, 2013. This schedule would allow SSS to process all the customer payments received through 12/31/2012 and to prepare the December 2012 activity report and State reimbursement checks.

A tentative schedule for implementing the seven steps identified in this transition plan appears below. Because of the uncertainty in timing of the award of the next contract, this schedule will be finalized at a later date.

Central Distributor Transition Steps	Party Responsible	Due Date
Notify the Public	SSS	Within 5 business days of Phase I start date
Transfer Data, Documentation, and Binder Master Files	SSS	Within 10 business days of Phase I start date
Transfer the Ordering Web site, Electronic Tracking System, Telephone, Fax, and E-Mail	SSS	During Phase II TBD
Transfer Inventory	SSS	Within 10 business days of Phase II start date

Central Distributor Transition Steps	Party Responsible	Due Date
Issue Final Activity Report and Partner Checks	SSS	15th of the month in Phase II
Issue Final Financial Statements for Customer Payment Accounts	SSS	With the final SSS invoice for the transition period
Archive/Delete/Transfer Remaining Materials	SSS	By the final business day of Phase II

Summary

Thomson Reuters and SSS are committed to making the potential transfer of the HCUP Central Distributor to a new contractor as seamless as possible. We are confident that all the steps presented in this draft plan will help ensure that commitment. If a new contactor is awarded the HCUP contract, Thomson Reuters will collaborate with the new staff to execute the proposed plan quickly and with little disruption to the daily routine of the HCUP Central Distributor.

DRAFT TECHNICAL ASSISTANCE (TA) TRANSITION PLAN

Introduction

Described in this section are the steps necessary to transition HCUP Technical Assistance (TA) activities at the end of the current HCUP contract in September 2012. It is intended to serve as a draft plan and will be refined after the contractor for the new HCUP contract is announced.

This plan includes two options:

- "Transition A" assumes that Thomson Reuters is selected as the contractor for the next HCUP contract.

- "Transition B" assumes that Thomson Reuters is not the prime contractor for the next HCUP contract.

The primary focus of this plan is preparing for "Transition B." If AHRQ selects a new HCUP contractor for the succeeding contract period, Thomson Reuters will tailor this transition plan to the capabilities and needs of the selected contractor.

To help ensure the smooth transition of TA services in a manner that is transparent to the HCUP user community, Thomson Reuters will prepare a Technical Assistance Guidance Document to serve as a procedure manual to provide support to HCUP users. This report will include a description of TA processes, procedures, specific instructions for particular types of requestors (e.g., Federal Agencies and media requests), and an appendix of standard responses for commonly-asked questions.

The goal of both AHRQ and Thomson Reuters is the continuous and seamless operation of the TA component of HCUP User Support activities regardless of the outcome of the contract re-competition. The sections that follow present a description of TA closeout procedures, specific steps to transition TA to a new contractor, a training plan, and a proposed schedule that will assist in ensuring the optimal transition of TA activities.

Closeout Procedures

Regardless of whether the contract remains with Thomson Reuters or moves to a new contractor, it is necessary to specify closeout procedures for concluding the current contract period. It is important to identify precisely which TA documentation and data will be deleted, archived, or carried forward to the new contract period.

Federal regulations limit the retention of data containing personally identifiable information to one year. Thomson Reuters has used an Excel database housed on an HCUP server to store information about TA inquiries since 2006 (the beginning of the HCUP-5 contract). The workbook tracks questions received and generates longitudinal TA user statistics, which are used in the quarterly Technical Support and Outreach Statistics Report. The report also provides guidance on staffing needs and the interests of users.

The Excel workbook is an easily-accessible way to track and compile user statistics. Additionally, Excel's versatility allows for the deletion of cells with identifiable information without jeopardizing the integrity of non-identifiable statistics. This lets the TA team keep trend information past the one-year limit.

Thomson Reuters recommends the continued use of the Excel workbook and will delete the names and affiliations of past users at the end of 2012. If a new contractor is selected, Thomson Reuters will delete the identifiable information prior to sending them the workbook.

E-mails sent from users to the HCUP-US inbox will be burned onto CDs at the end of 2012 and sent to AHRQ. The inquiries will be deleted from the mailbox folders. If a new contractor is selected, Thomson Reuters will burn and delete the inquiries at the end of the contract.

Thomson Reuters will also ensure that the information on the Frequently Asked Questions page of the HCUP-US Web site and the standardized TA responses workbook are fully updated at the end of the contract period and carried into the new contract.

Transition A: Thomson Reuters is Contractor on Subsequent HCUP Contract

Should the new contract be awarded to Thomson Reuters, staff will resume TA processes in accordance with the new scope of work. Under the new contract, Thomson Reuters will continue to provide users with technical guidance on their questions, create reports, and compile user recommendations for improving HCUP's databases, products, services, and events. It is also assumed that some of the suggested improvements will be implemented as directed by AHRQ.

Transition B: Thomson Reuters is not the Contractor for Subsequent HCUP Contract

In the event that the contract is awarded to a different contractor, additional activities will be required to ensure a smooth transition of TA services. The goal will be to avoid any interruption of the HCUP Technical Assistance task during this time. From the user's perspective, the transition process should be seamless.

To ensure the least disruptive transition of TA services, Thomson Reuters will continue to assist the new contractor with TA questions for a two-month period after the new contract begins. For the initial six weeks of the transition period, Thomson Reuters will continue to provide complete TA services to allow the new contractor adequate time to prepare for assuming TA responsibilities. During the final two-week period of the transition, Thomson Reuters will cease to provide most TA services. Our role will be limited to resolving any outstanding inquiries, answering questions from the new contractor, and providing them with all remaining support materials.

For Thomson Reuters to assist with additional User Support activities, including completing the Publications and Technical Support and Outreach Statistics reports for the third and fourth quarters of 2012, both the three-month extension period and two-month transition period options included in Modification 18 would need to be exercised. The three-month extension period (9/27/2012–12/26/2012) would allow sufficient time to collect data for the third quarter reports. The two-month transition period (12/27/2012–2/26/2013) would accommodate the fourth quarter reports.

Below is an outline of the three steps required for a smooth transition of TA activities, including proposed roles for AHRQ, Thomson Reuters, and the new contractor.

Step 1: Route TA e-mails from the hcup@ahrq.gov address to a new e-mail address

Currently, users send TA e-mail inquiries to the hcup@ahrq.gov mailbox. These queries are automatically forwarded to a Thomson Reuters e-mail domain, hcup@thomsonreuters.com, for response by the Thomson Reuters TA team.

AHRQ recently had a change in policy prohibiting the forwarding of e-mails to outside addresses. The HCUP inbox, which has been in use for several years, was given an exemption. AHRQ will need to determine if the change in contractor would be affected by this policy: if changing the target address to one accessible by the new contractor will be allowed because the wider HCUP User Support system is already in place, or if a new access procedure will need to be developed. Because it is a Thomson Reuters domain, the current address cannot be transferred to the new contractor. In the event that a new procedure is needed, we assume that AHRQ will work with the new contractor to determine an alternative method of receiving inquiries.

In the event that e-mails can be forwarded to the new contractor per the current procedure, the specific responsibilities of each organization for transferring e-mails are as follows:

- *AHRQ:* Alter the automatic forwarding system on the hcup@ahrq.gov inbox to send all TA inquiries to both Thomson Reuters and the new contractor after the contractor obtains a TA e-mail address. During the final two weeks of the transition, AHRQ will stop forwarding inquiries to the Thomson Reuters e-mail address.

- *Thomson Reuters:* Redirect any residual inquiries sent directly to the Thomson Reuters TA e-mail address to the AHRQ TA address. These e-mails will then be forwarded by AHRQ to the new contractor's e-mail address.

- *New Contractor:* Establish a new TA e-mail address and test it to verify that forwarded e-mails from the AHRQ e-mail system are being received.

Step 2: Establish a new toll-free TA telephone number

In addition to e-mail, HCUP users can also contact the TA team via a toll-free number. The current TA phone number, 1-866-290-HCUP (4287), is a Thomson Reuters-owned line that cannot be transferred. The new contractor will thus need to provide a replacement number.

The specific responsibilities of each organization for establishing a new toll-free telephone number are as follows:

- *AHRQ:* None.

- *Thomson Reuters:* Once the new contractor has established a toll-free number (approximately six weeks prior to the termination of the existing number), alter the current TA outgoing voicemail message to announce the new 1-800 number and the date that the current number will no longer be operational. Additionally, Thomson Reuters will update the HCUP-US TA Web page to include the new TA phone number and place a mention of the new number in the TA signature. The current TA phone number will be disconnected at the close of the two-month transition period.

- *New Contractor:* Establish a new toll-free number that is dedicated to receiving TA inquiries and create an appropriate voicemail message. The forthcoming TA Guidance Document will provide sample language that can be adapted for the new outgoing voicemail message.

Step 3: Provide the new contractor with appropriate documentation and training material

Providing TA in the most effective and efficient manner requires an in-depth knowledge of the HCUP databases, tools, and products. Thomson Reuters will provide the new contractor with

documentation and training material to assist in advancing their knowledge of HCUP and the TA task.

The specific responsibilities of each organization for documentation and training are as follows:

- *AHRQ:* Identify any documentation and/or training material not listed below that Thomson Reuters should provide to the new contractor.

- *Thomson Reuters:* Provide the new contractor with previous TA deliverables and other documentation to support their efforts to master HCUP knowledge and deliver TA, including:

  - Quarterly User Statistics and Product Feedback Reports

  - Quarterly Publications Reports

  - Frequently-Asked Questions page on the HCUP-US Web site

  - TA Guidance Document

  - TA Standardized Responses Workbook.

  During the transition period, Thomson Reuters will continue to prepare the Publications and Technical Support and Product Feedback Reports for the third and fourth quarters of 2012, assuming both the three-month extension period and two-month transition period options included in Modification 18 are exercised. Staff will also continue to update the Frequently Asked Questions page as needed during this period.

- *New Contractor:* Provide information regarding where to send the documentation and training materials.

Training of New Contractor

In order to ensure that HCUP users continue to receive the highest quality of user support, Thomson Reuters will assist with training the new contractor to respond to TA inquiries. Providing TA is a skill that is best acquired over time and with ongoing practice and project experience, but Thomson Reuters believes that one-on-one training would benefit the new contractor. The training will consist of providing the new contractor with detailed documentation and phone and e-mail support for two months after the new contract is awarded. To provide the most effective training, we will tailor our training approach to the new contractor's needs after AHRQ has identified the recipient of the HCUP contract. Initial training will be provided via a preliminary conference call with the new contractor's staff to explain the TA process and assess their capabilities. Their staff will then be copied on outgoing messages for the duration of the transition period.

Transition Plan Schedule

A tentative schedule for implementing the steps identified in this transition plan is provided below. Because of the uncertain timing of the award of the next contract, this schedule will be finalized at a later date.

TA Transition Steps	Responsible Party	Due Date
Establish a new TA e-mail address	New Contractor	Two weeks following award of the new contract

TA Transition Steps	Responsible Party	Due Date
Route TA e-mails from the hcup@ahrq.gov address to both the Thomson Reuters address and the new e-mail address	AHRQ	As soon as the new contractor establishes an address to receive the forwarded e-mail
Route TA e-mails received directly by the Thomson Reuters address to hcup@ahrq.gov for forwarding to the new e-mail address	Thomson Reuters	As soon as the new contractor establishes an address to receive the forwarded e-mail
Establish a new toll-free TA phone number	New Contractor	Two weeks following award of the new contract
Provide the new contractor with appropriate documentation and training material	Thomson Reuters	Two weeks following award of the new contract for existing documentation; four weeks following award of new contract for material that must be tailored to the new contractor
Respond to new contractor questions regarding HCUP knowledge and providing TA	Thomson Reuters	Ongoing for two months following award of the new contract
Terminate forwarding of TA e-mails to Thomson Reuters	AHRQ	Two weeks prior to the end of the transition period
Disconnect current toll-free TA phone number	Thomson Reuters	At the close of the two-month transition period

Summary

Thomson Reuters is committed to a seamless transfer of the existing HCUP TA activities to a new contractor. Our central goal is that the HCUP user community continues to receive the highest quality of service during the transition period. This plan provides the steps necessary to ensure a smooth and efficient transition. Upon receiving feedback from AHRQ, Thomson Reuters will update and refine this plan.

DRAFT HCUP-US WEB SITE TRANSITION PLAN

Introduction

Described in this section are the steps necessary to transition the HCUP User Support (HCUP-US) Web site at the end of the current HCUP contract in September 2012. It is intended to serve as a draft plan and will be refined after the contractor for the new HCUP contract is announced. This plan includes two options:

- "Transition A" assumes that Thomson Reuters is selected as the contractor for the next HCUP contract.

- "Transition B" assumes that Thomson Reuters is not the prime contractor for the next HCUP contract.

The primary focus of this memo is preparing for "Transition B." If Thomson Reuters is not the prime contractor for the next HCUP contract, we will tailor this transition plan to the capabilities and needs of the selected contractor.

This transition plan is specific to the continuing operation of the HCUP User Support (HCUP-US) Web site at www.hcup-us.ahrq.gov/. It is AHRQ's and Thomson Reuters' goal that the HCUP-US Web site remains in continuous and smooth operation regardless of the outcome of the HCUP contract re-competition. From a user's perspective, the transition should be transparent.

Before we can discuss how to transition the HCUP-US Web site, it is important to understand its components. There are three sites that are used for the maintenance and development of HCUP-US.

- The primary site, HCUP-US, is publicly available through the URL www.hcup-us.ahrq.gov/.

- A second HCUP-US "pre-production" site is used for preparing content to be posted on HCUP-US. A pre-production site allows changes to be entered and checked prior to being accessible to the public. For example, each week the section including HCUP deliverables is updated. Thomson Reuters enters the names of each deliverable under the proper category and includes a link to the deliverable, if appropriate. After all of the necessary updates to the deliverable section are completed and tested on the pre-production site, the section is copied onto HCUP-US. Information is transferred between sites using secure shell (SSH) and secure file transfer protocol (SFTP). This process ensures that users of HCUP-US never see a page that is in the process of being updated.

- A third "review" site is a version of HCUP-US that includes new sections and pages that need to be reviewed by AHRQ prior to being released on HCUP-US. The review site is available at the address. This site also serves as a test bed for prototyping potential new features of HCUP-US.

Understanding the distinctions between these three sites allows us to discuss what is needed to closeout and transition HCUP-US. Additional technical information needed to maintain the site is included at the end of this document (HCUP-US Technical Specifications). The following is a description of the HCUP-US closeout procedures, specific steps to transition HCUP-US to a

new contractor, a training plan, and a proposed schedule that will assist in ensuring the most optimal transition of HCUP-US activities.

This plan does not include transition of other Web-based applications developed by Thomson Reuters over the course of the current HCUP contract including the HCUP Automated Library (HAL), the HCUP Wiki, and Alfresco. These applications, which are used internally for interim work products, would not be appropriate for transfer. We assume a new contractor would utilize their own internal systems.

Closeout Procedures

Regardless of whether the contract remains with Thomson Reuters or is transitioned to a new contractor, it is necessary to specify closeout procedures that will wrap up the current HCUP contract period. Thomson Reuters assumes that development of new HCUP-US sections or functionality will be completed one month prior to contract end. It is understood that because HCUP-US is a repository for all project materials, new material such as deliverables and database documentation will be added to the site up until the last day of the contract, but that no new functionality will be added in the last month.

On the last day of the contract, Thomson Reuters will copy the information from HCUP-US onto a portable format, such as CD-ROM, for transfer to AHRQ. Content for HCUP-US is stored in a directory structure. All directories and subdirectories will be included with one exception. The monthly progress reports, which contain confidential financial information, will be removed from the site and the final closeout copy. Thomson Reuters will not copy information from the HCUP-US pre-production site, or the review site because it is assumed that the final version of all project information has been loaded onto HCUP-US. Thomson Reuters assumes that no transfer of equipment is required.

Transition A: Thomson Reuters is Contractor on Subsequent HCUP Contract

Should the new contract be awarded to Thomson Reuters, we will continue the operation of the HCUP-US site, the pre-production site for HCUP-US, and the review site. A certification and accreditation (C&A) process will have already been conducted for the Thomson Reuters HCUP Web Services system; therefore updates to HCUP-US can begin immediately. Thomson Reuters assumes that any changes to the site would be specified under the new contract.

Transition B: Thomson Reuters is not the Contractor for Subsequent HCUP Contract

In the event that the new contract is awarded to a different contractor, additional activities will be required to ensure that the HCUP-US Web site remains available to the HCUP user community during the transition. From a user's perspective, the transition will be transparent.

For a two-month period, Thomson Reuters will continue to maintain the HCUP-US Web site. Thomson Reuters assumes that the number of updates to the site will be minimal and include only essential information, such as new contact information for HCUP services transferred under the new contract. While Thomson Reuters is maintaining HCUP-US, the new contractor will be expected to build a site that is accessed through an IP (internet protocol) address, similar to the current review site. Once the new site is approved by the HCUP staff at AHRQ, the AHRQ Web master will be asked to map the new numeric Web address to the URL www.hcup-us.ahrq.gov. The site maintained by Thomson Reuters will then only be available by its IP address and will only remain active for a few additional days. This plan allows the transfer to be invisible to the HCUP user community. Further, this plan assumes the new HCUP contractor will implement HCUP-US "as is" and the new contractor is responsible for making any changes

to the site design, layout, and underlying architecture. The new contractor is also responsible for ensuring that their Web services system meets C&A requirements as directed by AHRQ.

Below is an outline of the steps necessary to ensure a smooth transition of HCUP-US including proposed roles for AHRQ, Thomson Reuters, and the new contractor.

Step 1: Provide new contractor with necessary information for building a new system for HCUP-US.

The HCUP-US Technical Specifications includes the technical specifications for the software and hardware requirements for the site. For content, the new contractor should use the copy of the site from the closeout to build their system. This allows them to focus on testing each part of the site rather than being distracted with any updates that may occur during the transition period.

- *AHRQ:* None

- *Thomson Reuters:* Provide the HCUP-US Technical Specifications and the closeout copy of HCUP-US content to the new contractor.

- *New Contractor:* Establish structure for a new site under a new IP address using the information provided in the HCUP-US Technical Specifications. Any necessary software purchases to establish the site will be the responsibility of the new contractor. Incorporate the copy of the close-out information and ensure that all sections of the site are functioning properly.

Step 2: Review site established by new contractor.

Once established, AHRQ should review the site created by the new contractor.

- *AHRQ:* Review the new site.

- *Thomson Reuters:* None, unless requested by AHRQ.

- *New Contractor:* Respond to any changes requested by AHRQ.

Step 3: Transfer current copy of HCUP-US content to new contractor.

Prior to the new site going live, Thomson Reuters will provide the new contractor with an updated copy of the HCUP-US content. This version will include any updates to the site since the closeout.

- *AHRQ:* None.

- *Thomson Reuters:* Copy current version of HCUP-US directories onto CD-ROM and transfer to new contractor.

- *New Contractor:* Update system accordingly.

Step 4: Map new IP address to URL www.hcup-us.ahrq.gov.

When the new site is approved by AHRQ for public use, the AHRQ Web master will be asked to map the new IP address to the URL www.hcup-us.ahrq.gov.

- *AHRQ:* Map new IP address to www.hcup-us.ahrq.gov.

- *Thomson Reuters:* None.

- *New Contractor:* Verify new contractor Web site is receiving requests. Verify requests to www.hcup-us.ahrq.gov are being routed to new IP address. Respond to any changes requested by AHRQ.

Step 5: Discontinue site maintained by Thomson Reuters.

As a precaution, Thomson Reuters will keep the IP address used for HCUP-US active for five days after the transfer. At the end of this time, the site will be taken down.

- *AHRQ:* None.

- *Thomson Reuters:* Verify requests to www.hcup.us.ahrq.gov are no longer being routed to current IP address.

- *New Contractor:* None.

Step 6: Destroy existing Web logs.

On the day the site is discontinued, Thomson Reuters will copy all existing Web logs generated by the Web server onto CD-ROM and send the CD to AHRQ for their archives. Once the CD has been received by AHRQ and its contents confirmed, Thomson Reuters will remove the Web logs from the Thomson Reuters servers.

- *AHRQ:* Confirm contents of CD with Web logs and notify Thomson Reuters to destroy their copies of the logs.

- *Thomson Reuters:* Copy Web logs to CD-ROM, send CD to AHRQ, and remove Web logs from Thomson Reuters servers after AHRQ confirms contents of CD.

- *New Contractor:* None.

Training of New Contractor

Training will consist of providing the new contractor with specifications for the HCUP-US site and answering technical questions as the new site is constructed. Thomson Reuters assumes that the new contractor will be well versed in building a Web site using Tomcat and Java, and that any questions will be specific to setting up HCUP-US in this environment.

Transition Plan Schedule

Following is a tentative schedule for implementing the steps identified in this two-month transition plan. Because of the uncertainty in timing of the award of the next contract, the actual dates will be finalized at a later time.

Transition Steps	Responsible Party	Due Date
Stop development of new functionality for HCUP-US site	Thomson Reuters	One month prior to contract end
Update site with final project information	Thomson Reuters	Last month of contract
Copy HCUP-US directory structure onto CD-ROM and provide closeout copy to AHRQ	Thomson Reuters	End of current HCUP contract
Maintain HCUP-US site with minimal weekly updates	Thomson Reuters	For 55 days from end of contract (during two-month transition period)

Transition Steps	Responsible Party	Due Date
Provide new contractor with the necessary information for building a new system for HCUP-US	Thomson Reuters	Within 3 days of contract end
Review site established by new contractor	AHRQ	Two week review period commencing by day 35 (week 5) and completing by day 49 (week 7)
Transfer current copy of HCUP-US content to new contractor	Thomson Reuters	Day 50
Map new IP address to URL www.hcup-us.ahrq.gov	AHRQ	Day 55
Discontinue site maintained by Thomson Reuters	Thomson Reuters	Day 60
Copy Web logs to CD and ship to AHRQ	Thomson Reuters	Day 60
Delete Web logs from Thomson Reuters servers	Thomson Reuters	After receiving confirmation from AHRQ

Summary

Thomson Reuters is committed to making the potential transfer of the HCUP-US Web site to a new contractor as seamless as possible. It is our goal that the HCUP user community continues to receive the highest quality of service during the transition period. This draft transition plan provides the steps necessary to ensure a smooth transition. Upon receiving feedback from AHRQ, Thomson Reuters will update this plan. If another organization is selected as the recipient of the next HCUP contract, Thomson Reuters will work with the new organization to tailor this plan as needed.

Introduction

The HCUP-US Web site (www.hcup-us.ahrq.gov) is a repository of information designed to support users of HCUP data, products, and tools. Although the site was originally designed to address the needs of AHRQ and other project staff, the scope has since evolved to include content for public users of HCUP data and products, the HCUP Partners, and staff associated with special projects (e.g., National Healthcare Quality Report/National Healthcare Disparities Report (NHQR/NHDR)). Much of the site can be used by "public" users or users who have not logged in to the site. In order to access non-public content, users are required to log in using a username and password. A system of user groups has been established which allows for assignment of access rights to a generalized "type" of user. In other words, some authenticated users, because of their group level privileges, have access to a limited set of non-public or "restricted" content whereas other users can view all public and restricted content. Examples of restricted content include HCUP intramural database documentation and project deliverables.

HCUP-US makes extensive use of several key technologies: JavaServer Pages (JSP), JSP Standard Tag Library (JSTL), eXtensible Markup Language (XML), and eXtensible Stylesheet Language Transformations (XSLT). XML is used to store persistent data (e.g., variable notes, SAS filenames and passwords) and is transformed using XSLT and displayed via JSP. Where appropriate, JSTL is used within each page to hide or display content appropriate for given user level.

Hardware

The production site for HCUP-US is hosted on virtualized servers utilizing VMWare technologies. The virtual servers are housed in the Thomson Reuters Eagan, Minnesota, Data Center and are roughly equivalent to a dual core Intel Xeon CPU running at 2.53GHz and having 8GB of RAM. Development and review sites are hosted on standard Pentium class desktops since these servers operate under a significantly reduced load.

Operating Systems

As of September 2011, the HCUP-US production site uses Red Hat Enterprise Linux version 5.6. The development sites are also running version 5.6 of the operating system (OS). The sites were initially developed using an older version of Red Hat Linux and the OS has been upgraded several times over the course of the project.

Web Server Software

As of September 2011, the HCUP-US sites use version 2.2.3 of Apache Software Foundation's HTTPD Web Server for static file requests and use version 6.0.32 of Apache Software Foundation's Tomcat Web server. The original HCUP documentation site used Tomcat 3, and the Web server software has been upgraded over the course of the project.

Runtime Environment

As of September 2011, the HCUP-US sites use Sun's J2SE 5.0 Java runtime environment (version 1.6.0_15). Use of a current Java runtime is essential in order for Tomcat to function.

Major Content Types

Content on HCUP-US can be broadly classified into two major categories: static content and dynamic content. Static content includes project documents (e.g., Word, Excel documents) and content stored in a stand-alone file such as a PDF document or text file. These documents are typically accessed by following a link from a page such as www.hcup-us.ahrq.gov/nisoverview.jsp to a document such as www.hcup-us.ahrq.gov/db/nation/nis/NIS_Introduction_2005.pdf.

Dynamic content includes JSP pages generated for various classes of users (e.g., public, Partner, team) and pages that dynamically generate content using XML documents and document fragments. An example of a dynamic document is the intramural SID description of data elements page (http://www.hcup-us.ahrq.gov/db/state/sid/sidvarnote_allstates.jsp). This page uses a parameter (e.g., sidnote.jsp?adate) to pass information to the page describing which data element information should be fetched. By convention, information for each data element is stored in directories that correspond to the SAS data element name. Within each directory, XML files exist to store information about general notes (_gennnote.xml), uniform values (_values.xml), and State-specific notes (st.xml). To facilitate future expansion, State-specific files exist for all 50 States, with empty files created for non-Partner States and States that do not have a State-specific note for a given data element. The JSP pages use JSTL to import the relevant files (e.g., /db/vars/adate/_gennote.xml, db/vars/adate/_values.xml, db/vars/adate/az.xml, db/vars/adate/ca.xml, and so forth) and use XSL to extract the relevant SID components of each file. Additional XSL is then used to format the content into HTML for display on the page.

User Authentication and Permission Groups

Authentication is achieved by storing usernames and passwords in a simple table stored in a MySQL database. Users enter their username and password in the login.jsp page and JSTL is used to check if the username/password combination matches that in the database. If there is a match, the database returns the user access level as both a numeric value and a text string. This information is then stored as a session variable in the browser and included in subsequent browser request/response cycles.

In 2010, the security scheme on HCUP-US was upgraded to Permission by Group to alleviate problems due to the inflexibility of the previous hierarchical security system. Site content is protected by specialized tagging in the JSP code files that are used by the Web site platform to generate the HTML pages sent to the browser. The custom tags surround the sensitive content and identify it as one of several predetermined content classifications:

- HCUP training

- General database documentation

- Intramural database documentation

- Data development passwords

- HCUP Partner

- HCUP team

- HCUP steering committee

- NHQR/NHDR.

A user is assigned to one or more groups that have specific permission to view specific types of content. For example, the HCUP Team has access to all database documentation and project deliverables, but not data development passwords. An AHRQ Contractor working with HCUP data would be assigned to the Associate group and allowed to view intramural database documentation after the appropriate data use agreements are signed and training courses completed.

Unless explicitly coded, access to content on JSP pages is available to the public. In some cases (e.g., the home page) the user / permission group is used to display some content to the public and additional content to authenticated users. In other cases, (e.g., intramural documentation) the page is designed to hide virtually all content from non-authorized users. Additional information about the permission by group security scheme is included in the section, Permission by Group Security Scheme.

Drop Down Menus

To expedite navigation of the Web site, drop down menus have been implemented on all JSP pages. The menus were created using smartmenu system that is 508 compliant and can be updated very easily. Depending on the user level, the drop down menu will display key pages that are available to them. This creates an experience that is faster and less complicated for the user to navigate content.

Content and Application Locations

All content for the HCUP-US site is stored in the /usr/local/hcup/doc directory of the server. As of September 2011, this consists of approximately 5 GB of content.

The Tomcat application, logs, and working files are stored in /usr/local/tomcat. As of September 2011, the Tomcat directory consists of approximately 2 GB of program files, configuration files, and log files. To achieve an efficient utilization of hardware resources and provide redundancy to production, application server instances run concurrently. They each reside in a subdirectory of the main Tomcat installation within the /usr/local/tomcat/instances directory.

The Apache Web Server acts as a front door to the HCUP-US Web site, handling static requests (.html, .jpg) and passing dynamic requests (.jsp) to either Tomcat instance. This is accomplished with the mod_jk module configured in the file /etc/httpd/conf.d/jk.conf.

The Java runtime is installed in the /usr/java/default directory. Tomcat-specific and application-specific configuration files reference these locations. Since MySQL runs as a service, it can be installed to an arbitrary location but is accessed using JDBC. Further details of this configuration are documented in the application configuration files, available upon request.

Other Functions

Several custom applications have been written to fulfill specific functions (e.g., search, user authentication) associated with the operation of the site. These are written in Java and are included as pre-compiled components in the application-specific configuration directories (e.g., WEB-INF). The Struts2 framework has been introduced to support the web-tier, in the areas of Publication Search and Keyword Search.

Other Applications

Over the course of the current HCUP contract, several Web-based applications have been developed for internal use on HCUP. These include:

- HAL - the HCUP Automated Library – an interoperable database system for tracking deliverables, data acquisition/processing tasks, and the receipt of source data files

- HCUP Wiki - a reference library for process-related documentation

- Alfresco – a content manager for HCUP internal documents.

All of these applications require users to login to participate and are stored on a separate Web server from HCUP-US (http://www.halfreski.net).

Disaster Recovery

For redundancy and convenience, three different methods are used to back up the HCUP Web servers based in the Eagan Data Center. This section details the three back-up procedures and scenarios for recovery.

TSM BACK-UPS

TSM utilizes back-up tapes with the user-level information stored in an encrypted format. TSM creates a back-up at the file level every day (Monday through Saturday) allowing for recovery of a file going back 14 versions. TSM back-ups allow recovery of individual files going back two weeks after it has been deleted.

VM SNAPSHOTS

The Web servers are hosted on Virtual Machines (VMs). A daily snapshot of the entire VM is created and stored on-site for quick recoveries. This method creates a back-up of both the user-level information and the system-level information. Snapshot back-ups are available going back two weeks.

OFFLINE MIRROR SITE (OFFSITE BACK-UP)

A duplicate copy of the HCUP-US production server is maintained in the Thomson Reuters Santa Barbara Office. Any updates/changes to the HCUP-US Web site are made on the mirror site in Santa Barbara first before the content is transferred to the production site in Eagan. Therefore, the Santa Barbara mirror site acts as an up-to-date offsite back-up of the production site in Eagan. However, Santa Barbara is not equipped to host a live production Web site, so it is strictly an offline mirror site.

SCENARIOS FOR EACH BACK-UP SOLUTION

In the event that a file is deleted or there is corruption to any of the files on the Web server, the TSM back-up could be used to do a file level recovery.

If there is a hardware issue with the server hosting the Web site and the Web site had to be hosted on a different physical server in Eagan, the VM snapshot could be copied to a new server and brought online. Since the VM snapshot contains a back-up of both the data and system files (including the operating system and applications), the VM snapshot would contain everything required to bring the Web site back online.

In the event of a disaster where all of the Eagan Data Center becomes unavailable, the back-up data on the HCUP-US mirror site in Santa Barbara could be transferred to a new hosting facility within the required recovery time objective (RTO) of five days.