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 10 - Consulting

Proc Folder: 189738

Doc Description: Addendum_3: RFP - HOSPITAL INPATIENT DATA SYSTEM

Proc Type: Central Master Agreement

Date Issued	Solicitation Closes	Solicitation No	Version
2016-07-11	2016-07-21 13:30:00	CRFP 0507 HCC1600000002	4

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All offers subject to all terms and conditions contained in this solicitation

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CRFP HCC1800000002

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

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I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Social & Scientific Systems, Inc.

Company


Authorized Signature

David D. Wagner, Director of Contracts

July 21, 2016

Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

(Name, Title)
David D. Wagner, Director of Contracts

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CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Social & Scientific Systems, Inc.

(Company)



(Authorized Signature) (Representative Name, Title)

David D. Wagner, Director of Contracts

(Printed Name and Title of Authorized Representative)

July 21, 2016

(Date)

301-628-3000/301-628-3001

(Phone Number) (Fax Number)

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

MANDATE: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Social & Scientific Systems, Inc.

Authorized Signature: David D. Wagan Date: July 19, 2016

State of Maryland

County of Montgomery, to-wit:

Taken, subscribed, and sworn to before me this 19 day of July, 2016.

My Commission expires 6/12/2019, 20 .

AFFIX SEAL HERE



NOTARY PUBLIC

[Signature]

Solicitation No.: CRFP 0507 HCC1600000002

TECHNICAL PROPOSAL – ORIGINAL

West Virginia Health Care Authority

Hospital Inpatient Data Collection, Processing, Analysis, and Reporting

July 21, 2016

Submitted by:

**Social & Scientific Systems, Inc.
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Cover Sheet Restriction on Disclosure and Use of Data

This proposal or quotation includes data that shall not be disclosed outside of the Government and shall not be duplicated, used, or disclosed in whole or in part for any purpose other than to evaluate this proposal or quotation. If, however, a contract is awarded to this Offeror or Quoter as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from other sources without restriction. The data subject to this restriction are contained in this entire proposal.

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Attachment A: Vendor Response Sheet

3.0 Qualifications and Experience

For the last 25 years, the West Virginia Health Care Authority (WVHCA) has collected hospital inpatient data from all non-federal hospitals in the state to help inform regulatory and policy decision making. The data collection, processing, analysis, and reporting are crucial for the HCA to fulfil their mission. The programs of the WVHCA have two overarching purposes:

- To constrain the rising cost of health care
- To ensure reasonable access to necessary health services

It remains vital that the HCA's work be carried out in a cost-effective manner, prioritizes high quality data collection and processing, and ensures data security and privacy.

Social & Scientific Systems, Inc. (SSS) has held the contract for the hospital inpatient data system (HIDS) with the HCA for the last 5 years. SSS is pleased to continue with our recently refreshed HIDS, the Hospital Data Submission System (HDSS). Our system, which emphasizes quality data, and our excellent help desk support and customer service (who know how to use this system best) truly minimize the burden on hospitals. Our proposed staff are West Virginia HIDS veterans. We have a WVHCA-customized and refined system already in place that hospitals and their vendors are already comfortable using. SSS staff already have excellent, established relationships with individual hospitals and vendors in addition to the deep technical knowledge necessary for this project.

SSS' expertise in data collection, management, and analytics at the federal and state level has a proven track record of successful state and federal partnerships and projects including clients such as the states of Maryland and West Virginia, the Agency for Healthcare Research and Quality (AHRQ), and the Centers for Medicare & Medicaid Services (CMS), among others. SSS brings expert working knowledge of the current hospital inpatient data collection process,

Continuing a history of high-quality data collection, database management, analysis, and reporting for the HCA, SSS combines nearly 13 years of responsive, high quality, low risk service delivery with our knowledgeable service desk support, established relationships with hospitals, and the recent upgrade to the HDSS.

management system, and reporting protocols. SSS' extensive, nuanced experience with the technical aspects of the data in conjunction with our deep and thorough understanding of the environment within which the HCA operates and the critical importance of these data to a variety of stakeholders makes us ideally suited to assist the HCA in meeting its future goals. As we have over the last 5 years, SSS intends to continue to meet all of HCA's stated goals:

- Provide data collection, processing, and editing
- Provide documentation and technical support
- Provide analytic files
- Provide data security and privacy
- Provide project management
- Provide ad hoc services to the HCA

SSS is uniquely qualified to meet all project goals and recognizes how fundamental the hospital inpatient data is to HCA's ability to perform its regulatory functions. Over the last 5 years, SSS has demonstrated, and will continue to demonstrate, the importance of implementing ongoing quality improvement techniques.

Our vendor response discusses the current successes, potential challenges we foresee, and how our team intends to address any anticipated challenges. Additionally, our core team intends to leverage their expertise from the current HCA project and utilize all opportunities to identify best practices and lessons learned. Our high quality technical and operational expertise, coupled with project management excellence and industry leading data security and privacy

systems, will ensure the successful execution of all project tasks and goals.

While we have provided multiple innovations during our current HCA contract, we will continue to do so; we will not rest on our laurels. Our proposal provides examples of this.

SSS brings the HCA a highly qualified, dedicated, and reliable team to perform the requirements with a demonstrated reputation for providing reliable, collaborative, and best value solutions. We are committing our most experienced resources to successfully inform HCA regulatory and policy decisions. Our proposed Project Manager and your single point of contact is **Ms. Christina Larson Chebili, MA** who will manage all project activities. Ms. Chebili has extensive project management, technical, and programming expertise for federal and state clients. Our proposed Operations/Technical Lead,

Mr. Jeffrey Schinckle, MSLS, will serve as the primary point of contact for all hospitals. Mr. Schinckle is skilled in building database-driven web applications and programming for federal and state clients. Our team has a proven track record of successful data management and analytics that will effectively support the HCA's ability to perform its regulatory functions.

Our team's offer includes a **technical approach** that reflects a clear understanding of the project goals; the **personnel experience** required to minimize risk and provide the best resources to accomplish project activities; directly relevant **corporate experience** that fully demonstrates our commitment and capabilities to effectively perform the requirements of this HCA project; and a **management approach** that will ensure successful delivery of the requirements.

3.1 Company Background and Organization

SSS is an employee-owned company that has specialized staff in technical, scientific, and research support services in health-related areas for more than 35 years. SSS is based in Silver Spring, Maryland, with offices in Durham, North Carolina and Kampala, Uganda. We have a staff of nearly 500 employees and a business base in five broad areas: clinical research services, epidemiology and public health studies, health information technology, health data management and analysis, and program evaluation and policy analysis. Additionally, we are a registered vendor in West Virginia.

SSS is a leader in helping public health professionals turn information into management insight through Internet database applications. We have developed several web-based data collection systems, including for the HCA, which are flexible enough to accommodate the ever-changing, evolving requirements of our clients. Many of these data sites require a high level of security with restricted, role-based access and confidential data. We are adept at designing, developing, and maintaining these secure environments and sites.

Furthermore, SSS is home to some of the industry's top analytical statistical programmers. To support our clients' missions, we provide an impressive depth of SAS, Stata, SUDAAN, and other statistical programming capabilities. We also use our in-depth statistical and database experience to develop customized, web-based, analytical systems for our clients. SSS understands the unique characteristics of many of the health-related data sets and is uniquely positioned to provide the most knowledgeable and experienced staff to for the HCA.

To facilitate effective communication and project management, SSS is organized in four major technical groups and six administrative groups, as shown in **Figure 3-1**. The four technical groups include Clinical Research and Biosciences (CRB), Health Policy and Data Analysis (HPDA), Health Technology and Research Solutions (HTRS), and Public Health Sciences (PHS). The West Virginia HIDS project will be managed and reside in the Health Data Analysis Center, which is part of the HPDA group. Paul Gorrell, PhD, Vice President of HPDA, will provide corporate oversight for the project, as well as assist in recommending new

analytic and dissemination approaches. Dr. Gorrell is a nationally known expert in analytic programming and data analysis in health services research. He has over 20 years of experience of research and management and health services

research and quality control. Dr. Gorrell has immense experience with quality-control audits, data quality assurance, and has previously managed various data validation activities for diverse clients.

Social & Scientific Systems, Inc.
Corporate Organization Chart

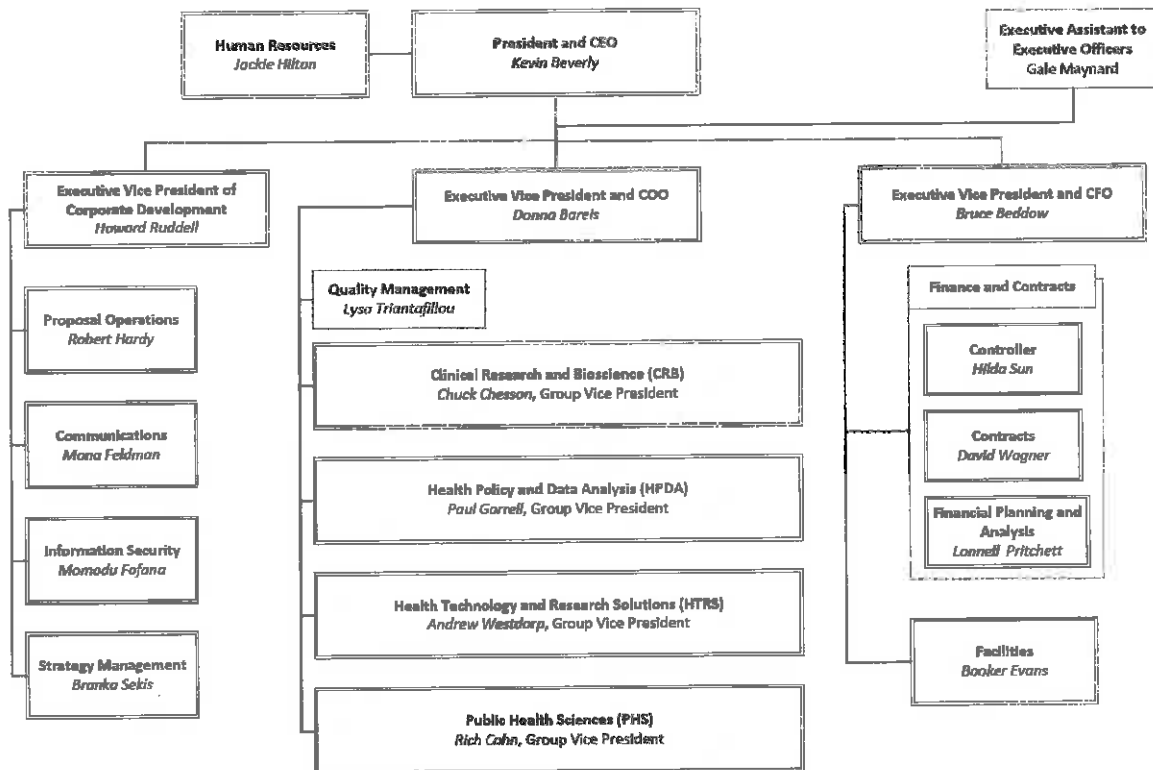


Figure 3-1: SSS' technical groups provide efficient and productive project management and organization.

SSS staff brings a wide range of quantitative, qualitative, and research methodology skills to bear on health research and supports clients such as AHRQ, the Maryland Health Care Commission (MHCC), the Medicare Payment Advisory Commission (MedPAC), the Medicaid and CHIP Payment and Access Commission (MACPAC), the MACRA Physician-Focused Payment Model Technical Advisory Committee for Assistant Secretary for Planning and Evaluation (ASPE), and other Federal and State agencies. We provide statistical programming of health expenditure, utilization, and quality data; collect, process, and analyze health care claims, survey, discharge, and enrollment data; and create analytical products

for dissemination. We are experts in designing efficient and creative software, debugging and testing programs, generating reliable results (frequently under time and budget constraints), and applying application-specific routines and procedures to verify output before delivery to our clients. We have also developed customized web-based statistical applications for many clients, such as a secure system for a state hospital association that provides online business management capabilities, quality-related indicators, and clinician performance reports to its hospital members. Our staff have extensive experience collecting, processing, and analyzing medical record and billing data and possess an in-

depth knowledge of medical coding and diagnosis-related group (DRG) grouping methodologies. In support of numerous Federal and state agencies, we have acquired a thorough understanding and appreciation of the changes that are taking place in the health care industry. We apply that understanding directly to improving the products and services we provide to our clients. This orientation makes SSS a highly engaged and suitable partner for HCA.

By concentrating on serving federal and state health-related agencies, SSS constantly builds

knowledge, methodologies, and systems on projects that subsequently benefit other projects. For example, the HCA system has been refined through its implementation in West Virginia for nearly 13 years, and in the state of Maryland. Our system’s modular structure offers our clients maximum flexibility. Unlike many other systems on the market that often use a “black box” approach, our system is readily transparent modifiable to specific client requirements.

3.2 Relevant Experiences and References

SSS supports health care stakeholders by providing patient data processing; statistical programming and data analysis; research and evaluation design; analytic and technical skills; policy expertise to clients focused on improving the nation’s public health and health care delivery systems; statistical consulting; Internet database applications support; and system design, development, and maintenance services. We help researchers and policymakers study trends in health care expenditures; analyze Medicare, Medicaid, and other public health programs; and understand the epidemiology of complex diseases.

Of particular importance to the current procurement, SSS served as the HCA’s Data Collection and Processing Services vendor for nearly 13 years, during which period we fulfilled HCA’s technical, cost, and schedule objectives. Under the existing contract, we improved data completeness, quality, efficiency, and usability, which allowed the HCA to complete five more years of inpatient data, 2011-2015. We reached 100 percent participation of all hospitals with no hospitals delinquent with regard to their data

submissions. In the following sections, we provide project descriptions and references for similar projects—both current and completed.

The following three customer references reflect SSS’ experience in accurately and efficiently managing projects of a similar scope and complexity to the project outlined in the RFP. Each reference includes a description of how the services provided align to the requirements of the RFP, the goals of the project, and the ways in which SSS is meeting those goals. SSS has successfully supported these clients for many years under multiple contracts:

- West Virginia Health Care Authority—13 years
- Maryland Health Care Commission—18 years
- Agency for Healthcare Research and Quality—35 years

We encourage the HCA to contact our references to confirm and expound on these descriptions.

The following projects represent current work that demonstrates SSS’ expertise and management in projects of similar scope and complexity to the project outlined in the RFP.

Project Name	Hospital Inpatient Data Collection, Processing, Analysis, and Reporting
Client	West Virginia Health Care Authority
Contract Type/Annual Amount/Period of Performance	Fixed Price/\$356,500 (annual average)/09/01/2011–08/31/2016
Reference	Laura Anderson, Director of Clinical Analysis Email: LAnderson@hcawv.org ; Phone: (304) 558-7000

Project Name	Hospital Inpatient Data Collection, Processing, Analysis, and Reporting
	Susan Dolly, Data Analyst Email: SDolly@hcawv.org ; Phone: (304) 558-7000 ext. 243
Description: How SSS Meets Projects Goals and Objectives	SSS is the current vendor for the WVHCA HIDS. For the last 5 years, we have supported the goals as outlined in the current RFP. Before that, we supported the WVHCA on similar contracts for 8 years. We have extensive experience with the WVHCA, and our hospital data collection focuses on error-free data with an easy to use interface. More specifically, our system, the HDSS, collects, processes, and edits hospital inpatient data through importer checks, validation processes, reporting, and record adjudication. We create and provide invaluable system guides, specifications, and manual. Our much-praised HDSS help desk provides friendly technical support to hospitals, their vendors, and the HCA on individual and group levels. We provide clean analytic files on a weekly basis and an annual final file for the data collection year – delivered on time. We have been protecting and defending the data with our data privacy and security measures, without mishap. Finally, we provide thorough project management ensuring project success.
Project Manager	Christina Larson Chebili
Project Location	Silver Spring, MD

Project Name	Data Management and Analytic Support for the Maryland Medical Care Data Base (MCDB)
Client	Maryland Health Care Commission (MHCC)
Contract Type/Annual Amount/Period of Performance	Fixed price/\$1,795,017 per year; 05/01/2016–04/30-2021
Reference	Contract Manager: Linda Bartnyska Director, Center for Analysis & Information Systems Maryland Health Care Commission 4160 Patterson Avenue Baltimore, MD 21215 410-764-3782; linda.bartnyska@maryland.gov Procurement Officer: Andrea Allen Maryland Health Care Commission 4160 Patterson Avenue Baltimore, MD 21215 Phone: (410) 764-8791 Fax: (410) 358-8811, e-mail: Andrea.Allen@maryland.gov RFP # MHCC 16-012 issued on 12/07/2015
Description: How SSS Meets Projects Goals and Objectives	SSS supports MHCC in collecting and processing all-payers claims data—containing eligibility, provider, dental, medical encounter, and prescription drug data—received from private payers, Medicare, and Medicaid and storing them into a data warehouse used for various research and policy initiatives of the state of Maryland. SSS analyzes the data and produces several quarterly and annual reports on physician utilization, prescription drug use, and health care expenditures in the State of Maryland. This project requires building and maintaining a data management system consisting of a web portal for data intake and communications with payers, an ETL (Extract, Transform, Load) module to validate and clean the data, and a data warehouse to store the processed

Project Name	Data Management and Analytic Support for the Maryland Medical Care Data Base (MCDB)
	data ready for consumption. In addition, the project requires working on multiple concurrent tasks with some quick turnaround efforts to respond to legislative inquiries; working one-on-one with MHCC and other outside analysts to produce the required analyses; and providing the writing support and quality control for the production of the annual reports. Finally, the project requires a high level of adaption to the ever-changing needs and standards in the health care industry.
Project Manager	Nitesh Patel
Project Location	Silver Spring, MD

Project Name	Data Management and Computer Programming Support
Client	Agency for Healthcare Research and Quality
Contract Type/Annual Amount/Period of Performance	Cost plus fixed fee/ approx. \$6,294,071 per year; 06/2014–06/2019 Time and Materials/\$400,000 per year; 06/2014–06/2019
Reference	Anita Soni Agency for Healthcare Research and Quality 5600 Fishers Lane Rockville, MD 20857 301.427.1425; Anita.Soni@ahrq.hhs.gov
Description: How SSS Meets Projects Goals and Objectives	<p>For more than 30 years, SSS has provided AHRQ with similar programming support, including database development, database management, statistical programming services, and development and maintenance of Web-based applications. This support involves using specialized databases developed to support health services research—in particular, the Healthcare Cost and Utilization Project (HCUP) databases. For more than 25 years, our programmers have used HCUP hospital discharge and outpatient data on many analytical tasks. For the last 10 years, we have also managed the HCUP Central Distributor, the data distribution unit for HCUP’s restricted access, public release databases. SSS staff use SAS and other statistical software to support statistical analyses and work one-on-one with AHRQ and outside health care analysts to support research, presentation, and publication efforts. Data are confidential and require a secure environment with security procedures established and enforced for working with the data files.</p> <p>SSS designed, implemented, and continues to maintain two database retrieval systems for AHRQ, HCUPnet, and MEPSnet.</p> <p>HCUPnet is a publically available tool that uses HCUP data to identify, track, analyze, and compare statistics on hospitals at the national, regional, and State levels. HCUPnet can produce national and state statistics on hospital stays, emergency department visits, and ambulatory surgeries using HCUP data. It can produce statistics for specific conditions or procedures of interest, rank order conditions or procedures, or can be used to examine all discharges in general. It can show outcomes and measures including length of stay (mean or median), hospital charges and costs, in-hospital deaths, discharge status. HCUPnet can compare the types of patients (by age, sex, primary payer, and income) and types of hospitals (by ownership, teaching status, location, bed size, and region). HCUPnet can also show county-level information on hospital stays.</p> <p>MEPSnet is a collection of analytical tools that operate on Medical Expenditure Panel Survey (MEPS) data. MEPSnet guides users step-by-step to obtain the statistics needed. All the data in MEPSnet/IC (Insurance Component) are based on the tables of national</p>

Project Name	Data Management and Computer Programming Support and State estimates derived from the MEPS IC List sample data. MEPSnet/HC (Household Component) provides easy access to nationally representative statistics of health care use, expenditures, sources of payment, and insurance coverage for the U.S. civilian non-institutionalized population.
Project Manager	Devi Katikineni
Project Location	Silver Spring, Maryland; Rockville, Maryland

3.3 Staffing Plan

SSS places a great deal of emphasis on retaining highly-trained personnel with the experience and education required to support scientific and technical research projects. Nearly 40 percent of SSS staff have advanced degrees across a wide array of disciplines, including data programmers, database administrators, policy researchers, qualitative and quantitative researchers, health informatics experts, and statisticians will lend expertise to this project.

Our team of experienced, skilled personnel draws on the combined strengths of SSS. Our proposed team offers a deep well of project management, operational, analytics, and subject matter experts to meet all HCA project requirements in the Hospital Inpatient Data Collection, Processing, Analysis, and Reporting (see Figure 3-2). Overall, we are proposing a staffing plan that retains staff from our current contract, on which we proved highly successful and responsive to HCA’s needs.

Given the success in the current HCA project, SSS is proposing two key staff members that have been fundamental to the on-going project success for the HCA and can commit to delivering high quality service and continue building strong relationships with the hospitals and the HCA. We are proposing **Christina Larson Chebili** as the Project Manager and **Jeffrey Schinckle** as the Functional/Operations Lead (See Figure 3-2). This team has demonstrated high quality project

management, communication, and data management and analytics expertise. Furthermore, they are knowledgeable of what high-level challenges to look for and can anticipate what hospital-specific issues are likely to be encountered.

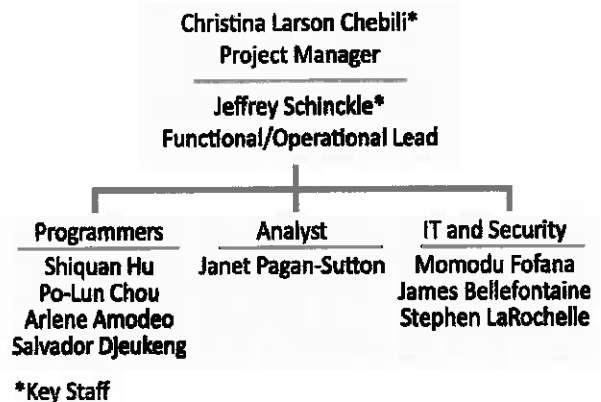


Figure 3-2: SSS Key Staff Organizational Chart

The key staff’s working knowledge and expertise of the current HCA systems only further demonstrates their necessary skills to provide the highest level of data processing services to the HCA with maximum efficiency. **Table 3-1** demonstrates the qualifications and specific project responsibilities of our key proposed staff – **Christina Larson Chebili** and **Jeffrey Schinckle**. This table highlights their education, skills, expertise, and project responsibilities.

Table 3-1: Qualifications Summary of SSS Key Staff

Key Personnel	Project Responsibilities, Professional Experience, and Special Qualifications
<p>Christina Larson Chebili, MA Project Manager Goal 1 Co-Lead, Goal 3-6 Lead, Goal 2 support MA, General Psychology, Catholic University of America Key Staff LOE: 43%</p>	<p>Project Responsibilities (Functions/Duties):</p> <ul style="list-style-type: none"> ▫ Assume overall responsibility for the project, including day-to-day program activities, task timeliness, and resource allocation; financial, staff, and quality ▫ Responsible for long-term project success and ensures high-quality results ▫ Work closely with all technical and operational staff to ensure that the technical solutions are implemented and operational needs are identified and addressed ▫ Manage and mitigates program risks <p>Goal 1 Co-Lead:</p> <ul style="list-style-type: none"> ▫ Manage data collection, processing, and editing, ensure data quality ▫ Assist the HCA with reconciling master database, including generating quarterly data reconciliation reports ▫ Oversee reports on data quality and completeness ▫ Implement processes to enhance the collection and analysis of National Provider Identifiers (NPI), and review and revise expected sources of payment <p>Goal 2 Support:</p> <ul style="list-style-type: none"> ▫ Document processes for HCA staff, provide training and support, communicate with hospitals about errors; submits data; respond to requests for assistance in a timely manner ▫ Ensure the HCA's immediate access to data; oversee ongoing maintenance of the data submission manual, user guide, and other documentation for the web-based application <p>Goal 3 Lead:</p> <ul style="list-style-type: none"> ▫ Provide all analytic files and ensure data quality <p>Goal 4 Lead:</p> <ul style="list-style-type: none"> ▫ Evaluate procedures for performance and compliance, including monitoring system security, providing immediate feedback to submitters, and reviewing edits <p>Goal 5 Lead:</p> <ul style="list-style-type: none"> ▫ Develop Project Management Plan (PMP) and ensure adherence to the PMP and the successful execution of all tasks and deliverables <p>Goal 6 Lead:</p> <ul style="list-style-type: none"> ▫ Oversee the creation of new reports and make recommendations to the HCA regarding data analysis, reporting, and dissemination
	<p>Professional Experience and Special Qualifications:</p> <ul style="list-style-type: none"> ▫ Offers 10 years of project management experience and 23 years of computer programming expertise with SAS, Oracle, SQL Server, SPSS, and ESRI mapping software ▫ Currently serves as project manager for West Virginia HCA Hospital Inpatient Data Collection, Processing, Analysis, and Reporting System ▫ Previously served as project manager for federal and state clients including the National Institute on Aging (NIA), Laboratory of Epidemiology, Demography, and Biometry (LEDB), the State of Connecticut Office of Health Care Access (OHCA), the American Nurses Credentialing Center (ANCC), and CGI Federal ▫ Brings expertise and specialization with building, manipulating, checking, unit testing, analyzing, and reporting on data in SAS ▫ Proven to successfully work closely with clients to understand the purpose, timeline, and specifications of each task and request to ensure usable and timely results ▫ Develops project work plans that provide a summary description of the tasks, plans, objectives, requirements

Key Personnel	Project Responsibilities, Professional Experience, and Special Qualifications
<p>Jeffrey Schinckle, MSLS Functional/Operational Lead Goal 1 Co-Lead and Goal 2 Lead; Goal 4 and 6 Support MSLS, Master of Library and Information Science; University of Washington Key Staff LOE: 41%</p>	<p>Project Responsibilities (Functions/Duties):</p> <p>Goal 1 Co-Lead:</p> <ul style="list-style-type: none"> ▫ Receive data from 60+ West Virginia hospitals ▫ Oversee any agreed upon changes in the interface design and front-end coding, including individual screen wire frames ▫ Oversee metrics analysis; oversees functional, unit, and performance testing; implementation testing; regression testing; and cross-browser testing; ▫ Read text files into SQL server ▫ Accept inpatient data files in ANSI 5010 format, uniform billing data elements in ICD-10 format ▫ Oversee the maintenance of the online application database, including audit module, format/value checking module, edit checking module, and notification module ▫ Oversee roles and affiliation-based functionality ▫ Oversee maintenance of secure web-based system, including configuration management, change control, and version control <p>Goal 2 Lead:</p> <ul style="list-style-type: none"> ▫ Assist in the ongoing maintenance and distribution of guidelines to data submitters; work with data submitters and their representatives ▫ Communicate with hospitals with errors or having trouble submitting data <p>Goal 4 Support:</p> <ul style="list-style-type: none"> ▫ Leverage working knowledge and expertise from existing relationship with the hospitals and the HCA to implement administrative, physical, and technical safeguards to ensure the confidentiality, integrity and availability of all system data <p>Goal 6 Support:</p> <ul style="list-style-type: none"> ▫ Develop tools, products, report templates, software, and/or code for us by HCA and/or external partners to conduct analysis of health care utilization, access, costs, and quality ▫ Maintain the master database ▫ Develop system enhancements and reports as needed
	<p>Professional Experience and Special Qualifications:</p> <ul style="list-style-type: none"> ▫ Offers over 14 years of experience as a web programmer with extensive experience in building and maintaining database-driven web applications ▫ Currently serves as the lead developer and managed for the user interface and .net development and brings expertise in the existing data collection, management, and analysis system utilized among West Virginia hospitals ▫ Serves as the technical resource for all West Virginia hospitals and consistently meets all anticipated and ad-hoc needs for the all technical and operational staff and relevant stakeholders ▫ Previously served as the lead programmer on the registration and data management websites for the Medical Product Safety Network (MedSun) project, conducted for the Food and Drug Administration (FDA) ▫ Expertise in ASP.NET (C# and VB.NET), VBScript, HTML/CSS, Javascript, and Microsoft Visual Studio and has designed databases in both Microsoft SQL Server and MySQL

SSS' experienced personnel will provide the ideal team to continue building and maintaining a well-crafted and executed project startup plan, an efficient project organization, and cost-effective ongoing support. SSS understands the logistical

and technical issues associated with data collection and database development efforts, and we are familiar with all coding and reporting requirements. Having processed hospital inpatient data many times before, we know what

general problems to look for and what hospital-specific issues are likely to be encountered.

Complete resumes for all members of the SSS team are included in Appendix A. The SSS Human Resources department verifies all educational credentials as condition of employment.

We have organized the HCA Hospital Inpatient Data Collection, Processing, Analysis, and Reporting team as shown in **Figure 3-3**. The team is organized based on their skills, expertise, and experience, which will allow SSS to successfully accomplish all project goals.

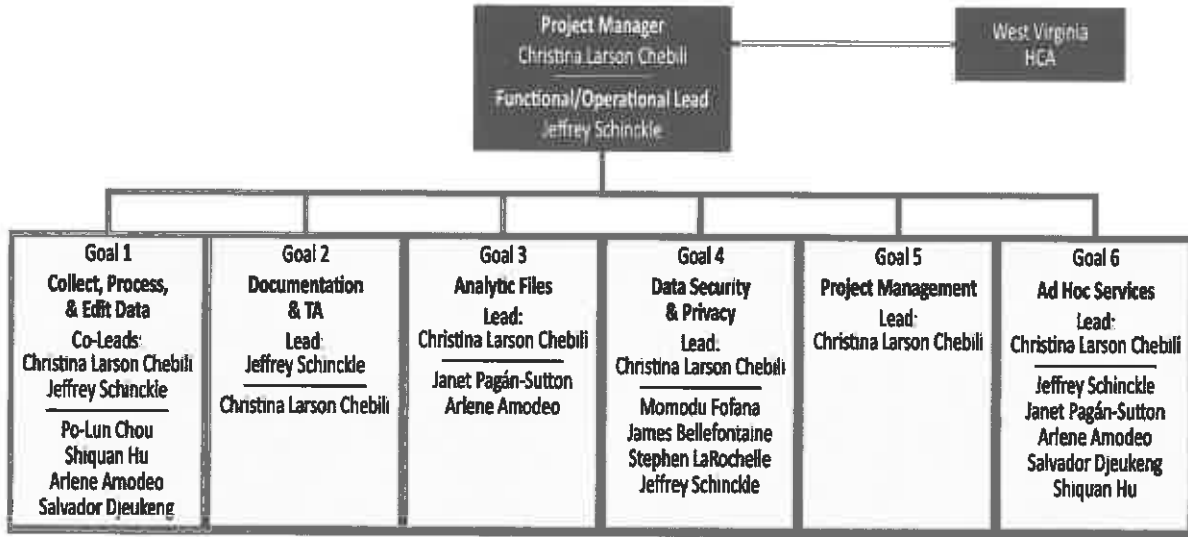


Figure 3-3: Our project organization provides efficient, effective program control and collaboration.

The team structure provides a primary point of contact with the HCA (the Project Manager) and delineates goal roles to ensure all team members understand their project roles/responsibilities. The team structure enables us to continually monitor project performance via strong quality assurance practices and identify/mitigate emerging issues. Our approach was developed based on our understanding of the HCA scope of work, our team’s current work with the HCA and HIDS, and alignment of each person’s expertise and position’s anticipating functions, roles, and responsibilities.

We have clearly identified a small team of SAS programmers to help achieve Goal 1, Goal 3, and Goal 6. These proposed SAS programmers include programmers who currently work with the HCA today, as well as, other SAS programmers who

bring expertise and experience from working with other clients such as the state of Maryland. Additionally, we have delineated tasks and roles to database administrators, web programmers, and IT and security personnel. The database administrators and IT and security personnel will contribute to Goal 4 activities and bring experience with database management, HIPAA security physical and technical safeguards, and installing and maintaining VMWare VCenter Security systems. The web programmers will be vital to integrating updates and revisions to ensure efficient system operations and conducting performance, implementation, regression, and cross-browser testing.

Table 3-2 outlines the SSS staff proposed for this project.

Table 3-2: Qualifications Summary of SSS Team: SSS' staffing plan will continue to ensure rapid project startup, ongoing system maintenance, and an appropriate level of communication and training.

SSS Personnel	Project Responsibilities, Professional Experience, and Special Qualifications
<p>Shiquan Hu, MS, MS Web Programmer MS, Computer Science; University of North Carolina at Charlotte; MS, Biology; Wake Forest University Key Staff LOE: 3%</p>	<p>Project Responsibilities (Functions/Duties): Goal 1 Support:</p> <ul style="list-style-type: none"> ▫ Maintain guidelines for data submissions and integrate all updates and revisions to ensure efficient system operation ▫ Develop and produce other reports as needed ▫ Acquire reference data files necessary to complete all tasks ▫ Adjudicate the data and create weekly reports <p>Goal 6 Support:</p> <ul style="list-style-type: none"> ▫ Support the development of tools, products, report templates, and software as needed ▫ Maintain secure web-based system, including configuration management, change control, and version control ▫ Conduct functional, unit, and performance testing, implementation testing, regression testing, and cross-browser testing
<p>Professional Experience and Special Qualifications:</p> <ul style="list-style-type: none"> ▫ Offers 14 years of experience in developing and supporting online enterprise software products, including requirements analysis, development, debugging, testing, support, and maintenance ▫ Brings expertise in relational database management systems (RDBMS) such as MS SQL Server, Oracle, and Sybase, as well as database programming ▫ Previous industrial experience in the full lifecycle development process, including requirement analysis, development, debugging, testing, support, and maintenance ▫ Strong background in developing web services, validating user requirements, and conducting unit testing. ▫ Upgraded the Monitoring and Evaluation of the Emergency Plan Progress (MEEPP) system from a classic ASP application to an ASP.NET 2.0 application 	
<p>Po-Lun Chou, MS SAS Programmer MS, Applied and Engineering Statistics LOE: 3%</p>	<p>Project Responsibilities (Functions/Duties): Goal 1 Support:</p> <ul style="list-style-type: none"> ▫ Maintain guidelines for data submissions and integrate all updates and revisions to ensure efficient system operation ▫ Develop and produce other reports as needed. ▫ Maintain the master database ▫ Acquire reference data files necessary to complete all tasks ▫ Adjudicate the data and create weekly reports
<p>Professional Experience and Special Qualifications:</p> <ul style="list-style-type: none"> ▫ Offers 17 years of experience in SAS programming with a specialization in data management, report generation, quality control systems, and web-based systems and applications ▫ Provides programming support and quality control for the HCA including creating programs to fix raw data problems and modified routine programs to update source data files, creating and modifying production programs to generate quarterly and final adjudication reports from the West Virginia hospital databases, and performing quality control checks to ensure database and report integrity ▫ Currently supports MHCC, NIA, AHRQ, and the American Nurses Credentialing Center (ANCC) ▫ For MHCC, supports the production of the annual Maryland Medical Care and Pharmacy databases 	

SSS Personnel	Project Responsibilities, Professional Experience, and Special Qualifications
<p>Arlene Amodeo, MS SAS Programmer MS, Statistics; Rutgers University LOE: 3%</p>	<p>Project Responsibilities (Functions/Duties): Goal 3 and 6 Support:</p> <ul style="list-style-type: none"> ▫ Assist in adjudicating the data and creating weekly reports ▫ Leverage skills and experience to efficiently assist in delivering analytic files to the HCA ▫ Support the development of tools, products, report templates, software, and/or code as needed
<p>Professional Experience and Special Qualifications:</p> <ul style="list-style-type: none"> ▫ Offers more than 8 years of experience in quantitative data analysis as a dedicated SAS programmer and 5 years of experience as a research analyst in the fields of educational testing and health care policy research ▫ Brings expertise in data management and analysis and currently applies analytic and programming support in health care policy research, with a focus on Medicare payment policy, health care quality, and outcomes of regulatory enforcement ▫ Currently working with the MHCC to critically reviews specifications provided by external clients for clarity, completeness, and sound utilization of data sources ▫ Performs data validation verifies results of data processing and statistical analyses 	
<p>Salvador Djeukeng, MS Web Programmer MS, Information Systems; Marshall University LOE: 3%</p>	<p>Project Responsibilities (Functions/Duties): Goal 1 Support:</p> <ul style="list-style-type: none"> ▫ Integrate updates and revisions to ensure efficient system operation ▫ Conduct functional, unit, and performance testing; implementation testing; regression testing; and cross-browser testing <p>Goal 6 Support:</p> <ul style="list-style-type: none"> ▫ Assist with developing and providing tools, products, report templates, software, and/or code for the HCA as needed
<p>Professional Experience and Special Qualifications:</p> <ul style="list-style-type: none"> ▫ Offers over 7 years of experience as a software/web applications developer primarily working Microsoft .Net Framework and Web Platform, ASP.Net (MVC, Web Form, and Web API), C#, VB Net, ADO.NET, LINQ, Web and database Development technologies ▫ Brings expertise working as Server-Side Applications Developer (Business, Model and Service layer) and also as a Backend Developer with an SQL Server (T-SQL) ▫ Proficient with HTML, CSS, AJAX, Javascript, JSON and XML 	
<p>Janet Pagan-Sutton, PhD Analyst PhD, Health Services, University of California, Los Angeles LOE: 13%</p>	<p>Project Responsibilities (Functions/Duties): Goal 3 Support:</p> <ul style="list-style-type: none"> ▫ Assist with the development of new reports ▫ Make recommendations to the HCA regarding data analysis, reporting, and dissemination <p>Goal 6 Support:</p> <ul style="list-style-type: none"> ▫ Assist with developing and providing tools, products, report templates, software, and/or code for the HCA as needed
<p>Professional Experience and Special Qualifications:</p> <ul style="list-style-type: none"> ▫ Offers more than 20 years of experience conducting health services and health policy research and is highly skilled in the application of a wide range of quantitative and qualitative research methods, as well as in the use of claims and administrative databases to address leading health policy issues ▫ Conduct a study for AHRQ using data from the HCUP State Inpatient Database to examine the relationship between Medicare Advantage market penetration and hospital costs ▫ Works with AHRQ as a lead researcher developing Statistical Briefs based on HCUP data 	

SSS Personnel	Project Responsibilities, Professional Experience, and Special Qualifications
<ul style="list-style-type: none"> ▫ Principal investigator on a project with the Maryland Health Services Cost Review Commission ▫ Deputy Project Director for CMS Research, Measurement, Assessment, Design, and Analysis Skilled Nursing Facility Initiative 	
<p>Momodu Fofana, PhD, MSc, PMP Security PhD, Civil Engineering, University of Maryland College Park; MSc, Systems Engineering, University of Maryland College Park LOE: 5%</p>	<p>Project Responsibilities (Functions/Duties): Goal 4 Support:</p> <ul style="list-style-type: none"> ▫ Comply with HIPAA security physical and technical safeguards ▫ Undertake valid risk assessment and establish effective risk management ▫ Conduct security audits ▫ Establish emergency, backup, and disaster plans ▫ Secure appropriate authentication for all users of the data and provide for automatic notification of non-routine access ▫ Review and revise data security and privacy policies and procedures ▫ Ensure security of all electronic systems, data, and their use ▫ Assist with ensuring the integrity, security, reliability, compatibility, and appropriate accessibility of databases and other electronic systems ▫ As needed, review and revise data security and privacy policies and procedures
<p>Professional Experience and Special Qualifications:</p> <ul style="list-style-type: none"> ▫ Offers over 20 years of experience of successfully initiating, planning, designing, developing, implementing, monitoring, managing, controlling, and closing out information security projects and audits, which facilitate operational security, promote organizational growth, and comply with Federal Information Security Management Act (FISMA), Federal Risk and Authorization Management Program (FedRAMP), Health Insurance Portability and Accountability Act (HIPAA) regulations, and contractual requirements ▫ Currently serving as the SSS Director of Information Security where he has successfully managed information security programs for federal agencies and received several letters of recognition for turning around challenging projects and streamlining processes within the dynamic threat environment. Dr. Fofana excelled in successfully managing security engagements for The Department of Labor, CMS, The Department of Education, and the Federal Aviation Administration (FAA) 	
<p>James Bellefontaine IT and Security BS, Information Systems & Technology – in progress LOE: 2%</p>	<p>Project Responsibilities (Functions/Duties): Goal 4 Support:</p> <ul style="list-style-type: none"> ▫ Acquire hardware and software necessary to complete all tasks ▫ Install and set up development, QA, and production servers ▫ Set up development, QA, and production SQL servers ▫ Configure backup server ▫ Install and maintain VMWare VCenter Security ▫ Maintain operating systems, analytic system, and SQL Server database
<p>Professional Experience and Special Qualifications:</p> <ul style="list-style-type: none"> ▫ Offers 8 years of experience as an IT technician, network engineer, and a systems administrator ▫ Currently manages the Wintel and VMWare infrastructure in a FISA moderate environment of 1000+ hosts ▫ Manages the networking and team to provide and support a stable network environment for several government contracts ▫ Experience focusing on quality process improvements and documentation for Tier III technicians ▫ Expertise with implementing the continuous improvement of internal corporate infrastructure including the complete upgrades of virtual hosts and improving corporate security systems 	

SSS Personnel	Project Responsibilities, Professional Experience, and Special Qualifications
<p>Stephen LaRochelle, MCITP IT and Security BS, Finance, Lehigh University, Microsoft Certified Information Technology Professional (MCITP) Database Administrator SQL LOE: 2%</p>	<p>Project Responsibilities (Functions/Duties): Goal 4 Support:</p> <ul style="list-style-type: none"> ▫ Acquire hardware and software necessary to complete all tasks ▫ Install and set up development, quality assurance, and production servers ▫ Set up development, quality assurance, and production SQL servers ▫ Configure backup server ▫ Install and maintain VMWare VCenter Security ▫ Maintain operating systems, analytic system, and SQL Server database
<p>Professional Experience and Special Qualifications:</p> <ul style="list-style-type: none"> ▫ Offers over 14 years of experience as a database administrator and has developed and administered databases on Microsoft SQL Server 7 through 2012 ▫ Expertise with managing SQL environments consisting of over 50 SQL 2008 R2/2012 servers across development/QA/UAT/production environment ▫ Administered Internet Information Systems (IIS) environment including regular deployments of web code across environments ▫ Established procedures for SQL and IIS deployments, allowing for task transition to junior administration staff ▫ Resolved SQL server issues related to query performance, space allocation, database backup maintenance, and user access 	

In addition to the staff proposed above, SSS has a large pool of experienced web and SAS programmers that spans over four major technical groups and six administrative groups—

many with directly relevant experience supporting other similar State and hospital discharge data work—who are available to support any potential project needs.

4.0 Project Goals and Objectives

On our current contract with the HCA, SSS delivered a user-friendly, highly customized, robust system for the West Virginia hospital partners. In the HDSS, we have made the process of data collection, processing, and editing as seamless as possible; hospitals and vendors have thanked us for having refined it the way that we have. Our help desk received 96% fewer requests for assistance in year 5 than we did in year 1. We were innovative, we listened to the HCA and hospital users, and we built a system that can adapt as needs change. We increased the data quality each year, with the recent closing of the 2015 data collection year being the best yet.

In this section, we comprehensively describe our approach for meeting each of the six goals that HCA has specified. We include appendices, text, and figures to highlight our capabilities and experience with the HCA's HIDS.

The design and features of the HDSS web-based system are given in Appendix B (HDSS User Guide) and **Figure 4.1**, while the structure of the master database is located in Appendix C (Master Files and Variables). The data quality reports (DQRs) we currently include in the HDSS are viewable in Appendix B with a deeper look at their use in Appendix J, which contains user instructions on the best way to work with these reports. Ideas for future DQRs are viewable in Appendix I, while analytic file fields and proposed analytic reports are in Section 4.3.5.

Technical materials of the current system are also included with this proposal. These include a listing of the HDSS warnings and errors, and their meaning (Appendix D); the reconciliation process document (Appendix F); and the companion guide to the official 837I Implementation Guide (Appendix G).

4.1 Provide Data Collection, Processing, and Editing

The following paragraphs provide an overview of the operational process. In the subsections that follow, we delve into the details of the HDSS.

Web Application Database. SSS' Web Application Database receives data from hospitals in the UB-04, ANSI 837 I 5010 format, ICD10 version. All data is submitted via this secure web based system. This system is designed to make the data import, correction, validation, and submission process as seamless to the user as possible, only requiring that users have minimal computer skills, internet access, and a modern web browser.

The application leverages both a modern programming framework (the Microsoft .NET Framework Version 4.6) and relational database (SQL Server 2014), which allows for rapid development and added built in security. All submissions and transactions are securely transmitted via Secure Sockets Layer (SSL), and an audit log of user interactions is stored in the application database. In addition to uploading and importing files/batches, the system allows users to fix and key in values for records by fields, and also take some actions for groups of records (such as delete). The system shows them what the original value was but also which actual values are allowed and what the errors are (edit checks) and allows for corrections online. Users have the ability to delete a single record, a group of records, or a portion of a record. The system does not require that the data batch be fixed all at once, as partial entries are stored and can be completed at a later date. Data is then securely stored in SQL Server, using field level encryption where necessary.

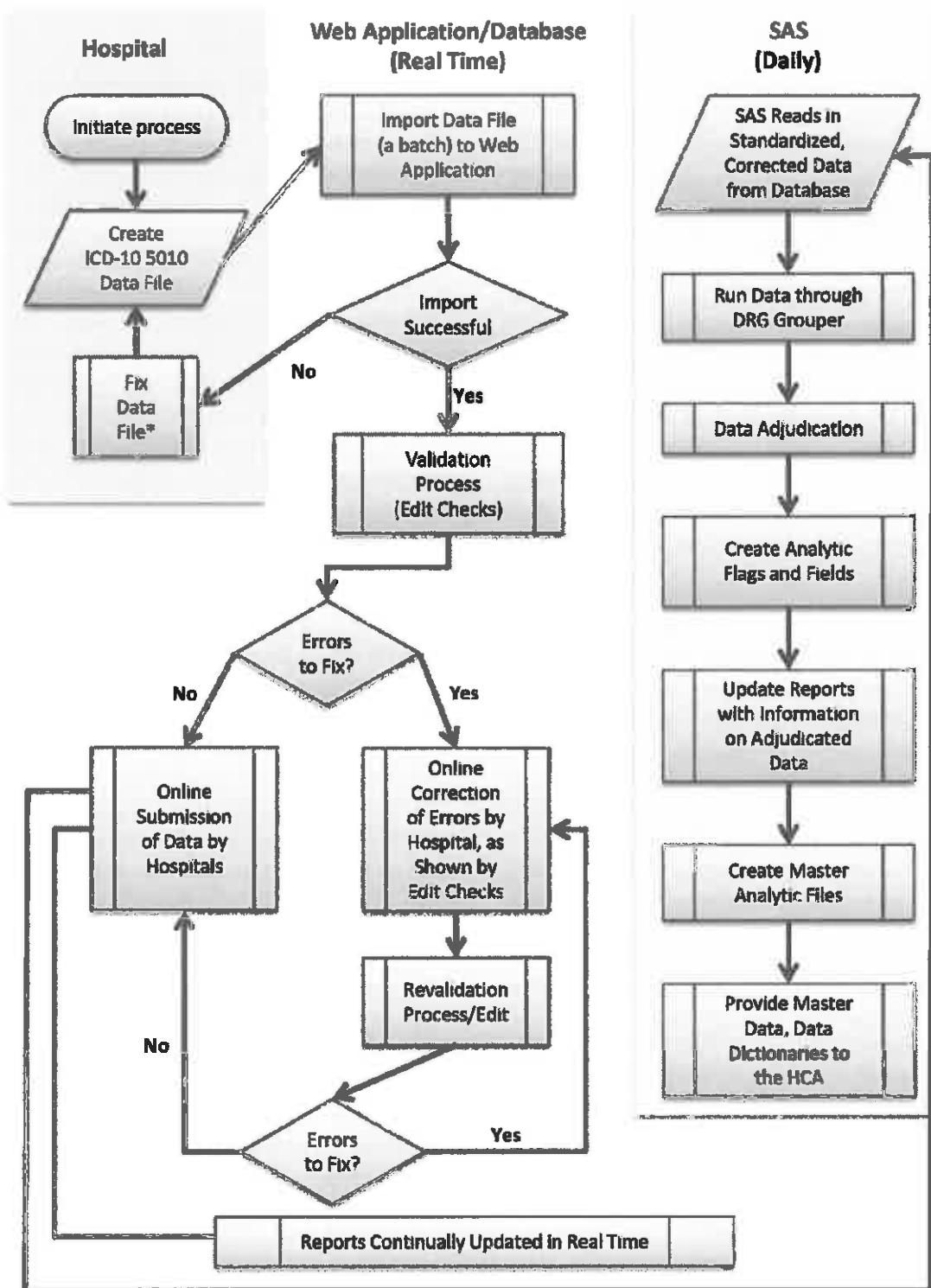
The system validates the data based on the UB-04 5010 ICD-10 format, and it notifies the

hospital user if there are correctible errors (edit checks) and allows for immediate correction. In the event that the entire set of data does not meet the minimum data quality requirements, the user will be instructed to correct, revalidate, and resubmit the batch. This entire process is audited for accountability and reporting purposes. Reports are updated in real time showing the status of data that is valid, invalid, and submitted, while completeness reports appear in real time on the HDSS home page, and on the reports tab.

SAS Process and Master Analytic File. As we currently do, SSS will, on a daily basis, pull in the standardized, cleaned, submitted batch data directly from the SQL server database to SAS. Then, we apply DRG grouping software to this data, adjudicate it, and create analytic flags and fields to create a master data set. We update reports daily with information from adjudicated records.

We provide, on at least a weekly basis, a copy of the current master data set to the HCA, in a delimited flat file that is suitable for easy import into the HCA's Oracle database. Corresponding SAS programs allow the HCA to read in the same flat files to SAS, in an automated fashion. In addition to completeness reports on the website, a hospital status report is created each day, which informs the HCA on hospital submission progress. At the end of the data collection year, typically June 30, SSS creates and delivers to the HCA, in a secure way, the final yearly master analytic file, and downloads of all reports.

We illustrate the operational process below, in the Data Collection Reporting Process Diagram (Figure 4.1).



* The SSS HDSS help desk will reach out to the user in the event of a file import failure, find the solution to fix the file, and work with the user to fix it

Figure 4-1: Data Collection and Reporting Process

4.1.1 Collect the hospital inpatient uniform billing (UB) data elements outlined in the Data Element Specifications Guide (available for download on the HCA website) and implement annual additions and/or modifications to reported data elements based on changes in state, federal, or industry standards or policies, in a manner and timeline approved by the HCA.

Vendor Response: SSS' secure web-based system has been used to collect hospital inpatient uniform billing (UB) data elements, submitted in batches, from hospital users and their vendors, with a focus on both data quality and application usability. The HDSS will continue to collect UB data elements from roughly 60 hospitals in West Virginia, in accordance with the West Virginia HIDS Policies and Procedures and outlined in the Data Element Specifications Guide. This represents about 300,000 records annually.

SSS is proactive with state, federal, and industry standards and policies, and each year at a minimum (in consultation with the HCA), SSS will

add and/or modify data elements. We will continually review the sources of data element standards, which include the National Uniform Billing Committee (NUBC) manual and policy changes and coding changes mandated by CMS, and will monitor any changes coming from the Washington Publishing Company's 5010 | 837-I Health Care Claim: Institutional Consolidated Implementation Guide. In addition, SSS will, at a minimum, look to make enhancements to the system where possible, for example, to improve data collection speed, to increase data collection quality, or to make processes more user-friendly.

4.1.1.1 Implement processes to enhance the current collection and analysis of physician identifiers (National Provider Identifiers (NPI)), including but not limited to the use of the National Plan and Provider Enumeration System (NPPES) to provide specialty mapping of providers.

Vendor Response: The NPI is a critical variable for health care data, and SSS has an excellent understanding of this HIPAA standard field.

SSS collects NPIs for the HCA in our current contract, and we have collected and analyzed NPI for various clients. For the HCA, SSS has been using and will continue to use the latest NPI file available from the National Plan and Provider Enumeration System¹ (updated quarterly) to assess the quality of the NPI field. We will keep the most current file online and validate all NPI fields as they are submitted. Although the NPI number is used to identify providers, its configuration does not carry any intelligence about health care providers, such as medical specialty or the state in which they live. Taxonomy and specialty codes are added to the four NPI fields listed in the Data Element Specification Guide on the NPI attending physician, NPI Billing Provider, NPI Operating Physician, and NPI Other Physician. Adding the

taxonomy code can be used to identify various categories of providers based on specialty or to group by specialties for analysis.

Another SSS project that utilizes the NPI is the MHCC contract. SSS uses the NEPPES file as a look-up table to validate the NPI field submitted by payers. Validating this field and providing feedback to payers improved the data collection of the NPI field for the MHCC by 26% between 2008 and 2012. In addition, the NPI is used to augment the claims data with taxonomy codes (specialties), license numbers, and entity type information (individual or organization). For this project, a master provider file is in development. It will use the NPPES as one of the sources of provider information. The master provider file used the NPI as the key field to identify providers of services and health care facilities. It is planned to be used for price transparency purpose as it facilitates to report prices of health care services at the provider and facility level.

¹ http://download.cms.gov/nppes/NPI_Files.html

4.1.1.2 Implement processes to review and revise the collection of expected source of payment, which is currently reported in accordance with the West Virginia Hospital Inpatient Data System Payer Coding Specifications (available for download on the HCA website).

Vendor Response: To allow consistent reporting of payer data, uniform source of payment is important. The lack of consistency in current reporting standards limits the ability to accurately compare source of payment data from different data sets and across different types of providers—analyses critical to understanding issues such as the effects of different financing methods and reimbursement levels on the provision of care or to assist with monitoring of health care access across payer categories. The current payer coding system has five components: HCA notation, type of payer, payment program, payment modality, and HMO. It allows the HCA to collect detailed payer information and thus provides valuable opportunities for important analyses that would otherwise be difficult to conduct. One of the drawbacks of the current 5-digit configuration, however, is room for human error. Since four of the five digits have multiple values (some of which consist of a long list), coding errors may occur when providers code each digit of the source of payment field.

SSS will review the current coding system to assess the quality of coding using other related fields. We will work with the HCA to find solutions to reduce coding errors while preserving the amount of information collected. One possibility is to revise the payer coding to resemble a hierarchical structure such as the source of payment typology, a standard maintained by the Public Health Data Standards Consortium (PHDSC)². This standard, which will be incorporated in the 5010 version of ANSI X12 837, has been adopted by Georgia, New York, and Oregon.

Such a hierarchical structure removes redundant information embedded in the current HCA configuration—for example, instead of having to code two digits for Medicare as in the current HCA system (the second digit to identify ‘federal government’ and the third digit to identify ‘Medicare’), in a hierarchical system, one digit is sufficient for Medicare since, by default, it is a federal government program.

While the wealth of information collected through the detailed payer coding system may be necessary and useful for the state government, data of similar details may not be available elsewhere in the country. Another possibility is to derive a higher-level source of payment structure that is frequently used by national data sources, e.g., HCUP, for the HCA. A higher-level source of payment variable, often consisting of six categories including Medicare, Medicaid, private insurance, self-pay, no charge, and other, will allow the comparison of health statistics by source of payment between West Virginia and other states. Many HCUP states distinguish Medicare fee-for-service from Medicare Advantage plans. Distinguishing between the two allows more accurate comparisons, for example, of utilization and expenditures. It is straightforward to combine Medicare Advantage and Medicare fee-for-service (FFS) into one field if needed. SSS is experienced in recoding and analyzing source of payment through the HCUP project for AHRQ and other projects funded by various state governments.

² <http://www.phdsc.org/standards/payer-typology-source.asp>
<http://www.phdsc.org/about/committees/presentations/SourceofPaymentTypologyVersion3.0.pdf>

4.1.2 Accept inpatient data files in the current HCA UB-04 (available for download on the HCA website) and ANSI ASC X12 837i 5010 (see Attachment D) formats that accommodate the data elements outlined in 4.1.1. Implement additions and/or modifications to the file format over the course of the contract based on changes to state, federal, and/or industry requirements, as required and/or approved by the HCA.

Vendor Response: The ANSI X12 837 is the standard required by HIPAA; SSS' HDSS accepts inpatient data files in the current HCA UB-04 and ANSI ASC X12 837i 5010 formats. The HDSS has used this format for almost 2 years, and SSS understands its nuances.

We will implement additions and/or modifications to the file format over the course of the new contract based on changes to state, federal, and/or industry requirements, as required and approved by the HCA. SSS is aware that version 5010 may go through changes. In our

current HCA contract, the HDSS system transitioned from the 4010 format to the 5010 format. By providing a test site and extra help desk assistance, we helped hospitals successfully transition. As in that transition, new health care requirements may call for new fields, new code values, new rules, and field deletions. The HDSS data collection system has the flexibility required by such changes, and SSS will assist the HCA and hospitals by providing technical support and by allowing a sufficient period where hospitals can test their data submissions.

4.1.3 Assess and confirm the accuracy, completeness, quality, appropriateness, and reasonability of the submitted data to identify and eliminate common errors. Implement current edit checks, as outlined in the Edit Check Definitions guide (available for download on the HCA website). Conduct routine and custom analyses to identify data submission and processing errors. Implement additional or revised edits over the course of the contract based on identified data quality issues; revised reporting requirements; or changes to coding, billing, and reimbursement standards, as requested, required, and/or approved by the HCA.

Vendor Response: The creation and refinement of SSS' HDSS system during the current contract has been a major success. The edit checks are working optimally, which encourages and enforces accuracy and completeness of data. The editing process is straightforward for hospital users. These characteristics all lead to accuracy,

completeness, quality, and appropriateness of data. We will continue to improve and adapt the system as needed throughout the upcoming contract, as we have seen this approach leads to continually increased value over time. The following subsections describe the edit checks and validation process in detail.

4.1.3.1 Develop data quality checks and reports using national and/or industry standards and implement data quality checks of collected data from facilities to ensure accuracy and completeness of submitted data, as agreed upon and approved by the HCA. The Vendor will incorporate at least an annual review of data quality checks to ensure they continue to meet the needs and approval of the HCA. An overview of current data quality reports and an overview of current warnings and errors are provided as Attachment E and Attachment F, respectively.

Vendor Response: SSS' current HDSS system uses multiple approaches to assess and confirm the accuracy, completeness, quality, appropriateness, and reasonability of the submitted data to

identify and eliminate common errors. Table 4-1 lists a few of the techniques and procedures that we will continue to use.

Table 4-1: HDSS uses multiple approaches to check and report on collected data.

Issue	Why Addressed	System Check(s)	Solution
837i 5010 batch file does not conform to specifications	Accurate file format ensures system is reading in data as intended	HDSS importer checks for these critical errors	System alerts user to batch failure, SSS HDSS help desk reaches out to user to have file fixed
Field values do not conform to data element specifications or data fails edit check rules	Invalid values decrease data quality. Questionable trends and other types of invalid data reduce quality	HDSS edit (validation) checks, warnings and errors	System reveals error issue and location, enforces replacement with allowed values
Duplicates, both full and partial	The “wrong” record may be kept in the database if the user not alerted and allowed opportunity to correct	Specific edit check warnings and errors <ul style="list-style-type: none"> ▪ E9: all fields identical within batch ▪ E10: key fields identical within batch ▪ W101: duplicates between batches ▪ DQR 6: potential duplicates ▪ DQR 9: duplicates on key fields 	User made aware and forced to choose which record to keep
Adjudication	Check relationship between claims for same visit	Series of algorithm checks applied after user submission	Extensive set of rules applied in system that govern how it manages specific combinations of bill types, rolling up to one record per discharge
Quarterly data reconciliation procedures	Verify completeness and reasonableness of the volume of quarterly data collected	Data quality reports on reconciliation, bill types, and over/under counting (DQRs 4, 5b, 7, 8)	User may correct batches and/or reconciliation form based on information gleaned from DQRs 4–9

SSS’ approach to the annual review of data quality checks involves reviewing sources of data element standards, including the NUBC manual.

In addition, we review policy changes and coding changes mandated by CMS and verify that checks are still relevant and conform to any updates.

4.1.3.2 The vendor develop a plan to identify processing errors, such as incomplete, inconsistent, incomprehensible, or incorrect records found within the system, notify the HCA on a regular basis of such errors, and consult with the HCA to determine how to handle identified issues. The process of identifying errors will be review annually or as requested by the HCA and will be updated as needed and agreed upon by the HCA. All processes used to handle these identified issues will be agreed upon and approved by the HCA prior to implementation.

Vendor Response: SSS’ enhanced HDSS system identifies processing errors and assists users with

correcting them, including upon import, during validation, and at reporting completion.

Upon import, SSS' HDSS system identifies and will continue to identify processing errors and batch malformations, such as incomplete, inconsistent, incomprehensible, or incorrect records. Batches that contain data that do not conform to the 837i 5010 file format are rejected. Users and the SSS HDSS help desk receive email and system messages notifying them of errors.

Once a file is in the correct format, it will successfully import into the system, entering validation processing. This process applies edit checks to the data. Data validation uses the edit checks from the Edit Check Definitions document to identify and notify the user about inconsistent, incorrect, and incomplete records. The system points the user to the exact location of the errors, where they must fix them to be able to submit a batch. A user who is in the system editing and entering values will have limits placed on those values since they are restricted to choosing from a drop down, as in Figure 4-2 (using fabricated data). For example, if editing a diagnosis code, only those diagnosis codes valid for the year in

question will be made available to choose from, making it impossible to enter an incomplete or incomprehensible value.

Although most inconsistencies will be caught by the edit checks, other types of information may still need attention, such as bill type inconsistencies, for which the DQRs are key. These reports are available for review by the user, the HCA, and SSS staff on-line on the HDSS site under the Reports tab. SSS reviews the contents these reports on a regular basis to point out any remaining issue to the users, and we help them diagnose the issue and fix the problem.

SSS also runs routine and custom analyses to identify any other kinds of data submission and processing errors as mentioned in Section 4.1.3.1. Notification and consultation between SSS and the data analyst and/or project officer will take place often and on a regular basis. Finally, SSS will work with the HCA on a process for identifying errors, annually or more often and update as, prior to implementation.

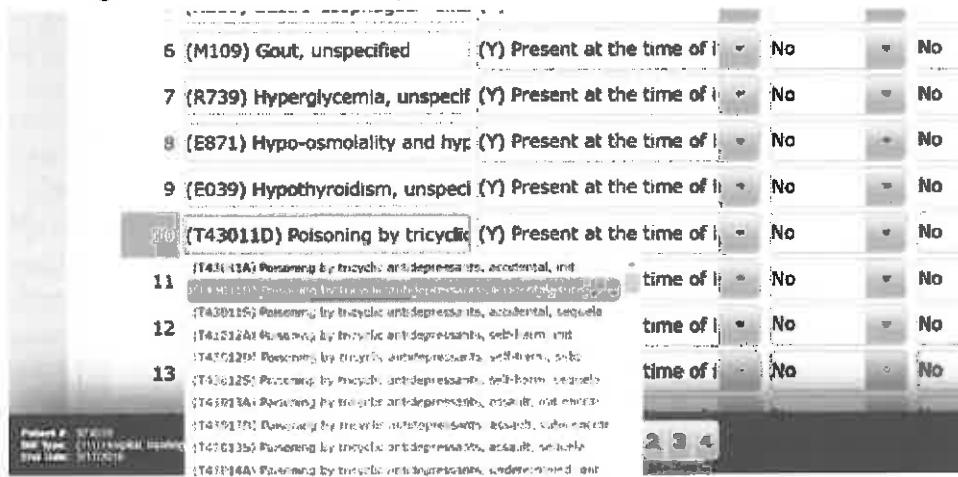


Figure 4-2: Snapshot of choice list of diagnosis code values

In (Figure 4-1, the data collection and reporting process, we highlight some of the processes and steps showing how the HDSS discovers, displays, and cleans errors, resulting in error-free data:

- On the first step, “import data file to web application”, malformed batches are rejected by the importer

- Right after a *successful* import, the validation process applies edit checks to the batch
- At the data adjudication step, the adjudication process rolls up clean records
- The reporting process (data quality reports) identifies remaining issues :
 - Continuously updated in real time

- Updated daily with information on adjudicated data
- At the last step, where master data and data dictionaries are provided to the HCA, only the

edited, cleaned, rolled up data with value added fields are delivered

4.1.4 Maintain a secure web-based system for the online submission and editing of hospital inpatient uniform billing (UB) data. Implement updates or revisions to the system based on changes adopted per 4.1.1, 4.1.2, and 4.1.3.

Vendor Response: SSS maintains the secure web-based HDSS by using standard best practices for software development lifecycle (SDLC) management. The system utilizes the Microsoft .NET Framework 4.6 and SQL Server 2014 for data capture, editing, and audit tracking. The system uses a FIPS compliant implementation of the AES algorithm to perform the encryption of personally identifiable information (PII)/protected health information (PHI) fields and a secure network configuration to protect them. All submissions and transactions are securely transmitted via SSL. The system is designed with an intuitive interface that includes secure log-in procedures (only for the identified user) and functions, such as submitting inpatient records, transferring relevant files, viewing reports, standard documentation, and customized help. Figure 4-3 shows an overview of the system; the HDSS block (at the top) includes the four main HCA application components:

- The HDSS Web Application is the front-facing site for HCA users, where users can upload and correct data, view reports, retrieve files, and view documentation.
- The HDSS Processing Server reads the data files uploaded by users, performs validation checks on the data, and inserts the data into the HDSS Web Application Database.
- The HDSS Web Application Database houses the encrypted data, reports, analytic files, and the audit log for the front-end system.
- The SAS Analytics module processes data, links records, adjudicates data, and creates reports.

All data submitters access the HCA application via the internet using HTTPS protocol, the production version of the system, housed within the SSS Secure Data Center (SDC) located within a tier-4 co-location facility. SSS staff working on the HCA system connect from corporate headquarters via a secure and encrypted connection shown on the block labeled SSS HCA Support: Silver Spring Headquarters. This site is also the HCA Disaster Recovery site.

The maintenance of the HDSS includes proper system configuration management and change control. Additionally, the SSS project team will use an online tool that manages version control, change requests, issue and bug tracking, and requirements. These processes and procedures are led by Ms. Larson Chebili, SSS' Project Manager, and supported by the project team to ensure that the implementation of updates and revisions to the system are tracked and prioritized to the stakeholders' requirements.

For implementation updates to the system, Ms. Larson Chebili will lead a Change Control Board (CCB) to provide a mechanism for ensuring that all proposed changes to the HDSS are adequately reviewed to ensure viability and compatibility with the operation of the current version of the system. All system changes will be recorded in the documentation log of changes. If any errors are identified in HDSS or resulting files, SSS will correct them. The HCA will be immediately notified of the errors and kept apprised of all ramifications and final corrections.

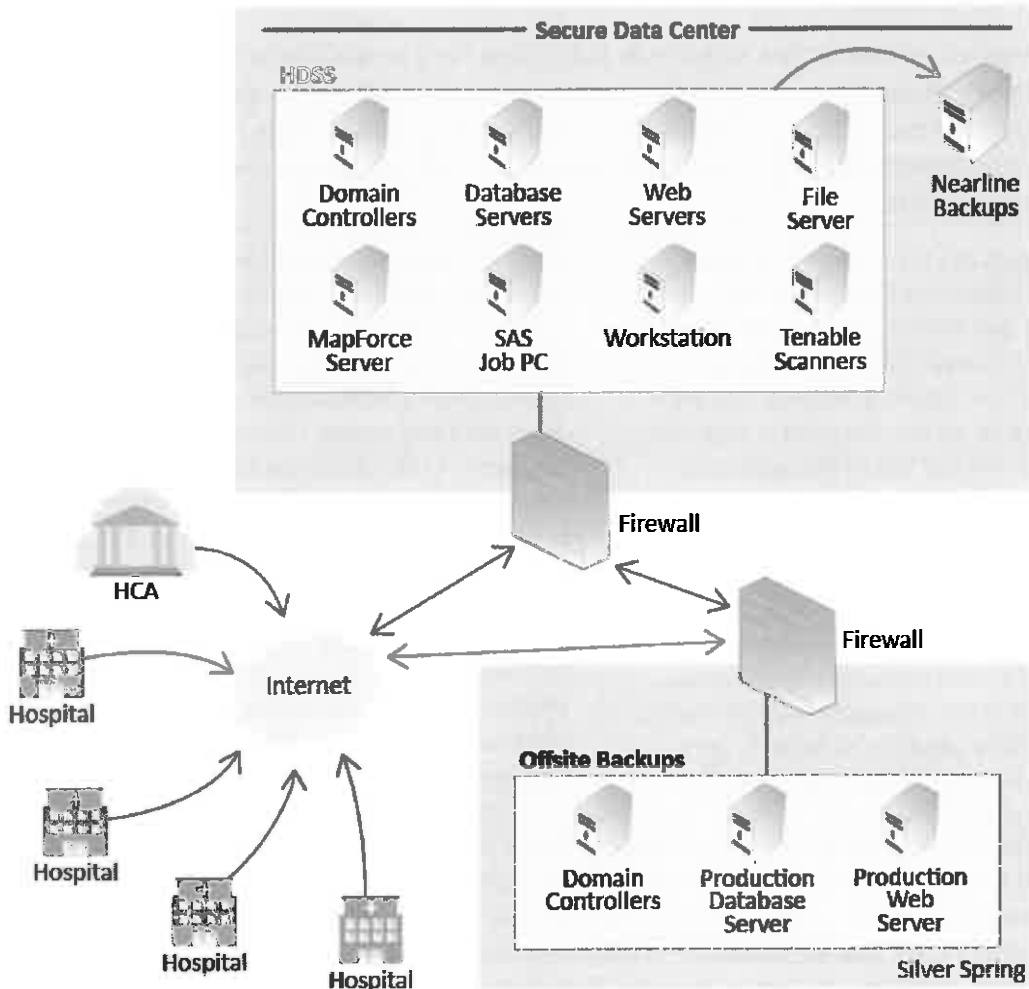


Figure 4-3: SSS will customize our secure web-based system for online submission and editing of hospital inpatient UB data.

4.1.5 Maintain a master database of all data collected during the contract period and develop and implement processes, including extract, transfer, load (ETL) processes, which allow for an audit trail of all submissions, additions, changes, and deletions to the master database (see additional information in Section 4, Subsection 4.4.4).

Vendor Response: SSS developed and currently maintains the master database. All data collected first goes through the application database, where the data are checked. As discussed in Section 4.2.2, and shown in Figure 4-3, this secure web-based application tracks and stores changes using a real-time mechanism for any edits that can be corrected at the time of submission. The application database stores the records that are audited while our auditing

system stores information on errors that were not immediately corrected via the interface. This system will track and identify all submitted records, records with errors and warnings that would be presented to the hospitals for correction to improve data quality, and all the information about errors that have not been corrected. Only after submission additions, changes, and deletions have taken place will those data be passed to the master database.

4.1.6 Implement methods to link all records submitted for a single discharge (including interim, replacement, and late charges bills) and create and/or identify a single complete (analytic) record representing each encounter, based on HCA adjudication rules, generally accepted industry standards, and record characteristics, such as patient control number, bill type, and discharge date.

Vendor Response: SSS is aware that multiple records can be submitted for a single stay, and we understand that the encounters need to be adjudicated to produce clean data suitable for analysis. After error checking, records that were not rejected will move into the master database. From there, SSS will use SAS to link encounter data based on HCA adjudication rules (generally accepted industry standards), involving record characteristics such as patient control number, bill type, and discharge date.

SSS will identify—using the bill type code—replacement bills, all late charges, and interim charges for each claim. If needed, we will remind hospitals to include separate records for each individual in their submissions. For example, in

cases of mothers/babies, it is important for hospitals not to combine the data but to submit separate records for the mother and the baby. In cases where provider ID, patient number, discharge date, and bill type are identical on more than one record, SSS will bring those groups of records to the attention of hospital representatives for de-duplication (as described in Section 4.1.7, details for DQRs 6 and 9). As a result of proper identification, linking, and de-duplication, we then adjudicate the data to create and/or identify a single complete inpatient encounter record. Each of these analytic encounters will be identified at the hospital Medicare provider number and patient control number levels.

4.1.7 Develop and make available to data submitters and the HCA, reports that promote the assessment of the quality and completeness of data submitted to the master database. The data quality reports should be updated on a reasonable and routine basis to summarize recently submitted data and be available in common formats (e.g., PDF, Excel, etc.). Propose a series of reports to be developed during the first project year. In subsequent years, plan for three modifications to current reports and for the development of two new reports annually.

Vendor Response: SSS has developed and currently provides 10 DQRs; we will continue to provide these reports. They promote the assessment of the quality and completeness of data submitted to the master database. The reports are updated in real time for submitted

data, and daily for reconciliation and adjudicated data. Each report is downloadable in PDF, Excel, XML, TIFF, Word, CSV, and MHTML.

Table 4-2 illustrates each data quality report and its use.

Table 4-2: Data Quality Reports

Data Quality Reports
DQR1-Batch Summary Report—Error/warning type and count per batch and the total charges involved. For correcting issues so the same errors do not continue to happen.
DQR2-Submitted Records by Month of Discharge—Displays the number of records adjudicated each month.
DQR3-Patient Listing—View of all records in the database, including batches that have been deleted, that are invalid (currently being edited by a hospital), submitted, and adjudicated.
DQR4-Payer Reconciliation Report—Important report that compares reported reconciliation counts to adjudicated data counts by Month, hospital unit, and payers, and calculates percentage difference is between reconciliation report counts and the adjudicated counts.

Data Quality Reports
DQR5a-Bill Type Report—Identifies missing interim records which prevent adjudication – overall picture
DQR5b-Non-Adjudicated Patient Level Bill Type Report—Patient detail on those missing interim records - patient listing with bill types that shows whether a record was adjudicated or not.
DQR5c-Adjudicated Bill Type Matrix Report—Adjudicated bill type matrix report to use in identifying missing interim records.
DQR6-Potential Duplicates Report—Shows records that have possibly been submitted for the same patient under another patient control number
DQR7-Overcounted Discharges Report—Detailed display of records that aren't adjudicating together but are being counted
DQR8-Undercounted Discharges Report—Detailed records that are not being counted because they cannot be adjudicated. These records have the wrong bill types, wrong coverage dates, or wrong admit date.
DQR9-Records with W101 Duplicate Warning—Shows records from different batches with the same provider, patient number, bill type, and coverage end date.
DQR10-Missing SSN Report—Shows when the SSN field is being populated in your batches (this field is not otherwise visible to the user or to the HCA)

We propose a series of additional reports for the first year based on use-case; listed below. SSS anticipates that these reports will prove valuable as a way to monitor improvements in data quality over time and to assist hospitals and SSS in identifying data gaps that must be resolved to develop a comprehensive discharge database. As we have seen under the current contract, there are a few hospitals with data issues that require extensive correction before submission.

- Statistics showing changes in the number of errors across time by hospital and a report on error frequency by hospital. This report will point out chronic problems for specific hospitals and list the most common errors in each hospital's submissions. This report will be enhanced with information/data on the volume of submitted records and errors, by bill type and unit.
- Trend analysis report as an additional check on completeness. Examples include by hospital, monthly changes in discharges compared to the previous year, and in the same period.
- Submissions management reports to assess completeness of accepted data for each subgroup of records defined by hospital unit, payer code, and service type. These reports will be updated in real time.

- Overall, cross frequency of payer type and payment program
- Payment program by hospital and year
- Frequency distributions, cross-frequency distributions, and other statistics for service type, length of stay, charges, MDCs, DRGs, discharge status, and other fields selected by the HCA.
- Discharges presented by payer, bill type, patient age, and/or other variable. The information gathered in these reports will enable the HCA and SSS to understand the overall content and legitimacy of the collected data.
- Validation reports comparing data to a previous time period. Examples of such reports will include a report that compares the top 10 principal diagnosis codes, by volume, during two separate time periods. In general, shifts in the volume of hospital discharge diagnosis codes are expected to occur slowly over time. Significant changes across reporting periods may signal problems in the quality of data submission.

SSS' plans for, in subsequent years, two new reports annually and three modifications to existing reports.

4.1.8 Provide resources or tools to assist the HCA with the quarterly reconciliation of the master database. Currently, hospitals submit to the HCA a quarterly reconciliation report summarizing the number of discharges by provider number (CMS Certification Number), month, and HCA payer classification (available for download on the HCA website). This report is manually compared to a report of the data contained in the master database. Hospitals are notified by the HCA of discrepancies and must revise the submitted data, as requested by the HCA. The current reconciliation process is outlined in Attachment G.

Vendor Response: Hospital users create reconciliation reports according to a schedule established by the HCA. Each participating hospital prepares its report online in the system based on the hospital-specific data from Uniform Financial Reports and other internal resources. These reports contain information on the record counts for each hospital by CMS certification number (unit) and payer. The payer groups for this report are based on the first two digits of the collected Payor Code field, and include Medicare, Medicaid, PEIA, Other Government, and Non-Government.

To assess and verify the completeness and reasonableness of the volume of quarterly data

collected and adjudicated, SSS will assist the HCA in examining and identifying discrepancies in the contents of the reconciliation reports.

Described above, DQR4 will show adjudicated counts in the master database compared to record counts recorded on the reconciliation form, by unit, month, and payer. Percent difference will be displayed, and non-matching counts stand out in red text. Reconciliation form counts also appear next to adjudicated counts for comparison, right on the HDSS home page.

As we have done over the last 5 years, SSS will work diligently with the HCA and hospitals to interpret issues and reconcile data.

4.1.9 Continually evaluate the data collection, processing, and editing procedures for performance and compliance; routinely implement quality improvements, based on these reviews, to enhance system processes, efficiencies, and speed, as requested and/or approved by the HCA.

Vendor Response: In addition to our current contract with the West Virginia HCA, SSS also supports the MHCC. We draw on this experience to continuously evaluate the process of data collection and recommend modifications in methods that will lead to increased efficiency and data quality improvements. In our current contract with the HCA, SSS recommended and implemented over 10 specific website updates that increased efficiency and improved data quality. Examples include:

- Improved the performance of the edit claim screen (the most complex portion of the site)
- Claim level validation rules now run in real time after saves, eliminating confusion as to number of errors actually left to fix

- Created more multi-record edit screens, especially useful for users with large numbers of validation issues

Upon approval by the HCA, we will implement notifications in a timely manner and according to schedules acceptable to the HCA. A few of the proposed methods to enhance the current data accumulation process are as follows:

- More help provided on the site itself
- Notify users which line/s of a failed batch import were responsible for the rejection
- Increased effectiveness of the edits applied; evaluate current edit checks, propose new edits, or modify the current set of edit checks
- Continuous monitoring of the process for ways to speed up the data correction process

4.2 Provide Documentation and Technical Support

In the following sections, we discuss our thorough approach to provide documentation and continue with our demonstrated excellent level of technical support. The value and

effectiveness of these SSS-developed materials and HDSS help desk on the current contract cannot be overstated.

4.2.1 Provide and maintain various materials for data submitters documenting rules, processes, and guidelines related to data collection, reporting, and editing, as requested and/or approved by HCA. Distribute documentation to data submitters in common formats and via the web within a reasonable period prior to the implementation date of required changes.

Vendor Response: Over the last 5 years, SSS has created and maintained a variety of detailed and informative pieces of documentation to benefit data submitters and intended to reduce burden on the user. These documents will continue to be available for viewing online on SSS' HDSS, where

they will also be downloadable in common formats. SSS will continue to maintain and update these materials as needed or requested, and they will be on the system prior to the implementation date of any changes.

Table 4-3: Overview of HDSS Materials

Materials	Data Collection	Reporting	Editing
User guide – covers maneuvering around the site and how to successfully import, edit, and submit data from start to finish.	✓	✓	✓
Companion Guide – Rules, detailed specifications data collection input file. Companion to the Washington Publishing Company's Implementation Guide (Health Care Claim Institutional (837) x12 Consolidated Guide).	✓		
Data Collection Policies and Procedures Guide – overview document covers rules, processes, and guidelines for data specifications, quality, adjudication, reconciliation, compliance, use and release, assistance, and reporting changes.	✓	✓	✓
Data Element Specifications – specification guide covering data collection field description and values and associated editing information	✓		✓
Listing of Warnings and Errors – detailed edit check rules and processes document			✓
Reconciliation process – reporting rules, processes and guidelines		✓	
Payer code list with descriptions – detailed guide on HCA's payer code values	✓		
DQR tips – guide with additional reporting advice		✓	

4.2.2 Provide documentation to the HCA that details the operational processes of the web-based data submission system necessary for HCA staff to evaluate effectiveness and understand and communicate information about the system to data submitters.

Vendor Response: SSS' HDSS manual of operations will be shared with the HCA to allow

the staff to be well versed in the operational details of the HDSS. This will enable them to

communicate with hospitals regarding the process. The manual points to several key components such as file format and file layout (Data Element Specifications Guide, Companion Guide), list of edits performed (Listing of Warnings and Errors), as well as data collection procedures (User Guide, Data Collection Policies

and Procedures Guide) were established by SSS. SSS will provide training and technical support to the HCA, data submitters, and/or their representatives on topics related to file formats, data submission, editing, as well as coding and billing standards.

4.2.3 Provide training and technical support to the HCA, data submitters, and/or their representatives on topics related to file formats, data submission, editing, and coding and billing standards

Vendor Response: Through thank you emails and verbal appreciation, we know that hospitals appreciate our technical support efforts, which in turn leads to a positive effect on data quality. SSS understands that data quality starts with effective communication and timely training and technical support for the HCA, hospitals, and their vendors. In response to requests by the HCA, data submitters, and/or their representatives, SSS will design and provide necessary training. We will also provide hospital-specific daily technical assistance as needed on file formats, data submissions, editing, and coding and billing standards.

versed in training and excel in our strong and tailored support to clients. Training may be conducted onsite, by teleconference, or by webinar. In the past 5 years, we went to the HCA's site to provide live training to large groups of hospital users, gave daily support via our toll free help desk number, and provided true one-on-one support.

SSS assumes close communication by phone, email, and fax. We are aware that occasionally there are new users who need to be trained on how to use the web application. We are well-

SSS will continue our attentive working relationships with all submitting West Virginia hospitals and their vendors, accepting both technical and non-technical inquiries.

In addition, the HCA will have direct access to key project staff as needed. We will respond to all inquiries received from the HCA in a timely manner by answering questions, making changes in the online system, and providing additional materials to the HCA and hospitals.

4.2.4 Work closely with diverse data submitters and/or their representatives, with varied levels of knowledge, skills, and resources, to understand their questions, problems, and demands, and be able to investigate and communicate solutions to them in a professional and cordial manner.

Vendor Response: Hospitals are comfortable with SSS' current HDSS system, as it was designed for data submitters with varied levels of knowledge, skills, and resources. The user interface is and will continue to be very user friendly. Still, questions, problems, and demands will come up. SSS provides user-focused system support in a timely and effective manner, and as in the current contract, users will have four main ways to receive assistance.

- The site's "help" tab, where a user can consult the help materials such as the user guide or edit check specifications
- Consult the DQRs
- Call or email the HDSS help desk, toll free. A friendly, courteous, knowledgeable help desk professional will answer the phone or reply quickly (if email) to the user with good solutions

- Pop up instructions in the site that appear when hovering

Many users have expressed appreciation of our patient help desk staff, and we will continue to provide this excellent level of service.

4.3 Provide Analytic Files

SSS will continue its timely and accurate creation and delivery of analytic files, as discussed in the following sections.

4.3.1 Create and provide to the HCA, on a routine basis, data file(s) containing all of the records and data elements submitted by hospitals, adjudicated records flagged for analysis, and processing and analytic fields created by the Vendor (including MDC, DRG, and other useful indicators of services, payment, cost, severity of illness, risk of mortality, intensity of service, and quality of care that will enhance HCA analysis). The minimum fields required in the analytic files are outlined in Attachment H.

Vendor Response: SSS will continue to create and routinely provide the HCA with data files containing all records and data elements submitted by hospitals. We will also provide adjudicated records flagged for analysis and the fields added during processing that enrich inpatient hospital data. The CMS Medicare Severity Diagnosis Related Grouper and Medicare Code Editor add the MDC and DRG with return code and CMS weight. We chose this grouper, which has been used for the last 5 years under

our current HCA contract, based on cost and technical considerations. Certainly, severity of illness and risk of mortality are other added-value files that will enhance HCA analysis. These could be obtained by running the data through another grouper, such as the APR DRG grouper. SSS understands how to use a number of different groupers and how each functions and the resulting output. We are happy to discuss alternatives that may be accommodated with the proposed level of resources with the HCA.

4.3.1.1 Implement methods to cross-walk existing and received discharge records between the ICD-9-CM and ICD-10-CM coding rules for any and all files requested by the HCA throughout the term of this contract, but only at the specific request of the HCA.

Vendor Response: Even though hospitals are already submitting data into SSS' HDSS system in the 5010 format, ICD-10 version, there will be an ongoing need to map to ICD-9 codes for trend analysis and consistency in data.

The ICD-10 coding system incorporates much greater specificity and clinical information than was available with the ICD-9 coding system, the number of diagnoses codes grew five-fold, and the number of procedure codes grew almost 19-fold. The number of present on admission (POA) indicators also changed, although the POA values themselves did not change.

In the absence of dual coding, SSS has already successfully used the cross-walking approach on the HCA's fourth quarter of 2015 analytic master data. Mapping will continue for each discharge and each code in the data set. These mappings will be based on the General Equivalence

Mappings (GEMs), which are considered to be the authoritative source for cross-walking between the two code frameworks, as they were developed over a period of 3 years by CMS and the Centers for Disease Control and Prevention (CDC), with input from both the American Hospital Association (AHA) and the American Health Information Management Association (AHIMA). The mappings will be downloaded from the CMS website, along with accompanying documentation.

There are two types of GEMs-related crosswalks: the GEMs files and the Reimbursement Mapping files. We propose using the Reimbursement Mapping files since they provide a one-to-one single translation of codes, whereas the GEMs files can involve multiple translations per code (mapping to choice lists of alternative codes). It is important to note that CMS created the Reimbursement Mappings files from the GEMs

files - formulating rules based on frequencies from three years of data and two sources (Medicare and California all-payer data), ICD-10 codes were mapped to the most dominant alternative ICD-9 code when the GEMs files presented choice lists. In less clear cases, CMS applied frequency rules and coding expertise to select the best choice for mapping.

Reimbursement Mapping files can be used in one of two ways:

- Forward mapping: ICD-9-CM to ICD-10-CM and ICD-9-PCS to ICD-10-PCS
- Backward mapping: ICD-10-CM to ICD-9-CM and ICD-10-PCS to ICD-9-PCS

We will use the approach selected by the HCA.

The Reimbursement Mappings may translate a single code in ICD-10 to a single code in ICD-9, a cluster of codes in ICD-9, or to no code in ICD-9. Although each diagnosis and procedure code for each discharge will be mapped, we will use the primary diagnosis and corresponding POA indicator as an example.

If the translation is to a single code, then the matching code will become the primary diagnosis. The POA indicator will remain the same. If instead the translation is to a cluster of codes (there may be up to six individual codes in a single cluster), then the first code in the map list will be the primary diagnosis, and the remaining diagnosis codes in the cluster will become secondary diagnosis codes for the record. Each of these newly assigned secondary diagnoses will be assigned POA indicators of the same value as the translated code. If secondary diagnosis codes already exist for the record in the original data, those will be pushed higher in sequence, along with their POA indicators. Finally, if the translation is not possible, that is, the code has no match in the other system, then the sequence numbers of secondary codes and POA indicators will be lowered accordingly.

Table 4-4 illustrates Reimbursement Mappings with an example of backward mapping.

Table 4-4: Reimbursement Mappings for Diagnosis Codes, Backward Mapping

Matching Situation	ICD-10 Code	ICD-10 Description	ICD-9 Code	ICD-9 Description	Percent of ICD-10 codes in this situation*
No match	Z6740	Type O blood, Rh positive	N/A	N/A	1.2%
One code paired up with one alternative	5762	Obstruction of bile duct	K831	Obstruction of bile duct	92%
One code paired up with one cluster	I25111	Atherosclerotic heart disease of native coronary artery with angina pectoris with documented spasm	41401	Coronary atherosclerosis of native coronary artery	6.8%
			4139	Other and unspecified angina pectoris	

The Reimbursement Mappings are based on the GEMs, linking codes of one system with codes in the other system
* =American Medical Association, Fact Sheet 7, Preparing for the ICD-10 Code Set: Cross-walking Between ICD-9 and ICD-10, September 2012.

4.3.2 Deliver the file(s) to the HCA in a secure electronic format approved by the HCA and acceptable for import into the HCA's then current version of SAS and Oracle, or other, then current software.

Vendor Response: As we have done for the last 5 years to the HCA, SSS will deliver separated value

delimited format file(s) with a header record(s) to enable import into Oracle and the HCA's then

current version of SAS (or other, then current software). The file(s) will be made available through a secure file transfer protocol (SFTP) download system. SSS will provide an SFTP

facility, and, as an added measure, will encrypt the files via secure compression software such as SecureZip.

4.3.3 Create and provide to the HCA data file(s) of merged data sets using field-level encrypted sensitive data fields as requested by the HCA during the contract term (see Section 4, Subsection 4.4.5 for additional details).

Vendor Response: The field-level encrypted sensitive data fields are stored as a non-human readable encrypted binary, which is encrypted using the FIPS compliant implementation of the AES cipher, and each record contains a unique encryption vector. Decryption could then only occur by taking a specific programmatic action. In the event that data needs to be linked on a key that is a sensitive data field, the data will be provided in an encrypted format to achieve the link. For example, if two pieces of data need to be linked on SSN, the SSN in each piece of data

would be decrypted by programmatic action using the unique encryption vector for each record, and then immediately re-encrypted using a new encryption vector shared by all records. The resulting binaries could then be compared. The sensitive field can be removed from the data and replaced by the encrypted binary, which serves as an artificial primary key. The artificial primary key can then be merged with the non-encrypted data and provided to the HCA.

4.3.4 Maintain and provide to the HCA documentation, reference files, and data dictionaries detailing the contents of the data file(s) and any information necessary or useful for HCA in its review and analysis of the data, including but not limited to: a data element frequency report; file layouts; load programs; code value definitions and labels; custom programming code; and descriptions of the methodologies related to the creation of the calculated fields added to the file(s) by the Vendor.

Vendor Response: SSS will continue to maintain and provide to the HCA documentation that will include a data dictionary with record layout and summary statistics for all variables. The contents of the file will include variable names and clear data labels. SSS will maintain and provide a report on data element frequency, file layouts,

load programs, code value definitions, and labels. Any custom programming code will be well documented, making it easy to follow and easily transported for use by others. SSS will maintain and provide descriptions of the methodologies related to the creation of the calculated fields added to the file(s).

4.3.5 Create and provide to the HCA, on a routine schedule as agreed upon and approved by the HCA, new reports (current standard reports are described in the UB data request form available for download on the HCA website) from the analytic file(s) that summarize key utilization, access, cost, and quality indicators, such as: patient days; case-mix; market share and service areas; and common DRGs/diagnoses/procedures by patient demographic characteristics, geographic region, and/or hospital. Propose a series of reports to be developed during the first project year. In subsequent project years, plan for three modifications to current reports and for the development of two new reports annually.

Vendor Response: SSS is widely known for health service research analytics. SSS has a strong

analytic team with extensive experience developing timely, accurate, and user-friendly

summary reports from a broad range of data sources. We regularly customize reports to address the information needs of a wide range of stakeholders such as policymakers, providers, analysts, and the public. Measures and/or indicators highlighted in summary reports may be classified as indicators of health system access, utilization, costs, quality, and the performance of the hospital market. Examples of measures that could be represented are shown in **Table 4-5** and are summarized below:

- **Access and Utilization**—Total discharges, overall and by DRG or procedure; average length of stay, overall and by DRG or procedure; state variation in inpatient and emergency department utilization; costs/resource use; case-mix index; charges and costs, total and by DRG.
- **Quality**—prevention quality indicators or potentially avoidable hospitalizations; hospital patient safety indicators; readmission rates, overall and by DRG; as well as inpatient mortality rates for selected procedures or DRGs.

- **Market**—Area day rate; area discharge rate; hospital share days; hospital discharge days.

Led by Dr. Janet Pagan-Sutton, these measures will be generated at the level of the state. Depending on the number of cases obtained from the data, these measures, or analytical fields, may be reported for regions of the state, health care markets, and for individual hospitals. As requested by the HCA, additional subgroup reports may be produced. For instance, it is possible to report utilization, costs, quality, and market measures by selected hospital characteristics, such as teaching status or size. Additional breakdowns may be conducted by patient characteristics. As an example, measures may be reported by primary payer and, to the extent available, patient characteristics that may include age, race/ethnicity, and rural/urban residence. The latter analysis is of particular importance if the state is interested in identifying the presence of health care disparities among subgroups in the population.

Table 4-5: SSS reports will include measures and analyses to enable the state to monitor utilization and access, quality of care, and market trends.

Example of Fields or Measures	Analytical Levels	Example of Cross-tabulations
Access and Utilization		
DRGs <ul style="list-style-type: none"> ▫ Total number of discharges ▫ Top ranking DRGs by volume and expenditures ▫ Average and median LOS ▫ Total charges and costs ▫ Case-mix index 	<ul style="list-style-type: none"> ▫ State ▫ Region ▫ Market area ▫ Hospital 	<ul style="list-style-type: none"> ▫ Patient Characteristics <ul style="list-style-type: none"> ▫ Insurance ▫ Age ▫ Residence (e.g., rural, urban) ▫ Hospital characteristics <ul style="list-style-type: none"> ▫ Size ▫ Teaching status ▫ Ownership
Procedures <ul style="list-style-type: none"> ▫ Total number of discharges ▫ Top ranking procedures by volume and expenditures ▫ Discharges by leading DRGs and procedures ▫ Case-mix index ▫ Average and median LOS 	<ul style="list-style-type: none"> ▫ State ▫ Region ▫ Market area ▫ Hospital 	<ul style="list-style-type: none"> ▫ Patient Characteristics <ul style="list-style-type: none"> ▫ Insurance ▫ Age ▫ Residence (e.g., rural, urban) ▫ Hospital characteristics <ul style="list-style-type: none"> ▫ Size

Example of Fields or Measures	Analytical Levels	Example of Cross-tabulations
<ul style="list-style-type: none"> ▪ Total charges and costs 		<ul style="list-style-type: none"> ▪ Teaching status ▪ Ownership
Market		
<ul style="list-style-type: none"> ▪ Area day rate – number of hospital days per 1,000 population in area (e.g., county, HSA) ▪ Area discharge rate – number of discharges per 1,000 population in area ▪ Hospital share days - percent of discharge days among residents in area, from a given hospital ▪ Hospital share discharges – percentage of discharges among residents in area, from a given hospital ▪ Market competition (Herfindahl index) 	<ul style="list-style-type: none"> ▪ Region ▪ Market ▪ Hospital 	<ul style="list-style-type: none"> ▪ Hospital characteristics <ul style="list-style-type: none"> ▪ Size ▪ Teaching status ▪ Ownership
Quality		
<ul style="list-style-type: none"> ▪ Prevention quality indicators or admission rates for ambulatory sensitive conditions <ul style="list-style-type: none"> ▪ Diabetes, short-term complications ▪ Adult asthma ▪ Bacterial pneumonia ▪ Mortality Rates for Discharge Diagnoses <ul style="list-style-type: none"> ▪ Acute myocardial infarction ▪ Hip fracture ▪ Pneumonia ▪ Mortality rates for surgical procedures <ul style="list-style-type: none"> ▪ Abdominal aortic aneurysm repair ▪ Coronary artery bypass graft ▪ Hip replacement ▪ Patient Safety indicators <ul style="list-style-type: none"> ▪ Decubitus ulcer ▪ Birth trauma ▪ Post-operative sepsis ▪ Readmission rates 	<ul style="list-style-type: none"> ▪ State ▪ Region* ▪ Hospital* <p>*As sample size permits</p>	<ul style="list-style-type: none"> ▪ Patient characteristics* <ul style="list-style-type: none"> ▪ Race/ethnicity** ▪ Age ▪ Gender ▪ Hospital characteristics* <ul style="list-style-type: none"> ▪ Size ▪ Teaching status ▪ Ownership <p>*As sample size permits **As available</p>

SSS has extensive experience working with a broad range of use, cost, and quality indicators and serves a vital role not only in coordinating, but also in generating data tables, and conducting analyses in support of AHRQ's National Healthcare Quality and National Healthcare Disparities Reports (NHQR/NHDR). Each year SSS generates over 1,000 tables with data on approximately 300 access, utilization, and quality measures. These data are compiled from over 40 federal, state, and private health care

agencies and organizations. Together, these measures are intended to describe the performance of the U.S. health care system. Several types of analyses that SSS performs with NHQR/NHDR data may also be used in analyses and reporting of West Virginia data. For instance, when multiyear data are available, SSS examines data over time to determine whether statistically significant trends can be identified (e.g., trends in cancer death rates). This same technique, which uses a log-linear, weighted least squares model to

estimate annual percentage change (using either SAS or Joinpoint software), is applied to population subgroups to ascertain whether health care disparities are improving, getting worse, or remaining the same over time. The HCA may wish to target consumer, provider, or legislative audiences with a particular set of reports; SSS has extensive experience in developing reports that present data in the

display (e.g., graphs, tables) and language most suitable to different target audiences. Dr. Pagan-Sutton, proposed as an analyst on this project, was part of a team that explored the analytic uses of hospital discharge data under contract to AHRQ. Table 4-6 illustrates how states (including West Virginia) have used hospital discharge data for a variety of public health, planning, market analysis, and policy purposes.

Table 4-6: SSS staff have investigated potential uses of hospital discharge data.

General Analytic Domain	State	Examples
Public Safety/Injury Surveillance	NC	Track rates of suicides and attempted suicides
	CO	Document underreporting of injuries related to lightning strikes
	MA	Monitor incidence and risk factors associated with injuries from weapons, falls, and drowning
	Many	Crash Outcomes Data Evaluation System (CODES), monitoring injuries from motor vehicle crashes
Public Health/Disease Surveillance	VT	Estimated the incidence of Guillain-Barré syndrome
	GA	Examined the prevalence and conducted epidemiological studies on arthritis to develop a state action plan to reduce the burden of this disease
	US	Substance Abuse and Mental Health Services Administration estimated spending for substance abuse and mental health services
	IA	Linked to tumor registry data to obtain supplemental information on cancer patients' comorbidities and insurance status
Health Planning & Community Assessment	NC	Produced county health data books to compile statistics used for community health assessments;
	WA	Produced customized counts of hospitalizations and hospitalization rates for local action
Public Reporting & Consumer Decision Making	IN	Provided public information on charges and length of stay (LOS), by hospital and by hospital peer groups, for selected categories of hospitalization and frequently performed procedures
	MO	Made hospital- and surgeon-specific volumes for selected surgical procedures available to public
	NM	Publicly reported readmission rates by hospital for gall bladder surgery and pneumonia
Quality Assessment and Performance Improvement	CA	Compared hospitals on the basis of heart attack outcomes & spurred hospital quality improvement activities (e.g., clinical pathways and improved use of thrombolytic therapy)
	RI	Examined trends in inpatient mortality following gall bladder removal and surgical complication rates
	FL	For purposes of quality improvement, reported diabetes outcomes -- admissions for diabetes with complications (e.g., kidney disease, nerve damage), rates of amputation and discharges to post-acute providers

General Analytic Domain	State	Examples
Private Sector & Commercial	CA	Patient origin and market share data electronically available to providers, insurers and others in state
	N/A	Development of liability reduction plans for hospitals, targeting quality problems that result in avoidable claims
	N/A	Health plans identification of top-performing hospitals for purposes of contracting.
Policy & Legislation	CT	Demonstrated that a bill that would have mandated acceptance of all NICU transfers was unnecessary
	HI	Web-based mapping of "top" conditions for use by House and Senate districts
	CA	Quantified a diverse set of environmental indicators, including asthma hospitalization rates, for environmental monitoring and state action
	WV	Drawing from studies which used HCUP data, to examine hospitalizations for motorcycle injuries, legislators dropped a bill that would have rescinded the state's helmet law.

Source: Schoenman J, Sutton J, Kintala S, Love D, Maw R. The Value of Hospital Discharge Databases, May 2005; http://www.hcup-us.ahrq.gov/reports/final_report.pdf; accessed April 17, 2011.

¹ Additional information on SSS' trending approach may be found in 2011 National Healthcare Quality Report. October 2014. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.ahrq.gov/research/findings/nhqrdr/nhqr11/index.html>

As preferred by the HCA, SSS will create custom or standard reports in formats including but not limited to Adobe PDF, ASCII Flat Text, ASCII delimited, and MS Office (Access or Excel).

SSS has substantial experience supporting states in developing, maintaining, and reporting on the state's health care experience. We have a long-standing relationship supporting the MHCC, not only in developing and maintaining the MCDB—an all payer, claims-based, ambulatory care database—but also in using the MCDB to analyze and develop reports on a range of topics, including payments for professional services by geography and payer market share.

SSS will work with HCA staff to identify a series of reports to be developed during the first project year, to suggest and implement modifications to current reports, and to develop two new reports annually. In selecting the specific reports to be produced, we will work with HCA staff to review policy priorities and assess information needs of key stakeholder groups.

Examples of reports may focus on providing information on the quality of care offered by West Virginia hospitals, such as admissions for

ambulatory care sensitive conditions or incidence of selected patient safety events (e.g., rates of post-operative sepsis). As previously indicated, these reports may be generated at the state level or the local and hospital levels, if the volume of records is sufficient to ensure that results are statistically reliable.

The HCA may wish to target consumer, provider, or legislative audiences with a particular set of reports; SSS has extensive experience in developing reports that present data in the display (e.g., graphs, tables) and language most suitable to different target audiences.

As preferred by the HCA, SSS will create custom or standard reports in formats including but not limited to Adobe PDF, ASCII Flat Text, ASCII delimited, and MS Office (Access or Excel). The reports can be generated with SAS Base software using features such as SAS Output Delivery System technology and SAS/ACCESS PC File Formats. The programs for generating the reports will use adjudicated data, and additional data screens and enhancements will be applied with the approval of the HCA. SSS will deliver the reports via any medium specified on a data request. The reports will be suitable for the HCA

to place them on the agency's website if desired. If needed, HCA can run the reports, and SSS will provide all the programs as well as the technical support to maintain them.

SSS also has custom mapping capabilities that create stunning data visualizations that tell a

story. **Figure 4-4**, a map SSS created, displays hospitalization rates for diabetes-related complications in West Virginia counties. Maps such as these can bring HCA data to life and reveal new insights.

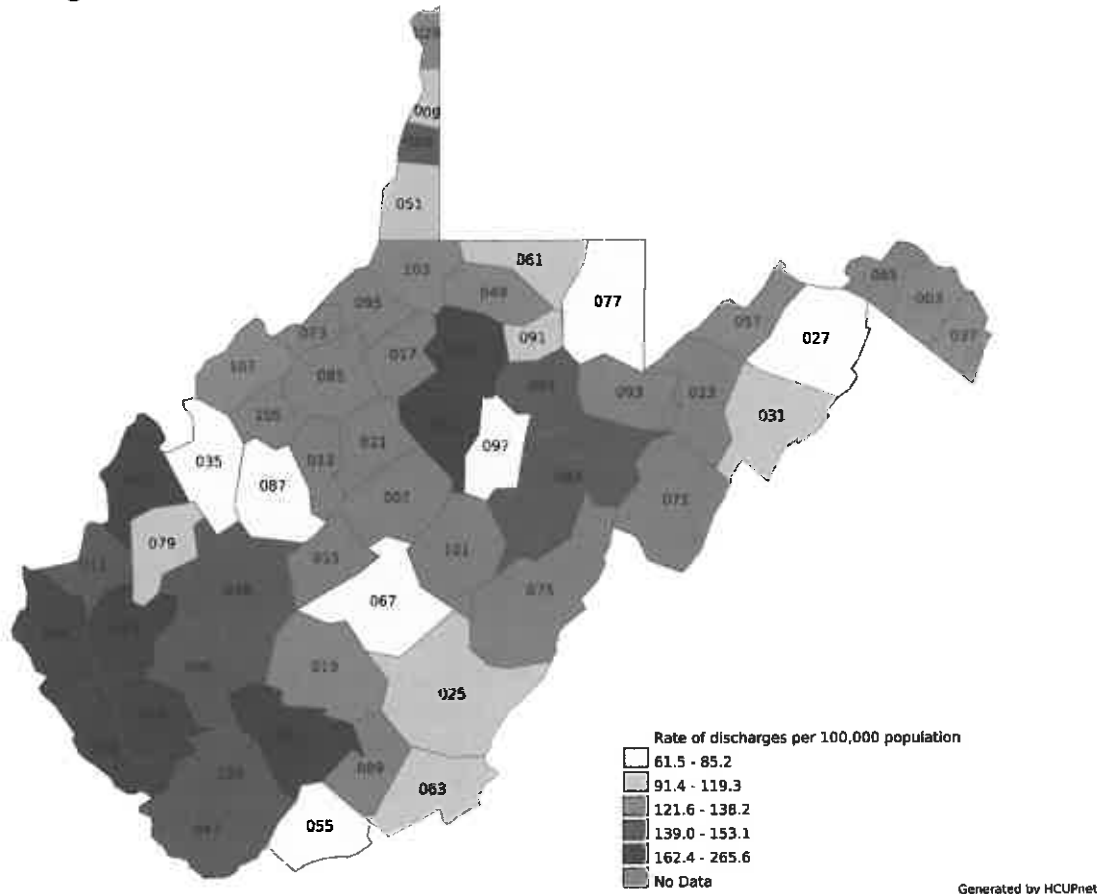


Figure 4-4: Community Hospital Stays, West Virginia 2013; PQI 3 - Diabetes Long-Term Complications Admission Rate (per 100,000 populations)

4.3.6 Develop and fulfill data requests upon specific request, review, and approval of the HCA, and provide these requests in requested formats (Excel, SAS, PDF, TXT files) throughout the contract term. These requests will be securely transmitted following outlined security measures in this document to the HCA in a manner and timeline agreed upon and approved by the HCA.

Vendor Response: SSS will continue to fulfill various data requests, after review and approval from the HCA in common requested formats such as Excel, SAS, PDF, and TXT files. We will do so throughout the contract term and securely transmit them according to the security measures

in the RFP, in a manner and timeline approved by the HCA. SSS is accustomed to turning around requests quickly and accurately. Examples of data requests that we have fulfilled during our current contract with the HCA are:

- Using SAS to recode out of sequence patient control numbers for a struggling hospital (after conferring with the hospital and the HCA)
- Creating data quality downloads for each hospital at the end of the data collection year
- Developing new and useful hospital status reports in the Excel format

4.3.7 During the duration of the contract, the HCA may adopt a third party entity as a data warehouse for the HIDS data. In the event this occurs, the transmission of weekly and annual files and/or additional documentation as identified by the HCA will be expanded to include such an identified third party entity, only at the specific request of the HCA. The Vendor will work with the HCA and the third party entity to ensure all data is transmitted securely and timely and meets all necessary privacy, security, and technical provisions in this document. All processes, timelines, and standards developed for this change will be implemented only as agreed upon and approved by the HCA.

Vendor Response: SSS will work with the HCA and a third-party entity to establish the procedures, schedules, and processes to deliver data on the desired transmission schedule. With HCA approval, SSS will securely transfer data to a third-party entity according the established guidelines.

SSS has consistently demonstrated, without error, the ability to securely deliver data to the HCA in a timely fashion. We also have the capability to deliver data to a data warehouse through a variety of means. SSS can deliver SAS

datasets or export the SAS datasets into a .csv delimited format with a header record to enable it to be imported into a variety of systems. As needed, data files can be made available through an SFTP download system. The SFTP system allows the HCA or a third-party entity to directly download a securely compressed encrypted file. If the HCA or third-party entity desires data transferred by physical media, the media itself will be encrypted using a FIPS 140-2 compliant algorithm and delivered to the HCA on a physical disk using secure delivery procedures.

4.4 Provide Data Security and Privacy

Over the last 5 years, SSS has provided the tightest data security and privacy available, without mishap. Our Director of Security is onsite, with a background in auditing and compliance that works with our IT department,

Systems, and all groups. We will continue to maintain this high level of data security and privacy following all federal and state laws, regulations, and HCA policies. We include a draft service level agreement in Appendix N.

4.4.1 Comply with all HIPAA Security administrative safeguards (45 CFR §164.308), including:

Vendor Response: The following subsections will describe in detail how SSS complies with all HIPAA Security administrative safeguards that include the following:

- Performing a risk assessment and establishing an effective risk management program for the HDSS.
- Auditing the HDSS activities that are documented in logs, access reports, and security incident reports.
- Conducting annual and ad-hoc security audits at the request of HCA to evaluate the appropriateness and effectiveness of policies and procedures for the protection of privacy, confidentiality, and security of the HDSS data. These will include the security controls in place for data transmission and storage.
- Ensuring compliance with the procedures that implement the SSS Information Security and Privacy Policies. Highlighting the Security

- Awareness Training program for all SSS employees and facilitating the appropriate background checks for the different risk designation positions.
- Maintaining and testing the HDSS Contingency Plan, which addresses the system disaster/emergency/backup plan. SSS will work with HCA to revise the backup plan until it is acceptable and agreed upon by the HCA. SSS will test and update the plan annually and as needed throughout the entire contract term. The HDSS Contingency Plan will identify the recovery time objectives (RTOs) for incidents that are less than 24 hours and greater than 24 hours. It will also clearly delineate personnel roles and responsibilities for the HDSS Contingency Plan.

We have attached our sample HDSS Security Plan, which describes, in detail, the:

- Logical controls in place for user authentication and authorization to HDSS data.
- How role-based access controls are implemented within the HDSS.
- The FIPS 140-2 compliant algorithm used for encryption of data in storage and during transmission. Separation of encryption keys from the stored data.
- Procedure for continuously auditing of access to the HDSS data.
- The incident response notification procedures for unauthorized access to HDSS data. SSS procedures are consistent with HCA's Executive Branch Response to Unauthorized Disclosures Procedures included in Attachment J.
- The use of anti-virus and intrusion detection software in the HDSS to ensure the integrity of data and compliance with HIPAA.

4.4.1.1 Undertake a valid risk assessment and establish an effective risk management program for the System.

Vendor Response: The SSS Information Security Group (IS) has established a risk management program for the SDC General Support System (GSS) that will host the Hospital Information Data System. The SDC is discussed further in Section 4.4.4. IS established the FIPS 199 Security Categorization of the SDC GSS as Moderate. The HDSS data will be assessed and documented to validate its FIPS 199 Security Categorization of Moderate. The IS program has also identified the common, inherited, hybrid, shared, and system specific controls. These control classifications are validated for each project prior to the assessment of the security safeguards their documentation in the HDSS System Security Plan. IS performs a security assessment annually or when there is a

significant change in the HDSS or its associated threat profile.

The IS performs a thorough risk assessment of any weakness identified during the security assessment to determine the likelihood of the weakness being exploited and its corresponding impact on the HDSS to assess the resulting risk rating. The IS collaborates with the project team and HTRS to develop a risk mitigation and management plan also called a Plan of Action and Milestones (POA&M) to remediate weaknesses identified during the security assessments. These POA&M are reviewed and updated monthly to ensure the project team and HTRS is making sufficient progress in remediating identified weaknesses.

4.4.1.2 Implement procedures to regularly review records of information systems activity, such as audit logs, access reports, and security incident tracking reports.

Vendor Response: SSS has standard operating procedures to record, analyze, and report auditable events including, but not limited to, account logon/logoff activities, account management, and policy changes. SSS bases our

auditable events on guidance from the U.S. Government Configuration Baseline (USGCB), NIST, and HIPAA standards. SSS information systems produce audit records that contain sufficient information to, at a minimum, establish

what type of event occurred, when and where the event occurred, and where possible, the source of the event, the outcome (success or failure) of the event, and the identity of any user or subject associated with the event. Event data is collected in application logs, database logs, and system/security event logs and shipped to a centralized syslog server. SSS also employs

intrusion detection/prevention systems to monitor for and prevent any network intrusions and attacks. Logs from these devices are monitored and analyzed 24x7 in real-time by a third-party managed security service. All unusual activity is immediately reported to SSS for investigation and remediation, as part of SSS' information security escalation process.

4.4.1.3 Conduct security audits, at the request of the HCA, to evaluate the appropriateness and effectiveness of policies and procedures for protection of privacy, confidentiality, and security of the System data, including an analysis of the mechanisms used for data transfer and storage. The audit may include a review of the networking and computer facilities used by the System, penetration testing, or an active assault on the preliminary evaluation of basic data security issues; therefore, some sources of risk may only need to be evaluated categorically (i.e., significant vs. not significant). The audit should be conducted by an external subcontractor with expertise in the field of data security. A report on the results of the security audit should contain at a minimum: effectiveness/ineffectiveness of current data security policy and procedures, including receipt of data, storage, handling printouts, LAN access, remote access, staff knowledge and compliance, data transmission, and loss control security risks not addressed in the report. If appropriate, the report should address how findings compared to standards relevant to general businesses that develop research files for the government. If significant data security risks are identified by the audit, the report should recommend measures by which such risks can be minimized. Additional audits may be required to assess new threats or to evaluate the effectiveness of remediation steps taken to resolve problems.

Vendor Response: SSS understands that all systems that have a FIPS 199 security categorization of Moderate must have an annual audit conducted by an independent third-party that is external to SSS. The external subcontractor that SSS retains to perform independent third-party audits has extensive expertise in the field of data security. Some of the audits that have been conducted in the past include:

- Review HDSS networking and computer facilities to assess the physical safeguards
- Penetration testing of the technical controls
- Testing of the implementation status of the administrative safeguards

The IS provides the vendor or collaborates with the independent third-party auditor to develop the following documents:

- The SSS Information Security and Privacy Policies
- Standard operating procedures that supports the implementation of the information security and privacy policies
 - A copy of a diagram showing the authorization boundary for the HDSS
 - A copy of the incident response plan to ensure all stakeholders are on the same page with reference to responding to incidents during the security assessments
 - A copy of the most recent HDSS self-assessment security assessment report
 - A security assessment plan that details the controls that will be assessed, the personnel that will be involved in the assessment, and the timeline for the assessment
 - The rules of engagement that discusses that IP addresses will be scanned, from what IP

- address, the scan window, and personnel to contact information for the auditor and SSS. This document must be signed by all parties that will be involved in the assessment.
- Baseline configuration documents for systems within the HDSS authorization boundary
 - A credentialed vulnerability scan for all systems within the HDSS authorization boundary
 - The current plan of action and milestones for the HDSS
 - Audit and access controls logs for the period being assessed
 - Other supporting artifacts that validate the implementation of the information security safeguards

These information security artifacts are always encrypted during transmission with an algorithm that is FIPS 140-2 compliant. They help the external auditor better evaluate the appropriateness and effectiveness of the policies and procedures for the protection of privacy, confidentiality, and security of HDSS data. At the

end of the audit and assessment of the results, the independent third-party assessor provides SSS with a report that:

- Discusses the results of the security audit that highlights the effectiveness/ineffectiveness of the data security policies and procedures
- Lists staff and the security awareness and role based trainings completed
- Identifies methods for local area network access and remote access
- Lists artifacts received and assessed during the audit
- Highlights any data transmission and loss control security risks not addressed in the report
- Presents recommendations for remediating significant data security risks identified during the audit
- Offers procedures that may be used to evaluate the effectiveness of the remediation steps taken to resolve identified data security risks

4.4.1.4 Have security policies and procedures in place for Vendor staff, which include appropriate sanctions for staff that act contrary to such policies and procedures. Implement a security awareness and training program for all members of the vendor workforce. The State may require that a vendor provide evidence of adequate background checks, including a nationwide record search, for individuals who are entrusted by the vendor to work with State information.

Vendor Response: All vendor staff are required by pass-through clauses in their contracts, to comply with the terms of this HCA contract and associated information security and privacy policies and procedures as defined by HCA. All vendor staff are required to complete the security awareness training at the start of the contract and annually thereafter. They are also required to review, sign, and abide by data use

agreements that SSS project employees execute. Vendor staff who have access to the HIDS data via an SSS provided connection are required to review and sign the SSS Rules of Behavior that governs their actions on the network. The SSS Human Resource team facilitates all background investigations for SSS and vendor staff that will work on the HCA contract.

4.4.1.5 Vendors should propose a draft disaster/emergency/backup plan for the System and submit with their proposal. Once a Vendor has been selected, that proposed plan shall be revised until acceptable and agreed upon by the HCA. The plan will be updated on an annual basis, or as needed, throughout the entire contract term.

Vendor Response: SSS previously developed an official Information System Contingency Plan

(ISCP) for the current HCA application, which was last updated and reviewed in September 2015.

New or modified requirements can be met after award to ensure that business contingencies are addressed and in place to meet RTOs and recovery point objectives (RPOs). The general recovery environments are maintained through a combination of VMware and Veeam backups, recovery tools, third-party virtualization utilities, and storage replication services. The West

Virginia ISCP is based on a multisite clustered VMware architecture.

The production version of the HIDS is and will remain housed at the SSS SDC in Equinix. Backups will be maintained offsite to rebuild from in the event of a disaster.

The Contingency Plan (Appendix K) will be tested within 60 days of contract award, and the plan will be updated as needed, per the requirement.

4.4.1.5.1 The proposed recovery plan should be designed to include (but is not limited to) the following: planning for minor incidents (loss of systems and/or data <24 hours) and major incidents (loss of systems and/or data for >24 hours); exercises to regularly test the plan on several scales; and designate roles and responsibilities of key personnel for implementation.

Vendor Response: SSS' updated WVHCA HIDS Information Systems Contingency Plan (Appendix K) details the disaster recovery environment,

RTOs and RPOs, plan review frequency, and designated roles and responsibilities of key personnel.

4.4.2 Comply with all HIPAA Security physical safeguards (45 CFR §164.310), including but not limited to the establishment of adequate Vendor facility access controls and device and media controls.

Vendor Response: SSS handles and maintains many sources of data, including federal and state claims records, and is thus intimately familiar with confidentiality and security requirements mandated under HIPAA. A number of regulatory requirements must be complied with and addressed, including the Federal Information Security Management Act (FISMA), HIPAA/HITECH for securing personal health information and general best practices for the protection of sensitive corporate data.

SSS established and maintains a SDC, separate from its corporate facilities, housed within an Equinix secure tier-four SSAE 6-certified co-location facility with industry leading security and

reliability. Physical access to the SSS SDC is limited to five SSS-employed network administrators. It is secured utilizing a multi-layered approach through the combination of physical and virtual security controls, including 24x7 security guards, biometric hand scanners with PIN access codes, logging and access control lists, private cage and rack access codes, and locks, cameras, and man traps. The security controls implemented are consistent with the recommendations from the National Institute of Standards and Technology (NIST) and are compliant with a FISMA moderate security categorization.

4.4.3 Comply with all HIPAA Security technical safeguards (45 CFR §164.312), including but not limited to:

Vendor Response: SSS utilizes all relevant and required technical and logical safeguards following NIST 800 special publication and HIPAA security standards. Because the SSS SDC is a multi-tenancy data center, several controls have

been implemented to ensure complete separation between clients. Tenant systems and data are separated physically and virtually via dedicated Microsoft Windows Active Directory forests with group memberships and rights

assignments. Tenant systems and data are also separate from other tenants and commodity SSS systems by segregated network segments, firewall policies, dedicated virtual hosts, and dedicated and segregated enclave storage on FIPS 140-2 self-encrypted hard drives. Other safeguards include enterprise patching software,

4.4.3.1 Secure and appropriate authentication of all users of the data.

Vendor Response: All personnel working on the HCA project are and will continue to be screened according to SSS' policy for permanent and temporary employees. Only authorized users will be able to access the data via Active Directory user accounts. These are unprivileged accounts assigned to individual end users to access systems and data and are not shared among multiple personnel.

An automated script runs nightly to disable accounts that have been inactive for 60 days. An inactive account is defined as one that has not logged on to the system.

4.4.3.2 Support role-based access to data

Vendor Response: Only project managers and system/data owners can request user accounts be created. All requests for accounts and system/data access are submitted to the SSS Service Desk. A ticketing system tracks and retains all account requests, reviews, and approvals/rejections. Project managers or system/data owners vet the person whom they are requesting access to ensure they have the appropriate clearance, required permissions, and need-to-know. SSS' IT Services group applies the "least privilege" concept to all SSS environments to ensure that users only have the minimum required access needed to properly perform their

4.4.3.3 Adequate encryption of data "at rest," per then current NIST Special Publication 800-111, and "in motion," per then current FIPS 140-2, and methods to ensure that System data may be transmitted over an electronic communications network between hospitals, the HCA, and the Vendor in a manner that prevents unauthorized access. Maintain all encryption keys on a separate device from the device upon which the encrypted System data is stored.

Vendor Response: All data is stored on dedicated disks within the SSS SDC, allowing project-specific

group policy, intrusion detection and prevention systems and firewalls, and real-time systems log monitoring by a third-party managed security service. Servers are hardened using USGCB and the Center for Internet Security standards. Compliance is monitored using Tenable Nessus.

As a further safeguard, SSS requires programmers and analysts to access the data via Citrix Netscalers using a FIPS 140-2-compliant encryption module. Access is then secured using two-factor authentication using RSA SecurID. Tokens are hand delivered to the user or Project Manager, or shipped using a trusted third-party that tracks and documents delivery of the token and collects the signature of the recipient. The recipient is then contacted by the SSS Service Desk to complete the process by creating a PIN number.

job functions. Using the "least privilege" concept is one step towards ensuring the confidentiality and integrity of the information systems and data contained within from intentional or accidental modification.

Project managers and system/data owners also submit Service Desk tickets to request that an account be disabled or access to a system/data is removed.

Active Directory and Unix accounts are monitored via event log and syslog with data being shipped to a third-party managed security service for monitoring.

data to be isolated onto independently allocated storage volumes. This allows SSS to restrict access

only to authorized individuals and enables secure data destruction. All data is stored on FIPS 140-2 self-encrypted hard drives, which secures all data at rest and prevents unauthorized physical access to any data on the disk.

For data that needs to be transmitted outside of the SDC, SSS requires all users to utilize a managed file transfer service, which encrypts the

4.4.3.4 The Vendor should propose an effective and efficient audit mechanism for tracking access to System data, including the preparation, update, and maintenance of audit logs and submit with their proposal.

Vendor Response: SSS' audit and accountability controls have been documented and formalized in existing corporate security documentation. Information includes designated roles, security posture, management commitment, and supporting policy language. Specifically, the baseline security controls for the computing systems, including audit information, are in accordance with established corporate policy.

Based on security control requirements and risk assessments, a broad range of auditable events have been identified and put into security program standard documents. For example, the following are audited:

- All user access attempts to the system
- Modification of sensitive system information
- Additions of new users

4.4.3.5 Provide for automatic notification of certain non-routine or unscheduled access of System data to designated personnel, as appropriate. This should be in line with the HCA's Executive Branch Response to Unauthorized Disclosures Procedure, found as Attachment J.

Vendor Response: SSS employs a number of security tools to protect data and systems from vulnerabilities and unauthorized access. SSS utilizes Symantec's managed security service to provide 24x7 security monitoring and real-time security analytics, allowing for faster detection and faster response. Any detection of attacks, threats, unauthorized scans, or other anomalies are immediately reported to the SSS Service Desk or on-call support personnel, in accordance with SSS' escalation process.

SSS Incident Response policies and procedures mandate that, if a breach occurs, it must be

data during transit with a FIPS 140-2-validated encryption algorithm that meets FISMA moderate compliance standards.

SSS programmers and analysts access the data via Citrix Netscalers using a FIPS 140-2-compliant encryption module. Access is then secured using two-factor authentication using RSA SecurID.

- Deletions of users
- Changes to user privileges
- Changes to system security settings

The information not only lists the audit control, but also provides information on why the control has been selected and in some cases when the control should be enabled (e.g., for incident response).

The list of auditable events will be updated, if required, after internal risk assessments are conducted and any deficiencies are discovered. Otherwise, audit controls for the system will be reviewed annually. Privileged execution is part of the list of auditable events being consistently recorded. The HCA system will also have audit tracking built in to HDPS.

reported and investigated. Upon notification of a breach or security incident, SSS will work with the appropriate personnel at WVHCA to resolve the matter. We will submit a PHI or PII report and/or the lost or stolen assets report within 3 workdays of incident discovery. The report will contain information about the incident, or as much as is known, regarding the date and time the incident occurred or was discovered, what information was lost or exposed, what steps have been taken to recover the information, and any other relevant information.

4.4.3.6 Employ systemic mechanisms, including anti-virus and intrusion detection software, to ensure the integrity of data from improper alteration and destruction, and to corroborate the data's ongoing integrity, in compliance with HIPAA.

Vendor Response: SSS uses Symantec EndPoint Protection to protect workstations against threats from viruses and spyware; and to provide firewall functionality, intrusion prevention, and application and device control. Vulnerabilities and statuses are reported back to a centralized management console and logs are shipped to a log collector, which is monitored and analyzed 24x7 in real-time by Symantec's managed security service. All threat detections are immediately report to ITS staff for investigation and remediation.

SSS also employs a pair of Juniper firewalls for intrusion protection, application security, and role-based firewall controls. A pair of Palo Alto firewalls are also leveraged at the SDC with inbound and outbound Internet traffic from the data center and all branch offices routed through for monitoring and protection. These firewalls detect malware and ransomware and block

threats by using up-to-date vulnerability signatures, blacklisted sites, IP addresses, and known vulnerabilities and exploits. Blocks are performed at the application layer, which detects attacks on ports that are traditionally left open such as HTTP and HTTPS. All traffic is monitored and analyzed 24x7 in real-time by a Symantec's managed security service. All threat detections and unusual activity are immediately reported to ITS staff for investigation and remediation.

SSS also employs Tenable Security Center using the Nessus application to schedule monthly or on-demand vulnerability scans. These scans look for known operating system vulnerabilities, active devices, communication paths, open ports, and associated services and applications, while also verifying that current operating system and application patches are in place and baseline hardening settings are in effect.

4.4.4 Specific sensitive data elements (outlined in the HCA Policy: Collection of Additional Identifiers in the Hospital Inpatient Uniform Bill as Attachment K) are collected that will not, by HCA policy, ever be disclosed to the HCA in plain text format. These elements will be field-level encrypted using industry best practice FIPS 140-2 approved encryption algorithms (or the most up to date encryption algorithms), with the encryption keys maintained by the Vendor on a separate device and not accessible in plain text by the HCA.

Vendor Response: Per HCA Policy, the additional collected identifiers, such as patient name and SSN, are stored in a field level encrypted format and never displayed to the end-user, or any other user, via the web interface, nor disclosed to the HCA in plain text format. Within the HDSS security boundary, the sensitive data fields

containing PII is field-level encrypted using industry best practice FIPS 140-2 approved encryption algorithms, specifically AES/Rijndael cipher. The sensitive data is encrypted and therefore not readable without the decryption programming elements built into the application, which is only accessible to authorized users.

4.4.4.1 The Vendor may be asked to perform record level linkage using the sensitive data elements outlined above by the HCA for data analyses. The Vendor should be able to securely receive and encrypt data sets for this linkage as needed by the HCA within a secure environment and, after linkage, securely deliver a linked, merged data set. All such requests will only be done at the specific request of the HCA.

Vendor Response: SSS securely receives and delivers data sets using Managed File Transfer

(MFT), a secure method to upload and download to SSS' SDC. Using this method, we securely

receive the encrypted data sets directly into the SDC, where SSS will link records as described in Section 4.3.3. Then, the linked, merged data set will be downloaded from the SDC, via MFT, to an SSS provided SFTP facility, where the HCA will be granted access through permission groups.

Three steps for disclosure limitation and confidentiality protection:

- Analysis of risk
- Recommend disclosure limitation method
- Development of limited datasets.

4.4.4.2 Develop and provide to the HCA an analysis of the risk of re-identification of patients in the database based on the information contained in the final annual file in combination with other readily accessible data sources; recommend appropriate statistical disclosure limitation methods to increase patient confidentiality; and develop a limited data set, based on these recommendations, for release to requestors.

Vendor Response: SSS proposes to complete three steps in the area of disclosure limitation and confidentiality protection. The first step is to develop and provide to the HCA an analysis of the risk of re-identification of patients in the database based on the information contained there in combination with other readily accessible data sources. The second step is to recommend appropriate statistical disclosure limitation methods to increase patient confidentiality. The third step is to develop a limited data set, based on these recommendations, for release to requestors. Re-identification occurs when someone with access to the database can use information in the data file to link a particular person in society to a patient discharge record. That is, they can say that they know who the record pertains to. Of course, if name, specific age information, and geographic information are included in the released file, then it would not be hard to use publicly available search information to identify individuals. Even if name is not released, combinations of other variables, such as geographic location down to ZIP codes, exact birth date, and sex, might be enough to identify some individuals. In an analysis of this type, it is critical to think about what someone with access to the data might know. For example, if one knows that a friend or relative is in the hospital, and their birth date and demographic variables are known, then it might not be difficult to find their record in the file. Then the person would learn principle diagnosis, payer, and other

information from the file about that specific person. As another example, if one knows that an acquaintance in the neighborhood was taken to a hospital via ambulance and did not return for 10 days, then one might be able to use geographic information, a rough idea of age, sex, marital status, and race/ethnicity, and the approximate length of stay to guess the identity of the individual in the file. Thus, there is not one re-identification scenario to consider, but many. Re-identification risks are specific to the set of variables included in the released data.

▫ In step one, SSS will consider the variables in the WVHCA data file and whether they individually pose a risk for release. We will also consider whether combinations of variables pose a risk for release. Variables will be compared to standards used by the U.S. Census Bureau³ for release of public data files and by the National Center for Health Statistics (NCHS)⁴ in its publication of data. For example, the U.S. Census Bureau requires there to be at least three records contributing to every cell of a cross-classification table. If there is one record contributing to a cell, it is unique in the data file and potentially linkable. If that same person shows up as a unique count in several cross-classifications, then essentially a micro-data record can be recreated for that person, leading to even greater disclosure. If there

³ (<http://www.census.gov/srd/sdc/>)

⁴ (<http://www.cdc.gov/nchs/about/policy/confidentiality.htm>)

are two records contributing to a cell and one of those people would possibly have access to the data file, then again there is effectively a unique record. Whether release of information in the HCA database violates standards such as the “rule of 3” will be reported.

- In step two, SSS will compare and contrast statistical disclosure limitation methods to increase patient confidentiality. Some variables, such as exact birth date, likely will be designated as simply not releasable. Some, such as sex, assuming cross-classifications do not produce sparse tables result in small cell size, might be acceptable for release as they are. Others might be releasable if they are recoded, top-coded, aggregated, or otherwise masked. Methods such as sampling, record swapping, and noise addition will be considered. Options for synthetic data generation will be described. Development of some advanced disclosure limitation methods for regular and full-scale

use will require more work and study than anticipated in this submission. This effort will, however, lay the ground work for future extensive studies of methods of disclosure limitation. A second dimension that of course should be considered is data utility: are the released data that have been protected for disclosure risk still useful for the analyst? As an initial measurement of utility, comparisons of marginal and joint distributions of variables before and after disclosure protection will be provided. Further, some prototypical analyses will be run on the original and on the altered data to give some idea of the impact of disclosure protection.

- In step three, SSS will develop a limited data set, based on these recommendations, for release to requestors. The data set will include documentation on the variables and any relevant limitations due to the disclosure limitation procedures involved.

4.4.4.3 Develop, validate, and implement methods to track patients within and between hospitals and encounters in order to estimate hospital readmissions and patient transfers, and develop a report summarizing the methodology and findings. If direct identifiers are collected in the data, this process should involve the development of a synthetic identifier, using methodology that can be replicated by the HCA.

Vendor Response: Tracking patients and linking of patient records is necessary to follow patients from one hospital or site of care to another, as well as to determine whether a re-admission to the same or another hospital occurred. The issue of re-admissions has received increasing attention as a symptom of lack of care coordination that increases costs and leads to poor health outcomes. Beginning in FY 2013, PPS hospitals have not been reimbursed by Medicare for re-admissions within 30-days for three specific conditions.

SSS developed and validated methods for tracking patients and encounters within hospitals, and we used this method for over 4 years for Connecticut’s Office of Health Care Access (2010-2014). We will use the medical record number to identify a patient within the same hospital. This

field will also be used in conjunction with the patient control number to track all admissions and re-admission. Since the methods are already in place, we will validate them for use with the West Virginia hospitals, and following validation, will implement these methods.

Linking of patient records across different sites of care is a relatively straightforward process when a unique patient identifier, such as a SSN, is available, as it is generally in the WVHCA data (although in an encrypted format). However, SSN is allowed to have missing values in the HCA data. In these cases, other data fields can be used to construct a “synthetic” patient identifier that may be used to link patient discharge records within and across different providers. Among those states submitting data to HCUP, over 20 have

encrypted unique patient identifiers that allow such linkage.

The principle behind the development of a synthetic identifier is that multiple fragments of individual information, such as date of birth, gender, first or last name (encrypted in the HCA's data), may be combined to determine, within some degree of probability, whether records taken at different times or at different facilities represent the same individual. The more unique the data elements used to create the synthetic patient identifier, and the greater the number of data elements that match, the greater the probability that records with the same identifier reference the same individual.

The HCA requires hospitals to report a medical record number for all patients; the medical record number may be used to track multiple admissions to the same provider and determine whether a re-admission to the same hospital as the index admission occurred.

A multi-stage deterministic matching algorithm, which uses a combination of patient characteristics, as defined in discharge or claims records, may be developed to create an additional field that may be used to link records within the same or across different providers. Data fields that may be useful in constructing synthetic personal identifiers include first and last name, address, zip code, date of birth, and residence. We propose to use an approach similar to that in use by the New York Statewide Planning and Research Cooperative System (SPARCS). In basic terms, the synthetic patient identifier is constructed by combining the first and last two characters of the patient first name, the first and last two characters of the patient's last name, and the last four digits of the patient's SSN. A significant amount of data editing may be required to ensure that records link on the identifier; "rules" designed to facilitate the linkage process will be identified. For instance, characters must all be uppercase and, when unavailable, zeroes are used in place of the last four digits of the SSN. SSS will work collaboratively with the HCA, should the HCA be interested in exploring other approaches.

A certain degree of error, caused by either mismatched or unmatched records, should be expected in any matching algorithm. Matched records will be subject to validation; date of birth and gender will be used to verify person identifiers. Other data elements, such as address or ZIP code of residence, are available for verification purposes; however, these are unreliable as they are subject to change over time. As noted by Steiner et al. (2010),⁵ using a similar deterministic approach to construct patient identifiers for the HCUP Revisit Files, across 12 states, 90% of person identifiers were verified. Lower verification rates were observed for children less than 1 year of age; only 58% of identifiers were verified in this group.

Once identifiers have been constructed and records linked, readmission rates will be estimated using a timeframe (e.g., 30-day readmission) selected in consultation with the HCA. Data may be estimated by state, region, hospital, and selected patient characteristics (e.g., diagnosis). We will also estimate and track patient transfers. SSS is currently using such encryption keys to track patient claims across payers under our MHCC contract. SSS will use methodology that can be replicated by the HCA. SSS analysts will create a summarized report of the approach used to link records and estimate readmission rates. Included in this report will be results from the verification process and findings on readmission rates. Once patients are linked, we will create a summarized report of our methodology and report on the findings.

⁵ Steiner C, Barrett M, Hunter K. Hospital Readmissions and Multiple Emergency Department Visits, in Selected States, 2006-2007. HCUP Statistical Brief #90. May 2010. Agency for Healthcare Research and Quality, Rockville, MD.
<http://www.hcup-us.ahrq.gov/reports/statbriefs/sb90.pdf>

4.4.5 Ensure that data maintained on behalf of the System is not used, released, or sold without the specific authorization of the HCA, regardless of whether the data has been de-identified or included within a limited data set (see Attachment J).

Vendor Response: At project start, Ms. Larson Chebili, our proposed Project Manager, will ensure that all HCA project staff have reviewed and signed the SSS Security Guidelines for Restricted Data and a project-specific Data Confidentiality Agreement. These guidelines will provide for the proper handling of restricted confidential data, such as data maintained on behalf of the SSS HDSS. We will continually stress the importance that all system data can only be used in a manner and for the purposes specified in the Data Confidentiality Agreement, regardless of whether the data has been de-identified or included within a limited data set. Further,

confidentiality and appropriate use of client and SSS data are governed by the SSS Rules of Behavior, which are mandatory for all permanent and temporary employees. SSS staff must agree to and sign the Rules of Behavior before access to information systems is granted. As such, all employees agree to abide by SSS confidentiality policies, which mandate that sensitive information is not shared by unauthorized personnel. Per corporate data use agreement, authorized users sign an acknowledgement form showing that they have read, understood, and agree with the SSS Acceptable Use Policy and the SSS Rules of Behavior.

4.4.6 Implement appropriate notification procedures upon the discovery or suspicion of a breach of security of System data (see Attachment J).

Vendor Response: Although there have been no security breaches on our current contract, SSS is very familiar with the HCA immediate incident reporting requirements for the unauthorized disclosure of PII. SSS will abide by the notification procedures for PII breaches using the provided incident reporting procedures defined in Attachment J.

SSS will report all incident reports at the Office of Technology website, which will simultaneously notify the State Privacy Office and Office of Technology. The reporting information

requirements include the date the incident occurred (or was identified), the type of PII exposed (with actual PII redacted from the reports), how the PII was compromised, the available information on the unauthorized parties, steps SSS has taken to recover the information, and any other relevant information to the incident report. SSS notification procedures are streamlined with the HCA notification procedures for the discovery or suspicion of a breach of security for HDSS data.

4.4.7 Routinely review and revise policies and procedures to ensure data security and privacy are in accordance with then current federal and state laws, and HCA standards and policies.

Vendor Response: The SSS IS reviews and revises policies and procedures every 3 years or when there is a significant change in the information system or the organizational threat profile. This ensures that the data security and privacy policies and procedures remain current with federal and state laws as well as HCA standards

and policies. SSS maintains a document review page in the templates for all policies and procedures that must be updated each time the applicable documents are reviewed. This also provides for an identification of who reviewed the documents and what changes if any were made to the document.

4.4.8 In the response to this RFP, the Vendor should provide the following:

4.4.8.1 Certify that it is not currently under investigation by any state or federal authority for a breach of data security.

Vendor Response: SSS is not currently under investigation by any state or federal authority for a breach of data security.

4.4.8.2 Disclose whether it has been involved in any breach of data security, especially involving any sensitive, protected, or confidential information, and provide details relating to the causes of the breach, the mitigating actions taken in response to the breach, and whether notification of affected consumers was undertaken.

Vendor Response: SSS has not been involved in any breach of data security that involves sensitive, protected, or confidential information. There has not been any need to assess the causes of the breach, mitigate actions to respond to the breach, or notification of consumers. Irrespective,

of the lack of data breaches, the IS works with HTRS and the project teams to complete incident reporting training and exercises to ensure all project stakeholders are familiar with the internal SSS incident reporting requirements and procedures.

4.4.8.3 Disclose details of any previous investigations by any state or federal authority related to privacy or security of patient information. The details must include the resulting corrective action plan or details of the final resolution, including the assessment of any fines or other sanctions against the vendor.

Vendor Response: There are no previous investigations for any state or federal authority related to privacy or security of patient

information. The requirement is not applicable to SSS.

4.4.8.4 Certify that both the Vendor and its employees have never been convicted of, charged with, or is under investigation for, violation of any criminal law, or violation of any civil law governing health care fraud, abuse, or waste.

Vendor Response: SSS has never been convicted of, charged with, or been under investigation for, violation of any criminal law, or violation of any

civil law governing health care fraud, abuse, or waste.

4.4.8.5 Certify that it does not employ any individuals who have been excluded or debarred by the federal or any state government from participating in any federal or state program or contract.

Vendor Response: SSS does not employ any individuals who have been excluded or debarred by the federal or any state government from

participating in any federal or state program or contract.

4.5 Provide Project Management

SSS' is pleased to continue with the current Project Manager, Ms. Christina Larson Chebili, as well as the core project team. This team is experienced in the data processing and analysis

and has an excellent working relationship with hospital partners. The SSS HDSS Project Management Plan (with Performance Management Plan) is included in Appendix M.

4.5.1 Provide a dedicated, knowledgeable, and experienced team to provide project management and consultation, as required and/or requested by the HCA, including a project manager, functional/operational lead, and programmer. The team will work directly with the HCA, hospitals, and/or their representatives (e.g., Vendors) to implement the project as described in this RFP, with FTEs listed in the proposed staffing plan (see Section 3).

Vendor Response: SSS organizes its projects into small, highly focused teams with the authority and responsibility to perform the project. Projects are led by experienced project managers, who have immediate access to top management for support if required. Senior system developers provide technical leadership on projects and guide less experienced staff. The HCA project work will be performed by staff in SSS' Health Policy and Data Analysis (HPDA) Group, which includes 75 programmers and researchers. This considerable technical depth ensures that SSS has the necessary available resources to perform this project. Our proposed Project Manager, Ms. Larson Chebili, will report directly to Dr. Paul Gorrell, the vice president of HPDA. The project management plan, which includes a performance management plan, is included in Appendix M.

To achieve project continuity under the new contract, SSS proposes to continue with the existing project team who know the data processing and analysis of hospital discharge data and have built a strong rapport with individual hospital users and their vendors. This team brings directly relevant experience in project management, SAS and .NET programming, system development, and all technical and communication-related areas.

As shown in the organization chart in Figure 4-5, Ms. Christina Larson Chebili will be supported by Mr. Jeffrey Schinckle as the functional/operational lead; Mr. Shiquan Hu and Mr. Salvador Djeukeng as web programmers, and Mr. Po-Lun Chou and Ms. Arlene Amodeo as SAS programmers, respectively. They will provide operational support. Mr. Schinckle will interact directly with the hospitals, as needed. Dr. Janet Pagan-Sutton will bring senior health care analytical expertise to the project. To address the

IT and security requirements, the team will be expanded to include Dr. Momodu Fofana, (Director of Information Security), James Bellefontaine (Senior Systems Administrator), and Stephen LaRochelle (Database Administrator). Ms. Larson Chebili and Mr. Schinckle are being bid as key staff.

Resumes for all team members are provided in Appendix A.

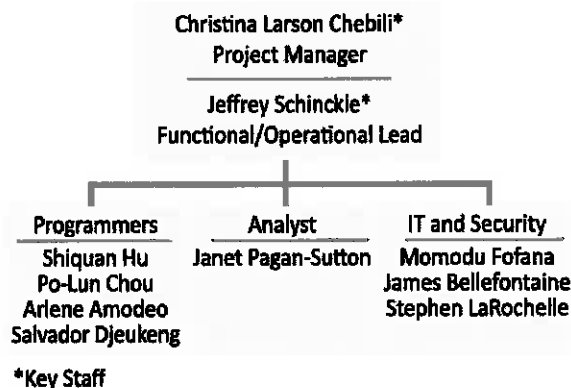


Figure 4-5: SSS' project team is organized to provide efficient, effective support to the HCA.

The roles and responsibilities of all staff, as well as their relevant experience, are described earlier in our response. We would like to note here that the following staff have particularly relevant experience that will help to ensure the success of this project:

- Christina Larson Chebili, as Project Manager, has successfully led the current contract with the HCA HIDS and will be directly responsible for the project. She has the management and technical skills to ensure the quality and timeliness of deliverables; strong communication with HCA, hospitals, and vendors, as needed; and oversight of the web, SAS, operational, analytical, and IT/security-related efforts of the team

- members. She also has a deep understanding of the reports and adjudication process.
- Jeffrey Schinckle, as functional/operational lead, will serve as a backup for Ms. Larson Chebili and will be responsible for technically directing the efforts of the team. He has served as the functional/operation lead for the last year, and he brings an in depth understanding of the file format, SSS' HDSS system, edit checks, as well as the requirements for the web interface. He also has a unique understanding of the wide variation in hospital expertise, experience, and resources, and he is invaluable in enrolling the cooperation of the hospitals and vendors submitting the data and corrections. He will work closely with Ms. Larson Chebili and HCA staff to fully understand the technical requirements of the project and direct SSS staff in achieving all project goals.
 - Po-Lun Chou, as SAS programmer, works on the current HCA contract providing backup for the reporting and adjudication process. He also provides web site testing and quality control. He will continue to provide this support throughout the HCA contract years, as needed. He will be responsible for incorporating any additional edits or capabilities into the SAS component of the HDSS.
 - Arlene Amodeo, SAS programmer, will provide further support and assistance, including testing, quality control, report generation, and adjudication.
 - Shiquan Hu, as web programmer, serves on the current HCA HIDS contract and is responsible for customizing the online system, and fully testing it.
 - Salvador Djeukeng will serve as a backup to Shiquan Hu. He will also assist in the customization of the site where needed.

4.5.2 Develop and provide an annual work plan, outlining proposed deadlines and activities, to be presented to the HCA and approved by the HCA prior to the beginning of the next contract year. The work plan for the first contract year will be provided to the HCA within ten (10) days of contract award for final approval and review by the HCA.

Vendor Response: During the project initiation and planning stage, SSS will develop and refine an annual work plan. Appendix H includes an initial work plan: deliverables and milestone timelines, staffing effort, and activities, while Appendix O contains work plans for years 2–4. The annual work plan provides a comprehensive guide to SSS' approach to conducting all major activities in the project, including assumptions. We use Microsoft Project software to develop and implement an electronic work plan to include resources, schedule, deliverables, and detailed

work plans for the activities during the initial year and option years of the contract

For each project year, SSS will develop a draft work plan and submit it to the HCA for review and feedback. At least 90 days prior to the beginning of the next contract year, we will submit a final annual work plan to the HCA, which will describe and provide a timeline for all key activities to be performed in the following year. We will provide the HCA with the work plan for the first contract year within 10 days of contract award.

4.5.3 Continuously monitor changes to coding, billing, reimbursement, and electronic exchange standards and provide recommendations to the HCA regarding updates/revisions to the project and System per approval by the HCA.

Vendor Response: Ms. Larson Chebili is currently performing these monitoring responsibilities under our existing HCA contract. Additionally, SSS' HPDA Group works with a range of federal

and state government and private-sector clients to support policy analysis and research studies, as well as analytic programming support. As part of our work, we routinely monitor the health care

delivery and financing systems, including aspects such as standards for electronic exchange of data, provider diagnostic and procedure coding changes, and financing or reimbursement changes that may affect billing procedures. CMS also provides automatic updates about requirements, transitions, and deadlines through an email subscription. Ms. Larson Chebili is also a subscriber to the National Uniform Billing Committee official data specifications manual, and thus receives updated specifications for the

data elements and codes included on the UB-04 claim form (used in the electronic HIPAA Institutional 837 Health Care Claim transaction standard). Ms. Larson Chebili will gather this information about health care-related changes anticipated during the next 4 years of the contract, communicate it in a timely manner to HCA staff, and make recommendations about appropriate updates or revisions to keep the project and HDSS system fully current.

4.5.4 Communicate regularly with the HCA regarding project status, including data submission activities, potential problems or barriers to project implementation, and contacts/communications with data submitters.

Vendor Response: SSS understands that regular communication with a client and a “no surprises” communication philosophy best ensure the

success of a project. Table 4-7 illustrates our communication plan for this project.

Table 4-7: Our Communications Plan demonstrates our understanding of client requirements.

Project Status Communication	Owner/Distribution List	Frequency	Method of Communication
Data Submission Activities	Ms. Larson Chebili/HCA Data Analyst and Director of Clinical Analysis	At least weekly	Hospital Status Report, Attachment to email, regular agenda topic on teleconferences
Potential Problems/Barriers to Project Implementation	Ms. Larson Chebili or Mr. Schinckle/HCA Data Analyst and Director of Clinical Analysis	At least weekly	Telephone, web conference, or email
Contacts/Communications with Data Submitters	Mr. Schinckle/Individual Hospital Data Submitter and HCA Data Analyst	Usually daily	SSS HDSS help desk (live help by direct phone line, email)

4.5.5 Maintain a documentation log of all changes implemented throughout the project period related to data collection and the resulting master and adjudicated files, including but not limited to: changes to file formats, data elements, coding, editing, revisions to the online data submission system; and any revisions applied to data submitted and contained in the master database, as approved by the HCA.

Vendor Response: SSS understands the value of maintaining a documentation log of changes, as it has been immensely helpful in the current contract with the HCA. We employ a CCB, led by Ms. Larson Chebili, for managing all changes. Throughout the life of the contract, SSS will make changes to the various stages or functions of the online data collection system and the backend SAS system. We will document those changes and

integrate them with the audit tracking system. We will send a report to the HCA on a regular basis with a summary of changes that occurred during a specific period. Alternatively, we will maintain the Log of Changes database online and allow the HCA and SSS authorized staff to review and consult on the changes via our secure website.

We will also summarize any changes that occurred in the prior month and include a brief

description of those changes in our regular teleconferences.

4.5.6 Provide consultation and recommendations to the HCA regarding HCA data analysis, reporting, and dissemination activities, including but not limited to, SAS software assistance as requested by HCA staff, and other activities aimed at assessing the utilization, access, cost, and quality of healthcare.

Vendor Response: Working with HCA, SSS will make recommendations for data analysis, reporting, and dissemination of tables and other work products. As detailed in Section 4.3.5, SSS proposes to develop several new analytical fields; among these are quality indicators and measures of health system performance. To expand the scope of quality indicators or measures that are available to the state and key stakeholders, SSS may generate indicators suggestive of performance in patient safety (e.g., health care acquired infections), ambulatory care (e.g., admissions for chronic and acute ambulatory sensitive conditions), and hospital performance (mortality rates for selected medical conditions and surgical procedures).

To accompany data tables or generated data, SSS typically provides focused narrative, which is intended to describe data and to fill in gaps in publicly-available information. The HCA currently provides reports—largely in the form of data tables—on the agency’s website. In addition to expanding the reports, or the data tables available, the HCA may be interested in conducting cross-tabulations that offer insight into health care for population subgroups or selected categories of providers. For instance, assuming the presence of data on race/ethnicity, it may be possible to examine disparities in access, utilization, and quality for racial and ethnic subgroups. Information on hospital characteristics, such as ownership, may offer insight into the utilization and performance of safety net providers. Several of the fields and cross-tabulations proposed to the HCA are expected to be available for the nation as a whole, from resources such as Hospital COMPARE or the National Healthcare Quality and Disparities reports. As such, the HCA would have a means to

evaluate the state’s health care experience relative to an outside benchmark.

SSS research staff have a broad range of experience in reporting and dissemination activities related to health policy and data analysis. We regularly work with federal, state, and private entities to identify issues that are relevant to key stakeholder groups and to develop data analyses, issue briefs, or lengthier reports that contain information that is most salient to these stakeholders. For example, for the State of Maryland, we examined the relationship between spending for persons with diabetes and the use of hospital and non-hospital based services; factors that contribute to differences in compensation across medical specialties; and therapeutic drug classes that experienced the greatest growth in spending. SSS staff routinely prepare AHRQ Statistical Briefs using data from the HCUP Nationwide Inpatient Sample or State Inpatient Database. A large number of topics explored in HCUP Statistical Briefs could be replicated for West Virginia and compared to figures nationally or from other states. As examples, statistical briefs on the following topics have been prepared by SSS staff:

- Adult hospitalizations with infections due to medical care
- Emergency department visits associated with motor vehicle accidents
- Several condition-specific reports, including reports focused on hospitalizations associated with gastroesophageal reflux disease (GERD), methicillin-resistance staphylococcus aureus (MRSA), and HIV.

Although the HCA may determine that dissemination should largely occur via the HCA website, multiple formats (e.g., issue briefs, reports, tables) may be recommended. The

decision as to the most appropriate format for dissemination will depend largely on the targeted audience, which may include the lay public, state policymakers, provider organizations, researchers, and analysts. In all cases, SSS will produce high-quality and information-rich

products that present information gained from analyses in a user-friendly manner. The target audience will have bearing on the extent to which technical descriptions of the data are presented and the depth in which methods and data will be discussed.

4.5.7 Create systems, programs, and processes that are flexible enough to integrate updates and revisions in a timely manner, as required and/or requested by the HCA, without creating undue burden on resources.

Vendor Response: SSS' experienced programmers have the expertise to write code that allows for easy and timely integration of updates and revisions to programs. For example, for the current HCA contract, SSS has been modifying programs to account for changes such as the file format switch from 837i 4010 to 837i 5010, and from ICD-9 to ICD-10. The system and programs were flexible enough to integrate these changes and make updates in a timely manner. The SSS project team will use project management tools that will allow the systems

and processes to be updated without undue burden. For example, to keep track of changes, SSS will use an online tool, Team Foundation Server, which manages version control, change requests, issue and bug tracking, and requirements. Proper system configuration management, and change control using the Change Control Board, and overall best practices will be used. These tools and practices, plus before and after unit testing, will ensure reliability of the system after making changes.

4.5.8 Respond to HCA inquiries or requests for technical assistance and/or project revisions/updates within reasonable time frames as agreed upon and approved by the HCA, based on the urgency and importance of the issue as determined by the HCA.

Vendor Response: Prompt communication with the HCA and data submitters requesting technical assistance is necessary to circumvent potential problems with the system and to ensure hospitals' continued support of the database. In response to requests by the HCA, SSS will provide hospital-specific technical assistance to hospital representatives and the HCA, when needed, in a timely manner. SSS has been extremely responsive and provided excellent technical assistance during our current contract with the HCA. Technical assistance for the new work will continue at the same level, include problem identification, suggested technical solutions, data reconciliation process, and follow-up consultation on technical problems associated with the HDSS. SSS' project manager and her functional/

operational lead will be designated as contact persons for all technical assistance requests. Close communication will take place by phone, email, and at periodic project review meetings. SSS will respond to all inquiries received from the HCA in a timely manner by answering questions, making immediate changes in the system, and providing additional materials to the HCA and hospitals.

In addition, during the term of the current HCA contract, SSS maintained close working relationships with all of the West Virginia hospitals and their vendors, which led to dramatically improved data timeliness, completeness, and quality, and to time and labor savings at the HCA. Hospitals rely on this level of help and technical support. We will continue this effort under the new contract.

4.5.9 Acquire or provide any necessary hardware, software, and reference data files to complete all tasks the Vendor proposes to perform in fulfillment of the project specifications and to meet all applicable timeframes set forth in this RFP. Data obtained for the sole purpose of the performance of this contract should not be used for any other purpose outside of the HCA contract.

Vendor Response: SSS employs versatile enterprise server and storage solutions that are scalable as demand requires. As more data is acquired and generated, the underlying infrastructure can be seamlessly expanded by adding disks and enclosures. SSS also runs a highly virtualized environment, which results in more efficient resource usage and better resource management. It is also highly scalable, allowing for additional resources (servers, workstations, applications, etc.) to be built quickly.

SSS' HDSS hardware and associated system software (e.g., SAS, SQL Server, .Net, etc.) are fully described in Section 4-1.

Additional software that will be purchased and integrated is the National Technical Information

Service (NTIS) DRG grouper for the MS DRGs. The DRG grouper from NTIS also includes the information needed to make lookup tables that will be needed for DRGs, MDCs, weights, and diagnoses and procedure codes (ICDs).

We will also use the following reference files for the HCA project:

- ZIP code file, which is free from SAS Institute and will be used to make a zip file lookup table. This will be retrieved and installed four times a year, since it is updated quarterly.
- Other lookup tables, as needed, such as for revenue code
- NPI file from the National Plan and Provider Enumeration System to assess the quality of the NPI field and to add needed data variables.

4.5.10 Cover, or include in the project budget, all costs associated with providing technical assistance, training, and status reports to the HCA and data submitters, including teleconferencing, webinars, and/or travel to a minimum of two onsite meetings each year.

Vendor Response: During SSS' 5 years of support to the HCA, we demonstrated our willingness to attend onsite meetings at the HCA and to hold web conferences (for large and small audiences) to implement services, training, and related implementation planning. We will continue to provide this support under the new contract.

At the HCA's request, Ms. Larson Chebili (or another SSS representative with relevant experience) will attend meetings at the HCA, at 100 Dee Drive, Charleston, WV or at any other location identified by the HCA. Such meetings might include start-up conferences, project planning meetings, deliverable review meetings,

and services implementation-related meetings, as well as training sessions involving the HCA and hospital representatives.

For example, SSS staff visited the HCA project team to review ongoing work and changes to the edits. In addition, SSS assisted the HCA in preparing the materials for the training sessions for the data submitters. SSS staff led training sessions in Charleston at the HCA's office and presented in web conferences for additional training sessions.

SSS staff will travel to a minimum of two onsite meetings per year.

4.6 Provide Ad Hoc Services to the HCA

SSS has experience in collecting, editing, maintaining, and delivering hospital data in non-

inpatient settings. We will leverage upon our existing HDSS system for inpatients.

4.6.1 Provide tools, products, report templates, software, and/or code for use by HCA and/or external partners to conduct analysis of health care utilization, access, costs, and quality.

Vendor Response: SSS has many staff with extensive training and experience in web-based tools, including the HDSS. As we have done for the HDSS, our web programmers are experts at integrating the latest web-based technologies. We have considerable experience in designing and developing web-based database applications that are used for data collection and information dissemination functions. Another example of an SSS product is the Health Indicators Warehouse (HIW), a website that has a collection of more than 1,200 health indicators derived from more than 170 data sources that are maintained to support researchers, technology developers, and policymakers. The health indicator data sets and

the web tools provided by the HIW support technology development leading to a broad array of applications and data services.

Should the HCA be interested in SAS tools, SSS has a strong team of SAS programming staff who is accustomed to writing well-documented code that can easily be understood and transferred from one person or organization to another, such as the HCA and/or external partners. SAS is widely recognized software that is a generally accepted tool to conduct analysis of health care utilization, access, cost, and quality. SSS can also use SAS to create report templates, such as Excel report templates.

4.6.2 Identify, collect, edit, maintain, and provide to the HCA data for services rendered in non-inpatient settings by West Virginia hospitals, and other relevant providers, using methods and processes comparable to inpatient data collection and would allow for integration with the existing inpatient data collection system. Develop data quality reports and/or analytic reports, determined necessary to perform the functions each specified project.

Vendor Response: Non-hospital services make up a large part of total national health expenditures. Hospital care accounts for approximately one-third of national health expenditures. Physician services account for about one-fifth of total expenditures, with the remainder largely accounting for services and products rendered in various other settings. As a result, it will be important for the HCA to collect and analyze data from non-inpatient settings and to be able to track patients from inpatient to non-inpatient settings, and vice-versa.

SSS has wide-ranging experience in identifying, collecting, editing, managing, and delivering files and reports for non-inpatient settings, including emergency department data and other types of hospital outpatient services. This experience is described in Section 4.6.2.1 (5 years of work we did for another state). Such experience will allow us to fully meet the HCA's needs for maintaining,

processing, analysis, and delivery of the required data.

SSS will integrate the system for non-inpatient settings with the existing inpatient data collection system, including keeping the same site and method for hospital submitters to input their data into the system, the same way to upload files and edit batches, the same types of fields where possible, the same types of edit checks and DQRs.

SSS proposes to work with HCA staff to develop a scope of work that satisfies the HCA's needs and fits within the level of resources we have allocated to these tasks in our budget. This could involve selecting a limited number of types of non-inpatient settings for which data will be collected, edited, maintained, and analyzed, or a limited number of facilities. Alternatively, we could develop a plan for using the allotted resources to conduct a core set of basic data

collection and programming tasks, and provide an additional estimate of a “per data submitter” charge for processing.

According to our budget estimate, we assume that SSS will perform the required tasks on the following types of outpatient data in the first contract year: emergency departments, outpatient surgery departments, outpatient observation stays, one diagnostic/therapeutic service, and one other type of service. It may be

4.6.2.1 Emergency Department data

Vendor Response: An increasing source of revenue for hospitals has been the emergency department—primarily as a source of hospital admissions. As a result, it is the focus of substantial policy attention due to concerns about overcrowding, potential inappropriate use, and high cost.

SSS will collect emergency department (ED) data in the same general manner as the inpatient UB data are collected, although, the criteria for extracting ED records may vary by hospital. As reported by AHRQ⁶, special UB and revenue codes, internal record flags, a special value within the patient account number; and “type of service” code can all be potential variations in ED records. Note that in general, records for patients admitted as inpatients through the ED are considered inpatient records and not ED data.

SSS will develop recommendations and a methodology, create data submission manuals and guides, work closely with the HCA and data providers, and implement a process for efficiently and uniformly collecting data. We will pay attention to uniformity of coding of admission source (e.g., another hospital, another health care facility). This will enable identification and tracking of patients who were treated and released, admitted to the same hospital, or transferred to another hospital or facility.

possible to include additional service types in subsequent contract years or depending on the number of records and facilities, and on the level of data quality from those facilities. We are interested in exploring the best way to support the HCA in providing the data needed for reporting and decision-making in the most cost-effective manner possible. In the following subsections, we describe our approach to each of the different types of data in more detail.

Ms. Larson Chebili, the Project Manager for the current HCA contract, has over 5 years of experience collecting, editing, processing, and reporting on emergency department data for the State of Connecticut. She built and oversaw a system that collected selected fields on the UB form from state hospitals, and she has a deep understanding of additional fields needed in this area such as CPT/HCPCs codes, procedure codes, and modifiers as well as charges (which include hospital based charges only and not professional fees). She implemented checks for initial quality, cross field quality, and applied Ambulatory Payment Classification (APC) grouper software to deliver value added grouper fields, and reported annually on these data in a series of detailed and summary reports.

For ED data, we will leverage upon the existing system that hospitals are already comfortable with, and we will integrate it. We will specify that batches coming into the system be in the same data format (ASC x12 5010), will similar edits in the familiar web interface, with similar reports, guides, and instructions. As with the existing inpatient system, DQRs will be made available on the system itself, both in real time and downloadable.

Integration will lead to a much shorter learning curve for hospitals, their vendors, and other users, greatly reducing the burden on them.

⁶ Moles E, Andrews RM. Emergency Department Data Evaluation. May 2005. HCUP Methods Series Report #2005-2. ONLINE. June 3, 2005. U.S. Agency for Healthcare Research and Quality. Available: <http://www.hcupus.ahrq.gov/reports/EmergencyDepartmentDataEvaluation.pdf>.

4.6.2.2 Outpatient surgery data from hospitals

Vendor Response: A potentially cost-saving source of care, hospital outpatient surgical departments and centers offer a variety of services for which an inpatient stay is not required. This includes endoscopies, cataract surgery, colonoscopies, and pain management services. Hospitals may offer outpatient surgery either in a freestanding facility or in a department or center that is physically part of a hospital. Patients undergoing a surgical procedure are admitted and released from the hospital on the same day.

SSS will collect, edit, maintain, and analyze outpatient surgery data. The data will be collected from hospitals in the same general manner as the inpatient UB data are collected. Based on our experience with the ambulatory surgery data collection process and various experiences of other states in this area, we fully support the HCA's strategy to start the collection of the ambulatory surgery data in the same manner as the inpatient collection is performed. Of importance in collection of these data is identification of revenue center codes that are

4.6.2.3 Outpatient observation stays

Vendor Response: The use of observation services (OS) has been receiving heightened attention from consumers, providers, payers, and the media, and has increased dramatically in recent years. OS can be provided in a variety of outpatient settings, including emergency department and ambulatory surgery centers, and often leads to an inpatient admission. Based on the rising policy focus, AHRQ has been assessing the capabilities of HCUP data for addressing research questions related to observation services and working to identify strategies for improving these capabilities.

According to AHRQ, in 2001–2009, there was an increase of more than 100 percent in the numbers of outpatient encounters involving OS for Medicare FFS beneficiaries. Also according to AHRQ, there was a substantial range in the percentage of OS records for the 30 states with

indicative of care rendered in a hospital ambulatory care center or in another hospital center. We will ensure that codes are uniformly collected and formatted to facilitate comparison of data—such as data submitted by states that participate in the HCUP State Ambulatory Surgery Databases (SASD).

As another means to facilitate analyses and comparisons, we will examine ambulatory payment classifications to develop meaningful groupings, such as in the SASD “Ambulatory Payment Group Type” field, where CPT codes are used to determine whether a “significant,” “ancillary,” “incidental,” or other type of procedure occurred. We will develop recommendations and a methodology for the submission and collection of these data, create a data submission manual and/or guides, and work closely with the HCA and the providers to implement the process. SSS will allow for integration with the existing inpatient data collection system. We will develop DQRs and/or analytic reports as necessary.

evidence of OS—from an SSS tabulation on 2008 West Virginia inpatient data, it appears that West Virginia was at the top end of this range, with 8.8% of records showing use of OS.

SSS researchers have a deep understanding of the intricacies of identifying OS across different settings and files, having analyzed the use of OS by Medicare beneficiaries in a study funded by the Robert Wood Johnson Foundation. While Medicare and private insurers require providers to record specific APC codes for observation services, there is evidence that APC codes are underreported in many cases. AHRQ HCUP partners use a combination of other pieces of information to identify OS, including CPT/HCPCS codes indicating OS, charge buckets made from individual revenue center codes, and UB revenue center code 762 (observation hours).

Using the same approach as with the inpatient UB data, SSS will collect, edit, and maintain data on observation services provided in outpatient settings. We will develop recommendations and a methodology, create a data submission manual

and/or guides, work closely with the HCA and the providers, and implement the process. SSS would allow for integration with the existing inpatient data collection system. We would develop DQRs and/or analytic reports as necessary.

4.6.2.4 Outpatient diagnostic and therapeutic hospital services

Vendor Response: A broad range of outpatient diagnostic and therapeutic services are delivered in a hospital setting. These include an array of diagnostic imaging services (such as CT scans, MRIs, PET scans); diagnostic services that rely on imaging technologies (e.g., angiograms); and therapeutic services, many of which also rely on imaging technologies (e.g., angioplasty, embolization). Other diagnostic and therapeutic services provided in the hospital include blood product replacement, hydration therapy, bone densitometry, and laboratory services. A Standard Report currently on the HCA website provides data on the number of diagnostic and therapeutic cardiac catheterization procedures provided in West Virginia annually, by hospital, and state and county of patient residence.

SSS will collect outpatient diagnostic and therapeutic data in the same general manner as the inpatient UB data are collected. We will develop recommendations and a methodology, create a data submission manual, work closely

with the HCA and the providers, and implement the process. Because of the broad range of services that are potentially included under this activity, SSS proposes to work closely with the HCA to identify the types of outpatient diagnostic and therapeutic services that are of the greatest interest, and to select a small number of these services for the initial contract year. For the selected services, we will work with hospitals to collect the data, develop a data submission manual, and provide guidance as needed. We will develop procedures for editing the data, using methods similar to those used for the inpatient data and for other outpatient services described above. The data will be maintained and provided to the HCA. Depending on the number of records and quality of data (i.e., the extent of data cleaning and editing required), it may be possible to collect data for additional services in the first contract year; in subsequent contract years, SSS will work closely with the HCA to expand the number of services for which data are collected.

4.6.2.5 Outpatient physician office visits or other types of hospital outpatient services

In addition to the outpatient hospital-based services discussed thus far, other types of hospital outpatient services may be of interest to the HCA. These could include outpatient physician visits (primary care and specialty), administration of intravenous drugs, hospital-billed lab services, dialysis services, rehabilitation services, and others. For services delivered in a hospital outpatient setting, SSS will collect, edit, and analyze the data in a manner similar to that used for inpatient data. As with the process described above for emergency department data, data collection for various types of outpatient services may require selection of specific fields from the UB forms; these fields will include at a minimum revenue center, CPT/HCPCS, and modifiers. For drugs (e.g., chemotherapy

administration or injectables), additional fields such as drug name, strength, and NDC code will likely be required for processing and analysis. As appropriate, we will use the NTIS Integrated Outpatient Code Editor to create an APC number for each service as well as to conduct necessary edit checks.

The RFP also refers to physician office visits and services delivered by non-hospital providers. We assume that the HCA is interested primarily in procedures delivered in physician offices that operate out of the hospital, or are financially associated with the hospital, rather than services performed in all office-based physician practices. SSS proposes to work closely with the HCA to identify the types of outpatient physician office

visits and other types of hospital outpatient services that are of the greatest interest, and to select one of these services for the initial contract year. For the selected service, we will work with hospitals to collect the data, develop a data submission manual, and provide guidance as needed. We will develop procedures for editing the data, using methods similar to those used for the inpatient data and for other outpatient services described above. The data will be maintained and provided to the HCA. Depending on the number of records and quality of data (i.e., the extent of data cleaning and editing required), it may be possible to collect data for additional services in the first contract year; in subsequent contract years, SSS will work closely with the HCA to expand the number of services for which data are collected.

Services delivered outside of a hospital setting present a greater challenge for data collection. For the past 12 years, SSS has successfully collected annual data for services delivered in an

outpatient physician office setting for MHCC. For the most recent year, SSS developed an outpatient database consisting of more than 70 million outpatient physician office services and more than 4 million institutional services. In this process, we have gained a practical appreciation and an in-depth understanding of the technical and organizational issues involved in this type of data collection. Unlike the inpatient claims that are collected straight from the hospitals, it is not practical to collect outpatient physician office claims directly from practitioners. Instead, in Maryland, and an increasing number of other states, claims for professional services are submitted by private payers. Based on our experience developing and maintaining Maryland's private payer claims database for the last 12 years, SSS staff would be happy to discuss with the HCA approaches to collecting data on non-hospital services; however, we have not included in our budget any resources for actual data collection.

4.6.3 Develop and implement new data submission system enhancements, data quality reports, or analytic reports, determined necessary to perform the functions of this project but not elsewhere specified or required by this RFP.

Vendor Response: At SSS, we follow a guiding principle to continually assess and improve processes and methods for our clients. Our staff enjoy working closely with clients to meet the full range of needs.

SSS has successfully developed and implemented several data submission enhancements over the last 5 years of the current contract with the HCA, and will continue to do so with the focus on reducing the burden on the user, ease of use in the site, with data quality always in mind.

As requested, SSS will develop DQRs in a timely manner (examples of DQRs that have been modified to protect the confidentiality of hospital

names are included in Appendix I). We also have extensive expertise designing and producing useful analytic reports with a quick-turnaround time. For example, we have worked collaboratively with MHCC staff developing an array of analytic reports and briefs to suit the needs of stakeholders such as providers, payers, and consumers. We also collaborate with AHRQ research staff to produce Statistical Briefs and other analyses using HCUP inpatient, ED, and ambulatory surgery data. SSS will develop and implement any system enhancements, as requested. SSS would allow for integration with the existing inpatient data collection system.

Attachment B: Mandatory Specification Checklist

5.0 Mandatory Requirements

5.1 Mandatory Requirements

5.1.1 The successful vendor agrees that all data and any software, programming code (including code to implement editing and adjudication procedures, and to create non-proprietary analytic fields), file formats, or other deliverables developed to fulfill the contract requirements, be the sole property of the HCA.

Vendor Response: SSS proposes to continue using the highly customized West Virginia HDSS. This system has been enhanced and maintained to meet the specific data collection needs of the HCA over the last 5 years, and meets and/or exceeds all the data processing requirements, including a user friendly web interface that hospitals use to edit submitted data online. SSS agrees that all data and any software, programming code (including code to implement

editing and adjudication procedures, and to create non-proprietary analytic fields), file formats, or other deliverables developed to fulfill the contract requirements, are the sole property of the HCA. If needed, any programming code for a developed deliverable that is embedded in HDSS can be extracted, documented, and provided to the HCA, along with the deliverable, to ensure fully meeting this mandatory requirement.

5.1.2 The Vendor MUST PROVIDE privacy and security safeguards to protect all data from any use or disclosure for any purpose other than that described within this proposal or expressly authorized by the HCA Project Manager through written signed consent.

Vendor Response: SSS adheres to NIST standards and HIPAA guidelines for developing and maintaining a comprehensive security strategy. At SSS, the confidentiality, integrity, and availability of client data is essential and embraces our commitment to employ best practices in applying appropriate security controls to adequately protect data and resources. Privacy and security are core functions that are built into every aspect of SSS operations. All SSS employees and subcontractors are required to take an Information System Security

Awareness Training course and annual refresher training. Training is tracked through ComplianceWire, which generates alerts if staff are found to be non-compliant. All new SSS employees are provided with a copy of the company's security policy, Acceptable Use Policy, and Rules of Behavior. Additionally, Ms. Larson Chebili, our proposed Project Manager, will ensure that all HCA project staff have reviewed and signed a project-specific Data Confidentiality Agreement.

5.2 Mandatory Deliverables

5.2.1 The Vendor SHALL maintain a secure website for the on-line data collection, data submission by file upload, data editing, and distribution of reports to data submitters and the HCA, as approved by the HCA, within 90 days of contract award.

Vendor Response: As detailed in Section 4.1.4, SSS will maintain the secure web-based system

for online submission and editing of hospital inpatient data by using standard best practices

for SDLC management. The system uses Microsoft IIS 8.0 and SQL Server 2014 for data capture, editing, and audit tracking. All data submitters will access the HCA application via the internet using the HTTPS protocol. SSS protects

all externally-facing websites with SSL certificates, locking down site visitors' sensitive data against fraud and identity theft by providing encryption and validation. All SSS SSL certificates are configured with 256-bit encryption.

5.2.2 The Vendor MUST provide live help desk support by telephone to data submitters and/or their representatives for at least eight hours per day during daytime business hours (EST), five days per week, excluding West Virginia state holidays.

Vendor Response: SSS will continue to provide our highly praised live help desk support by telephone to data submitters and/or their representatives for at least 8 hours per day during daytime business hours, 5 days per week, excluding West Virginia state holidays. Help desk

support will also be made available by email. To ensure that the HCA staff and the hospitals have access to SSS project staff, we will provide technical assistance from 8:30 a.m. to 4:30 p.m. Eastern time.

5.2.3 The Vendor SHALL conduct analyses to investigate and determine potential data quality issues, as requested by the HCA, within at least ten (10) business days of request.

Vendor Response: Within 10 business days of request, SSS will conduct analyses to investigate and determine potential data quality issues, as requested by the HCA. The techniques and

procedures we will use include detailed examination and interpretation of DQRs as well as additional diagnostic steps using SAS and SQL server.

5.2.3.1 The Vendor MUST correct identified data submission errors that are determined cannot or should not be corrected by the data submitter, as requested and/or approved by the HCA, within at least twenty (20) business days of request/approval.

Vendor Response: Within 20 business days of request or approval, SSS will correct identified data submission errors that are determined cannot or should not be corrected by the data submitter, as requested and/or approved by the HCA. Occasionally, there may be errors or inconsistencies in the submitted data for a

hospital that are not worth the burden on the hospital to resubmit the data again. If this type of error is uncovered by SSS or the HCA and the HCA requests or approves for SSS to correct the data, we will accomplish this within 20 business days. We will provide feedback to both the HCA and the hospital about how the data were corrected.

5.2.3.2 The Vendor MUST correct any identified errors in the System or the resulting file(s), which are attributable to the Vendor, within at least 10 business days of request.

Vendor Response: Within 10 business days of request, SSS will correct any identified errors in the system or the resulting files that are attributable to SSS. The HCA will be immediately

informed of any errors. Ms. Larson Chebili, our proposed Project Manager, will communicate any ramifications and the status of the updates.

5.2.4 The Vendor SHALL certify that the disaster recovery plan, as approved by HCA, has been tested and proven effective within sixty (60) days of contract award.

Vendor Response: Within 60 days of contract award, SSS will certify that the Disaster Recovery Plan, as approved by the HCA, has been tested

and proven effective. We will test the detailed plan by creating a disaster scenario that has a probability of occurring. HCA staff will be invited

to observe the test and participate in a debriefing to review performance and suggest improvements.

The Disaster Recovery Plan will be consistent with the procedures for disaster recovery outlined in SSS' Disaster Prevention and Recovery Plan, which include a combination cold site and warm site scenarios for system backups, as well as a distributed computing model to provide employees access for business continuity. In

coordination with the HCA staff, the plan will detail the priorities for recovery, as well as the acceptable downtime for each function of the project. It will detail the steps to be taken during the backup and protection phases, as well as the precise steps required to restore and recover from a disaster. This will include the provision for a temporary restoration of data and services and a long-term restoration in the event of a protracted event.

5.2.5 The Vendor MUST deliver a final complete data file for the previous calendar year, with all identified data quality issues resolved, by July 1 each year.

Vendor Response: As we have done for the data collection years under our current contract with the HCA, by July 1 of each year SSS will deliver a final complete data file for the previous calendar year. All identified data quality issues will be

resolved with this delivery. The files will be submitted in SAS, as well as in a delimited format that is suitable for easy import into HCA's Oracle database.

5.2.6 The Vendor SHALL, within 30 days of the end of each contract year, provide to the HCA an annual report of the project, including but not limited to: project successes and barriers; revisions or updates implemented to the System during the project year; and any recommendations for future project and System enhancements.

Vendor Response: SSS has been submitting clear and concise annual reports to the HCA each year under our current contract. SSS will continue to draft an annual report by the end of each contract year and submit it to the HCA for review and feedback. Each year's annual report will

describe the project successes and barriers; revisions or updates to HDSS in the prior year; and any recommendations for future project and system enhancements. The final annual report will be delivered to the HCA within 30 days of the end of the contract year.

5.2.7 The Vendor SHALL, at least 90 days prior to each contract year, submit to HCA a final and approved annual detailed work plan of key activities and projects to be completed during the year. The work plan must include an implementation timeline for key project activities and identify responsible team members.

Vendor Response: At least 90 days prior to each contract year, SSS will submit to HCA a final and approved annual detailed work plan of key activities and projects to be completed during the year. The work plan will include a detailed description of key activities and projects to be

completed during the year. It will also include an implementation timeline for key project activities and identify responsible team members. We will submit a draft of the first year's plan, which will be based on the work plan submitted with our proposal to the HCA for review.

5.2.8 The Vendor SHALL cooperate with the HCA and any subsequent Vendor should the contract, which is the subject of this RFP, be terminated, and to deliver any and all data, documentation, and associated work products to the HCA or its designee within thirty (30) days of receipt of notice of contract termination.

Vendor Response: Should the contract be terminated, SSS will cooperate with the HCA and any subsequent vendor. We will deliver any and all data, documentation, and associated work products to the HCA or its designee within 30 days of receipt of notice of contract termination.

In those cases where SSS does not win a re-compete, we are very cooperative in providing all project work products, and staff are available for conference calls to discuss project processes and activities. As a professional and ethical company, SSS believes strongly in supporting our clients, especially in a transition situation.

5.2.9 The Vendor SHALL destroy all data in the System at the end of the contract and/or upon the request of the HCA in accordance with the then current NIST Special Publication 800-88.

Vendor Response: In accordance with NIST Special Publication 800-88, SSS will effectively sanitize or destroy all data with authorization from the HCA, either due to the end of the contract or for other reasons. Depending on the type of data and where it resides, the sanitization will be performed using either Secure Delete (a command line utility that implements the

Department of Defense clearing and sanitizing standard DOD 5220.22-M) with seven passes or using a secure FIPS-compliant deletion or destruction method at the storage level.

Any copies of data for backup and restoration purposes will also be appropriately sanitized or destroyed.

5.2.10 The Vendor SHALL notify the designated HCA Project Manager immediately, by telephone call at 304.558.7000 and e-mail, upon the discovery of breach of security of System data, where the use or disclosure is not provided for by this RFP or contract, of which it becomes aware, if the System data was, or is reasonably believed to have been, acquired by an unauthorized person. If there is a suspected security incident, intrusion or unauthorized use or disclosure of PHI in violation of this RFP or contract, or potential loss of System data affecting this RFP or contract, then notification must occur within 24 hours by the same methods above. The Vendor shall immediately investigate such security incident, breach, or Authorized use or disclosure of System data. Within 72 hours of the discovery, the Vendor shall notify the HCA Project Manager of: (a) What data elements were involved and the extent of the data involved in the breach; (b) A description of the Authorized persons known or reasonably believed to have improperly used or disclosed System data; (c) A description of where the System data is believed to have been improperly transmitted, sent, or utilized; (d) A description of the probable causes of the improper use or disclosure; and (e) Whether any federal or state laws requiring individual notifications of breaches are triggered. HCA will coordinate with the Vendor to determine additional specific actions that will be required of the Vendor for mitigation of the breach, which may include notification to the individual or other authorities. All associated costs shall be borne by the Vendor. This may include, but not be limited to costs associated with notifying affected individuals.

Vendor Response: SSS is very familiar with the HCA immediate incident reporting requirements for the unauthorized disclosure of PII. SSS accepts to abide by the notification procedures for PII information breach using the provided incident reporting procedures defined in Attachment J. SSS will report all incident reports at the Office of Technology website, which will simultaneously notify the State Privacy Office and Office of Technology. The reporting information requirements include the; date the incident

occurred (or was identified), the type of PII exposed (with actual PII redacted from the reports), how the PII was compromised and the available information on the unauthorized parties, steps SSS has taken to recover the information and any other relevant information to the incident report. SSS notification procedures are streamlined with the HCA notification procedures for the discovery or suspicion of a breach of security for the HDSS data.

5.2.11 The Vendor SHALL submit a detailed draft data security plan for the system as part of their proposal for this project, to address key concerns, particularly with the safeguards found in HIPAA regulations and additional items outlined in Section 4, Subsection 4.4. The plan must be submitted with this proposal.

Vendor Response: A draft data security plan for the HDSS is included as Appendix L.

5.2.12 The Vendor WILL submit the work plan for the first contract year and will be provided to the HCA within fifteen (15) days of contract award for final approval and review by the HCA.

Vendor Response: Within 15 days of contract award, SSS will submit to the HCA a work plan of key activities to be completed during the first contract year. It will not only describe how the SSS team will accomplish the work activities that are required during the initial year of the project, but it will also include an implementation

timeline for key project activities and identify responsible team members.

We will submit a draft of the first year's plan—which will be based on the work plan submitted with our proposal—to the HCA for review within 15 days of contract award, and we will finalize the plan within 30 days of contract award.

REQUEST FOR PROPOSAL

CRFP 0507 HCC1600000002

Hospital Inpatient Data Collection, Processing, Analysis, and Reporting

By signing below, I certify that I have reviewed this Request for Proposal in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that, to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.



Social & Scientific Systems, Inc.

(Company)

David D. Wagner, Director of Contracts

(Representative Name, Title)

301-628-3000/301-628-3001

(Contact Phone/Fax Number)

July 21, 2016

(Date)

Appendix A Proposed Staff Resumes

The following resumes are included in Appendix A:

- ▣ Christina Larson Chebili, MA – Project Manager
- ▣ Jeffrey Schinckle, MLIS— Functional/Operation Lead
- ▣ Momodu Fofana, PhD
- ▣ Janet Pagan-Sutton, PhD
- ▣ Shiquan Hu, MS, MS
- ▣ Po-Lun Chou, MS
- ▣ Arlene Amodeo, MS
- ▣ Salvador Djeukeng, MS
- ▣ James Bellefontaine
- ▣ Stephen LaRochelle

Christina Larson Chebili

Project Manager/Senior Programmer Analyst

Social & Scientific Systems, Inc.

Ms. Chebili has more than 8 years of project management experience and 23 years of computer programming experience using SAS, Oracle, SQL Server, SPSS, and ESRI mapping software. She currently serves as project manager for projects with the state of West Virginia Health Care Authority (HCA), National Institute on Aging (NIA) Laboratory of Epidemiology, Demography, and Biometry (LEDB), the State of Connecticut Office of Health Care Access (OHCA), the American Nurses Credentialing Center (ANCC), and CGI Federal. She specializes in programming to support research in public health, including building, manipulating, checking, unit testing, analyzing, and reporting on data in SAS. She has a proven ability to automate and streamline complex processes.

Education and Certifications

- MA, General Psychology, Catholic University of America, 1992
- BA, Psychology, George Washington University, 1989

Experience

Project Manager, Social & Scientific Systems, Inc., 2003–Present

Serves as the project manager on projects with NIA, WV HCA, OHCA, CGI, and the ANCC involving building and maintenance of hospital data submission web sites, SAS data processing and statistical programming support. Responsibilities include the following:

- Works closely with project officers to understand and carry out the processes and steps taken to complete the scope of services and specific tasks.
- Develops project work plans and project management plans that provide a summary description of the tasks, plans, objectives, and requirements.
- Works closely with clients to understand the purpose, timeline, and specifications of each task and request to ensure usable and timely results.
- Supervises programming staff, maintains and organizes data files and written materials, writes ongoing task correspondence and progress reports, and coordinates requests.

Current projects include the following:

- For the WV HCA, manage a project to develop and maintain the online Hospital Data Submission System, which includes real time data collection, processing, and editing of inpatient hospital discharge electronic billing data from all West Virginia hospitals. Write specifications, coordinate SAS programmers and .NET developers, and create documentation, training, and technical support regarding data collection, editing, reconciliation, and adjudication. Use SAS to create and provide to the HCA adjudicated analytic files containing submitted fields, appropriate groupers and adjustment factors, and other demographic, cost, clinical, and quality fields. Deliver training to hospitals to guide web site users.
- For NIA's Age, Gene/Environment Susceptibility (AGES) study and ancillary studies, oversee staff and provide technical work to create datasets, manipulate data, and analyze and report on complex data. For the Health, Aging and Body Composition Study (Health ABC), links person-level clinic data to medical events as recorded by the Centers for Medicare and Medicaid Services (CMS) via complicated process of matching encrypted IDs. Analyze medical events gleaned from CMS inpatient, outpatient, and skilled nursing files. Develop summary analytic files. Create disease categories by combining appropriate diagnosis and procedures codes. Develop and analyze complex specifications and formulates original programming approaches. Refine complicated programs written by others. Convert SAS code to Oracle SQL code and vice versa. Construct complex subset

- databases and files for analysis. Write and maintain documentation on all aspects of a task, including progress on requests, reporting on inconsistencies, and mapping of data.
- For OHCA, oversee all aspects of a semiannual SQL Server database delivery regarding all acute-care hospital inpatient and emergency department discharges in Connecticut. Use SAS to load source data, manipulate the data into a usable format, check for errors, select appropriate DRG and APC groupers and apply them in conjunction with the data, consult with client and data suppliers regarding data issues, and create detailed and summary reports on the quality of the data. Load the cleaned, processed data into SQL server databases for delivery and update the database as necessary. Also, create a series of in-house validation tables, which report on the state of the data.
 - ◀ For the Administration on Aging, apply standard procedures in SAS to load, verify, enhance, link, and document National Survey of Older Americans Act Title III Service Recipients surveys. Combine and restructure the data to make it more user-friendly, standardize the treatment of missing values, collapse scores, and create additional versions of variables. Explore and document the quality of the data received. Prepare data for use on client website. Also, create public-use files and export files for this survey. Process the annual American Community Survey data from Census for use on the client's Aging Integrated Database. Conduct analyses in response to ad-hoc requests.
 - For the American Nurses Credentialing Center and CGI Federal, manage and oversee a project where staff provide on-site SAS programming support.
 - For the Medicare Payment Advisory Commission (MedPAC), build and analyze large SAS datasets (many millions of records) for preparation of ad hoc reports to Congress on Medicare questions.

Senior Software Engineer, Automatic Data Processing—Medical Claims Services, 1999–2003

Wrote original SAS programs to build, manipulate, export, and unit test SAS data and then load that data into Oracle. Created SAS code to automate processes inside and outside of SAS. Employed sophisticated SAS programming techniques, such as macro, SQL, and client/server strategies like the SQL Procedure Pass-Through facility. Job functions included maintaining graphical user interface data for insurance software product, building content data for engine of that software product, extracting data from data warehouse, and producing customized reports from that data. Also developed material for and taught nine in-house SAS classes to groups of fellow SAS users (topics included macros, programming efficiency, and SQL).

SAS programmer/analyst, Quantum Research Corporation, 1998–1999

Programmed original SAS code, improved the efficiency and logic of established SAS programs, utilized complex programming techniques such as SQL and macros to analyze data, constructed data files, integrated data from diverse sources, and automated repetitive processes. Projects included an evaluation of the National Institutes of Health (NIH) Research Centers in Minority Institutions Program, a study on National Research Service Award postdoctoral appointments, and institution name tracking and matching for the Howard Hughes Medical Institute. Also gave frequent presentations on various SAS topics to in-house SAS users groups and co-researched and recommended a version-control system for companywide use.

SAS programmer, Westat, 1996–1998

Developed original SAS programs (proc and data step programming plus macros and some SQL), manipulated and statically analyzed data and presented the results, automated and produced reports, and created SAS tables. Contributed to three NIH-sponsored projects, including clinical trials of mother-to-child HIV transmission (reviewed by the Food and Drug Administration); a study of the major risk factors of neonatal group B streptococcal disease; and site performance evaluations.

SPSS Programmer and Research Assistant, NIH/National Institute of Child Health and Human Development (NICHD), 1991–1996

Wrote statistical programs, analyzed data and communicated results, trained individuals and groups on statistical computer programming, set up and formatted spreadsheets for data entry, cleaned and edited data, and edited written work for publications. Coauthored two published articles. Contributed to 15 studies on domestic violence, sexual abuse, parental beliefs, and mother-infant interaction.

Systems and Languages

SAS, SPSS, SQL; Oracle, SQL server, Microsoft Access; ArcGIS; Microsoft Excel, Lotus 1-2-3, Framework III; Microsoft PowerPoint, Harvard Graphics; Microsoft Word, WordPerfect; Source Safe; PVCS Tracker; On Time; Windows, MVS, UNIX, DOS; IBM-PC, IBM mainframe

Jeffrey Schinckle

Senior Programmer Analyst

Social & Scientific Systems, Inc.

Mr. Schinckle is a web programmer with more than 14 years of experience in building database-driven web applications. He serves as the lead programmer for the West Virginia Health Care Authority Health Data Submission System (HDSS). He is an expert in ASP.NET (C# and VB.NET), Javascript, HTML/CSS, and Microsoft Visual Studio. He has designed databases in both Microsoft SQL Server and MySQL.

Education and Certifications

- Master of Library and Information Science, University of Washington, 2005
- B.A., History, Carleton College, 1997

Experience

Programmer Analyst, Social & Scientific Systems, Inc., 2005–Present

Designs, tests, builds, and maintains database-driven web applications using ASP.NET, Javascript, SQL, HTML, and CSS. Performed the following web application development tasks for several SSS clients:

West Virginia Health Care Authority. Served as programmer for creating the Health Data Submission System (HDSS). The site allows authenticated hospital users to upload patient data files that are imported and transformed to securely store the data. The HDSS is an ASP.Net application that validates the imported data and provides users a convenient tool to manage their data files, edit patient records, and manually input patient records when needed. Enhanced the site to accept different data formats, added editing options to allow users easier options to edit larger number of patient records at once, and integrated the hospital submission schedule and data submission progress into a user dashboard. Created reports to ensure data quality with SQL Server Reporting Services.

National Children's Study. Served as a programmer for the Vanguard Instrument Central (VIC). The VIC served as a place to create, edit, and track the regulatory progress of survey instruments for the National Children's study. Created a single page application using ASP.Net and Javascript to allow users to collaboratively design and review survey instruments. Features included roles based access to edit sections of the instrument, a view an instrument to input translated versions, and validation checks of the instrument to confirm that it followed established conventions.

U. S. Food and Drug Administration (FDA). Serves as the lead programmer for a web application and database for the registration and data management for the FDA MedSun project conferences and education programs. Developed an ASP.Net application template for creating multiple instances of registration sites that can be easily customized for each use. Wrote documentation for application template to guide the creation of new versions of the application. The ASP.NET web application for conferences and education programs includes event information and a registration form that collects contact, conference attendance, travel, and hotel information. The registration management site created reports of registrants and exported registration data in a comma-delimited file to a separate conference management system.

U.S. Agency for International Development (USAID). Served as a programmer for a database and web application to capture funding of microbicide projects. The project followed an agile model that uses an iterative development process of creating a prototype and then meeting with stakeholders to review and refine the prototype. Created prototypes for the multiple cycles of this process, and a final version of the prototype that was used as the design requirements for the development of the database. Built the application using ASP and SQL server, which allows the entry of financial and program data over a specified reporting period and provides a mechanism for USAID program administrators to approve or

reject entries before the data are transferred to a separate reporting database. Crystal Reports was used to create reports based on the approved data.

National Institutes of Health Undergraduate Scholarship Program (UGSP). Served as programmer to maintain the UGSP web application and database. The ASP web application includes several forms for scholars to enter information that is captured in the SQL database. Made updates to the site and added new features to existing functions. Worked as the lead programmer in updating the security features of the site.

Association for Public Policy Analysis and Management (APPAM). The ASP web application and SQL database consist of information about APPAM's activities and annual conference. Built an online membership ASP.NET application that interfaces with a third-party credit card processor to process membership information and payments. Membership application and payment information can be reviewed and updated through an ASP.NET administrative interface that works with the data stored in SQL server. Worked as the lead programmer to rebuild conference registration forms with enhanced functionality and security in ASP.NET with a SQL server database backend. Updated an ASP.NET conference registration application to accept credit card payment. Made content changes and modified existing functions. Added new features to enhance the conference search function.

AIDS Clinical Trial Group (ACTG). Served as a programmer for a database and web application that displays protocol, committee, and site-related information to ACTG members. Built security authentication and authorization system for the ASP.NET web application that requires all users to have an account in the system and grants access based on the role assigned to the user.

West Virginia Health Care Authority. Served as programmer for updating the web application and database based on security recommendations from an outside audit. Added ASP and SQL code to sanitize form input and enforce password rules.

Lead Web Developer, Vehicle Donation Processing Center, 2003–2005

Worked collaboratively in a team to design, test, build, and maintain charity car donation websites using HTML, CSS, PHP, and MySQL. Optimized the company's main site for organic search results and created custom landing pages. Designed a MySQL database employed to generate site content and track vehicle donations.

Independent Contractor, 2001–2005

Designed, built, and tested three online scientific journals as part of the Plant Management Network using HTML, CSS, ASP, ColdFusion, and a SQL database. Coordinated efforts of the content team and the IS department to implement a new site password scheme.

Worked independently to create Internet forms for submission, administration, and searching a SQL database of plant science websites through a web interface. Picked appropriate technologies that led to finishing the project ahead of schedule.

Constructed a web form to record scientific data into a SQL database and upload an associated file using ASP and JavaScript. The form included a set of JavaScript controls to accommodate special characters and italics.

Tested and coded HTML and CSS for the new Benaroya Research Institute at Virginia Mason website. Addressed design issues in a high-pressure situation to meet launch deadline.

Built a web form for the September Project, an event held in libraries on September 11 to share ideas and stimulate discussion. The sign-up form was built with ASP, CSS, and HTML. Designed an administrative interface to allow nontechnical staff to search and modify speaker information collected.

Library Intern, King County Hazardous Waste Library, 2003–2004

Managed usability testing on the Local Hazardous Waste Management website. Planned and conducted a card-sorting exercise, producing a report on the results. Built several sections of the new website for the organization, using HTML, CSS, and ColdFusion. Served as a site tester and fixed problems reported by other site testers.

Website Manager, Scientific Societies, 2000–2001

Created, produced, and maintained the company's websites. Worked with multiple teams to gather requirements for new and ongoing projects. Scheduled and ran meetings involving coworkers and contractors to achieve project goals and meet deadlines. Designed sites and graphics to ensure usability for the variety of platforms and browsers employed by the worldwide scientific community. Worked both independently and in a team to redesign a site with more than 500 pages to use new technologies, improve organizational structure, and streamline maintenance. Established processes and procedures for site maintenance. Designed and constructed a new online plant science journal using DHTML, ASP, and SQL. Created an image search using ASP to query a SQL database.

Systems and Languages

- Database Applications: MS SQL Server, My SQL, Basic Oracle
- Programming Languages and Frameworks: ASP.NET (C# and VB.Net), JavaScript (Backbone, Knockout, HighMaps, jQuery), CSS, HTML, MSSQL Language, SQL Server Reporting Services, Basic PHP, Basic Java, Basic Python.
- Software Applications: Visual Studio.NET, SQL Server Management Studio, Sublime Text, Adobe Photoshop, MS Access, MS Excel, MS PowerPoint, MS Word, Visio.
- Version Control: Microsoft TFS, Git.
- Web Servers: MS IIS, Apache
- Website development and maintenance

Momodu Fofana

Director, Information Security

Social & Scientific Systems, Inc.

Dr. Fofana is an accomplished Information Security Director with over 18 years of work experience successfully initiating, planning, designing, developing, implementing, monitoring, managing, controlling, and closing out information security projects and audits, which facilitate operational security, promote organizational growth, and comply with Federal Information Security Management Act (FISMA), Federal Risk and Authorization Management Program (FedRAMP), Health Insurance Portability and Accountability Act (HIPAA) regulations, and contractual requirements. He has successfully managed information security programs for federal agencies and received several letters of recognition for turning around challenging projects and streamlining processes within the dynamic threat environment. Dr. Fofana excelled in successfully managing security engagements for The Department of Labor, The Centers for Medicare and Medicaid Services (CMS), The Department of Education, and the Federal Aviation Administration (FAA).

Education and Certifications

- PhD, Civil Engineering, University of Maryland College Park, 2010
- MSc, Systems Engineering, University of Maryland College Park, 2001
- BEng, Mechanical Engineering, University of Sierra Leone, 1992
- Project Management Professional
- Certified Information Systems Security Professional
- Cisco Certified Network Associate
- Microsoft Certified Professional
- Certified Network Administrator
- A+ Certified Technician

Experience

Director, Information Security, Social & Scientific Systems, Inc. (SSS), 2014–Present

Provides leadership for the SSS Information Security Group and manages the SSS Information Security Program. Representative tasks include the following:

- Met with the Executive Team and Group Vice Presidents within SSS to determine their current operational concerns, tactical and strategic goals and discuss the role that the Information Security Program would play to help them meet their operational, tactical, and strategic goals.
- Met with the Director of the Information Technology Services (ITS) and Team Leads to plan and develop the information audit and monitoring program for SSS.
- Developed the Information Security and Privacy Policies for SSS and established the Information Security Program. Ensured that the information security and privacy policies are compliant for the four countries (in three continents) where SSS operates.
- Developed a collaborative project management plan to help the Information Security and ITS groups meet their information security, privacy, audit monitoring, and IT operational goals. This ensured that the IT environment was properly secured, monitored controlled and audited.
- Ensure that the SSS Information Security and Privacy Policies are compliant with the Federal and State regulations/presidential directives, contractual requirements and information security, privacy and audit industry best practices and National Institute of Science and Technology (NIST) Guidelines.
- Provide guidance to the SSS President and Chief Operating Officer (COO) on all information security, privacy, and audit issues for the organization.
- Evaluated existing procedures and facilitate the update of procedures to ensure they are consistent with SSS Information Security and Privacy Policies.

- Participate in the annual SSS Strategic Board meeting and provide guidance for Information Security Program Strategic goals.
- ▣ Developed and managed the annual budget for the Information Security Program.
- Classified the NIST SP 800-53 Rev 4 Controls for the organization into common, inherited, hybrid and system specific controls.
- Prepared, developed, and presented an-hour training on “SSS Project Security”.
- Facilitated the penetration testing of the organizations infrastructure and major applications that are Internet facing.
- ▣ Facilitated the successful restore of a deleted virtual drive from the Secure Data Center (SDC).
- ▣ Facilitated the successful and timely migration of major applications to the SDC.
- ▣ Facilitated the security assessment and audit of the general support system and hosted major application and ensure that proper information security and privacy controls are implemented and document in the appropriate System Security Plan.
- Developed and maintained a project schedule for all information security tasks and their associated priority. This ensured the effective utilization of resources for the Information Security Program.
- ▣ Identified information security program risk and facilitated the implementation of solutions that mitigated risk to acceptable levels for the organization.
- Identified security and audit tools that facilitated and enabled the Information Security Program to meet its information security and privacy goals and objectives.
- Prepared and delivered the information security quarterly reports for the SSS Audit Committee. Prepare ad-hoc reports for the President and COO.
- Organized monthly brown bag lunch sessions for the Information Security and ITS groups to meet, socialize and discuss information security challenges affecting the industry and its risk potential to the organization. This also served as an information sharing session for the groups that resulted in overall staff improvement.
- ▣ Performed quarterly literature review and background research on information security, privacy and auditing to ensure I remain abreast with industry best practices for securing information and organizational assets. Write white papers on topics of interest to the Information Security Group.
- Under contract with Westat for the Medicare Contractor Provider Satisfaction Survey to construct sample frames and sample designs for Fiscal Intermediaries, Carriers, Rural Home Health Intermediaries and Durable Medical Equipment Contractors, provided SAS programming support to randomly sort data from STAR, UPIN and SADMERC files; determined a sample frame based on provider type; and generated SAS PROC UNIVARIATE output.

Project Manager, Radius Technology Group, 2012–2014

Managed a \$14.4M contract with the Department of Labor (DOL), providing information security services to the OCIO and ensured compliance with FISMA, FedRAMP, and HIPAA. Lead a team of five information security auditors. The project progressively received excellent past performance ratings from OCIO Federal Manager and Contract Technical Representative (COTR). Served as the Cyber Security Subject Matter Experts to the OCIO Information Security Officer (ISO) and the OCIO Information System Security Officer (ISSO).

Guided the interpretation of the DOL Computer Security Handbook (CSH) that is based on the National Institute of Science and Technology (NIST) Special Publication (SP) 800-53 and ensured the requirements are met or a plan of action and milestones (POAM) is developed for “Other than satisfied” security controls. Developed and facilitated the execution of corrective action plans for deficiency remediation. Established and maintained relationships with other service providers that include Lockheed Martin, Office of the Inspector General (OIG), KPMG, and other agencies to ensure timely deliverables.

Ensured timely delivery of security assessment reports (SAR) to the OCIO ISO and OCIO ISSO. Facilitated the prompt development of POAM for vulnerabilities that cannot be mitigated. The POAM are documented in the Department of Justice Cyber Security Assessment and Management (CSAM) tool for tracking and monitoring of vulnerabilities until they are mitigated. Performed quality control review of all project deliverables that included: memorandum of understandings/agreements, SAR and supporting evidence, updated to the DOL CSH, POAMs, audit evidence, impact analysis, incident response reports, configuration change management control requests, standard operating procedures, incident reports, log reports, etc.

Developed and delivered annual two hours Incident Response and Contingency Plan training to DOL agencies. Reviewed and updated the general support system (GSS) contingency plan. Prepared and timely delivered contractor's monthly reports and bi-weekly activity reports to the customer. Reviewed and approved team timesheets. Ensured the timely delivery of FISMA Quarterly reports. Ensured the timely completion of all role-based and incident response training for OCIO operations and security teams. Timely updated and tested the contingency plan with notification drill, tabletop, and tape restore. Performed impact analysis and vulnerability scans on proposed software and hardware prior to installing on the GSS.

Reviewed and made recommendations to the Change Control Board to approve or deny change control requests. Prepared and utilized a project management methodology to effectively monitor, control, and manage project deliverables. Reviewed and managed team member leave request to ensure that they do not negatively impact the project. Provided expert advice on information assurance and project management best practices to the OCIO ISOs. Reviewed RFPs and SOW for third party security assessment engagements.

Adjunct Professor in the Management Information System Department, Bowie State University, 2009–2011

Taught the following graduate level courses: Information Systems Project Management (INSS 775); Decision Support Systems and Business Intelligence (BUIS462).

Information Assurance Risk Manager, Perot Systems Government Services, 2009–2009

For a Department of Education contract to manage network security, developed a Microsoft Project Plan to manage the implementation of McAfee Foundstone vulnerability and penetration scanning of the Department of Education user workstations, Intel servers, messaging servers and Internet protocol telephony system. Performed quarterly Foundstone credential scans for all systems and distributed the filtered results to the appropriate stakeholders to mitigate the identified vulnerabilities.

Identified the stakeholders (systems owners, business owners and system administrators) for the systems and secured their concurrence on the most suitable schedule for performing of weekly, monthly and quarterly vulnerability and penetration tests for their systems. Managed the successful development and implementation of a POAM for mitigating risk to all DOE information technology assets. Assisted with the development of risk acceptance forms (RAFs) for risks the Department of Education intends to accept.

Developed and define Six-Sigma limits for monitoring of network intrusion detection systems. Provided support for the FISMA 2002 Act by ensuring the implementation of the NIST 800-53 Series guidelines. Developed, designed, automated and implemented the daily security reports and chaired the daily security meetings with the Department of Education Computer Security Officers. Developed, documented, and instituted the following standard operating procedures for: (1) Vulnerability Assessment and Risk Management (2) Audits, Data and Telephone Records request for the Office of the Inspector General (OIG) and the Department of Education.

Tracked and managed all requests for sensitive data, audits, and telephone records for the OIG and the Department of Education. Designed, developed, and implemented a Vulnerability Assessment database for tracking of vulnerabilities for the ED network. Chaired the Vulnerability Assessment and Risk Management bi-weekly meetings between PSGS Team Leads and ED Application Owners.

Technical Lead, Lockheed Martin, 2006–2009

Received the National Airspace Support Contract (NISC) Sport Award for excellence. Identified, interviewed, selected, recommended for hiring, trained, and led a team of eight engineers in performing a security certification and assessment of 34 Federal Aviation Administration (FAA) Aviation Safety (AVS) systems within a 3-month time line.

Developed, monitored, and managed a Microsoft Project Plan that ensured the successful security assessment of thirty-four systems in a month. Developed training materials, designed and implemented a database to support the Security Controls Application Package (SCAP) effort and monitored, managed and controlled the project using Microsoft Project, PERT and critical path analysis. Designed the Aviation Safety Knowledge Management Environment infrastructure and roadmap for the Aviation Safety line of business of the FAA.

Provided technical leadership in the management of the INA application server and other servers. Performed Security Annual Updates and SCAP (Security Certification and Accreditation Package) of twenty-one FAA systems and applications annually. This involved performing penetration testing and vulnerability assessment of the systems using Nessus Tenable, CI Security, and Microsoft Baseline Security Analyzer. Analyzed, assessed, and reported on the physical and logical access controls in place to protect FAA systems.

Built and administered a Lotus Domino Server and installed a CMIS application and databases that use the server for authentication and access control. Installed and configured Microsoft SQL 2005 and web servers for the CMIS application.

Relevant Publications

Dissertation: "e-Government Technical Security Controls for Information Assurance Contractors – A Relational Approach." University of Maryland, 2010.

Janet A. Pagán-Sutton

Project Director/Task 1 Lead

Dr. Sutton has more than 20 years of experience conducting health services and health policy research. Her research interests include Medicare reimbursement policy, the organization and delivery of post-acute services, access and organization of health care in rural communities, and quality of care. Dr. Sutton is highly skilled in the application of a wide range of quantitative and qualitative research methods, as well as in the use of claims and administrative databases to address leading health policy issues.

Education and Certifications

- PhD, Health Services, University of California Los Angeles, School of Public Health, 1993
- MSPH, Health Policy and Planning, University of California Los Angeles, School of Public Health, 1989
- BA, Biology and Sociology, Cornell University, College of Arts and Sciences, 1984

Experience

Senior Research Scientist, Social & Scientific Systems, Inc., 2008–Present

Research activities include the following:

- Key contributor to an evaluation of the Center for Medicare & Medicaid Innovation (CMMI) Accountable Care Organizations (ACO) initiative, under subcontract to L&M Policy Research. Along with SSS colleagues, led the construction of the ACO analytic file, performed baseline data analysis, conducted quarterly assessments (in-depth phone interviews) and site visits with ACOs, and provided input on overall evaluation design.
- Conducted a study for AHRQ using data from the Health Care Cost and Utilization Project (HCUP) State Inpatient Database—a hospital discharge database—to examine the relationship between Medicare Advantage market penetration and hospital costs.
- Using data from the State Medicaid program, led the development of measures to assess the quality of care rendered to New Jersey’s vulnerable population. Project was funded by the Nicholson Foundation and performed under subcontract to Discern Health.
- Under subcontract to L&M Policy Research LLC, examined profitability of Home Health Resource Groups and the beneficiary and agency characteristics associated with episode margins. Results were used by the Centers for Medicare and Medicaid Services (CMS) to refine the home health prospective payment system.
- Led a study for the Assistant Secretary for Planning and Evaluation (ASPE) that used data from the National Home Health Aide Survey and the National Home Health Survey to examine the relationship between agency and home health worker characteristics and quality of care.

National Opinion Research Center (NORC) Walsh, 2003–2007

Research activities included the following:

- Served as principal investigator on a study of access and use of health care services among racial and ethnic minorities with multiple sclerosis, conducted for the National Multiple Sclerosis Society. Conducted analyses and published an article comparing patterns of care among persons with multiple sclerosis who received care in an MS Comprehensive Care Center and those who were treated by a neurologist or other providers.
- Led an Office of Rural Health Policy funded study that examined rural/urban differences in patterns of post-acute placement in home health, skilled nursing facilities, and inpatient medical rehabilitation settings.

- Conducted a series of studies to determine the effect of home health prospective payment system reform on access and use of home-based therapeutic and rehabilitative services in rural communities.
- Served as project director on a study of “best practices” in Quality Improvement Organization (QIO)-rural hospital/critical access hospital (CAH) partnerships leading to significant progress in process improvement and advancement of organizational safety culture.
- Played key role on several projects for the Medicare Payment Advisory Commission (MedPAC), including a survey of imaging facilities, site visits to identify effective integrated healthcare systems, and a study of outcomes among Medicare beneficiaries with end-stage renal disease (ESRD).
- As principal investigator on an Assistant Secretary for Planning and Evaluation (ASPE)-funded study, developed alternative evaluation designs of the Centers for Medicare and Medicaid Services (CMS) QIO program.

Project HOPE Center for Health Affairs, 1999–2003

Research activities included the following:

- Served as principal investigator on a California HealthCare Foundation study that profiled the characteristics of persons who receive charity care services and the levels of charitable contributions provided by private hospitals.
- Completed a study for the Maryland Health Care Commission to determine whether residents insured through the small group market differ in terms of chronic conditions, illness burden, or use from those insured through the large group market.
- Conducted studies for Office of Rural Health Policy (ORHP) to assess the impact of Medicare home health payment reform on access to home-based ancillary services in rural communities and the impact of changes to the disproportionate share formula on the financial performance of rural hospitals.

United Mine Workers of America Health and Retirement Funds, 1998–1999

Research activities included the following:

- Evaluated the cost-effectiveness of care management programs, including a congestive heart failure disease management program and a geriatric care management program.
- Assessed the health and functional status of beneficiaries using the results of a mail-administered survey.

Project Director, National Rehabilitation Hospital Research Center, Medlantic Research Institute, 1994–1998

Research activities included the following:

- Project director for a National Institute on Disability and Rehabilitation Research (NIDRR)-funded study on risk adjustment for premium payment and outcomes for people with disabilities.
- Project director on a NIDRR-funded Research and Training Center (Medical Rehabilitation Services and Health Policy) project on outcomes in alternative medical rehabilitation settings.
- Project director for a study funded by the Office of the Civilian Health and Medical Program for the Uniformed Services (OCHAMPUS), which developed recommendations for the revision of the medical rehabilitation benefit using input from an expert panel of rehabilitation providers and a survey of payer practices.
- Conducted analyses to identify alternative prospective payment models for inpatient medical rehabilitation and evaluated the fiscal impact of these models on rehabilitation hospitals and units.

PacifiCare of California, 1989–1990; 1993–1994

Research activities included the following:

- Developed a model to predict subscribers' expenditures based on a health information survey administered prior to enrollment in a Medicare risk health maintenance organization (HMO).
- Used the SF-36 to evaluate the impact of a senior wellness program on physical and mental health status. Negotiated provider agreements between the HMO, hospitals, and medical groups. Formulated and implemented a strategy for reimbursing hospital-based physicians.

RAND, 1990–1994

Research activities included the following:

- Analyzed the effect of competition and payer leverage on physician participation and discounting in a preferred provider organization.
- Participated in studies that analyzed the implementation of State selective contracting legislation on provider costs, pricing, and practice patterns.

Culver-Palms Medical Group, 1987–1988

Activities included the following:

- Served as liaison between the medical group and contracting health plans.
- Administered weekly utilization review committees.

Relevant Publications

Wilhelm J, Bryant N, Sutton J, Stone R. "Predictors of Job Satisfaction and Intent to Leave among Home Health Workers: An Analysis of the National Home Health Aide Survey." Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation, January 2015.

<http://aspe.hhs.gov/report/predictors-job-satisfaction-and-intent-leave-among-home-health-workers-analysis-national-home-health-aide-survey>

Washington R, Sutton J. "Characteristics of Safety Net Hospitals, 2012": Statistical Brief. Healthcare Cost and Utilization Project (HCUP) Statistical Briefs [Internet]. Rockville (MD): Agency for Health Care Policy and Research (US); Forthcoming.

Stone R, Sutton J, Bryant N, Adams A, Squillace M. "The Home Health Workforce: A distinction between worker categories." *Home Health Care Services Quarterly* 2013; 32:1-16.

Sutton J, Friedman B. "Trends in Septicemia Hospitalizations and Readmissions in Selected HCUP States, 2005 and 2010": Statistical Brief #161. Healthcare Cost and Utilization Project (HCUP) Statistical Briefs [Internet]. Rockville (MD): Agency for Health Care Policy and Research (US); Feb-2013.

Adams A, Sutton J, Elixhauser A. "Emergency Department Visits and Hospitalizations Associated with Animal Injuries, 2009": Statistical Brief #134. Healthcare Cost and Utilization Project (HCUP) Statistical Briefs [Internet]. Rockville (MD): Agency for Health Care Policy and Research (US); May 2012.

Sutton J, Eichner J. "Experiences of critical access hospitals in the provision of emergency medical services." *The Nation's Health*. Shi L and Singh D(Eds.). Jones and Bartlett Learning, Sudbury, MA, 2011.

Sutton J, Ramos C, Lucado J. "U.S. Physician Assistant supply by state and county, in 2009." *J Am Acad Phys Assist* 2010; 23(9).

Sutton J and Eicher J. *Experiences of critical access hospitals in the provision of emergency medical services*. Walsh Center for Rural Health Policy Analysis Brief 2008; W(15).

Sutton J, Kennedy A. *How will elimination of hospital bad debt reimbursement affect rural PPS hospitals?* Walsh Center for Rural Health Policy Analysis Brief 2007; W(11).

Sutton J. "Outcomes in rural and urban home health agencies." *Home Health Care Mgt Practice* 2007; 19(3):196-202.

- Sutton J, Schur C, Feldman J, and Tyry T. "Do comprehensive care centers make a difference in the treatment of persons with MS?" *Int J MS Care* 2007; 9(3):104-110.
- Sutton J. "Outcomes in rural and urban home health agencies." *Home Health Care Mgt Practice* 2007; 19(3):196-202.
- Schoenman J, Sutton J, Love D, and Elixhauser A. "Understanding and enhancing the value of hospital administrative data." *Med Care Res Rev* 2007; 64(4):449-468.
- O'Day B, Killeen M, Sutton J, and Iezzoni L. "Primary care experiences of people with psychiatric disabilities: Barriers to care and potential solutions." *Psychiatr Rehabil J* 2005 Spring; 28(4):339-45.
- Sutton J and Stensland J. "Promoting accountability: Hospital charity care in California, Washington and Texas." *J Health Care Poor U* 2004; 15(2):237-250.
- Sutton J, Stensland J, Zhao L, and Cheng M. "Achieving equity in Medicare DSH payments to rural hospitals." *J Rural Health* 2002;18(4):494-502.
- Sutton J, Blanchfield B, and Milet M. "Profitability of Rural Hospitals in Texas: Implications for Access to Charity Care." *Texas J Rural Health* 2001; XIX(1):40-48.
- Sutton J and DeJong G. "Managed care and people with disabilities: Framing the issues." *Arch Phys Med Rehab* 1998; 79(10):1312-1316.
- Wheatley B, DeJong G, and Sutton J. "Consolidation in the inpatient medical rehabilitation industry." *Health Affairs* 1998; 17(3):209-215.
- DeJong G and Sutton J. "Managed care and catastrophic injury: The case of spinal cord injury." *Top Spinal Cord Inj* 1998; 3(4):1-16.
- Tepper S, Sutton J, Beatty P, and DeJong G. "Alternative definitions of disability: Relationship to health care expenditures." *Disabil Rehab* 1997; 19(12):556-558.
- DeJong G and Sutton J. "Rapid growth of post-acute care services leads policy makers to reconsider bundling Medicare post-acute services." *Outlook* 21997 Summer; 8-9.
- DeJong G and Sutton J. "FRGs: An idea whose time is past or an idea whose time is still to come." *Outlook* 2 1997 Summer;6-7, 9.
- Wheatley B, DeJong G, and Sutton J. "Managed care and the transformation of the medical rehabilitation industry." *Health Care Manage R* 1997; 22(3):25-39.
- Sutton J, DeJong G, Song H, and Wilkerson D. "The impact of a function-based payment model on the financial performance of acute inpatient medical rehabilitation providers: A simulation analysis." *Arch Phys Med Rehab* 1997 Dec; 78:1290-1297.
- Wheatley B, DeJong G, and Sutton J. "How managed care is transforming American health care: A survey of rehabilitation providers in leading markets." *Georgetown Pub Pol R* 1996; 1(2):135-147.
- DeJong G, Wheatley B, and Sutton J. "Medical rehabilitation undergoing major shakeup in advanced managed-care markets." *Managed Care Reporter* 2 1996 Feb; 138-141.
- DeJong G, Wheatley B, and Sutton J. "Medical rehabilitation undergoing major shakeup in advanced managed-care markets." *Eli Rehab Report* 1996; 3(2):3527-30, 3536. Reprinted from *Managed Care Reporter* 2 1996 Feb; 138-141.
- Sutton J, DeJong G, and Wilkerson D. "Function-based payment model for inpatient medical rehabilitation: An evaluation." *Arch Phys Med Rehab* 1996 July; 77:693-701.
- DeJong G and Sutton J. "Rehab 2000: The evolution of medical rehabilitation in American health care." In *Outcome Oriented Rehabilitation: Principles, Strategies, and Tools for Effective Program Management*. P. Kitchell Landrum, et al., (eds). Aspen Publishers, Inc., Gaithersburg, MD, 1995.

Aliberti E and Sutton J. "Improving outcomes reporting in a senior wellness program." In *Clinical Practice Improvement: A New Technology for Developing Cost-Effective Quality Health Care*. S. Horn and D. Hopkins, (eds.) Faulkner Gray, New York, 1994.

Sutton J and Aliberti E. "Characteristics of high cost older adults who are newly enrolled in an HMO." *Medical Interface* 1994; 7(7).

Professional Papers and Presentations

Contributor to the *2012 National Healthcare Quality Report*. U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, 2013

Contributor to the *2011 National Healthcare Disparities Report*. U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, 2012.

Contributor to the *2010 National Healthcare Quality Report*. U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, 2011.

Sutton J, Lucado J. *Findings from the American Academy of Physician Assistants 2009 Physician Assistant Census*. April 2010.

Sutton J, Lucado J, Ramos C. *An Overview of Research on the Physician Assistant Profession*. A presentation at the American Academy of Physician Assistants Research Summit, March 4, 2010.

Sutton, J. *Access to Physician Assistants in Rural Communities: What Can we Learn from AAPA's Census Survey*. A presentation to the Board of Directors of the American Academy of Physician Assistants. February 20, 2010.

Sutton J, Lucado, Ramos C. *Findings from the American Academy of Physician Assistants 2009 Annual Conference Survey: Trends in Employment, Preceptorships, Continuing Medical Education, and Perceptions of AAPA Products & Services*. December 2009.

Sutton J, Ramos C, Hayashi S, and Regenstein M. *Ambulatory Care Quality Improvement Initiatives in Aligning Forces for Quality Communities*. A report to the Robert Wood Johnson Foundation, 2009.

Sutton J, Silver L, Gupta J. *Achieving Success in QIO and Rural Hospital Partnerships*. A final report submitted to the Office of Rural Health Policy, February 2009.

Schoenman J, Sutton J. *Impact of Critical Access Hospital Conversion on Hospital Finances and Mix of Inpatient Services*. A final report submitted to the Office of Rural Health Policy. August, 2008.

Meit M, Briggs T, Kennedy A, Sutton J, and Feldman J. *Spontaneous Evacuation Following a Dirty Bomb or Pandemic Influenza: Highlights from a National Survey of Urban Residents' Intended Behavior*. Policy Analysis Brief, W Series, No. 12, November 2007.

Sutton J and Eichner J. *Experiences of Critical Access Hospitals in the Provision of Emergency Medical Services*. A draft final report submitted to the Office of Rural Health Policy, September 2007.

Sutton J, Mueller C, Kennedy A, and Hammer L. *How Will Elimination of Hospital Bad Debt Reimbursement Affect Rural PPS Hospitals?* A paper presentation at the National Rural Health Association Annual Meeting, Anchorage, Alaska, May 2007.

Schur C, Sutton J, Cerbone F, Harris K, and Gupta J. *Standardizing an Evaluation Methodology for Disease Management and Medical Management Program Financial Impact Assessment*. A final report submitted to the Disease Management Association of America, May 2006.

Sutton J and Berk M. *Survey of Imaging Centers: Use of MRI and CT Equipment in Five Markets*. A final report submitted to MedPAC, May 2006.

Sutton J. *Performance of Rural and Urban Home Health Agencies in Improving Patient Outcomes*. A final report submitted to the Office of Rural Health Policy, May 2006.

- NORC National Resource Center. *Evaluation of the Health Information Technology Portfolio*. A final report submitted to the Agency for Healthcare Research and Quality (AHRQ), November 2005.
- Sutton J and Schur C. *Spotlight: Asthma Could Be More Effectively Managed for Many Privately Insured Children in Maryland*. Maryland Health Care Commission, April 2005, October 2005.
- Schoenman J, Sutton J, and Zhao L. *Revisions to Medicare's Disproportionate Share Payment Policy to Incorporate Bad Debt and Charity Care*. A final report submitted to the Office of Rural Health Policy, September 2005.
- Sutton, J. *Utilization of Home Health Services among Rural Medicare Beneficiaries Before and After the PPS*. Final Report. August 2005.
- Schoenman J, Sutton J, Kintala S, Love D, and Maw R. *The Value of Hospital Discharge Databases*. A final report submitted to AHRQ under Contract Number 282-98-0024, May 2005.
- Schur C and Sutton J. *Prescription Drug Use and Expenditure: Trends Among Privately Insured Patients, 2003*. Maryland Health Care Commission, April 2005.
- Merrell K, Sutton J, Brunda N, and Goldman S. *Private and Public Health Care Purchasing Strategies: Findings From NORC Feasibility Study*. A final report submitted to MedPAC, November 30, 2005.
- Sutton J. *Home Health Payment Reform: Trends in the Supply of Rural Agencies and Availability of Home-based Skilled Services*. NORC Walsh Center for Rural Health Analysis Policy Analysis Brief, W Series, Number 6, March 2005.
- Schoenman J, Sutton J, Love D, and Maw R. *Hospital Discharge Databases: How Are They Used? How Can They Be Improved?* Annual Meeting of the Healthcare Cost and Utilization Project Partners. Gaithersburg, Maryland, March 2005.
- Sutton J. *Patterns of Post-Acute Utilization in Rural and Urban Communities: Home Health, Skilled Nursing, and Inpatient Medical Rehabilitation*. A final report submitted to the Federal Office of Rural Health Policy, March 2005.
- Schoenman J, Sutton J, Love D, and Maw R. *Uses and Value of Hospital Discharge Data*. Annual Meeting of the National Association of Health Data Organizations. Washington, D.C., December 2004.
- Mueller C, Mueller K, and Sutton J. *Rural Perspectives Regarding Regulation Implementing Titles I and II of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003*. A joint publication of the Walsh Center for Rural Health Analysis and the RUPRI Center for Rural Health Policy Analysis, August 9, 2004.
- Sutton J. *Access to Home Health Care in Rural Communities*. A presentation at the Joint National Rural Health Association and Office of Rural Health Policy Rural Post Acute Care Meeting, Washington, D.C., June 17, 2004.
- Sutton J. *Access to Primary Care and Quality of Care in Rural America*. A final report submitted to the Federal Office of Rural Health Policy, June 2004.
- Schoenman J and Sutton J. *Documenting the Value of Hospital Administrative Data*. Annual Meeting of the Healthcare Cost and Utilization Project Partners. Gaithersburg, Maryland, April 2004.
- Sutton J. *Rural Hospitals' Strategies for Achieving Compliance with HIPAA Privacy Requirements*. NORC Walsh Center for Rural Health Analysis Policy Analysis Brief, W Series No. 3, March 2004.
- Schoenman J and Sutton J. *Documenting the Value of Hospital Administrative Data*. Poster presentation at the Annual Meeting of the National Association of Health Data Organizations, Baltimore, Maryland, December 2003.
- Sutton J and Dunn T. *Strategies for Achieving Compliance with HIPAA Privacy Regulations: Case Studies of Rural Hospitals*. A final report submitted to the Federal Office of Rural Health Policy, April 24, 2003.

- Schur C and Sutton J. *Feasibility of Using Maryland Hospital Data to Study Health Care Disparities*. A final report submitted to the Maryland Health Care Commission, June 2002.
- Stensland J, Mueller CD, and Sutton J. *An Analysis of the Financial Conditions of Health Care Institutions in the Appalachian Region and their Economic Impacts*. A final report prepared for the Appalachian Regional Commission, December 2002.
- Sutton J, Franco S, Mueller C, Dunbar J, and Blanchfield B. *Rural Dimensions of Medicare Reimbursement for Inpatient and Outpatient Institutional and Physician Services*. A final report submitted to the Federal Office of Rural Health Policy, December 2002.
- Langwell K and Sutton J. *People with Disabilities on Tribal Lands: Education, Health, Rehabilitation, and Independent Living*. A report prepared for the National Council on Disabilities, September 2002.
- Stensland J, Sutton J, and Milet M. *Are Fundamental Changes to Medicare's Disproportionate Share Methodology Needed?* A final report submitted to the Federal Office of Rural Health Policy, August 2002.
- Sutton J, Milet M, Blanchfield B, and Silver L. *The Role of Private Hospitals in the California HealthCare Safety Net: A Comparison of Charitable Contributions Reported by For-Profit and Non-Profit Hospitals in 1998*. Project HOPE Center for Health Affairs Policy Analysis Brief, H Series 3(2), June 2002.
- Sutton, J. *The Role of Private Hospitals in the California Healthcare Safety Net*. A Poster presented at the Academy of Health Services Research Annual Meeting, Washington D.C., June 23, 2002.
- Sutton, J. *Quality Related Provisions in Health Plan Contracts*. A presentation at the Integrated Delivery System Research Network (IDSRN) Meeting, Rockville, Maryland, January 28, 2002.
- Sutton J, Blanchfield B, Milet M, and Silver L. *Hospital Charity Care Policies and the California Health Care Safety Net*. Project HOPE Center for Health Affairs Policy Analysis Brief, H Series 3(1), January 2002.
- Sutton, J. *The Impact of BIPA-mandated Changes to the Medicare Disproportionate Share Formula on Rural Hospitals' Financial Performance*. A presentation to the National Rural Health Association, Dallas, Texas, May 24, 2001.
- Sutton J. *What Role Do Private Hospitals Play in the California Health Care Safety Net?* A report submitted to the California HealthCare Foundation, September 2001.
- Sutton J. *Characteristics of Maryland Residents who Obtain Health Insurance from the Small and Large Group Markets*. A report submitted to the Maryland Health Care Commission (contract #DCT-98-5194), August 2001.
- Sutton J. *Quality Related Provisions in Health Plan Contracts*. A report submitted to AHRQ under Contract No. 290-00-0016, May 7, 2001.
- Project HOPE Walsh Center for Rural Health Analysis. *Rural Quality of Care: Issues and Challenges*. A report submitted to MedPAC, March 2, 2001.
- Project HOPE Walsh Center for Rural Health Analysis. *Is the Rural Safety Net at Risk? Analysis of Charity Care Provided by Rural Hospitals in Five States*. Project HOPE Walsh Center for Rural Health Analysis Policy Brief, March 2001.
- Sutton J, Blanchfield B. *Will the Outpatient Prospective Payment System Increase the Number of Distressed Rural Hospitals in Iowa, Texas, Washington, and West Virginia?* A report submitted to the Federal Office of Rural Health Policy, January 2001.
- Project HOPE Center for Health Affairs. *Selected Health Statistics for Medicare Recipients and Privately Insured Maryland Residents: County-Level Estimates from the 1998 Medical Care Database*. A report submitted to the Maryland Health Care Commission under Contract No. DCT-98-5194, December 2000. Presented to members of the Commission on January 11, 2001, in Baltimore, Maryland.

Project HOPE Center for Health Affairs. *Assessment of the Maryland Medical Care Private Payer Database: The Quality of Data Reported*. A report submitted to the Maryland Health Care Commission under Contract No. DCT-98-5194, August 2000. Presented to Members of the Commission on August 18, 2001, in Baltimore, Maryland.

Project HOPE Center for Health Affairs. *A Profile of Clinical Preventive Services Provided to Maryland Medicare Beneficiaries with Diabetes: Focus on HCA1c and Eye Exams*. A report submitted to the Maryland Health Care Commission under Contract No. DCT-98-5194, April 7, 2000.

Project HOPE Walsh Center. *Rural and Urban Patterns of Home Health Use: Implications for Access Under the Interim Payment System*. Project HOPE Walsh Center for Rural Health Analysis Policy Brief, March 2000.

Sutton J. *Medicare Payment Reform and Implications for Access to Home-based Ancillary Services in Rural Communities*. A presentation to the National Rural Health Association, New Orleans, Louisiana, May 25, 2000.

Sutton J, Blanchfield B, and Milet M. *Is the Rural Safety Net at Risk? Analyses of Charity and Uncompensated Care Provided by Rural Hospitals in Washington, West Virginia, Texas, Iowa, and Vermont*. A report submitted to the Federal Office of Rural Health Policy, Health Resources and Services Administration under Contract No. U1CCS00015-04, March 2000.

Characteristics of Rural Home Health Users and Implications for Payment Reform. A report submitted to the Federal Office of Rural Health Policy, Health Resources and Services Administration under Contract No. U1CCS00015-04), March 2000.

Sutton J. *Linking Medical Rehabilitation Payment to Outcomes*. A presentation at the Rehab 2000 conference, Arlington, Virginia, September 26, 1997.

Sutton J. *Health Care Expenditures Among Working Age People with Disabilities: Patterns and Predictors*. A poster presentation at the annual meeting of the Association for Health Services Research, Atlanta, Georgia, June 1997.

Sutton J. *Strategic Responses to Managed Care*. A presentation at the second annual joint meeting of the American Rehabilitation Association and the American Hospital Association Section on Rehabilitation, Tampa, Florida, November 12, 1996.

Sutton J. *Factors Shaping the Levels of Research Rigor in Medical Rehabilitation Outcomes Research*. A presentation made at the annual meeting of the American Congress of Rehabilitation Medicine, Chicago, Illinois, October 13, 1996.

Sutton J. *The State-of-the-Science in Medical Rehabilitation*. A report submitted to the Office of the Civilian Health and Medical Program of the Uniformed Services under Contract No. MDA906-91-D-0009, under subcontract to Birch and Davis Associates, Inc., March 11, 1996.

NRH Research Center. *Trends in the Organization and Delivery of Medical Rehabilitation and Third-Party Coverage of Medical Rehabilitation: Supplementary Recommendations to the State-of-the-Science Report*. A white paper submitted to the Office of the Civilian Health and Medical Program of the Uniformed Services under Contract No. MDA906-91-D-0009, under subcontract to Birch and Davis Associates, Inc., April 26, 1996.

Sutton J. *The Development of Provider Sponsored Networks as a Strategic Response to Managed Care*. A presentation and panel discussion at the National Association of Rehabilitation Agencies Spring Conference, Washington, D.C., May 11, 1996.

Sutton J. *Evaluation of a Function Based Payment Model for Inpatient Medical Rehabilitation*. A paper presented at the first annual joint meeting of the American Rehabilitation Association and the American Hospital Association Section on Rehabilitation, Phoenix, Arizona, October 31, 1995.

Sutton J. *Facility Characteristics Associated with Higher Costs for Inpatient Medical Rehabilitation: Implications for the Development of a Payment Model.* A paper presented at the first annual joint meeting of the American Rehabilitation Association and the American Hospital Association Section on Rehabilitation, Phoenix, Arizona, October 31, 1995.

Sutton J. *Characteristics of Rehabilitation Facilities Who are Economic 'Winners' and Economic 'Losers' Under an FIM-FRG Prospective Payment Model.* A paper presented at the first annual joint meeting of the American Rehabilitation Association and the American Hospital Association Section on Rehabilitation, Phoenix, Arizona, October 31, 1995.

Sutton J. *Alternative Prospective Payment Models for Inpatient Medical Rehabilitation.* A poster presented at the 12th annual meeting of the Association for Health Services Research and the Foundation for Health Services Research, Chicago, Illinois, June 5, 1995.

Sutton J. *Physician Responses to Competition in California: A Study of Participation and Price Concessions in a Preferred Provider Organization.* Unpublished dissertation, University of California Los Angeles, 1993.

Shiquan Hu

Senior Programmer Analyst

Social & Scientific Systems, Inc.

Mr. Hu has more than 10 years of experience in developing and supporting enterprise software products. He is proficient with object-oriented design and development using C#, VB.NET, ASP.NET, and COM. Mr. Hu has a strong background in relational database management systems (RDBMS) such as MS SQL Server, Oracle, and Sybase, as well as database programming. He has industrial experience in the full life-cycle development process, including requirement analysis, development, debugging, testing, support, and maintenance. He has a strong background in developing web services, code management and version control applications, and commercial metadata management software. Mr. Hu has experience validating user requirements, conducting unit testing, and collaborating with team members.

Education and Certifications

- MS, Computer Sciences, University of North Carolina at Charlotte, 1999
- MS, Biology, Wake Forest University, 1998
- BS, Biology, Hangzhou University, China, 1985

Experience

Senior Programmer Analyst, Social & Scientific Systems, Inc., 2006–Present

Serves as team member for requirements analysis, functionality design, and development of web applications to collect, store, and deploy research and administrative data. Tasks include the following:

- Serves as team member to develop Health Indicators Warehouse (<http://www.healthindicators.gov/>), which provides one repository for national, state, and community health indicators
- Serves as team member to develop WVHCA Hospital Data Submission System. Have worked on collecting, processing, maintaining, and assuring quality of the hospital data and created SSRS reports.
- Serves as team member to develop Administration on Aging: Aging Integrated Database (AGID), an on-line query system based on ACL-related data files and surveys, and includes population characteristics from the Census Bureau for comparison purposes.
- Upgraded GTRP web application, which helps the NHLBI Gene Therapy Resource Program (GTRP) to facilitate the translation of gene therapy research into clinical interventions.
- Serves as team member to develop MedPac application, a task management system.
- Serves as team member to develop Community Abstract Mentoring Program (CAMP), an online mentoring system that provides abstract writing assistance for the junior researcher

Software Engineer, Computer Associates International, Inc. (CA), 1999–2005

Served as a team member for object-oriented analyzing, designing, and developing new version (release 7) of CA's AllFusion Harvest Change Manager (Harvest CM), a multimillion-dollar revenue product, which is a multi-tier client/server enterprise product for change management written in VC++ (JSP for web application). Provided analysis, requirement gathering, and validation. Used C++, C#, and COM to develop new version control integration (VCI) and upgraded the existing ones (three-member team). Analyzed and performed the Harvest CM development environment upgrade from VC++ 6.0 to C++.Net 2003 and the open source standard library STLPort from version 3.01 to 4.6.2. Supported the existing Harvest CM versions. Used C++, Java, and JSP to debug application; validated the bugs reported by the customers; and fixed, tested, and documented the fixes. Reviewed the codes written by coworkers. Built the test cases for Harvest CM VCI plug-in support for JBuilder 2005 IDE. Designed and developed the Windows installation procedures for the Harvest CM with InstallShield 9.0. Used C++ to develop Installer

external API functions. Installed databases (Oracle 9i, 10g) and created and administered the Harvest CM repositories on these databases.

As a software developer, acted as a team member and code reviewer for developing and supporting CA's AllFusion Repository for Distribution System (CAARDS), a multi-tier enterprise metadata management software written in VC++ (ASP for web application). Designed, developed, tested, and delivered the new features for CAARDS to scan the Oracle 9i database in time. Worked with Oracle technical supporters to go through the Oracle system tables to get the required metadata information from Oracle databases. Used C++ to parse the SQL statements retrieved from the system tables. Analyzed and extended the metadata models for a variety of data sources. Updated the metadata reuse rules. Used the RogueWave DBTools to access repository hosting databases. Analyzed, upgraded, and validated CAARDS to support the repository to be hosted either in Oracle 9i, Sybase 12, or MS SQL Server 2000 database. Analyzed, designed, developed, and supported the CAARDS web application. Used ASP and Microsoft Data Access Component to develop and support CAARDS web interface running on IIS web server. Served as a team member and code reviewer in supporting CAARDS. Used C++, VB, COM, RogueWave DBTools, and STL to debug application, validate the bugs reported by customers, fix the bugs, and test and document the fixes. Reviewed the codes written by coworkers. Helped customers administer the databases hosting CAARDS repositories (teamwork). Installed the databases (Oracle 8i, 9i, MS SQL Server 7, and Sybase 11.9, 12) and created and administered CAARDS repositories on these databases.

Systems and Languages

C#, VB.NET, ASP.NET (2003, 2005, 2008, and 2010), ASP.NET MVC, MFC/Visual C++, COM+, SQL, PL/SQL, VB; MS Windows 98, NT, 2000, XP, Vista, UNIX; MS SQL Server (7.0, 2000, 2005, and 2008), Oracle (8i, 9i, 10g), Sybase (11.9 and 12)

Client-Server, Object-Oriented Programming, Web Development, Distributed Processing, Graphical User Interface, Database Development, Metadata Modeling, Metadata ETL Tools, Version Control, Source Code Control, IIS

Po-Lun Chou

Programmer

Social & Scientific Systems, Inc.

Mr. Chou has more than 14 years of experience in SAS programming. At SSS, he specializes in data management, report generation, quality control systems, and web-based systems and applications for a variety of clients, including the Medicare Payment Advisory Commission (MedPAC), the Maryland Health Care Commission (MHCC), the West Virginia Health Care Authority (WVHCA), the National Institute on Aging (NIA), CGI, and the American Nurses Credentialing Center (ANCC).

Education and Certifications

- MS, Applied and Engineering Statistics, George Mason University, 1997
- BS, Statistics, National Cheng-Kung University, 1992

Experience

Programmer, Social & Scientific Systems, Inc., 2002–Present

Under the direction of the MedPAC task manager, provides programming support using Medicare data files under MedPAC project tasks. Also works on the tasks per clients' requests.

For the MHCC project, provides programming, quality control, and documentation support activities, including:

- Provides descriptive statistical reporting based on the MD annual databases; the results are part of the information which are used to evaluate the health care policy.
- Provides analytical programming support for the annual MHCC Practitioner Pricing Trends Report and State Health Expenditure Accounts report.
- Supports the production of the annual Maryland Private Payer Medical Care Professional, Provider, Pharmacy, Institutional, Dental, and Medicare databases.
- Develops quality control systems as required to ensure data integrity. Tasks include data downloading, data verification, program modification, database development, descriptive statistical reporting, data backup and archiving, and database documentation.

For the WVHCA project, provides programming and documentation support activities, including:

- Helps to modify programs to resolve problems or errors if there are any on the initial run of the weekly routine data submission.
- Help to provide one report table to WVHCA based on the weekly submitted data files.

Additional projects and responsibilities include the following:

- Provides programming support and quality control for ANCC project. Tasks include program creation, data verification, statistical analysis, and database creation. Provides analysis results, which are used to adjust the data collection method. Translates existing SPSS codes into SAS codes.
- Provides programming support for several NIA projects. Tasks involve creating and modifying programs, ensuring quality control for data sets based on computer-assisted diagnostic interviews, preparing error reports, updating final data sets based on client comments, and writing memoranda for each data set.
- Provided programming and quality control support for the West Virginia Health Care Authority project, including creating programs to fix raw data problems and modified routine programs to update source data files, creating and modifying production programs to generate quarterly and final adjudication reports from the WV hospital databases, and performing quality control checks to ensure database and report integrity. Responsible for project backup.

ADP/Integrated Medical Solutions, 1998–2001

Used SAS programs to perform all phases of data collection, data analysis, data comparison, report generation, and data conversion. Implemented data validity checks to ensure data quality. Wrote specifications for data key entry or table layout. Resolved data problems with the data providers. Prepared data processing documents for a Workers' Compensation Fee database. Used Oracle scripts for ICE software by loading data into an Oracle database. Performed functional testing for IMPACT software.

PharMark Corporation, 1997–1998

Used SAS programs to collect Medicaid data, solve data problems, analyze results, and explore the relationships between variables for a New York State long-term care project and the National Health and Nutrition Examination Survey III and hypertension project.

Systems and Languages

- * Operating Systems: Unix
- ▣ Programming Languages: SAS, HTML, MatLab, SQL Language
- ▣ Software Applications: Macromedia Dreamweaver, MS Access, MS FrontPage, Watchfire, JAWS

Relevant Publications

Practitioner Utilization: Trends Among Privately Insured Patients, 2005–2006. Maryland Health Care Commission, May 2008.

Practitioner Utilization: Trends Among Privately Insured Patients, 2004–2005, Maryland Health Care Commission, May 2007.

Practitioner Utilization: Trends Among Privately Insured Patients, 2003–2004. Maryland Health Care Commission, Apr 2006.

State Health Care Expenditures: Experience from 2004. Maryland Health Care Commission, Jan 2006.

Practitioner Utilization: Trends among Privately Insured Patients, 2002–2003. Maryland Health Care Commission, Mar 2005.

State Health Care Expenditures: Experience from 2003. Maryland Health Care Commission, Jan 2005.

Practitioner Utilization: Trends for Patients in Traditional Medicare, 2001–2002. Maryland Health Care Commission, Mar 2004.

State Health Care Expenditures: Experience from 2002. Maryland Health Care Commission, Jan 2004.

Practitioner Utilization: Trends for Patients in Traditional Medicare, 2000–2001. Maryland Health Care Commission, Mar 2003.

State Health Care Expenditures: Experience from 2001. Maryland Health Care Commission, Jan 2003.

Practitioner Utilization: Trends Among Privately Insured Patients, 1999–2000. Maryland Health Care Commission, Mar 2002.

Arlene Amodeo

Senior Programmer

Social & Scientific Systems, Inc.

Ms. Amodeo has more than 9 years of experience in quantitative data analysis, which includes 4 years of experience as a dedicated SAS programmer and 5 years of experience as a research analyst in the fields of educational testing and health care policy research. Her skills in data management and analysis are rooted in her contributions to the field testing of new educational assessments that required her to design unique standard operating procedures and customized SAS programs. Through this experience, she became advanced proficient in SAS programming (including PROC SQL and macros) and pursued additional challenges as a dedicated SAS Programmer in the field of educational testing and teacher evaluation. She applies and expands her analytical and programming skills as a Programmer in the field of health care policy research, with a focus on utilizing technical knowledge of SAS and SQL to assess and improve upon the quality of claims and enrollment data; to prepare data for use by the research community; and to create analytic files and generate statistics to support health care cost and utilization analyses.

Education and Certifications

- MS, Statistics, Rutgers – The State University of New Jersey, 2012
- BS, Statistics and Economics, University of Pittsburgh, 2007

Experience

Senior Programmer, Social & Scientific Systems, Inc., 2015–Present

Maryland Health Care Commission (MHCC): Data Management and Analytic Support for the Maryland Medical Care Data Base (MCDB)

- Analyzes statistical reports of electronic submissions of health insurance claims and enrollment information collected by a web-based system (“Portal”) to assess the submissions’ adherence to MHCC reporting requirements and quality standards.
- Liaises with health insurance companies (“payors”) to:
 - Verify trends in payment and service utilization demonstrated in their Portal submissions, and instruct payors to modify submissions as necessary to reflect actual business conducted;
 - Provide information to payors to assist them in rectifying inconsistencies in the data and deviations from requirements;
 - Encourage payors to correct data issues and improve comprehensiveness of data provided (beyond basic requirement) in a timely manner.
- Uses SAS and Microsoft SQL Server to create custom reports of data trends and characteristics to assess quality of data (e.g. consistency between data elements, correct usage of encrypted identifiers across time, reasonableness of trends, adherence to sample definitions).
- Crafts specifications for statistical reports generated by the system; harnesses in-house and accumulating knowledge of data submission issues to recommend new data checks in the Portal; assists in prioritizing and scheduling the development of new reports and of modifications, bug fixes, and improvements to the system.
- For each payor, documents requirement variances, market information, and information regarding claims platforms to calibrate and focus reviews of submissions by other staff.
- Verifies the accuracy of statistics shown the Portal.

On an as-needed basis for various contracts

- Creates, modifies, and refines SAS programs to execute analyses of health care payment policy, health care quality, and access to health care.

- Critically reviews specifications provided by external clients for clarity, completeness, and sound utilization of data sources.
- Prepares analytic data files for release to the research community according to specifications provided by clients; makes recommendations to data stewards regarding coding systems for individual variables and data clean-up algorithms to maximize usability of files by the customer; generates information for inclusion in documentation and codebooks.
- Validates and verifies results of data processing and statistical analyses.

SAS Analyst, American Health Care Association, 2014–2015

Utilized SAS programming skills to manipulate, manage, and analyze data. Standardized health care claims and other data across varying file layouts and executed analyses of Medicare claims and cost report data. Summarized findings of analyses for both internal review and delivery to association members and affiliates. Ensured the quality of the association’s pivotal web-based product by contributing to the methodological design of reports, verifying report calculations, and assisting in the crafting of publication materials to support users. Managed acquisition of confidential data procured from the Centers for Medicare & Medicaid Services.

SAS Programmer/Senior Data Analyst, American Institutes for Research, 2012–2014

Integrated programming skills and statistical knowledge to prepare data for statistical modeling and compile data deliverables to clients, such as state Departments of Education. Ensured utmost accuracy and quality of data by matching computational results with colleagues working independently in a production/replication (i.e. double-programming) workflow. Critically analyzed data processing rules provided by the Technical Team to ensure that specified calculations were valid for all empirical data utilized.

Research Associate, Law School Admission Council, 2007–2012

Created and managed SAS programs, codebooks, databases, and standard operating procedures for field tests of educational assessments. Crafted tables, graphs, and written summaries as deliverable products to describe statistical outcomes of assessments and inform future decisions regarding the statistical designs of assessments. Updated cyclical analyses of test-taker behavior and testing outcomes by analyzing and describing trends for publication of technical reports for public consumption.

Relevant Publications

Amodeo, Marcus, Thornton, and Pashley. “Predictive Validity of Accommodated LSAT Scores for the 2002–2006 Entering Law School Classes (TR 09-01)” Law School Admission Council. 2009.

Salvador Djeukeng

Software Developer

Social & Scientific Systems, Inc.

- Software/Web Applications Developer with 8 years of experience, primarily working with Microsoft .Net Framework, including ASP.Net (MVC, Web Form, and Web API), C#, VB.Net, ADO.NET, Entity Framework, LINQ, and Web and database development technologies
- Great experience working at all the layers of an application (Model, Business, Service, and presentation layers) and also as a Backend Developer in secondary role, mainly with SQL Server (T-SQL, SSIS for data integration). I also have good experience with frontend (client-side) development, I'm also proficient with HTML, CSS, AJAX, Javascript, JSON and XML, which constitute the core of most client-side development that popular and used today for cross browsing and responsive design (Bookstrap, JQuery, CSS3, etc.)
- Expertise with ASP.Net MVC, Entity Framework and SQL-Server T-SQL
- Experience creating RESTful services using Web API 2 and WCF
- Experience in building distributed applications using Windows Communication Foundation (WCF) Services and implementing SOAP and REST architectures
- Experience MS Test and Moq framework for automated unit testing
- Expertise in data-driven web application development using ASP.NET 2.0/3.5/4.0/4.5, C#, VB.NET, Visual Studio.NET, ADO.NET, MVC, Web Forms, LINQ, IIS, AJAX, HTML, CSS, Bootstrap, JQuery, JSON, XML,
- Expertise in troubleshooting and debugging applications using all versions of Visual Studio IDE (Very proficient in it – one of my greatest strengths)
- Experience with version and source control tools, including Team Foundation Server (TFS), Git, and MS Visual Source Safe
- Extensive experience with SQL Server T-SQL and database objects such as stored procedures, functions, schema, views, triggers in addition to table objects and indexes.
- Good Experience with DB2 Database
- Experience with data integration and BI tools such as SSIS and SSRS
- Experience in utilizing Microsoft SharePoint
- Excellent knowledge JavaScript data binding frameworks including AngularJS, KnockoutJS
- Excellent knowledge of UML modeling Use-case diagrams, activity diagrams, sequence diagrams, collaboration diagrams, class diagrams using, use-case descriptions and other analysis and design tools
- Expert Knowledge of SQL and strong knowledge of Transact-SQL (T-SQL)
- Experience with SQL Server SSIS and SSRS tools for integrating data from multiple diverse sources and for rapidly creating elegant and interactive reports with tools for manipulating and exporting report data
- Experience with Database and query analyzer tools such as IBM DB2 Connect, IBM Data Studio, MS SQL Server, MS SQL Server Management Studio, MySQL Server, and Microsoft Access
- Experience with Windows Event Viewer and Windows Logs, useful for finding root cause of errors in applications and for troubleshooting them.
- Good understanding of Systems Development Life Cycle (SDLC) Phases and have been a part of all 5 phases of SDLC: Requirements Analysis, Design, Coding, Testing, and Maintenance
- Experience with Agile and Waterfall methodologies
- Fast learner and ability to quickly adapt to any changing situation or environment. Strong leadership qualities
- Very dependable and goal oriented

Education and Certifications

- Master of Science in Information Systems, Marshall University, West Virginia
- Bachelor of Science in Computer & Information Technology, Marshall University, WV

Experience

Software Developer, Social and Scientific Systems, 01/2015–Present

- Help implement, build, test, deploy and maintain the Corporate Study Management Systems (CSMS) designed to support NIC, NIH, NCS researchers and study staff with their research studies and to make easy and efficient for them to set up their participants, and track the different stages and statuses of their studies by phases, events, activities. One of my recent tasks included analyzing, designing, and integrating the Health Care Provider (HCP) information for each of the participant with the application. The features for this functionality include providing UI for adding a new HCP record, UI for modifying an existing one and UI for showing a detail report of a single study participant's HCP and also a UI for showing a report of the HCPs for all the participant in the systems in list view like report.
- For the CSMS application, I also leveraged SQL Server Reporting and BI development tools for creating elegant aggregate reports, their corresponding detail reports. The tool allows the system to quickly generated reports that can be easily and quickly charted or exported to other forms, such as Excel, PDF, etc.
- Contribute to the development of web-based application designed to make accessible and present study data about participants to researchers and other study staff. One of my main responsibilities consists of integrating study data, processed and generated by SAS teams, from Excel to a SQL Server database, which serves as a backend data store for the web application that serves as the portal and user interface for NIH and NCS researchers who need access to the data
- Contributed to the conversion of a public health research-based application to an Single Page Application (SPA) for better performance and better data presentation. The new application consisted of ASP.Net Web API RESTful services, SQL Server, and Backbone to build the frontend client side.
- Primary focus consisted of mainly on the model, service, business data layers, creating web services using Web API
- Created and maintained the application data models that mapped to the backend database table fields and that I also used, through proper manipulation in the controllers to drive the user interface for presenting the data in a report like view, and also user interfaces for adding new records or for modifying existing ones.
- Implemented and utilized defined business rules
- Used repository and dependency injection patterns to implement data access and keep objects loosely coupled, which allowed us to address the separation of concerns, consisting of clearly separating the different layers of the application (data, business, service, UI) in a way that any changes in any of the layers have no or just a minimal impact on the other layers and so that each layer or each component of each layer can be separately tested as in a unit test.
- Implement and made use of automated unit testing through Microsoft Test and the Moq framework to ensure the quality of the logic and code before deployment
- Leveraged the Moq Framework, which works along with MS Test, for mocking Entity Framework objects, including classes, methods, etc.
- Leveraged LINQ for writing queries at the application level
- Managed data in the SQL Server backend using T-SQL within SSMS

- Worked in team setting ranging from three members to more than ten members at time, with some team members and managers located across the country. Meetings and collaborations were conducted in person as well as through a combination of web meeting and phone conference tools
- Worked with QA team to solve bugs and to make sure we deploy quality code with no issues in production
- We follow the agile methodology with two-week sprints and daily scrum meetings for reporting progress status
- Product backlog, user stories, sprint backlog, tasks and progress status were all managed through TFS and TFS Web Portal

Environment: ASP.NET 4.5 C#, Visual Studio 20013, Team Foundation Server (TFS), SQL Server database objects and scripts development, T-SQL, SSMS, SQL Server Reporting Services (SSRS), ADO.Net, Entity Framework LINQ, SRRS, Data integration with SQL Server , Web API 2, MVC5, DI (Dependency Injection) and Unity Container, MS Test, JQuery AJAX, CSS, JavaScript, XML, JSON, Nuget Package Manager, Typescript, SAASS

.Net Developer, Xerox Business Services/Cognizant, 12/2013–11/2014

- Develop and maintain Health Insurance Applications
- Products consist of a database-driven web applications that allow Individuals, families, employees and other kind of groups to shop for and compare health insurance plans they are eligible for, select and enroll into desired plans within the four Product Lines (Medical, Dental, Medicaid, and CHIP), and finally buy their health insurance policy
- The client side and front end UI are based on ASP.NET MVC 4.0, C#, Entity Framework, AJAX, JQuery, Razor Engine, Knockout JS, HTML5, CSS3, Bootstrap,
- The backend is based on SQL Server 2012 and T-SQL
- Consume third parties web services, such as Quotit web service, used to determine member eligibility and the health plans they qualify for, Melissa web service, for address verification.
- Analyzed and implemented fix for Premium capped Dependents in the code. A subscriber with more than three dependents under the age of 26 should not be charged a premium Amount for all the dependents after the third one. Also created data fix scripts to correct the Premium and re-allocate elected or mac APTC (Advanced Premium Tax Credit) among all the members of families that qualify for premium capping
- Responsibilities included working in all tiers of the application, including the presentation layer (client side), business logic layer (BLL), and data access layer (DAC). Perform a great deal of backend task (TFS Work Item) using T-SQL and SQL Server Management Studio
- Extensively utilize T-SQL and SQL to create and alter stored procedures for implementing enhancements and new features, create ad hoc scripts for resolving reported issues. Scripts included backend termination of a customer enrollment to a Product Line (Medical, Dental, Medicaid, CHIP); Cleaning customers' data in the database so the billing process could generate their invoices and the EDI process could pick up their data and send the EDI files (Enrollments and Payment/Financial Information) to their corresponding carriers. Helped lead the efforts with writing scripts for data fixes and enjoyed doing that
- Help implement Qualifying Life Event (QLE) features, which are enhancements and new features designed to allow customers, (and CSR and Brokers on behalf of customers) to add members to their policy, drop members from their policy, or request a partial termination of one of the products in their policy during the time the policy is active.
- Analyze front end code including client side (Razor Syntax, HTML5, JQuery, AJAX based code) and business logic code to determine root cause of bugs and defects and fix them. Utilize Visual Studio IDE debugging tools, Fiddle, Firefox Firebug, Google Chrome Developer tool for achieving that.

- Collaborated and work well in a large team made of Quality Analysts, Developers, Leads, Managers, with team members located in multiple locations, both onshore and offshore
- Went the extra mile whenever needed to get the work done. Work during some weekends, work from home at night to follow execution of my scripts by the Release team or to support code deployment, or to work with the offshore team on some tasks
- Learn and adapt quickly to fast changing environments, including technology, techniques, tricks, etc.

Environment: ASP.NET 4.5/4.5 C#, Visual Studio 20012, Team Foundation Server 2010 (TFS), MS SQL Server 20012 R2, SQL Server Management Studio (SSMS), ADO.NET, LINQ, ORM with Entity Framework, T-SQL, SQL Client, WCF, Web API, ASP.NET MVC4, DI (Dependency Injection), XHTML, JQuery UI and JQuery Validation, CSS, XHTML, JavaScript, Knockout JS, XML

Senior .Net Applications Developer, Philadelphia Insurance Company/TMNAS, 07/2012–11/2013

- Triangle Builder – A loss analysis Report Web ASP.NET web-based application
- New Business Pricing Tool – ASP.NET MVC web-based application
- Automation of Property Checks Via Excel Automation (Creating stored procedures and calling them from and displaying results on Excel
- Claim Expenses Report – a web based tool
- Work as a member of the Actuarial Development and Support (ADS) Team of the Company
- Responsible for implementing Functional Requirements and creating source code for the Triangle Report Builder, New Business Pricing Tool, Claim Expenses Numbers Web Applications
- Responsible for building the UI, Data Access Logic and Business Logic
- Create and alter stored procedure and table objects as needed
- Responsible for performing unit testing
- Responsible for Deploying new applications and application changes in QA and Production environments
- Responsible for determining root cause of issues or bugs and for fixing them on existing systems
- Responsible for setting up the development environment for all the Developers, including IIS7.5, Visual Studio 2008 and 2010, and connection to the source control server TFS 10.0
- Use ASP.NET User Controls for creating all common controls once and in once file and just making a reference in the other nine pages where they were needed.
- Extensively utilize List View and Grid View data controls and data binding features
- Implement applications by separating, as much as possible, the presentation layer (UI) from the business layer and from the Data tiers
- Leverage the Object Relational Mapping via Entity Framework for mapping entity sets to classes
- Utilize LINQ to query and manage data in data stores
- Extensively used ASP.NET Caching
- Train in-house Developers so they have an understanding of the server and development environments and the source code of the application so they will be able to maintain, enhance, and add new functionality to the application as needed.
- Maintain, enhance, and/or create database objects, including adding new fields to tables, creating and modifying stored procedures
- Leverage Enterprise Library classes for logging exceptions and for managing access to data in the data store
- Manage IIS 7.5 – Setup, Application Pool and Virtual Directory configurations
- Leverage Windows Event Viewer/Windows Logs for finding the causes of some errors
- Responsible for training developers and coordinating knowledge transfer
- Also help with data integration and the creation of packages using SSIS
- Automate Excel report creations and formatting using VBA for the Underwriter Team

Environment: ASP.NET 3.5/4.0, C#, Visual Studio 2010/2008, Team Foundation Server 2010 (TFS), MS SQL Server 2008 R2, SQL Server Management Studio (SSMS), ADO.NET, LINQ, ORM with Entity Framework, T-SQL, SSIS, Web Services, Microsoft Enterprise Library, DCOM Configuration, ASP.NET MVC3, XHTML, JQuery UI and JQuery Validation, CSS, XHTML, JavaScript, XML, FootPrints

Senior Web Developer, BrownGreer PLC, 03/2012–06/2012

Senior Web Developer responsible using ASP.Net Web Forms and Server controls along with AJAXToolkit, XHTML, JavaScript, CSS, and SQL Server Stored procedures to design and build the Claims Forms that enforce business rules and apply access control to each step of the online application process.

- Implement the user interface using XHTML, ASP.Net Server Controls including Master Pages, CSS, and JavaScript
- Create the data access layer (DAL) class and the code behind using C# and ADO.Net
- Create Datasets for temporary holding the user data retrieved from the data store during a page visit and create Data grids for presenting the data to the users.
- Made use of data controls such as ASP.NET Gridviews, Repeaters, and Listviews,
- Leveraged ASP.NET Panel Controls and AJAXToolkit controls for a well-organized and highly responsive user interface and functionality
- Consume and modify WCF services as needed
- Used SQL Server 2008 as the data store
- Perform all data manipulation (Retrieve, Insert, Update, Delete) through stored procedure, Data Access Layers and WCF Services
- Work extended hours week days and weekend days to meet the tight deadlines

Environment: ASP.NET 3.5/4.0, C#, Visual Studio 2010, Visual Source Safe 2005, MS SQL Server 2008, SSMS, ADO.NET, Web Services, HTML, JQuery, JQuery UI, CSS, XHTML, T-SQL, JavaScript, XML, IIS.

Senior Web Developer, USA Today, 11/2011–01/2012

- Senior Web Developer responsible for using ASP.Net Web Form and server controls along with XHTML Controls, JavaScript, CSS, and SQL Server Stored procedures to design and build the Series and Stories Tag Management Tool application for News editors to post their stories' headlines by order of importance on the existing template web pages
- Created the user interface using XHTML, ASP.Net Server Controls, CSS, and JavaScript
- Created the data access layer (DAL) class and the code behind using C# and ADO.Net
- The user interface consisted of a ASP.Net List Box for displaying all the series (Sub-topics), a grid view (data grid) for displaying all the stories associated with each sub-topic and for allowing users to edit, update, or dissociate a story with a series
- Created input boxes for allowing the user to create new series, associate a story's headline with that series, and specify the position of that story's headline as it would display on the browser.
- Created and modified stored procedures in SQL Server as needed.
- Created the DAL for the application
- Used XML templates and layout pages to create new pages as requested by the editors
- used C#, ASP.Net, Visual Studio 2010, Visual Source Safe 2005, SQL Server 2008, SQL Server Management Studio, HTML, CSS, XML, JavaScript
- Participate in agile sprint planning and daily scrum meetings for giving progress status on my assigned tasks

Environment: ASP.NET 3.5/4.0, C#, Visual Studio 2010, Visual Source Safe 2005, MS SQL Server 2008, SSMS, ADO.NET, AJAX, JSON, Web Services, HTML, JQuery, JQuery UI, CSS, XHTML, T-SQL, UML,

JavaScript, XML, IIS, Agile Scrum, Basecamp (online project collaboration tool), Jira (project, bugs, and defects tracker tool)

Applications/GUI Programmer, IBM/PEPCO, 02/2011–11/2011

- Responsible for development and maintenance of the application using Visual Studio.Net 2008 and 2010, and IBM DB2 Connect and IBM Data Studio
- Involved in writing the system requirements, technical requirements, and coding the application
- Develop the web application with Microsoft.Net technologies - Web layer with ASP.NET and JavaScript, business layer with VB.Net, and Data access layer with ADO.NET advanced functionality
- Modify existing screens and integrate customers, smart meters, dynamic pricing rate plans, and order menus, statuses, and alerts
- Extensively used ADO.NET objects such as Dataset, Data Adapter, Data Tables, Data Reader, and Data Controls such as Grid view, and stored procedures for data access and manipulation
- Write SQL Statements, through ADO.Net objects, for retrieving, inserting, updating, and deleting data from the data stores in the appropriate time and events, and event handlers for triggering them
- Also leveraged existing web services by calling them and using the datasets and data they returned when possible
- Leverage ASP.Net Validation controls for making sure the user input is accurate and clean
- Used Cascading Style Sheets (CSS) to maintain uniformity on all web pages
- Utilized Team Foundation Server and Visual Source Safe for source and version control
- Utilized Microsoft SharePoint as one of the primary collaboration tool
- Leverage Windows Event Viewer/Windows Logs for finding the causes of some errors
- Performed unit testing and assisted during stage testing of the application modules
- Created and wrote the system requirements and the technical (design) specification documentation

Environment: ASP.NET 2.0/3.5, VB.NET, IBM DB2, SQL Server, MS Visual Studio.Net, ADO.NET, ORM with Entity Framework, TFS, Visual Source Safe, AJAX, JSON, Web Services, WCF, XHTML, CSS, JQuery, JQuery UI, JavaScript, T-SQL, UML, XML, IIS 6.0, MS Excel, MS Visio,

.Net Developer, CSX (Chessie Seaboard Multiplier), 01/2009–01/2011

- Configured the Winwedge program for capturing RS232 serial data transmitted by the tracking device, directly into a Microsoft SQL Server
- Designed and built MS SQL Server tables and stored procedures objects for storing the data
- Used ASP.NET and Bing Map Controls to create the web interface
- Used C#, ADO.NET objects, ASP.Net AJAX controls such as Update Panel, Script Manager, Timer Control to asynchronously access and retrieve the appropriate data from the data store and display it in a Data Grid
- Utilized AJAX to make the Data Grid self-update itself asynchronously on the fly at a specified interval time so the client did not have to take any action in order to refresh the webpage in order to see an update of the positions of his/her products (goods on railcars)
- Configured and managed the Internet Information Service (IIS) web server and created a virtual directory for hosting the website
- Created the project documentation using Microsoft Visio and Microsoft Word
- Designed and built database for importing, analyzing, updating (changing) CSX's huge volume of geospatial data as required, and exporting it back to shapefile format (map points file) through Excel, utilizing SQL Server R2 2008 and SQL Server Import and Export tools

- Used Survey equipment such as Survey Controllers, GPS Receivers, Base stations to assist with surveys consisting of collecting data points and Using ASP.Net along with C# and ADO.Net to create methods that capture the data points and put them on a Bing Map
- Used ArcGIS Software suite (ArcMap, ArcCatalog, etc.) to process geospatial data as needed
- Used AutoCAD and AutoDesk to process geospatial data as needed

Environment: Visual Studio 2008, .NET 3.5, C#, IIS 7.0, SQL Server 2005/2008, SSIS, SQL Web Forms, Data Controls, Microsoft SharePoint, AJAX, XHTML, Update Panel, Script Manager, Linux/Ubuntu

Research Associate, Rahall Transportation Institute, 05/2007–12/2008

- Involved in gathering the requirements from end-user.
- Involved in the analysis, design, and development of the project.
- Actively involved in coding and designing using ASP.NET, C#, ADO.NET, XML, XSL, JavaScript, HTML, and DHTML.
- Responsible for design and development of Web Forms using ASP.Net for the front end and C# and ADO.Net in the back end
- All the user interface layers, web pages are created and integrated to maintain the performance of data flow and data integrity using ASP.NET User Controls, Web Server Controls and ADO.NET.
- Implemented Server and Client side validations using ASP.NET validation controls and JavaScript.
- Involved in designing shopping cart for processing credit card payments.
- Data binding was extensively used to bind various server controls to the data from database. List controls like repeater controls, data list controls and data grid controls was used in displaying rows of data in a customized template format.
- Implemented web services to make easy to reuse programs common to different parts of the application
- Designed and developed several SQL Server stored procedures for all the DML functionality for the web site.

Environment: ASP.Net 2.0, C#, VB.NET ASP, SQL-Server 2005, Web Services, Visual Studio .Net 2005, XML, MS-Windows XP, AJAX, MS Project 2003, MYSQL. Linux/Ubuntu

Information Technology Analyst, HELP Program, Marshall University, 06/2006–05/2007

- Involved in planning and development of Application life cycle - Study and analysis of the Business process flow and existing systems requirements.
- Developed the web application with Microsoft.Net technologies - UI layer with ASP.NET, business layer with C#, and Data access layer with ADO.NET advanced functionalities.
- Designing complex User Interface screens, modifying existing screens to use AJAX framework.
- Responsible for development of desktop applications in Visual Studio 2008 and SQL Server
- Used Script Manager and Update Panel to provide interactive screens.
- Developed Web-based user interface using ASP.NET, HTML, JQuery, JavaScript, CSS
- Designed UI using latest AJAX controls/features and ASP.NET 3.5 tools (Master pages, themes, site navigation maps).
- Designed the applications databases entity relationship diagram(ERD) using MS Visio, UML, the Crow's foot notation, and the functional dependency technique to show dependencies, the relationships, between the entities and tables, and to also show the logical and physical models of the database, creating normalized databases
- Created the tables in MS. SQL Server using MS. SQL Server Management Studio and SQL Data Definition Language (DDL) in the Query Editor of SSMS
- Created stored procedures (some with parameters for values provided at runtime) through which retrieving, inserting, updating, and deleting data in the database would be accomplished

- Created stored procedures that performed calculations on the data and Used them to allow the managers to generate stylish reports in user interface through ASP.NET
- Leveraged ASP.Net Membership and role providers to authenticate users and give them appropriate file (page) access rights based on their role in the system
- Used ASP.NET Web Forms, C#, ADO.NET and other ASP.Net controls to build the user interface and to implement business objects and rules
- Leveraged ADO.NET to handle access to data in the SQL Server data store by using Visual Studio controls to create data access layer (DAL) and creating a business layer for implement business rules and a layer of security to avoid compromising or losing the integrity of the data in the data store
- Utilized ADO.NET's Dataset, Tables, Data Table Adapters, Data Reader, Parameter, connection objects to access and manipulate the data in the data store.
- Built web services to centralize programs common (used in) to several other pages
- Utilized the web configuration XML file and the provided ASP.Net web configuration tool to configure settings for the ASP.Net web server engine and IIS
- Responsible for training managers and the staff on how to use the website
- Responsible for also maintaining the website

Environment: C#, Visual Studio 2005-2008, ASP 2.0/3.5, SQL Server 2005/2008, MS Visio, HTML, DHTML, CSS, XML, JavaScript, SQL Server Management Studio

Systems and Languages

- **Technologies:** .NET Framework 2.0 - 4.5, ASP.NET, ADO.NET, LINQ, MVC, Web API, WebForm, WinForm, ORM/Entity Framework, JSON, WCF Services (SOAP and REST), JQuery AJAX
- **Languages:** C#, VB.NET, C++, and database scripting with SQL and T-SQL
- **Scripting Languages:** ASP.NET Razor Syntax, PHP, JavaScript, JQuery
- **Web Technologies:** HTML, XHTML, XML, XAML, AJAX, JSON, CSS and bootstrap
- **Operating Systems:** Windows VISTA/XP/2000/NT/98/95, Linux/Ubuntu
- **Databases:** MS SQL Server 2005-2015, DB2, Oracle, MySQL, MS Access
- **Protocols:** TCP/IP, HTTP, HTTPS, FTP, SOAP, REST, DHCP
- **BI Tools:** SQL Server Reporting Services (SSRS) , SQL Server Integration Services (SSIS)
- **Web servers:** IIS and Apache
- **Development Tools:** Visual Studio 2003-20115, Team Foundation Server (TFS), SSMS, SSRS, SSIS, IBM DB2 Connect, IBM Data Studio, MS Visio, MS SharePoint, LINQPad, Notepad++,

James Bellefontaine

Senior Systems Administrator

Education and Certifications

- BS - Information Systems & Technology, The Pennsylvania State University, in progress – 2017
- Option - Integration and Application
- Minor - Security & Risk Analysis

Experience

Senior Systems Administrator, Social & Scientific Systems, 7/2015-Present

In my role as a Senior Systems Administrator, I am responsible for 'Wintel' and VMWare infrastructure in a FISMA moderate environment of 1000+ hosts. My focus is on improving processes and documentation for Tier III technicians. I work tightly with the networking and Unix teams to provide and support a stable, secure network environment for a team of hundreds supporting several government contracts.

Systems Administrator III, Edaptive Systems 11/2013–06/2015

As a Senior Systems Administrator at Edaptive, I focused on strategic upgrades to our infrastructure, design and rollout of new contract infrastructure, and maintained a leadership role within the internal team. I worked closely with our developers in an Agile cycle in order to deploy releases and troubleshoot systems. Worked with our security team to develop and maintain security compliance practices as well as prepare for and handle security audits. Worked on CMS with subK and prime contractors to develop, maintain, and troubleshoot government contract systems.

Products: Edaptive Systems provides program management; software engineering; business intelligence; data abstraction; and information systems and technologies solutions to both public and private sector customers.

Accomplishments: Continuous improvement of internal corporate infrastructure including complete upgrade of virtual hosts. Improved corporate security by implementing two-factor authentication system for administrative users. Managed the successful on-time rollout of infrastructure for newly awarded CMS contract system. Streamlined and formalized release process for Java and web deployments.

Senior (Tier 3) Network Engineer, netlogicdc, llc, 02/2010–09/2013

Junior (Tier 2) Network Engineer, netlogicdc, llc, 07/2008–02/2010

Start-to-finish design, installation, proactive management and troubleshooting of enterprise-level office networks and systems. Tier 2 support for front-line engineers. Systems assessment and deployment for new clients. Provided training in best practices and mentorship with emphasis on documentation and client satisfaction for junior technicians.

Products: netlogicdc is a managed service provider offering technical consulting services to small and medium businesses throughout the Washington, DC metro area. netlogicdc focuses on a high quality of personal service.

Accomplishments: Formalized processes for server installations. Minimized business interruption for server cutover process from four-day to overnight. Increased efficiency metrics of front-line support by working directly with technicians to lower average time to resolution up to 75%.

IT support technician, Dell, Inc., 10/2006–05/2008

Technical troubleshooting of any/all PC issues, including manual virus removal, windows blue screen errors, hardware error diagnosis, and all windows XP/Vista software applications.

Products: Dell is an international company that develops and distributes a broad spectrum of computer products to individuals and corporate IT departments. Dell On Call delivers premium support service to their most valued clients.

Accomplishments: Achieved Advanced Resolution Expert certification, and performed consistently in top 10% in site metrics ranking, frequently in top ten agents for Dell On Call. Delivered team training and worked as Resolution Specialist to provide advanced support to my peers. Distinguished myself by consistently delivering sales that exceeded my cost of support.

Site Manager, Time Shop, Inc., 05/2006–10/2006

Self- Managed operations, record keeping, training new hires, repair of watches, represented Time Shop when dealing with affiliate company (Hudson's Bay Co.)

Products: Time shop is an independent, family-operated business. Watch repair is either done on-site in Hudson's Bay Store kiosks, or repair warehouse for more complex work.

Accomplishments: Took personal responsibility of Orleans branch and moved it from a cost center to a profit center by reducing number of warehouse repairs, increasing sales of services and products, hiring and training new staff.

IT support Technician, Convergy's, Inc., 07/2005–05/2006

Delivered diagnostic and troubleshooting support of consumer cable Internet connectivity.

Products: Outsource technical support company, contracted with major ISPs

Accomplishments: Top call center performer – consistently top 10% in quality and efficiency metrics

Systems and Languages

-
- LAN administration
 - Project Management
 - Systems Installation, Configuration
 - Network Security
 - Backup/Disaster Recovery
 - Mentoring/Secondary Support
 - Web backend, Apache
 - DNS/DHCP/SNMP
 - Windows Server 2008, 2012
 - Java
 - Active Directory/Group Policy
 - Exchange Server 2007, 2010, 2013
 - Linux – Ubuntu, CentOS
 - Asterisk / Elastix VoIP
 - Scripting –Powershell
 - MySQL, MSSQL
 - EMC, IBM, Dell SAN
 - Cisco, Juniper, Firebox, SonicWall
 - ESX, HyperV virtualization
 - LAMP stackery

Stephen LaRochelle

Database Administrator

Social & Scientific Systems, Inc.

Mr. LaRochelle has 14 years of experience as a database administrator. He developed and administered databases on Microsoft SQL Server 7 through 2012. He has worked with network/SAN/VM administrators, database and web developers, vendors and clients, and internal and external customers. Mr. LaRochelle has expertise in SQL installation and configuration, HA/DR implementation, TSQL development, performance tuning, and Powershell.

Education and Certifications

- BS, Finance, Lehigh University
- Microsoft Certified Information Technology Professional (MCITP) Database Administrator SQL 2005 & 2008
- Microsoft Certified Systems Engineer (MCSE) Windows NT

Experience

Database Administrator, Social & Scientific Systems, Inc., 11/2014–Present

- Managed SQL environment consisting of over 50 SQL 2008 R2/2012 servers across development/QA/UAT/production environment.
- Administered Internet Information Systems (IIS) environment including regular deployments of web code across environments.
- Established procedures for SQL & IIS deployments, allowing for transition of tasks to junior administration staff.
- Resolved SQL server issues related to query performance, space allocation, database backup maintenance, and user access.
- Deployed failover environments for SQL, IIS, and application servers.
- Participated in on-call rotation with other Windows and Unix engineers and administrators.

Enterprise Application Engineer/Database Administrator, Crowell & Moring LLP, 10/2013–06/2014

- Supported and monitored enterprise applications including Autonomy FileSite (document management system), Elite (accounting system), IPManager, VIDesktop, and West KM (legal environment software packages), as well as associated database systems. Worked with software vendors for troubleshooting applications and software updates.
- Oversaw rollout of BigHand Digital Dictation enterprise software package, including multi-tiered back-end software installation, desktop and VDI installation of client software, and coordinating training events for all levels of support staff.
- Maintained SQL Servers. Ensured appropriate backup/recovery plan in place. Performed routine maintenance, ad hoc reporting, and data recovery. Installed SQL server and service pack.

Senior Operations Database Administrator, RR Donnelley & Sons Company (acquired Edgar-Online, Inc., 2012), 2006–10/2013

- Built out disaster recovery environment for Azure-based database applications. Audited SQL server installations across company; documenting server details. Reduced SQL licensing footprint through consolidation, edition downgrades, decommissioning.
- Virtualized all remaining physical SQL servers. Upgraded all SQL instances to currently supported version of SQL. Installed SQL server using standardized installation scripts leading to consistently and uniformly built servers. Migrated SQL servers from SQL 7 to 2000, 2005 2008R2 and 2012. Applied service packs and cumulative updates. Performed both side by side and in place upgrade. Converted

servers from physical to virtual machines. Configured database mirroring and log shipping to provide local high availability and a remote disaster recovery environment (HA/DR).

- Used SQL profiler and Performance Dashboard Reports, along with anecdotal data to identify long running processes. Examined query plans and identified areas of improvement; query design, indexing improvements or identified system bottlenecks.
- Wrote Powershell scripts to automate obtaining and databasing performance counters for SQL servers (disk, CPU, memory), as well as SQL specific counters (wait stats, buffer pool usage, database growth, SQL agent job history). Implemented code releases, understood impact to environment, advised development and QC team on design and testing methods.

Operations Database Administrator, Company, 2001–2006

Oversaw dozens of SQL servers in an OLTP environment with a complex transactional replication structure, accessed by internal and external processes.

- Troubleshot database and non-database issues in a complicated data flow model where database processing was only a small part of the enterprise's activity. Required both knowledge of process as well as data details.
- Developed ETL processes (Extract Transform Load) using TSQL and DTS to generate data files based on client & contract specifications and deliver via SQL Agent jobs.
- Wrote ad hoc reports with minimal requirements provided.
- Implemented and maintained complex transactional replication model involving over 20 SQL servers, 40 databases, and hundreds of publications.
- Coordinated database backups for over 20 servers, reducing network and disk contention on network shared storage. Applied security best practices for creating SQL server, windows, and FTP accounts. Maintained and troubleshot hundreds of SQL jobs across 20+ servers.

Database Developer, Edgar-Online, Inc., 1999–2000

Built databases based on user requirements and Securities and Exchange Commission documentation, including data model (tables, indexes, foreign keys), stored procedures, functions views for an OLTP system.

- Performed coding for comprised back end processing, data extractions, and end user reporting.
- Developed process to update database of stock prices and other corporate information with data supplied by vendors.
- Built supporting tools for use by analysts to audit and modify data.

Sales Reporting Analyst/Applications Developer, Snyder Communications, 1996–1999

Designed, coded, and implemented client/server based applications for telemarketing division of targeted marketing firm. Administered 20+ client/server applications utilized in two separate locations by up to 200 users for 16 hours/day. Implemented process to reconcile orders passing through numerous processes, identifying status & location of missing orders. Created database to provide effectiveness measurement of field sales office operation.

Systems and Languages

TSQL, Powershell, Microsoft Office, Visio, Erwin, FTP; familiar with various Redgate and Idera database management tools

Appendix B **WVHCA HDSS UserGuide 2.0**



West Virginia Health Care Authority

Social & Scientific Systems, Inc.

Hospital Data Submission System

User Guide

July, 2016

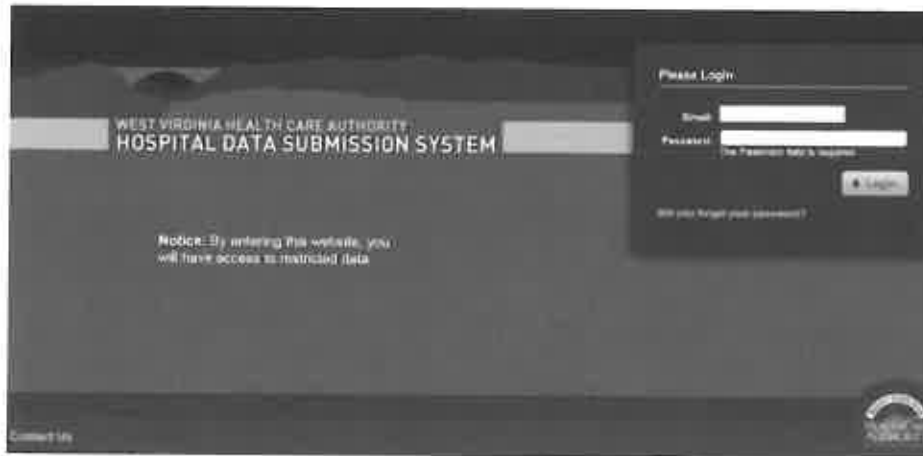
Hospital Data Submission System User Guide

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Hospital Data Submission System User Guide

1. Open the web site

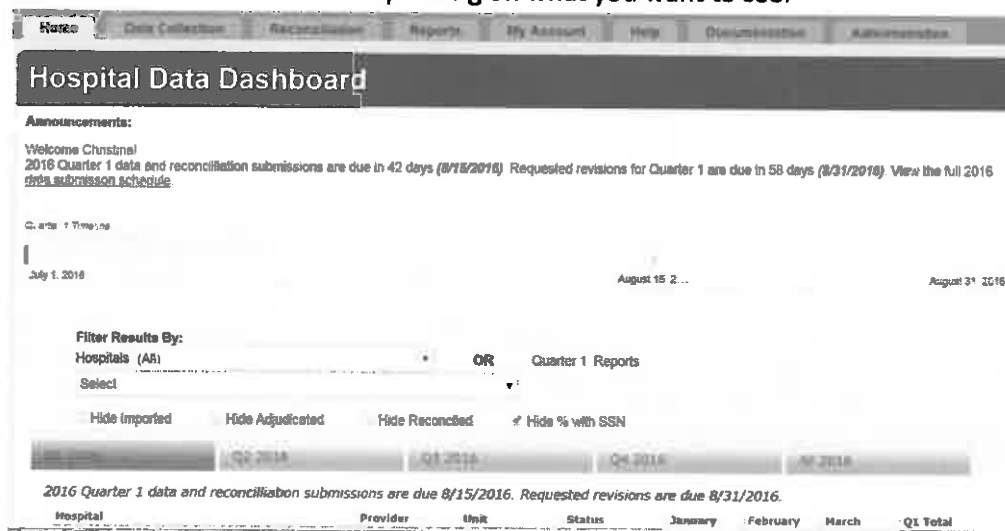
- Go to <https://hdss.s-3.net>
- If it's not your first time logging in, login with your information, such as:
 - User: xxxxx@hospital1.com
 - Pass: Password



- For the first time logging in or if you forgot your password, click on “Did you forget your password?” – a screen such as the one below will appear. Enter your email address and click Submit. An e-mail will automatically be sent to you with instructions on how to reset your password. Passwords must be strong – with a length of 8 and at least 1 symbol, 1 number, 1 lowercase letter, and 1 uppercase letter.

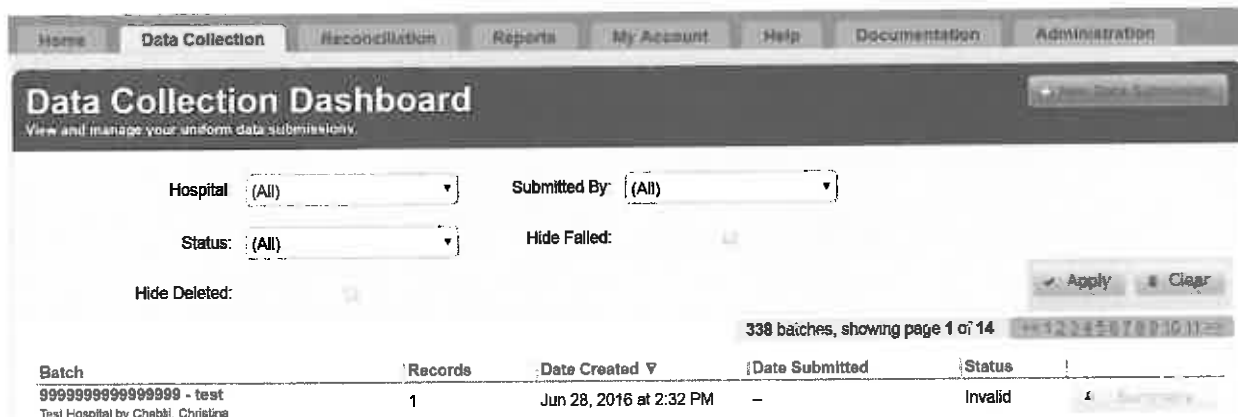
2. Begin on the home page

- After logging in, you'll land on the home page. You can see the schedule and your progress here. Note you can filter to show or hide rows depending on what you want to see.



Hospital Data Submission System User Guide

- To begin a data import or to review previous submissions, click on the Data Collection tab which will bring you to the Data Collection Dashboard. This page has filters for hiding failed and deleted batches and sortable columns.



The screenshot shows the Data Collection Dashboard with a navigation bar at the top containing links for Home, Data Collection, Reconciliation, Reports, My Account, Help, Documentation, and Administration. The main heading is "Data Collection Dashboard" with a sub-heading "View and manage your uniform data submission." and a "New Data Submission" button. Below the heading are filter controls: Hospital (All), Submitted By (All), Status (All), Hide Failed (checkbox), and Hide Deleted (checkbox). There are "Apply" and "Clear" buttons. A summary bar indicates "338 batches, showing page 1 of 14" with a pagination control. Below this is a table with columns: Batch, Records, Date Created, Date Submitted, Status, and Actions.

Batch	Records	Date Created	Date Submitted	Status	Actions
999999999999999999 - test Test Hospital by Chebli, Christina	1	Jun 28, 2016 at 2:32 PM	-	Invalid	4

3. Upload a new batch or create an empty batch

- From the Data Collection Dashboard, click on the New Data Submission button located toward the top-right of the page.

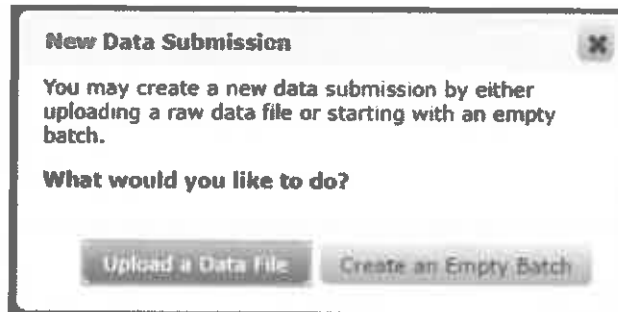


This image is a close-up of the "New Data Submission" button, which is a grey rectangular button with a plus sign icon and the text "New Data Submission". Below the button, a summary bar shows "63 batches, showing page 1 of 3" and a pagination control with arrows and the numbers 1, 2, and 3.

- If you have a 5010 ICD-10 837i file prepared, you can upload a new batch. Choose "Upload a Data File". If you have to manually enter the batch, click on "Create an Empty Batch".

Hospital Data Submission System

User Guide



- You will be brought to the Batch Information screen where you will enter general batch information. If you are uploading a data file:
 - Browse for your file by clicking Browse.
 - In most cases, your hospital will be pre-selected. If you are associated with multiple hospitals, choose the appropriate hospital from the Hospital drop-down list.
 - Give your batch a name in the Batch Name textbox.
 - Click Continue in the bottom right corner.

- The data submission will begin processing and the system will bring you to the Batch Processing screen.
 - The system imports and validates the batch in two separate steps.
 - Import and validation progress bars will keep you informed of wait times.

Hospital Data Submission System User Guide

Home Data Collection Reconciliation Reports My Account Help Documentation Administration

Batch Processing

Your data submission is currently processing.

Create Import **Validate** Edit Submit

We are currently validating your data submission.
Hospital: Test Hospital
Batch Name and Number: 001 Jan 2016 - 00257D08103830673724
Status: Batch Validation Running (Estimated time remaining: 15s)
Message: Validating
Import Progress: —
Validate Progress: 29 %

Note: You do not need to remain on this page while your data is processing. You will be notified via email when the processing is complete. At that point you may login and visit your [dashboard](#) to view the data summary.

Note: You do not need to remain on this page while your data is processing; you will be notified by e-mail when processing is complete.

1. E-mails come from HDSSsupport@s-3.com

- The "import succeeded" e-mail will contain a message such as: *The batch "Hospital1 876" which you submitted on Mar 19 at 6:43 AM has finished importing. The batch was successfully imported and validation will start soon.*
- The next e-mail, the "validation succeeded" e-mail, will contain a message such as: *The batch "Hospital1 876" which you submitted on Mar 19 at 6:43 AM has finished validating.*

Please login to the HDSS and view the summary for this batch in order to view and correct any validation issues which may have occurred.

2. At that point you may login and visit the Data Collection Dashboard to review your data summary.

- If your batch results in a status of "Failed" it means there were one or more "critical" errors. This usually means that there is something wrong with the formatting of the raw data which will not allow the data to be submitted. The raw data will need to be put in the proper 837i format before trying to upload again. Should a critical error occur, an e-mail will be sent to you informing you of the issue:

The batch "Hospital Data 1" which you submitted on Mar 17 at 1:50 PM has finished importing. Unfortunately, the import has failed with one or more critical errors.

Hospital Data Submission System User Guide

For more information, please login to the HDSS and view the summary for this batch. You will likely have to fix and then resubmit the entire batch.

- The HDSS help desk will receive notification of the failed batch and reach out to you to help fix any formatting problems which exist in the original text file that you uploaded.
- Once fixed, re-upload it

Batch ID	Submitted By	Date Submitted	Status	Action
99999999999999999999 - JJS Test 51 Test Hospital by Schinckle, Jeff	1	Jun 8, 2016 at 12:16 PM	Valid	Summary
99999999999999999999 - JJS Test 33 Test Hospital by Schinckle, Jeff	1	May 25, 2016 at 1:35 PM	Valid	Summary
99999999999999999999 - JJS Test 01 Test Hospital by Schinckle, Jeff	1	May 17, 2016 at 6:45 PM	Valid	Summary
99999999999999999999 - JJS pat as sub Test Hospital by Schinckle, Jeff	1	May 17, 2016 at 4:33 PM	Failed	Summary
00257D06103830673724 - JJS E0 again Test Hospital by Schinckle, Jeff	1	May 17, 2016 at 4:23 PM	Failed	Summary

4. Review uploaded batches

- On the Data Collection Dashboard, you may review previous uploads.

The screenshot shows the 'Data Collection Dashboard' interface. At the top, there are navigation tabs: Home, Data Collection, Administration, Reports, My Account, Help, Documentation, and Administration. Below the tabs, there are filter dropdowns for Hospital (All), Submitted By (All), and Status (All). The main content area displays a table with the following data:

Batch	Claims	Date Created	Date Submitted	Status	Action
00000025 - Christina test 5 WV University Hospitals Inc by CHSIS Online	2314	Mar 18, 2012 at 7:36 PM		Invalid	Summary
00000025 - JSM-HCCRA Claims 09150741_July 2011 Troy Valley Hospital - Regional Hospital by MCGough, Julia	2314	Mar 18, 2012 at 12:54 PM		Invalid	Summary
0102 - Christina test 3 TAVC - Troy Valley Hospital Inc by Cheryl, Catherine	3453	Mar 18, 2012 at 9:41 AM		Invalid	Summary
0102 - Christina test 2 Troy Valley Hospital - Regional Hospital by Cheryl, Catherine	3453	Mar 17, 2012 at 2:13 PM		Invalid	Summary
00000025 - Christina test 1 WV University Hospitals Inc by Cheryl, Catherine		Mar 17, 2012 at 1:50 PM		Failed	Summary
0102 - WVHSPHS 2011-01_037_112310001 TAVC - Troy Valley Hospital Inc by MCGough, Julia	3453	Mar 17, 2012 at 12:41 PM		Invalid	Summary

8 batches, showing page 1 of 1

Hospital Data Submission System

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- There are a number of statuses for a batch; they are defined as:
 - Pending: The data file has been successfully uploaded but processing has yet to begin.
 - Importing: The data file is currently being imported.
 - Failed: The system encountered a critical error while importing the batch.
 - Validating: The batch is currently being validated.
 - Invalid: The batch has completed the import and validation process and was found to have one or more errors.
 - Valid: The batch has completed the import and validation process and does not have any errors (it could, however, have one or more warnings).
 - Submitted: The batch has been submitted and may no longer be edited.
 - Deleted: The batch has been marked as deleted and may no longer be edited.

- For a batch with a status that can be edited (Invalid, Valid), click on the Summary button to edit the batch.
- For a batch that has a Submitted status, click on the Reports button to see the data quality reports for this batch.

5. Editing

The warnings and errors are highlighted for you to easily find. Errors are in orange, warnings are in yellow. Errors must be fixed before the batch can be submitted whereas Warnings *should* be fixed, but the batch may be submitted with them. You do not need to fix errors and warnings all at once. You can fix some and return another time. Simply view the Data Submission Dashboard and locate your batch (it will still have an invalid status if errors remain).

There is an option to get a listing of all records, including valid records. Click on the Listing of all Records button, and you will be brought to all records sorted by patient control number. You may filter the records displayed by using the drop-down lists just above the list. You may edit clean records in the same way you edit a record with errors and warnings.

Note – it is possible from the listing of all records for 1 record to show just 1 *type of* validation issue, yet to see multiple occurrences of that issue for the record. For example, 1 type of validation Issue can listed at top of record, such as E154 - missing POA. However, this record appears multiple times on the E154 Validation Issues list if they have missing POAs on multiple diagnosis codes.

Hospital Data Submission System User Guide

- **Batch Summary Screen**
 - For invalid or valid batches, after the system imports and validates the data, it will bring you to the Batch Summary screen.
 - Errors and/or warnings resulting from the validation process need to be fixed here – click on the View button to see a list of records which are afflicted with the error or warning.
 - If the batch contains a high number of errors or warnings and you wish to submit a new data file, you may delete the batch using the Discard Entire Batch button at the bottom of the page.

Batch Summary

Hospital: Test Hospital
Batch Name and Number: Test Hospital - JWD120
Total Number of Records: 23

Issue Type	Count
Batch-Level Issues	0
Record-Level Issues	23

Code	Message	Count	% Records
ERR001	Invalid External Provider ID (PROV)	11	100%
ERR002	Invalid NPI (npi)	3	4%
ERR003	Invalid Medical Provider ID	2	22%
ERR004	Invalid PCN	1	4%
ERR005	Invalid DTN	1	4%
ERR006	Invalid DTN	1	4%
ERR007	Invalid ICD9 procedure code	23	100%
ERR008	Invalid ICD9 procedure code	1	4%
ERR009	Invalid ICD9 procedure code	1	4%

- **Validation Issues Screen**
 - You may filter the records displayed on this screen by selecting from the drop-down lists toward the top of the page.
 - Locate the record you would like to edit and click the Edit button.

E13 Validation Issues

Hospital: Test Hospital
Batch Name and Number: Test Hospital - JWD120
Records: 23

Medical Record #: (All) Patient Control #: (All) Bill Type: (All)

Record Edited?	Issue Type	Medical Record #	Patient Control #	Bill Type	Discharge Date
<input type="checkbox"/>	Record Level	5140006	9PLD9176		Apr 2, 2011

Hospital Data Submission System User Guide

- The system will bring you to a new screen where you can edit the data.
 - You can keep track of which records were edited by using the checkbox to the left
 - All validation issues for the current record appear at the top of the page.
- Some errors feature “in-line” editing. That is, when you click on the error, you can fix the error right there without entering the edit claim screen.

E0 Validation Issues
Test Hospital, Batch: 001 Jan 2016 - 00257008103830673/24

E0 Description: Discharge not part of current period (valid EDATE and before January 1st or after December 31st of the current period.)
E0 Condition: Valid EDATE but before or after 01/01/20xx (current reporting year)
Records: 1

Patient Control #: Provider #:

Bill Type: (All) Discharge Date: (All)

1 record, showing page 1 of 1

Edit...	PATNO A	BTYPE	PROV	SD DATE	EDATE	ADMIT	TCHG
<input type="checkbox"/>	99999999	(11) Hospital, Inpati	510/20	Mar 1, 2015	Mar 4, 2015	Mar 4, 2015	\$10,000.00

- Edit Claim Screens
 - Other errors and warnings will be fixed on the edit claim screen. This page is broken down into different sections each of which may be edited using the Edit button located to the right of each section.

Edit Claim
Current Reporting Period: 001 Jan 2016 - 00257008103830673/24

E0 Description: Discharge not part of current period (valid EDATE and before January 1st or after December 31st of the current period.)
E0 Condition: Valid EDATE but before or after 01/01/20xx (current reporting year)
Records: 1

Batch Information

Batch Name: Edit
Batch Number: Edit
Batch Date: Edit

Provider Information

Billing Provider Number: Edit
Provider Name: Edit
Provider Address: Edit

Patient Information

Patient Name: Edit
Patient Address: Edit
Patient Phone Number: Edit

Hospital Data Submission System User Guide

If you wish to completely delete an entire record, this is done by going to the All Records Listing and clicking on the delete checkbox. Confirm by clicking on the Delete Selected Records Button.



- If provider or patient information need editing, go to those sections of the edit claim page. If claim information needs to be fixed (claim information includes non-demographic patient details, diagnoses, payers, procedure, and revenue information), go to the claims section, as pictured below.

4 Claim Information

A screenshot of the "Claim Information" section of the edit claim page. The page has a navigation bar with tabs for "Diagnoses", "Procedures", and "Revenues". The "Claim Information" section contains several fields:

- ICD Version:** ICD10 (dropdown menu)
- Patient Control Number (PATNO):** 999999999 (text input)
- Medical Record Number (MRN):** 999999 (text input)
- Total Claim Charges (TCHG):** 10000.00 (text input)
- Bill Type (BTTYPE):** (111) Hospital; Inpatient (Including Medicare Part A); Admit Th... (dropdown menu)
- Auto Accident State (ACCSTATE):** (None) (dropdown menu)
- Admission Type (TYPEAD):** (None) (dropdown menu)
- Admission Source (SRCE):** (1) Non-health care facility point of origin (dropdown menu)
- Admission Date (ADMIT):** Mar 1, 2015 (calendar picker)
- Patient Status (PSTAT):** (1) Discharged to home or self-care (routine discharge) (dropdown menu)
- Emergency Room Condition Code (CCODE):** (text input)
- Statement Start Date (SDATE):** Mar 1, 2015 (calendar picker)

Hospital Data Submission System User Guide

Maneuvering around the claims section

To edit the details for the claim (such as patient control number, bill type, admit date) just go to the appropriate white box with the highlighted error/warning, as shown above.

- While editing data, the raw data which was imported from the data file is displayed in a gray area below the textbox or drop-down list for that field.

Details Tab

- To fix a value for a field, enter the value. Either a drop down will appear for you to choose from, or you must start typing in the 1st 3 digits, and then a drop down will appear. You then must choose a value from the drop down. This ensures a valid value will be entered.
- When you have finished making changes, click the Save button in the bottom right.
- You can return to the Batch Summary screen any time using the go back button and the back to summary buttons at the bottom of every edit page.

Diagnosis Tab

To edit a diagnosis, click directly in the box of interest. To add a diagnosis, click on the Add a New Diagnosis button.

The screenshot shows the 'Diagnosis (DIAG) A' section with a list of diagnosis codes and their descriptions. Below this is a table for 'Present on Admission (POA)' with columns for 'Principal', 'Admitting', and 'External Cause of Injury'. The table contains several rows of data with checkboxes for each status.

Diagnosis (DIAG) A	Present on Admission (POA)	Principal	Admitting	External Cause of Injury
0373 Amblyopia, bilateral	Present at the time of inpatient admission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
122 Cardiac arrhythmia, NEC	Present at the time of inpatient admission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23120 Cardiac arrhythmia, NEC	Present at the time of outpatient admission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4134 Aortic atherosclerosis	Present at the time of inpatient admission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6285 Hemorrhage, febrile	Diagnosis not reported or not used - Exempt from POA reporting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6284 Cerebral hemorrhage	Diagnosis not reported or not used - Exempt from POA reporting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1201 Tension pneumothorax	Present at the time of inpatient admission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Click inside the text box to edit an incorrect field.
- Start typing the code or name of the diagnosis and an auto-complete drop-down list will appear – select the appropriate diagnosis.
- Present on Admission (POA) also has a drop down menu. You may type in the text box use the arrow button to the right to select a POA from the list.
- There are check box(s) if you need to mark the diagnosis as one of the following:
 - Principal
 - Admitting
 - External Cause of Injury
- Click on Save Diagnosis.

Hospital Data Submission System User Guide

Payer Tab

To edit a payer, click on Edit to the right of the payer. To add a payer, click on the Add a Payer button.

The screenshot shows the 'Payer Information' tab. It contains a form with the following fields: Payer (PAYOR), Address, City, State, and Zip. To the right of the form, there are buttons for 'Add Payer', 'Edit Payer', and 'Delete Payer'. Below the form, there are navigation buttons: 'Previous', 'Next', and 'Cancel'.

- Edit a payer by clicking directly in the box and start typing the first 3 digits for a dropdown menu to appear.
- To add secondary or tertiary payers, just enter the data in the box.

Procedure Tab

To edit a procedure, click directly in the box of interest. To add a procedure, click on the Add a New Procedure button.

The screenshot shows the 'Procedure Information' tab. It contains a form with the following fields: Procedure (PROC), Date, and Principal. To the right of the form, there are buttons for 'Add New Procedure', 'Edit Procedure', and 'Delete Procedure'. Below the form, there are navigation buttons: 'Previous', 'Next', and 'Cancel'.

- Start typing the code or name of the procedure and an auto-complete drop-down list will appear – select the appropriate procedure.
- Click on save

Revenue Tab

To edit a revenue, click directly in the box where editing is necessary. Again, start typing the first 3 digits for the autocomplete drop down menu to appear, then choose a value. Click save when done.

The screenshot shows the 'Revenue Information' tab. It contains a table with the following columns: Revenue Code (REV), Unit Type, Units of Serv., and Charges. The table has 6 rows of data. To the right of the table, there are buttons for 'Add Revenue', 'Edit Revenue', and 'Delete Revenue'. Below the table, there are navigation buttons: 'Previous', 'Next', and 'Cancel'.

Revenue Code (REV)	Unit Type	Units of Serv.	Charges
10000 - All Other State Blue Cross Health Plans	100	1	50.00
10001 - Laboratory - Chemistry	101	1	100.00
10002 - Laboratory - Hematology	102	1	100.00
10003 - Laboratory - Urinalysis	103	1	100.00
10004 - Pharmacy - Generic Class - Other	104	1	100.00
10005 - Room & Board - Semi-private "In-Bed" (Nurse) of General - Psychiatric	105	1	100.00

Hospital Data Submission System User Guide

- When editing the Charges field, enter the amount as dollars and cents, using a decimal point but no dollar sign (\$).

Once you are done editing

- Upon finishing up with editing, click save, then go back, and then back to summary. At that point, you'll be back on the batch summary page. Click the Revalidate button so the system will double check for errors and warnings.
- The system will return you to the Batch Processing screen while validation occurs.
- Once validation has completed, you will be brought back to the Batch Summary screen.
- All the errors and warnings that have been fixed will no longer be visible on this screen.
- It is possible that due to the fixes you have made one or more new validation issues may occur. In this case, you will have to fix the errors before you may continue.

The screenshot shows the 'Batch Summary' page for Hospital: Test Hospital. The batch name and number is 'testbatch0001 - JMR12' and the total number of records is 25. The summary table shows:

	Errors	Warnings	Valid
Batch-Level Issues	0	0	--
Record-Level Issues	2 OK	23 (91%)	21 (84%)

- If the system finds no errors, you now have a Valid batch

The screenshot shows the 'Batch Summary' page for Hospital: actual hospital name. The batch name and number is 'testbatch0001 - JMR12' and the total number of records is 1. The summary table shows:

	Errors	Warnings	Valid
Batch-Level Issues	0	1	--
Record-Level Issues	0	1 (100%)	1 (100%)

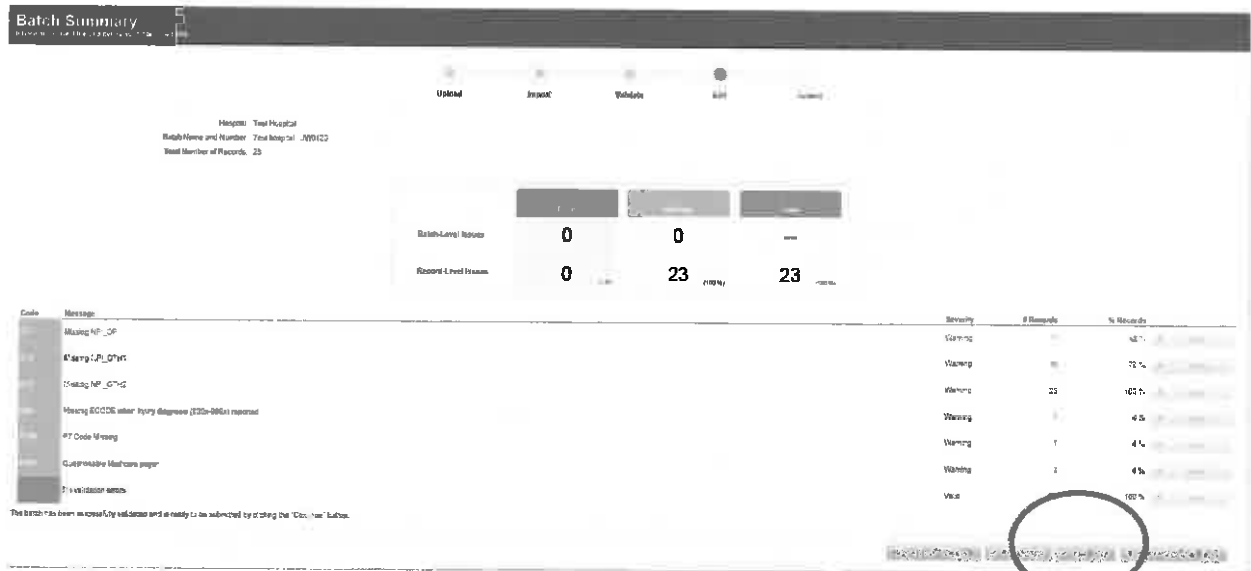
A message box is displayed at the bottom left, stating: 'Batch Summary: Batch testbatch0001 - JMR12 is valid. All errors and warnings have been resolved. The batch is ready for submission.' Below the message box is a table with columns: Severity, # of Issues, and Details.

Hospital Data Submission System

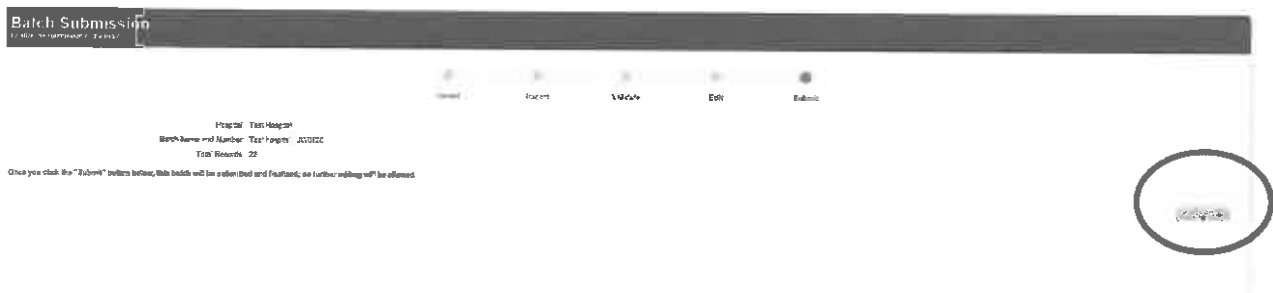
User Guide

Submit data

- Once the batch has no remaining errors (or preferably, no remaining warnings), you will submit it by clicking on the Continue button on the Batch Summary screen.



- The system will bring you to the Batch Submission screen.
 - Ensure that you are ready to submit the batch; once you click the "Submit" button, the batch will be submitted and finalized.
 - No further editing will be allowed.
 - You will be now able to view the data quality reports.



- The system will return you to the Data Submission Dashboard where you will see a note that your batch was successfully submitted.



Hospital Data Submission System

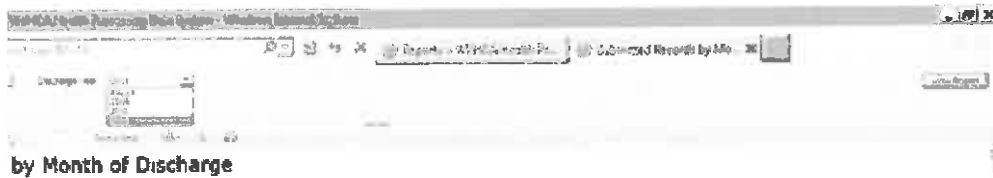
User Guide

6. Reports

- Once data has been submitted, data quality reports will be available for viewing and downloading.
- These reports are very useful tools to evaluate the state of your data.
- Click on the Reports button from the data collection dashboard for the successfully submitted batch, or click on the reports tab to get to the Reports page.

Batch	Records	Date Created	Date Submitted	Status
JW0128 - JIS Test Hosp L33886 10/12/2012 10:15:25 PM	22	Oct 12, 2012 at 10:15 PM		Invalid
JW0129 - JIS Test Hosp L33886 10/12/2012 10:15:25 PM		Oct 12, 2012 at 10:15 PM		Deleted
JW0130 - JIS Test Hosp L33886 10/12/2012 10:15:25 PM		Oct 12, 2012 at 2:19 PM		Submitted
JW0131 - Test Hospital Test records to CSV		Oct 12, 2012 at 12:24 PM	Oct 12, 2012 at 2:44 PM	Submitted

For any of the data quality reports, if changing one of the filters, be sure to click on the View Report button for the report to “refresh.”



Hospital Data Submission System User Guide

DQR1 Batch Summary Report

A real-time report that summarizes key information for *each* batch submitted to the master database. May be filtered on date of submission.

Hospital: Test Hospital Submitted After: NULL
Submitted Before: NULL

1 of 1 100% Find | Next

DQR1 Batch Summary Report

Date/time report last updated: 10/10/2012 3:17:00 PM

Hospital Name: Test Hospital

Hospital ID: 510020 Number Records Uploaded: 23
Hospital Batch Name: Test hospital Number Records Submitted with Warnings: 23
Hospital Batch Number: JW0120 Number Records Submitted – No Warnings: 0
HCA Batch Number: 204
Date/Time Uploaded: 10/10/2012 12:01:30 PM
Date/Time Submitted: 10/10/2012 2:44:58 PM
Date/Time Revised: 10/10/2012 2:44:55 PM Discharge Months: APR/2011

Batch-Level Warnings

Element-Level Warnings

Edit Code	Edit Description	Error Count	Total Charges
E164	P7 Code Missing	1	\$7,992.47
E165	Questionable Medicare payer	1	\$7,992.47
E71	Missing NPI_OP	11	\$136,255.65
E72	Missing NPI_OTH1	18	\$277,611.79
E73	Missing NPI_OTH2	23	\$560,603.64
E88	Missing ECODE when injury diagnosis (800x-999x) reported	1	\$91,061.56

Hospital Data Submission System

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DQR2 Submitted Records by Month of Discharge

Summarizes the number of records submitted by Medicare Provider Number ("PROV"), warning status, and month of discharge. Real-time for submitted, non-adjudicated data, weekly for adjudicated data.

PROV	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
No Warnings			0		0							
Warnings			2		16							
Total			2		16							

- The report is expandable by unit, discharge year, submitted records (non adjudicated), and adjudicated discharges. The current collection year is the default year. If other years need to be viewed, filter by year and click View Report.

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DQR3 Patient Listing

Presents key fields from all individual records. A real-time report for submitted (non-adjudicated data), adjudicated data is updated weekly.

DQR3 Patient Listing, ALL Records

Test Hospital

MRN	Provider Number	Bill Type	Start of Service	End of Service	Total Charges	Days	Patient Gender	Patient Birth	Physician Specialty	Procedural Diagnosis	HCC Back	Hospital Number	Hospital Name	Batch	Report	STATUS
BR409039	510026	111	1/27/2011	1/28/2011	\$1,099.78	H2120	Female	2/15/2010 26361	96611	51 X00075	JANFEB2011	nextest	10/10/2012 Deleted			
BR409039	510026	111	1/27/2011	1/28/2011	\$1,099.78	H2120	Female	2/15/2010 26361	96611	87 X00075	nextest	10/10/2012 Deleted				
BR409039	510026	111	1/27/2011	1/28/2011	\$1,099.78	H2120	Female	2/15/2010 26361	96611	108 X00075	JANFEB2011	nextest	10/10/2012 Invald			
6M11402	510026	111	1/28/2011	1/30/2011	\$4,964.32	H5310	Female	2/4/1965 26452	9620	51 X00075	JANFEB2011	nextest	10/10/2012 Deleted			
6M11402	510026	111	1/28/2011	1/30/2011	\$4,964.32	H5310	Female	2/4/1965 26452	9620	87 X00075	nextest	10/10/2012 Deleted				
6M11402	510026	111	1/28/2011	1/30/2011	\$4,964.32	H5310	Female	2/4/1965 26452	9620	108 X00075	JANFEB2011	nextest	10/10/2012 Invald			
VF41424	510026	111	1/28/2011	1/29/2011	\$790.90	H2120	Male	12/4/2069 26351	9644	51 X00075	JANFEB2011	nextest	10/10/2012 Deleted			
VF41424	510026	111	1/28/2011	1/29/2011	\$790.90	H2120	Male	12/4/2069 26351	9644	87 X00075	nextest	10/10/2012 Deleted				
VF41424	510026	111	1/28/2011	1/29/2011	\$790.90	H2120	Male	12/4/2069 26351	9644	108 X00075	JANFEB2011	nextest	10/10/2012 Invald			
6415068	510026	111	1/28/2011	1/29/2011	\$7,957.63	H2420	Male	1/28/1949 26351	1623	51 X00075	JANFEB2011	nextest	10/10/2012 Deleted			
6415068	510026	111	1/28/2011	1/29/2011	\$7,957.63	H2420	Male	1/28/1949 26351	1623	87 X00075	nextest	10/10/2012 Deleted				

DQR4 Payer Reconciliation

A report that compares adjudicated discharge counts contained in the master database to discharge counts submitted by hospitals on the on-line quarterly reconciliation summary form (see section 8 on reconciliation). This is only visible after the online reconciliation form has been submitted.

DQR4 - Payer Reconciliation

Test Hospital - 510020

Provider Number	Discharge Month	Status	Medical	Medicare	HCIA	Other (UNASSIGNED)	Non-Contributing (UNASSIGNED)	Unbilled	Total	
518059	Jan, 2011	Reported	10	48	120	0	5676	40	6	5890
		Adjudicated	18	40	120	0	5675	40	6	5880
		Difference	8	-8	0	0	1	0	0	0
Feb, 2011	Reported	26	40	90	0	3456	70	1	3671	
	Adjudicated	30	45	90	0	3456	70	1	3671	
	Difference	4	5	0	0	0	0	0	0	
Mar, 2011	Reported	10	10	10	10	10	0	2345	1388	
	Adjudicated	10	10	10	10	10	0	2348	1390	
	Difference	0	0	0	0	0	0	3	2	
	Reported	10	10	10	10	10	0	2345	1388	
	Adjudicated	10	10	10	10	10	0	2348	1390	
	Difference	0	0	0	0	0	0	3	2	

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DQR5A, DQR5B, DQR5C – Bill Type Reports

Three reports updated weekly that identify missing interim records that prevent the adjudication of claims.

DQR5 Bill Type Report Non-Adjudicated, a matrix showing potential issues to be investigated.

DQR5 Bill Type Report Non-Adjudicated

Test Hospital - 510020

Date/time report last updated: 23MAR12 11:19
Date/time data processed: 3/8/2012 9:48:07 AM

Bill Category	No-Charge Bill XXX	Admit Through Discharge XXX	Interim First Claim XXX	Interim Continuing Claim XXX	Interim Last Claim XXX	Late Charge Only XXX	Replacement of Prior Claim XXX	Void/Cancel of Prior Claim XXX	Number of Discharges per Bill Type	Number of Hospital Discharges	Percent Distribution	Needs Review
11	0	1	0	0	0	0	0	0	1954	1954	100.0%	No
12	0	1	0	0	0	0	0	0	1	1	0.1%	No
12	0	0	1	0	0	0	0	0	1	1	0.1%	Yes

DQR5b Bill Type Report Patient Listing, for those situations marked as Needs Review from DQR5.

DQR5b Bill Type Report Patient Listing

Test Hospital - 510020

Date/time report last updated: 23MAR12 11:19

Date/time data modified: 3/8/2012 9:48:07 AM

Patient Number	End of Service	Bill Type
P000399967 2	1/1/2011	122

DQR5c Bill Type Report Adjudicated, a matrix showing potential issues have been resolved through adjudication.

DQR5c Bill Type Report Adjudicated

Test Hospital - 510020

Date/time report last updated: 23MAR12 11:19
Date/time data processed: 3/8/2012 9:48:07 AM

Bill Category	No-Charge Bill XXX	Admit Through Discharge XXX	Interim First Claim XXX	Interim Continuing Claim XXX	Interim Last Claim XXX	Late Charge Only XXX	Replacement of Prior Claim XXX	Void/Cancel of Prior Claim XXX	Number of Discharges per Bill Type	Number of Hospital Discharges	Percent Distribution	Needs Review
11	0	1	0	0	0	0	0	0	1955	1955	100.0%	No
12	0	1	0	0	0	0	0	0	1	1	0.1%	No

Hospital Data Submission System User Guide

DQR6 Potential Duplicates Report

Hospital:

1 of 1 of 1 of 1 of 100%

DQR6 Potential Duplicates Report Test Hospital

Date/time report last updated: 16MAY12 14:29

Date/time data processed: 15MAY2012:21

Hospital Batch Number	Start of Service	Bill Type	Provider Number	Payer	Principal Diagnosis	Patient Number	Number of Duplicates
199712	3/10/2011	111	510020	H2159	V3001	UY154198550	1
199712	3/10/2011	111	510020	H5390	V3000	<u>UY154198717</u>	2

A report that identifies records with different patient control numbers which could potentially represent a single patient (based on the fact that the records match on other key fields). Updated weekly on adjudicated data.

DQR7 Over-counted Discharges Report

DQR7 Overcounting Report

Test Hospital
Date/time report last updated: 07JUN2016:20
Date/time data processed: 07JUN16 17:09

Provider Number	Patient Control Number	Admit Date	Start of Service	End of Service	Bill Type	Adjudicated	Total Charge	Principal Procedure	Primary Diagnosis	Primary Payer	Birth Date	Sex	NCA Batch ID	Batch Name	Combined Claim	Submit	Complete Interim Claims
999999	XX1444	1/12/2015	1/12/2015	1/19/2015	211	1	\$4,556	4280	H1159	H1159	11/1/1950	F	1 Test Batch	0	1	0	
999999	ZZ8976	1/23/2016	1/23/2016	2/7/2016	211	1	\$11,191	4280	H1110	H1110	12/10/1929	M	2 Test 2	0	1	0	
999999	WV9087	4/1/2015	4/1/2015	5/29/2015	211	1	\$39,641	42731	H1116	H1116	5/21/1976	F	3 Test 3	0	1	0	

A report presenting information about records that are being over counted and are not adjudicating together.

DQR8 Under-counted Discharges Report

DQR8 Undercounted Discharges Report

Test Hospital
Date/time report last updated: 14JUN16 12:14
Date/time data processed: 12JUN2016:12

Patient Control	Admit Date	Start of Service	End of Service	Bill Type	Adjudicated	Total Charge	Principal Procedure	Primary Diagnosis	Primary Payer	DOB	Sex	Batch ID	Batch Name
XX45	10/7/2012	10/7/2012	10/9/2012	111	0	\$7,584.18	4513	53541	H1120	1/4/1947	F	1 Test	
XX45	10/7/2012	10/7/2012	10/9/2012	118	0	\$7,584.18	4513	53541	H1120	1/4/1947	F	1 Test	
33RR	11/26/2012	11/26/2012	12/1/2012	111	0	\$24,097.31	5149	57431	H1120	8/9/1931	M	1 Test	
33RR	11/26/2012	11/26/2012	12/1/2012	118	0	\$24,097.31	5149	57431	H1120	8/9/1931	M	1 Test	

A report presenting information about records that are being under-counted and are not adjudicating together.

Hospital Data Submission System User Guide

DQR9 Under-counted Discharges Report

DQR9 Records with W101 Duplicate Warning
(Matching PROV, PATNO, BTYPE, EDATE)

Patient	Provider	Hospital	Discharge Date	Discharge Type	Discharge Status	Discharge Reason	Discharge Location	Discharge Date	Discharge Time	Discharge Status	Discharge Reason	Discharge Location	Discharge Date	Discharge Time	Discharge Status	Discharge Reason	Discharge Location			
999999	11270015335	9428	5/2/2015	11	10/18/1802	U	F	26354	4280	M	04,003	W1120	4	4	0	12/16/2015 12:31:25 PM	12/16/2015 11:27:21 AM	12/16/2015 11:31:25 PM TEST	Yes	
999999	11270015335	9428	5/2/2015	11	10/18/1802	U	F	26354	4280	M	04,003	W1120	4	4	0	10/5/2015 4:40:54 PM	2/23/2015 12:31:16 PM	10/5/2015 4:31:05 PM TEST	No	
999999	11470017444	93942	6/4/2015	6/18/2015	11	2/21/1868	U	M	26354	00849	M	03,730	W1120	5	0	0	12/16/2015 12:31:25 PM	12/16/2015 11:27:21 AM	12/16/2015 12:31:25 PM TEST	Yes
999999	11470017444	93942	6/4/2015	6/18/2015	11	2/21/1868	U	M	26354	00849	M	03,730	W1120	5	0	0	10/5/2015 4:41:04 PM	7/15/2015 12:31:17 PM	10/5/2015 4:01:05 PM TEST	No

A report that displays records with matching provider, patient number, bill type, and edate, but are from different batches.

DQR10 Missing SSN Report

HCA Hospital ID	Medicare Provider Number	Hospital Name	# w/SSN	# w/o SSN	# Total	% w/SSN	% w/out SSN
32325	510423	Test Hospital	0	2	2	0	100

On an aggregate level, shows the percent of records with missing social security number (null or 999999999). This report is necessary because for the user, the HCA, and SSS, the social security number is not visible in the system.

Exporting Reports

All reports, except for DQR10, may be exported by clicking on the disk icon. In Excel, the report will retain expandable capabilities.



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7. On-line Reconciliation

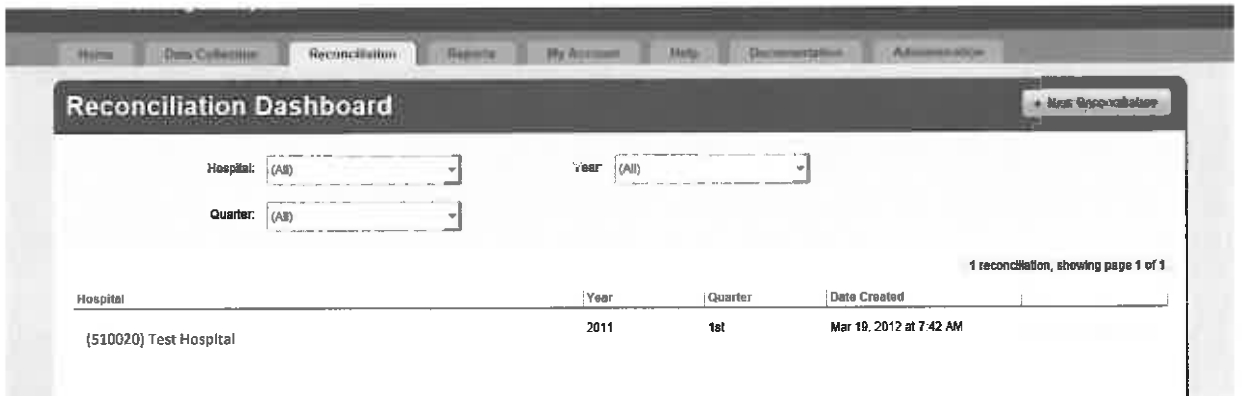
- The reconciliation form is on-line. Click on the Reconciliation tab and you will be brought to the Reconciliation Dashboard.
- To fill out a new reconciliation form, click on the New Reconciliation button.
- You will be brought to the form where you will populate your information.
- Before you may enter discharge information, first select a Hospital, Year, and Quarter. Note: only one reconciliation form may be created for each hospital per quarter.

- Reconciliation information will be entered by quarter and counts for the three months of that quarter must be entered for the following categories: Medicare, Medicaid, PEIA, Other Government, Non-Government, Unknown/NEC, and Uninsured. The *Total* column will auto-sum for each row.

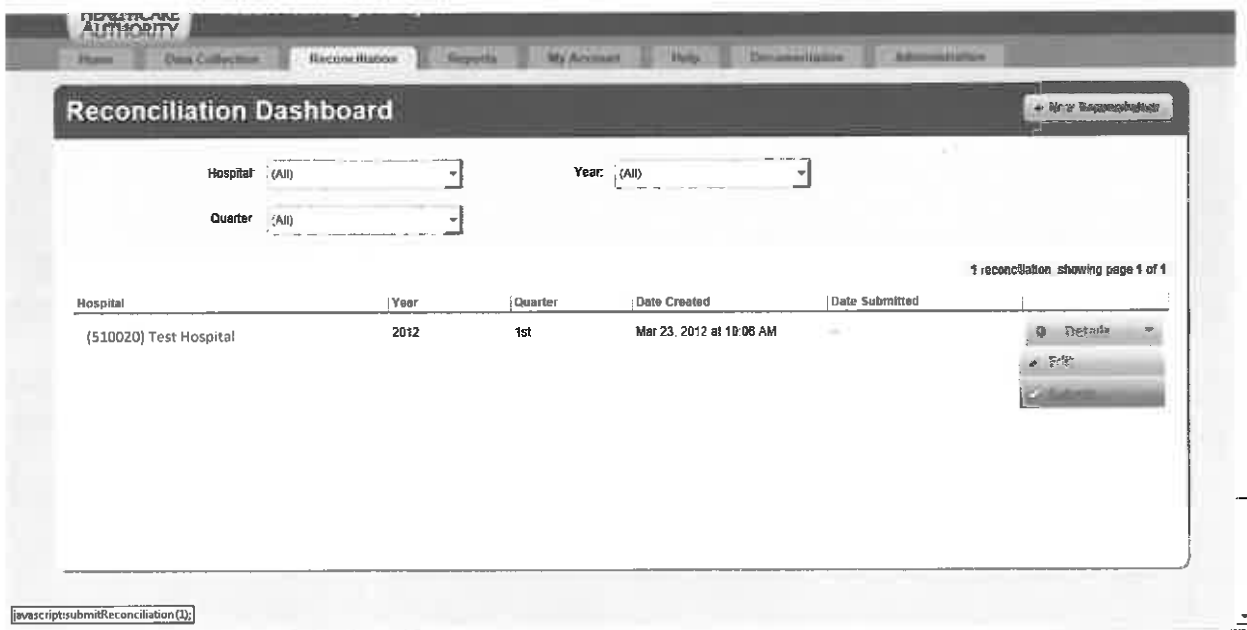
Month	Medicare	Medicaid	PEIA	Other Govt	Non-Govt	Unknown/NEC	Uninsured	Total
January	10	11	12	13	14	15	16	75
February	20	21	22	23	24	25	26	141
March	30	31	32	33	34	35	36	211

- From the Reconciliation Dashboard, you can also view and edit reconciliation information that has already been entered and saved.

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- Click on the Details button, and you will see a read-only view of the reconciliation. This information can continue to be edited by clicking the Edit button from the Details.
- You may also edit a reconciliation from the Reconciliation Dashboard by clicking the arrow next to the details button. In the same manner, you may also submit the reconciliation.
- Submitting the reconciliation will finalize the data and it can no longer be edited.



- After submission, the reconciliation report is viewable (DQR4).

8. Finishing up a Session

Idle time is 20 minutes. As a best practice, users should logout using the link at the top-right of every page when they are done.

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User Guide

9. General Information

- **Minimum system requirements:**
 - **Resolution:** 1280x768
 - **Operating System:** Any, providing one of the following browsers is available.
 - **Browser:** Internet Explorer 11, Chrome (any recent version), Firefox (any recent version), Safari (any recent version), Opera (any recent version).
- **Further resources:**
 - The Help tab is full of FAQs and useful information – please search here first if you have a question.
 - The help desk is available to you by clicking on the Contact Us link at the bottom left of each screen, or e-mail the help desk at HDSSSupport@s-3.com
 - The Documentation tab contains useful documentation pertinent to the system

Appendix C **WVHCA Master Files and Variables**

Appendix C is provided as a separate Excel document.

Tab Name	Description
Masterfiles Description	Description of Masterfiles: General description, year of data collected, fields collected
MASTER	Variables, Variable Name, Type, Location Label in Master file
MASTER2	Variables, Variable Name, Type, Location Label in Master2 file
MASTADJ	Variables, Variable Name, Type, Location Label in MasterAdjudicated file
MASTADJ2	Variables, Variable Name, Type, Location Label in Master2Adjudicated file
Masterfiles Vars Universe	All variables in all files, in which Masterfile they are located, variable origin, OLE name if variable is submitted, originating variable if parsed, code source, and additional notes
HCA Coding	If code source is HCA, coding for variable

Column Descriptions in "Masterfiles Vars | Universe Tab"

Data Element Category	Variables are categorized by their content/meaningful use
Variable Name	Name of variables in all datasets above (universe)
HPDS Variable Name	This is the name of the variable as presented to data submitters on the Health Data Processing System - the name is either the "Same" as the Variable Name in Column B or the HPDS name is provided
Variable Type	Character or numeric
Variable Label	Proposed New Variable Label (if it is left blank, it is because we are no longer collecting the data element)
Variable Origin	Variables are either: submitted, vendor created: processing, or vendor created: analytic
Code Source	If variable has a code source other than the meaning of the variable itself (such as DOB) the code source is listed here.
Master.txt	1 = variable present in dataset/ 0 = variable not present in dataset
Master2.txt	1 = variable present in dataset/ 0 = variable not present in dataset
MasterAdjudicated.txt	1 = variable present in dataset/ 0 = variable not present in dataset
Master2Adjudicated.txt	1 = variable present in dataset/ 0 = variable not present in dataset
Adjudication - Interim Bill Types	Interim bill type(s) used to create final complete record during adjudication
Adjudication - Values Retained	Values/codes retained from interim bill(s) when creating final complete record during adjudication
Variable Notes/Information	If variable is "vendor created: analytic," the originating variable is listed here. If this information is unknown, the question or concern surrounding this variable is posed here.

File Name	File Description	Fields Collected
MASTER.TXT	This file contains all observations as submitted from hospitals, prior to the application of adjudication rules.	The majority of fields in this file are submitted only. There are some exceptions-a few processing fields and 1-2 analytic fields.
MASTER2.TXT	This is a tail file of MASTER.TXT, containing observations with more than 12 accommodation charges or more than 45 ancillary charges, or both (per CHG_FLG label description)	Fields in this file: Ancillary Charges, Revenue Codes, and Units 46-99/ Room Charges, Revenue Codes, and Units 13 - 20/ Key fields: BATCHID, BATNO, BTYPE, CHG_FLAG, EDATE, HOSPID, HOSPID2, PATNO, PROV
MASTERADJUDICATED.TXT	This file is created from the MASTER.TXT after the application of adjudication rules. It contains the analytic variable: ANFLAG = 1/0.	This file contains fields submitted by the hospital, and processing and analytic fields created by the vendor
MASTER2ADJUDICATED.TXT	This file is a tail file of MASTERADJUDICATED.TXT, containing observations with more than 45 charges (per CHG_FLG label description)	Fields in this file: Charges, Units, and Revenue Codes 46-119. Key fields: ANFLAG, BATCHID, BATNO, BTYPE, COMBFLAG, DISCTYPE, EDATE, HOSPID, HOSPID2, MASTERF, MASTKEY, PATNO, PROV

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Diagnosis/Ecode/POA	ACCSTATE	Same	character	Accident State
Diagnosis/Ecode/POA	ADMDIAG	Same	character	Admitting Diagnosis
Date	ADMIT	Same	numeric	Date of Admission
Patient Demographics	AG	N/A	numeric	Patient Age Category
Patient Demographics	AGE	N/A	numeric	Patient Age - Single Year
Charges/Revenue Codes/Units	ANCHG1	Same	numeric	Ancillary Charge: 1st
Charges/Revenue Codes/Units	ANCHG10	Same	numeric	Ancillary Charge: 10th
Charges/Revenue Codes/Units	ANCHG11	Same	numeric	Ancillary Charge: 11th
Charges/Revenue Codes/Units	ANCHG12	Same	numeric	Ancillary Charge: 12th
Charges/Revenue Codes/Units	ANCHG13	Same	numeric	Ancillary Charge: 13th
Charges/Revenue Codes/Units	ANCHG14	Same	numeric	Ancillary Charge: 14th
Charges/Revenue Codes/Units	ANCHG15	Same	numeric	Ancillary Charge: 15th
Charges/Revenue Codes/Units	ANCHG16	Same	numeric	Ancillary Charge: 16th
Charges/Revenue Codes/Units	ANCHG17	Same	numeric	Ancillary Charge: 17th
Charges/Revenue Codes/Units	ANCHG18	Same	numeric	Ancillary Charge: 18th
Charges/Revenue Codes/Units	ANCHG19	Same	numeric	Ancillary Charge: 19th
Charges/Revenue Codes/Units	ANCHG2	Same	numeric	Ancillary Charge: 2nd
Charges/Revenue Codes/Units	ANCHG20	Same	numeric	Ancillary Charge: 20th
Charges/Revenue Codes/Units	ANCHG21	Same	numeric	Ancillary Charge: 21st
Charges/Revenue Codes/Units	ANCHG22	Same	numeric	Ancillary Charge: 22nd
Charges/Revenue Codes/Units	ANCHG23	Same	numeric	Ancillary Charge: 23rd
Charges/Revenue Codes/Units	ANCHG24	Same	numeric	Ancillary Charge: 24th
Charges/Revenue Codes/Units	ANCHG25	Same	numeric	Ancillary Charge: 25th
Charges/Revenue Codes/Units	ANCHG26	Same	numeric	Ancillary Charge: 26th
Charges/Revenue Codes/Units	ANCHG27	Same	numeric	Ancillary Charge: 27th
Charges/Revenue Codes/Units	ANCHG28	Same	numeric	Ancillary Charge: 28th
Charges/Revenue Codes/Units	ANCHG29	Same	numeric	Ancillary Charge: 29th
Charges/Revenue Codes/Units	ANCHG3	Same	numeric	Ancillary Charge: 3rd
Charges/Revenue Codes/Units	ANCHG30	Same	numeric	Ancillary Charge: 30th
Charges/Revenue Codes/Units	ANCHG31	Same	numeric	Ancillary Charge: 31st
Charges/Revenue Codes/Units	ANCHG32	Same	numeric	Ancillary Charge: 32nd
Charges/Revenue Codes/Units	ANCHG33	Same	numeric	Ancillary Charge: 33rd
Charges/Revenue Codes/Units	ANCHG34	Same	numeric	Ancillary Charge: 34th
Charges/Revenue Codes/Units	ANCHG35	Same	numeric	Ancillary Charge: 35th
Charges/Revenue Codes/Units	ANCHG36	Same	numeric	Ancillary Charge: 36th
Charges/Revenue Codes/Units	ANCHG37	Same	numeric	Ancillary Charge: 37th
Charges/Revenue Codes/Units	ANCHG38	Same	numeric	Ancillary Charge: 38th
Charges/Revenue Codes/Units	ANCHG39	Same	numeric	Ancillary Charge: 39th
Charges/Revenue Codes/Units	ANCHG4	Same	numeric	Ancillary Charge: 4th
Charges/Revenue Codes/Units	ANCHG40	Same	numeric	Ancillary Charge: 40th
Charges/Revenue Codes/Units	ANCHG41	Same	numeric	Ancillary Charge: 41st
Charges/Revenue Codes/Units	ANCHG42	Same	numeric	Ancillary Charge: 42nd
Charges/Revenue Codes/Units	ANCHG43	Same	numeric	Ancillary Charge: 43rd
Charges/Revenue Codes/Units	ANCHG44	Same	numeric	Ancillary Charge: 44th
Charges/Revenue Codes/Units	ANCHG45	Same	numeric	Ancillary Charge: 45th
Charges/Revenue Codes/Units	ANCHG46	Same	numeric	Ancillary Charge: 46th
Charges/Revenue Codes/Units	ANCHG47	Same	numeric	Ancillary Charge: 47th
Charges/Revenue Codes/Units	ANCHG48	Same	numeric	Ancillary Charge: 48th
Charges/Revenue Codes/Units	ANCHG49	Same	numeric	Ancillary Charge: 49th

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Charges/Revenue Codes/Units	ANCHG5	Same	numeric	Ancillary Charge: 5th
Charges/Revenue Codes/Units	ANCHG50	Same	numeric	Ancillary Charge: 50th
Charges/Revenue Codes/Units	ANCHG51	Same	numeric	Ancillary Charge: 51st
Charges/Revenue Codes/Units	ANCHG52	Same	numeric	Ancillary Charge: 52nd
Charges/Revenue Codes/Units	ANCHG53	Same	numeric	Ancillary Charge: 53rd
Charges/Revenue Codes/Units	ANCHG54	Same	numeric	Ancillary Charge: 54th
Charges/Revenue Codes/Units	ANCHG55	Same	numeric	Ancillary Charge: 55th
Charges/Revenue Codes/Units	ANCHG56	Same	numeric	Ancillary Charge: 56th
Charges/Revenue Codes/Units	ANCHG57	Same	numeric	Ancillary Charge: 57th
Charges/Revenue Codes/Units	ANCHG58	Same	numeric	Ancillary Charge: 58th
Charges/Revenue Codes/Units	ANCHG59	Same	numeric	Ancillary Charge: 59th
Charges/Revenue Codes/Units	ANCHG6	Same	numeric	Ancillary Charge: 6th
Charges/Revenue Codes/Units	ANCHG60	Same	numeric	Ancillary Charge: 60th
Charges/Revenue Codes/Units	ANCHG61	Same	numeric	Ancillary Charge: 61st
Charges/Revenue Codes/Units	ANCHG62	Same	numeric	Ancillary Charge: 62nd
Charges/Revenue Codes/Units	ANCHG63	Same	numeric	Ancillary Charge: 63rd
Charges/Revenue Codes/Units	ANCHG64	Same	numeric	Ancillary Charge: 64th
Charges/Revenue Codes/Units	ANCHG65	Same	numeric	Ancillary Charge: 65th
Charges/Revenue Codes/Units	ANCHG66	Same	numeric	Ancillary Charge: 66th
Charges/Revenue Codes/Units	ANCHG67	Same	numeric	Ancillary Charge: 67th
Charges/Revenue Codes/Units	ANCHG68	Same	numeric	Ancillary Charge: 68th
Charges/Revenue Codes/Units	ANCHG69	Same	numeric	Ancillary Charge: 69th
Charges/Revenue Codes/Units	ANCHG7	Same	numeric	Ancillary Charge: 7th
Charges/Revenue Codes/Units	ANCHG70	Same	numeric	Ancillary Charge: 70th
Charges/Revenue Codes/Units	ANCHG71	Same	numeric	Ancillary Charge: 71st
Charges/Revenue Codes/Units	ANCHG72	Same	numeric	Ancillary Charge: 72nd
Charges/Revenue Codes/Units	ANCHG73	Same	numeric	Ancillary Charge: 73rd
Charges/Revenue Codes/Units	ANCHG74	Same	numeric	Ancillary Charge: 74th
Charges/Revenue Codes/Units	ANCHG75	Same	numeric	Ancillary Charge: 75th
Charges/Revenue Codes/Units	ANCHG76	Same	numeric	Ancillary Charge: 76th
Charges/Revenue Codes/Units	ANCHG77	Same	numeric	Ancillary Charge: 77th
Charges/Revenue Codes/Units	ANCHG78	Same	numeric	Ancillary Charge: 78th
Charges/Revenue Codes/Units	ANCHG79	Same	numeric	Ancillary Charge: 79th
Charges/Revenue Codes/Units	ANCHG8	Same	numeric	Ancillary Charge: 8th
Charges/Revenue Codes/Units	ANCHG80	Same	numeric	Ancillary Charge: 80th
Charges/Revenue Codes/Units	ANCHG81	Same	numeric	Ancillary Charge: 81st
Charges/Revenue Codes/Units	ANCHG82	Same	numeric	Ancillary Charge: 82nd
Charges/Revenue Codes/Units	ANCHG83	Same	numeric	Ancillary Charge: 83rd
Charges/Revenue Codes/Units	ANCHG84	Same	numeric	Ancillary Charge: 84th
Charges/Revenue Codes/Units	ANCHG85	Same	numeric	Ancillary Charge: 85th
Charges/Revenue Codes/Units	ANCHG86	Same	numeric	Ancillary Charge: 86th
Charges/Revenue Codes/Units	ANCHG87	Same	numeric	Ancillary Charge: 87th
Charges/Revenue Codes/Units	ANCHG88	Same	numeric	Ancillary Charge: 88th
Charges/Revenue Codes/Units	ANCHG89	Same	numeric	Ancillary Charge: 89th
Charges/Revenue Codes/Units	ANCHG9	Same	numeric	Ancillary Charge: 9th
Charges/Revenue Codes/Units	ANCHG90	Same	numeric	Ancillary Charge: 90th
Charges/Revenue Codes/Units	ANCHG91	Same	numeric	Ancillary Charge: 91st
Charges/Revenue Codes/Units	ANCHG92	Same	numeric	Ancillary Charge: 92nd
Charges/Revenue Codes/Units	ANCHG93	Same	numeric	Ancillary Charge: 93rd

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Charges/Revenue Codes/Units	ANU91	Same	numeric	Ancillary Service Unit: 91st Charge
Charges/Revenue Codes/Units	ANU92	Same	numeric	Ancillary Service Unit: 92nd Charge
Charges/Revenue Codes/Units	ANU93	Same	numeric	Ancillary Service Unit: 93rd Charge
Charges/Revenue Codes/Units	ANU94	Same	numeric	Ancillary Service Unit: 94th Charge
Charges/Revenue Codes/Units	ANU95	Same	numeric	Ancillary Service Unit: 95th Charge
Charges/Revenue Codes/Units	ANU96	Same	numeric	Ancillary Service Unit: 96th Charge
Charges/Revenue Codes/Units	ANU97	Same	numeric	Ancillary Service Unit: 97th Charge
Charges/Revenue Codes/Units	ANU98	Same	numeric	Ancillary Service Unit: 98th Charge
Charges/Revenue Codes/Units	ANU99	Same	numeric	Ancillary Service Unit: 99th Charge
Processing	BATCHID	N/A	character	HCA Unique Batch Number Applied by Vendor
Processing	BATDATE	Same	numeric	Date Batch Prepared
Processing	BATNO	Same	character	Hospital Batch Number
Patient Demographics	BDAY	DOB	numeric	Patient birth day
Bill and Visit Codes	BILLCAT	N/A	character	Bill Category
Patient Demographics	BMO	DOB	numeric	Patient birth month
Bill and Visit Codes	BTYPE	Same	numeric	Bill Type
Patient Demographics	BYEAR	DOB	numeric	Patient birth year
Date	B_MONTH	N/A	character	Billing Month Flag
Bill and Visit Codes	CCODE	Same	character	Condition Code
Charges/Revenue Codes/Units	CHG1	N/A	numeric	Charges 1
Charges/Revenue Codes/Units	CHG10	N/A	numeric	Charges 10
Charges/Revenue Codes/Units	CHG100	N/A	numeric	Charges 100
Charges/Revenue Codes/Units	CHG101	N/A	numeric	Charges 101
Charges/Revenue Codes/Units	CHG102	N/A	numeric	Charges 102
Charges/Revenue Codes/Units	CHG103	N/A	numeric	Charges 103
Charges/Revenue Codes/Units	CHG104	N/A	numeric	Charges 104
Charges/Revenue Codes/Units	CHG105	N/A	numeric	Charges 105
Charges/Revenue Codes/Units	CHG106	N/A	numeric	Charges 106
Charges/Revenue Codes/Units	CHG107	N/A	numeric	Charges 107
Charges/Revenue Codes/Units	CHG108	N/A	numeric	Charges 108
Charges/Revenue Codes/Units	CHG109	N/A	numeric	Charges 109
Charges/Revenue Codes/Units	CHG11	N/A	numeric	Charges 11
Charges/Revenue Codes/Units	CHG110	N/A	numeric	Charges 110
Charges/Revenue Codes/Units	CHG111	N/A	numeric	Charges 111
Charges/Revenue Codes/Units	CHG112	N/A	numeric	Charges 112
Charges/Revenue Codes/Units	CHG113	N/A	numeric	Charges 113
Charges/Revenue Codes/Units	CHG114	N/A	numeric	Charges 114
Charges/Revenue Codes/Units	CHG115	N/A	numeric	Charges 115
Charges/Revenue Codes/Units	CHG116	N/A	numeric	Charges 116
Charges/Revenue Codes/Units	CHG117	N/A	numeric	Charges 117
Charges/Revenue Codes/Units	CHG118	N/A	numeric	Charges 118
Charges/Revenue Codes/Units	CHG119	N/A	numeric	Charges 119
Charges/Revenue Codes/Units	CHG12	N/A	numeric	Charges 12
Charges/Revenue Codes/Units	CHG13	N/A	numeric	Charges 13
Charges/Revenue Codes/Units	CHG14	N/A	numeric	Charges 14
Charges/Revenue Codes/Units	CHG15	N/A	numeric	Charges 15
Charges/Revenue Codes/Units	CHG16	N/A	numeric	Charges 16
Charges/Revenue Codes/Units	CHG17	N/A	numeric	Charges 17

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Charges/Revenue Codes/Units	CHG18	N/A	numeric	Charges 18
Charges/Revenue Codes/Units	CHG19	N/A	numeric	Charges 19
Charges/Revenue Codes/Units	CHG2	N/A	numeric	Charges 2
Charges/Revenue Codes/Units	CHG20	N/A	numeric	Charges 20
Charges/Revenue Codes/Units	CHG21	N/A	numeric	Charges 21
Charges/Revenue Codes/Units	CHG22	N/A	numeric	Charges 22
Charges/Revenue Codes/Units	CHG23	N/A	numeric	Charges 23
Charges/Revenue Codes/Units	CHG24	N/A	numeric	Charges 24
Charges/Revenue Codes/Units	CHG25	N/A	numeric	Charges 25
Charges/Revenue Codes/Units	CHG26	N/A	numeric	Charges 26
Charges/Revenue Codes/Units	CHG27	N/A	numeric	Charges 27
Charges/Revenue Codes/Units	CHG28	N/A	numeric	Charges 28
Charges/Revenue Codes/Units	CHG29	N/A	numeric	Charges 29
Charges/Revenue Codes/Units	CHG3	N/A	numeric	Charges 3
Charges/Revenue Codes/Units	CHG30	N/A	numeric	Charges 30
Charges/Revenue Codes/Units	CHG31	N/A	numeric	Charges 31
Charges/Revenue Codes/Units	CHG32	N/A	numeric	Charges 32
Charges/Revenue Codes/Units	CHG33	N/A	numeric	Charges 33
Charges/Revenue Codes/Units	CHG34	N/A	numeric	Charges 34
Charges/Revenue Codes/Units	CHG35	N/A	numeric	Charges 35
Charges/Revenue Codes/Units	CHG36	N/A	numeric	Charges 36
Charges/Revenue Codes/Units	CHG37	N/A	numeric	Charges 37
Charges/Revenue Codes/Units	CHG38	N/A	numeric	Charges 38
Charges/Revenue Codes/Units	CHG39	N/A	numeric	Charges 39
Charges/Revenue Codes/Units	CHG4	N/A	numeric	Charges 4
Charges/Revenue Codes/Units	CHG40	N/A	numeric	Charges 40
Charges/Revenue Codes/Units	CHG41	N/A	numeric	Charges 41
Charges/Revenue Codes/Units	CHG42	N/A	numeric	Charges 42
Charges/Revenue Codes/Units	CHG43	N/A	numeric	Charges 43
Charges/Revenue Codes/Units	CHG44	N/A	numeric	Charges 44
Charges/Revenue Codes/Units	CHG45	N/A	numeric	Charges 45
Charges/Revenue Codes/Units	CHG46	N/A	numeric	Charges 46
Charges/Revenue Codes/Units	CHG47	N/A	numeric	Charges 47
Charges/Revenue Codes/Units	CHG48	N/A	numeric	Charges 48
Charges/Revenue Codes/Units	CHG49	N/A	numeric	Charges 49
Charges/Revenue Codes/Units	CHG5	N/A	numeric	Charges 5
Charges/Revenue Codes/Units	CHG50	N/A	numeric	Charges 50
Charges/Revenue Codes/Units	CHG51	N/A	numeric	Charges 51
Charges/Revenue Codes/Units	CHG52	N/A	numeric	Charges 52
Charges/Revenue Codes/Units	CHG53	N/A	numeric	Charges 53
Charges/Revenue Codes/Units	CHG54	N/A	numeric	Charges 54
Charges/Revenue Codes/Units	CHG55	N/A	numeric	Charges 55
Charges/Revenue Codes/Units	CHG56	N/A	numeric	Charges 56
Charges/Revenue Codes/Units	CHG57	N/A	numeric	Charges 57
Charges/Revenue Codes/Units	CHG58	N/A	numeric	Charges 58
Charges/Revenue Codes/Units	CHG59	N/A	numeric	Charges 59
Charges/Revenue Codes/Units	CHG6	N/A	numeric	Charges 6
Charges/Revenue Codes/Units	CHG60	N/A	numeric	Charges 60
Charges/Revenue Codes/Units	CHG61	N/A	numeric	Charges 61

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Charges/Revenue Codes/Units	CHG62	N/A	numeric	Charges 62
Charges/Revenue Codes/Units	CHG63	N/A	numeric	Charges 63
Charges/Revenue Codes/Units	CHG64	N/A	numeric	Charges 64
Charges/Revenue Codes/Units	CHG65	N/A	numeric	Charges 65
Charges/Revenue Codes/Units	CHG66	N/A	numeric	Charges 66
Charges/Revenue Codes/Units	CHG67	N/A	numeric	Charges 67
Charges/Revenue Codes/Units	CHG68	N/A	numeric	Charges 68
Charges/Revenue Codes/Units	CHG69	N/A	numeric	Charges 69
Charges/Revenue Codes/Units	CHG7	N/A	numeric	Charges 7
Charges/Revenue Codes/Units	CHG70	N/A	numeric	Charges 70
Charges/Revenue Codes/Units	CHG71	N/A	numeric	Charges 71
Charges/Revenue Codes/Units	CHG72	N/A	numeric	Charges 72
Charges/Revenue Codes/Units	CHG73	N/A	numeric	Charges 73
Charges/Revenue Codes/Units	CHG74	N/A	numeric	Charges 74
Charges/Revenue Codes/Units	CHG75	N/A	numeric	Charges 75
Charges/Revenue Codes/Units	CHG76	N/A	numeric	Charges 76
Charges/Revenue Codes/Units	CHG77	N/A	numeric	Charges 77
Charges/Revenue Codes/Units	CHG78	N/A	numeric	Charges 78
Charges/Revenue Codes/Units	CHG79	N/A	numeric	Charges 79
Charges/Revenue Codes/Units	CHG8	N/A	numeric	Charges 8
Charges/Revenue Codes/Units	CHG80	N/A	numeric	Charges 80
Charges/Revenue Codes/Units	CHG81	N/A	numeric	Charges 81
Charges/Revenue Codes/Units	CHG82	N/A	numeric	Charges 82
Charges/Revenue Codes/Units	CHG83	N/A	numeric	Charges 83
Charges/Revenue Codes/Units	CHG84	N/A	numeric	Charges 84
Charges/Revenue Codes/Units	CHG85	N/A	numeric	Charges 85
Charges/Revenue Codes/Units	CHG86	N/A	numeric	Charges 86
Charges/Revenue Codes/Units	CHG87	N/A	numeric	Charges 87
Charges/Revenue Codes/Units	CHG88	N/A	numeric	Charges 88
Charges/Revenue Codes/Units	CHG89	N/A	numeric	Charges 89
Charges/Revenue Codes/Units	CHG9	N/A	numeric	Charges 9
Charges/Revenue Codes/Units	CHG90	N/A	numeric	Charges 90
Charges/Revenue Codes/Units	CHG91	N/A	numeric	Charges 91
Charges/Revenue Codes/Units	CHG92	N/A	numeric	Charges 92
Charges/Revenue Codes/Units	CHG93	N/A	numeric	Charges 93
Charges/Revenue Codes/Units	CHG94	N/A	numeric	Charges 94
Charges/Revenue Codes/Units	CHG95	N/A	numeric	Charges 95
Charges/Revenue Codes/Units	CHG96	N/A	numeric	Charges 96
Charges/Revenue Codes/Units	CHG97	N/A	numeric	Charges 97
Charges/Revenue Codes/Units	CHG98	N/A	numeric	Charges 98
Charges/Revenue Codes/Units	CHG99	N/A	numeric	Charges 99
Charges/Revenue Codes/Units	CHG_FLAG	N/A	numeric	Charge Flag
Processing	COMBFLAG	N/A	character	Combined Flag
Processing	COMPLETE	N/A	character	Complete Flag
Patient Demographics	COUNTY	N/A	character	Patient County
Patient Demographics	CTYPE	N/A	character	County Category
Diagnosis/Ecode/POA	DIAG1	Same	character	Principal Diagnosis
Diagnosis/Ecode/POA	DIAG10	Same	character	Other Diagnosis: 10th
Diagnosis/Ecode/POA	DIAG11	Same	character	Other Diagnosis: 11th

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Diagnosis/Ecode/POA	DIAG12	Same	character	Other Diagnosis: 12th
Diagnosis/Ecode/POA	DIAG13	Same	character	Other Diagnosis: 13th
Diagnosis/Ecode/POA	DIAG14	Same	character	Other Diagnosis: 14th
Diagnosis/Ecode/POA	DIAG15	Same	character	Other Diagnosis: 15th
Diagnosis/Ecode/POA	DIAG16	Same	character	Other Diagnosis: 16th
Diagnosis/Ecode/POA	DIAG17	Same	character	Other Diagnosis: 17th
Diagnosis/Ecode/POA	DIAG18	Same	character	Other Diagnosis: 18th
Diagnosis/Ecode/POA	DIAG2	Same	character	Other Diagnosis: 2nd
Diagnosis/Ecode/POA	DIAG3	Same	character	Other Diagnosis: 3rd
Diagnosis/Ecode/POA	DIAG4	Same	character	Other Diagnosis: 4th
Diagnosis/Ecode/POA	DIAG5	Same	character	Other Diagnosis: 5th
Diagnosis/Ecode/POA	DIAG6	Same	character	Other Diagnosis: 6th
Diagnosis/Ecode/POA	DIAG7	Same	character	Other Diagnosis: 7th
Diagnosis/Ecode/POA	DIAG8	Same	character	Other Diagnosis: 8th
Diagnosis/Ecode/POA	DIAG9	Same	character	Other Diagnosis: 9th
Provider	DISCTYPE	N/A	character	Discharge Type
DRG/MDC	DRG	N/A	numeric	MS-DRG
DRG/MDC	DRG_INITIAL	N/A	numeric	Initial MS-DRG (no POA)
Diagnosis/Ecode/POA	ECODE	Same	character	External Cause of Injury
Date	EDATE	Same	numeric	Discharge/End Bill Date
Diagnosis/Ecode/POA	EPOA	Same	character	External Cause of Injury POA Code
Provider	FEIN	Same	character	Federal Tax Number
Patient Demographics	FIPSCODE	N/A	character	State/County FIPS
Patient Demographics	GRP	N/A	character	State Category
Payer Code	HMO	N/A	character	HMO Flag
Provider	HNAME1	N/A	character	Hospital Name
Provider	HOSPID	N/A	character	Hospital ID (H)
Provider	HOSPID2	N/A	character	Hospital Unit ID (H)
Date	LOS	N/A	numeric	Length of Stay (days)
Processing	MASTERF	N/A	character	Master Flag
DRG/MDC	MDC	N/A	character	grouped)
DRG/MDC	MDC_INITIAL	N/A	character	Initial MS-DRG MDC
Processing	SUBMITFMT	N/A	character	Submission Format
Patient ID	MRN	Same	character	Medical Record Number
Processing	MASTKEY	N/A	numeric	Masterkey
Payer Code	NPAYOR1	Same	character	Primary Payer
Payer Code	NPAYOR2	Same	character	Secondary Payer
Payer Code	NPAYOR3	Same	character	Tertiary Payer
Provider	NPI	Same	character	Hospital NPI
Physician	NPI_ATT	Same	character	Attending Physician NPI
Physician	NPI_OP	Same	character	Operating Physician NPI
Physician	NPI_OTH1	Same	character	Other Physician NPI
Physician	NPI_OTH2	Same	character	Other Physician NPI
Patient ID	PATNO	Same	character	Patient Control Number
Payer Code	PAYGRP	N/A	numeric	Primary Payer Category
Payer Code	PAYTYP	N/A	numeric	Payer Type and Program
Diagnosis/Ecode/POA	POA1	Same	character	Present on Admission Principal Dx
Diagnosis/Ecode/POA	POA10	Same	character	Present on Admission 10th Dx
Diagnosis/Ecode/POA	POA11	Same	character	Present on Admission 11th Dx

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Diagnosis/Ecode/POA	POA12	Same	character	Present on Admission 12th Dx
Diagnosis/Ecode/POA	POA13	Same	character	Present on Admission 13th Dx
Diagnosis/Ecode/POA	POA14	Same	character	Present on Admission 14th Dx
Diagnosis/Ecode/POA	POA15	Same	character	Present on Admission 15th Dx
Diagnosis/Ecode/POA	POA16	Same	character	Present on Admission 16th Dx
Diagnosis/Ecode/POA	POA17	Same	character	Present on Admission 17th Dx
Diagnosis/Ecode/POA	POA18	Same	character	Present on Admission 18th Dx
Diagnosis/Ecode/POA	POA2	Same	character	Present on Admission 2nd Dx
Diagnosis/Ecode/POA	POA3	Same	character	Present on Admission 3rd Dx
Diagnosis/Ecode/POA	POA4	Same	character	Present on Admission 4th Dx
Diagnosis/Ecode/POA	POA5	Same	character	Present on Admission 5th Dx
Diagnosis/Ecode/POA	POA6	Same	character	Present on Admission 6th Dx
Diagnosis/Ecode/POA	POA7	Same	character	Present on Admission 7th Dx
Diagnosis/Ecode/POA	POA8	Same	character	Present on Admission 8th Dx
Diagnosis/Ecode/POA	POA9	Same	character	Present on Admission 9th Dx
Procedure	PROC1	Same	character	Principal Procedure
Procedure	PROC2	Same	character	Other Procedure: 2nd
Procedure	PROC3	Same	character	Other Procedure: 3rd
Procedure	PROC4	Same	character	Other Procedure: 4th
Procedure	PROC5	Same	character	Other Procedure: 5th
Procedure	PROC6	Same	character	Other Procedure: 6th
Provider	PROV	Same	character	Medicare Provider Number
Provider	PROVM	N/A	character	Main Hospital Medicare Provider Number
Bill and Visit Codes	PSTAT	Same	character	Patient Discharge Status
Patient Demographics	RACE	Same	character	Patient Race and Ethnicity
Charges/Revenue Codes/Units	RC1	N/A	numeric	Revenue Code 1
Charges/Revenue Codes/Units	RC10	N/A	numeric	Revenue Code 10
Charges/Revenue Codes/Units	RC100	N/A	numeric	Revenue Code 100
Charges/Revenue Codes/Units	RC101	N/A	numeric	Revenue Code 101
Charges/Revenue Codes/Units	RC102	N/A	numeric	Revenue Code 102
Charges/Revenue Codes/Units	RC103	N/A	numeric	Revenue Code 103
Charges/Revenue Codes/Units	RC104	N/A	numeric	Revenue Code 104
Charges/Revenue Codes/Units	RC105	N/A	numeric	Revenue Code 105
Charges/Revenue Codes/Units	RC106	N/A	numeric	Revenue Code 106
Charges/Revenue Codes/Units	RC107	N/A	numeric	Revenue Code 107
Charges/Revenue Codes/Units	RC108	N/A	numeric	Revenue Code 108
Charges/Revenue Codes/Units	RC109	N/A	numeric	Revenue Code 109
Charges/Revenue Codes/Units	RC11	N/A	numeric	Revenue Code 11
Charges/Revenue Codes/Units	RC110	N/A	numeric	Revenue Code 110
Charges/Revenue Codes/Units	RC111	N/A	numeric	Revenue Code 111
Charges/Revenue Codes/Units	RC112	N/A	numeric	Revenue Code 112
Charges/Revenue Codes/Units	RC113	N/A	numeric	Revenue Code 113
Charges/Revenue Codes/Units	RC114	N/A	numeric	Revenue Code 114
Charges/Revenue Codes/Units	RC115	N/A	numeric	Revenue Code 115
Charges/Revenue Codes/Units	RC116	N/A	numeric	Revenue Code 116
Charges/Revenue Codes/Units	RC117	N/A	numeric	Revenue Code 117
Charges/Revenue Codes/Units	RC118	N/A	numeric	Revenue Code 118
Charges/Revenue Codes/Units	RC119	N/A	numeric	Revenue Code 119
Charges/Revenue Codes/Units	RC12	N/A	numeric	Revenue Code 12

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Charges/Revenue Codes/Units	RC13	N/A	numeric	Revenue Code 13
Charges/Revenue Codes/Units	RC14	N/A	numeric	Revenue Code 14
Charges/Revenue Codes/Units	RC15	N/A	numeric	Revenue Code 15
Charges/Revenue Codes/Units	RC16	N/A	numeric	Revenue Code 16
Charges/Revenue Codes/Units	RC17	N/A	numeric	Revenue Code 17
Charges/Revenue Codes/Units	RC18	N/A	numeric	Revenue Code 18
Charges/Revenue Codes/Units	RC19	N/A	numeric	Revenue Code 19
Charges/Revenue Codes/Units	RC2	N/A	numeric	Revenue Code 2
Charges/Revenue Codes/Units	RC20	N/A	numeric	Revenue Code 20
Charges/Revenue Codes/Units	RC21	N/A	numeric	Revenue Code 21
Charges/Revenue Codes/Units	RC22	N/A	numeric	Revenue Code 22
Charges/Revenue Codes/Units	RC23	N/A	numeric	Revenue Code 23
Charges/Revenue Codes/Units	RC24	N/A	numeric	Revenue Code 24
Charges/Revenue Codes/Units	RC25	N/A	numeric	Revenue Code 25
Charges/Revenue Codes/Units	RC26	N/A	numeric	Revenue Code 26
Charges/Revenue Codes/Units	RC27	N/A	numeric	Revenue Code 27
Charges/Revenue Codes/Units	RC28	N/A	numeric	Revenue Code 28
Charges/Revenue Codes/Units	RC29	N/A	numeric	Revenue Code 29
Charges/Revenue Codes/Units	RC3	N/A	numeric	Revenue Code 3
Charges/Revenue Codes/Units	RC30	N/A	numeric	Revenue Code 30
Charges/Revenue Codes/Units	RC31	N/A	numeric	Revenue Code 31
Charges/Revenue Codes/Units	RC32	N/A	numeric	Revenue Code 32
Charges/Revenue Codes/Units	RC33	N/A	numeric	Revenue Code 33
Charges/Revenue Codes/Units	RC34	N/A	numeric	Revenue Code 34
Charges/Revenue Codes/Units	RC35	N/A	numeric	Revenue Code 35
Charges/Revenue Codes/Units	RC36	N/A	numeric	Revenue Code 36
Charges/Revenue Codes/Units	RC37	N/A	numeric	Revenue Code 37
Charges/Revenue Codes/Units	RC38	N/A	numeric	Revenue Code 38
Charges/Revenue Codes/Units	RC39	N/A	numeric	Revenue Code 39
Charges/Revenue Codes/Units	RC4	N/A	numeric	Revenue Code 4
Charges/Revenue Codes/Units	RC40	N/A	numeric	Revenue Code 40
Charges/Revenue Codes/Units	RC41	N/A	numeric	Revenue Code 41
Charges/Revenue Codes/Units	RC42	N/A	numeric	Revenue Code 42
Charges/Revenue Codes/Units	RC43	N/A	numeric	Revenue Code 43
Charges/Revenue Codes/Units	RC44	N/A	numeric	Revenue Code 44
Charges/Revenue Codes/Units	RC45	N/A	numeric	Revenue Code 45
Charges/Revenue Codes/Units	RC46	N/A	numeric	Revenue Code 46
Charges/Revenue Codes/Units	RC47	N/A	numeric	Revenue Code 47
Charges/Revenue Codes/Units	RC48	N/A	numeric	Revenue Code 48
Charges/Revenue Codes/Units	RC49	N/A	numeric	Revenue Code 49
Charges/Revenue Codes/Units	RC5	N/A	numeric	Revenue Code 5
Charges/Revenue Codes/Units	RC50	N/A	numeric	Revenue Code 50
Charges/Revenue Codes/Units	RC51	N/A	numeric	Revenue Code 51
Charges/Revenue Codes/Units	RC52	N/A	numeric	Revenue Code 52
Charges/Revenue Codes/Units	RC53	N/A	numeric	Revenue Code 53
Charges/Revenue Codes/Units	RC54	N/A	numeric	Revenue Code 54
Charges/Revenue Codes/Units	RC55	N/A	numeric	Revenue Code 55
Charges/Revenue Codes/Units	RC56	N/A	numeric	Revenue Code 56
Charges/Revenue Codes/Units	RC57	N/A	numeric	Revenue Code 57

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Charges/Revenue Codes/Units	RC58	N/A	numeric	Revenue Code 58
Charges/Revenue Codes/Units	RC59	N/A	numeric	Revenue Code 59
Charges/Revenue Codes/Units	RC6	N/A	numeric	Revenue Code 6
Charges/Revenue Codes/Units	RC60	N/A	numeric	Revenue Code 60
Charges/Revenue Codes/Units	RC61	N/A	numeric	Revenue Code 61
Charges/Revenue Codes/Units	RC62	N/A	numeric	Revenue Code 62
Charges/Revenue Codes/Units	RC63	N/A	numeric	Revenue Code 63
Charges/Revenue Codes/Units	RC64	N/A	numeric	Revenue Code 64
Charges/Revenue Codes/Units	RC65	N/A	numeric	Revenue Code 65
Charges/Revenue Codes/Units	RC66	N/A	numeric	Revenue Code 66
Charges/Revenue Codes/Units	RC67	N/A	numeric	Revenue Code 67
Charges/Revenue Codes/Units	RC68	N/A	numeric	Revenue Code 68
Charges/Revenue Codes/Units	RC69	N/A	numeric	Revenue Code 69
Charges/Revenue Codes/Units	RC7	N/A	numeric	Revenue Code 7
Charges/Revenue Codes/Units	RC70	N/A	numeric	Revenue Code 70
Charges/Revenue Codes/Units	RC71	N/A	numeric	Revenue Code 71
Charges/Revenue Codes/Units	RC72	N/A	numeric	Revenue Code 72
Charges/Revenue Codes/Units	RC73	N/A	numeric	Revenue Code 73
Charges/Revenue Codes/Units	RC74	N/A	numeric	Revenue Code 74
Charges/Revenue Codes/Units	RC75	N/A	numeric	Revenue Code 75
Charges/Revenue Codes/Units	RC76	N/A	numeric	Revenue Code 76
Charges/Revenue Codes/Units	RC77	N/A	numeric	Revenue Code 77
Charges/Revenue Codes/Units	RC78	N/A	numeric	Revenue Code 78
Charges/Revenue Codes/Units	RC79	N/A	numeric	Revenue Code 79
Charges/Revenue Codes/Units	RC8	N/A	numeric	Revenue Code 8
Charges/Revenue Codes/Units	RC80	N/A	numeric	Revenue Code 80
Charges/Revenue Codes/Units	RC81	N/A	numeric	Revenue Code 81
Charges/Revenue Codes/Units	RC82	N/A	numeric	Revenue Code 82
Charges/Revenue Codes/Units	RC83	N/A	numeric	Revenue Code 83
Charges/Revenue Codes/Units	RC84	N/A	numeric	Revenue Code 84
Charges/Revenue Codes/Units	RC85	N/A	numeric	Revenue Code 85
Charges/Revenue Codes/Units	RC86	N/A	numeric	Revenue Code 86
Charges/Revenue Codes/Units	RC87	N/A	numeric	Revenue Code 87
Charges/Revenue Codes/Units	RC88	N/A	numeric	Revenue Code 88
Charges/Revenue Codes/Units	RC89	N/A	numeric	Revenue Code 89
Charges/Revenue Codes/Units	RC9	N/A	numeric	Revenue Code 9
Charges/Revenue Codes/Units	RC90	N/A	numeric	Revenue Code 90
Charges/Revenue Codes/Units	RC91	N/A	numeric	Revenue Code 91
Charges/Revenue Codes/Units	RC92	N/A	numeric	Revenue Code 92
Charges/Revenue Codes/Units	RC93	N/A	numeric	Revenue Code 93
Charges/Revenue Codes/Units	RC94	N/A	numeric	Revenue Code 94
Charges/Revenue Codes/Units	RC95	N/A	numeric	Revenue Code 95
Charges/Revenue Codes/Units	RC96	N/A	numeric	Revenue Code 96
Charges/Revenue Codes/Units	RC97	N/A	numeric	Revenue Code 97
Charges/Revenue Codes/Units	RC98	N/A	numeric	Revenue Code 98
Charges/Revenue Codes/Units	RC99	N/A	numeric	Revenue Code 99
Charges/Revenue Codes/Units	RMCHG1	Same	numeric	Room Charge 1st
Charges/Revenue Codes/Units	RMCHG10	Same	numeric	Room Charge 10th
Charges/Revenue Codes/Units	RMCHG11	Same	numeric	Room Charge 11th

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Charges/Revenue Codes/Units	RMCHG12	Same	numeric	Room Charge 12th
Charges/Revenue Codes/Units	RMCHG13	Same	numeric	Room Charge 13th
Charges/Revenue Codes/Units	RMCHG14	Same	numeric	Room Charge 14th
Charges/Revenue Codes/Units	RMCHG15	Same	numeric	Room Charge 15th
Charges/Revenue Codes/Units	RMCHG16	Same	numeric	Room Charge 16th
Charges/Revenue Codes/Units	RMCHG17	Same	numeric	Room Charge 17th
Charges/Revenue Codes/Units	RMCHG18	Same	numeric	Room Charge 18th
Charges/Revenue Codes/Units	RMCHG19	Same	numeric	Room Charge 19th
Charges/Revenue Codes/Units	RMCHG2	Same	numeric	Room Charge 2nd
Charges/Revenue Codes/Units	RMCHG20	Same	numeric	Room Charge 20th
Charges/Revenue Codes/Units	RMCHG3	Same	numeric	Room Charge 3rd
Charges/Revenue Codes/Units	RMCHG4	Same	numeric	Room Charge 4th
Charges/Revenue Codes/Units	RMCHG5	Same	numeric	Room Charge 5th
Charges/Revenue Codes/Units	RMCHG6	Same	numeric	Room Charge 6th
Charges/Revenue Codes/Units	RMCHG7	Same	numeric	Room Charge 7th
Charges/Revenue Codes/Units	RMCHG8	Same	numeric	Room Charge 8th
Charges/Revenue Codes/Units	RMCHG9	Same	numeric	Room Charge 9th
Charges/Revenue Codes/Units	RMRC1	Same	numeric	Room Revenue Code: 1st Charge
Charges/Revenue Codes/Units	RMRC10	Same	numeric	Room Revenue Code: 10th Charge
Charges/Revenue Codes/Units	RMRC11	Same	numeric	Room Revenue Code: 11th Charge
Charges/Revenue Codes/Units	RMRC12	Same	numeric	Room Revenue Code: 12th Charge
Charges/Revenue Codes/Units	RMRC13	Same	numeric	Room Revenue Code: 13th Charge
Charges/Revenue Codes/Units	RMRC14	Same	numeric	Room Revenue Code: 14th Charge
Charges/Revenue Codes/Units	RMRC15	Same	numeric	Room Revenue Code: 15th Charge
Charges/Revenue Codes/Units	RMRC16	Same	numeric	Room Revenue Code: 16th Charge
Charges/Revenue Codes/Units	RMRC17	Same	numeric	Room Revenue Code: 17th Charge
Charges/Revenue Codes/Units	RMRC18	Same	numeric	Room Revenue Code: 18th Charge
Charges/Revenue Codes/Units	RMRC19	Same	numeric	Room Revenue Code: 19th Charge
Charges/Revenue Codes/Units	RMRC2	Same	numeric	Room Revenue Code: 2nd Charge
Charges/Revenue Codes/Units	RMRC20	Same	numeric	Room Revenue Code: 20th Charge
Charges/Revenue Codes/Units	RMRC3	Same	numeric	Room Revenue Code: 3rd Charge
Charges/Revenue Codes/Units	RMRC4	Same	numeric	Room Revenue Code: 4th Charge
Charges/Revenue Codes/Units	RMRC5	Same	numeric	Room Revenue Code: 5th Charge
Charges/Revenue Codes/Units	RMRC6	Same	numeric	Room Revenue Code: 6th Charge
Charges/Revenue Codes/Units	RMRC7	Same	numeric	Room Revenue Code: 7th Charge
Charges/Revenue Codes/Units	RMRC8	Same	numeric	Room Revenue Code: 8th Charge
Charges/Revenue Codes/Units	RMRC9	Same	numeric	Room Revenue Code: 9th Charge
Charges/Revenue Codes/Units	RMU1	Same	numeric	Room Service Unit: 1st Charge
Charges/Revenue Codes/Units	RMU10	Same	numeric	Room Service Unit: 10th Charge
Charges/Revenue Codes/Units	RMU11	Same	numeric	Room Service Unit: 11th Charge
Charges/Revenue Codes/Units	RMU12	Same	numeric	Room Service Unit: 12th Charge
Charges/Revenue Codes/Units	RMU13	Same	numeric	Room Service Unit: 13th Charge
Charges/Revenue Codes/Units	RMU14	Same	numeric	Room Service Unit: 14th Charge
Charges/Revenue Codes/Units	RMU15	Same	numeric	Room Service Unit: 15th Charge
Charges/Revenue Codes/Units	RMU16	Same	numeric	Room Service Unit: 16th Charge
Charges/Revenue Codes/Units	RMU17	Same	numeric	Room Service Unit: 17th Charge
Charges/Revenue Codes/Units	RMU18	Same	numeric	Room Service Unit: 18th Charge
Charges/Revenue Codes/Units	RMU19	Same	numeric	Room Service Unit: 19th Charge
Charges/Revenue Codes/Units	RMU2	Same	numeric	Room Service Unit: 2nd Charge

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Charges/Revenue Codes/Units	RMU20	Same	numeric	Room Service Unit: 20th Charge
Charges/Revenue Codes/Units	RMU3	Same	numeric	Room Service Unit: 3rd Charge
Charges/Revenue Codes/Units	RMU4	Same	numeric	Room Service Unit: 4th Charge
Charges/Revenue Codes/Units	RMU5	Same	numeric	Room Service Unit: 5th Charge
Charges/Revenue Codes/Units	RMU6	Same	numeric	Room Service Unit: 6th Charge
Charges/Revenue Codes/Units	RMU7	Same	numeric	Room Service Unit: 7th Charge
Charges/Revenue Codes/Units	RMU8	Same	numeric	Room Service Unit: 8th Charge
Charges/Revenue Codes/Units	RMU9	Same	numeric	Room Service Unit: 9th Charge
DRG/MDC	RTC	N/A	numeric	MS-DRG grouper return code
Date	SDATE	Same	numeric	Beginning Bill Date
Processing	SEQ	N/A	numeric	Sequential Number within BATCHID
Patient Demographics	SEX	Same	character	Patient Sex
Bill and Visit Codes	SRCE	Same	character	Source of Admission
Patient Demographics	STATE	N/A	character	Patient State
Processing	STEPNUM	N/A	numeric	Processing Step Number
Charges/Revenue Codes/Units	TACHG	N/A	numeric	Total Ancillary Charges
Charges/Revenue Codes/Units	TCHG	Same	numeric	Total Charges
Charges/Revenue Codes/Units	TRCHG	N/A	numeric	Total Room Charges
Bill and Visit Codes	TYPEAD	Same	character	Type of Admission
Charges/Revenue Codes/Units	U1	N/A	numeric	Service Units 1
Charges/Revenue Codes/Units	U10	N/A	numeric	Service Units 10
Charges/Revenue Codes/Units	U100	N/A	numeric	Service Units 100
Charges/Revenue Codes/Units	U101	N/A	numeric	Service Units 101
Charges/Revenue Codes/Units	U102	N/A	numeric	Service Units 102
Charges/Revenue Codes/Units	U103	N/A	numeric	Service Units 103
Charges/Revenue Codes/Units	U104	N/A	numeric	Service Units 104
Charges/Revenue Codes/Units	U105	N/A	numeric	Service Units 105
Charges/Revenue Codes/Units	U106	N/A	numeric	Service Units 106
Charges/Revenue Codes/Units	U107	N/A	numeric	Service Units 107
Charges/Revenue Codes/Units	U108	N/A	numeric	Service Units 108
Charges/Revenue Codes/Units	U109	N/A	numeric	Service Units 109
Charges/Revenue Codes/Units	U11	N/A	numeric	Service Units 11
Charges/Revenue Codes/Units	U110	N/A	numeric	Service Units 110
Charges/Revenue Codes/Units	U111	N/A	numeric	Service Units 111
Charges/Revenue Codes/Units	U112	N/A	numeric	Service Units 112
Charges/Revenue Codes/Units	U113	N/A	numeric	Service Units 113
Charges/Revenue Codes/Units	U114	N/A	numeric	Service Units 114
Charges/Revenue Codes/Units	U115	N/A	numeric	Service Units 115
Charges/Revenue Codes/Units	U116	N/A	numeric	Service Units 116
Charges/Revenue Codes/Units	U117	N/A	numeric	Service Units 117
Charges/Revenue Codes/Units	U118	N/A	numeric	Service Units 118
Charges/Revenue Codes/Units	U119	N/A	numeric	Service Units 119
Charges/Revenue Codes/Units	U12	N/A	numeric	Service Units 12
Charges/Revenue Codes/Units	U13	N/A	numeric	Service Units 13
Charges/Revenue Codes/Units	U14	N/A	numeric	Service Units 14
Charges/Revenue Codes/Units	U15	N/A	numeric	Service Units 15

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Charges/Revenue Codes/Units	U16	N/A	numeric	Service Units 16
Charges/Revenue Codes/Units	U17	N/A	numeric	Service Units 17
Charges/Revenue Codes/Units	U18	N/A	numeric	Service Units 18
Charges/Revenue Codes/Units	U19	N/A	numeric	Service Units 19
Charges/Revenue Codes/Units	U2	N/A	numeric	Service Units 2
Charges/Revenue Codes/Units	U20	N/A	numeric	Service Units 20
Charges/Revenue Codes/Units	U21	N/A	numeric	Service Units 21
Charges/Revenue Codes/Units	U22	N/A	numeric	Service Units 22
Charges/Revenue Codes/Units	U23	N/A	numeric	Service Units 23
Charges/Revenue Codes/Units	U24	N/A	numeric	Service Units 24
Charges/Revenue Codes/Units	U25	N/A	numeric	Service Units 25
Charges/Revenue Codes/Units	U26	N/A	numeric	Service Units 26
Charges/Revenue Codes/Units	U27	N/A	numeric	Service Units 27
Charges/Revenue Codes/Units	U28	N/A	numeric	Service Units 28
Charges/Revenue Codes/Units	U29	N/A	numeric	Service Units 29
Charges/Revenue Codes/Units	U3	N/A	numeric	Service Units 3
Charges/Revenue Codes/Units	U30	N/A	numeric	Service Units 30
Charges/Revenue Codes/Units	U31	N/A	numeric	Service Units 31
Charges/Revenue Codes/Units	U32	N/A	numeric	Service Units 32
Charges/Revenue Codes/Units	U33	N/A	numeric	Service Units 33
Charges/Revenue Codes/Units	U34	N/A	numeric	Service Units 34
Charges/Revenue Codes/Units	U35	N/A	numeric	Service Units 35
Charges/Revenue Codes/Units	U36	N/A	numeric	Service Units 36
Charges/Revenue Codes/Units	U37	N/A	numeric	Service Units 37
Charges/Revenue Codes/Units	U38	N/A	numeric	Service Units 38
Charges/Revenue Codes/Units	U39	N/A	numeric	Service Units 39
Charges/Revenue Codes/Units	U4	N/A	numeric	Service Units 4
Charges/Revenue Codes/Units	U40	N/A	numeric	Service Units 40
Charges/Revenue Codes/Units	U41	N/A	numeric	Service Units 41
Charges/Revenue Codes/Units	U42	N/A	numeric	Service Units 42
Charges/Revenue Codes/Units	U43	N/A	numeric	Service Units 43
Charges/Revenue Codes/Units	U44	N/A	numeric	Service Units 44
Charges/Revenue Codes/Units	U45	N/A	numeric	Service Units 45
Charges/Revenue Codes/Units	U46	N/A	numeric	Service Units 46
Charges/Revenue Codes/Units	U47	N/A	numeric	Service Units 47
Charges/Revenue Codes/Units	U48	N/A	numeric	Service Units 48
Charges/Revenue Codes/Units	U49	N/A	numeric	Service Units 49
Charges/Revenue Codes/Units	U5	N/A	numeric	Service Units 5
Charges/Revenue Codes/Units	U50	N/A	numeric	Service Units 50
Charges/Revenue Codes/Units	U51	N/A	numeric	Service Units 51
Charges/Revenue Codes/Units	U52	N/A	numeric	Service Units 52
Charges/Revenue Codes/Units	U53	N/A	numeric	Service Units 53
Charges/Revenue Codes/Units	U54	N/A	numeric	Service Units 54
Charges/Revenue Codes/Units	U55	N/A	numeric	Service Units 55
Charges/Revenue Codes/Units	U56	N/A	numeric	Service Units 56
Charges/Revenue Codes/Units	U57	N/A	numeric	Service Units 57
Charges/Revenue Codes/Units	U58	N/A	numeric	Service Units 58
Charges/Revenue Codes/Units	U59	N/A	numeric	Service Units 59
Charges/Revenue Codes/Units	U6	N/A	numeric	Service Units 6

Data Element Category	Variable Name	HPDS Variable Name	Variable Type	Variable Label
Charges/Revenue Codes/Units	U60	N/A	numeric	Service Units 60
Charges/Revenue Codes/Units	U61	N/A	numeric	Service Units 61
Charges/Revenue Codes/Units	U62	N/A	numeric	Service Units 62
Charges/Revenue Codes/Units	U63	N/A	numeric	Service Units 63
Charges/Revenue Codes/Units	U64	N/A	numeric	Service Units 64
Charges/Revenue Codes/Units	U65	N/A	numeric	Service Units 65
Charges/Revenue Codes/Units	U66	N/A	numeric	Service Units 66
Charges/Revenue Codes/Units	U67	N/A	numeric	Service Units 67
Charges/Revenue Codes/Units	U68	N/A	numeric	Service Units 68
Charges/Revenue Codes/Units	U69	N/A	numeric	Service Units 69
Charges/Revenue Codes/Units	U7	N/A	numeric	Service Units 7
Charges/Revenue Codes/Units	U70	N/A	numeric	Service Units 70
Charges/Revenue Codes/Units	U71	N/A	numeric	Service Units 71
Charges/Revenue Codes/Units	U72	N/A	numeric	Service Units 72
Charges/Revenue Codes/Units	U73	N/A	numeric	Service Units 73
Charges/Revenue Codes/Units	U74	N/A	numeric	Service Units 74
Charges/Revenue Codes/Units	U75	N/A	numeric	Service Units 75
Charges/Revenue Codes/Units	U76	N/A	numeric	Service Units 76
Charges/Revenue Codes/Units	U77	N/A	numeric	Service Units 77
Charges/Revenue Codes/Units	U78	N/A	numeric	Service Units 78
Charges/Revenue Codes/Units	U79	N/A	numeric	Service Units 79
Charges/Revenue Codes/Units	U8	N/A	numeric	Service Units 8
Charges/Revenue Codes/Units	U80	N/A	numeric	Service Units 80
Charges/Revenue Codes/Units	U81	N/A	numeric	Service Units 81
Charges/Revenue Codes/Units	U82	N/A	numeric	Service Units 82
Charges/Revenue Codes/Units	U83	N/A	numeric	Service Units 83
Charges/Revenue Codes/Units	U84	N/A	numeric	Service Units 84
Charges/Revenue Codes/Units	U85	N/A	numeric	Service Units 85
Charges/Revenue Codes/Units	U86	N/A	numeric	Service Units 86
Charges/Revenue Codes/Units	U87	N/A	numeric	Service Units 87
Charges/Revenue Codes/Units	U88	N/A	numeric	Service Units 88
Charges/Revenue Codes/Units	U89	N/A	numeric	Service Units 89
Charges/Revenue Codes/Units	U9	N/A	numeric	Service Units 9
Charges/Revenue Codes/Units	U90	N/A	numeric	Service Units 90
Charges/Revenue Codes/Units	U91	N/A	numeric	Service Units 91
Charges/Revenue Codes/Units	U92	N/A	numeric	Service Units 92
Charges/Revenue Codes/Units	U93	N/A	numeric	Service Units 93
Charges/Revenue Codes/Units	U94	N/A	numeric	Service Units 94
Charges/Revenue Codes/Units	U95	N/A	numeric	Service Units 95
Charges/Revenue Codes/Units	U96	N/A	numeric	Service Units 96
Charges/Revenue Codes/Units	U97	N/A	numeric	Service Units 97
Charges/Revenue Codes/Units	U98	N/A	numeric	Service Units 98
Charges/Revenue Codes/Units	U99	N/A	numeric	Service Units 99
Provider	UNIQUE_1	N/A	character	HCA Unique ID
DRG/MDC	WEIGHT	N/A	numeric	MS-DRG Weight
DRG/MDC	INITIAL_WEIGHT	N/A	numeric	Initial MS-DRG Weight
Patient Demographics	ZIP	Same	character	Patient Zip Code

Variable Origin	Code Source	Master.txt	Master2.txt	MasterAdjudicated.txt
submitted	NUBC	1	0	1
submitted	ICD9-CM	1	0	1
submitted		1	0	1
vendor created - analytic	HCA	0	0	1
vendor created - analytic	HCA	1	0	1
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
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submitted	NUBC	1	0	0
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0

Variable Origin	Code Source	Master.txt	Master2.txt	MasterAdjudicated.txt
submitted	NUBC	1	0	0
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
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submitted	NUBC	0	1	0

Variable Origin	Code Source	Master.txt	Master2.txt	MasterAdjudicated.txt
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
submitted	NUBC	1	0	0
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submitted	NUBC	1	0	0
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0

Variable Origin	Code Source	Master.txt	Master2.txt	MasterAdjudicated.txt
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
submitted	NUBC	1	0	0
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submitted	NUBC	0	1	0
submitted	NUBC	1	0	0
submitted	NUBC	0	1	0

Variable Origin	Code Source	Master.txt	Master2.txt	MasterAdjudicated.txt
submitted	NUBC	1	0	0
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
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submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
submitted	NUBC	0	1	0
submitted	NUBC	1	0	0

Variable Origin	Code Source	Master.txt	Master2.txt	MasterAdjudicated.txt
submitted	NUBC	0	1	0
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
submitted	NUBC	1	0	0
vendor created - processing	MS-DRG grouper	1	0	1
submitted		1	0	1
vendor created - processing		1	0	0
submitted	HCA	1	0	1
submitted	NUBC	1	0	1
vendor created - analytic	SAS Zip Code File	0	0	1
vendor created - processing	HCA	1	0	1
vendor created - analytic		0	0	1
submitted	NUBC	1	0	1
vendor created - analytic		0	0	1
submitted	NUBC	1	0	1
vendor created - processing	NUBC	0	0	1
vendor created - processing	NUBC	0	0	1
vendor created - processing	NUBC	0	0	0
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vendor created - processing	NUBC	0	0	0
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vendor created - processing	NUBC	0	0	1
vendor created - processing	NUBC	0	0	1
vendor created - processing	NUBC	0	0	1
vendor created - processing	NUBC	0	0	1
vendor created - processing	NUBC	0	0	1

Variable Origin	Code Source	Master.txt	Master2.txt	MasterAdjudicated.txt
vendor created - processing	NUBC	0	0	0
vendor created - processing	NUBC	0	0	0
vendor created - processing	NUBC	0	0	0
vendor created - processing	NUBC	0	0	0
vendor created - processing	NUBC	0	0	0
vendor created - processing	NUBC	0	0	0
vendor created - processing	NUBC	0	0	0
vendor created - processing	NUBC	0	0	0
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vendor created - processing	NUBC	0	0	0
vendor created - processing	NUBC	0	0	0
vendor created - processing	NUBC	0	0	0
vendor created - processing	NUBC	0	0	0
vendor created - analytic	HCA	0	0	1
vendor created - analytic	MS-DRG grouper	0	0	1
vendor created - analytic	MS-DRG grouper	0	0	1
submitted		1	0	1

Master2Adjudicated.txt	Adjudication - Interim Bill Type(s)	Adjudication - Values Retained
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances

Master2Adjudicated.txt	Adjudication - Interim Bill Type(s)	Adjudication - Values Retained
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
1	xx4,xx3,xx2	all unique instances
0	xx4,xx3,xx2	
1		
0		
0		
0		
0	xx4	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances

Master2Adjudicated.txt	Adjudication - Interim Bill Type(s)	Adjudication - Values Retained
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
1		
0		
0		
0	xx4,xx3,xx2	first instance
1	xx4	
0	xx4,xx3,xx2	first instance
0	xx4	
0		
0		
0		
0		
1	xx4	
1	xx4	
0	xx4	
1		
0		
0		
0		
0	xx4	
1		
0	xx4	
0	xx4	
0	xx4	
0	xx4	
0	xx4	
0	xx4	
0	xx4	
0	xx3,xx2	first instance
0	xx3,xx2	Second instance
1	xx4	
0		
0		
0	xx4	
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances

Master2Adjudicated.txt	Adjudication - Interim Bill Type(s)	Adjudication - Values Retained
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
0	xx4	
0	xx4,xx3,xx2	all instances
0	xx4,xx3,xx2	all instances
0	xx4,xx3,xx2	all instances
0	xx4,xx3,xx2	all instances
0	xx4,xx3,xx2	all instances
1	xx4	
0		
0	xx4	
0		
0	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances

Master2Adjudicated.txt	Adjudication - Interim Bill Type(s)	Adjudication - Values Retained
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
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1	xx4,xx3,xx2	All unique instances
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1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
0		
0		
0		

Master2Adjudicated.txt	Adjudication - Interim Bill Type(s)	Adjudication - Values Retained
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
0	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
1	xx4,xx3,xx2	All unique instances
0		
0		
0		
0	xx4	

Variable Notes/Information
Changes.xlsx, altered variables tab.

DOB submitted but split into BDAY, BMO, BYEAR in data files

DOB submitted but split into BDAY, BMO,

Parsed from BTYPE

DOB submitted but split into BDAY, BMO, BYEAR in data files

DOB submitted but split into BDAY, BMO,

DOB submitted but split into BDAY, BMO, BYEAR in data files

DOB submitted but split into BDAY, BMO,

SDATE/EDATE

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

Variable Notes/Information

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

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RMCHG1-20, ANCHG1-99

RMCHG1-20, ANCHG1-99

Variable Notes/Information

RMRC1-20, ANRC1-99

RMRC1-20, ANRC1-99

RMRC1-20, ANRC1-99

RMRC1-20, ANRC1-99

RMRC1-20, ANRC1-99

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RMRC1-20, ANRC1-99

RMRC1-20, ANRC1-99

RMRC1-20, ANRC1-99

Variable Notes/Information

Refer to Final W VHIDS Variable Changes.xlsx, altered variables tab.

represents the service start date of the bill)

Sequential number within a batch

STEPNUM typically gets incremented once per week, but may increment more than once per week if the weekly processing was executed more than once during the week. Thomson Reuters used the last value of STEPNUM from the prior vendor as a starting point and incremented by one each time the weekly process was run.]

sum of ANCHG1 - ANCHG99

sum of RMCHG1 - RMCHG99

BYEAR in data files

BYEAR in data files

BYEAR in data files

File Name	Variable Name	Variable Type	Variable Number/Order
MASTER.TXT	ACCSTATE	character	221
MASTER.TXT	ADMDIAG	character	232
MASTER.TXT	ADMIT	numeric	18
MASTER.TXT	AGE	numeric	211
MASTER.TXT	ANCHG1	numeric	149
MASTER.TXT	ANCHG10	numeric	158
MASTER.TXT	ANCHG11	numeric	159
MASTER.TXT	ANCHG12	numeric	160
MASTER.TXT	ANCHG13	numeric	161
MASTER.TXT	ANCHG14	numeric	162
MASTER.TXT	ANCHG15	numeric	163
MASTER.TXT	ANCHG16	numeric	164
MASTER.TXT	ANCHG17	numeric	165
MASTER.TXT	ANCHG18	numeric	166
MASTER.TXT	ANCHG19	numeric	167
MASTER.TXT	ANCHG2	numeric	150
MASTER.TXT	ANCHG20	numeric	168
MASTER.TXT	ANCHG21	numeric	169
MASTER.TXT	ANCHG22	numeric	170
MASTER.TXT	ANCHG23	numeric	171
MASTER.TXT	ANCHG24	numeric	172
MASTER.TXT	ANCHG25	numeric	173
MASTER.TXT	ANCHG26	numeric	174
MASTER.TXT	ANCHG27	numeric	175
MASTER.TXT	ANCHG28	numeric	176
MASTER.TXT	ANCHG29	numeric	177
MASTER.TXT	ANCHG3	numeric	151
MASTER.TXT	ANCHG30	numeric	178
MASTER.TXT	ANCHG31	numeric	179
MASTER.TXT	ANCHG32	numeric	180
MASTER.TXT	ANCHG33	numeric	181
MASTER.TXT	ANCHG34	numeric	182
MASTER.TXT	ANCHG35	numeric	183
MASTER.TXT	ANCHG36	numeric	184
MASTER.TXT	ANCHG37	numeric	185
MASTER.TXT	ANCHG38	numeric	186
MASTER.TXT	ANCHG39	numeric	187
MASTER.TXT	ANCHG4	numeric	152
MASTER.TXT	ANCHG40	numeric	188
MASTER.TXT	ANCHG41	numeric	189
MASTER.TXT	ANCHG42	numeric	190
MASTER.TXT	ANCHG43	numeric	191
MASTER.TXT	ANCHG44	numeric	192
MASTER.TXT	ANCHG45	numeric	193
MASTER.TXT	ANCHG5	numeric	153
MASTER.TXT	ANCHG6	numeric	154
MASTER.TXT	ANCHG7	numeric	155
MASTER.TXT	ANCHG8	numeric	156
MASTER.TXT	ANCHG9	numeric	157
MASTER.TXT	ANRC1	numeric	59
MASTER.TXT	ANRC10	numeric	68
MASTER.TXT	ANRC11	numeric	69
MASTER.TXT	ANRC12	numeric	70
MASTER.TXT	ANRC13	numeric	71

MASTER.TXT	ANRC14	numeric	72
MASTER.TXT	ANRC15	numeric	73
MASTER.TXT	ANRC16	numeric	74
MASTER.TXT	ANRC17	numeric	75
MASTER.TXT	ANRC18	numeric	76
MASTER.TXT	ANRC19	numeric	77
MASTER.TXT	ANRC2	numeric	60
MASTER.TXT	ANRC20	numeric	78
MASTER.TXT	ANRC21	numeric	79
MASTER.TXT	ANRC22	numeric	80
MASTER.TXT	ANRC23	numeric	81
MASTER.TXT	ANRC24	numeric	82
MASTER.TXT	ANRC25	numeric	83
MASTER.TXT	ANRC26	numeric	84
MASTER.TXT	ANRC27	numeric	85
MASTER.TXT	ANRC28	numeric	86
MASTER.TXT	ANRC29	numeric	87
MASTER.TXT	ANRC3	numeric	61
MASTER.TXT	ANRC30	numeric	88
MASTER.TXT	ANRC31	numeric	89
MASTER.TXT	ANRC32	numeric	90
MASTER.TXT	ANRC33	numeric	91
MASTER.TXT	ANRC34	numeric	92
MASTER.TXT	ANRC35	numeric	93
MASTER.TXT	ANRC36	numeric	94
MASTER.TXT	ANRC37	numeric	95
MASTER.TXT	ANRC38	numeric	96
MASTER.TXT	ANRC39	numeric	97
MASTER.TXT	ANRC4	numeric	62
MASTER.TXT	ANRC40	numeric	98
MASTER.TXT	ANRC41	numeric	99
MASTER.TXT	ANRC42	numeric	100
MASTER.TXT	ANRC43	numeric	101
MASTER.TXT	ANRC44	numeric	102
MASTER.TXT	ANRC45	numeric	103
MASTER.TXT	ANRC5	numeric	63
MASTER.TXT	ANRC6	numeric	64
MASTER.TXT	ANRC7	numeric	65
MASTER.TXT	ANRC8	numeric	66
MASTER.TXT	ANRC9	numeric	67
MASTER.TXT	ANU1	numeric	104
MASTER.TXT	ANU10	numeric	113
MASTER.TXT	ANU11	numeric	114
MASTER.TXT	ANU12	numeric	115
MASTER.TXT	ANU13	numeric	116
MASTER.TXT	ANU14	numeric	117
MASTER.TXT	ANU15	numeric	118
MASTER.TXT	ANU16	numeric	119
MASTER.TXT	ANU17	numeric	120
MASTER.TXT	ANU18	numeric	121
MASTER.TXT	ANU19	numeric	122
MASTER.TXT	ANU2	numeric	105
MASTER.TXT	ANU20	numeric	123
MASTER.TXT	ANU21	numeric	124
MASTER.TXT	ANU22	numeric	125

MASTER.TXT	ANU23	numeric	126
MASTER.TXT	ANU24	numeric	127
MASTER.TXT	ANU25	numeric	128
MASTER.TXT	ANU26	numeric	129
MASTER.TXT	ANU27	numeric	130
MASTER.TXT	ANU28	numeric	131
MASTER.TXT	ANU29	numeric	132
MASTER.TXT	ANU3	numeric	106
MASTER.TXT	ANU30	numeric	133
MASTER.TXT	ANU31	numeric	134
MASTER.TXT	ANU32	numeric	135
MASTER.TXT	ANU33	numeric	136
MASTER.TXT	ANU34	numeric	137
MASTER.TXT	ANU35	numeric	138
MASTER.TXT	ANU36	numeric	139
MASTER.TXT	ANU37	numeric	140
MASTER.TXT	ANU38	numeric	141
MASTER.TXT	ANU39	numeric	142
MASTER.TXT	ANU4	numeric	107
MASTER.TXT	ANU40	numeric	143
MASTER.TXT	ANU41	numeric	144
MASTER.TXT	ANU42	numeric	145
MASTER.TXT	ANU43	numeric	146
MASTER.TXT	ANU44	numeric	147
MASTER.TXT	ANU45	numeric	148
MASTER.TXT	ANU5	numeric	108
MASTER.TXT	ANU6	numeric	109
MASTER.TXT	ANU7	numeric	110
MASTER.TXT	ANU8	numeric	111
MASTER.TXT	ANU9	numeric	112
MASTER.TXT	BATCHID	character	6
MASTER.TXT	BATDATE	numeric	10
MASTER.TXT	BATNO	character	8
MASTER.TXT	BDAY	numeric	13
MASTER.TXT	BMO	numeric	12
MASTER.TXT	BTYPE	numeric	4
MASTER.TXT	BYEAR	numeric	14
MASTER.TXT	CCODE	character	260
MASTER.TXT	CHG_FLAG	numeric	217
MASTER.TXT	DIAG1	character	194
MASTER.TXT	DIAG10	character	223
MASTER.TXT	DIAG11	character	224
MASTER.TXT	DIAG12	character	225
MASTER.TXT	DIAG13	character	226
MASTER.TXT	DIAG14	character	227
MASTER.TXT	DIAG15	character	228
MASTER.TXT	DIAG16	character	229
MASTER.TXT	DIAG17	character	230
MASTER.TXT	DIAG18	character	231
MASTER.TXT	DIAG2	character	195
MASTER.TXT	DIAG3	character	196
MASTER.TXT	DIAG4	character	197
MASTER.TXT	DIAG5	character	198
MASTER.TXT	DIAG6	character	199
MASTER.TXT	DIAG7	character	200

MASTER.TXT	DIAG8	character	201
MASTER.TXT	DIAG9	character	202
MASTER.TXT	DRG	numeric	214
MASTER.TXT	DRG_INITIAL	numeric	258
MASTER.TXT	ECODE	character	209
MASTER.TXT	EDATE	numeric	3
MASTER.TXT	EPOA	character	257
MASTER.TXT	FEIN	character	9
MASTER.TXT	HOSPID	character	1
MASTER.TXT	HOSPID2	character	237
MASTER.TXT	LOS	numeric	210
MASTER.TXT	MDC	numeric	215
MASTER.TXT	MDC_INITIAL	numeric	259
MASTER.TXT	MRN	character	219
MASTER.TXT	NPAYOR1	character	21
MASTER.TXT	NPAYOR2	character	22
MASTER.TXT	NPAYOR3	character	220
MASTER.TXT	NPI	character	222
MASTER.TXT	NPI_ATT	character	233
MASTER.TXT	NPI_OP	character	234
MASTER.TXT	NPI_OTH1	character	235
MASTER.TXT	NPI_OTH2	character	236
MASTER.TXT	PATNO	character	2
MASTER.TXT	POA1	character	239
MASTER.TXT	POA10	character	248
MASTER.TXT	POA11	character	249
MASTER.TXT	POA12	character	250
MASTER.TXT	POA13	character	251
MASTER.TXT	POA14	character	252
MASTER.TXT	POA15	character	253
MASTER.TXT	POA16	character	254
MASTER.TXT	POA17	character	255
MASTER.TXT	POA18	character	256
MASTER.TXT	POA2	character	240
MASTER.TXT	POA3	character	241
MASTER.TXT	POA4	character	242
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MASTER.TXT	POA6	character	244
MASTER.TXT	POA7	character	245
MASTER.TXT	POA8	character	246
MASTER.TXT	POA9	character	247
MASTER.TXT	PROC1	character	203
MASTER.TXT	PROC2	character	204
MASTER.TXT	PROC3	character	205
MASTER.TXT	PROC4	character	206
MASTER.TXT	PROC5	character	207
MASTER.TXT	PROC6	character	208
MASTER.TXT	PROV	character	5
MASTER.TXT	PROVM	character	213
MASTER.TXT	PSTAT	character	20
MASTER.TXT	RACE	character	238
MASTER.TXT	RMCHG1	numeric	47
MASTER.TXT	RMCHG10	numeric	56
MASTER.TXT	RMCHG11	numeric	57
MASTER.TXT	RMCHG12	numeric	58

MASTER.TXT	RMCHG2	numeric	48
MASTER.TXT	RMCHG3	numeric	49
MASTER.TXT	RMCHG4	numeric	50
MASTER.TXT	RMCHG5	numeric	51
MASTER.TXT	RMCHG6	numeric	52
MASTER.TXT	RMCHG7	numeric	53
MASTER.TXT	RMCHG8	numeric	54
MASTER.TXT	RMCHG9	numeric	55
MASTER.TXT	RMRC1	numeric	23
MASTER.TXT	RMRC10	numeric	32
MASTER.TXT	RMRC11	numeric	33
MASTER.TXT	RMRC12	numeric	34
MASTER.TXT	RMRC2	numeric	24
MASTER.TXT	RMRC3	numeric	25
MASTER.TXT	RMRC4	numeric	26
MASTER.TXT	RMRC5	numeric	27
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MASTER.TXT	RMRC7	numeric	29
MASTER.TXT	RMRC8	numeric	30
MASTER.TXT	RMRC9	numeric	31
MASTER.TXT	RMU1	numeric	35
MASTER.TXT	RMU10	numeric	44
MASTER.TXT	RMU11	numeric	45
MASTER.TXT	RMU12	numeric	46
MASTER.TXT	RMU2	numeric	36
MASTER.TXT	RMU3	numeric	37
MASTER.TXT	RMU4	numeric	38
MASTER.TXT	RMU5	numeric	39
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MASTER.TXT	RMU7	numeric	41
MASTER.TXT	RMU8	numeric	42
MASTER.TXT	RMU9	numeric	43
MASTER.TXT	RTC	numeric	216
MASTER.TXT	SDATE	numeric	19
MASTER.TXT	SEQ	numeric	7
MASTER.TXT	SEX	character	11
MASTER.TXT	SRCE	character	16
MASTER.TXT	STEPNUM	numeric	218
MASTER.TXT	SUBMITFMT	character	261
MASTER.TXT	TCHG	numeric	212
MASTER.TXT	TYPEAD	character	15
MASTER.TXT	ZIP	character	17

Variable Label
Accident State
Admitting Diagnosis Code
Admission date
Patient age on admission
The 1st ancillary charge
The 10th ancillary charge
The 11th ancillary charge
The 12th ancillary charge
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Service units for 20th ancillary charge
Service units for 21th ancillary charge
Service units for 22th ancillary charge

Other diagnosis
Other diagnosis
MS-DRG in effect on discharge date
Initial MS-DRG in effect on discharge date
External cause of injury
Discharge date-Ending date of hosp stay
External Cause of Injury Present on Admission
Federal tax number
Hospital ID-four digit code
Hospital unit ID-four digit code
Length of stay in days - created
MDC for MS_DRG in effect on discharge date
MDC for initial MS_DRG in effect on discharge date
Medical record number
Primary payor
Secondary payor
Tertiary payor
NPI
Attending NPI
Operating NPI
Other NPI
Other NPI
Patient control number
Principal Present on Admission
Present on Admission10
Present on Admission11
Present on Admission12
Present on Admission13
Present on Admission14
Present on Admission15
Present on Admission16
Present on Admission17
Present on Admission18
Present on Admission2
Present on Admission3
Present on Admission4
Present on Admission5
Present on Admission6
Present on Admission7
Present on Admission8
Present on Admission9
Principle procedure
Other procedure
Other procedure
Other procedure
Other procedure
Other procedure
Medical provider number (detailed)
Main hospital medicare provider number
Patient status
Patient Race/Ethnicity
The 1st room charge
The 10th room charge
The 11th room charge
The 12th room charge

The 2nd room charge
The 3rd room charge
The 4th room charge
The 5th room charge
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Revenue code for 1st room charge
Revenue code for 10th room charge
Revenue code for 11th room charge
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Revenue code for 3rd room charge
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Service units for 1st room charge
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Service units for 11th room charge
Service units for 12th room charge
Service units for 2nd room charge
Service units for 3rd room charge
Service units for 4th room charge
Service units for 5th room charge
Service units for 6th room charge
Service units for 7th room charge
Service units for 8th room charge
Service units for 9th room charge
Return code of MS-DRG grouper
Admission date-Begin date of hosp stay
Sequential num within BATCHID
Patient sex
Source of admission
Processing step number
Submission Format
Total charge submitted
Type of admission
Patient zipcode

File Name	Variable Name	Variable Type	Variable Number/Order
MASTER2.TXT	ANCHG46	numeric	140
MASTER2.TXT	ANCHG47	numeric	141
MASTER2.TXT	ANCHG48	numeric	142
MASTER2.TXT	ANCHG49	numeric	143
MASTER2.TXT	ANCHG50	numeric	144
MASTER2.TXT	ANCHG51	numeric	145
MASTER2.TXT	ANCHG52	numeric	146
MASTER2.TXT	ANCHG53	numeric	147
MASTER2.TXT	ANCHG54	numeric	148
MASTER2.TXT	ANCHG55	numeric	149
MASTER2.TXT	ANCHG56	numeric	150
MASTER2.TXT	ANCHG57	numeric	151
MASTER2.TXT	ANCHG58	numeric	152
MASTER2.TXT	ANCHG59	numeric	153
MASTER2.TXT	ANCHG60	numeric	154
MASTER2.TXT	ANCHG61	numeric	155
MASTER2.TXT	ANCHG62	numeric	156
MASTER2.TXT	ANCHG63	numeric	157
MASTER2.TXT	ANCHG64	numeric	158
MASTER2.TXT	ANCHG65	numeric	159
MASTER2.TXT	ANCHG66	numeric	160
MASTER2.TXT	ANCHG67	numeric	161
MASTER2.TXT	ANCHG68	numeric	162
MASTER2.TXT	ANCHG69	numeric	163
MASTER2.TXT	ANCHG70	numeric	164
MASTER2.TXT	ANCHG71	numeric	165
MASTER2.TXT	ANCHG72	numeric	166
MASTER2.TXT	ANCHG73	numeric	167
MASTER2.TXT	ANCHG74	numeric	168
MASTER2.TXT	ANCHG75	numeric	169
MASTER2.TXT	ANCHG76	numeric	170
MASTER2.TXT	ANCHG77	numeric	171
MASTER2.TXT	ANCHG78	numeric	172
MASTER2.TXT	ANCHG79	numeric	173
MASTER2.TXT	ANCHG80	numeric	174
MASTER2.TXT	ANCHG81	numeric	175
MASTER2.TXT	ANCHG82	numeric	176
MASTER2.TXT	ANCHG83	numeric	177
MASTER2.TXT	ANCHG84	numeric	178
MASTER2.TXT	ANCHG85	numeric	179
MASTER2.TXT	ANCHG86	numeric	180
MASTER2.TXT	ANCHG87	numeric	181
MASTER2.TXT	ANCHG88	numeric	182
MASTER2.TXT	ANCHG89	numeric	183
MASTER2.TXT	ANCHG90	numeric	184
MASTER2.TXT	ANCHG91	numeric	185
MASTER2.TXT	ANCHG92	numeric	186
MASTER2.TXT	ANCHG93	numeric	187
MASTER2.TXT	ANCHG94	numeric	188
MASTER2.TXT	ANCHG95	numeric	189
MASTER2.TXT	ANCHG96	numeric	190
MASTER2.TXT	ANCHG97	numeric	191
MASTER2.TXT	ANCHG98	numeric	192
MASTER2.TXT	ANCHG99	numeric	193

MASTER2.TXT	ANRC46	numeric	32
MASTER2.TXT	ANRC47	numeric	33
MASTER2.TXT	ANRC48	numeric	34
MASTER2.TXT	ANRC49	numeric	35
MASTER2.TXT	ANRC50	numeric	36
MASTER2.TXT	ANRC51	numeric	37
MASTER2.TXT	ANRC52	numeric	38
MASTER2.TXT	ANRC53	numeric	39
MASTER2.TXT	ANRC54	numeric	40
MASTER2.TXT	ANRC55	numeric	41
MASTER2.TXT	ANRC56	numeric	42
MASTER2.TXT	ANRC57	numeric	43
MASTER2.TXT	ANRC58	numeric	44
MASTER2.TXT	ANRC59	numeric	45
MASTER2.TXT	ANRC60	numeric	46
MASTER2.TXT	ANRC61	numeric	47
MASTER2.TXT	ANRC62	numeric	48
MASTER2.TXT	ANRC63	numeric	49
MASTER2.TXT	ANRC64	numeric	50
MASTER2.TXT	ANRC65	numeric	51
MASTER2.TXT	ANRC66	numeric	52
MASTER2.TXT	ANRC67	numeric	53
MASTER2.TXT	ANRC68	numeric	54
MASTER2.TXT	ANRC69	numeric	55
MASTER2.TXT	ANRC70	numeric	56
MASTER2.TXT	ANRC71	numeric	57
MASTER2.TXT	ANRC72	numeric	58
MASTER2.TXT	ANRC73	numeric	59
MASTER2.TXT	ANRC74	numeric	60
MASTER2.TXT	ANRC75	numeric	61
MASTER2.TXT	ANRC76	numeric	62
MASTER2.TXT	ANRC77	numeric	63
MASTER2.TXT	ANRC78	numeric	64
MASTER2.TXT	ANRC79	numeric	65
MASTER2.TXT	ANRC80	numeric	66
MASTER2.TXT	ANRC81	numeric	67
MASTER2.TXT	ANRC82	numeric	68
MASTER2.TXT	ANRC83	numeric	69
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MASTER2.TXT	ANRC88	numeric	74
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MASTER2.TXT	ANRC92	numeric	78
MASTER2.TXT	ANRC93	numeric	79
MASTER2.TXT	ANRC94	numeric	80
MASTER2.TXT	ANRC95	numeric	81
MASTER2.TXT	ANRC96	numeric	82
MASTER2.TXT	ANRC97	numeric	83
MASTER2.TXT	ANRC98	numeric	84
MASTER2.TXT	ANRC99	numeric	85
MASTER2.TXT	ANU46	numeric	86

MASTER2.TXT	ANU47	numeric	87
MASTER2.TXT	ANU48	numeric	88
MASTER2.TXT	ANU49	numeric	89
MASTER2.TXT	ANU50	numeric	90
MASTER2.TXT	ANU51	numeric	91
MASTER2.TXT	ANU52	numeric	92
MASTER2.TXT	ANU53	numeric	93
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MASTER2.TXT	ANU55	numeric	95
MASTER2.TXT	ANU56	numeric	96
MASTER2.TXT	ANU57	numeric	97
MASTER2.TXT	ANU58	numeric	98
MASTER2.TXT	ANU59	numeric	99
MASTER2.TXT	ANU60	numeric	100
MASTER2.TXT	ANU61	numeric	101
MASTER2.TXT	ANU62	numeric	102
MASTER2.TXT	ANU63	numeric	103
MASTER2.TXT	ANU64	numeric	104
MASTER2.TXT	ANU65	numeric	105
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MASTER2.TXT	ANU67	numeric	107
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MASTER2.TXT	ANU73	numeric	113
MASTER2.TXT	ANU74	numeric	114
MASTER2.TXT	ANU75	numeric	115
MASTER2.TXT	ANU76	numeric	116
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MASTER2.TXT	ANU78	numeric	118
MASTER2.TXT	ANU79	numeric	119
MASTER2.TXT	ANU80	numeric	120
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MASTER2.TXT	ANU95	numeric	135
MASTER2.TXT	ANU96	numeric	136
MASTER2.TXT	ANU97	numeric	137
MASTER2.TXT	ANU98	numeric	138
MASTER2.TXT	ANU99	numeric	139
MASTER2.TXT	BATCHID	character	6
MASTER2.TXT	BATNO	character	7

MASTER2.TXT	BTYPE	numeric	4
MASTER2.TXT	CHG_FLAG	numeric	194
MASTER2.TXT	EDATE	numeric	3
MASTER2.TXT	HOSPID	character	1
MASTER2.TXT	HOSPID2	character	195
MASTER2.TXT	PATNO	character	2
MASTER2.TXT	PROV	character	5
MASTER2.TXT	RMCHG13	numeric	24
MASTER2.TXT	RMCHG14	numeric	25
MASTER2.TXT	RMCHG15	numeric	26
MASTER2.TXT	RMCHG16	numeric	27
MASTER2.TXT	RMCHG17	numeric	28
MASTER2.TXT	RMCHG18	numeric	29
MASTER2.TXT	RMCHG19	numeric	30
MASTER2.TXT	RMCHG20	numeric	31
MASTER2.TXT	RMRC13	numeric	8
MASTER2.TXT	RMRC14	numeric	9
MASTER2.TXT	RMRC15	numeric	10
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MASTER2.TXT	RMU13	numeric	16
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MASTER2.TXT	RMU15	numeric	18
MASTER2.TXT	RMU16	numeric	19
MASTER2.TXT	RMU17	numeric	20
MASTER2.TXT	RMU18	numeric	21
MASTER2.TXT	RMU19	numeric	22
MASTER2.TXT	RMU20	numeric	23

Variable Label
The 46th ancillary charge
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Revenue code for 46th ancillary charge
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Revenue code for 90th ancillary charge
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Revenue code for 92th ancillary charge
Revenue code for 93th ancillary charge
Revenue code for 94th ancillary charge
Revenue code for 95th ancillary charge
Revenue code for 96th ancillary charge
Revenue code for 97th ancillary charge
Revenue code for 98th ancillary charge
Revenue code for 99th ancillary charge
Service units for 46th ancillary charge

Service units for 47th ancillary charge
Service units for 48th ancillary charge
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Service units for 94th ancillary charge
Service units for 95th ancillary charge
Service units for 96th ancillary charge
Service units for 97th ancillary charge
Service units for 98th ancillary charge
Service units for 99th ancillary charge
Batch ID-four digit code
HCCRA batch number

Type of bill
1=Rm>12,2=An>45,3=both,4-6=prblm,0=none
Discharge date-Ending date of hosp stay
Hospital ID-three digit code
Hospital unit ID-four digit code
Patient control number
Medical provider number (detailed)
The 13th room charge
The 14th room charge
The 15th room charge
The 16th room charge
The 17th room charge
The 18th room charge
The 19th room charge
The 20th room charge
Revenue code for 13th room charge
Revenue code for 14th room charge
Revenue code for 15th room charge
Revenue code for 16th room charge
Revenue code for 17th room charge
Revenue code for 18th room charge
Revenue code for 19th room charge
Revenue code for 20th room charge
Service units for 13th room charge
Service units for 14th room charge
Service units for 15th room charge
Service units for 16th room charge
Service units for 17th room charge
Service units for 18th room charge
Service units for 19th room charge
Service units for 20th room charge

File Name	Variable Name	Variable Type	Variable Number/Order
MASTERADJUDICATED.TXT	ACCSTATE	character	55
MASTERADJUDICATED.TXT	ADMDIAG	character	54
MASTERADJUDICATED.TXT	ADMIT	numeric	14
MASTERADJUDICATED.TXT	AG	numeric	214
MASTERADJUDICATED.TXT	AGE	numeric	213
MASTERADJUDICATED.TXT	ANFLAG	character	23
MASTERADJUDICATED.TXT	B_MONTH	character	17
MASTERADJUDICATED.TXT	BATCHID	character	18
MASTERADJUDICATED.TXT	BATDATE	numeric	19
MASTERADJUDICATED.TXT	BATNO	character	21
MASTERADJUDICATED.TXT	BDAY	numeric	211
MASTERADJUDICATED.TXT	BILLCAT	character	12
MASTERADJUDICATED.TXT	BMO	numeric	210
MASTERADJUDICATED.TXT	BTYPE	numeric	11
MASTERADJUDICATED.TXT	BYEAR	numeric	212
MASTERADJUDICATED.TXT	CCODE	character	248
MASTERADJUDICATED.TXT	CHG_FLAG	numeric	204
MASTERADJUDICATED.TXT	CHG1	numeric	66
MASTERADJUDICATED.TXT	CHG10	numeric	75
MASTERADJUDICATED.TXT	CHG11	numeric	76
MASTERADJUDICATED.TXT	CHG12	numeric	77
MASTERADJUDICATED.TXT	CHG13	numeric	78
MASTERADJUDICATED.TXT	CHG14	numeric	79
MASTERADJUDICATED.TXT	CHG15	numeric	80
MASTERADJUDICATED.TXT	CHG16	numeric	81
MASTERADJUDICATED.TXT	CHG17	numeric	82
MASTERADJUDICATED.TXT	CHG18	numeric	83
MASTERADJUDICATED.TXT	CHG19	numeric	84
MASTERADJUDICATED.TXT	CHG2	numeric	67
MASTERADJUDICATED.TXT	CHG20	numeric	85
MASTERADJUDICATED.TXT	CHG21	numeric	86
MASTERADJUDICATED.TXT	CHG22	numeric	87
MASTERADJUDICATED.TXT	CHG23	numeric	88
MASTERADJUDICATED.TXT	CHG24	numeric	89
MASTERADJUDICATED.TXT	CHG25	numeric	90
MASTERADJUDICATED.TXT	CHG26	numeric	91
MASTERADJUDICATED.TXT	CHG27	numeric	92
MASTERADJUDICATED.TXT	CHG28	numeric	93
MASTERADJUDICATED.TXT	CHG29	numeric	94
MASTERADJUDICATED.TXT	CHG3	numeric	68
MASTERADJUDICATED.TXT	CHG30	numeric	95
MASTERADJUDICATED.TXT	CHG31	numeric	96
MASTERADJUDICATED.TXT	CHG32	numeric	97
MASTERADJUDICATED.TXT	CHG33	numeric	98
MASTERADJUDICATED.TXT	CHG34	numeric	99
MASTERADJUDICATED.TXT	CHG35	numeric	100
MASTERADJUDICATED.TXT	CHG36	numeric	101
MASTERADJUDICATED.TXT	CHG37	numeric	102
MASTERADJUDICATED.TXT	CHG38	numeric	103
MASTERADJUDICATED.TXT	CHG39	numeric	104
MASTERADJUDICATED.TXT	CHG4	numeric	69
MASTERADJUDICATED.TXT	CHG40	numeric	105
MASTERADJUDICATED.TXT	CHG41	numeric	106
MASTERADJUDICATED.TXT	CHG42	numeric	107

MASTERADJUDICATED.TXT	CHG43	numeric	108
MASTERADJUDICATED.TXT	CHG44	numeric	109
MASTERADJUDICATED.TXT	CHG45	numeric	110
MASTERADJUDICATED.TXT	CHG5	numeric	70
MASTERADJUDICATED.TXT	CHG6	numeric	71
MASTERADJUDICATED.TXT	CHG7	numeric	72
MASTERADJUDICATED.TXT	CHG8	numeric	73
MASTERADJUDICATED.TXT	CHG9	numeric	74
MASTERADJUDICATED.TXT	COMBFLAG	character	24
MASTERADJUDICATED.TXT	COMPLETE	character	25
MASTERADJUDICATED.TXT	COUNTY	character	207
MASTERADJUDICATED.TXT	CTYPE	character	208
MASTERADJUDICATED.TXT	DIAG1	character	35
MASTERADJUDICATED.TXT	DIAG10	character	44
MASTERADJUDICATED.TXT	DIAG11	character	45
MASTERADJUDICATED.TXT	DIAG12	character	46
MASTERADJUDICATED.TXT	DIAG13	character	47
MASTERADJUDICATED.TXT	DIAG14	character	48
MASTERADJUDICATED.TXT	DIAG15	character	49
MASTERADJUDICATED.TXT	DIAG16	character	50
MASTERADJUDICATED.TXT	DIAG17	character	51
MASTERADJUDICATED.TXT	DIAG18	character	52
MASTERADJUDICATED.TXT	DIAG2	character	36
MASTERADJUDICATED.TXT	DIAG3	character	37
MASTERADJUDICATED.TXT	DIAG4	character	38
MASTERADJUDICATED.TXT	DIAG5	character	39
MASTERADJUDICATED.TXT	DIAG6	character	40
MASTERADJUDICATED.TXT	DIAG7	character	41
MASTERADJUDICATED.TXT	DIAG8	character	42
MASTERADJUDICATED.TXT	DIAG9	character	43
MASTERADJUDICATED.TXT	DISCTYPE	character	13
MASTERADJUDICATED.TXT	DRG	numeric	62
MASTERADJUDICATED.TXT	DRG_INITIAL	numeric	245
MASTERADJUDICATED.TXT	ECODE	character	53
MASTERADJUDICATED.TXT	EDATE	numeric	16
MASTERADJUDICATED.TXT	EPOA	character	244
MASTERADJUDICATED.TXT	FEIN	character	5
MASTERADJUDICATED.TXT	GRP	character	209
MASTERADJUDICATED.TXT	HMO	character	34
MASTERADJUDICATED.TXT	HNAME1	character	6
MASTERADJUDICATED.TXT	HOSPID	character	2
MASTERADJUDICATED.TXT	HOSPID2	character	7
MASTERADJUDICATED.TXT	INITIAL_WEIGHT	numeric	246
MASTERADJUDICATED.TXT	LOS	numeric	216
MASTERADJUDICATED.TXT	MASTERF	character	22
MASTERADJUDICATED.TXT	MASTKEY	numeric	1
MASTERADJUDICATED.TXT	MDC	character	65
MASTERADJUDICATED.TXT	MDC_INITIAL	character	247
MASTERADJUDICATED.TXT	MRN	character	10
MASTERADJUDICATED.TXT	NEWPAY1	numeric	29
MASTERADJUDICATED.TXT	NEWPAY2	numeric	30
MASTERADJUDICATED.TXT	NEWPAY3	numeric	31
MASTERADJUDICATED.TXT	NPAYOR1	character	26
MASTERADJUDICATED.TXT	NPAYOR2	character	27
MASTERADJUDICATED.TXT	NPAYOR3	character	28

MASTERADJUDICATED.TXT	NPI	character	220
MASTERADJUDICATED.TXT	NPI_ATT	character	221
MASTERADJUDICATED.TXT	NPI_OP	character	222
MASTERADJUDICATED.TXT	NPI_OTH1	character	223
MASTERADJUDICATED.TXT	NPI_OTH2	character	224
MASTERADJUDICATED.TXT	PATNO	character	9
MASTERADJUDICATED.TXT	PAYGRP	numeric	33
MASTERADJUDICATED.TXT	PAYTYP	numeric	32
MASTERADJUDICATED.TXT	POA1	character	226
MASTERADJUDICATED.TXT	POA10	character	235
MASTERADJUDICATED.TXT	POA11	character	236
MASTERADJUDICATED.TXT	POA12	character	237
MASTERADJUDICATED.TXT	POA13	character	238
MASTERADJUDICATED.TXT	POA14	character	239
MASTERADJUDICATED.TXT	POA15	character	240
MASTERADJUDICATED.TXT	POA16	character	241
MASTERADJUDICATED.TXT	POA17	character	242
MASTERADJUDICATED.TXT	POA18	character	243
MASTERADJUDICATED.TXT	POA2	character	227
MASTERADJUDICATED.TXT	POA3	character	228
MASTERADJUDICATED.TXT	POA4	character	229
MASTERADJUDICATED.TXT	POA5	character	230
MASTERADJUDICATED.TXT	POA6	character	231
MASTERADJUDICATED.TXT	POA7	character	232
MASTERADJUDICATED.TXT	POA8	character	233
MASTERADJUDICATED.TXT	POA9	character	234
MASTERADJUDICATED.TXT	PROC1	character	56
MASTERADJUDICATED.TXT	PROC2	character	57
MASTERADJUDICATED.TXT	PROC3	character	58
MASTERADJUDICATED.TXT	PROC4	character	59
MASTERADJUDICATED.TXT	PROC5	character	60
MASTERADJUDICATED.TXT	PROC6	character	61
MASTERADJUDICATED.TXT	PROV	character	8
MASTERADJUDICATED.TXT	PROVM	character	3
MASTERADJUDICATED.TXT	PSTAT	character	219
MASTERADJUDICATED.TXT	RACE	character	225
MASTERADJUDICATED.TXT	RC1	numeric	111
MASTERADJUDICATED.TXT	RC10	numeric	120
MASTERADJUDICATED.TXT	RC11	numeric	121
MASTERADJUDICATED.TXT	RC12	numeric	122
MASTERADJUDICATED.TXT	RC13	numeric	123
MASTERADJUDICATED.TXT	RC14	numeric	124
MASTERADJUDICATED.TXT	RC15	numeric	125
MASTERADJUDICATED.TXT	RC16	numeric	126
MASTERADJUDICATED.TXT	RC17	numeric	127
MASTERADJUDICATED.TXT	RC18	numeric	128
MASTERADJUDICATED.TXT	RC19	numeric	129
MASTERADJUDICATED.TXT	RC2	numeric	112
MASTERADJUDICATED.TXT	RC20	numeric	130
MASTERADJUDICATED.TXT	RC21	numeric	131
MASTERADJUDICATED.TXT	RC22	numeric	132
MASTERADJUDICATED.TXT	RC23	numeric	133
MASTERADJUDICATED.TXT	RC24	numeric	134
MASTERADJUDICATED.TXT	RC25	numeric	135
MASTERADJUDICATED.TXT	RC26	numeric	136

MASTERADJUDICATED.TXT	RC27	numeric	137
MASTERADJUDICATED.TXT	RC28	numeric	138
MASTERADJUDICATED.TXT	RC29	numeric	139
MASTERADJUDICATED.TXT	RC3	numeric	113
MASTERADJUDICATED.TXT	RC30	numeric	140
MASTERADJUDICATED.TXT	RC31	numeric	141
MASTERADJUDICATED.TXT	RC32	numeric	142
MASTERADJUDICATED.TXT	RC33	numeric	143
MASTERADJUDICATED.TXT	RC34	numeric	144
MASTERADJUDICATED.TXT	RC35	numeric	145
MASTERADJUDICATED.TXT	RC36	numeric	146
MASTERADJUDICATED.TXT	RC37	numeric	147
MASTERADJUDICATED.TXT	RC38	numeric	148
MASTERADJUDICATED.TXT	RC39	numeric	149
MASTERADJUDICATED.TXT	RC4	numeric	114
MASTERADJUDICATED.TXT	RC40	numeric	150
MASTERADJUDICATED.TXT	RC41	numeric	151
MASTERADJUDICATED.TXT	RC42	numeric	152
MASTERADJUDICATED.TXT	RC43	numeric	153
MASTERADJUDICATED.TXT	RC44	numeric	154
MASTERADJUDICATED.TXT	RC45	numeric	155
MASTERADJUDICATED.TXT	RC5	numeric	115
MASTERADJUDICATED.TXT	RC6	numeric	116
MASTERADJUDICATED.TXT	RC7	numeric	117
MASTERADJUDICATED.TXT	RC8	numeric	118
MASTERADJUDICATED.TXT	RC9	numeric	119
MASTERADJUDICATED.TXT	RTC	numeric	63
MASTERADJUDICATED.TXT	SDATE	numeric	15
MASTERADJUDICATED.TXT	SEX	character	215
MASTERADJUDICATED.TXT	SRCE	character	217
MASTERADJUDICATED.TXT	STATE	character	206
MASTERADJUDICATED.TXT	STEPNUM	numeric	20
MASTERADJUDICATED.TXT	SUBMITFMT	character	249
MASTERADJUDICATED.TXT	TACHG	numeric	201
MASTERADJUDICATED.TXT	TCHG	numeric	202
MASTERADJUDICATED.TXT	TRCHG	numeric	203
MASTERADJUDICATED.TXT	TYPEAD	character	218
MASTERADJUDICATED.TXT	U1	numeric	156
MASTERADJUDICATED.TXT	U10	numeric	165
MASTERADJUDICATED.TXT	U11	numeric	166
MASTERADJUDICATED.TXT	U12	numeric	167
MASTERADJUDICATED.TXT	U13	numeric	168
MASTERADJUDICATED.TXT	U14	numeric	169
MASTERADJUDICATED.TXT	U15	numeric	170
MASTERADJUDICATED.TXT	U16	numeric	171
MASTERADJUDICATED.TXT	U17	numeric	172
MASTERADJUDICATED.TXT	U18	numeric	173
MASTERADJUDICATED.TXT	U19	numeric	174
MASTERADJUDICATED.TXT	U2	numeric	157
MASTERADJUDICATED.TXT	U20	numeric	175
MASTERADJUDICATED.TXT	U21	numeric	176
MASTERADJUDICATED.TXT	U22	numeric	177
MASTERADJUDICATED.TXT	U23	numeric	178
MASTERADJUDICATED.TXT	U24	numeric	179
MASTERADJUDICATED.TXT	U25	numeric	180

MASTERADJUDICATED.TXT	U26	numeric	181
MASTERADJUDICATED.TXT	U27	numeric	182
MASTERADJUDICATED.TXT	U28	numeric	183
MASTERADJUDICATED.TXT	U29	numeric	184
MASTERADJUDICATED.TXT	U3	numeric	158
MASTERADJUDICATED.TXT	U30	numeric	185
MASTERADJUDICATED.TXT	U31	numeric	186
MASTERADJUDICATED.TXT	U32	numeric	187
MASTERADJUDICATED.TXT	U33	numeric	188
MASTERADJUDICATED.TXT	U34	numeric	189
MASTERADJUDICATED.TXT	U35	numeric	190
MASTERADJUDICATED.TXT	U36	numeric	191
MASTERADJUDICATED.TXT	U37	numeric	192
MASTERADJUDICATED.TXT	U38	numeric	193
MASTERADJUDICATED.TXT	U39	numeric	194
MASTERADJUDICATED.TXT	U4	numeric	159
MASTERADJUDICATED.TXT	U40	numeric	195
MASTERADJUDICATED.TXT	U41	numeric	196
MASTERADJUDICATED.TXT	U42	numeric	197
MASTERADJUDICATED.TXT	U43	numeric	198
MASTERADJUDICATED.TXT	U44	numeric	199
MASTERADJUDICATED.TXT	U45	numeric	200
MASTERADJUDICATED.TXT	U5	numeric	160
MASTERADJUDICATED.TXT	U6	numeric	161
MASTERADJUDICATED.TXT	U7	numeric	162
MASTERADJUDICATED.TXT	U8	numeric	163
MASTERADJUDICATED.TXT	U9	numeric	164
MASTERADJUDICATED.TXT	UNIQUE_1	character	4
MASTERADJUDICATED.TXT	WEIGHT	numeric	64
MASTERADJUDICATED.TXT	ZIP	character	205

Charges (by revenue code)
Charges (by revenue code)
Charges (by revenue code)
Charges (by revenue code)
Charges (by revenue code)
Charges (by revenue code)
Charges (by revenue code)
Charges (by revenue code)
Charges (by revenue code)
1 - flag new combined records
Y - complete discharge
Patient county
State/county groupings
Principle diagnosis
Other Diagnosis
Other Diagnosis
Other Diagnosis
Other Diagnosis
Other Diagnosis
Other Diagnosis
Other Diagnosis
Other Diagnosis
Other diagnosis
Other diagnosis
Other diagnosis
Other diagnosis
Other diagnosis
Other diagnosis
Other diagnosis
Other diagnosis
Other diagnosis
H-inpatient,L-LTC, S-Swing bed, O-others
MS-DRG in effect on discharge date
Initial MS-DRG in effect on discharge date
External cause of injury
Discharge date-Ending date of hosp stay
External Cause of Injury Present on Admission
Federal tax number
Category of state and county groupings
HMO payor type
Hospital Name
Hospital ID-four digit code
Hospital unit ID-four digit code
Weight for initial MS_DRG imported from CMS tables
Length of stay in days-created
1 - flag records for master file
MastKey
MDC imported from CMS tables
MDC for initial MS_DRG imported from CMS tables
Medical record number
Primary payor without leading H
Secondary payor without leading H
Tertiary payor without leading H
Primary payor
Secondary payor
Tertiary payor

Units of service
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Units of service
HCA unique hospital number
MS-DRG weight imported from CMS tables
Patient zipcode

File Name	Variable Name	Variable Type	Variable Number/Order
MASTER2ADJUDICATED.TXT	ANFLAG	character	12
MASTER2ADJUDICATED.TXT	BATCHID	character	9
MASTER2ADJUDICATED.TXT	BATNO	character	10
MASTER2ADJUDICATED.TXT	BTYPE	numeric	6
MASTER2ADJUDICATED.TXT	CHG100	numeric	68
MASTER2ADJUDICATED.TXT	CHG101	numeric	69
MASTER2ADJUDICATED.TXT	CHG102	numeric	70
MASTER2ADJUDICATED.TXT	CHG103	numeric	71
MASTER2ADJUDICATED.TXT	CHG104	numeric	72
MASTER2ADJUDICATED.TXT	CHG105	numeric	73
MASTER2ADJUDICATED.TXT	CHG106	numeric	74
MASTER2ADJUDICATED.TXT	CHG107	numeric	75
MASTER2ADJUDICATED.TXT	CHG108	numeric	76
MASTER2ADJUDICATED.TXT	CHG109	numeric	77
MASTER2ADJUDICATED.TXT	CHG110	numeric	78
MASTER2ADJUDICATED.TXT	CHG111	numeric	79
MASTER2ADJUDICATED.TXT	CHG112	numeric	80
MASTER2ADJUDICATED.TXT	CHG113	numeric	81
MASTER2ADJUDICATED.TXT	CHG114	numeric	82
MASTER2ADJUDICATED.TXT	CHG115	numeric	83
MASTER2ADJUDICATED.TXT	CHG116	numeric	84
MASTER2ADJUDICATED.TXT	CHG117	numeric	85
MASTER2ADJUDICATED.TXT	CHG118	numeric	86
MASTER2ADJUDICATED.TXT	CHG119	numeric	87
MASTER2ADJUDICATED.TXT	CHG46	numeric	14
MASTER2ADJUDICATED.TXT	CHG47	numeric	15
MASTER2ADJUDICATED.TXT	CHG48	numeric	16
MASTER2ADJUDICATED.TXT	CHG49	numeric	17
MASTER2ADJUDICATED.TXT	CHG50	numeric	18
MASTER2ADJUDICATED.TXT	CHG51	numeric	19
MASTER2ADJUDICATED.TXT	CHG52	numeric	20
MASTER2ADJUDICATED.TXT	CHG53	numeric	21
MASTER2ADJUDICATED.TXT	CHG54	numeric	22
MASTER2ADJUDICATED.TXT	CHG55	numeric	23
MASTER2ADJUDICATED.TXT	CHG56	numeric	24
MASTER2ADJUDICATED.TXT	CHG57	numeric	25
MASTER2ADJUDICATED.TXT	CHG58	numeric	26
MASTER2ADJUDICATED.TXT	CHG59	numeric	27
MASTER2ADJUDICATED.TXT	CHG60	numeric	28
MASTER2ADJUDICATED.TXT	CHG61	numeric	29
MASTER2ADJUDICATED.TXT	CHG62	numeric	30
MASTER2ADJUDICATED.TXT	CHG63	numeric	31
MASTER2ADJUDICATED.TXT	CHG64	numeric	32
MASTER2ADJUDICATED.TXT	CHG65	numeric	33
MASTER2ADJUDICATED.TXT	CHG66	numeric	34
MASTER2ADJUDICATED.TXT	CHG67	numeric	35
MASTER2ADJUDICATED.TXT	CHG68	numeric	36
MASTER2ADJUDICATED.TXT	CHG69	numeric	37
MASTER2ADJUDICATED.TXT	CHG70	numeric	38
MASTER2ADJUDICATED.TXT	CHG71	numeric	39
MASTER2ADJUDICATED.TXT	CHG72	numeric	40
MASTER2ADJUDICATED.TXT	CHG73	numeric	41
MASTER2ADJUDICATED.TXT	CHG74	numeric	42
MASTER2ADJUDICATED.TXT	CHG75	numeric	43

MASTER2ADJUDICATED.TXT	CHG76	numeric	44
MASTER2ADJUDICATED.TXT	CHG77	numeric	45
MASTER2ADJUDICATED.TXT	CHG78	numeric	46
MASTER2ADJUDICATED.TXT	CHG79	numeric	47
MASTER2ADJUDICATED.TXT	CHG80	numeric	48
MASTER2ADJUDICATED.TXT	CHG81	numeric	49
MASTER2ADJUDICATED.TXT	CHG82	numeric	50
MASTER2ADJUDICATED.TXT	CHG83	numeric	51
MASTER2ADJUDICATED.TXT	CHG84	numeric	52
MASTER2ADJUDICATED.TXT	CHG85	numeric	53
MASTER2ADJUDICATED.TXT	CHG86	numeric	54
MASTER2ADJUDICATED.TXT	CHG87	numeric	55
MASTER2ADJUDICATED.TXT	CHG88	numeric	56
MASTER2ADJUDICATED.TXT	CHG89	numeric	57
MASTER2ADJUDICATED.TXT	CHG90	numeric	58
MASTER2ADJUDICATED.TXT	CHG91	numeric	59
MASTER2ADJUDICATED.TXT	CHG92	numeric	60
MASTER2ADJUDICATED.TXT	CHG93	numeric	61
MASTER2ADJUDICATED.TXT	CHG94	numeric	62
MASTER2ADJUDICATED.TXT	CHG95	numeric	63
MASTER2ADJUDICATED.TXT	CHG96	numeric	64
MASTER2ADJUDICATED.TXT	CHG97	numeric	65
MASTER2ADJUDICATED.TXT	CHG98	numeric	66
MASTER2ADJUDICATED.TXT	CHG99	numeric	67
MASTER2ADJUDICATED.TXT	COMBFLAG	character	13
MASTER2ADJUDICATED.TXT	DISCTYPE	character	7
MASTER2ADJUDICATED.TXT	EDATE	numeric	8
MASTER2ADJUDICATED.TXT	HOSPID	character	2
MASTER2ADJUDICATED.TXT	HOSPID2	character	3
MASTER2ADJUDICATED.TXT	MASTERF	character	11
MASTER2ADJUDICATED.TXT	MASTKEY	numeric	1
MASTER2ADJUDICATED.TXT	PATNO	character	5
MASTER2ADJUDICATED.TXT	PROV	character	4
MASTER2ADJUDICATED.TXT	RC100	numeric	142
MASTER2ADJUDICATED.TXT	RC101	numeric	143
MASTER2ADJUDICATED.TXT	RC102	numeric	144
MASTER2ADJUDICATED.TXT	RC103	numeric	145
MASTER2ADJUDICATED.TXT	RC104	numeric	146
MASTER2ADJUDICATED.TXT	RC105	numeric	147
MASTER2ADJUDICATED.TXT	RC106	numeric	148
MASTER2ADJUDICATED.TXT	RC107	numeric	149
MASTER2ADJUDICATED.TXT	RC108	numeric	150
MASTER2ADJUDICATED.TXT	RC109	numeric	151
MASTER2ADJUDICATED.TXT	RC110	numeric	152
MASTER2ADJUDICATED.TXT	RC111	numeric	153
MASTER2ADJUDICATED.TXT	RC112	numeric	154
MASTER2ADJUDICATED.TXT	RC113	numeric	155
MASTER2ADJUDICATED.TXT	RC114	numeric	156
MASTER2ADJUDICATED.TXT	RC115	numeric	157
MASTER2ADJUDICATED.TXT	RC116	numeric	158
MASTER2ADJUDICATED.TXT	RC117	numeric	159
MASTER2ADJUDICATED.TXT	RC118	numeric	160
MASTER2ADJUDICATED.TXT	RC119	numeric	161
MASTER2ADJUDICATED.TXT	RC46	numeric	88
MASTER2ADJUDICATED.TXT	RC47	numeric	89

MASTER2ADJUDICATED.TXT	RC48	numeric	90
MASTER2ADJUDICATED.TXT	RC49	numeric	91
MASTER2ADJUDICATED.TXT	RC50	numeric	92
MASTER2ADJUDICATED.TXT	RC51	numeric	93
MASTER2ADJUDICATED.TXT	RC52	numeric	94
MASTER2ADJUDICATED.TXT	RC53	numeric	95
MASTER2ADJUDICATED.TXT	RC54	numeric	96
MASTER2ADJUDICATED.TXT	RC55	numeric	97
MASTER2ADJUDICATED.TXT	RC56	numeric	98
MASTER2ADJUDICATED.TXT	RC57	numeric	99
MASTER2ADJUDICATED.TXT	RC58	numeric	100
MASTER2ADJUDICATED.TXT	RC59	numeric	101
MASTER2ADJUDICATED.TXT	RC60	numeric	102
MASTER2ADJUDICATED.TXT	RC61	numeric	103
MASTER2ADJUDICATED.TXT	RC62	numeric	104
MASTER2ADJUDICATED.TXT	RC63	numeric	105
MASTER2ADJUDICATED.TXT	RC64	numeric	106
MASTER2ADJUDICATED.TXT	RC65	numeric	107
MASTER2ADJUDICATED.TXT	RC66	numeric	108
MASTER2ADJUDICATED.TXT	RC67	numeric	109
MASTER2ADJUDICATED.TXT	RC68	numeric	110
MASTER2ADJUDICATED.TXT	RC69	numeric	111
MASTER2ADJUDICATED.TXT	RC70	numeric	112
MASTER2ADJUDICATED.TXT	RC71	numeric	113
MASTER2ADJUDICATED.TXT	RC72	numeric	114
MASTER2ADJUDICATED.TXT	RC73	numeric	115
MASTER2ADJUDICATED.TXT	RC74	numeric	116
MASTER2ADJUDICATED.TXT	RC75	numeric	117
MASTER2ADJUDICATED.TXT	RC76	numeric	118
MASTER2ADJUDICATED.TXT	RC77	numeric	119
MASTER2ADJUDICATED.TXT	RC78	numeric	120
MASTER2ADJUDICATED.TXT	RC79	numeric	121
MASTER2ADJUDICATED.TXT	RC80	numeric	122
MASTER2ADJUDICATED.TXT	RC81	numeric	123
MASTER2ADJUDICATED.TXT	RC82	numeric	124
MASTER2ADJUDICATED.TXT	RC83	numeric	125
MASTER2ADJUDICATED.TXT	RC84	numeric	126
MASTER2ADJUDICATED.TXT	RC85	numeric	127
MASTER2ADJUDICATED.TXT	RC86	numeric	128
MASTER2ADJUDICATED.TXT	RC87	numeric	129
MASTER2ADJUDICATED.TXT	RC88	numeric	130
MASTER2ADJUDICATED.TXT	RC89	numeric	131
MASTER2ADJUDICATED.TXT	RC90	numeric	132
MASTER2ADJUDICATED.TXT	RC91	numeric	133
MASTER2ADJUDICATED.TXT	RC92	numeric	134
MASTER2ADJUDICATED.TXT	RC93	numeric	135
MASTER2ADJUDICATED.TXT	RC94	numeric	136
MASTER2ADJUDICATED.TXT	RC95	numeric	137
MASTER2ADJUDICATED.TXT	RC96	numeric	138
MASTER2ADJUDICATED.TXT	RC97	numeric	139
MASTER2ADJUDICATED.TXT	RC98	numeric	140
MASTER2ADJUDICATED.TXT	RC99	numeric	141
MASTER2ADJUDICATED.TXT	U100	numeric	216
MASTER2ADJUDICATED.TXT	U101	numeric	217
MASTER2ADJUDICATED.TXT	U102	numeric	218

MASTER2ADJUDICATED.TXT	U103	numeric	219
MASTER2ADJUDICATED.TXT	U104	numeric	220
MASTER2ADJUDICATED.TXT	U105	numeric	221
MASTER2ADJUDICATED.TXT	U106	numeric	222
MASTER2ADJUDICATED.TXT	U107	numeric	223
MASTER2ADJUDICATED.TXT	U108	numeric	224
MASTER2ADJUDICATED.TXT	U109	numeric	225
MASTER2ADJUDICATED.TXT	U110	numeric	226
MASTER2ADJUDICATED.TXT	U111	numeric	227
MASTER2ADJUDICATED.TXT	U112	numeric	228
MASTER2ADJUDICATED.TXT	U113	numeric	229
MASTER2ADJUDICATED.TXT	U114	numeric	230
MASTER2ADJUDICATED.TXT	U115	numeric	231
MASTER2ADJUDICATED.TXT	U116	numeric	232
MASTER2ADJUDICATED.TXT	U117	numeric	233
MASTER2ADJUDICATED.TXT	U118	numeric	234
MASTER2ADJUDICATED.TXT	U119	numeric	235
MASTER2ADJUDICATED.TXT	U46	numeric	162
MASTER2ADJUDICATED.TXT	U47	numeric	163
MASTER2ADJUDICATED.TXT	U48	numeric	164
MASTER2ADJUDICATED.TXT	U49	numeric	165
MASTER2ADJUDICATED.TXT	U50	numeric	166
MASTER2ADJUDICATED.TXT	U51	numeric	167
MASTER2ADJUDICATED.TXT	U52	numeric	168
MASTER2ADJUDICATED.TXT	U53	numeric	169
MASTER2ADJUDICATED.TXT	U54	numeric	170
MASTER2ADJUDICATED.TXT	U55	numeric	171
MASTER2ADJUDICATED.TXT	U56	numeric	172
MASTER2ADJUDICATED.TXT	U57	numeric	173
MASTER2ADJUDICATED.TXT	U58	numeric	174
MASTER2ADJUDICATED.TXT	U59	numeric	175
MASTER2ADJUDICATED.TXT	U60	numeric	176
MASTER2ADJUDICATED.TXT	U61	numeric	177
MASTER2ADJUDICATED.TXT	U62	numeric	178
MASTER2ADJUDICATED.TXT	U63	numeric	179
MASTER2ADJUDICATED.TXT	U64	numeric	180
MASTER2ADJUDICATED.TXT	U65	numeric	181
MASTER2ADJUDICATED.TXT	U66	numeric	182
MASTER2ADJUDICATED.TXT	U67	numeric	183
MASTER2ADJUDICATED.TXT	U68	numeric	184
MASTER2ADJUDICATED.TXT	U69	numeric	185
MASTER2ADJUDICATED.TXT	U70	numeric	186
MASTER2ADJUDICATED.TXT	U71	numeric	187
MASTER2ADJUDICATED.TXT	U72	numeric	188
MASTER2ADJUDICATED.TXT	U73	numeric	189
MASTER2ADJUDICATED.TXT	U74	numeric	190
MASTER2ADJUDICATED.TXT	U75	numeric	191
MASTER2ADJUDICATED.TXT	U76	numeric	192
MASTER2ADJUDICATED.TXT	U77	numeric	193
MASTER2ADJUDICATED.TXT	U78	numeric	194
MASTER2ADJUDICATED.TXT	U79	numeric	195
MASTER2ADJUDICATED.TXT	U80	numeric	196
MASTER2ADJUDICATED.TXT	U81	numeric	197
MASTER2ADJUDICATED.TXT	U82	numeric	198
MASTER2ADJUDICATED.TXT	U83	numeric	199

MASTER2ADJUDICATED.TXT	U84	numeric	200
MASTER2ADJUDICATED.TXT	U85	numeric	201
MASTER2ADJUDICATED.TXT	U86	numeric	202
MASTER2ADJUDICATED.TXT	U87	numeric	203
MASTER2ADJUDICATED.TXT	U88	numeric	204
MASTER2ADJUDICATED.TXT	U89	numeric	205
MASTER2ADJUDICATED.TXT	U90	numeric	206
MASTER2ADJUDICATED.TXT	U91	numeric	207
MASTER2ADJUDICATED.TXT	U92	numeric	208
MASTER2ADJUDICATED.TXT	U93	numeric	209
MASTER2ADJUDICATED.TXT	U94	numeric	210
MASTER2ADJUDICATED.TXT	U95	numeric	211
MASTER2ADJUDICATED.TXT	U96	numeric	212
MASTER2ADJUDICATED.TXT	U97	numeric	213
MASTER2ADJUDICATED.TXT	U98	numeric	214
MASTER2ADJUDICATED.TXT	U99	numeric	215

AGE

(SDATE-DOB)/365.25

AG

Value	Description
0	Missing
1	0-14
2	15-44
3	45-64
4	65+

B MONTH

SDATE/EDATE

BILLCAT

Value	Description
11x	Acute bill type
18x	Swing bill type
21x	Skilled nursing bill type

ANFLAG

1 = flag records for analysis file

CHG_FLAG

Depeding on dataset:

Master datasets 1=Rm>12,2=An>45,3=both,4-6=prblm,0=none

Master Adjudicated Datasets 1=more than 45 charge elements, 0=not

COMBFLAG

Value	Description
	Blank if record not combined
1	Flag for new combined records

COMPLETE

Value	Description
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	Applies to long term care hospitalizations with series bills. Blank if B_MONTH indicates that a bill has not been received for all months of the year. This is a B_MONTH value other than "123456789ABC".
Y	Applies to long term care hospitalizations with series bills. Flag is present if B_MONTH indicates that a bill has been received for all months of the year. This is a B_MONTH value of "123456789ABC"

CTYPE

Value	Description
BORDERS	Patient county borders West Virginia (2000-Present)
BORDR ST	Patient county is in a state bordering West Virginia (2001-Present)
IN-STATE	Patient county is in West Virginia (2001-Present)
INVALID	Missing (2000-Present)
NON-BORD	Patient county does not border West Virginia (2001-Present)
NONBORD	Patient county does not border West Virginia (2000 only)

DISCTYPE

Value	Description	Created from
H	Inpatient discharge	BTYPE = 11X
L	Long term care discharge	BTYPE = 2XX
S	Swing bed discharge	BTYPE = 18X
O	Other discharge	

GRP

Value	Description
1	Patient is a West Virginia resident
2	Patient is a resident of a state bordering West Virginia
3	Patient is a resident of a distant (nonbordering) or unknown state

HNAME1

hospital name mapped from HOSPID

HMO

"HMO" when 4th digit of NPAYOR1 = 4

MASTKEY

SUBMITFMT	
Value	missing
UB04	UB04
UB04X	UB04 EXTENDED
UB837	UB 837 FORMAT

PAYGRP

Value	Description	Created from
0	Missing	PAYTYP =
1	Medicare	PAYTYP = 11
2	Medicaid	PAYTYP = 21
3	PEIA	PAYTYP = 24
4	Workers' Compensation	PAYTYP = 22
5	Other Federal government	PAYTYP = 12 - 19
6	Other WV government	PAYTYP = 23, 25 - 29, 55 - 56
7	Other States' government	PAYTYP = 31 - 39
8	Commercial	PAYTYP = 41 - 49
9	Nonprofit	PAYTYP = 51 - 54, 57 - 59
10	Employer/Union	PAYTYP = 61 - 69
11	Self-pay	PAYTYP = 71
12	Charity	PAYTYP = 72
13	Unknown	PAYTYP = 88
14	NEC (not elsewhere classified)	PAYTYP = 99

PAYTYP

Value	Description
11	Federal Govt Medicare
12	Federal Govt DOL-Black Lung
13	Federal Govt Railroad Workers
14	Federal Govt UMWA Trusts
15	Federal Govt Veterans Admin

16	Federal Govt Federal Bur Corrections
17	Federal Govt Champus
18	Federal Govt (Reserved)
19	Federal Govt Federal NEC
21	WV State Govt WV Medicaid
22	WV State Govt WV Workers Comp
23	WV State Govt WV Voc Rehab
24	WV State Govt WV PEIA
25	WV State Govt WV Maternal & Child Health
26	WV State Govt WV Dept of Corrections
27	WV State Govt WV County/Local Corrections
28	WV State Govt (Reserved) [until 12/31/05]; WV State Govt Children's Health Insurance Program [as of 1/1/06]
29	WV State Govt WV Govt NEC
31	Other States Govt Other States Medicaid
32	Other States Govt Other States Workers Comp
33	Other States Govt (Unassigned)
34	Other States Govt (Unassigned)
35	Other States Govt (Unassigned)
36	Other States Govt (Unassigned)
37	Other States Govt (Unassigned)
38	Other States Govt (Reserved)
39	Other States Govt Other States Govt NEC
41	Commercial Acordia
42	Commercial Advantage
43	Commercial Aetna
44	Commercial Health Plan of the Upper Ohio
45	Commercial Prudential
46	Commercial (Unassigned)
47	Commercial (Unassigned)
48	Commercial (Reserved)
49	Commercial Commercial NEC
51	Non-Profit AARP
52	Non-Profit Blue Cross of VA
53	Non-Profit Mountain State Blue Cross
54	Non-Profit Other Blues
55	Non-Profit (Unassigned) [until 1/17/06]; Non-Profit AccessWV [as of 1/18/06]

56	Non-Profit (Unassigned) [until 1/17/06]; Non-Profit West Virginia Small Business Plan [as of 1/18/06]
57	Non-Profit (Unassigned)
58	Non-Profit (Reserved)
59	Non-Profit Non-Profit NEC
61	Employer/ERISA/Union Camcare
62	Employer/ERISA/Union Natl Assoc Letter Carriers
63	Employer/ERISA/Union Teamsters
64	Employer/ERISA/Union UMWA
65	Employer/ERISA/Union (Unassigned)
66	Employer/ERISA/Union (Unassigned)
67	Employer/ERISA/Union (Unassigned)
68	Employer/ERISA/Union (Reserved)
69	Employer/ERISA/Union Employer/ERISA/Union NEC
71	Uninsured Self-Pay
72	Uninsured Charity
73	Uninsured (Reserved)
74	Uninsured (Reserved)
75	Uninsured (Reserved)
76	Uninsured (Reserved)
77	Uninsured (Reserved)
78	Uninsured (Reserved)
79	Uninsured (Reserved)
88	Unknown Unknown
99	NEC NEC

RACE

Value	Description
1	White and Non-Hispanic
2	White and Hispanic/Latino
3	White and Unknown Ethnicity
4	Black and Non-Hispanic
5	Black and Hispanic/Latino
6	Black and Unknown Ethnicity
7	Asian
8	Native Hawaiian or Other Pacific Islander
9	American Indian or Alaska Native
M	Multiple Races and Non-Hispanic

	R	Multiple Races and Hispanic/Latino
	S	Multiple Races and Unknown Ethnicity
	T	Unknown Race and Unknown Ethnicity
	Y	Other
	U	Unknown

SEX

Value	Description
F	Female
M	Male
U	Unknown

STEPNUM

STEPNUM typically gets incremented once per week, but may increment more than once per week if the weekly processing was executed more than once during the week.

LOS

LOS = EDATE – SDATE; If LOS = 0 Then LOS = 1

Appendix D HDSS Listing of Warnings and Errors



Hospital Inpatient Data System
Edit Check Definitions Data Collection Year 2016
 Listing of Warnings and Errors for the Hospital Data Submission System
 April 2016

Batch-Level Warnings

These warnings identify questionable trends observed at the batch-level. The existence of these warnings does not necessarily indicate an error in the data. They are intended to alert you to unusual trends and must be reviewed to determine whether or not a coding mistake exists. It is preferred, but not required, that any identified coding mistakes be corrected before submitting the batch.

Code	Level	Description	Condition
B1	Batch	Missing or invalid ZIP on >10% records in batch	More than 10% of records in batch have missing or invalid ZIP code
B2	Batch	Missing secondary payer on all records in batch	100% records in batch are missing secondary payer
B3	Batch	Missing secondary diagnosis on >40% records in batch	More than 40% of records in batch are missing secondary diagnosis
B5	Batch	Admission type identical on all records in batch	All records in batch have same TYPEAD
B6	Batch	Point of origin/Admission source identical on all records in batch	All records in batch have same SRCE
B7	Batch	Patient status identical on all records in batch	All records in batch have same PSTAT
B8	Batch	No rev code 174 for any NICU discharge in batch	Hospitals with NICU has 0 records in the batch with 174 revenue code
B9	Batch	SSN not reported for any record in batch	All records in the batch have missing SSN (999999999 or blank)
B161	Batch	Questionable number of admissions from ER in batch	For 510xxx, 511xxx, and 51Sxxx discharges only. % of records with a P7 Condition Code (CCODE) is <30% or >70%

Edit Check Definitions

Listing of Warnings and Errors for the Hospital Data Submission System

April 2016

Record-Level Warnings

These warnings identify questionable codes submitted on the record. They are intended to alert you to an unusual code and must be reviewed to determine whether or not a coding mistake exists. For example, for most patients age 65 or older, the primary payer for the discharge is Medicare. In prior years data there were coding mistakes that identified the payer was Commercial when it should have been Medicare. Therefore, the W165 warning was created to identify patients age 65 and older that have a primary payer other than Medicare. If this is correct, then there is no coding mistake and the payer should not be edited (the warning should be ignored). It is preferred, but not required, that any identified coding mistakes be corrected before submitting the batch.

Code	Level	Description	Condition
W57	Questionable	Interim continuing or interim last bill found in January end of service	If EDATE month is in January, then fire if BTYPE in 214, 114, 184, 124, 213, 113, 183,123
W58	Questionable	Interim first or interim continuing bill in found December end of service	If EDATE month is in December, then fire if BTYPE in 212, 112, 182, 122, 213, 112, 183, 123
W60	Questionable	Missing ZIP code	Not reported
W61	Questionable	Invalid ZIP code	Not valid U.S. ZIP code
W67	Questionable	Questionable total charges	Reported total charge (TCHG) is >\$50,000 per day or <\$100 if BTYPE<>115
W70	Questionable	Invalid external cause of injury code	Not a valid value according to ICD-CM codes effective on discharge date
W72	Questionable	Missing NPI other physician 1	NPI_OTH1 not reported
W73	Questionable	Missing NPI other physician 2	NPI_OTH2 not reported
W87	Questionable	Missing procedure code	Revenue code 036x reported and no procedure code reported
W88	Questionable	Missing ECODE when injury diagnosis (ICD-9 codes 800x-999x, ICD-10 codes S00 - T88) reported	ECODE not reported when at least one injury diagnosis reported (ICD-9 codes E800-E999, ICD-10 codes S00 - T88)
W89	Questionable	Auto accident reported in ECODE with no accident state indicated	ACCSTATE not reported when ECODE (ICD-9 codes E810-E825, ICD-10 codes V40 - V49) reported
W90	Questionable	Missing NPI operating physician	NPI_OP not provided when 036x is reported in at least one revenue code
W101	Duplicate	Duplicate record ID (same PROV, PATNO, EDATE, BTYPE) in master database	A record with the same PROV, PATNO, EDATE, BTYPE exists in master database
W164	Questionable	Missing P7 condition code	For 510xxx discharges only. Revenue code 045x reported in at least one revenue code and no P7 Condition Code (CCODE) reported
W165	Questionable	Questionable Medicare payer	Patient's age is 65 or older and primary payer code is not Medicare (H11xx)

Edit Check Definitions

Listing of Warnings and Errors for the Hospital Data Submission System
April 2016

Record-Level Errors

These errors identify missing or invalid codes submitted on the record. All record-level errors must be corrected before the batch can be submitted.

Code	Level	Description	Condition
E0	Rejected	Discharge date not in the current reporting year	Valid EDATE but before or after 01/01/20xx (current reporting year)
E9	Duplicate	Complete duplicate record in batch	Other record(s) in batch identical on all data elements
E10	Duplicate	Duplicate record ID (same PROV, PATNO, EDATE, BTYPE) in batch	Other record(s) in batch have identical PROV, PATNO, EDATE, BTYPE
E11	Rejected	Missing patient control number	PATNO not reported
E12	Rejected	Missing bill type	BTYPE not reported
E13	Rejected	Invalid bill type	BTYPE values other than 11X, 12X, 21X, 18X
E14	Rejected	Missing statement covers period	Complete SDATE or EDATE not provided
E15	Rejected	Invalid statement covers period	EDATE < SDATE or SDATE <= 1992 or SDATE > BATDATE
E16	Rejected	Missing patient birth date	Complete DOB not provided
E17	Rejected	Invalid patient birth date	DOB not valid or later than admit date or earlier than 120 years prior to admit date
E18	Rejected	Missing patient sex	SEX not reported
E19	Rejected	Invalid patient sex	SEX values other than M, F or U
E20	Rejected	Missing admission date	Complete date not provided
E21	Rejected	Invalid admission date	Invalid ADMIT or ADMIT later than BATDATE
E22	Rejected	Missing type of admission	TYPEAD not reported
E23	Rejected	Invalid type of admission	TYPEAD not a valid value per NUBC standards effective on discharge date
E24	Rejected	Missing point of origin/admission source	SRCE not reported
E25	Rejected	Invalid point of origin/admission source	SRCE not a valid value per NUBC standards effective on discharge date, and SRCE indicating newborn checked against TYPEAD indicating newborn
E26	Rejected	Missing patient discharge status	PSTAT not reported
E27	Rejected	Invalid patient discharge status	PSTAT not a valid value per NUBC standards effective on discharge date
E28	Rejected	Missing revenue code	Revenue code not reported when unit or charge reported
E29	Rejected	Missing total charge	TCHG not reported
E30	Rejected	Invalid total charge	Variance (+/-5%) between the reported total charge (TCHG) and calculated total charge (i.e., sum of all individual revenue charges reported)

Edit Check Definitions

Listing of Warnings and Errors for the Hospital Data Submission System

April 2016

E31	Rejected	Missing revenue charge	All revenue charges are missing or a charge not reported when revenue code or unit reported
E32	Rejected	Invalid revenue charge	Revenue charge is < 0 or > total charges
E33	Rejected	Missing primary payer	NPAYOR1 not reported
E34	Rejected	Invalid primary payer	NPAYOR1 not a valid value per HCA <i>Payer Coding Specifications</i> . Reserved or Unassigned codes not acceptable. H8888 and H9999 not acceptable.
E35	Rejected	Missing Medicare provider ID	PROV not reported
E36	Rejected	Invalid Medicare provider ID (PROV)	PROV is not consistent with the WV hospital (HOSPID)
E37	Rejected	Missing principal diagnosis	DIAG1 not reported
E38	Rejected	Invalid principal diagnosis	DIAG1 not a valid value per ICD-CM codes effective on discharge date
E39	Rejected	Invalid principal procedure	PROC1 not a valid value per ICD-CM codes effective on discharge date
E40	Rejected	Multiple reported total charges	Multiple total charges (TCHG) reported
E41	Rejected	Discharge date later than today	EDATE > today's date
E43	Rejected	Medicare provider ID does not match bill type	3rd digit of PROV = 0,1,2,3,4,S,T and not BTYPE=1xx, except 18x; OR 3rd digit of PROV=U or Z and not BTYPE=18x; OR 3rd digit of PROV=5 and not BTYPE=2xx
E44	Rejected	Invalid revenue code	Revenue code not a valid value per NUBC standards effective on discharge date
E45	Rejected	Missing units of service	Unit not reported when revenue code or charge reported
E46	Rejected	Invalid units of service	Unit value < 0
E47	Rejected	Service start date precedes admission date by four days	SDATE<(ADMIT-4)
E48	Rejected	Invalid second or third payer	NPAYOR2 or NPAYOR3 not a valid value per HCA <i>Payer Coding Specifications</i> . Reserved or Unassigned codes not acceptable. H8888 and H9999 not acceptable.
E49	Rejected	Invalid secondary diagnosis	DIAG not a valid value per ICD-CM codes effective on discharge date
E51	Rejected	Invalid secondary procedure	PROC not a valid value per ICD-CM codes effective on discharge date
E53	Rejected	Missing admitting diagnosis	ADMITDX not reported
E54	Rejected	Missing NPI	NPI not reported
E55	Rejected	Missing NPI attending physician	NPI_ATT not reported
E56	Rejected	Missing medical record number	MRN not reported
E60	Rejected	Principal procedure reported but principal procedure date missing	If a principal procedure has occurred, a principal procedure date is required
E61	Rejected	Principal procedure date with no corresponding principal procedure	If principal procedure date exists, there must also be a principal procedure
E62	Rejected	Principal procedure is not within the statement start and end dates	PROC1DATE is not within statement coverage dates SDATE and EDATE

Edit Check Definitions

Listing of Warnings and Errors for the Hospital Data Submission System

April 2016

E63	Rejected	Other procedure reported but corresponding procedure date missing	If other procedure has occurred, the other procedure date is required
E64	Rejected	Other procedure date with no corresponding other procedure	If other procedure date exists, there must also be a matching other procedure
E65	Rejected	Other procedure date not within the statement start and end dates	PROCxDATE is not within statement coverage dates SDATE and EDATE
E66	Rejected	Duplicate diagnosis code	Identical diagnosis code reported on the record two or more times.
E67	Rejected	ADMIT > EDATE	The admission date is after the end of service date
E150	Rejected	Missing Race/Ethnicity	RACE not reported
E151	Rejected	Invalid Race/Ethnicity	RACE not a valid value per HCA <i>Data Element Specifications</i>
E155	Rejected	Invalid POA	Values other than Y, N, U, W, blank/null. For exempt and non-exempt hospitals and diagnosis codes. Does not include the EPOA.
E156	Rejected	Missing diagnosis when POA reported	Corresponding DIAG code not reported when POA is reported. For exempt and non-exempt hospitals. Does not include the EPOA
E157	Rejected	Invalid admitting diagnosis	ADMITDX not a valid value per ICD-CM codes effective on discharge date
E158	Rejected	Excess ancillary charge field count	Maximum number of Ancillary Charges exceeded (999 max). Discharge record must be deleted from batch
E159	Rejected	Invalid external cause of injury POA	Values other than Y, N, U, W, or blank/null.
E160	Rejected	Excess room charge field count	Maximum number of Room Charges exceeded (999 max). Discharge record must be deleted from batch
E162	Rejected	Invalid condition code	CCODE value not P7. Other condition codes are not accepted.
E163	Rejected	No Revenue Code of 045x	For 510xxx discharges only. No 045x Revenue Code when CCODE P7 is reported
E167	Rejected	Newborn but date of birth year does not match the data collection year	TYPEAD=4 (type of admission is newborn), but the year of the date of birth is not within the data collection year. The previous year is okay if the month is December.

Appendix E **Data Element Specifications**



**West Virginia
Hospital Inpatient Data System**

***Data Element Specifications Guide
for 5010 Format, ICD-10***

**May 2015
Version 1**

West Virginia Hospital Inpatient Data System

Data Element Specifications Guide for 837i 5010, ICD-10 Version

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Introduction

The West Virginia Hospital Inpatient Data System (WVHIDS) collects, processes, and analyzes inpatient discharge data that are collected by the West Virginia Health Care Authority (WVHCA). This Guide outlines specifications for the data elements that are required to be submitted to the WVHCA by all non-federal hospitals in the state. The table below defines the information that is contained in the data element tables presented in this Guide.

Refer to the *Data Collection Policies and Procedures* guide for hospital inpatient data reporting requirements. Additional technical documents are available to provide specific details regarding the data file layout and submission procedures. All data reporting and technical documentation can be accessed from the WVHCA website (<http://www.hca.wv.gov/fdhome/HospInpatientData>) or from the Hospital Data Submission System (HDSS) (<https://hdss.s-3.net/Documentation>).

Data Element Specification Table Layout

Data Element Name

Description	A description or definition of the data element.
837i Guide	WVHCA/Social & Scientific Systems, Inc. 837i Companion Guide corresponding page number
UB-04 Element	Reference to the UB-04 Form Locator.
HDSS Field	Name of the data element as it appears in the West Virginia Hospital Data Submission System.
Format & Valid Codes	A description of the required format and accepted codes.
Edit Check Errors & Warnings	A list of the errors and/or warnings that may appear in the Hospital Data Submission System as a result of the edits checks performed on the data element. Warnings must be reviewed, and if possible, corrected prior to submission. Errors must be corrected before the data can be submitted.
Notes	Any special data submission or processing notes related to the data element.

Alphabetical Index of Data Elements

This table presents an alphabetical list of the data elements, their abbreviated field name in the Hospital Data Submission System (HDSS), and the page number of the corresponding data element specifications table in this Guide.

Data Element Name / Field Description	HDSS Field Name	Page Number
Accommodation/Ancillary Charges	RMCHG, ANCHG	16
Accommodation/Ancillary Revenue Codes	RMRC, ANRC	15
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Other Diagnosis Code(s)	DIAG2-DIAG24	17
Other Procedure Code(s)	PROC2-PROC12	21
Other Procedure Date(s)	PROC1DATE-PROC12DATE	22
Patient Address Line	N/A	27
Patient Birth Date	DOB	24
Patient City Name	N/A	27
Patient Control Number	PATNO	9
Patient First Name	N/A	26
Patient Last Name	N/A	26
Patient Gender Code	SEX	24
Patient Name Suffix	N/A	26
Patient Race and Ethnicity Code	RACE	25
Patient State	N/A	27
Patient Status Code	PSTAT	12
Patient Zip Code	ZIP	25

Payer Code(s)	NPAYOR1, NPAYOR2, NPAYOR3	14
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Principal Procedure Date	PROC1DATE	21
Social Security Number	N/A	28
Statement Coverage Dates	SDATE, EDATE	11
Total Claim Charges	TCHG	14

I. Data Element Specifications – Submission/Processing Fields

HCA Batch Number

Description	Unique identifier for each batch of claims submitted to the Health Care Authority
837i Guide	Page 5
UB-04 Element	N/A
HDSS Field	BATNO
Format & Valid Codes	No standard format required
Edit Check Errors & Warnings	
Notes	<ul style="list-style-type: none">• It is recommended that all records within a batch contain the same batch number, assigned and formatted per hospital specifications.• It is recommended that a unique batch number be applied to each submitted batch. Should data have to be accessed at a later date for review or editing, a unique number will help to identify the appropriate batch.

HCA Batch Date

Description	Date the batch was created for submission to the Health Care Authority
837i Guide	Page 5
UB-04 Element	N/A
HDSS Field	BATDATE
Format & Valid Codes	Date formatted as YYYYMMDD
Edit Check Errors & Warnings	
Notes	

II. Data Element Specifications – Administrative Fields

Medicare Provider Number (CMS Certification Number)

Description	Medicare provider identification number indicating the type of service
837i Guide	Page 5
UB-04 Element	N/A
HDSS Field	PROV
Format & Valid Codes	<p><u>Digits 1-2</u> All WV provider numbers begin with '51'</p> <p><u>Digit 3</u> 0 = Acute 1 = Critical Access Hospital (CAH) 2 = Long Term Acute Care Hospital (LTACH) 3 = Rehabilitation Hospital 4 = Psychiatric Hospital 5 = Skilled Nursing Facility (SNF) S = Psychiatric Unit T = Rehabilitation Unit U = Swing SNF Z = Swing SNF CAH</p> <p><u>Digits 4-6</u> Unique numeric ID for each service provider</p>
Edit Check Errors & Warnings	<ul style="list-style-type: none"> E35 = Missing Medicare provider ID (Record Error) E36 = Invalid Medicare provider ID (Record Error) E43 = Medicare provider ID does not match bill type (Record Error)
Notes	<ul style="list-style-type: none"> All provider numbers for the facility must be registered in the HDSS prior to submission on a record. All records that represent the same discharge (patient control number), must have the same provider number.

Federal Tax Number

Description	Number assigned to the billing provider by the federal government for tax reporting purposes
837i Guide	Page 5
UB-04 Element	FL 05
HDSS Field	FEIN
Format & Valid Codes	No standard format required
Edit Check Errors & Warnings	
Notes	

Bill Type Code

Description	Code indicating the specific type of bill
837i Guide	Page 5
UB-04 Element	FL 04
HDSS Field	BTYPE
Format & Valid Codes	<p><u>Digit 1</u></p> <p>1 = Hospital 2 = Skilled Nursing</p> <p><u>Digit 2</u></p> <p>1 = Inpatient (Including Medicare Part A) 2 = Inpatient – Medicare Part B only 8 = Swing Bed</p> <p><u>Digit 3</u></p> <p>1 = Admit through Discharge Claims 2 = Interim – First Claim 3 = Interim – Continuing Claim 4 = Interim – Last Claim 5 = Late Charges Only 7 = Replacement of Prior Claim 8 = Void/Cancel of Prior Claim</p>
Edit Check Errors & Warnings	<ul style="list-style-type: none"> E12 = Missing bill type (Record Error) E13 = Invalid bill type (Record Error)
Notes	<ul style="list-style-type: none"> In the 837 format, the bill type code is submitted in two fields, but is displayed as one field in the HDSS.

Patient Control Number

Description	Unique identification number assigned to each discharge
837i Guide	Page 6
UB-04 Element	FL 03a
HDSS Field	PATNO
Format & Valid Codes	No standard format required
Edit Check Errors & Warnings	<ul style="list-style-type: none"> E11 = Missing patient control number (Record Error)
Notes	<ul style="list-style-type: none"> The patient control number must be unique to each discharge. The patient control number must be identical for all records/bills (including interim bills) representing a single inpatient stay.

Medical Record Number

Description	Number assigned to the patient's medical/health record by the provider
837i Guide	Page 5
UB-04 Element	FL 03b
HDSS Field	MRN
Format & Valid Codes	No standard format required
Edit Check Errors & Warnings	<ul style="list-style-type: none"> E56 = Missing medical record number (Record Error)
Notes	<ul style="list-style-type: none"> The patient control number identifies a single episode of care; the medical record number identifies a patient across multiple episodes of care.

Admission Type Code

Description	Code indicating the priority (type) of admission
837i Guide	Page 4
UB-04 Element	FL 14
HDSS Field	TYPEAD
Format & Valid Codes	Submit valid codes per NUBC Official UB-04 Data Specifications
Edit Check Errors & Warnings	<ul style="list-style-type: none"> E22 = Missing type of admission (Record Error) E23 = Invalid type of admission (Record Error) B5 = Admission type identical on all records in batch (Batch Warning) E167 = Newborn but date of birth year does not match the data collection year (Record Error)
Notes	<ul style="list-style-type: none"> For births occurring in the hospital, the admission type should be coded as '4.' This code requires the use of the newborn codes for source of admission. In accordance with WVHCA <i>Data Collection Policies and Procedures</i>, separate discharge records should be submitted for newborns and mothers.

Point of Origin (Admission Source Code)

Description	Code indicating the point of patient origin for the admission
837i Guide	Page 7
UB-04 Element	FL 15
HDSS Field	SRCE
Format & Valid Codes	Submit valid codes per NUBC Official UB-04 Data Specifications
Edit Check Errors & Warnings	<ul style="list-style-type: none"> E24 = Missing point of origin/admission source (Record Error) E25 = Invalid point of origin/admission source (Record Error) B6 = Point of origin/admission source identical on all records in batch (Batch Warning)
Notes	<ul style="list-style-type: none"> In accordance with WVHCA <i>Data Collection Policies and Procedures</i>, separate discharge records should be submitted for newborns and mothers. If TYPEAD = 4 then SRCE must be 5 or 6.

Admit from Emergency Room Condition Code

Description	Code indicating the patient was admitted directly from this facility's Emergency Room/Dept.
837i Guide	Page 4
UB-04 Element	FL 18-28
HDSS Field	CCODE
Format & Valid Codes	Submit a "P7" per NUBC Official UB-04 Data Specifications if the patient was admitted as an inpatient directly from the emergency room/department.
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • B161 = Questionable number of admissions from ER in batch (Batch Warning) • E162 = Invalid condition code (Record Error) • E163 = No Revenue Code of 045x (Record Error) • W164 = Missing P7 condition code (Record Warning)
Notes	

Admission Date

Description	Date of admission to hospital
837i Guide	Page 4
UB-04 Element	FL 12
HDSS Field	ADMIT
Format & Valid Codes	Date formatted as specified in the <i>WVHCA 837i Companion Guide</i>
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E20 = Missing admission date (Record Error) • E21 = Invalid admission date (Record Error)
Notes	<ul style="list-style-type: none"> • In the HDSS, admission date is formatted as MM/DD/YYYY.

Statement Coverage Dates

Description	Dates of the service period included on the bill
837i Guide	Page 8
UB-04 Element	FL 06
HDSS Field	SDATE = Beginning date of service (From) EDATE = Ending date of service (Through)
Format & Valid Codes	Dates formatted as specified in the <i>WVHCA 837i Companion Guide</i>
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E0 = Discharge date prior to current reporting year (Record Error) • E14 = Missing statement covers period (Record Error) • E15 = Invalid statement covers period (Record Error) • E41 = Discharge date later than today (Record Error)
Notes	<ul style="list-style-type: none"> • In the 837i format, the statement coverage dates are required to be submitted as one field, but are presented in the HDSS as two separate fields.

Patient Status Code

Description	Code indicating the status of the patient at the end of the service period covered on this bill
837i Guide	Page 7
UB-04 Element	FL 17
HDSS Field	PSTAT
Format & Valid Codes	Submit valid codes per NUBC Official UB-04 Data Specifications
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E26 = Missing patient discharge status (Record Error) • E27 = Invalid patient discharge status (Record Error) • B7 = Patient status identical on all records in batch (Batch Warning)
Notes	

NPI Billing Provider

Description	Unique national provider identification number assigned to the provider submitting the bill
837i Guide	Page 5
UB-04 Element	FL 56
HDSS Field	NPI
Format & Valid Codes	10 character National Provider Identifier
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E54 = Missing NPI (Record Error)
Notes	

NPI Attending Physician

Description	Unique national provider identification number assigned to the attending provider
837i Guide	Page 5
UB-04 Element	FL 76
HDSS Field	NPI_ATT
Format & Valid Codes	10 character National Provider Identifier
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E55 = Missing NPI attending physician (Record Error)
Notes	<ul style="list-style-type: none"> • The attending provider is the individual who had overall responsibility for the patient's medical care and treatment reported in the claim.

NPI Operating Physician

Description	Unique national provider identification number assigned to the operating physician
837i Guide	Page 6
UB-04 Element	FL 77
HDSS Field	NPI_OP
Format & Valid Codes	10 character National Provider Identifier
Edit Check Errors & Warnings	<ul style="list-style-type: none">W90 = Missing NPI operating physician (Record Warning)
Notes	<ul style="list-style-type: none">The operating physician is the individual with the primary responsibility for performing the surgical procedure(s).

NPI Other Physician(s)

Description	Unique national provider identification number assigned to other physicians involved in care
837i Guide	Page 6
UB-04 Element	FL 78, FL 79
HDSS Field	NPI_OTH1, NPI_OTH2
Format & Valid Codes	10 character National Provider Identifier
Edit Check Errors & Warnings	<ul style="list-style-type: none">W72 = Missing NPI other physician 1 (Record Warning)W73 = Missing NPI other physician 2 (Record Warning)
Notes	<ul style="list-style-type: none">NPIs for two additional physicians can be submitted.

NPI Rendering Provider

Description	Unique national provider identification number assigned to the rendering provider.
837i Guide	Page 6
UB-04 Element	FL 78, FL 79
HDSS Field	NPI_REND
Format & Valid Codes	10 character National Provider Identifier
Edit Check Errors & Warnings	
Notes	Send if available.

III. Data Element Specifications – Charge Fields

Payer Code(s)

Description	Codes indicating the primary, secondary, and tertiary payers billed for the service
837i Guide	Page 7
UB-04 Element	FL 50
HDSS Field	NPAYOR1, NPAYOR2, NPAYOR3
Format & Valid Codes	Submit WVHCA payer codes as defined in the <i>WVHCA Payer Coding Specifications</i>
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E33 = Missing primary payer (Record Error) • E34 = Invalid primary payer (Record Error) • E48 = Invalid second or third payer (Record Error) • B2 = Missing secondary payer on all records in batch (Batch Warning) • W165 = Questionable Medicare payer (Record Warning)
Notes	<ul style="list-style-type: none"> • Secondary and tertiary payer codes are required to be submitted when other payers are known to potentially be involved in paying the claim. • In the event of an W165 Warning, only change primary payer to Medicare if valid.

Total Claim Charges

Description	Total charges billed for the services included on the bill
837i Guide	Page 8
UB-04 Element	N/A
HDSS Field	See Notes below
Format & Valid Codes	Dollar amount - 15 character max (including decimal point). If the decimal point is not submitted, it will be interpreted that the charge is a whole dollar amount. For example, '30025' = \$30,025.00 '300.25' = \$300.25
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E29 = Missing total charge (Record Error) • E30 = Invalid total charge (Record Error) • E40 = Multiple reported total charges (Record Error) • W67 = Questionable total charges (Record Warning)
Notes	<ul style="list-style-type: none"> • The charge amount submitted in this field will be presented in the HDSS as the Total Claim Charges (TCHG).

Accommodation/Ancillary Revenue Codes

Description	Codes identifying specific accommodation and ancillary services provided
837i Guide	Page 4
UB-04 Element	FL 42
HDSS Field	RMRC1 – RMRC999 = Accommodation/Room Revenue Codes ANRC1 – ANRC999 = Ancillary Revenue Codes
Format & Valid Codes	Submit valid codes per NUBC Official UB-04 Data Specifications
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E28 = Missing revenue code (Record Error) • E44 = Invalid revenue code (Record Error) • B8 = No revenue code 174 for any NICU discharge in batch (Batch Warning)
Notes	<ul style="list-style-type: none"> • All revenue codes are listed in the HDSS on the Revenues tab. • Revenue codes 70-219 are labeled as accommodation/room services in the master database; Revenue codes less than 70 or greater than 219 are labeled as ancillary services in the master database. • A maximum of 999 accommodation charges (and corresponding revenue codes and units) and 999 ancillary charges (and corresponding revenue codes and units) can be submitted.

Accommodation/Ancillary Units

Description	Service quantity pertaining to the corresponding revenue code
837i Guide	Page 4
UB-04 Element	FL 46
HDSS Field	RMU1 – RMU999 = Accommodation/Room Service Units ANU1 – ANU999 = Ancillary Service Units
Format & Valid Codes	Number of units
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E45 = Missing units of service (Record Error) • E46 = Invalid units of service (Record Error)
Notes	<ul style="list-style-type: none"> • A maximum of 999 accommodation charges (and corresponding revenue codes and units) and 999 ancillary charges (and corresponding revenue codes and units) can be submitted.

Accommodation/Ancillary Charges

Description	Total charges pertaining to the corresponding revenue code
837i Guide	Page 4
UB-04 Element	FL 47
HDSS Field	RMCHG1 – RMCHG999 = Accommodation/Room Charges ANCHG1 – ANCHG999 = Ancillary Charges
Format & Valid Codes	Dollar amount - 15 character max (including decimal point). If the decimal point is not submitted, it will be interpreted that the charge is a whole dollar amount. For example, '30025' = \$30,025.00 '300.25' = \$300.25
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E31 = Missing revenue charge (Record Error) • E32 = Invalid revenue charge (Record Error) • E158 = Excess ancillary charge filed count (Record Error) • E160 = Excess room charge field count (Record Error)
Notes	<ul style="list-style-type: none"> • A maximum of 20 accommodation charges (and corresponding revenue codes and units) and 99 ancillary charges (and corresponding revenue codes and units) can be submitted. • The sum of the revenue charges is displayed in the HDSS on the Revenues tab.

Data Element Specifications – Clinical Fields

Principal Diagnosis Code

Description	Code indicating the condition determined to be chiefly responsible for the admission
837i Guide	Page 5
UB-04 Element	FL 67
HDSS Field	DIAG1
Format & Valid Codes	ICD-10-CM Diagnosis Codes
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E37 = Missing principal diagnosis (Record Error) • E38 = Invalid principal diagnosis (Record Error) • E66 = Duplicate diagnosis code (Record Error)
Notes	

Other Diagnosis Code(s)

Description	Codes corresponding to additional/secondary conditions related to the admission
837i Guide	Page 5
UB-04 Element	FL 67A-Q
HDSS Field	DIAG2 – DIAG24
Format & Valid Codes	ICD-10-CM Diagnosis Codes
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E49 = Invalid secondary diagnosis (Record Error) • B3 = Missing secondary diagnosis on >40% records in batch (Batch Warning) • E66 = Duplicate diagnosis code (Record Warning)
Notes	<ul style="list-style-type: none"> • Report additional conditions that coexist at the time of admission, that develop subsequently, or that affect the treatment received and/or the length of stay. • Up to 24 secondary diagnosis codes can be submitted.

Present on Admission (POA) Code(s)

Description	Present on admission code corresponding to a diagnosis code
837i Guide	Page 7
UB-04 Element	FL 67, FL67 A-Q
HDSS Field	POA1 – POA25
Format & Valid Codes	<p><i>*Refer to the 837i documentation for details regarding the format of the POA field.</i></p> <p><i>*Refer to ICD-10-CM Official Guidelines for additional code descriptions and instructions.</i></p> <p>Y = Yes (Diagnosis was present at the time of inpatient admission) N = No (Diagnosis was not present at the time of inpatient admission) U = No Information in the Record (Documentation insufficient to determine if condition was present at the time of inpatient admission) W = Clinically Undetermined (Provider unable to clinically determine whether condition was present at the time of inpatient admission) Blank/null = Exempt from present on admission reporting</p>
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E155 = Invalid POA (Record Error) • E156 = Missing diagnosis when POA reported (Record Error)
Notes	<ul style="list-style-type: none"> • WVHCA requires POA reporting in accordance with ICD-10-CM and CMS official coding and reporting guidelines. CMS POA website: https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-LN/MLNMattersArticles/downloads/MM7280.pdf • Per ICD-10-CM and CMS guidelines, some hospitals and diagnosis codes are exempt from POA reporting. Medicare Provider numbers with the first 3 digits of 511, 512, 513, 514, 515, 51S, 51T, 51U, or 51Z are exempt. Although it is not required, exempt hospitals are strongly encouraged to submit POA information to the WVHCA. • Hospitals exempt from POA reporting will submit a blank/null for all corresponding diagnosis fields that were submitted. A POA value of '1' is no longer allowed. • Non-exempt hospitals with exempt diagnosis codes must submit a blank/null for the corresponding diagnosis fields that were exempt. A '1' is no longer allowed.

External Cause of Injury Code(s)

Description	Code(s) pertaining to external cause of injuries, poisoning, or adverse effect
837i Guide	Page 5
UB-04 Element	FL 72a-c
HDSS Field	ECODE1-ECODE12
Format & Valid Codes	ICD-10-CM Codes
Edit Check Errors & Warnings	<ul style="list-style-type: none"> W70 = Invalid external cause of injury code (Record Warning) W88 = Missing external cause of injury code when injury diagnosis reported (Record Warning)
Notes	<ul style="list-style-type: none"> Required when an injury, poisoning, or adverse effect is the cause for seeking medical treatment.

External Cause of Injury POA Code(s)

Description	Code indicating present on admission status of external cause of injuries, poisoning, or adverse effect
837i Element	Page 5
UB-04 Element	FL 72a-c
HDSS Field	EPOA1-EPOA12
Format & Valid Codes	<p><i>*Refer to the 837i documentation for details regarding the format of the POA field.</i></p> <p><i>*Refer to ICD-10-CM Official Guidelines for additional code descriptions and instructions.</i></p> <p>Y = Yes (Diagnosis was present at the time of inpatient admission)</p> <p>N = No (Diagnosis was not present at the time of inpatient admission)</p> <p>U = No Information in the Record (Documentation insufficient to determine if condition was present at the time of inpatient admission)</p> <p>W = Clinically Undetermined (Provider unable to clinically determine whether condition was present at the time of inpatient admission)</p> <p>Blank/null = Exempt from present on admission reporting</p>
Edit Check Errors & Warnings	<ul style="list-style-type: none"> E159 = Invalid external cause of injury POA (Record Error)
Notes	<ul style="list-style-type: none"> WVHCA requires POA reporting in accordance with ICD-10-CM and CMS official coding and reporting guidelines. CMS POA website: https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-LN/MLNMattersArticles/downloads/MM7280.pdf Per ICD-10-CM and CMS guidelines, some hospitals and diagnosis codes are exempt from POA reporting. Medicare Provider numbers with the first 3 digits of 511, 512, 513, 514, 515, 51S, 51T, 51U, or 51Z are exempt. Although it is not required, exempt hospitals are strongly encouraged to submit POA information to the WVHCA. Hospitals exempt from POA reporting will submit a blank/null for all corresponding diagnosis fields that were submitted. A POA value of '1' is no longer allowed. Non-exempt hospitals with exempt diagnosis codes must submit a blank/null for the corresponding diagnosis fields that were exempt. A '1' is no longer allowed.

Auto Accident State Code

Description	State abbreviation code where the auto accident occurred
837i Guide	Page 5
UB-04 Element	FL 29
HDSS Field	ACCSTATE
Format & Valid Codes	Two-digit state abbreviation
Edit Check Errors & Warnings	<ul style="list-style-type: none"> W89 = Missing auto accident state (Record Warning)
Notes	<ul style="list-style-type: none"> Required when the services reported on the claim are related to an auto accident.

Admitting Diagnosis Code

Description	Code indicating the diagnosis at the time of admission
837i Guide	Page 5
UB-04 Element	FL 69
HDSS Field	ADMITDX
Format & Valid Codes	ICD-10-CM Codes
Edit Check Errors & Warnings	<ul style="list-style-type: none"> E53 = Missing admitting diagnosis (Record Error) E157 = Invalid admitting diagnosis (Record Error)
Notes	

Principal Procedure Code

Description	Code identifying the inpatient principal procedure performed during the service period
837i Guide	Page 7
UB-04 Element	FL 74
HDSS Field	PROC1
Format & Valid Codes	ICD-10-PCS Procedure Codes
Edit Check Errors & Warnings	<ul style="list-style-type: none"> E39 = Invalid principal procedure (Record Error) W87 = Missing procedure code (Record Warning) E60 = Principal procedure reported but principal procedure date missing (Record Error) E61 = Principal procedure date with no corresponding principal procedure (Record Error)
Notes	<ul style="list-style-type: none"> Required when a procedure was performed.

Principal Procedure Date

Description	Date corresponding to the principal procedure code
837i Guide	Page 8
UB-04 Element	FL 74
HDSS Field	PROC1DATE
Format & Valid Codes	Dates formatted as specified in the <i>WVHCA 837i Companion Guide</i>
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E60 = Principal procedure reported but principal procedure date missing • E61 = Principal procedure date with no corresponding principal procedure
Notes	

Other Procedure Code(s)

Description	Codes identifying additional significant procedures performed during the service period
837i Guide	Page 8
UB-04 Element	FL 74a-e
HDSS Field	PROC2 – PROC12
Format & Valid Codes	ICD-10-PCS Procedure Codes
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E51 = Invalid secondary procedure code (Record Error) • E63 = Other procedure reported but corresponding procedure date missing (Record Error) • E64 = Other procedure date with no corresponding other procedure (Record Error)
Notes	<ul style="list-style-type: none"> • Required when additional procedures were performed. • Report all (up to 12) additional procedures that were most important for the episode of care and specifically any therapeutic procedures closely related to the principal diagnosis.

Other Procedure Dates

Description	Dates corresponding to other procedure codes
837i Guide	Page 8
UB-04 Element	FL 74 a-e
HDSS Field	PROC2DATE – PROC12DATE
Format & Valid Codes	Dates formatted as specified in the <i>WVHCA 837i Companion Guide</i>
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E63 = Other procedure reported but corresponding procedure date missing (Record Error) • E64 = Other procedure date with no corresponding other procedure (Record Error) • E65 = Other procedure date not in the data collection year (Record Error)
Notes	

IV. Data Element Specifications – Patient Demographic Fields

Patient Gender Code

Description	Sex of the patient as recorded at admission
837i Guide	Page 6
UB-04 Element	FL 11
HDSS Field	SEX
Format & Valid Codes	M = Male F = Female U = Unknown
Edit Check Errors & Warnings	<ul style="list-style-type: none">• E18 = Missing patient sex (Record Error)• E19 = Invalid patient sex (Record Error)
Notes	

Patient Birth Date

Description	Date of birth of the patient
837i Guide	Page 6
UB-04 Element	FL 10
HDSS Field	DOB
Format & Valid Codes	Date formatted as YYYYMMDD
Edit Check Errors & Warnings	<ul style="list-style-type: none">• E16 = Missing patient birth date (Record Error)• E17 = Invalid patient birth date (Record Error)• E167 = Newborn but date of birth year does not match the data collection year
Notes	

Patient Race & Ethnicity Code

Description	Race and ethnicity as reported by the patient
837i Guide	Page 7
UB-04 Element	N/A
HDSS Field	RACE
Format & Valid Codes	<p>Submit WVHCA valid codes as outlined below.</p> <p>1 = White and Non-Hispanic 2 = White and Hispanic/Latino 3 = White and Unknown Ethnicity 4 = Black and Non-Hispanic 5 = Black and Hispanic/Latino 6 = Black and Unknown Ethnicity 7 = Asian 8 = Native Hawaiian or Other Pacific Islander 9 = American Indian or Alaska Native M = Multiple Races and Non-Hispanic R = Multiple Races and Hispanic/Latino S = Multiple Races and Unknown Ethnicity T = Unknown Race and Hispanic/Latino Y = Other U = Unknown</p>
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • E150 = Missing Race/Ethnicity (Record Error) • E151 = Invalid Race/Ethnicity (Record Error)
Notes	<ul style="list-style-type: none"> • New race and ethnicity codes were required with the implementation of the WVHCA 837i 4010 file format.. They are continued with the 837i 5010 file format.

Patient Zip Code

Description	Zip code where the patient resides
837i Guide	Page 7
UB-04 Element	FL 09 subset
HDSS Field	ZIP
Format & Valid Codes	Five digit postal zip code
Edit Check Errors & Warnings	<ul style="list-style-type: none"> • W60 = Missing ZIP code (Record Warning) • W61= Invalid ZIP code (Record Warning) • B1 = Missing or invalid ZIP on >10% of records in batch (Batch Warning)
Notes	

Patient First Name

Description	First name of the patient
837i Guide	Page 6
UB-04 Element	FL 08
HDSS Field	N/A
Format & Valid Codes	Submit per NUBC Official UB-04 Data Specifications
Edit Check Errors & Warnings	
Notes	This field will not be visible or editable on the HDSS, and it will not appear on any reports.

Patient Last Name

Description	Last name of the patient
837i Guide	Page 6
UB-04 Element	FL 08
HDSS Field	N/A
Format & Valid Codes	Submit per NUBC Official UB-04 Data Specifications
Edit Check Errors & Warnings	
Notes	This field will not be visible or editable on the HDSS, and it will not appear on any reports.

Patient Name Suffix

Description	Patient name suffix
837i Guide	Page 7
UB-04 Element	FL 08
HDSS Field	N/A
Format & Valid Codes	Submit per NUBC Official UB-04 Data Specifications
Edit Check Errors & Warnings	
Notes	This field will not be visible or editable on the HDSS, and it will not appear on any reports.

Patient Address Line

Description	Patient address line, street address or PO Box
837i Guide	Page 6
UB-04 Element	FL 09
HDSS Field	N/A
Format & Valid Codes	Submit street address per NUBC Official UB-04 Data Specifications
Edit Check Errors & Warnings	
Notes	This field will not be visible or editable on the HDSS, and it will not appear on any reports.

Patient City Name

Description	Patient address line, city name
837i Guide	Page 6
UB-04 Element	FL 09
HDSS Field	N/A
Format & Valid Codes	Submit city name per NUBC Official UB-04 Data Specifications
Edit Check Errors & Warnings	
Notes	This field will not be visible or editable on the HDSS, and it will not appear on any reports.

Patient State

Description	Patient address line, state abbreviation
837i Guide	Page 7
UB-04 Element	FL 09
HDSS Field	N/A
Format & Valid Codes	Submit state per NUBC Official UB-04 Data Specifications
Edit Check Errors & Warnings	
Notes	This field will not be visible or editable on the HDSS, and it will not appear on any reports.

Patient SSN

Description	Patient social security number
837i Guide	Page 7
UB-04 Element	N/A
HDSS Field	N/A
Format & Valid Codes	Submit social security number with no spaces or dashes.
Edit Check Errors & Warnings	N/A
Notes	If unknown, put 999999999. This field will not be visible or editable on the HDSS, and it will not appear on any reports.

Appendix F **WVHIDS Reconciliation Process**



West Virginia Hospital Inpatient Data System Reconciliation Process

This document presents an overview of the steps to take to complete the reconciliation of UB data in the Hospital Data Submission System (HDSS). Reconciliation is typically completed quarterly and at the end of each data collection year. Please refer to the *Data Submission and Reconciliation Schedule* for deadlines.

1) Make sure all data has been submitted.

- a. Review DQR2
 - i. Filter to "submitted" to review how many records have been submitted.
 - ii. Filter to "adjudicated" to review how many discharges are being counted.
 - iii. Make sure the number of adjudicated discharges seems reasonable across months.
 - iv. Make sure data has been submitted for all units (PROVs).
- b. If there are missing months of data, review the batches in the Data Collection Dashboard to determine if there are any that need to be edited and submitted.

2) Make sure all quarterly reconciliation forms have been submitted.

- a. Review the Reconciliation Dashboard to verify all four quarterly reconciliation forms have been submitted.
- b. Review DQR4. If there are months of data missing from this report then there are data and/or reconciliation forms that have not been submitted.

3) Initial Review of DQR 4 – Payer Reconciliation

This report compares the number of discharges by provider number, payer, and month of discharge that exist in the master database (Adjudicated) with the number of discharges reported on the reconciliation form (Reported). Discrepancies between the Adjudicated and Reported counts must be resolved. An initial review of DQR4 should be completed at the beginning of the reconciliation process. However, payer code changes should not be implemented until the issues identified on the other DQRs have been resolved.

4) Review DQR9 – W101 Duplicates Report

This report lists all records with a W101 warning (i.e., multiple submitted records with the same PROV, PATNO, EDATE, and BTYPE). These records may have different dates, payers, or charges. The system keeps the most recently submitted record and ignores the other records during adjudication. If the “wrong” record is kept then the payer or charges may be incorrect in the master database. Review this report to make sure the correct record is being kept. If there wrong record is being kept, delete the wrong record from the batch.

5) Review DQR5 – Bill Type Report

The purpose of DQR5 is to identify missing interim records that prevent the adjudication of records. DQR5a shows you odd combinations of bill types before adjudication in matrix form, while DQR5b shows you the exact odd combinations, at a record level. DQR5c shows you how the system was able to auto – adjudicate these, and it shows, in matrix form, how cases have been resolved. The records listed on DQR5b are not adjudicating and are not being counted. Missing interim records or a final complete record (xx1) should be submitted so that these discharges will be counted. Inconsistent dates of service between records could also be causing an adjudication problem. In these cases, the records should be edited to correct the dates of service.

6) Review DQR7 – Over-counted Discharges Report

This report lists patient numbers that have 2 or more adjudicated records. These are discharges that are being “double-counted.” This is often due to different discharge dates or provider numbers or odd combinations of bill types. The correct final record(s) should be identified by the hospital and the other record(s) should be deleted from the batch.

7) Review DQR8 – Under-counted Discharges Report

This report lists additional records (besides those listed on DQR5b) that are not adjudicated (not being counted). This is usually because void bills (xx8) exist and are voiding final complete bills. These records should be reviewed to ensure they are being handled correctly. If a record should not be voided, the xx8 bill needs to be deleted.

8) Final Review of DQR4 – Payer Reconciliation

This report should be re-reviewed after issues on all other DQRs have been reviewed and/or resolved. If payer coding errors exist, the records should be edited to correct the payers. Requests for revising the counts on the reconciliation form can be submitted to HCA.

Other Resources

- **DQR3 – Patient Listing.** This report lists key fields for all records that have been submitted. It can be used to further investigate issues identified in the DQRs.
- Data submission documentation is available under the “Documentation” tab in the HDSS.
- HDSS Help Desk: HDSSSupport@s-3.com, 1-888-398-7268
- WVHCA: Susan Dolly, SDolly@hcawv.org, 304-558-7000 x243

TIPS

- Typically adjudication occurs each Wednesday night. However, adjudication is performed more often during reconciliation periods. Submitted data will not appear in adjudicated reports until adjudication has been performed.
- The patient number (PATNO) and provider number (PROV) must be the same on all records representing a single discharge. Inconsistent PATNOs and PROVs could result in under-counting or over-counting.
- The admission date (ADMIT) must be the same on all interim records representing a single discharge. Inconsistent ADMITs will prevent adjudication of interim records.
- The discharge date (EDATE) must be the same on all non-interim records representing a single discharge. Inconsistent EDATEs will result in over-counting.
- The HDSS now allows for the manual entry of records. This method can be used to submit records rather than creating and uploading a new batch.
- There are generally three ways to change records in order to resolve issues identified on the DQRs. The most efficient method often varies depending on the combination of records submitted.
 1. Delete a record(s) so that the remaining record(s) will adjudicate correctly;
 2. Change the bill type, patient number, provider number, and/or service date of submitted records so that they will adjudicate correctly; or,
 3. Edit a final bill (xx1, xx7) so that it represents the entire service period (service dates, charges, payer). This is often the best scenario when a final bill (xx1, xx7) and interims have been submitted but the final bill does not represent the entire service period.

Which Data Quality Report Should I Use?

Situation	Report to use
You want to see the error/warning type and count per batch and the total charges involved. This will aid you in correcting issues in your batches prior to upload so the same errors don't continue to happen.	DQR1-Batch Summary Report
You want to know the number of records submitted each month.	DQR2-Submitted Records by Month of Discharge (filter to submitted status)
You want to know the number of records adjudicated each month.	DQR2-Submitted Records by Month of Discharge (filter to adjudicated status)
You've run DQR 2 for adjudicated and submitted records and you have discrepancies when comparing, so you want to see details on the patients by PROV, year, and/or month. Or you have reviewed DQR4 and find discrepancies between the adjudicated and reported. It becomes necessary to see which records didn't get adjudicated. You want to see the record or records that are included in the combination of the creation of an adjudicated record for a patient. You want to see details of all records submitted.	DQR3-Patient Listing
You want to know how your reported reconciliation counts compare to your adjudicated data counts by Month, PROV, Payers. You would also like to know what the percentage difference is between your counts and the adjudicated counts.	DQR4-Payer Reconciliation Report
You want to identify missing interim records which prevent adjudication of a record.	DQR5b-Non-Adjudicated Patient Level Bill Type Report
You need to make sure you haven't submitted duplicate records for the same patient under another PATNO. You need a list that matches records on several key fields.	DQR6-Potential Duplicates Report
You have records that are being counted more than once because records are not adjudicating correctly. You need a detailed list in order to make corrections and reconcile.	DQR7-Over-counted Discharges Report
You need to see detail on records that aren't being counted because they can't be adjudicated. These records have the wrong bill types, or the SDATE, ADMIT DATE, or EDATE aren't correct.	DQR8-Under-counted Discharges Report
You want to know if you have records in different batches with the same PROV, PATNO, BTYPE, and EDATE and make sure that the correct record was retained during the de-duplication process.	DQR9-Records with W101 Duplicate Warning

Appendix G 837I Companion Guide



West Virginia Health Care Authority

Social & Scientific Systems, Inc.

837i Companion Guide

5010 with ICD-10

Effective for Discharges with Service End Dates 10/1/2015 or later

Comparison of 5010 ICD-10 to 5010 ICD-9 Format

Qualifier changes

1. Diagnosis code admitting,-qualified by "ABJ" for ICD-10, was "BJ" for ICD-9
2. Diagnosis code other- qualified by "ABF" for ICD-10, was "BF" for ICD-9
3. Diagnosis code principal - qualified by "ABK" for ICD-10, was "BK" for ICD-9
4. External cause of injury code - qualified by "ABN" for ICD-10, was "BN" for ICD-9
5. Procedure code principal -qualified by "BBR" for ICD-10, was "BR" for ICD-9
6. Other procedure codes – qualified by "BBQ" for ICD-10, was "BQ" for ICD-9

Overview

The following information is intended to serve only as a companion document to the Washington Publishing Company's 837I implementation guide. The use of this document is solely for the purpose of clarification.

ANSI 837i Completion Information

To ensure that your claim files are processed correctly, please include the following information in the appropriate ANSI EDI elements:

ANSI Element	
ISA07	"ZZ" qualifier
ISA08	Production ID: "WVHCA"
ISA15	Enter T when submitting a test claim file. Enter P when submitting a production claim file.
GS03	Production ID: "WVHCA"

Transaction Set Notes:

Loop 2400 can be repeated up to 999 times to accommodate multiple accommodation and ancillary charges. Each occurrence of Loop 2400 must contain the LX segment which assigns an identification number (counter) for each occurrence. In other words, for each LX segment, increment the LX01 by 1. You can only send one SV2 segment per Loop 2400.

The total claim amount should be sent ONLY in the CLM segment (in the CLM02). DO NOT send the total claim amount in an SV2 segment.

Transaction Set Details

The 837 described in this document covers two different scenarios.

- 1 The Subscriber IS the Patient
- 2 The Subscriber IS NOT the Patient

The requirements for each of these scenarios differ slightly, yet both are accounted for in the implementation guide.

The tables in the last two sections of this document address both scenarios separately and indicate the MINIMUM REQUIREMENTS for each.

Key Information Required

WV Health Care Authority / Social & Scientific Systems, Inc. require certain pieces of information to successfully process claims. Below is an explanation of these requirements:

Required Field:

Location / Notes:

Accommodation Charges,
Revenue Codes, and Units/Days

Send the information about accommodation charges in the SV2 segment within Loop 2400 with a National Uniform Billing Committee (NUBC) Revenue Code greater than or equal to 70 and less than or equal to 219 (in the SV2_01 segment within Loop 2400).

- Send the accommodation charge amount in the SV203.
- Send the accommodation quantity in the SV205.
- Send the accommodation unit of measure ("DA" Days or "UN" Unit) that describes the accommodation quantity in the SV204 segment.

Admission Date

Send in the DTP03 data element where DTP01 = "435" and DTP02 = "DT". The format of this date/time is CCYYMMDDHHMM. This DTP is in Loop 2300.

Admission Type Code

Send in the CL101 data element in Loop 2300

Admit from Emergency Room:

Send the code P7 in the HI01-02 component data element where HI01-01 = "BG"

Ancillary Charges, Revenue
Codes, and Units/Days

Send information about the ancillary charges in the SV2 segment within Loop 2400 with a National Uniform Billing Committee (NUBC) Revenue Code less than 70 or greater than 219 (in the SV201 data element within Loop 2400).

- Send the ancillary charge amount in the SV203 data element.
- Send the ancillary quantity in the SV205 data element
- Send the ancillary unit of measure ("DA" Days or "UN" Unit) that describes the ancillary quantity in the SV204 data element

Required Field:

Location / Notes:

Auto Accident State Code	If this claim is related to an auto accident, send the two character state abbreviation in the auto accident state segment (REF). Send in REF02 where REF01="LU" within Loop 2300.
Batch Date (HCA)	Send this value in the BHT04 data element to supply the date when the data was written to the file.
Batch Number (HCA)	Send this value in the BHT03 data element to supply the batch ID assigned to a deliverable batch
Bill Type (Uniform Bill Type Code)	The first and second positions of the Uniform Bill Type. Code should be sent in CLM05-01 within Loop 2300. The third position of the Uniform Bill Type Code should be sent in CLM05-03 within Loop 2300.
Diagnosis Code (Admitting)	Send this code in the HI01-2 component data element where HI01-1="ABJ"
Diagnosis Codes (Other)	Send the first other diagnosis code (if applicable) in the HI01-2 component data element where HI01-1 = "ABF". You can send up to 12 other diagnosis codes in this segment, each one qualified by "ABF" in the first component data element. In addition, you can send a second occurrence of this HI segment if needed to report up to 5 additional other diagnosis codes.
Diagnosis Code (Principal)	Send this code in the HI01-2 component data element where HI01-1 = "ABK" first sub-element of the first element).
External Cause of Injury Code (United States Department of Office of Vital Statistics E-Code)	Send this code in the HI01-2 component data element where HI01-1 = "ABN".
External Cause of Injury POA	Send the EPOA in the HI01-9 component data element of the external cause of injury code HI component data element
Federal Tax Number of the Billing Provider	Send in the REF02 data element where REF01 = "EI" in the NM1 Loop qualified by "85" in Loop 2010AA.
Medical Record Number	Send this in the REF02 data element where REF01 = "EA". This REF segment is located in Loop 2300 following the CL1 segment.
Medicare Provider Number (aka CCN – CMS Certification Number)	Send in the REF02 data element where REF01="G2", billing provider secondary information, in Loop 2010BB
NPI (Attending Provider)	Send the Attending Physician's National Provider Identifier in the NM109 data element where NM101 = "71" and NM108 = "XX" in Loop 2310A.
NPI (Billing Provider)	Send this code in the NM102-09 component data element within Loop 2010AA where NM102-08 = "XX" and NM102-01 = "85".

Required Field:

Location / Notes:

NPI (Operating Physician)

If applicable, send the Operating Physician's National Provider Identifier in the NM109 data element where NM101 = "72" and NM108 = "XX" in Loop 2310B.

NPI (Other Operating Physician)

If applicable, send the Other Operating Physician's National Provider Identifier in the NM109 data element where NM101 = "ZZ" and NM108 = "XX" in Loop 2310C. The standard generally only allows for one occurrence of the Loop 2310C Other Operating Physician, but both can be successfully processed. If applicable, please send two occurrences of Loop 2310C to report two Other Operating Physicians.

NPI (Rendering Provider)

Send the Rendering Provider's National Provider Identifier in the NM109 data element where NM101 = "82" and NM108 = "XX" in Loop 2310D.

Patient Address Line

Send in the N301 data element in the NM1 Loop qualified by "IL" in Loop 2010BA if the Subscriber is the Patient, else in the NM1 Loop qualified by "QC" in Loop 2010CA if the Subscriber is not the Patient.

Patient Birth Date

Send in the DMG02 data element in Loop 2010BA if the Patient is the Subscriber, else in Loop 2010CA if the Patient is not the Subscriber.

Patient City Name

Send in the N401 data element in the NM1 Loop qualified by "IL" in Loop 2010BA if the Subscriber is the Patient, else in the NM1 Loop qualified by "QC" in Loop 2010CA if the Subscriber is not the Patient. -

Patient Control Number

Send in the CLM01 data element in Loop 2300.

Patient First Name

Send in the NM104 data element in the NM1 Loop qualified by "IL" and where NM102="1" in Loop 2010BA if the Subscriber is the Patient, else in the NM1 Loop qualified by "QC" and NM102="1" in Loop 2010CA if the Subscriber is not the Patient

Patient Gender Code

Send in the DMG03 data element in Loop 2010BA if the Patient is the Subscriber, else in Loop 2010CA if the patient is not the Subscriber

Patient Middle Name/Initial

Send in the NM105 data element in the NM1 Loop qualified by "IL" and where NM102="1" in Loop 2010BA if the Subscriber is the Patient, else in the NM1 Loop qualified by "QC" and NM102="1" in Loop 2010CA if the Subscriber is not the Patient

Patient Last Name

Send in the NM103 data element in the NM1 Loop qualified by "IL" and where NM102="1" in Loop 2010BA if the Subscriber is the Patient, else in the NM1 Loop qualified by "QC" and NM102="1" in Loop 2010CA if the Subscriber is not the Patient

Required Field:**Location / Notes:**

Patient Name Suffix

Send in the NM107 data element in the NM1 Loop qualified by "IL" and where NM102="1" in Loop 2010BA if the Subscriber is the Patient, else in the NM1 Loop qualified by "QC" and NM102="1" in Loop 2010CA if the Subscriber is not the Patient

Patient Race & Ethnicity Code

Send a valid WVHCA race and ethnicity code in the DMG05 data element in Loop 2010BA if the Patient is the Subscriber, else in Loop 2010CA if the Patient is not the Subscriber. Refer to the WVHCA Data Element Specifications Guide for required WVHCA codes.

Patient SSN

Send in the REF02 data element where REF01 = "SY" in Loop 2010BA if the Subscriber is the Patient, else send in the REF02 data element where REF01 = "SY" in Loop 2010CA if the Subscriber is not the Patient. Note that this field must not have spaces or dashes.

Patient State Code

Send in the N402 data element in the NM1 Loop qualified by "IL" in Loop 2010BA if the Subscriber is the Patient, else in the NM1 Loop qualified by "QC" in Loop 2010CA if the Subscriber is not the Patient.

Patient Status Code

Send this code in the CL103 data element within Loop 2300.

Patient Zip Code

Send in the N403 data element in the NM1 Loop qualified by "IL" in Loop 2010BA if the Subscriber is the Patient, else in the NM1 Loop qualified by "QC" in Loop 2010CA if the Subscriber is not the Patient.

Payer Code

Up to 3 codes can be submitted to identify the expected source of payment. Refer to the WVHCA Data Element Specifications Guide for required WVHCA codes.

- Send the primary payer in the NM109 data element within Loop 2010BB with NM108 = "PI" where NM101 = "PR" and NM102 = "2" in the 2010BB Loop.
- If applicable, send the secondary payer in the NM109 data element within Loop 2330B with NM108 = "PI" where NM101 = "PR" and NM102 = "2" in the 2330B Loop.
- If applicable, send the third payer in the NM109 data element within Loop 2330B with NM108 = "PI" where NM101 = "PR" and NM102 = "2" as described for the secondary payer.

Present on Admission
(POA) Codes

Send the POA for Primary Diagnosis in the HI01-9 component data element qualified by "ABK" in the first component data element. You can send up to 12 other POAs in this segment, each one qualified by "ABF" in the first component data element. In addition, you can send a second occurrence of this HI segment if needed to report up to 5 additional other POAs

Point of Origin
(Admission Source Code)

Send in the CL102 data element in Loop 2300. Effective for claims with a start date of 1/1/2011 or later. The value '7' is no longer valid.

Required Field:

Location / Notes:

Procedure Codes (Other)

Send the first other procedure code (if applicable) in the HI01-2 component data element where HI01-1 = "BBQ". You can send up to 4 additional other procedure codes in the HI03-2, HI04-2, HI05-2, HI06-2 component data elements.

Procedure Code (Principal)

Send this code in the HI01-2 component data element where HI01-1 = "BBR".

Procedure Date (Principal)

In Loop 2300, send this code in the HI01-4 component data element where HI01-3 = "D8".

Procedure Date (Other)

Send the first other procedure date (if applicable) in the HI01-4 component data element where HI01-3 = "D8". You can send up to 4 additional other procedure dates in the HI02-4, HI03-4, HI04-4, HI05-4 component data elements, qualified by "D8".

Statement Coverage Dates

Send this as a date range in the DTP03 data element where DTPO1 = "434" and DTP02 = "RD8". Format will be CCYYMMDD-CCYYMMDD. First date is the coverage start date. Second date is the coverage end date. This DTP is in Loop 2300.

Total Claim Charges

Send the total claim amount in the CLM02 data element in Loop 2300

MINIMUM REQUIREMENTS if the Subscriber IS the Patient:

Note: See the implementation guide for detailed information on the Loop/Segment/Data Element

Loop	Segment	Element	Description	Required by
	BHT	BHT01	Hierarchical Structure Code	ANSI
	BHT	BHT02	Transaction Set Purpose Code	ANSI
	BHT	BHT03	HCA Batch Number	SSS/WV
	BHT	BHT04	HCA Batch Date	SSS/WV
	BHT	BHT06	Transaction Type Code	ANSI
	ST	ST03	"005010X223A2" Transaction Type	ANSI
1000A			Submitter Name Loop	ANSI
1000A	NM1	NM101	Entity ID Code "41"	ANSI
1000A	NM1	NM102	Entity Type Qualifier	ANSI
1000A	NM1	NM108	Identification Code Qualifier	ANSI
1000A	NM1	NM109	Identification Code	ANSI
1000A	PER	PER01	Contact Function Code "IC"	ANSI
1000A	PER	PER03	Communication Number Qualifier	ANSI
1000A	PER	PER04	Communication Number	ANSI
1000B			Receiver Name Loop	ANSI
1000B	NM1	NM101	Entity Identifier Code "40"	ANSI
1000B	NM1	NM102	Entity Type Qualifier "2"	ANSI
1000B	NM1	NM108	Identification Code Qualifier	ANSI
1000B	NM1	NM109	Identification Code	ANSI
2000A			Billing/Provider Loop	ANSI
2000A	HL	HL01	Hierarchical ID Number	ANSI
2000A	HL	HL03	"20" Hierarchical Level Code	ANSI
2000A	HL	HL04	Hierarchical Child Code	ANSI
2010AA	NM1		Billing Provider Information	SSS/WV
2010AA	NM1	NM101	"85" Billing Provider	ANSI
2010AA	NM1	NM102	"2" Non-Person Entity	ANSI
2010AA	NM1	NM103	Last Name	ANSI
2010AA	NM1	NM108	"XX" NPI Qualifier	SSS/WV
2010AA	NM1	NM109	National Provider Identifier	SSS/WV
2010AA	N3	N301	Address Information	ANSI
2010AA	N4	N401	City Name	ANSI
2010AA	REF	REF01	"EI" Employer's ID Number	ANSI
2010AA	REF	REF02	Federal Tax Number	SSS/WV
2000B			Subscriber Loop	SSS/WV
2000B	HL	HL01	Hierarchical ID Number	ANSI
2000B	HL	HL02	Hierarchical Parent ID Number	ANSI
2000B	HL	HL03	"22" Hierarchical Level Code	ANSI
2000B	HL	HL04	"0" Hierarchical Child Code	ANSI
2000B	SBR	SBR01	"P" for Primary Payer	ANSI
2010BA	NM1		Subscriber-Patient Information	SSS/WV
2010BA	NM1	NM101	"IL" Insured or Subscriber	ANSI
2010BA	NM1	NM102	"1" Person	ANSI
2010BA	N4	N403	Subscriber-Patient Zip Code	SSS/WV
2010BA	DMG	DMG01	"D8" Date/Time Qualifier	ANSI
2010BA	DMG	DMG02	Subscriber-Patient Birth Date	ANSI

Loop	Segment	Element	Description	Required by
2010BA	DMG	DMG03	Subscriber-Patient Gender Code	ANSI
2010BA	DMG	DMG05	Subscriber-Patient Race and Ethnicity Code	SSS/WV
2010BA	N3	N301	Subscriber-Patient Address Line	ANSI
2010BA	N4	N401	Subscriber-Patient City Name	ANSI
2010BA	N4	N402	Subscriber-Patient State Code	ANSI
2010BA	REF	REF01	"SY" Social Security Number Qualifier	SSS/WV
2010BA	REF	REF02	Subscriber-Patient SSN	SSS/WV
2010BA	NM1	NM107	Subscriber-Patient Name Suffix	SSS/WV
2010BA	NM1	NM103	Subscriber-Patient Last Name	ANSI
2010BA	NM1	NM105	Subscriber-Patient Middle Name/Initial	SSS/WV
2010BB	NM1	NM104	Subscriber-Patient First Name	SSS/WV
2010BB	NM1		Payer Information	SSS/WV
2010BB	NM1	NM101	"PR" Payer	ANSI
2010BB	NM1	NM102	"2" Non-Person Entity	ANSI
2010BB	NM1	NM108	"PI" Payer Identification	SSS/WV
2010BB	NM1	NM109	Primary Payer Code	SSS/WV
2010BB	N3	N301	Address Information	ANSI
2010BB	N4	N401	City Name	ANSI
2010BB	REF	REF01	"G2" Medicare Provider Number	ANSI
2010BB	REF	REF02	Medicare Provider Number	SSS/WV
2300	HI	HI01	"D8" Principal Procedure Date Qualifier	ANSI
2300	HI	HI01	Principal Procedure Date	ANSI
2300	HI	HIxx	"D8" Other Procedure Date Qualifier	ANSI
2300	HI	HIxx	Other Procedure Dates	ANSI
2300	CLM	CLM01	Patient Control Number	ANSI
2300	CLM	CLM02	Total Claim Charges	SSS/WV
2300	CLM	CLM05	Health Care Service location Information - Facility Code Value - the first & second positions of the Uniform Billing Claim Form Bill Type code	SSS/WV
2300	CLM	CLM05	Health Care Service location Information - Facility Code Qualifier "A"	ANSI
2300	CLM	CLM05	Health Care Service Location Information - Claim Frequency Type Code - the third position of the Uniform Billing Claim Form Bill Type code	SSS/WV
2300	REF	REF01	"LU" Location Number	SSS/WV
2300	REF	REF02	Auto Accident State or Province Code	SSS/WV
			"434" Statement Coverage Dates Qualifier	
2300	DTP	DTP02	"RD8" Date Format Qualifier	ANSI
2300	DTP	DTP03	Statement Coverage Dates	ANSI
2300	DTP	DTP01	"435" Admission Date Qualifier	ANSI
2300	DTP	DTP02	"DT", "D8" Date Format Qualifiers	ANSI
2300	DTP	DTP03	Admission Date	SSS/WV
2300	CL1	CL101	Admission Type Code	SSS/WV
2300	CL1	CL102	Admission Source Code	SSS/WV
2300	CL1	CL103	Patient Status Code	SSS/WV
			"EA" Medical Record Identification Number	
2300	REF	REF02	Medical Record Number	SSS/WV

Loop	Segmen	Element	Description	Required by
2300	HI	HI01	"ABK" Principal Diagnosis Qualifier	ANSI
2300	HI	HI01	Principal Diagnosis Code	SSS/WV
2300	HI	HI01	POA for Principal Diagnosis	ANSI
2300	HI	HI01	"ABJ" Admitting Diagnosis Qualifier	ANSI
2300	HI	HI01	Admitting Diagnosis Code	SSS/WV
2300	HI	HI01	"ABN" E-Code Qualifier	ANSI
2300	HI	HI01	External Cause of Injury Code (E-Code)	SSS/WV
2300	HI	HI01	POA for External Cause of Injury Code	ANSI
2300	HI	HIxx	"ABF" Other Diagnosis Qualifier	ANSI
2300	HI	HIxx	Other Diagnosis Codes	SSS/WV
2300	HI	HIxx	Other Diagnosis Codes	SSS/WV
2300	HI	HIxx	POA(s) for Other Diagnosis Code(s)	ANSI
2300	HI	HI01	"BBR" Principal Procedure Qualifier	ANSI
2300	HI	HI01	Principal Procedure Code	SSS/WV
2300	HI	HIxx	"BBQ" Other Procedure Qualifier	ANSI
2300	HI	HIxx	Other Procedure Codes	SSS/WV
2300	HI	HI01	"BG" Condition Code Qualifier	ANSI
2300	HI	HI01	P7 Condition Code	SSS/WV
2310A	NM1		Attending Provider	SSS/WV
2310A	NM1	NM101	"71" Attending Provider	ANSI
2310A	NM1	NM102	Entity Type Qualifier	ANSI
2310A	NM1	NM103	Last Name	ANSI
2310A	NM1	NM108	"XX" NPI Qualifier	SSS/WV
2310A	NM1	NM109	National Provider Identifier	SSS/WV
2310B	NM1		Operating Physician	SSS/WV
2310B	NM1	NM101	"72" Operating Physician	ANSI
2310B	NM1	NM102	Entity Type Qualifier	ANSI
2310B	NM1	NM103	Last Name	ANSI
2310B	NM1	NM108	"XX" NPI Qualifier	SSS/WV
2310B	NM1	NM109	National Provider Identifier	SSS/WV
2310C	NM1		Other Physician (Primary & Secondary)	SSS/WV
2310C	NM1	NM101	"ZZ" Other Physician	ANSI
2310C	NM1	NM102	Entity Type Qualifier	ANSI
2310C	NM1	NM103	Last Name	ANSI
2310C	NM1	NM108	"XX" NPI Qualifier	SSSIWV
2310C	NM1	NM109	National Provider Identifier	SSS/WV
2320	SBR	SBR01	"S" for Secondary Payer "T" for Tertiary Payer	ANSI
2330B	NM1	NM101	"PR" Payer	ANSI
2330B	NM1	NM102	"2" Non-Person Entity	ANSI
2330B	NM1	NM108	"PI" Payer Identification	SSS/WV
2330B	NM1	NM109	Secondary/Tertiary Payer Codes	SSS/WV
2400	LX	LX01	Service Line Number	ANSI
2400	SV2	SV201	Revenue Code	SSS/WV
2400	SV2	SV203	Line Item Charge Amount	SSS/WV
2400	SV2	SV204	"DA" Days or "UN" Unit	SSS/WV
2400	SV2	SV205	Quantity of days or units	SSS/WV

MINIMUM REQUIREMENTS if the Subscriber IS NOT the Patient:

Note: See the implementation guide for detailed information on the Loop/Segment/Data Element

Loop	Segment	Element	Description	Required by
	BHT	BHT01	Hierarchical Structure Code	ANSI
	BHT	BHT02	Transaction Set Purpose Code	ANSI
	BHT	BHT03	HCA Batch Number	SSS/WV
	BHT	BHT04	HCA Batch Date	SSS/WV
	BHT	BHT06	Transaction Type Code	ANSI
	ST	ST03	"005010x223A2" Transaction Type	ANSI
1000A			Submitter Name Loop	ANSI
1000A	NM1	NM101	Entity ID Code "41"	ANSI
1000A	NM1	NM102	Entity Type Qualifier	ANSI
1000A	NM1	NM108	Identification Code Qualifier	ANSI
1000A	NM1	NM109	Identification Code	ANSI
1000A	PER	PER01	Contact Function Code "IC"	ANSI
1000A	PER	PER03	Communication Number Qualifier	ANSI
1000A	PER	PER04	Communication Number	ANSI
1000B			Receiver Name Loop	ANSI
1000B	NM1	NM101	Entity Identifier Code "40"	ANSI
1000B	NM1	NM102	Entity Type Qualifier "2"	ANSI
1000B	NM1	NM108	Identification Code Qualifier	ANSI
1000B	NM1	NM109	Identification Code	ANSI
2000A			Billing/Provider Loop	ANSI
2000A	HL	HL01	Hierarchical ID Number	ANSI
2000A	HL	HL03	"20" Hierarchical Level Code	ANSI
2000A	HL	HL04	Hierarchical Child Code	ANSI
2010AA	NM1	NM101	"85" Billing Provider	ANSI
2010AA	NM1	NM102	"2" Non-Person Entity	ANSI
2010AA	NM1	NM103	Last Name	ANSI
2010AA	NM1	NM108	"XX" NPI Qualifier	SSS/WV
2010AA	NM1	NM109	National Provider Identifier	SSS/WV
2010AA	REF	REF01	"EI" Employer's ID Number	ANSI
2010AA	N3	N301	Address Information	ANSI
2010AA	N4	N401	City Name	ANSI
2010AA	REF	REF02	Employer's ID Number	SSS/WV
2000B			Subscriber Loop	SSS/WV
2000B	HL	HL01	Hierarchical ID Number	ANSI
2000B	HL	HL02	Hierarchical Parent ID Number	ANSI
2000B	HL	HL03	"22" Hierarchical Level Code	ANSI
2000B	HL	HL04	"1" Hierarchical Child Code	ANSI
2000B	SBR	SBR01	"P" for Primary Payer	ANSI
2010BB	NM1		Payer Information	SSS/WV
2010BB	NM1	NM101	"PR" Payer	ANSI
2010BB	NM1	NM102	"2" Non-Person Entity	ANSI
2010BB	NM1	NM103	Organization Name	SSS/WV
2010BB	NM1	NM108	"PI" Payer Identification	SSS/WV
2010BB	NM1	NM109	Payer Identification Number	SSS/WV
2010BB	N3	N301	Address Information	ANSI
2010BB	N4	N401	City Name	ANSI

Loop	Segment	Element	Description	Required by
2010BB	REF	REF01	"G2" Medicare Provider Number	ANSI
2010BB	REF	REF02	Medicare Provider Number	SSS/WV
2000C			Patient Hierarchical Loop	ANSI
2000C	HL	HL01	Hierarchical Parent ID Number	ANSI
2000C	HL	HL02	Hierarchical Parent ID Number	ANSI
2000C	HL	HL03	"23" Hierarchical Level Code	ANSI
2000C	HL	HL04	"0" Hierarchical Child Code	ANSI
2000C	PAT	PAT01	Individual Relation Code "1"	ANSI
2010CA	NM1		Patient Information	SSS/WV
2010CA	NM1	NM101	"QC" Patient Qualifier	ANSI
2010CA	NM1	NM102	"1" Person Entity Type Qualifier	ANSI
2010CA	N4	N403	Patient Zip Code	SSS/WV
2010CA	DMG	DMG01	"D8" Date/Time Qualifier	ANSI
2010CA	DMG	DMG02	Patient Birth Date	ANSI
2010CA	DMG	DMG03	Patient Gender Code	ANSI
2010CA	DMG	DMG05	Patient Race and Ethnicity Code	SSS/WV
2010CA	N3	N301	Patient Address Line	ANSI
2010CA	N4	N401	Patient City Name	ANSI
2010CA	N4	N402	Patient State Code	ANSI
2010CA	REF	REF01	"SY" Social Security Number Qualifier	SSS/WV
2010CA	REF	REF02	Patient SSN	SSS/WV
2010CA	NM1	NM107	Patient Name Suffix	SSS/WV
2010CA	NM1	NM103	Patient Last Name	ANSI
2010CA	NM1	NM105	Patient Middle Name/Initial	SSS/WV
2010CA	NM1	NM104	Patient First Name	SSS/WV
2300	HI	HI01	"D8" Principal Procedure Date Qualifier	ANSI
2300	HI	HI01	Principal Procedure Date	ANSI
2300	HI	HIxx	"D8" Other Procedure Date Qualifier	ANSI
2300	HI	HIxx	Other Procedure Dates	ANSI
2300	CLM	CLM01	Patient Control Number	ANSI
2300	CLM	CLM02	Total Claim Charge Amount	SSS/WV
2300	CLM	CLM05	Health Care Service Location Information - Facility Code Value -the first & second positions of the Uniform Billing Claim Form Bill Type code	SSS/WV
2300	CLM	CLM05	Health Care Service Location Information - Facility Code Qualifier "A"	ANSI
2300	CLM	CLM05	Health Care Service Location Information - Claim Frequency Type Code -the third position of the Uniform Billing Claim Form Bill Type code	SSS/WV
2300	REF	REF01	"LU" Location Number	SSS/WV
2300	REF	REF02	Auto Accident State or Province Code	SSS/WV
2300	DTP	DTP01	"434" Statement Coverage Dates Qualifier	ANSI
2300	DTP	DTP02	"RD8" Date Format Qualifier	ANSI
2300	DTP	DTP03	Statement Coverage Dates	ANSI
2300	DTP	DTP01	"435" Admission Date Qualifier	ANSI
2300	DTP	DTP02	"DT","D8" Date Format Qualifiers	ANSI
2300	DTP	DTP03	Admission Date	SSS/WV

Loop	Segment	Element	Description	Required by
2300	CL1	CL101	Admission Type Code	SSS/WV
2300	CL1	CL102	Admission Source Code	SSS/WV
2300	CL1	CL103	Patient Status Code	SSS/WV
2300	REF	REF01	"EA" Medical Record Identification Number Qualifier	ANSI
2300	REF	REF02	Medical Record Number	SSS/WV
2300	HI	HI01	"ABK" Principal Diagnosis Qualifier	ANSI
2300	HI	HI01	Principal Diagnosis Code	SSS/WV
2300	HI	HI01	POA for Principal Diagnosis Code	ANSI
2300	HI	HI02	"ABJ" Admitting Diagnosis Qualifier	ANSI
2300	HI	HI02	Admitting Diagnosis Code	SSS/WV
2300	HI	HI01	"ABN" E-Code Qualifier	ANSI
2300	HI	HI01	External Cause of Injury Code (E-Code)	SSS/WV
2300	HI	HI01	POA for External Cause of Injury Code	ANSI
2300	HI	HIxx	"ABF" Other Diagnosis Qualifier	ANSI
2300	HI	HIxx	Other Diagnosis Codes	SSS/WV
2300	HI	HIxx	POA(s) for Other Diagnosis Code(s)	
2300	HI	HI01	"BBR" Principal Procedure Qualifier	ANSI
2300	HI	HI01	Principal Procedure Code	SSS/WV
2300	HI	HIxx	"BBQ" Other Procedure Qualifier	ANSI
2300	HI	HIxx	Other Procedure Codes	SSS/WV
2300	HI	HI01	"BG" Condition Code Qualifier	ANSI
2300	HI	HI01	P7 Condition Code	
2310A	NM1		Attending Provider	SSS/WV
2310A	NM1	NM101	"71" Attending Provider	ANSI
2310A	NM1	NM102	Entity Type Qualifier	ANSI
2310A	NM1	NM103	Last Name	ANSI
2310A	NM1	NM108	"XX" NPI Qualifier	SSS/WV
2310A	NM1	NM109	National Provider Identifier	SSS/WV
2310B	NM1		Operating Physician	SSS/WV
2310B	NM1	NM101	"72" Operating Physician	ANSI
2310B	NM1	NM102	Entity Type Qualifier	ANSI
2310B	NM1	NM103	Last Name	ANSI
2310B	NM1	NM108	"XX" NPI Qualifier	SSS/WV
2310B	NM1	NM109	National Provider Identifier	SSS/WV
2310C	NM1		Other Physician (Primary & Secondary)	SSS/WV
2310C	NM1	NM101	"ZZ" Other Physician	ANSI
2310C	NM1	NM102	Entity Type Qualifier	ANSI
2310C	NM1	NM103	Last Name	ANSI
2310C	NM1	NM108	"XX" NPI Qualifier	SSS/WV
2310C	NM1	NM109	National Provider Identifier	SSS/WV
2320	SBR	SBR01	"S" for Secondary Payer, "T" for Tertiary Payer	ANSI
2330B	NM1	NM101	"PR" Payer	ANSI
2330B	NM1	NM102	"2" Non-Person Entity	ANSI
2330B	NM1	NM108	"PI" Payer Identification	SSS/WV
2330B	NM1	NM109	Secondary/Tertiary Payer	SSS/WV
2400	LX	LX01	Service Line Number	ANSI
2400	SV2	SV201	Revenue Code	SSS/WV
2400	SV2	SV203	Line Item Charge Amount	SSS/WV
2400	SV2	SV204	"DA" Days or "UN" unit	SSS/WV
2400	SV2	SV205	Quantity of days or units	SSS/WV

Appendix H **WVHCA Draft Year 1 Workplan**

West Virginia Hospital Data Submission System

Year1 Work Plan: July 9, 2016
Technical Approach

HDSS Functional Updates

SSS will continue to monitor the Hospital Data Submission System (HDSS) to increase speed, functionality, and user interface experience.

Mapping between ICD-9 and ICD-10 Version of 5010 Data Format

In year one, SSS envisions a need to continue using the reimbursement mappings on the HCA master analytic file. We will forward map or backward map as requested.

Data Quality Reports, Analytic Reports, and Calculated New Fields

If requested, SSS will develop a series of new reports (content to be determined). SSS will assist the HCA in developing these reports which are important sources of information for hospitals in the data correction process, and which are important for the HCA in evaluating the quality and completeness of submitted data. If applicable, SSS will also propose and create new analytic reports that summarize key utilization, access, cost, and quality indicators. If requested, SSS will create new calculated fields from the existing fields that are already collected.

Annual/Routine Tasks

SSS will complete the following annual/routine tasks per the contract:

1. Submit an annual report
2. Revise edit checks and/or lookup tables based on updates to the following code sets (all edit checks/lookup tables should be based on codes/rules valid as of the discharge date):
 - NUBC coding standards – review NUBC updates quarterly to identify relevant changes prior to next year data collection
 - Zip Codes
 - NPI
 - Diagnosis and procedure codes
 - Exempt from POA diagnosis list
3. Update edit checks, as requested by HCA, prior to each data collection year to address identified data quality issues
4. Implement the DRG grouper and weights effective for discharge date
5. Perform year end activities including archiving the database and reconciliation entries, and exporting data quality reports from the data collection year

End of Contract Activities

At the request of the HCA, SSS will destroy all data and document the destruction per NIST Special Publication 800-88.

Assumptions

In order for SSS to stay within scope and on schedule for deliverables, the following lists of assumptions (by task area) are made:

<p>Additional/ Changes to Data Quality Reports and Analytic Reports</p>	<ol style="list-style-type: none"> 1. If requested, SSS will plan for three modifications to current data quality reports and for the development of two new data quality reports. 2. If requested, SSS will plan for the creation of five new analytic reports. 3. These reports will be able to run on existing system data or on new data from some point forward. Existing batches will not have to be reimported or revalidated to prepare data for a new report. 4. The specifications for these reports will be finalized and approved by HCA before they are given to the development team. An Excel spreadsheet will be used to document the changes, with a space for approval by the HCA. 5. There will be a minimal need for additional input forms to drive these reports (such as the reconciliation form). 6. SQL Server Reporting Services will continue to be used as the tool to create, deploy, and manage data quality reports.
<p>Calculated New Fields</p>	<ol style="list-style-type: none"> 1. If new fields are requested, SSS will calculate them from fields that are already collected. 2. There will be minimal need to purchase new software or data to calculate new fields.
<p>Support and Training</p>	<ol style="list-style-type: none"> 1. SSS will continue to provide the high level of to ensure files are correctly formatted and will assist with reporting and maneuvering around the system 2. SSS utilizes a trouble-ticket system for streamlined tracking and reporting of bugs. The HCA, hospitals, and hospital vendors will report issues and request technical assistance by contacting the SSS Help Desk (HDSSSupport@s-3.com or 866-843-1083).
<p>Browsers</p>	<p>As new browsers come out, or new versions of an existing browser are released, the system may behave differently than it does on tested browsers. Although the system's behavior can't be predicted in advance, SSS will test, fix, and enhance the system against any new browsers or new releases of browsers.</p>
<p>New Tasks</p>	<p>One new task in first year. Tasks include reviewing and revising expected sources of payment, re-identification of patients, tracking patients within and between hospitals, additional enhancement of the NPI field.</p>

West Virginia Hospital Data Submission System

Year 1 Work Plan

ID	Task Name	Start	Finish	September	October	November	December	January
1	Contract year 1 begin, estimate	Thu 10/20/16	Thu 10/20/16					
2	Assist hospitals 2016 data (continued from previous contract)	Thu 10/20/16	Fri 10/20/17					
3	HDSS performance monitoring	Thu 10/20/16	Fri 10/20/17					
4	Accept data from hospitals	Thu 10/20/16	Fri 10/20/17					
5	Map ICD10 data for master datasets	Thu 10/20/16	Fri 10/20/17					
6	End of Year Activities 2016 data	Thu 6/15/17	Fri 6/30/17					
7	Begin 2017 data collection year	Mon 7/3/17	Mon 7/3/17					
8	Analytical reports (timing is flexible)	Thu 10/20/16	Fri 10/20/17					
9	Data quality reports (timing is flexible)	Thu 10/20/16	Fri 10/20/17					
10	Calculated new fields (timing is flexible)	Thu 10/20/16	Fri 10/20/17					
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Thu 10/20/16	Fri 10/20/17					
12	Contract year 1 end	Fri 10/20/17	Fri 10/20/17					

◆ Contract year 1 begin, estimate

Assist hospitals 2016 data (continued from previous contract)

HDSS performance monitoring

Accept data from hospitals

Map ICD10 data for master datasets

Analytical reports (timing is flexible)

Data quality reports (timing is flexible)

Calculated new fields (timing is flexible)

new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI

West Virginia Hospital Data Submission System

Year 1 Work Plan

ID	Task Name	Start	January	February	March	April	May	June
1	Contract year 1 begin, estimate	Thu 10/20/16						
2	Assist hospitals 2016 data (continued from previous contract)	Thu 10/20/16	Assist hospitals 2016 data (continued from previous contract)					
3	HDSS performance monitoring	Thu 10/20/16	HDSS performance monitoring					
4	Accept data from hospitals	Thu 10/20/16	Accept data from hospitals					
5	Map ICD10 data for master datasets	Thu 10/20/16	Map ICD10 data for master datasets					
6	End of Year Activities 2016 data	Thu 6/15/17	End of Year Activities 2016 data					
7	Begin 2017 data collection year	Mon 7/3/17	Begin					
8	Analytical reports (timing is flexible)	Thu 10/20/16	Analytical reports (timing is flexible)					
9	Data quality reports (timing is flexible)	Thu 10/20/16	Data quality reports (timing is flexible)					
10	Calculated new fields (timing is flexible)	Thu 10/20/16	Calculated new fields (timing is flexible)					
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Thu 10/20/16	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI					
12	Contract year 1 end	Fri 10/20/17						

West Virginia Hospital Data Submission System

Year 1 Work Plan

ID	Task Name	Start	June	July	August	September	October	November	
1	Contract year 1 begin, estimate	Thu 10/20/16							
2	Assist hospitals 2016 data (continued from previous contract)	Thu 10/20/16	Assist hospitals 2016 data (continued from previous contract)						
3	HDSS performance monitoring	Thu 10/20/16	HDSS performance monitoring						
4	Accept data from hospitals	Thu 10/20/16	Accept data from hospitals						
5	Map ICD10 data for master datasets	Thu 10/20/16	Map ICD10 data for master datasets						
6	End of Year Activities 2016 data	Thu 6/15/17	2016 data						
7	Begin 2017 data collection year	Mon 7/3/17							
8	Analytical reports (timing is flexible)	Thu 10/20/16	Analytical reports (timing is flexible)						
9	Data quality reports (timing is flexible)	Thu 10/20/16	Data quality reports (timing is flexible)						
10	Calculated new fields (timing is flexible)	Thu 10/20/16	Calculated new fields (timing is flexible)						
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Thu 10/20/16	re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)						
12	Contract year 1 end	Fri 10/20/17						10/20 Contract year 1 end	

West Virginia Hospital Data Submission System

Year 1 Work Plan

ID	Task Name	Start	November	December	January	February	March	April
1	Contract year 1 begin, estimate	Thu 10/20/16						
2	Assist hospitals 2016 data (continued from previous contract)	Thu 10/20/16						
3	HDSS performance monitoring	Thu 10/20/16						
4	Accept data from hospitals	Thu 10/20/16						
5	Map ICD10 data for master datasets	Thu 10/20/16						
6	End of Year Activities 2016 data	Thu 6/15/17						
7	Begin 2017 data collection year	Mon 7/3/17						
8	Analytical reports (timing is flexible)	Thu 10/20/16						
9	Data quality reports (timing is flexible)	Thu 10/20/16						
10	Calculated new fields (timing is flexible)	Thu 10/20/16						
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Thu 10/20/16						
12	Contract year 1 end	Fri 10/20/17						

Appendix I Examples New Data Quality Reports

Example of New Data Quality Reports

Discharge Counts by Hospital

1b. Discharge counts by hospital

Hospital	# of Discharges in 2012	% of Discharges in 2012	# of Discharges in 2013	% of Discharges in 2013	% Diff over 2012	# of Discharges in Q1 2013	# of Discharges in Q2 2013	# of Discharges in Q3 2013	# of Discharges in Q4 2013	% Increase of Q2 over Q1	% Increase of Q3 over Q2	% Increase of Q4 over Q3	% Increase of Q3/Q4 over Q1/Q2
	11,838	2.84%	11,299	2.74%	-4.54%	2,782	2,781	2,837	2,890	-0.04%	2.01%	2.19%	3.11%
	19,139	4.59%	18,681	4.53%	-2.50%	4,692	4,713	4,585	4,671	0.45%	-2.72%	1.86%	-1.58%
	7,541	1.81%	7,395	1.79%	-1.94%	1,896	1,796	1,810	1,893	-5.27%	0.78%	4.59%	0.30%
	6,602	1.58%	6,382	1.55%	-3.33%	1,683	1,597	1,575	1,627	-5.11%	-1.38%	-3.05%	-5.42%
	19,607	4.70%	18,440	4.47%	-5.95%	4,771	4,493	4,027	4,549	-5.83%	2.98%	-1.68%	-0.95%
	5,100	1.22%	4,503	1.09%	-11.71%	1,099	1,179	1,099	1,129	7.57%	-6.79%	2.73%	-2.07%
	8,373	2.01%	8,580	2.08%	2.47%	2,094	2,202	2,185	2,119	5.18%	-1.48%	-2.12%	-0.26%
	11,848	2.84%	12,384	3.00%	4.37%	3,201	2,961	3,187	3,125	-7.81%	8.00%	-5.08%	0.98%
	3,852	0.93%	7,022	1.70%	1.89%	1,717	1,844	1,770	1,891	7.40%	-4.01%	-4.48%	-2.81%
	41,405	9.93%	41,877	10.10%	1.14%	10,383	10,199	10,462	10,833	-1.77%	2.58%	3.55%	3.48%
	8,331	1.52%	6,529	1.58%	-3.13%	1,840	1,647	1,682	1,580	0.43%	0.91%	-4.93%	-1.37%
	18,239	4.37%	17,910	4.35%	-1.80%	4,475	4,539	4,597	4,299	1.43%	1.28%	-8.48%	-1.16%
	3,250	0.78%	3,112	0.76%	-4.25%	778	718	755	881	-7.71%	5.15%	14.04%	8.02%
	14,956	3.59%	14,586	3.54%	-2.47%	3,652	3,523	3,751	3,680	-3.53%	6.47%	-2.4%	3.29%
	8,759	2.10%	9,294	2.26%	6.11%	2,258	2,368	2,395	2,277	4.88%	1.03%	-4.93%	1.28%
	17,887	3.92%	14,661	3.56%	-7.27%	3,753	3,683	3,539	3,606	-2.40%	0.66%	-0.91%	-2.31%
	3,506	0.84%	3,281	0.80%	-6.42%	838	880	876	747	5.01%	-7.27%	-8.48%	-9.02%
	10,293	2.47%	9,829	2.39%	-4.60%	2,529	2,481	2,387	2,472	-2.34%	-3.82%	4.44%	-2.85%
	2,281	0.55%	1,825	0.44%	-20.34%	499	450	451	420	-7.88%	-1.53%	-6.87%	-8.70%
	15,048	3.61%	13,109	3.18%	-12.95%	3,531	3,105	3,270	3,254	-12.08%	3.38%	1.37%	-2.59%
	2,518	0.60%	2,567	0.62%	1.95%	620	671	621	655	8.23%	-7.45%	5.48%	-1.16%
	32,193	7.72%	32,998	7.86%	0.54%	8,215	8,076	8,155	7,952	-1.68%	0.98%	-2.49%	-1.13%
	12,052	2.89%	11,828	2.87%	-1.88%	2,951	2,952	2,888	3,036	0.03%	-2.17%	5.08%	0.34%
	19,947	4.78%											
	22,028	5.28%	20,454	4.99%	-7.15%	5,300	5,085	5,007	4,972	-4.80%	-0.35%	-1.87%	-3.81%
	2,898	0.64%	2,877	0.70%	7.91%	708	798	779	711	-4.37%	14.90%	-8.73%	7.43%
	14,295	3.42%	14,840	3.60%	4.19%	3,800	3,778	3,722	3,808	3.28%	0.11%	2.28%	2.87%
	12,397	2.97%	11,842	2.87%	-4.25%	3,070	2,969	2,895	2,811	-3.38%	-2.38%	0.55%	-3.61%
	4,506	1.08%	4,140	1.00%	-8.12%	1,094	1,273	1,255	988	1.92%	-6.34%	-2.98%	-8.95%
	59,795	14.34%	60,480	15.53%	34.59%	20,507	19,540	20,152	20,281	-4.72%	3.13%	0.56%	-0.95%
Total	417,009	100%	412,071	100%	-1%	104,358	101,874	103,344	102,803	-2%	1%	0%	0%

Top 10 codes, Principal Diagnosis

2a. Top 10 principal diagnosis codes

Top 10 principal diagnosis codes in FY2012	# of Discharges with this diagnosis in FY2012	# of Discharges with this diagnosis in FY2013	% Change from FY2012	Top 10 principal diagnosis codes in FY2013	# of Discharges with this diagnosis in FY2013
Total	417,009	412,071	-1.18%	Total	412,071
V3000	22,978	22,641	-1.47%	V3000	22,641
V3001	12,058	11,705	-2.93%	V3001	11,705
486	9,550	8,771	-8.18%	0389	10,665
0389	8,828	10,665	23.64%	486	8,771
5990	5,620	5,266	-9.48%	5849	5,617
42731	5,551	5,473	-1.41%	42731	5,473
5849	5,474	5,617	2.81%	71536	5,388
71536	4,875	5,388	10.52%	5990	5,288
65421	4,858	4,800	-1.19%	49121	5,228
49121	4,834	5,228	8.11%	65421	4,800
Total for Top 10	84,624	85,654			85,654
Top 10 as a % of Total Discharges	20.3%	20.8%	2.3%		20.8%

Top 10 Codes, Principal Procedure

3a. Top 10 principal procedure codes

Top 10 principal procedure codes in FY2012	# of Discharges with this procedure in FY2012	# of Discharges with this procedure in FY2013	% Change from FY2012	Top 10 principal procedure codes in FY2013	# of Discharges with this procedure in FY2013
Total	417,009	412,071	-1.18%	Total	412,071
No procedure	185,171	162,456	-1.84%	No procedure	162,456
741	12,870	12,315	-2.80%	9955	13,186
9955	11,620	13,186	13.48%	741	12,315
640	11,113	10,738	-3.37%	640	10,738
7359	10,046	10,737	6.88%	7359	10,737
7569	8,254	7,860	-4.77%	7569	7,860
9904	6,873	6,242	-9.18%	8154	6,909
8154	6,856	6,909	0.77%	9904	6,242
0066	5,346	4,806	-13.84%	0066	4,806
8151	4,486	4,548	1.84%	8151	4,548
4518	4,274	4,248	-0.61%	9482	4,317
Total for Top 10	81,518	81,389			81,458
Top 10 as a % of Total Discharges	32.4%	32.6%	0.7%		32.8%

Length of Stay

14a. Length of Stay					
LOS	Count for 2012	Percent for 2012	Count for 2013	Percent for 2013	Percent Increase of 2013 over 2012
1	64,578	15.49	60,240	14.62	-6.72%
2	93,455	22.41	91,610	22.23	-1.97%
3	77,505	18.59	77,619	18.84	0.15%
4	51,706	12.40	50,883	12.35	-1.59%
5	30,704	7.36	31,362	7.61	2.14%
6	21,803	5.23	21,927	5.32	0.57%
7	16,468	3.95	16,600	4.03	0.80%
8	11,763	2.82	11,815	2.87	0.44%
9	8,335	2.00	8,535	2.07	2.40%
10	6,508	1.56	6,515	1.58	0.11%
11	5,038	1.21	5,291	1.28	5.02%
12	3,971	0.95	4,180	1.01	5.26%
13	3,498	0.84	3,529	0.86	0.89%
14	3,054	0.73	3,136	0.76	2.69%
15	2,342	0.56	2,495	0.61	6.53%
16	1,871	0.45	1,855	0.45	-0.86%
17	1,462	0.35	1,530	0.37	4.65%
18	1,252	0.30	1,343	0.33	7.27%
19	1,114	0.27	1,133	0.27	1.71%
20	997	0.24	971	0.24	-2.61%
21	941	0.23	955	0.23	1.49%
22	793	0.19	779	0.19	-1.77%
23	645	0.15	660	0.16	2.33%
24	569	0.14	562	0.14	-1.23%
25	502	0.12	516	0.13	2.79%
26	465	0.11	439	0.11	-5.59%
27	406	0.10	430	0.10	5.91%

Appendix J **How to Use Your Data Quality Reports**

DQR Tip Sheet

How To Use Your Data Quality Reports (DQRs)	
Situation	Report to use
You want to see the error/warning type and count per batch and the total charges involved. This will aid you in correcting issues so the same errors don't continue to happen.	DQR1-Batch Summary Report
You want to know the number of records submitted each month.	DQR2-Submitted or Adjudicated Records by Month of Discharge
You want to know the number of records adjudicated each month.	DQR2-Submitted Records by Month of Discharge
You've run DQR 2 for adjudicated and submitted and you have discrepancies when comparing, so you want to see details on the patients by PROV, year, and/or month. Or you have reviewed DQR4 and find discrepancies between the adjudicated and reported. It becomes necessary to see which records didn't get adjudicated. You want to see the record or records that are included in the combination of the creation of an adjudicated record for a patient.	DQR3-Patient Listing
You want to know how your reported reconciliation counts compare to your adjudicated data counts by Month, PROV, Payers, and Total dollars. You would also like to know what the percentage difference is between your counts and the adjudicated counts.	DQR4-Payer Reconciliation Report
You want to identify missing interim records which prevent adjudication of a record.	DQR5a-Bill Type Report
You need more detail in identifying missing interim records and would like a non-adjudicated patient listing with bill types that shows whether a record was adjudicated or not.	DQR5b-Non-Adjudicated Patient Level Bill Type Report
You want an adjudicated bill type matrix report to use in identifying missing interim records.	DQR5c-Adjudicated Bill Type Matrix Report
You need to make sure you haven't submitted duplicate records for the same patient under another PATNO. You need a list that matches records on several key fields.	DQR6-Potential Duplicates Report
You have records that are being counted, but aren't adjudicating together and you need a detailed list in order to make corrections and reconcile	DQR7-Overcounted Discharges Report
You need to see detail on records that aren't being counted because they can't be adjudicated. These records have the wrong bill types, or the SDATE, ADMIT DATE, or EDATE aren't correct.	DQR8-Undercounted Discharges Report
You want to know if you have records in different batches with the same PROV, PATNO, BTYPE, and EDATE.	DQR9-Records with W'101 Duplicate Warning
You want to make sure the SSN field is being populated in your batches	DQR10-Missing SSN Report

Appendix K **Contingency Plan**



SOCIAL & SCIENTIFIC SYSTEMS, INC.

Hospital Data Submission System

Security Categorization: Moderate

West Virginia Health Care Authority

Information Security Contingency Plan

**VERSION 1.5
6/20/2016**

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Plan Approval

As the designated authority for the Hospital Data Submission System (HDSS), I hereby certify that the Information System Contingency Plan (ISCP) is complete, and that the information contained in this ISCP provides an accurate representation of the application, its hardware, software, and telecommunication components. I further certify that this document identifies the criticality of the system as it relates to the mission of the West Virginia Health Care Authority (WVHCA), and that the recovery strategies identified will provide the ability to recover the system functionality in the most expedient and cost-beneficial method in keeping with its level of criticality.

I further attest that this ISCP for HDSS will be tested annually, at minimum. This plan has been tested on 08/15/2013.

Amy Wenmoth
Epidemiologist/Director of Clinical Analysis

Date

1 INTRODUCTION

Information systems are vital to the West Virginia Health Care Authority (WVHCA) mission/business functions; therefore, it is critical that services provided by the Hospital Data Submission System (HDSS) are able to operate effectively without excessive interruption. This Information System Contingency Plan (ISCP) establishes comprehensive procedures to recover the HDSS quickly and effectively following a service disruption.

1.1 BACKGROUND

This ISCP establishes procedures to recover the HDSS following a disruption. The following recovery plan objectives have been established:

- Maximize the effectiveness of contingency operations through an established plan that consists of the following phases:
 - *Activation and Notification phase* to activate the plan and determine the extent of damage;
 - *Recovery phase* to restore HDSS operations; and
 - *Reconstitution phase* to ensure that the HDSS is validated through testing and that normal operations are resumed.
- Identify the activities, resources, and procedures to carry out HDSS processing requirements during prolonged interruptions to normal operations.
- Assign responsibilities to designated personnel and provide guidance for recovering the HDSS during prolonged periods of interruption to normal operations.
- Ensure coordination with other personnel responsible for WVHCA contingency planning strategies. Ensure coordination with external points of contact and vendors associated with the HDSS and execution of this plan.

1.2 SCOPE

This ISCP has been developed for the HDSS, which is classified as a moderate-impact system, in accordance with *Federal Information Processing Standards (FIPS) 199 – Standards for Security Categorization of Federal Information and Information Systems*. Procedures in this ISCP are for moderate-impact systems and designed to recover HDSS within 24 hours. This plan does not address replacement or purchase of new equipment, short-term disruptions lasting less than 24 hours, or loss of data at the onsite facility or at the user-desktop levels. WVHCA has contracted the development, hosting, and maintenance of the HDSS system to Social & Scientific Systems, Inc. (SSS).

1.3 ASSUMPTIONS

The following assumptions were used when developing this ISCP:

- HDSS has been established as a moderate-impact system, in accordance with *FIPS 199*.
- The HDSS is inoperable and cannot be recovered within 24 hours.
- Key HDSS personnel have been identified and trained in their emergency response and recovery roles; they are available to activate the HDSS Contingency Plan (CP).
- Access to backup data, configuration files, hardware, and software is accessible by key CP personnel.
- The HDSS CP is up to date and accessible to key personnel responsible for executing the plan.
- The procedures within the plan have been validated to ensure that the strategies are viable.

The HDSS Contingency Plan does not apply to the following situations:

- **Overall recovery and continuity of mission/business operations.** The Business Continuity Plan (BCP) and Continuity of Operations Plan (COOP) address continuity of mission/business operations.
- **Emergency evacuation of personnel.** The Occupant Emergency Plan (OEP) addresses employee evacuation.

2 CONCEPT OF OPERATIONS

The Concept of Operations section provides a description of the HDSS, an overview of the three phases of the ISCP (Activation and Notification, Recovery, and Reconstitution), and a description of roles and responsibilities of SSS and WVHCA's personnel during a contingency activation.

2.1 SYSTEM DESCRIPTION

Abstract:

SSS has designed a customized web interface, the Hospital Data Submission System (HDSS), and backend SAS components to meet requirements for hospital inpatient data submission, data processing and editing, feedback, and reporting.

Detailed Description:

Through the West Virginia Hospital Data Submission System, hospitals will submit their data online in batches through the secure Web interface, which will validate the data, provide feedback to the hospitals on the quality of their submission, and allow hospitals to edit the data, if needed, or just resubmit their data. The data will be transmitted to the SAS backend processor and, after the data are fully edited, will be included in the master database.

The HDSS meets rigorous HIPAA requirements and operates in a secure environment using modern Web tools. The system is installed at the SSS Secure Data Center (SDC), a 24/7 secure hosting facility, which meets all the HIPAA security physical safeguards including access controls and device and media controls. SSS collects the hospital inpatient data elements from the

62 acute, psychiatric, long-term care, and rehabilitation hospitals in the State of West Virginia, representing roughly 300,000 records annually.

System Architecture:

A private contractor, Social & Scientific Systems (SSS), develops and maintains the HDSS application module components. The development, staging, and production environments are hosted within the SSS Data Center.

Diagram 1 describes the HDSS application projection environment.

Mission/Business Process	Description
Hospital inpatient data imports	HDSS customized web interface
Hospital inpatient processing and validation	HDSS customized web interface
Master database	SQL server 2014 for data capture, editing, audit tracking
Reporting	HDSS customized web interface, backend SAS components
Adjudication	Backend SAS components
Analytic Files	Backend SAS components

The following impact categories represent important areas for consideration in the event of a disruption or impact.

- Project delay – ability for SSS staff to perform assigned tasks in order to meet deliverables set forth by the project officer.
- Cost – the cost of obtaining and configuring new equipment, installing software, and restoring data.
- SSS Reputation – the potential impact on the reputation of SSS to the client.
- Client Reputation – the potential impact on the reputation of the client to the customer.

The table below summarizes the impact on each mission/business process if the HDSS were unavailable, based on the following criteria:

Mission/Business Process	Impact Category				
	Project delay	Cost	SSS Rep	Client Rep	Total Impact
Hospital inpatient data imports	5	4	4	4	21
Hospital inpatient processing and validation	5	4	4	4	21
Master database	5	4	4	4	21
Reporting	5	4	4	4	21
Adjudication	4	3	4	4	19
Analytic Files	4	3	4	4	19

1= low impact 5 = major impact

2.3 RECOVERY OBJECTIVES, RESTORATION PRIORITIES, AND METRIC

Working directly with mission/business process owners, departmental staff, managers, and other stakeholders, the following downtime factors were consideration per each mission/business process.

- **Maximum Tolerable Downtime (MTD).** The MTD represents the total amount of time leaders/managers are willing to accept for a mission/business process outage or disruption and includes all impact considerations.
- **Recovery Time Objective (RTO).** RTO defines the maximum amount of time that a system resource can remain unavailable before there is an unacceptable impact on other system resources, supported mission/business processes, and the MTD.
- **Recovery Point Objective (RPO).** The RPO represents the point in time, prior to a disruption or system outage, to which mission/business process data must be recovered (given the most recent backup copy of the data) after an outage.

The table below identifies the MTD, RTO, and RPO (as applicable) for the organizational mission/business processes that rely on the Hospital Data Submission System.

Mission/Business Process	MTD	RTO	RPO
Hospital inpatient data imports	48 hours	72 hours	72 hours
Hospital inpatient processing and validation	48 hours	72 hours	72 hours
Master database	48 hours	72 hours	72 hours
Reporting	48 hours	72 hours	72 hours
Adjudication	48 hours	72 hours	72 hours
Analytic Files	48 hours	72 hours	72 hours

The following table identifies the resources that compose the HDSS including hardware, software, and other resources such as data files.

System Resource/Component	Platform/OS/Version (as applicable)	Description
p2bp1139.westva.local	Windows Server 2012	Domain Controller
p2bp1140.westva.local	Windows Server 2012	Domain Controller
p2gp6198.westva.local	Windows Server 2012	IIS Server
p21u6200.westva.local	Windows Server 2012	IIS Server
p2tp6047.westva.local	Windows Server 2008 R2	IIS Server
p2tp7235.westva.local	Windows Server 2012	IIS Server
p2jp5122.westva.local	Windows Server 2012	MSSQL

System Resource/Component	Platform/OS/Version (as applicable)	Description
p22u5123.westva.local	Windows Server 2012	MSSQL
p2tp5048.westva.local	Windows Server 2008 R2	MSSQL
p2tp3189.westva.local	Windows Server 2012	File Server
p2tp7235.westva.local	Windows Server 2012	MapForce
p2tp7258.westva.local	Windows 7	SAS Job PC
p2tp9007.westva.local	Windows 7	Workstation
p2bp2007.westva.local	Linux 2.6	Tenable Scanner
p2tp7123.westva.local	Linux 2.6	Tenable

The table below lists the order of recovery for the HDSS resources. The table also identifies the expected time for recovering the resource following a “worst case” (complete rebuild/repair or replacement) disruption.

Priority	System Resource/Component	Recovery Time Objective
1	Domain Controllers	72 hours
2	MSSQL Servers	72 hours
3	IIS Servers	72 hours
4	File Server	72 hours
5	MapForce	72 hours
6	SAS job PC	72 hours
7	Workstations	72 hours
8	Tenable scanners	72 hours

2.4 OVERVIEW OF THREE PHASES

This ISCP has been developed to recover and reconstitute the HDSS using a three-phased approach. This approach ensures that system recovery and reconstitution efforts are performed in a methodical sequence to maximize the effectiveness of the recovery and reconstitution efforts and minimize system outage time due to errors and omissions.

The three system recovery phases are:

Activation and Notification Phase – Activation of the ISCP occurs after a disruption or outage that may reasonably extend beyond the Recovery Time Objective (RTO) established for a system. The outage event may result in severe damage to the facility that houses the system, severe damage or loss of equipment, or other damage that typically results in long-term loss.

Once the ISCP is activated, system owners and users are notified of a possible long-term outage, and a thorough outage assessment is performed for the system. Information from the outage assessment is presented to system owners and may be used to modify recovery procedures specific to the cause of the outage.

Recovery Phase – The Recovery phase details the activities and procedures for recovery of the affected system. Activities and procedures are written at a level that an appropriately skilled technician can use to recover the system without intimate system knowledge. This phase includes notification and awareness escalation procedures for communication of recovery status to system owners and users.

Reconstitution – The Reconstitution phase defines the actions taken to test and validate system capability and functionality at the original or new permanent location. This phase consists of two major activities: validating successful reconstitution and deactivation of the plan.

2.5 ROLES AND RESPONSIBILITIES

The ISCP establishes several roles for HDSS recovery and reconstitution support. Persons or teams assigned ISCP roles have been trained to respond to a contingency event affecting the HDSS.

Direction and management of the contingency plan is pushed top-down through the WVHCA organizational structure. Key WVHCA individuals identified in the plan are:

- CP Director (CPD) – System Owner, designated by WVHCA, has the responsibility to approve implementing the contingency plan.
- CP Coordinator (CPC) – SSS Project Manager has the responsibility of communicating and coordinating tasks and deadlines with the CPD and the CPM.
- CP Manager (CPM) – SSS IT Customer Relationship Manager (CRM) has the responsibility of coordinating tasks and deadlines with the CP Recovery Team.
- CP Recovery Team – SSS IT Support Team has the responsibility of handling the tasks involved with implementing the network, database, system administrative, development, and validation tasks.

The roles and responsibilities outlined in the CP will ensure that the plan is activated and normal operations are restored in the most efficient manner possible. Figure 1 provides a graphical depiction of plan's organizational chart and hierarchy of roles.

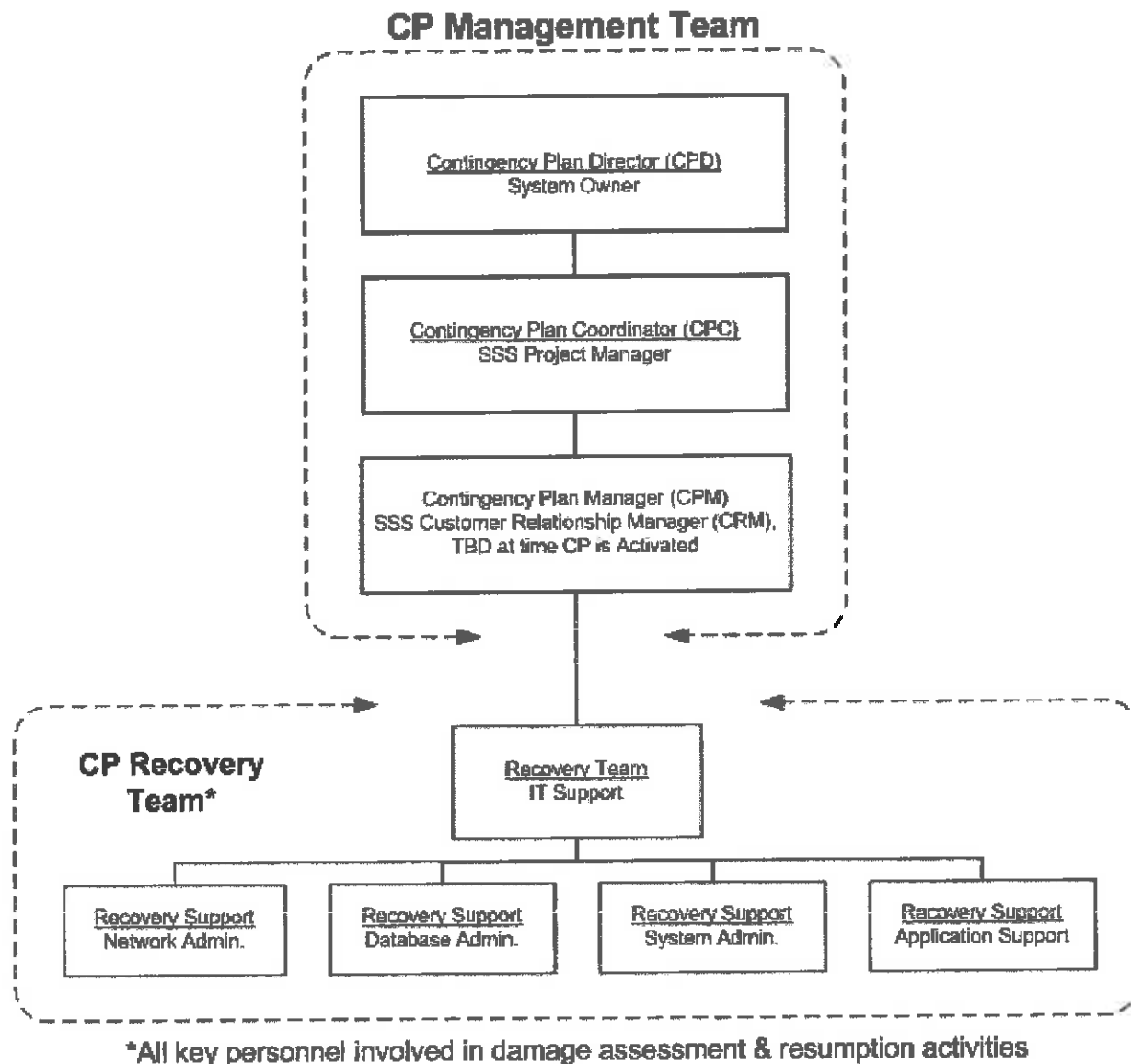


Figure 1

3 ACTIVATION AND NOTIFICATION

The Activation and Notification Phase defines initial actions taken once an HDSS disruption has been detected or appears to be imminent. This phase includes activities to notify recovery personnel, conduct an outage assessment, and activate the ISCP. At the completion of the Activation and Notification Phase, HDSS ISCP staff will be prepared to perform recovery measures.

3.1 ACTIVATION CRITERIA AND PROCEDURE

The HDSS ISCP may be activated if one or more of the following criteria are met:

1. The type of outage indicates the HDSS will be down for more than 24 hours;
2. The facility housing HDSS is damaged and may not be available within 24 hours

The following persons or roles may activate the ISCP if one or more of the above criteria are met:

- Contingency Plan Director
- Contingency Plan Coordinator

3.2 NOTIFICATION

The first step upon activation of the HDSS ISCP is notification of appropriate mission/business and system support personnel. Contact information for appropriate points of contact (POCs) is included in Appendix B “Key Personnel Contact List.”

In the event of an incident that compromises the HDSS information system, the following notification procedures are to be followed:

1. The “first responder” will notify the CPC via email and/or phone.
2. The CPC will notify the CPM via email and/or phone as well as start the documentation process by opening a service desk ticket with the information currently obtained.
3. The CPM will notify the Recovery Support Team to complete a damage assessment report and determine a time by which the outage is estimated to be recovered by.
4. The CPM will work with the Recovery Support Team to finalize the damage assessment report, and then provide the report to the CPC.
5. The CPC will then provide the report to the CPD, and the ISSO informing them of the status.
6. The CPC is then responsible for obtaining status updates from the CPM and providing status updates to the CPD and the ISSO.

3.3 DAMAGE ASSESSMENT

Upon notification that a system failure has occurred, it is imperative that an assessment be made as quickly as possible to assess the nature and extent of the system disruption. The purpose of this assessment is to gain relevant information on the system failure and to determine the best strategies for recovering the system. Upon notification, the CPM should instruct the Recovery Team to perform a damage assessment report (appendix D) to determine the following information:

- Cause of the system disruption, including type, scope, location, and time of incident
- Whether the outage is localized (this system only) or widespread
- The location of failing components and those users without service
- The impact of the disruption or components damaged
- The functional status of all system components (e.g., fully functional, partially functional, nonfunctional)
- The potential for additional disruption or system damage
- Identification of a single point of failure (if possible)

- Items to be replaced (e.g., hardware, software, firmware, supporting materials)
- Anticipated downtime of the application (e.g., longer than two days)

A standard damage assessment report form is provided in the back of this document to assist in collecting this information (Appendix D). Additionally, to perform an effective assessment, it is important to have an available list of equipment, software, and data on hand as found in the System Inventory (Appendix C).

4 RECOVERY

The Recovery Phase provides formal recovery operations that begin after the ISCP has been activated, outage assessments have been completed (if possible), personnel have been notified, and appropriate teams have been mobilized. Recovery Phase activities focus on implementing recovery strategies to restore system capabilities, repair damage, and resume operational capabilities at the original location, if possible, or to an alternate location. At the completion of the Recovery Phase, the HDSS will be functional and capable of performing the functions identified in Section 2.2 of this contingency plan.

4.1 SEQUENCE OF RECOVERY ACTIVITIES

The following activities occur during recovery of the HDSS:

1. Identify recovery location (if not at original location).
2. Identify required resources to perform recovery procedures.
3. Retrieve backup and system installation media.
4. Recover hardware and operating system (if required).
5. Recover system from backup, source control, or system installation media.

4.2 RECOVERY PROCEDURES

Depending on the nature of the system outage, a combination of the following recovery procedures should be implemented by the Recovery Team personnel. Recovery procedures listed in this section provide the CPM with high-level guidance regarding the types of activities to be performed during contingency operations.

4.2.1 Building and Facility Services

If the building that houses the failing HDSS component(s) is damaged or has been evacuated, the CPM should contact the building services department for assistance on obtaining an estimated time that recovery personnel may safely reenter the building to begin supporting HDSS contingency plan operations. During this phase of recovery operations the following activities should occur.

1. The CPM coordinates with the building services department for an assessment of the damage to the building and facility services, and to obtain an estimated time the building would be safe for reentry.

2. The CPM notifies the CPC of the situation; the CPM should also monitor and adjust all recovery plan activities accordingly to reflect any delays in the restoration of power or telecommunication services that may have been temporarily damaged or disrupted.
3. The CPC should provide the CPD with periodic updates regarding the reopening of the building and the restoration of facilities services.

4.2.2 IT Infrastructure Procedures

- SSS network is no longer functioning properly
 1. If the information system is not accessible and it's been determined that the SSS Secure Data Center is still operating, determine if the SSS network is operational.
 2. If the SSS network is reported as no longer functioning tests may include but not limited to:
 - a. Check reports of lost functionality
 - b. Test connectivity
 - c. Check Network monitoring system for reported issues
 - d. Check SSS network devices for errors
 - i. After determining cause of issue proceed with restoring device to full functionality
 - ii. If it is determined the event is a problem of hardware failure, replace the damaged hardware and recover SSS network to full functionality.
- Information system server(s) are not functioning properly
 1. If the server(s) are not functioning properly, determine if the source of the problem is a result of hardware failure or software failure.
 2. In the event the source of the problem is hardware failure, replace the damaged hardware, recover any necessary software and/or database files from backup and reevaluate if the server is functioning properly.
- Information system SQL servers are not responding
 1. Check reports of lost functionality
 2. Test connectivity
 3. Check System monitoring for reported SQL issues
 4. Check and/or connect to SQL server and check for SQL server errors and events
 5. Check and/or connect to SQL server databases to determine system stats
 - a. After determining cause of SQL server not responding proceed with restoring not functional system components or restore from backups.
- Information system SAS analytic workstation(s) are not functioning properly (if applicable)
 1. Check reports of lost functionality
 2. Check system monitoring for reported issues
 3. Determine if the source of improper function is isolated to single analytic workstation or all analytic workstations.
 - a. Determine if system can be restored to full functionality or build and replace workstation
- Information system data has been damaged and/or corrupted
 1. Check reports of damaged and/or corrupt data
 2. Investigate cause of damage and/or corrupt data
 3. Restore damaged and/or corrupt files from backups

- Security incident suspected
 1. In the event there is a security incident suspected, immediately refer to the SSS Security Handling and Reporting SOP (ITS-IS-005 Information Security Incident Handling)
 2. Use the Security Incident Handling Form and attach it to the Service Desk ticket (F-IS-008 Information Security Incident Handling Form)

4.2.3 Recovery Escalation Notices/Awareness

During recovery efforts, the procedures listed below for notifications involving problem escalation and status awareness to system owners and users will be followed:

1. The CPM reviews problem escalation and status awareness problems and makes the determination of how to remediate the issue, or pushes the unresolved issue(s) up to the CPC. All other status information is forwarded to the CPC.
2. The CPC follows the same process as the CPM, except the CPC contacts the CPD if the problem remains unresolved. All other status information is forwarded to the CPD as well.

Problems should be reported as soon as they are discovered at a minimum. Whenever possible, problems should be identified during CP activation.

5 RECONSTITUTION

Reconstitution is the process by which recovery activities are completed and normal system operations are resumed. If the original facility is unrecoverable, the activities in this phase can also be applied to preparing a new permanent location to support system processing requirements. A determination must be made as to whether the system has undergone significant change and will require reassessment and reauthorization. The Reconstitution Phase consists of two major activities: validating successful reconstitution and deactivation of the plan.

5.1 TESTING AND VALIDATION

Once the original/new information system site is ready, the Recovery Team will reconstitute from backup the recovered HDSS information system. The site should be tested for connectivity and given a “burn in” period of at least 1 day prior to scheduling a migration from the contingency location to the original/new site. The Recovery Team should test connectivity, performance, security, backup procedures, scheduled procedures, perform OS vulnerability scans, and monitor system events during the “burn in” period. Once the “burn in” period is over, the Recovery Team can plan to migrate the data to the original/new site. This migration will need to be communicated several days ahead of time to the ISSO list, the CPD, and CPC.

5.2 DEACTIVATION

Once all activities have been completed and documentation has been updated, the CPD will formally deactivate the ISCP recovery and reconstitution effort. Notification of this declaration will be provided to all business and technical POCs via email.

6 PLAN TRAINING, TESTING, AND EXERCISES

FPC 65A provides guidance to Federal Executive Branch Departments and agencies for developing viable and executable training and exercising programs.

6.1 TRAINING

CP training of recovery team(s) personnel is an integral component of the CP process. The goal of training is to ensure that recovery team personnel are able to execute their respective recovery roles without the aid of the CP.

- The system stewards and CP Coordinator will develop a viable and executable training program. Training will be conducted at least annually, and when significant changes are made to the IT system, supported business process, or the CP. New employees who will have CP responsibilities will receive training promptly after hire.
- The CP Coordinator should be responsible for identifying essential training requirements and training team personnel. Training must be documented.
- Personnel training will consist of individual and team training to ensure currency of knowledge and skills necessary to implement the CP and carry out essential functions. Training will incorporate simulated events to facilitate effective response by personnel in a crisis situation.
- The system stewards and CP Coordinator will ensure that training for personnel with plan responsibilities complements plan testing and after-action report recommendations.

6.2 TESTING

CP testing is another critical element of the contingency process, and will be conducted at least annually, and when significant changes are made to the IT system, supported business process, or the CP. Testing should identify any deficiencies in the CP in addition to evaluating the ability of recovery team(s) personnel to implement it. The specific objectives of testing the CP are:

- Conduct a performance-based test of the recovery procedures identified in the CP;
- Contact all the key personnel via a call-tree test to ensure the contact information is accurate;
- Identify and correct any emergency weaknesses within the CP; and
- Conduct familiarization and training in the testing environment on the CP process and procedures.

Each element of the CP should be tested first individually and then as a whole to confirm the accuracy of recovery procedures and overall effectiveness. The CP Coordinator is responsible for testing and exercising the plan.

6.3 TEST EXERCISES

It is important that an exercise never disrupts normal operations.

The following areas should be addressed during the contingency exercise:

- System recovery on an alternate platform from backup media
- Coordination among recovery teams
- Internal and external connectivity
- System performance using alternate equipment
- Restoration of normal operations
- Notification procedures
- System recovery at the alternate processing site (for high-impact systems only)

The level of effort related to the conduct of exercises will correspond with the C&A three year life cycle. A variety of exercise types prepare members of the recovery team(s) to deal with the complex roles, responsibilities, and individual/team interactions necessary during response. The major types of exercises are described below.

6.3.1 Tabletop Exercises

Tabletop exercises bring members of the response organizations (i.e., CP Coordinator, CP Manager, representatives from the Recovery Team) together in a conference room setting to discuss how they would react to an emergency scenario. This is a cost-effective and efficient way to identify areas of overlap and confusion before conducting more demanding exercise activities. An Exercise Facilitator keeps team members focused on the pertinent issues and ensures objectives are accomplished. An Evaluator(s) captures the primary discussions and decisions for inclusion in the evaluation report (after-action report).

6.3.2 Functional Exercises

Functional exercises are used to validate specific functions within the response organization. Typically, these exercises address a particular function of the CP (e.g., emergency notification and mobilization, or data recovery). Participants are asked to evaluate how well the necessary functions were performed and identify lessons learned and areas for improvement. An Evaluator(s) captures the primary recovery activity and decisions for inclusion in the evaluation report (after-action report).

APPENDIX A: RECORD OF CHANGES

CP Version	Revision Date	Description of Changes	Section Number(s)	Page(s)	Name of Individual Posting Change
1.1	11/10/11	Added maintenance window in restoration process	5.3	15/28	Kevin Eisentraut
1.2	12/15/11	Added database backup/recovery	4.2.4, 5.7	14-18, 20	Kevin Eisentraut
1.3	7/30/13	Updated all sections to reflect current status of operations and procedures	ALL		Kevin Eisentraut
1.4	9/4/15	Updated contacts	Appendix B	25	Christina Larson Chebili
1.5	6/27/16	Updated formatting to new SSS template; Updated system resources/components; Updated contacts	ALL; Appendix B	10-11, 20	Jeffrey Hsii

APPENDIX B: KEY PERSONNEL CONTACT LIST

HDSS ISCP Key Personnel		
Key Personnel	Contact information	
ISCP Director	Work	304-347-4135
Laura Anderson	Home	
	Cellular	540-336-7750
	Email	LAnderson@hcawv.org
ISCP Director – Alternate	Work	304-558-8000
Susan Dolly	Home	
	Cellular	304-549-6242
	Email	sdolly@hcawv.org
ISCP Coordinator	Work	301-628-3263
Christina Larson Chebili	Home	703-448-0665
	Cellular	240-478-2145
	Email	CChebili@s-3.com
ISCP Coordinator – Alternate	Work	301-628-3573
Paul Gorrell	Home	
	Cellular	
	Email	PGorrell@s-3.com
ISCP Manager	Work	301-628-3571
Allen Selwyn	Home	
8785 Georgia Ave., 12 th Floor	Cellular	240-475-2796
Silver Spring, MD 20910	Email	ASelwyn@s-3.com
ISCP Manager – Alternate	Work	301-628-3524
Jeff Hsii	Home	
	Cellular	240-460-1850
	Email	JHsii@s-3.com
SSS After-Hours On-Call	Phone	301-628-3500

APPENDIX C: SYSTEM INVENTORY

Hardware Inventory

Device / Component	Make	Model	Hostname	Serial Number
Compute	Dell	R720	R7YP8178	285v3y1
Compute	Dell	R720	R7YP8223	6v3zk02
Compute	Dell	R720	R7YP8224	6v4tk02
Compute	Dell	R720	R7YP8177	185v3y1
Storage	Dell	MD3460	N/A	jm8yx12
Remote Access	Citrix	9700		

Network Inventory

Device/Component	Make	Model	IP Address	Serial Number
Switch	Cisco	Nexus 9K	10.3.152.31	SAL1952VWNE
Switch	Cisco	Nexus 9K	10.3.152.32	SAL2004XELO
Firewall	Juniper	SRX1400	10.3.254.5	BH3215AK0362
Firewall	Juniper	SRX1400	10.3.254.5	BH3215AK0360
Firewall, IDS/IPS	Palo Alto	3050	10.3.152.56	1701008692
Firewall, IDS/IPS	Palo Alto	3050	10.3.152.57	1701008710

Device/Component	Make	Model	IP Address	Serial Number
IDS/IPS	SourceFire	3D2500	10.3.151.101	3D25-11301007-FA02

APPENDIX D: DAMAGE ASSESSMENT REPORT

The following report is to be used by Recovery Team personnel in developing an assessment of the system failure.

DAMAGE ASSESSMENT REPORT			
Recovery Team:			
Event Information			
Date:	Time of Incident:		
Location:	Type of Event:		
Impact to System:	Facility Damage:		
Users Affected:	Outage Is Local To: <input type="checkbox"/> Project <input type="checkbox"/> Server <input type="checkbox"/> Widespread		
System Information			
POC:	Estimated Length of Disruption:		
Impact on Components:	Potential for Additional Disruptions:		
Component Resources Affected:	Was There a Single Point of Failure:		
Type of Damage to Resource:			
Estimated Equipment Needs:			
Recovery Information			
Suggested Recovery Strategy:			
Activation of Contingency Plan Recommended: (Y) (N)			
CP Coordinator Signature	Date/Time	CP Director Signature	Date/Time

System Component	Status		
	Fully Functional	Partially Functional	Not Functional
	Fully Functional	Partially Functional	Not Functional
	Fully Functional	Partially Functional	Not Functional
	Fully Functional	Partially Functional	Not Functional
	Fully Functional	Partially Functional	Not Functional
	Fully Functional	Partially Functional	Not Functional
	Fully Functional	Partially Functional	Not Functional

APPENDIX E: VENDOR CONTACT LIST

Vendor	Phone	Email
Dell	1-866-203-6875	N/A
Citrix	1-784-449-3700	N/A
Juniper	1-888-314-5822	N/A
Cisco	1-800-553-2447	N/A
SAS	1-800-727-0025	N/A
Equinix	1-866-378-4649	N/A
Level 3	877-453-8353	N/A
Zayo	918-295-7191	N/A
Datatility	877-585-46788	N/A

Appendix L **Draft HIDS Security Plan**

Information System Security Plan

1. **Information System Name/Title:** West Virginia Hospital Inpatient Data System (HIDS)

2. **Information System Categorization:**

MODERATE

3. **Information System Owner:** TBD

- **[Client Name]**
[Title]
[Address]
[Email]
[Phone]

4. **Authorizing Official:**

- TBD
[Client Name]
[Title]
[Address]
[Email]
[Phone]

- **Dr. Donna Bareis**
Authorizing Official
Social & Scientific Systems, Inc.
8757 Georgia Ave, 12th Floor
Silver Spring, MD 20901
DBareis@s-3.com
301-628-3015

5. **Assignment of Security Responsibility:**

- **Dr. Momodu Fofana, CISSP, PMP**
Director of Information Security
Social & Scientific Systems, Inc.
8757 Georgia Ave, 12th Floor
Silver Spring, MD 20901
MFofana@s-3.com
301-628-3540

6. **Information System Operational Status:**

Operational

7. **Information System Type:**

Major Application

8. General System Description/Purpose

The West Virginia Health Care Authority (HCA) is an autonomous state agency under the umbrella of the Department of Health and Human Resources. The WV Hospital Inpatient Data System (HIDS) resides within SSS' Secure Data Center (SDC). The HCA provides services to maintain and enhance the current outcomes of hospital inpatient data collection, processing, analysis and reporting. The HIDS provides secure storage and transfer of operational data, containing personal identifiable information (PII) and protected health information (PHI), as well as research data. The HIDS supports:

- HCA's ability to perform its regulatory functions.
- Improving the completeness, accuracy and timeliness of data collection.
- Data Management (including Preparation, Processing, Analysis and secure file Transfer)
- Development of website and web-based applications
- Remote desktop services
- Database servers
- File servers
- SAS workstations
- Printer systems, including secure printer systems

9. System Environment

Social & Scientific Systems, Inc. (SSS) has established a secure data center (SSS-SDC) that provides a centralized infrastructure for data storage, processing, and analysis. The SSS-SDC has been designed as a secure environment to support FISMA moderate, compliant solutions for our clients with fault tolerance, resiliency, and security in mind. SSS acknowledges that HCA staff or agent thereof reserves the right to inspect the HIDS environment, during normal business hours and upon written notice, to ensure compliance with the DUA and security plan.

10.1 Secure Data Center

The SSS-SDC operates at a tier 4, secure colocation facility with industry-leading security and reliability. The facility is a SAS 70-certified data center in which physical access to the hardware is limited only to a select number of administrators and is secured through a number of physical access controls, including biometric hand scanners, 24x7 guards, pin access codes, private cage access codes, and man traps. The facility contains N+1 redundancy for power and standby generators, cooling and environmental systems, and a pre-stage fire-suppression system. The facility provides a number of services, including power, cooling, flood control, fire detection and suppression, and other controls.

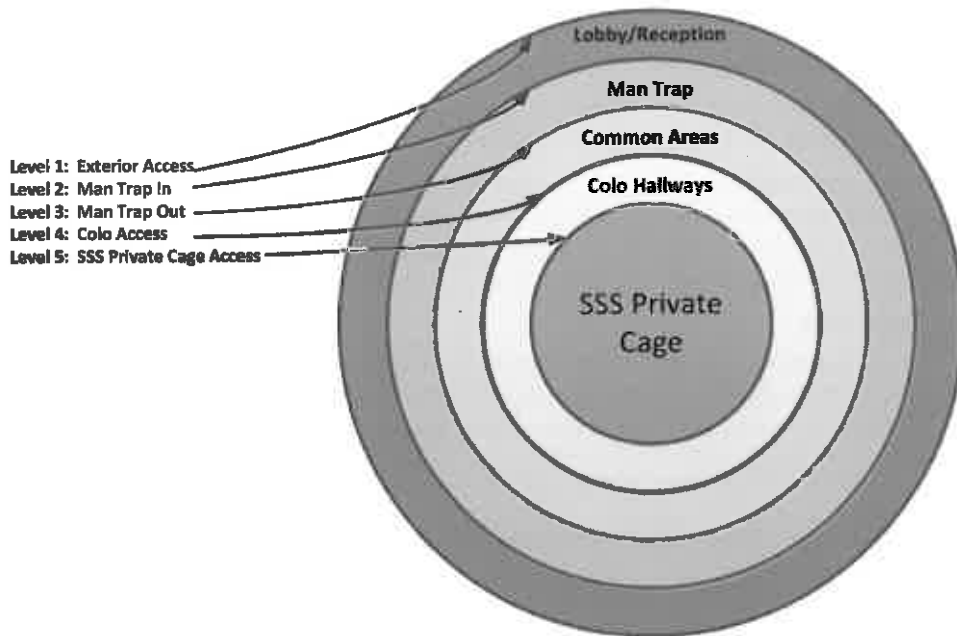


Figure G-1: SSS-SDC Physical Security Boundaries.

SSS has engineered and secured the SSS-SDC using a multi-layered approach through the combination of physical and virtual security controls. The security controls implemented are consistent with the recommendations from NIST and are compliant with a FISMA moderate security categorization. This secure environment currently hosts numerous FISMA moderate systems and was established and maintained based on the requisite FISMA moderate security controls and a foundation of corporate- and project-based policies and procedures.

10.2 Encrypted Communication

SSS operates redundant encrypted communication paths between the SSS Silver Spring location and the SSS-SDC using site-to-Virtual Private Network (VPN) connections. Data is transferred to the SSS-SDC using a managed file transfer (MFT) service. The MFT service encrypts the data during transit using a FIPS 140-2 validated encryption algorithm that meets FISMA moderate compliance standards. The data that resides at the SSS-SDC, while at rest, is stored on encrypted drives that are dedicated to the project.

Authorized users, such as SSS programmers and analysts, access the data via Citrix NetScaler using a FIPS 140-2 compliant encryption module.

10.3 Data Access and Sharing

Authorized users are required to access the HIDS using two-factor authentication. Users are required to use a unique username and password combination in addition to an RSA SecurID token. Each user is allocated a virtual machine (VM) in a secure enclave for access to the SSS-SDC environment. Once authenticated, users are permitted access to the environment and data files per role-based access controls (RBAC) using Windows Active Directory groups. Only authorized system administrators and research team members are added to access groups. These groups specify either system administrator access or research team access. Because the environment leverages a dedicated Windows Active Directory, all access is logged to servers operating as domain controllers that require user accounts managed from a central user directory for management and auditing. Local accounts are not permitted.

In addition, there are protocols in place at the SSS-SDC that further limit access and sharing to authorized activities only. Printing capabilities within the SSS-SDC have been removed; Internet access from within the SSS-SDC is denied.

10.4 Security controls in place to protect proprietary/confidential data

SSS manages several moderate level security plans that address all aspects of security, from physical access to the premises to the proper disposal of data storage devices and media. Within 30 days of contract award, SSS will deliver a comprehensive SSP detailing the security controls in place that meet the NIST 800-53 moderate level security categorization.

10.5 System Separation

The SSS-SDC is a multi-tenancy data center, so several controls have been implemented to ensure complete separation between clients. As shown in Figure 2 below, each tenant environment is separated by firewalls, Windows Active Directory forest boundaries, non-commodity virtual hosts, and dedicated storage per tenant.

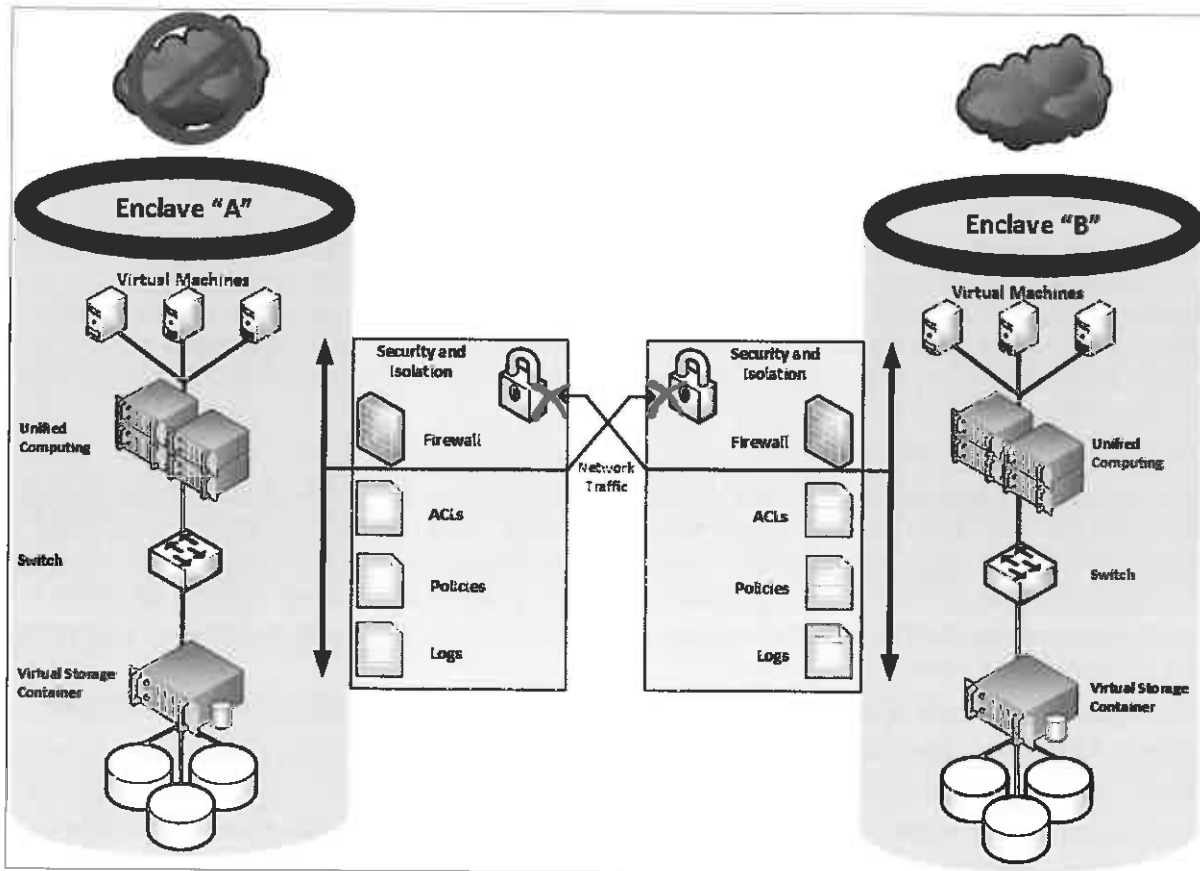


Figure G-2: SSS-GSS enclave separation.

10. System Interconnections/Information Sharing

System Name	Organization	Type	Agreement (ISA/MOU/MOA)	Date	FIPS 199 Category	C&A Status	Auth. Official
N/A							

11. Related Laws/Regulations/Policies

The following provides guidance on generally applicable laws, regulations, and policies relevant to the HIDS.

Executive Orders (EO)

- ▣ OMB Circular A-130
- ▣ Homeland Security Presidential Directive – 12, August 2004
- ▣ Homeland Security Presidential Directive – 7, December 2003
- ▣ International Organization for Standardization (ISO) 27001/27002
- ▣ Presidential Decision Directive 63 (PDD 63), May 1998

Federal Laws

- ▣ Title II of the E-Government Act of 2002, Section 208
- ▣ Privacy Act of 1974 (P.L. 93-579)
- ▣ Freedom of Information Act of 1974
- ▣ Federal Records Management Act of 1974
- ▣ Computer Fraud and Abuse Act of 1986 (P.L. 99-474)
- ▣ Clinger-Cohen Act of 1996
- ▣ Defense Authorization Act (P.L. 106-398)
- ▣ Health Insurance Portability and Accountability Act (HIPAA) of 1996 (P.L. 104-191)
- ▣ Federal Information Security Management Act of 2002 (FISMA)
- ▣ Sarbanes-Oxley Act of 2002 (P.L. 107-204)
- ▣ Gramm-Leach-Bliley Act (P.L. 106-102)
- ▣ Computer Security Act of 1987 (P.L. 100-235)
- ▣ E-Government Act of 2002
- ▣ Paperwork Reduction Act of 1995

National Institute of Standards and Technology (NIST) Special Publication (SP) and Guidelines

- ▣ NIST SP 800-12, An Introduction to Computer Security: The NIST Handbook
- ▣ NIST SP 800-14, Generally Accepted Principles and Practices for Security Information Technology Systems
- ▣ NIST SP 800-16, Information Technology Security Training Requirements
- ▣ NIST SP 800-18, Guide for Developing Security Plans for Information Technology Systems
- ▣ NIST SP 800-26, Security Self-Assessment Guide for Information Technology Systems
- ▣ NIST SP 800-27, Engineering Principles for Information Technology Security (A Baseline for Achieving Security)
- ▣ NIST SP 800-30, Risk Management Guide for Information Technology Systems
- ▣ NIST SP 800-34, Contingency Planning Guide for IT Systems
- ▣ NIST SP 800-37, Guide for Security Certification and Accreditation of Federal Information Systems
- ▣ NIST SP 800-44, Guidelines on Security Public Web Servers
- ▣ NIST SP 800-47, Security Guide for Interconnecting Information Technology Systems
- ▣ NIST SP 800-53 Revision 4, Recommended Security Controls for Federal Information Systems
- ▣ NIST SP 800-60 Vols. 1 & 2, Guide for Mapping Types of Information and Information Systems to Security Categories

- NIST SP 800-63, Electronic Authentication Guideline: Recommendation of the National Institute of Standards and Technology
- NIST SP 70, The NIST Security Configuration Checklists Program
- NIST SP 800-81, Secure Domain Name System (DNS) Deployment Guide
- NIST SP 800-83, Guide to Malware Incident Prevention and Handling
- NIST SP 800-86, Guide to Integrating Forensic Techniques Into Incident Response
- NIST SP 800-92, Guide for Computer Security Log Management
- NIST SP 800-95, Guide for Secure Web Services
- NIST SP 800-97, Guide to IEEE 802.111: Establishing Robust Security Networks (this is related to wireless network deployment)

Federal Information Processing Standards Publications (FIPS)

- FIPS PUB 199, Standards for Security Categorization of Federal Information and Information Systems
- FIPS PUB 200, Minimum Security Requirements for Federal Information and Information Systems

Office of Management and Budget (OMB) Circulars and Government Accounting Office (GAO) Requirements

- OMB Circular No. A-130, Appendix III
- OMB Circular No. A-123, Management Accountability and Control
- OMB M 00-07, Incorporating and Funding Security in Information Systems Investments
- OMB M-02-01, Guideline for Preparing and Submitting Security Plans of Action and Milestones
- OMB M-04-04, E-Authentication Guidance for Federal Agencies

12. Minimum Security Controls

Select the appropriate minimum security control baseline (low-, moderate-, high-impact) from NIST SP 800-53, then provide a thorough description of how all the minimum security controls in the applicable baseline are being implemented or planned to be implemented. The description should contain: 1) the security control title; 2) how the security control is being implemented or planned to be implemented; 3) any scoping guidance that has been applied and what type of consideration; and 4) indicate if the security control is a common control and who is responsible for its implementation.

As part of creating, operating, and maintaining an information system, a range of protective controls is required to help ensure that the HIDS' confidentiality, integrity, and availability are being properly protected. To this end, a specific subset of protection mechanisms has been selected by NIST for implementation on all information systems.

Specifically:

“Organizations are expected to apply the tailoring guidance described in Section 3.3 of NIST Special Publication 800-53 (as amended) to the initial moderate-impact baseline security controls—producing a tailored baseline. The tailored security control baseline serves as the starting point for organizations in determining the appropriate safeguards and countermeasures necessary to protect their information systems. Supplements to the tailored baseline (see Section 3.3 of NIST Special Publication 800-53, as amended) will likely be necessary in order to adequately mitigate risks to organizational operations (including mission, functions, image, and reputation), organizational assets, and individuals. The tailored baseline is supplemented based on an organizational assessment of risk with the supplemented baseline documented in the security plan for the information system. The supplemented security control baseline, along with any information system use restrictions required to achieve adequate risk mitigation, represents the organization's definition for information system security due diligence.”

For the HIDS, the controls in NIST SP 800-53-rev4 are being used to ensure that protections commensurate with **Moderate** level requirements are in place. The information in the following sections provides a high-level review of what is in place for each control in the 18 control families. The following

control families are further broken down into three main control groups: Management controls, Operational controls, and Technical controls.

Table G-1: 800-53 Rev.4 Control Families.

Identifier	Family	Class
AC	Access Control	Technical
AT	Awareness and Training	Operational
AU	Audit and Accountability	Technical
CA	Security Assessment and Authorization	Management
CM	Configuration Management	Operational
CP	Contingency Planning	Operational
IA	Identification and Authentication	Technical
IR	Incident Response	Operational
MA	Maintenance	Operational
MP	Media Protection	Operational
PE	Physical and Environmental Protection	Operational
PL	Planning	Management
PS	Personnel Security	Operational
RA	Risk Assessment	Management
SA	System and Services Acquisition	Management
SC	System and Communications Protection	Technical
SI	System and Information Integrity	Operational
PM	Program Management	Management

Management Controls

Security Assessment and Authorization

Security Assessment

[Project-Specific Control – Information Security Group]

SSS maintains individual Security Assessments (SA) for projects as mandated through contractual requirements. Additional SAs are conducted on all projects that collect, maintain, or disseminate sensitive information, specifically PII or PHI. During the assessment, security controls are defined, implemented, and tested to ensure they are meeting the expected outcome. SSS uses automated tools to perform system vulnerability scans to ensure that OS security settings are implemented according to USGCB standards and Web applications have been secured against the most known and common threats.

Plan of Action and Milestones

[Project-Specific Control – Information Security Group]

The Information Security Group maintains project-level Plans of Action and Milestones (POA&Ms), consisting of discrepancies against known standards and baselines, a weakness or security control that is not fully satisfied due to lack of provisioning, non-compliance, or deficiency in some of the information systems. Items are added to the project POA&M list through security assessments, monthly vulnerability scans, and policy reviews, and are rated based upon criticality (e.g., Low, Medium, High, or Critical).

Security Authorization

[Project-Specific Control – Information Security Group]

The Information Security Group works with several Federal agencies to ensure that project requirements that have the contractual language to obtain an Authority to Operate (ATO) are met. The Information Security Group works with key project personnel, system and network architects, and client security analysts in order to complete the Certification and Accreditation (C&A) security package. The ATO process is required every 3 years, but could occur sooner if the project undergoes significant changes to the scope of work or design. Ultimately, a senior-level executive receives the C&A security package, reviews the security controls and potential risks associated with the project, and provides the authorization (and acceptance of risk) for the project to move into production.

Continuous Monitoring

[Common Control – Information Security Group]

SSS has an established continuous monitoring program that scans our HIDS environment in real time for viruses and malware using Symantec. SSS servers are scanned with Tenable Security Center to ensure proper patch management and security hardening. SSS uses CheckMK to send real-time alerts to system administrators when SSS-defined criteria are met to provide a proactive approach to potential system issues.

Internal System Connections

[Common Control – Information Security Group]

SSS authorizes internal connections through networking protocols on switches, routers, and virtual LAN settings. The ITS networking team maintains a system architecture diagram for each project and any system interconnections required.

Planning

System Security Plan

[Project-Specific Control – Information Security Group/Project Staff]

SSS has in place project-specific System Security Plans (SSP) that exist in conjunction with corporate security policies and procedures, and are applied to the corporate information system. The SSPs are consistent with SSS's existing enterprise architecture, and explicitly define the authorization boundary of said architecture. The plans clearly outline the operational context in regard to the corporate mission and business processes, as well as define the security controls according to the NIST requirements, which are categorized according to the FIPS 199 guidelines. Copies of the security plan and subsequent modifications are distributed to the Authorizing Official, ISO, Project Manager, and additional key personnel to review annually, at a minimum.

Rules of Behavior

[Common Control – Information Security Group/Human Resources]

As a measure of maintaining SSS policies, SSS readily disseminates to all staff, rules that describe the roles and expected behavior in relation to information system usage. SSS requires all personnel to agree to and sign the appropriate rules of behavior before granting access to systems. This documentation is maintained on the SSS compliance tracking system, ComplianceWire, for annual security awareness training for SSS employees, contractors, and temporary employees. SSS provides mandatory refresher training and security awareness training for users who access corporate data or information. Both types of training require being re-signed. In addition to the Rules of Behavior is an agreement that all users must sign when they begin to work on SSS systems. This additional signed documentation is an acknowledgment of, and in compliance with, the information technology security policies.

Information Security Architecture

[Hybrid Control – Information Security Group/Project Staff]

SSS developed an information security architecture for the corporation that has been documented through the SSP that describes the overall philosophy, requirements, and approach to be taken to protect the confidentiality, integrity, and availability of SSS and client information. The existing documentation describes how the information security architecture is integrated into and supports the enterprise architecture; and further describes how there are no foreseen security assumptions about, or dependencies on, external services. This documentation is reviewed annually and all changes therein are reflected in the SSP.

Risk Assessment

Security Categorization

[Project-Specific Control – Information Security Group/Project Staff]

SSS categorizes all major systems based upon their intended use for the purpose of assigning an appropriate protection level in accordance with applicable laws. System owners and clients work together to assign a security categorization so that appropriate controls can protect the content that is detailed in an inventory of information assets. Because control complexity and overhead are almost always commensurate with the estimated impact to Confidentiality, Integrity, and Availability, the impact levels are carefully chosen. SSS also documents the security categorization results and supporting rationale using the FIPS-199 and NIST 800-60 publications.

Risk Assessment

[Project-Specific Control – Information Security Group/Project Staff]

SSS performs Risk Assessments through the SSS Information Security Group (IS) and provides the results to the client as part of the C&A package. The documented risk assessments result in the risk assessment report, which is reviewed and re-performed annually at a minimum, barring any significant changes to the information system or environment of operation (including the identification of new threats and vulnerabilities), or other conditions that may impact the security state of the system. All assessments are reviewed by the IS.

Vulnerability Scans

[Common Control – Information Security Group]

The IS scans network components monthly using a SCAP-approved vulnerability scanning tool to ensure servers and network devices are securely configured and patched. Results of the scans are provided to the Enterprise Team Lead and reported to the IT Director. Web applications are scanned for vulnerability assessment prior to significant changes and/or at least quarterly to ensure that common application vulnerabilities are configured against. Scans that result in moderate, high, or critical issues are provided to the lead developer.

System and Services Acquisition

Allocation of Resources

[Common Control – Information Security Group]

SSS maintains a dedicated information security organization composed of the Director of Information Security, acting as the Information Security Officer (ISO) with guidance from members of the Executive Team as designated by the President. The ISO is ultimately responsible for strategic security due diligence with supporting tactical activities carried out by the Information Security Officer and IT staff or other designated subject matter experts. SSS also determines, documents, and allocates the resources required to protect the information system as part of the overall corporate security program, capital planning, and investment control process, as the ISO maintains an appropriate and dedicated budget to adequately fund security-related activities.

System Development Life Cycle

[Hybrid Control – Information Technology Services/Project Staff]

SSS manages the information systems using an SDLC methodology that includes security considerations from the ISO. Through project-specific SSPs and associated documents, the system security roles and responsibilities throughout the system development life cycle are identified, as are individuals having information security roles and responsibilities. The ISO directs staff or other subject matter experts in their roles for maintaining adequate security as detailed within the project SSPs.

Acquisition Process

[Hybrid Control – Information Security Group/Information Technology Services/Project Staff]

SSS is careful to understand the risk associated with any commercial software and hardware products acquired as part of any systems. In particular, proposed component acquisitions are evaluated for appropriateness to the task. Component functional specifications are evaluated for their applicability to maintaining overall systems security. Component documentation and testing methods to maintain information assurance are critiqued. Memos and documents are in place to outline the acquisition process for SSS.

Information System Documentation

[Hybrid Control – Information Technology Services/Project Staff]

SSS, through either ITG or the Project Manager, retains administrator documentation for the SSS systems that describes the secure configuration, installation, and operation of the HIDS. Also of note is the effective use and maintenance of security functions/mechanisms with known vulnerabilities regarding configuration and use of administrative (i.e., privileged) functions. SSS also documents and retains any user documentation for the HIDS that describes user-accessible security functions/mechanisms and how to effectively use them. Methods for user interaction, which enable individuals to use the HIDS in a more secure manner, are also maintained.

Security Engineering Principles

[Hybrid Control – Information Technology Services/Project Staff]

SSS system and network engineers remain cognizant of contemporary security techniques within their areas of specialty. This culture of security is promoted by encouraging staff to pursue technological certifications and training in order to maintain and increase the quality of their knowledge. Security control information that defines the SSS security program can be found by reviewing the SSS Information Security Handbook and relevant supporting information.

Developer Configuration Management

[Hybrid Control – Information Technology Services/Project Staff]

All SSS network engineers and developers are required to perform configuration management during all phases of the SSS system development life cycle. This includes documenting, managing, and controlling the integrity of changes to all system components and software patches. It also entails the implementation and documentation of only reviewed and approved changes to the HIDS and assesses the security impact potential of such changes. Additionally, they are required to track security flaws and resolve them within the system, component, or service and report all findings to the Project Manager, ISO, or IT Director, depending on the security threat level.

Developer Security Testing and Evaluation

[Project-Specific Control –Project Staff]

The Information Security Group requires the SSS development teams of the information system, system component, or information system service to create and implement a security assessment plan that consists of unit and integration testing/evaluation at the application level. The

Information Security Group requires the development team to produce evidence of the execution of the security assessment plan, the results of the testing/evaluation, and the implementation of a verifiable flaw remediation process using an issue-tracking mechanism in order to address and correct flaws identified during the security testing/evaluation.

Program Management

Information Security Officer

[Common Control – Information Security Group]

The SSS Director of Information Security acts as the Information Security Officer, which is appointed by the President. The ISO is responsible for managing and implementing security-related directives and initiatives as provided by the SSS Information Security and Privacy Policies.

Information Security Resources

[Common Control – Information Security Group]

SSS implements an annual budgetary planning process, during which resources are made available for projected activity as well as contingency measures. During this planning, a documented high-level plan and goals are established and approved. These plans align both corporate and project initiatives submitted by the ISO in an annual budget to SSS management for the allocation of personnel and resources, while ensuring that the allocated information security resources are available for expenditure.

Information System Inventory

[Common Control – Information Technology Services]

SSS documents and retains the HIDS inventory for all hardware and software related to the HCA contract. This inventory is maintained within the IT Service Desk by the Inventory Assurance Manager.

Information Security Measures of Performance

[Common Control – Information Technology Services / Information Security Group]

SSS relies on various technologies to report system performance anomalies. The frequency, type, and number of anomalies are tracked and any findings and associated recommendations are used for remediation. This responsibility lies primarily within the ITS Enterprise Team, although the responsibility overlaps with the Information Security during C&A activities as applicable.

Enterprise Architecture

[Common Control – Information Technology Services]

SSS has taken into account any critical security requirements during the development and implementation of the corporate information systems. The design of each system provides a multi-layered approach to handle possible threats to the security tenets (Confidentiality, Integrity, and Availability). Corporate documentation has been developed that details the key resources used to protect these critical infrastructure and all associated elements.

Critical Infrastructure Plan

[Common Control – Information Technology Services]

The Information Security Group and Enterprise Teams have provided additional documentation that addresses the installation, configuration, and maintenance of the components critical to the proper functioning of the corporate information system. This standard configuration is monitored and modified as necessary with respect to threats, technological advances, and operational requirements aligned with goals and objectives of the Information Security Group to preserve the security posture of the SSS environment.

Risk Management Strategy

[Common Control – Information Security Group/Information Technology Services]

SSS has developed and implemented a risk management strategy closely aligned with the SSS corporate goals and objectives. This strategy is maintained by the SSS ISO/ITS and undergoes constant review and updates to further maintain alignment to corporate goals. Also in place is a strategy used within the context of individual projects to include, but not limited to, risk assessments, contingency planning, change control, configuration management, and project management. SSS also reviews and updates the risk management strategy at least annually, or as required, to address organizational changes.

Security Authorization Process

[Common Control – Information Security Group]

As a corporation, SSS maintains the secure state of the security authorization process via annual assessments. The designation of individuals with specific roles or responsibilities within the risk management process is handled according to project documentation as well as the SSS corporate Security Plan. This is in conjunction with the full integration of the authorization process into a specific risk management program by the ISO.

Mission/Business Process Definition

[Common Control – Information Security Group/Information Technology Services]

SSS has defined a mission/business process, taking into consideration Information Security via the FIPS 199 security classification. The ISO works with the necessary Project Managers to document any necessary information to validate the assigned categorization. They then work with the ITS staff to develop an architecture that meets the needs of the corporation while adhering to the strict regulations for information confidentiality, integrity, and availability set forth by the security classification. To ensure constant compliance, this process is reviewed at least annually, with constant documentation review and revision.

Information Security Workforce

[Common Control – Information Security Group/Information Technology Services]

SSS IT staff members are encouraged to take vendor training and SANS training when appropriate for their job and role. The ISO has established relationships with security vendors and consultants to fill gaps when identified. Security consultants can also be brought in to manage specific aspects of security when required. These consultants help to establish standards, and conduct audits for corporate systems as well as client-based systems. Information gathered during these consulting arrangements is centralized and applied across the company to further strengthen the corporate security program.

Testing, Training, and Monitoring

[Common Control – Information Security Group]

Security audits and continuous monitoring are part of the C&A process. When needed, corporate-level audits are conducted on all internal systems, with all lists of maintenance items being updated and verified for all applicable systems. A third-party SOC is in place to ensure the security of the network, with many system tools and automated alerts used to assist administrators when systems are impacted. The continuous gathering and compilation of system information is being implemented organization-wide.

Contacts with Security Groups and Organizations

[Common Control – Information Security Group]

SSS remains committed to the establishment of and continued contact with a number of selected groups and organizations such as US-CERT and ISC2, with the goals of facilitating ongoing security education and training for our personnel, remaining up-to-date with current and

recommended security practices, tactics, and technologies, and sharing all current security-related information regarding threats, vulnerabilities, and incidents.

Threat Awareness Program

[Common Control – Information Security Group]

SSS shares information as needed, when required. As a corporation that maintains an active relationship with various security organizations, SSS shall provide all relevant threat information experienced and ensure the recording, tracking, and remediation of all threats while providing all relevant information to clients as necessary, in accordance with the SSS Incident Response Policy.

Operational Controls

Awareness and Training

Security Awareness Training

[Common Control – Information Security Group/Human Resources]

SSS has implemented a security training and awareness program to educate all SSS staff and contractors on their daily responsibility for securing SSS resources and information. All staff are required to take the NIH Information Security Awareness Course annually. Staff with significant security responsibility, as defined by HHS as Executives, Managers, and IT Administrators, are required to take role-based training courses at least annually. The Information Security Group reviews and works with HR to track the completion of all required training courses to meet our Federal regulated compliance requirements. Additionally, the Information Security Group provides security awareness material through corporate emails, weekly newsletter articles, and brown bag lunches.

Role-Based Security Training

[Hybrid Control – Information Security Group/Human Resources/Project Staff]

When SSS projects require additional training above and beyond the SSS core security program, staff members assigned to those projects are required to take additional role-based training courses prior to gaining access to the HIDS or sensitive data. All training certificates are documented and retained by Human Resources through the online compliance tracking tool, ComplianceWire.

Security Training Records

[Common Control – Human Resources]

The SSS Human Resources department maintains all training activities using ComplianceWire, which is hosted by the vendor Kaplan EduNeering and is used as SSS's Learning Management System (LMS). ComplianceWire enables SSS to provide an audit trail and identify users who have not yet undergone their required training. Human Resources maintains the training records indefinitely in order to provide an auditor at any time with SSS's compliance with Federal training requirements.

Configuration Management

Baseline Configuration

[Hybrid Control – Information Technology Services/Project Developers]

SSS servers follow SSS configuration baselines, which can be mapped to USGCB standards and are documented per project requirements. Features (e.g., ports, protocols, etc.) that are not required are disabled to ensure that potential vulnerabilities associated with them are not accessible. Any exceptions to the standard configuration baselines are discussed among project staff, the IT Enterprise Team, IT Director, and/or the Information Security Group to ensure that

security requirements are not circumvented and the exceptions do not pose an unacceptable risk to SSS.

Configuration Change Control

[Hybrid Control – Information Technology Services/Project Staff]

Configuration change control is handled through a managed change control process. Proposed changes to information systems are reviewed by the Enterprise Team leaders as well as members of the Information Security Group to ensure the change does not pose a significant risk to SSS. All change requests are documented and approved prior to implementation of the change, and, when feasible, are implemented in the development environment for quality assurance testing of system functionality and to ensure security hardening is not affected.

Access Restrictions for Change

[Common Control – Information Technology Services]

SSS restricts access to personnel who can perform the privileged functions required to implement change requests. The networking environment is segmented to ensure users from one project cannot access another projects' information system. Access to server environments is limited to ITS and developers who have been given elevated rights in order to perform only the tasks required for their specific job duties. Active Directory authentication is used to allow ITS control and maintain user access.

Information System Component Inventory

[Common Control – Information Technology Services]

The SSS Inventory Assurance Manager maintains inventory lists of all hardware and software purchased by SSS, including license keys, serial numbers, and personnel assigned.

Software Usage Restrictions

[Common Control – Information Technology Services]

SSS has strict software usage restrictions in order to maintain compliance with contractual agreements and copyright laws. All software purchases are to be approved by ITS so that the Inventory Assurance Manager can then track and distribute software licenses accordingly.

User-Installed Software

[Common Control – Information Technology Services]

SSS has established the governing of the installation of software for users, and furthermore enforces the software installation policies through least-privilege concepts applied to the Group Policies within the OS configuration baseline, which prohibits non-administrators from installing software.

Contingency Planning

Contingency Plans

[Project-Specific Control – Information Security Group/Project Staff]

SSS Contingency Plans (CP) are tied to individual projects and are, as such, tied into the corporate Disaster Recovery Plan (DRP). The DRP, once enacted, triggers the individual project CP into effect, whereupon it is carried out by the respective Project Managers and their associated teams in accordance with the requirements, roles, and responsibilities of the project, with guidance from IS with the intent to restore critical functions initially and move towards the eventual full restoration of the information system, while mitigating information deterioration as outlined within the project-specific SSP. Each project-

specific CP has identified all essential missions, objectives, and business functions of its respective project, and is designed to retain said functions and mission in the event of system disruption, compromise, or failure. All CPs are reviewed for efficiency, and revisions are made as needed.

Contingency Plan Training

[Project-Specific Control – Information Security Group/Project Staff]

All CP training is provided to the information system users with assigned roles and responsibilities within 2 weeks of assuming a contingency role or responsibility. The user is provided with a copy of the CP and all associated policies and procedures deemed necessary to perform the responsibilities of the role, when required by information system changes and annually thereafter.

Contingency Plan Testing

[Project-Specific Control – Information Security Group/Project Staff]

Tests to the HIDS CP are performed annually, using table-top, functional, and to determine the effectiveness of the plan and the organizational readiness. These tests are conducted by a member of the IS with assistance from all necessary personnel on an annual basis. The test results are documented and provided to the ISO and/or IT Director, as required for performance review; and from there, determinations are made regarding which corrective actions, if needed, will be implemented.

Alternate Storage Site

[Common Control – Information Technology Services]

SSS has established an alternate storage site, including the necessary agreements to permit the storage and retrieval of information system backup information, which is addressed within the individual CP documentation and ensures that the alternate storage site provides information security safeguards equivalent to those of the primary site.

Alternate Processing Site

[Common Control – Information Technology Services]

SSS has an established alternate processing site, including the necessary agreements and regulations to permit the transfer and resumption of essential missions/business functions. When the primary processing capabilities are unavailable, steps are taken to ensure that the equipment and supplies required to transfer and resume operations are available at the alternate processing site, or contracts are in place to support delivery to the site within the agreed upon time period for transfer/resumption, and that the alternate processing site provides information security safeguards equivalent to those of the primary site based on the availability of project funding. SSS maintains its own system environment and is currently not bound to any restriction on accessing an alternate process site, for remote users, the alternate process site will be the SSS corporate office or via VPN. With the system being virtual, remote access is preferred and shall be the primary way of accessing systems. VPN is an alternate method of accessing data or systems.

Telecommunication Services

[Common Control – Information Technology Services]

The individual projects shall use SSS's corporate disaster recovery plan. Additionally, SSS uses IPsec and has created alternate paths using multiple Internet providers, giving

SSS the capability to continue operations during an outage with one vendor. To that effect, multiple agreements are in place with the vendor to address network provisions.

Information System Backups

[Common Control – Information Technology Services]

SSS conducts daily backups of user- and system-level information contained in the information system. Also captured is any information system documentation. These are taken to protect the confidentiality and integrity of backup information using access controls and physical controls. BackupExec is used on all physical systems, with Virtual Machine (VM) backups being taken daily, and during maintenance windows, via Veeam.

Information System Recovery

[Common Control – Information Technology Services]

If there is a disruption, disaster, or event, backup media will be used to restore functional data. VM machines will be rebuilt to the last known state before the disruption, disaster, or event. The projects shall use the SSS corporate disaster plan. Both full and incremental backups are taken of all systems. Database backups are also conducted for the restoration of systems.

Incident Response

Incident Response Training

[Common Control – Human Resources]

Incident Response Training is conducted through the use of ComplianceWire and is tracked therein. SSS provides refresher training as system changes or modifications require it, otherwise, the training is provided to key personnel annually.

Incident Handling

[Hybrid Control – Information Security Group/Information Technology Services/Project Staff]

SSS currently implements an incident handling capability for security incidents that includes preparation, detection and analysis, containment, eradication and recovery, and post incident activities. SSS intends to coordinate incident handling activities with contingency planning activities and incorporate any lessons learned from ongoing incident handling activities into future incident response procedure revisions, training, and testing/exercises.

Incident Monitoring

[Common Control – Information Technology Services]

SSS currently tracks and documents system security incidents in order to maintain records about each incident, the status of the incident, and other pertinent information. Additionally, SSS monitors the system for security incidents using tools such as Symantec Endpoint Security. Security incidents are recorded and investigated to determine what, if any, follow-up action is required. SSS also reviews security risk notifications from organizations such as US-CERT to stay apprised of new and current security risks.

Incident Reporting

[Hybrid Control – Information Security Group/Information Technology Services/Project Staff]

All personnel are required by SSS to report any security incidents to the proper personnel/department, and likewise, SSS will report relevant security incidents to designated authorities as defined within the Incident Response Policy (IRP).

Incident Response Assistance

[Common Control – Information Security Group]

SSS has an Information Security Officer who acts as a support resource for incident response. Working with various resources within the organization, the ISO reports on incidents to senior management and clients as necessary and uses the corporate support system for tracking security incidents. Email is used to notify clients of possible security incidents when necessary.

Incident Response Plan

[Common Control – Information Security Group/Quality Management Office]

SSS has developed an Incident Response Plan (IRP) that is documented and integrated with SSS's larger security program. SSS has provided the organization with a guideline for implementing its incident response capability. SSS provides a high-level approach for how the incident response capability fits into the overall organization, while meeting the unique requirements of the organization, which relate to mission, size, structure, and functions. SSS defines reportable incidents as any unauthorized access that might lead to the alteration, damage, or destruction of automated resources and data, unintended release of data, interrupted service, and/or denial of service.

SSS provides metrics for measuring the incident response capability within the organization and defines the resources and management support needed to effectively maintain and mature an incident response capability. The IRP is reviewed, revised, and approved by the ISO and the Director of IT Services as part of an ongoing process to maintain a strong security position according to industry best practices. SSS makes available copies of the IRP to all key personnel listed within the plan, communicating IRP changes as necessary. Overall, the IT support team and the Information Security Group form the group that supports the incident plan. Additional resources are brought in to act as subject matter experts, depending on the incident.

Maintenance

Controlled Maintenance

[Common Control – Information Technology Services]

ITS schedules maintenance for all corporate workstations and servers. The patch management process uses an automated tool, which advises on all corporate assets, state of the hardware, and availability of the vulnerability patches. Patches are approved by the ITS administrator and applied across the network. Maintenance that falls outside of the standard maintenance weekend is scheduled and approved prior to implementing. The Information Security Group requires that maintenance performed on all media must be performed in a secure location, have an audit trail if moved off site, or be sanitized prior to being moved off site.

Maintenance Tools

[Common Control – Information Technology Services]

SSS safeguards the corporate information systems by allowing only authorized IT personnel with access to perform privileged functionality. Additionally, formal

procedures validate system maintenance tools prior to permitting them access to corporate devices. All tools used during the maintenance of SSS devices are inspected for obvious issues or problems, and subjected to proper escort procedures and oversight. Systems that use diagnostic and test tools are from approved vendors and are verified by continual support from vendors.

Non-local Maintenance

[Common Control – Information Technology Services]

ITS performs most of its maintenance activities remotely either by using a centralized management tool or by remotely connecting to the information system. ITS authorizes, monitors, and controls non-local maintenance and diagnostic activities through strong firewall-based access controls to stop or lock access to only specific users or systems.

Maintenance Personnel

[Common Control – Information Technology Services]

ITS maintains a list of approved maintenance personnel who have been authorized for corporate assets and project systems.

Media Protection

Media Access

[Common Control – Information Technology Services/Facilities Group]

Physical security controls (e.g., DataWatch access cards, locked doors, etc.) provide a first line of defense against unauthorized use of digital and non-digital media. ITS has the ability through GPOs and object-level permissions to protect digital data files. Project requirements drive further access requirements to media that contain sensitive information. Information Owners provide the Facilities Group and ITS with specific instructions as to who has authorization for physical and logical access to media.

Media Marking

[Project-Specific Control – Project Staff]

The Information Security Group requires that all portable media, whether digital or non-digital, containing sensitive information be marked “Confidential” along with the sensitivity level of the information contained on the media.

Media Storage

[Hybrid Control – Information Technology Services/Project Staff]

The Information Security Group requires that all digital and non-digital media containing sensitive information be physically stored in an environment that is secured, providing access only to authorized personnel. Authorized storage environments are locked offices or a UL-rated fireproof safe. The Information Security Group also recommends locked filing cabinets within secured offices. All system media is to be secured until properly disposed of per the SSS Information Security Handbook.

Media Transport

[Project-Specific Control – Project Staff]

SSS protects and controls media during transport outside of SSS or client controlled areas using the agreements made between SSS and the client. Audit logs for media accountability are maintained, and the transport of media is only authorized to select project personnel. Media being transported that contain sensitive information such as PII,

PHI, or financial data are required to be encrypted to protect the confidentiality and integrity of the information stored on the digital media. Media containing confidential information while in transit must be double sealed, with the inner package to be labeled with the classification of the information stored and the outer seal to contain the information for who is authorized to receive the package.

Media Sanitization

[Hybrid Control – Information Technology Services/Project Staff]

The Information Security Group requires employees to sanitize digital or non-digital media prior to disposal, release out of organizational control, or release for reuse according to the SSS Information Security Handbook. The mechanism used for sanitizing media employs mechanisms with strength and integrity commensurate with the security category or classification of the information stored.

Media Use

[Hybrid Control – Information Technology Services/Project Staff]

All digital media such as hard drives, USB flash drives, and DVDs are handled by authorized staff. System administrators follow SOPs in handling media. Drives are documented and inventoried when not in use. Project managers are required to store digital media in locked cabinets, and sanitize it when no longer needed for the project. Additionally, the Information Security Group requires that digital media containing sensitive information be encrypted in order to protect the confidentiality and integrity of the information.

Physical and Environmental Protections

Physical Access Authorizations

[Hybrid Control – Facilities Group/Information Technology Services/Project Staff]

SSS maintains an up-to-date list of personnel with access to all system locations. Said personnel are issued authorized privileges and credentials from the ITS and Facilities groups. The list is reviewed at least quarterly, and in the event that an employee's access is revoked for any reason, HR will notify ITS, and Facilities will remove the individual's access level from the DataWatch System immediately.

Physical Access Controls

[Common Control – Information Technology Services/Facilities Group]

The SSS corporate office enforces physical access via security personnel at the main entrance. DataWatch cards are required to gain access to the floor and location of the data center at this location. Furthermore, the entrance to the data center is protected for unauthorized access via a five-digit cipher lock. All visitors to SSS are recorded, as to the day and time and the authorized person they have come to visit. Said visitors are to be escorted at all time by SSS staff or authorized personnel. The SSS-SDC (a/k/a Equinix) enforces physical access at the building entrance, the restricted data center entrance, and the private cage entrance. Equinix enforces access through the use of biometric hand scanners, posted security guards, and ingress man-traps to gain access to public areas. All access to the data center is controlled by a biometric hand scanner. Access to the customer cage is controlled by a biometric hand scanner and a combination pin code. Access to the HIDS rack is controlled with another combination pin code. The biometric information associated with individuals is retained in Equinix's secure system and only

available to the security personnel. The combination locks for the cabinets located inside the private cage are set to combinations designated by SSS and are retained in an encrypted password file accessible only to authorized personnel.

Equinix keeps access audit logs via their internal systems, and any reports are provided to SSS as requested. Visitors must be accompanied by authorized personnel. Said personnel are identified in a list provided to the Equinix facility by SSS. This list is validated quarterly by the SSS data center administrator.

Access Controls for Transmission Medium

[Common Control – Information Technology Services]

Physical security controls are applied to communication lines as well as the systems themselves. All critical transmission mediums are protected in locked rooms and/or closets and are protected by access badges systems and card readers/proximity cards.

Access Controls for Output Devices

[Common Control – Information Technology Services]

Output and printing controls are in place in some of the facility by measures of pin codes and card readers. Displays have password protected screen savers set to activate after no more than 5 minutes of inactivity. Devices are all in access controlled areas and printed materials are not to be left on the printer. Project staff needing to print sensitive data are required to print to designated printers in a secure environment. Only authorized personnel have access to these printers.

Monitoring Physical Controls

[Common Control – Information Technology Services]

SSS provides monitored access 24x7x365 via the use of biometric hand scanners, closed-circuit TV cameras, and on-site security personnel. Retention of all access logs to the facility is required; these logs will be requested by the SSS administrator on a quarterly basis for review. This is coordinated with any applicable procedures in the event of the activation of the SSS Incident Response Plan.

Visitor Access Records

[Common Control – Facilities Group]

As a matter of procedure, SSS keeps and maintains all visitor access records indefinitely, and reviews them quarterly.

Power Equipment and Cabling

[Common Control – Information Technology Services]

The SSS-SDC physically secures all cables in conduits or in racks above the cages to provide strong segmentation. Power is not directly accessible, but is managed by the building's overall redundant power strategy to minimize outages and promote up time.

Emergency Shutoff

[Common Control – Information Technology Services]

While SSS has extensive redundant power options and high resiliency, there is no emergency shutoff provided. However, systems can be shut down directly from the cage by an authorized person if physical access is available.

Emergency Power

[Common Control – Information Technology Services]

The SSS-SDC provides a backup power option with a diesel generator along with UPS systems in a configuration designed to minimize power outages or downtime.

Emergency Lighting

[Common Control – Information Technology Services]

SSS facilities, per local county guidelines and building codes, have emergency lighting systems that activate in the event of a power outage. Emergency exits and routes provide sufficient lighting for evacuation.

Fire Protection

[Common Control – Information Technology Services]

All SSS facilities are equipped with and maintain a county-approved fire detection and suppression system. In addition, Equinix is equipped with fire detection and suppression systems that limit the potential damage in the event of a fire. Key features of the fire detection and suppression system include:

- Multi-zoned, dry-type, double interlock pre-action fire suppression system
- Laser-based Very Early Smoke Detection Apparatus (VESDA)
- Dual alarms (heat and/or smoke) activation
- Zoned gaseous-based fire extinguishing system.

The fire suppression system is monitored 24x7 by an external alarm monitoring company, which will dispatch the city fire department upon receipt of an alarm. Inside the IBX, software is used for fire detection and monitoring, combined with customized floor plan graphics to illustrate detection devices and fire zones to aid IBX personnel and the fire department in responding to and coordinating fire control activities.

Temperature and Humidity Controls

[Common Control – Information Technology Services]

The SSS-SDC maintains the temperature and humidity levels in any facility where the HIDS reside in accordance with industry best practices and guidelines. To that end, temperature and humidity sensors are placed strategically throughout the data center and are monitored 24x7.

Water Damage Protection

[Common Control – Information Technology Services]

The SSS-SDC minimizes water problems with its pre-action fire protection system. A leak detection system that monitors for water is installed, surrounding the “at risk” areas within the building. The leak detection system is monitored by the BMS, and facilities at that location control other water issues without any direct SSS interaction. A third party inspects the fire suppression system at each data center facility at least annually. All data center facility equipment is protected from water damage through the combination of elevated racks, water detection sensors, and elevated, anti-static floors.

Delivery and Removal

[Common Control – Information Technology Services]

Equipment is very static and will be changed only in the event of a hardware failure. Only authorized IT staff are allowed to handle hardware components. All systems entering and existing within the environment are tracked with the type of hardware, serial

number, date, and purpose. All equipment is registered and recorded in logs that can be provided at a customer's request.

Alternate Work Site

[Common Control – Information Technology Services]

SSS uses NIST Moderate level physical controls at alternate work sites and assesses, as feasible, the effectiveness of said controls. It also provides employees with a method to communicate with the IS in case of security incidents or problems. In case of emergency, incident, or natural disaster, SSS workers have the means and ability to work remotely through the use of corporate laptops, virtualized private networks, and remote desktop solutions.

Location of Information System Components

[Common Control – Information Technology Services]

ITS positions information system components within the facility to minimize potential damage from environmental hazards; for example, servers are not located directly under water pipes, and unauthorized access is prevented by positioning several access points to gain entry.

Personnel Security

Position Risk Designation

[Hybrid Control – Human Resources/Project Staff]

SSS maintains that all personnel position categorizations are determined by project-specific requirements, and that all temporary and permanent employees working on the project are screened per SSS policy. Furthermore, position categorizations for SSS are reviewed annually, at a minimum.

Personnel Screening

[Common Control – Human Resources]

SSS personnel screening is commensurate with the requirements provided by the project. The SSS Human Resources team follows these requirements for validating users prior to authorizing access to the HIDS. That said, personnel are subject to re-screening per any requirements provided by the project.

Personnel Termination

[Common Control – Human Resources]

Upon termination of employment, it is SSS's policy and procedure to disable access to all systems, terminate all associated authentication and credentials, and hold an exit interview. In addition, the prompt retrieval of all security-related organizational information or systems controlled by the terminated individual is necessary.

Personnel Transfer

[Common Control – Human Resources]

SSS continuously reviews and confirms ongoing operational need for current logical and physical access authorizations to information systems/facilities when individuals are reassigned or transferred to other positions within the organization.

Access Agreements

[Hybrid Control – Human Resources/Project Staff]

SSS has developed the Employee Acceptable Use Policy and the Employee Handbook. Additionally, project-specific access agreements (Data Use Agreement) are required, ensuring that employees who access systems containing sensitive data are required to sign binding non-disclosure agreements. For the project, all staff follow the SSS specific requirements and policies. The Employee Acceptable Use Policy is reviewed and updates are made to the access agreements at least annually.

Third-Party Personnel Security

[Hybrid Control – Human Resources/Contracts/Project Staff]

All subcontractors that support the organization are subject to similar stipulations as SSS employees when those contractors are working in performance of a client system. As such, these vendors are subject to the same criminal and financial background checks and acceptable use policies. Personnel security requirements are provided at the project level. All personnel, whether in-house or subcontracted, must adhere to the project's security requirements. Said requirements are a part of one or all of the system security plan, SSS security plan, or subcontractor contracts, and require all third-party providers to notify SSS HR immediately upon termination of any personnel transfers or terminations of third-party personnel who possess organizational credentials and/or badges, or who have information system privileges.

Personnel Sanctions

[Common Control – Human Resources]

SSS applies personnel sanctions for violations of the Code of Ethics that are clearly stated within the Employee Handbook. The handbook is readily available in its complete form on the corporate intranet. Employees use ComplianceWire to electronically acknowledge their agreement with the code on an annual basis. In addition, SSS notifies the supervisor, applicable project managers, and/or the IT Director prior to the initiation of a formal employee sanctions process.

System and Information Integrity

Flaw Remediation

[Hybrid Control – Information Technology Services/Project Developers]

SSS employs malicious code protection at the system on all workstations and servers on the network using Intrusion Detection Systems (IDS) and Symantec Endpoint protection. Additionally SSS performs URL content filtering and updates any mechanisms used for protections against malicious code whenever possible. Said mechanisms are used to scan the network on a monthly basis, as well as in real time for certain systems. For the real-time systems, any malicious code found is either blocked, quarantined, or deleted as necessary, while a system administrator is concurrently notified of the action taken.

Projects that maintain Websites are scanned for application code vulnerabilities on a set schedule and vulnerabilities found are mitigated according to the SSS Information Security Handbook policy.

Information System Integrity

[Common Control – Information Technology Services]

SSS monitors all systems with the intent to detect attacks, indicators of potential attacks, and unauthorized connections of any kind. SSS also utilizes and deploys monitoring devices strategically and at ad hoc locations within the network to collect essential

information and track specific types of transaction that are deemed of interest to the corporation. All information acquired from the aforementioned monitoring devices is protected against unauthorized access, modification, or deletion via the implementation of role-based access. At any indication of possible increased risk to the organization, all system monitoring activities are heightened, thus providing all relevant information to key SSS personnel as needed.

Software, Firmware, and Information Integrity

[Common Control – Information Technology Services]

All access to modifying software or firmware is restricted to authorized accounts holding the necessary privileges. Events are tracked when possible via Active Directory or SQL databases. Events regarding unauthorized changes are flagged through various technical or auditing controls when possible, to identify said activity or events.

Spam Protection

[Common Control – Information Technology Services]

SSS employs spam protection mechanisms for all electronic mail communications that enter the network using a McAfee appliance. Symantec Endpoint protection is installed at the desktop level with updates to the spam protection mechanisms as soon as there is a new security definition. The updates are applied in accordance with the SSS configuration management policy and procedures.

Information Input Validation

[Project-Specific Control – Project Staff]

For projects that use data input, SSS validates all system inputs at the application level. Furthermore, all data validation occurs on the application for both form validation and application data inputs. Database checks are done to ensure non-validated data is not stored within the database.

Memory Protection

[Common Control – Information Technology Services]

SSS implements Symantec 12 and Microsoft Data Execution Protection (DEP) to protect against harmful programs attempting to run code from system memory locations reserved for Windows.

Technical Controls

Account Access

Account Management

[Hybrid Control – Information Technology Services/Human Resources/Project Staff]

Accounts are managed and enforced by ITS through Microsoft Active Directory. HR follows department procedures for notifying ITS when accounts are to be created, modified, or disabled. Access to specific SSS system resources and confidential information is managed through role-based permissions and can be tailored to the specific users having access only to specific resources or information when necessary.

Failed Login Attempts

[Common Control – Information Technology Services]

In order to deter the possibility of an account breach by an unauthorized user, ITS has set a limit for consecutive failed login attempts within a 15-minute timeframe. If the limit is reached, the user is automatically locked out.

Locking Sessions

[Common Control – Information Technology Services]

SSS information systems limit the ability for users to accidentally leave a system unlocked by automatically locking an open session after a designated period of inactivity, which hides any information previously displayed. The session remains locked until the authorized user or system administrator reestablishes access using authorized SSS credentials.

Flow of Information

[Common Control – Information Technology Services]

Where applicable, ITS controls the flow of information through logical segmentation of projects, virtualized network environments, and firewall rules designed to prevent unauthorized data movement.

Actions Permitted Without Authentication

[Common Control – Information Technology Services]

SSS further secures system resources by not permitting any actions on the SSS network or corporate workstations without authentication.

Remote Access to SSS

[Common Control – Information Technology Services]

Remote access to the SSS network requires dual-factor authentication. Users are issued an RSA SecurID token device, which receives a new six-digit pin approximately every minute. Users must log into the network using a combination of their UserID, password, and RSA SecurID device to enter the current pin. Once the authorization process has been validated, a secure encrypted connection is established between the SSS network and the user's workstation/laptop.

SSS Wireless Access Network

[Common Control – Information Technology Services]

SSS has established a corporate wireless access network (WAN) that ties into the main corporate network. Access to the WAN is provided to authorized users and is managed through Microsoft Active Directory.

Portable Devices

[Common Control – Information Technology Services]

In a world where computers are getting smaller and more portable, the need to protect the confidentiality and integrity of the sensitive data contained is paramount. SSS devices are configured to corporate standards and policies prior to being issued to users. Additionally, SSS safeguards the data stored on the device hard drives by using whole-disk encryption that is compliant with government regulations.

Secure Information Sharing

[Hybrid Control – Information Technology Services/Project Staff]

ITS understands that the sharing of information is paramount in performing daily business functions and vital to the success of SSS in the marketplace. ITS has facilitated information sharing by enabling authorized users access to the SSS network, shared drives, email system, files transfer servers, and other shared system resources. It is ultimately the responsibility of each SSS employee to understand the classification of information they wish to share internally or externally and abide by the SSS Information Security Handbook's policies, procedures, standards, and guidelines to ensure the confidentiality of the information being shared.

Audit and Accountability

Auditable Events

[Common Control – Information Technology Services]

All SSS workstations, laptops, and servers that are installed with a version of a Microsoft Operating System (OS) capture standard security events in the OS audit logs. As required, SSS selects additional security events to be audited and follows the recommendations of the United States Government Standard Baselines (USGCB), unless otherwise noted by National Institute of Standards and Technology (NIST). The Information Security Group has deemed that following industry best practices and recommendations is adequate for supporting after-the-fact investigations of security-related incidents.

Contents of Audit Records

[Common Control – Information Technology Services]

Because capturing auditable events is a key element of the SSS Information Security Group, the contents of the events captured are paramount in ensuring an adequate investigation of events. To that end, all auditable events captured are required to contain not only the type of event, but also a time stamp, source and destination addresses, user/process identifiers, event descriptions, success or fail indications, file names involved, and access control or flow control rules invoked, at a minimum.

Storage Capacity

[Common Control – Information Technology Services]

Ample internal storage capacity allocated for SSS hardware ensures that audit records are not continually overwritten. For servers, SSS uses CheckMK, a disk monitoring tool that notifies the Service Desk when hard drives begin to reach capacity. Each server has been allocated with at least 4 GB of hard drive space for audit logs, and the audit log will overwrite the oldest log when it fills to capacity. All audit logs are scheduled to automatically archive daily to a different partition on the hard drive and are automatically baselined for any changes. Audit records for corporate systems/network devices are retained for at least 90 days, and any audit records that pertain to a security incident are retained for at least 36 months.

Audit Failures

[Common Control – Information Technology Services]

If the audit logs fail to capture events, SSS uses CheckMK to immediately alert the lead engineer for immediate investigation. If the failure is due to a security incident, the system can be shut down or isolated from the SSS network while the incident is being further investigated. If the

event affects the production environment for any SSS projects, the project contingency plans can be enacted to ensure the appropriate procedures are met in regards to client requirements.

Audit Reviews

[Common Control – Information Technology Services]

The Service Desk reviews audit logs when issues arise through CheckMK, performance issues are noticed, or they are brought to their attention by SSS staff or clients. If the investigation uncovers unusual or inappropriate activities, the Enterprise Team escalates the issue to the identified authorized personnel and organizational officials. SSS maintains an Incident Response policy and associated procedure for how to properly respond to common security incidents.

Protection of Audit Records

[Common Control – Information Technology Services]

Audit logs are not permitted to be modified or deleted. Audit records are protected through layered authentication and are accessed only by authorized privileged user accounts (i.e., system admin, security admin, etc.) based on a need to know.

Identification and Authentication

Identification of Organizational Users

[Common Control – Information Technology Services]

Identification and authorization of authorized accounts is managed via Microsoft Active Directory (AD), in addition to the use of logical segmentation, virtual networks, and firewall rules, which are all designed to prevent the unauthorized access to system resources and movement of data. Additionally, multi-factor authentication is implemented for remote access to SSS networks using RSA SecurID token devices.

Device Identification

[Common Control – Information Technology Services]

All devices issued by SSS and/or gaining access to the SSS network require valid credentials for identification prior to being authenticated to access SSS resources.

Identifier Management

[Common Control – Information Technology Services/Human Resources]

SSS manages identifier accounts by requiring authorization from HR prior to establishing a new account. After authorization is set per HR documented procedures, ITS creates unique accounts and assigns access levels. Accounts are disabled when no longer in use and are not reused in order to ensure non-repudiation. Furthermore, accounts are automatically disabled after a period of inactivity and require a request to the SSS Service Desk to re-activate the account.

Authentication Management

[Common Control – Information Technology Services]

In order for SSS to manage the number of accounts required on a day-to-day basis for all employees, contractors, and devices, ITS follows documented procedures to ensure that accounts are managed and kept up-to-date. Specifically, ITS manages accounts by:

- a. Verifying the identity of the individual through HR's policy for establishing a new account
- b. Requiring unique user identifiers as well as complex passwords per IT policies

- c. Establishing and implementing administrative procedures for initial authenticator distribution, for lost/compromised passwords, and for revoking authenticators. Requiring passwords to be changed every 90 days and establishing minimum and maximum lifetime restrictions on the reuse of passwords.

Authenticator Feedback

[Common Control – Information Technology Services]

In order to protect the confidentiality of users' passwords, all corporate devices are configured to display asterisks instead of plain text when passwords are being entered. This prevents unauthorized individuals from compromising authentication mechanisms.

Cryptographic Module Authentication

[Common Control – Information Technology Services]

ITS requires that all information systems that contain confidential or highly confidential information (e.g., PII, PHI, financial data, etc.) use encryption technology that requires authentication for access. Furthermore, ITS requires the encryption module using the government standard FIPS 140-2 compliant encryption algorithm. For many SSS contracts, this is a contractual requirement and ITS has adopted this requirement across the entire SSS architecture.

Systems and Communication Protections

Information in Shared Resources

[Common Control – Information Technology Services]

SSS has logical and physical separation of shared servers at the operating system (OS) and application levels, such as firewalls, network switches, routers, etc. These security functionalities prevent the unauthorized and unintended transfer of information via shared system resources. Transfer of unauthorized and unintended information via shared system resource is enforced based on role-based permissions or logical segmentation. Any users who have been removed or are no longer working on projects within the SSS environment are removed, disabled, or deactivated from access to resources. Any data that is no longer in use is scrubbed, wiped, degaussed, shredded, or destroyed in accordance with SSS policy.

Denial of Service Protections

[Common Control – Information Technology Services]

The existing network architecture is designed to protect against, or limit the effects of, different types of denial of service attacks, such as the consumption of computational resources (i.e., bandwidth, disk space, or processor time), the disruption of configuration information, and others. Accordingly, the network employs several layers of protection to mitigate the effects of a Denial of Service (DoS) event. These layers include Intrusion Detection Systems (IDS) as well as Intrusion Prevention Systems (IPS) and firewalls with rules sets specifically designed to counter that type of threat.

Boundary Protection

[Common Control – Information Technology Services]

The SSS networking architecture maintains conservative boundary protection mechanisms where networks of different trust levels meet. By policy, all "any/any" traffic is disallowed ("deny all") unless specifically required from external resources. All externally required traffic flows are defined through exceptions and specified as possible through means of ports, protocols, source/destination, and services. There are IDS/IPS, firewall, and antivirus protection at key access points. Furthermore, SSS employs virtualized network separation with "least-access" firewall policies to separate different network functions.

Transmission Confidentiality and Integrity

[Common Control – Information Technology Services]

The SSS system protects the confidentiality and integrity of transmitted information. Secure Socket Layer (SSL) encryption protects the integrity of internal transmissions of data. Internal files are protected and reside behind networking firewalls. External connection is established through the SSS Virtual Private Network (VPN). The Information Security Group requires that any email containing sensitive information have the information encrypted using approved software in order to protect the confidentiality and integrity of the information while in transit.

Network Namespace Resolution

[Common Control – Information Technology Services]

The project networks use Active Directory (AD) to handle all internal namespace-addressing tasks as well as the internal domain name system (DNS) infrastructure. There are redundant AD/DNS servers within the SSS system, and corporate name servers are distributed throughout SSS and throughout all zones.

Protection for Information at Rest

[Common Control – Information Technology Services]

The protection of information at rest is being performed by a variety of compensating controls such as firewalls, IDS/IPS, and logical controls such as file-level permissions. Projects storing sensitive information are identifying the appropriate fields and ensuring the data stored is encrypted. Hard drives containing sensitive information are encrypted using whole-disk encryption.

Process Isolation

[Common Control – Information Technology Services]

SSS uses VMware, which enforces process isolation and prevents process overlapping. A virtual address space is provided that holds the programs and all related data. This prevents modification of one process from accessing another in the OS and application.

13. **Information System Security Plan Completion Date:** 07/05/2016
14. **Information System Security Plan Approval Date:** _____

Appendix M Project Management Plan with Performance Management Plan



West Virginia Inpatient Data System

Project Plan

Version 2.0



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1.0 Introduction

1.1 Purpose, Goals, Objectives and Period of Performance

For the West Virginia Health Care Authority (HCA), SSS provides Mandatory Services including data collection, processing and editing of inpatient hospital discharge electronic billing data from West Virginia hospitals. The system we built for this purpose is called the Hospital Data Submission System, or HDSS. The two main goals of this data collection and editing system are to reduce the burden on hospitals, and keep the quality of data high.

Work also includes documentation, training, and technical support regarding data collection, editing, and reconciliation. SSS also creates and provides to the HCA adjudicated analytic files containing submitted fields, appropriate groupers and adjustment factors, and other demographic, cost, clinical, and quality fields. The HCA uses the adjudicated analytic files for three main purposes, which include certificate of need (CON), hospitalization rates, and rate review (case mix index and if charging is within the threshold). The data also goes into HCUP databases.

The period of performance with this contract is September 1, 2011 to August 31, 2016.

1.2 Project Background

The WVHCA's mission is to gather information on health care costs, develop a system of cost control and ensure accessibility to appropriate acute care services.

SSS has been working with the HCA for 13 years. SSS, under a different project manager, had a contract with the HCA from 1998-2006 for the same scope of work. In 2007, SSS lost that re-compete of the contract to Thomson Reuters (now IBM-Truven). We took the project back, though, with the next re-compete in 2011, which is the current five year contract.

1.3 Assumptions and Constraints

The assumptions for this project are that the work is performed at the Silver Spring office using our Secure Data Center. SSS, not the HCA, provides all software and hardware. A list of assumptions, updated yearly, is also provided in the Annual Work Plan, which is comprised of the two documents "HDSS Year 1 Timeline.pdf" and "HDSS Year 1 Technical Approach.pdf".



The project constraints include a reliance on hospitals to get data in on time, however that has not been an issue in the most previous data collection year under the previous contract.



2.0 Organization

2.1 Roles and Responsibilities

Table 1. Project Roles and Responsibilities

Roles	Responsibilities	Skills Required	Person(s) Assigned
Project Manager	Oversee the overall success of the project, including quality of deliverables, deadlines, budget, staffing.	Communication, organization, understanding of financial aspect	Christina Larson Chebili
Quality Analyst	Test the system, run diagnostics	Attention to detail, knowledge of what results should look like	Christina Larson Chebili
.NET programmer	Design web interface and understand Importer, validation process, reporting	Integrate importer, .NET, SQL server, interact with IT regarding servers and SDC	Jeff Schinckle Shiquan Hu
SAS programmer	Lookup tables, adjudication, reporting	SAS programming, SQL, interaction between SAS and SQL server, integrate DRG grouper	Christina Larson Chebili
IT	Servers, SDC	Setup and maintenance of systems, servers, VMs.	James Bellafontaine, Stephen LaRochelle
IS	Oversee privacy and security, defends the data	Integration and testing, operation and maintenance of systems security	Dr. Momodu Fofana



2.2 Communication and Reporting

The tables below show the communication plan and the reporting deliverables

Table 2: Communication Plan

Project Status Communication	Owner/Distribution List	Frequency	Method of Communication
Data Submission Activities	Ms. Larson Chebil/HCA Data Analyst and Director of Clinical Analysis	At least weekly	Hospital Status Report, Attachment to email, regular agenda topic on teleconferences
Potential Problems/Barriers to Project Implementation	Ms. Larson Chebil or Mr. Schinckle/HCA Data Analyst and Director of Clinical Analysis	At least weekly	Telephone, web conference, or email
Contacts/Communications with Data Submitters	Mr. Schinckle/Individual Hospital Data Submitter and HCA Data Analyst	Usually daily	SSS HDSS help desk (live help by direct phone line, email)

Table 3: Reporting Deliverables

Data Quality Reports	
DQR1-Batch Summary Report	Error/warning type and count per batch and the total charges involved. For correcting issues so the same errors do not continue to happen.
DQR2-Submitted Records by Month of Discharge	Displays the number of records adjudicated each month.
DQR3-Patient Listing	View of all records in the database, including batches that have been deleted, that are invalid (currently being edited by a hospital), submitted, and adjudicated.
DQR4-Payer Reconciliation Report	Important report that compares reported reconciliation counts to adjudicated data counts by Month, hospital unit, and payers, and calculates percentage difference between reconciliation report counts and the adjudicated counts.
DQR5a-Bill Type Report	Identifies missing interim records which prevent adjudication – overall picture
DQR5b-Non-Adjudicated Patient Level Bill Type Report	Patient detail on those missing interim records - patient listing with bill types that shows whether a record was adjudicated or not.
DQR5c-Adjudicated Bill Type Matrix Report	Adjudicated bill type matrix report to use in identifying missing interim records.
DQR6-Potential Duplicates Report	Shows records that have possibly been submitted for the same patient under another patient control number
DQR7-Overcounted Discharges Report	Detailed display of records that aren't adjudicating together but are being counted
DQR8-Undercounted Discharges Report	Detailed records that are not being counted because they cannot be adjudicated. These records have the wrong bill types, wrong coverage dates, or wrong admit date.
DQR9-Records with W101 Duplicate Warning	Shows records from different batches with the same provider, patient number, bill type, and coverage end date.
DQR10-Missing SSN Report	Shows when the SSN field is being populated in your batches (this field is not otherwise visible to the user or to the HCA)
Other Reports	
Annual Report	provide on project successes and barriers within 30 days after year end
Annual work plan	– timeline and deliverables for upcoming year
Hospital status report	– provide weekly to show hospital submission progress to HCA

Project_Plan



2.3 Training

Table 3 below shows the types of training and assistance conducted on this project.

Table 3. Training Requirements

Role	Training Required	Planned Training Date
Trainer/presenter Christina Larson Chebili and Jeff Schinckle	Train new users to maneuver around and understand the HDSS – web conferences	Dependent upon when there is a new user
HDSS help desk: Christina Larson Chebili and Jeff Schinckle	Respond to help desk requests of HCA and users.	As needed, typically daily



3.0 Project Approach

3.1 Project Planning and Initiation

Project planning and initiation materials include client financial materials and corporate financial reports, other non-financial reports, and a work breakdown structure (WBS).

The corporate reports include the budget and cost spreadsheet, updated monthly, "WVHCA Option Year 1 Actuals and ETC - &Month.&Year..xlsx", and corporate financial reports such as projections, "WVHCA Projections &Month.&Year..xlsx", and the quarterly project review set of spreadsheets "WVHCA Project Review &Month.&Year..xlsx".

Invoicing occurs once per quarter, in arrears.

Non-financial materials include an annual work plan to client, which is comprised of a schedule of deliverables "HDSS Year 1 Timeline.pdf" and a list of assumptions for the upcoming year statement of work "HDSS Year 1 Technical Approach.pdf". We also deliver an annual report, due on October 1st of each year, on project successes and barriers, "AnnualReport_October 1 &Year.docx".

The work breakdown structure is as follows:

- 001 Goal 1 Data Collection, Processing, and Editing
- 002 Goal 2 Documentation and Technical Support
- 003 Goal 3 Analytic Files
- 004 Goal 4 Data Security and Privacy
- 005 Goal 5 Project Management
- 006 Goal 6 Ad-hoc Services

Other project planning and initiation items are the mandatory requirements and specifications. The requirements for this project are as follows: programs, formats, software and deliverables are the sole property of the HCA, and that there be privacy and security safeguards. For specifications, we have created a number of guides, manuals, and specification documents as outlined in the table below.



Materials	Data Collection	Reporting	Editing
User guide – covers maneuvering around the site and how to successfully import, edit, and submit data from start to finish.	✓	✓	✓
Companion Guide – Rules, detailed specifications data collection input file. Companion to the Washington Publishing Company's Implementation Guide (Health Care Claim Institutional (837) x12 Consolidated Guide).	✓		
Data Collection Policies and Procedures Guide – overview document covers rules, processes, and guidelines for data specifications, quality, adjudication, reconciliation, compliance, use and release, assistance, and reporting changes.	✓	✓	✓
Data Element Specifications – specification guide covering data collection field description and values and associated editing information	✓		✓
Listing of Warnings and Errors – detailed edit check rules and processes document			✓
Reconciliation process – reporting rules, processes and guidelines		✓	
Payer code list with descriptions – detailed guide on HCA's payer code values	✓		
DQR tips – guide with additional reporting advice		✓	

3.2 Execution of the Project (Monitoring & Quality Assurance)

This project is monitored by establishing a baseline (e.g. deployment date), and scrutinizing progress via our tracking system Team Foundation Server (TFS). The project manager monitors progress of the work using these tickets against the baseline on a weekly basis.

For quality assurance on this project, we test for bugs and defects for certain critical requirements, consistent screen layouts, and correctly calculating variables. SAS quality is determined through a series of diagnostics.

Quality is ensured by formal testing and documentation of defects in TFS where they are documented, fixed, retested and closed.

3.3 Delivery and Support (Reporting & Deliverables)



Major Project Deliverables	Responsible Person or Group	Planned Completion Date	Note
HDSS Import, collection, editing, reporting	Christina Larson Chebili and Jeff Schinckle	June 30, 2017	
Annual report	Christina Larson Chebili	October 1, 2018	
Work plan	Christina Larson Chebili	Year 1, Complete	
Data files	Christina Larson Chebili	Weekly, annual file due July 1, 2017	

3.4 Methods and Tools for Project Monitoring and Control

The tool for tracking defects, changes, requirements, and bugs is Team Foundation Server.

Ms. Larson Chebili leads the Change Control Board (CCB) to provide a mechanism for ensuring that all proposed changes to the HDSS are adequately reviewed to ensure viability and compatibility with the operation of the current version of the system. This ensures control over accurate and time implementation updates to the system.

The budget, costs and projection tool is the cost spreadsheet referenced in section 3.1.

3.5 Operating Budget

The operating budget for year 1 is \$410,605. The cost spreadsheet for tracking costs against the budget is referenced in section 3.1.



4.0 Management Approach

4.1 Risk Management

The contract for this project is firm fixed price. Fixed price contracts always pose the least risk to the government but the maximum risk and full responsibility for all costs and resulting profit for the contractor.

The other risk for this project is that it would be helpful to have more staff available that can both understand the technical side and can communicate well with hospital users, a rare combination of skills. We are currently actively working on identifying such individuals within the Health Technology Research Solutions Center.

4.2 Quality Management

The HDSS system itself filters hospital data down in a series of steps to eliminate errors, forcing the user to arrange the data according to specifications and only allowing in-range values and correct alignment of bills. The figure below shows the steps in the filtering process.

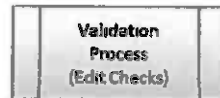
Quality management and issue control is also ensured by formal testing of data on the QA server before being deployed to production, the TFS ticketing system, and SAS diagnostics.

Figure 1: SSS' HDSS system cleans records and values until the data is error-free

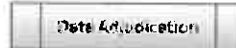
1. Malformed batches rejected by importer



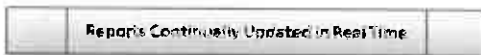
2. Validation process applies edit checks to batch



3. Adjudication rolls up clean records



4. Reporting identifies remaining issues



5. Edited, cleaned, rolled up data with value added fields delivered to HCA





4.3 Subcontractor Management

N/A

4.4 Performance Management

Performance management covers the entire continuum of supervisory interaction with employees regarding their performance, from performance conversations to disciplinary actions.

The manager ensures that they and staff have a shared understanding of their roles and responsibilities, and monitors progress periodically on assignments and projects. To monitor staff performance effectively, the manager provides clarity regarding job expectations and consistently measure performance progress towards goals. Recommendations for monitoring performance include conducting progress reviews with employees in which their performance is compared with your expectations. Ongoing monitoring activities gives the manager the opportunity to check how well employees are meeting the agreed standards and timelines and to make changes to unrealistic or problematic standards. By monitoring continually (rather than only at the end of the annual review cycle), unacceptable performance is identified earlier during the appraisal period and provides assistance to improve performance in a timely manner.

Annual reviews are the end result of an ongoing process that is based on periodic and effective communication between managers and their employees. Managers should spend more time preventing performance problems than evaluating and resolving them at the end of the year. When a manager observes, documents, and provides frequent feedback during the year, the evaluation is easy to do and more comfortable, because nothing unexpected should need to be addressed.

The manager carries out the following performance management activities with all of the individuals on the project at the intervals listed as follows:

Performance Management Guidelines

Activity	Frequency	Length of Contact With Staff
Job Orientation	Upon new job assignment	1-2 hours
Goals Review	Quarterly	15-30 minutes
Feedback	Twice a month	5-10 minutes
Coaching	Once a month	15-30 minutes
Annual Performance Review	Once a year	2 hours



A Performance Management Log is a tool for documenting the performance of staff. The manager documents key events, such as feedback and coaching interactions (both positive and corrective), as well as progressive disciplinary actions during the year. Keeping track of these actions are useful when it is time to complete performance reviews. The log should document the following:

- Dates of feedback and coaching interactions
- Performance objectives or new work assignments
- Instances of positive performance and areas in which improvement is needed
- Commitments or action plans discussed and agreed to
- Follow-up dates
- Follow-up results

A performance memo is a useful documentation tool that may be needed at any point in the performance management process, but it usually is associated with a written warning. A key part of our successful approach to administering performance management and discipline at SSS is having formal letters and memos regarding performance issues constructed in a consistent format.

Steps to Documenting Disciplinary Actions

Step	Description
1	State what the employee was expected to have known and/or done, including how that expectation was transmitted. (Otherwise, the employee may successfully claim ignorance of the expectation.)
2	Describe the factual occurrence using what, when, where, who, and how, with the objective of highlighting the gap between expectations and results or occurrence.
3	State the result that is now expected of the employee using what, when, where, who, and how.
4	Provide an infrastructure for support and assistance (consider available resources and training).
5	Clarify the actions that you are taking now, and establish the actions that will be taken if the employee's performance, conduct, or both do not change as described in step 3.

Reviewing and giving feedback about performance is a continuous process at SSS. A companywide annual review occurs during August and September to



summarize each employee's overall performance compared with company standards and performance expectations. Performance reviews are completed according to the guidance and timeline issued by Human Resources in late July.

The review process is a participatory process. It is intended to allow for input from all individuals who managed a staff member during the course of a given year. In addition, it provides for input from the employee. All available information is used to come up with an accurate picture of the level of an individual's contribution. This ensures that employee performance will be viewed as fairly as possible.

Appendix N Service Level Agreement

Service Level Agreement

For Information Technology Services

Rev. 2014.1

Effective Date: August 2014



**Social &
Scientific
Systems, Inc.**

Executive Summary

This Service Level Agreement (SLA) is a general agreement between Social & Scientific Systems, Inc. (SSS), and the internal administrative group, Information Technology Services (IT Services or ITS), for the provision of information technology support services to the overall organization. This SLA allows the users and business units at SSS to consistently expect and receive the stated level of service or better. Expectations related to user activity (i.e., "customer responsibilities") are also defined in this SLA.

The agreement defined herein covers the service level regarding the network infrastructure as well as the end user environment. This includes support of servers, network connectivity and Internet access, telecommunications systems, desktops and laptops, peripherals, and standard and approved software.

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Introduction

Service level management deals with how network infrastructure and end user service requirements are understood and handled, while providing the basis for managing relationships between ITS and the business units that it supports within SSS. Many benefits can be realized from a well-implemented service level management discipline including better alignment between the business units and ITS, more efficient IT service delivery, and improved user satisfaction.

The most important benefits of a service level agreement (SLA) are that they allow users to articulate their needs, they permit ITS to get an accurate picture of the needs of the organization and its users, and they lay the framework for the delegation of responsibility for meeting those needs. Well-crafted and properly implemented service level management disciplines can prevent, or at least minimize, most of the rifts between ITS and users in the business units.

An SLA, when properly implemented, can assist ITS with the proper allocation of resources toward what the business truly requires. The SLA documents what really matters to the business units, so ITS can allocate resources to providing services that are needed, properly prioritized, and user-friendly for staff. This will allow both ITS and the business to be better aligned.

Customers want their expectations to be met or exceeded. An SLA creates the opportunity to set this expectation level realistically. Since satisfaction is then no longer arbitrary or subjective, it can be more accurately measured and reported.

Scope

This document covers the service level regarding systems, services, and network functions. This includes support of servers (e.g. file and print services, Exchange, database management systems), network connectivity and Internet access, telecommunications systems (e.g. phone system, Xpressions, video conferencing equipment), desktops and laptops, peripherals, and the end user environment. A list of the standard end user environment services can be found in Appendix F. Standard network infrastructure services are detailed in Appendix G.

Any systems or services that are not included in these descriptions will be governed by a separate SLA specific to the system or service in question. This agreement may also be updated with additional appendices that describe additional software, systems, and/or services.

This agreement is valid from the effective date shown on the title page and is valid for one year from that date. This agreement should be reviewed and renewed prior to the anniversary date; however, in lieu of a review during the period specified, the current agreement will remain in effect.

The Director of IT Services is responsible for facilitating regular reviews of this document. Contents of this document may be amended as required, provided mutual agreement is obtained from the primary stakeholders and communicated to all affected parties. The Director of IT Services will incorporate all subsequent revisions into this document and obtain mutual agreements or approvals as required.

Roles

Role	Function	Name
System Owner	Responsible for the outcome or results produced by a business system or process.	<i>As defined in the addendum specific to the system</i>
System Project Manager	Responsible for the planning, execution, and closing of a project to bring a system into production; accountable for accomplishing the stated project objectives.	<i>As defined in the addendum specific to the system</i>
Director of IT Services	Oversees the IT Services group.	Kevin Brumbaugh
Solutions Architect	Manages and leads the planning and operations of the SSS enterprise IT systems, network infrastructure, and data and voice communication systems.	Allen Selwyn
IT Operations Manager	Manages and leads the planning and operations of daily IT tasks and processes, including overseeing the ITS Service Desk and the end user environment.	Jeffrey Hsii
Information Security Manager	Manages and leads the planning and operations of tasks related to security and compliance requirements of SSS systems.	Kevin Eisentraut

Definitions

Term	Definition
administrator	ITS staff responsible for maintaining and supporting back-end systems including servers, networks, and databases.
after hours coverage	ITS support for emergency business interruption events that occur outside of ITS business hours.
Altiris	Service-oriented management software used by the ITS group to record and track tickets.
Altiris MyHelpDesk	Web-based self-service portal for end users to create and view Altiris tickets.
availability	The probability that a system will work as required when required at all times. This includes online availability for end users and automated or batch processing capabilities.
business unit	Operating division, administrative group, or any other recognized unit of staff in the organization.
CheckMK	An extension to the Nagios monitoring system that allows creating rule-based configuration and offloading work from the Nagios core to make it scale better, allowing more systems to be monitored from a single Nagios server.
colocation provider	A type of data center where equipment, space, and bandwidth are available for rental to retail customers.
database	An organized collection of data.
database management system (DBMS)	Specially designed software applications that interact with the user, other applications, and the database itself (e.g. Microsoft SQL and Oracle).
DBMS-based application	Software that utilizes a database management system (e.g. Skills, WinAward, MAPS, Peopleware).
data center	A facility used to house computer systems and associated systems and generally includes redundant power, data communications, cooling, and various security devices.
effective date	Beginning date of agreement.

Term	Definition
end user	A person who uses an ITS system or service.
end user environment	The systems that end users work with (e.g. laptop, desktop, Outlook).
engineer	ITS staff responsible for designing and managing back-end systems including servers, networks, and databases.
Equinix	Data center and colocation provider used by SSS ITS for customer-facing systems.
Exchange	Microsoft e-mail, calendaring, and contact management server software.
file and print services	Services to provide access to shared files and network printers.
Genifax	Network fax system.
hours of operation	Time that end users and customers require systems to be up and functional.
Internet access	Connects individual computers, mobile devices, and networks to the Internet.
Internet Mail Services	SMTP send and receive services, antivirus and antispam gateways.
Intranet	A solution for sharing information, operational systems, or computing services within an organization.
IT Service Desk	ITS staff who provide support for end user and application-related support problems. Also referred to as Service Desk.
IT Services Coordinator	ITS staff responsible for ensuring tickets are logged, properly assigned, and meeting SLA response times. Also responsible for managing all IT assets and software licensing.
ITS business hours	Time ITS staff are available to acknowledge and troubleshoot ticket requests. SSS ITS business hours are 7:00 am to 5:30 pm EST, Monday to Friday, excluding company holidays.
ListServ®	E-mail list management software.
MXLogic	McAfee hosted security software that provides first line of defense email protection.
Nagios	An open source software that monitors hosts, services, applications, and

Term	Definition
	business processes.
Newman	SSS' Outlook Web Access site (http://newman.s-3.com).
network availability	The probability that a computer or other device will be able to connect to network systems as required when required at all times.
network connectivity	An active connection to the network infrastructure and the ability to authenticate to network systems.
network infrastructure	The architecture, in terms of equipment and connections, that makes up a network.
network monitoring	Use of a system or systems that constantly monitor a network for slow or failing components and that notifies administrators in case of outages or predictive failures.
Nextance	Contract lifecycle management software.
Outlook	Microsoft e-mail, calendar, and contacts management desktop software that integrates with Exchange.
Outlook Web Access	Browser-based access to Microsoft e-mail, calendar, and contacts management.
peripheral	A device that is used to put information into or get information out of a computer (e.g. scanner, printer).
Prowl	An app on an iPhone used by the ITS group to remotely access ITS' Nagios environment
Prowl alert	An alert generated by Prowl when a system or service becomes unavailable or reaches a predefined critical threshold
remote access	Connection to the corporate network from a location other than a business owned or leased location.
Security Operations Center (SOC)	Symantec managed security service that offers real-time, comprehensive protection from known and emerging threats.
Service Desk	An ITS resource intended to provide customer or end users with information and support related to the company's technology and network infrastructure.

Term	Definition
Sharepoint	Microsoft web application framework and platform for intranet, content management, and document management.
simple mail transfer protocol (SMTP)	An Internet standard for e-mail transmission.
SSSense	SSS' Intranet site (http://sssence).
stakeholder	A group or member who affects or can be affected by an organization's actions.
ticket	An end user request or question or a network event that requires an action or service as a response. Altiris refers to this as an "incident."
uptime	Measure of the time a system has been working and available, excluding scheduled outages or force majeure events.
United States Computer Emergency Readiness Team (US-CERT)	Part of the Department of Homeland Security's National Cybersecurity and Communications Integration Center. Leads efforts to improve the nations'a cybersecurity posture, coordinate cyber information sharing, and proactively manage cyber risks.
video conferencing equipment	Equipment that allows two or more locations to communicate by simultaneous two-way video and audio transmissions.
virtual private network (VPN)	Extends a private network across a public network. Enables a computer to send and receive data across shared or public networks as if it is directly connected to the private network, while benefiting from the functionality, security, and management processes of the private network.
Xpressions	Siemens web-based voice mail system.

Acceptance

This agreement will be posted on SSSence and made accessible to all stakeholders.

Role	Signature	Date
Director of IT Services:		

Solutions Architect:		
IT Operations Manager:		

Revision History

Version	Date	Description	Modified By
1.0	07 May 2007	Initial version	Allan Taylor
2.0	26 Jan 2009	Updates	Allan Taylor
3.0	17 Jul 2012	Updates	Allan Taylor Kevin Brumbaugh
4.0	01 Aug 2014	Updates	Jeff Hsii

Section I: System Availability

ITS, whenever possible, designs systems and chooses solutions with high availability in mind. To accomplish this, ITS carefully selects vendors, hardware, and software to maximize reliability and availability. The chart below details the expected uptime of major ITS services. All times indicated are Eastern Standard Time, unless otherwise indicated, and do not include scheduled system outages.

System/Service	Uptime	Availability	Locations
Equinix	99.99+%	Availability: 24 hours a day, 7 days a week. Per agreement with Equinix signed on March 1, 2010, there will be no more than 52 minutes of unavailability over a 12 month period.	All
Network Connectivity	99.9%	End User Online Hours: 7 am to 11 pm, Monday through Sunday Batch Processing hours: 2 am to 6 am Monday through Sunday System performance may be impacted for up to 8 hours daily (11 pm to 7 am, 7 days a week) while housekeeping and maintenance processes run.	Silver Spring, Rockville, Durham
Network Connectivity	98%	End User Online Hours: 7 am to 11 pm, Monday through Sunday local Kampala, Uganda time. Batch Processing Hours: 2 am to 6 am Monday through Sunday local Kampala, Uganda time. System performance may be impacted for up to 8 hours daily (11 pm to 7 am, 7 days a week) while housekeeping and maintenance processes run local Kampala, Uganda time.	Kampala
File and Print Services	99.9%	End User Online Hours: 7 am to 11 pm, Monday through Sunday	Silver Spring, Rockville, Durham
File and Print Services	99.9%	End User Online Hours: 7 am to 11 pm, Monday through Sunday local Kampala, Uganda time.	Kampala

System/Service	Uptime	Availability	Locations
Exchange	99.9%	Availability: 24 hours a day, 7 days a week	All
Internet Mail Services	99%	Availability: 24 hours a day, 7 days a week	All
Newman	99%	Availability: 24 hours a day, 7 days a week	All
ListServ®	95%	Availability: 24 hours a day, 7 days a week	All
DBMS	99.9%	End User Online Hours: 7 am to 11 pm, Monday through Sunday	Silver Spring, Rockville, Durham
DBMS	98%	End User Online Hours: 7 am to 11 pm, Monday through Sunday local Kampala, Uganda time	Kampala
Internet Access	99%	End User Online Hours: 1 am to 11 pm, Monday through Friday	Silver Spring, Rockville, Durham
Internet Access	95%	End User Online Hours: 11 pm to 1 am, Monday through Friday, 11 pm Friday to 1 am Monday	Silver Spring, Rockville, Durham
Internet Access	95%	End User Online Hours: 7 am to 11 pm, Monday through Sunday local Kampala, Uganda time.	Kampala
DBMS-Based Applications	99%	End User Online Hours: 7 am to 11 pm, Monday through Sunday Batch Processing Hours: 2 am to 6 am, Monday through Sunday	Silver Spring, Rockville, Durham
DBMS-Based Applications	95%	End User Online Hours: 7 am to 11 pm, Monday through Sunday local Kampala, Uganda time. Batch Processing hours: 2 am to 6 am, Monday through Sunday local Kampala, Uganda time.	Kampala
SSSence	95%	End User Online Hours: 24 hours a day, 7 days a week	All
Genifax	99.9%	End User Online Hours: 24 hours a day, 7 days a	All

System/Service	Uptime	Availability	Locations
		week	
Xpressions	99.9%	End User Online Hours: 24 hours a day, 7 days a week	All
Altiris	95%	End User Online Hours: 24 hours a day, 7 days a week	All
Sharepoint	95%	End User Online Hours: 24 hours a day, 7 days a week	All
Remote Access	95%	End User Online Hours: 24 hours a day, 7 days a week	All
End User Environment	99%	End User Online Hours: 8 am to 5:30 pm, Monday through Friday	Silver Spring, Rockville, Durham
End User Environment	97%	End User Online Hours: 7 am to 6 pm, Monday through Friday local Kampala, Uganda time.	Kampala

New systems and services are constantly being implemented by the ITS group, often due to a system upgrade or replacement, a new project need, or a newly identified need decided through capacity planning (detailed in Section III). These new systems and services are expected to adhere to the above uptime and availability guidelines unless specifically stated otherwise. CheckMK is added to all new systems and services, unless explicitly deemed unnecessary or denied with just cause by the system owner, system project manager, Solutions Architect, or Director of IT Services. Monitoring and SLA reporting is detailed in Section III below.

Section II: Ticket Management

The chart below details key components of the ticket management process. Ticket management is used to facilitate all end user environment issues and network infrastructure administration, engineering, and incident handling.

Services	Description	Specifications
Ticket Management	Process for the recording, diagnosis, tracking, and closure of support tickets. This includes the flow of information, call severity definitions, and call resolution responsibilities. This covers from initial contact by the user to problem closure.	See Appendix A for support request methods. See Appendix B for problem severity definitions.
Ticket Logging	Documentation to capture requests including relevant information on symptoms, priority, and contact information.	All support requests are logged through Altiris by the IT Services Coordinator or the Service Desk staff first assigned to handle the ticket.
Ticket Acknowledgment	Time for ITS to contact the call originator, acknowledging that the contact was received.	See Appendix C for contact response times.
ITS Support Team Response and Callback	Response and callback timeframe is the length of time for the ITS Support Team to respond to the user via phone or e-mail. Note: The call originator must provide contact information to the ITS Support Team.	The ITS Support Team provides staffed coverage from 7:00 am to 5:30 pm Monday through Friday, except on company holidays. Emergency afterhours coverage is provided at all other times via an on-call schedule. For the non-staffed hours, the response time for Priority 1 through 3 problems is within two hours. See Appendix C for call response times.

Services	Description	Specifications
Status Updates	The ITS Support Team will provide updates on progress to identified personnel. Updates will be provided by e-mail and phone call as appropriate.	See Appendix C for the timing of status updates. See Appendix D for status update contacts.
Target Resolution Time	Target time that the ITS Support Team will take to resolve each call depending on priority.	See Appendix C for call response times.
Escalation Procedures	Management notification procedure that is invoked when a problem persists after the Target Resolution Time is exceeded.	See Appendix E for escalation contacts.

Section III: Network Infrastructure Services

The chart below details regular systems administration and management that is done on a regular and recurring basis, that falls outside of the end user environment and general network infrastructure maintenance, engineering, and incident handling.

Services	Description	Specifications
Equinix	Data center and colocation provider where corporate and project-based systems reside due to enhanced physical security and power, cooling, and network redundancy.	The facility provides 99.99+% uptime for mission critical customer-facing systems and provides elevated physical security to ensure systems and protected health information and personal identifiable information are not compromised.
Network Monitoring	Use of a system or systems that constantly monitor a network for slow or failing components, vulnerabilities, and threats. Notifies administrators in case of these events.	<p>CheckMK is utilized to monitor network and system devices including servers, routers, and switches for uptime and performance spikes. In the event of a failure or critical alert, technical staff are alerted, allowing remediation to begin before business processes, end users, or customers are affected. One or more on-call engineers are available seven days a week, 24 hours a day to monitor, acknowledge, and troubleshoot CheckMK alerts. See document M-SAM-006 (ITS Service Level Agreement (SLA) Compliance and Reporting) for more details on CheckMK reports.</p> <p>Symantec SOC is an outsourced monitoring, analysis, and response service, leveraged to provide real-time comprehensive protection from known and emerging threats. Analysts and experts from Symantec scan for and respond to customer incidents to notify ITS of actions that may need to be taken. One or more on-call engineers are available seven days a week, 24 hours a day to monitor, acknowledge, and</p>

		<p>troubleshoot SOC alerts.</p> <p>MXLogic is a third party e-mail security solution that scans and filters external e-mails, looking for potential spam and virus threats, prior to being delivered to SSS' e-mail servers. MXLogic is also used to scan outbound e-mails to protect SSS' customers and business contacts.</p>
System Backups	The process of copying and archiving computer data so it may be used to restore the original after a data loss event.	System software and data will be backed up daily between the hours of 11 pm and 2 am.
Security and Compliance Monitoring and Regulation	Information security program to assure information assets are adequately protected and in line with best practices and regulatory and compliance requirements.	US-CERT and similar notifications are monitored weekly and as received by the Information Security Manager, Director of IT Services, and ITS Security team. The Information Security Manager and Director of IT Services are responsible for inspecting the notifications for issues that could potentially impact the corporate network. These issues are then escalated to the Solutions Architect within four hours to take corrective or preventative action.
System Change Management	The process to transition systems to a desired future state through formal introduction and approval.	<p>All systems change requests are to be submitted to the ITS Support Team. Altiris functions as the control and tracking point for all changes.</p> <p>Change notification request periods are based on the type of change. Default periods are:</p> <ul style="list-style-type: none"> ▪ <i>Major Projects</i>: Two weeks prior to change date ▪ <i>Nonemergency</i>: Five days prior to change date ▪ <i>Emergency Fix</i>: Submitted within 24 hours after the fix has been implemented
SLA Reporting	Reporting of key metrics	To ensure network infrastructure components

	to provide systems and network availability and incident tracking.	<p>and critical end user environment devices are meeting the System Availability SLAs in Section I, Prowl alerts are configured to send real-time notifications to all engineers in the on-call rotation, regardless if they are on-call, at all times. The weekly on-call engineer is responsible for ensuring these notifications are acknowledge and handled, if necessary. See Section 3.2.2 in document M-SAM-006 for details.</p> <p>CheckMK reports are reviewed at least monthly by the Solutions Architect to ensure SLA compliance. Any systems that are out of compliance, or are at risk of being out of compliance, are discussed on a weekly basis at the ITS Project Meeting. The attendees of these meetings are Director of IT Services, Solutions Architect, IT Operations Manager, and all Tier 5 engineers (subject matter experts). See document M-SAM-006 for more details on CheckMK reports.</p>
Scheduled System Outage	A preplanned period when a system is unavailable for the purpose of maintenance or other scheduled activity.	Whenever possible, stakeholders will be notified a minimum of seven days in advance via email.
Capacity Planning	Identification and development of future capacity requirements to meet system business requirements and budgeting cycles.	Capacity planning requirements will be identified and reviewed at least twice annually as part of an overall resource optimization and budgetary planning process.

Section IV: Customer Responsibilities

In order to better support customers and end users, the IT Services group expects everyone to adhere to the following responsibilities:

- Read and abide by all company, business unit, and project security and standards policies.
- Attend training on all software, hardware, and systems used by the company, business unit, and project.
- Create, maintain, and provide to ITS all required project documentation.
- Submit all requests for support via phone, email, or Altiris MyHelpDesk.
- Provide all information necessary for ITS to classify, prioritize, and resolve the requests.
- Be available to ITS representatives when resolving a service related incident or request.

Appendix A: Support Request Methods

ITS business hours are defined as Monday through Friday, 7:30 am to 5:30 pm Eastern Standard Time, excluding SSS recognized holidays. All other times are considered after hours. Requests by phone, email, and Altiris are answered and constantly monitored during ITS business hours. Only end user support requests that originate by phone are acknowledged outside of business hours. After hours requests should only be used for Priority 1 through 3 issues. One or more on-call engineers are available 24x7.

During business hours

- Phone: (301) 628-3500
- Email: servicedesk@s-3.com
- Altiris MyHelpDesk: accessible through the "ITS Service Desk" link on SSSence

After business hours

- Phone: (301) 628-3500
 - Press 2 for end user environment issues (Priority 3 issues)
 - Press 3 for network infrastructure issues (Priority 1 and 2 issues)

The ITS group, while geographically dispersed, works as a cohesive unit with an established tiering structure based on staff capabilities. Especially true for end user environment issues, tickets are first assigned to the lowest tier capable of handling specified issues. Since some issues require hands-on assistance (e.g. moving equipment, power supply issues), the ITS group has at least one Tier 2+ technician assigned to the Silver Spring, Rockville, and Durham offices every business day for at least eight hours.

Appendix B: Problem Severity Definitions

All incidents and requests for service will be classified into the following severity levels:

- Priority 1 (Critical)
- Priority 2
- Priority 3
- Priority 4
- Priority 5 (Planned)

Priority	Definitions
Priority 1	The inability to conduct business or to directly service the client. <i>Examples: Server down, network down, database down, application down</i>
Priority 2	Service is seriously degraded but can continue its operation via a workaround for a short period of time before business stops. <i>Examples: Extremely slow system performance, application functionality negatively impacted</i>
Priority 3	Service is lost by a single user or small number of users, affecting significant business functionality. <i>Examples: Hard drive failure in user workstation, special purpose printer out of service</i>
Priority 4	A problem or incident in which the ability for an individual user to operate is negatively impacted, but they are able to accomplish work through alternate means. <i>Examples: Workgroup or personal printer is out of service and an alternative is available; company-provided wireless phone is out of service</i>
Priority 5	A call from an individual user or site group that is requesting a new service or some clarification. <i>Examples: Requesting a new user logon, a new printer setup, or the meaning of a system message</i>

Priority 1 and 2 problems will be worked on a 24 x 7 basis until resolved. A user contact must be assigned and be available on a 24 x 7 basis to assess alternative solutions and finalize problem resolution verification.

Priority 3 problems will be worked on a 24x7 basis until resolved or a suitable workaround is implemented.

Priority 4 and 5 problems will be worked during regular local business hours.

The following graphic describes how priorities are assigned to a service request or incident.

	Core Business Service (High)	Support Service (Medium)	Non-urgent Service (Low)
Entire floor, <50% company (High)	1 (Critical)	2	3
(Department, small group of users) (Medium)	2	3	4
Single User (Low)	3	4	5 (Planned)

Appendix C: Problem Resolution Control Table

The following times are cumulative for incidents that are routed to the Service Desk.

Severity	Acknowledgement*	Standard / After-Hours Support Response	Target Resolution	Status Update or Report
Priority 1	15 min	15 min / 2 hours	24 hours	Every 2 hrs
Priority 2	15 min	15 min / Next business day	1 to 2 business days	Every 4 hrs
Priority 3	15 min	1 hour / 2 hours	1 to 5 business days	Daily
Priority 4	15 min	1 day / Next business day	Per agreement (see following table for target resolutions)	Upon closure*
Priority 5	15 min	1 day / Next business day	1 to 5 business days (see following table for target resolutions)	Upon closure*

*Times apply during standard ITS business hours only.

Target Resolution Times for Ordinary Events and Service Requests

Event	Target Resolution (in Business Hours)
New user account setup	8
New user computer system setup (from existing inventory of supported hardware and software)	8
New user telephone setup	8
Existing user account maintenance	8
Office move (IT components: PC, phone, LAN port)	16
Meeting setup (internal meeting)	8

New Exchange mailbox	8
New Exchange distribution list	8
New Listserv list	8
Remote access via SSL VPN (after authorization, from existing license pool)	8
Software installation (after authorization, from existing inventory of supported software)	8
Hardware installation (after authorization, from existing inventory of supported hardware)	8
Loaner equipment (after authorization, from existing inventory)	8

Appendix D: Status Update Contacts

The following people are contacted when a ticket is created, updated, or closed.

Problem Severity	People to Contact
Priority 1	Call originator Business unit contact ITS Service Desk IT Services Coordinator IT Operations Manager Solutions Architect ITS Director
Priority 2	Call originator Business unit contact ITS Service Desk IT Services Coordinator IT Operations Manager Solutions Architect
Priority 3	Call originator ITS Service Desk
Priority 4, Priority 5	Call originator

Appendix E: Escalation Contacts

An SLA query is run at least twice a day by the IT Services Coordinator to see if there are any tickets in Altiris that have exceeded the "Status Update or Report" threshold in Appendix C. For tickets that are reported to be past this threshold, the IT Services Coordinator or IT Operations Manager contacts the ITS staff member assigned to the ticket to update the ticket. If the assigned ITS staff member is unavailable or cannot continue working on the ticket at that time for any reason, the ticket is reassigned to another ITS staff member in the same tier or, if no one in that tier is available, is escalated to the next level tier. In the event that the IT Services Coordinator is unavailable, the IT Operations fulfills this duty.

The following people are contacted when the Problem Resolution Targets are exceeded.

Problem Severity	People to Contact
Priority 1, Priority 2	Call originator IT Operations Manager Solutions Architect ITS Director
Priority 3, Priority 4, Priority 5	Call originator IT Operations Manager

Appendix F: Service Catalog: End User Environment

The following equipment and software are explicitly supported by ITS. Equipment and software not specifically listed below may, in certain cases, also be supported by ITS.

Equipment

Equipment	Description
Laptop or Desktop	12" or 14" touchscreen (laptops only), Windows 7 Enterprise, Intel i7 Processor, 8GB RAM, 256GB Solid State Drive
Monitor	One 24" or two 19" LCD(s)
Printer	If required for handling of confidential data/information
Keyboard	OEM keyboard or equivalent
Pointing Device	OEM mouse or equivalent
Smart phone or tablet	iOS based devices
Video conferencing units	Lifesize cameras and room systems

Common Software (available to all users)

Software Application	Description
Adobe Acrobat Reader	Read Adobe PDF documents and fill out PDF forms
Adobe Flash Player	Browser add-in to access Flash-based media files
Adobe Shockwave Player	Browser add-in to access Shockwave-based media files
Altiris Client	Provides local management and support functions
CutePDF	Create Adobe Acrobat PDF format files via printer driver
Deltak Costpoint	Electronic Timesheets, Benefits, and other ERP functions (browser based)
7Zip	Tool for accessing and creating compressed archives

Microsoft Internet Explorer	Web browser for Windows environments
Mozilla Firefox	Web browser
Microsoft Office 2010 Professional	Application suite that includes word processing (Word), spreadsheet (Excel), groupware client (Outlook), and presentation software (PowerPoint) applications
Microsoft Windows 7 Enterprise	PC operating system and integrated applications, such as Internet Explorer, Media Player, Notepad, etc.
Symantec EndPoint Protection	Virus and malware protection
WinSCP	FTP file transfer client
WS-FTP Pro	FTP client application

Other Supported Software (installed as needed)

Software Application	Description
Adobe Acrobat Standard	Create and edit PDF format files
Adobe PageMaker	Desktop publishing software
Adobe ImageReady	Graphics and desktop publishing utility
Adobe Creative Cloud	Graphic design, video editing, web development, and photography software that includes Photoshop, Illustrator, InDesign, Acrobat Pro, and After Effects
Adobe Type Manager	Font management software
Blaise	Computer assisted interviewing system and survey processing tool
Citrix	Server, desktop, and application virtualization software.
Conversions Plus	File format conversions utility
CrashPlan	Remote backup service software agent
Crystal Reports	Create and publish reports from a variety of data sources
DBMSCopy	File format conversion utility

Software Application	Description
Deltek Cognos Impromptu	Report writer for use with Deltek Costpoint
Deltek GovWin	Government contracting and business development software
EasyGrouper	ICD-9 grouper software for medical procedures
EndNote	Bibliographic & citation management application
GuruNet	Browser add-in for accessing online research service
HipChat	Private instant messaging, group chat, and video chat software
iTunes	Software to backup company issued iPhone and iPad devices
JAWS	Text-based browser for the visually-impaired
Java	Sun platform independent language
Juniper Pulse	Support software for SSL VPN services
Macromedia/Adobe Studio	Suite of applications that includes Dreamweaver used for development of Internet sites, pages, and applications
MSDN	Microsoft Developers Network; collection of tools and applications targeted for software developers
Microsoft ActiveSync	Software to provide synchronization and communication function with a Windows Mobile device
Microsoft Office applications	Specialized applications in the MS Office family, such as Access, FrontPage, Project, Visio, OneNote, etc.
Microsoft Visual Studio	Application development environment
Microsoft Visual SourceSafe	Version control software for developers
PDF Converter Pro	Create and edit PDF format files (alternative to Acrobat)
PFE	Full featured text editor
Quark Express	Desktop publishing and layout software
Reference Manager	Bibliographic & citation management application
SAS	Statistical analysis software

Software Application	Description
SARA	Security tool and vulnerability scanner
Search & Replace	Search and replace text utility
SecureZip	Encrypted Compression Utility
Snag-It	Capture and edit screen images
SPSS	Statistical analysis application
Sudaan	Statistical application, generally called from within SAS
Stata	Statistical analysis application
StatXfer	File conversion software for statistical applications
Teleform	Capture information in forms, documents, and electronic files
UltraEdit	Full featured text editor
Visual SlickEdit	Full featured text editor
VMWare Player	Software tool for mounting and running virtual hosts on desktops within their own operating system
WebSurveyor Desktop	Application for developing surveys for use on WebSurveyor
WinZIP	File compression utility

All software is installed by the ITS group. Any software not explicitly listed above may require approval from one or more of the following people: System Project Manager, Solutions Architect, IT Operations Manager, Information Systems Manager, or Director of IT Services. This includes free and open source software.

Appendix G: Service Catalog: Network Infrastructure

The following systems and services are explicitly supported by ITS. Systems and services not specifically listed below may, in certain cases, also be supported by ITS.

Service	Description
Network Operating System	Microsoft Windows Server, Linux CentOS
File and Print Services	Home directories, project directories, network printers, server backup and recovery services
Messaging	Microsoft Exchange, Listserv, Newman
DBMS	Microsoft SQL, Oracle, MySQL
Internet/Network Access	IP-based Internet access, LAN/WAN, Firewall
DBMS Applications	Delttek (all modules), PeopleWare, WinAward, Skills
SSSense	Microsoft IIS, SharePoint Services
Web Services	Apache, IIS
Genifax	Network faxing integrated with Microsoft Exchange
Xpressions	Voice mail application integrated with Microsoft Exchange
Altiris	Enterprise systems management suite
SharePoint	Group collaboration portal
Remote Access	Secure remote access to internal network resources via SSL VPN
SFTP, MFTP	Secure File Transfer Systems

Appendix O WVHCA Draft Years 2 to 4 Workplan

West Virginia Hospital Data Submission System

Years 2 to 4 Work Plan: July 9, 2016

Technical Approach

HDSS Functional Updates

SSS will continue to monitor the Hospital Data Submission System (HDSS) to increase speed, functionality, and user interface experience.

Mapping between ICD-9 and ICD-10 Version of 5010 Data Format

In years two to four, SSS envisions a need to continue using the reimbursement mappings on the HCA master analytic file. We will forward map or backward map as requested.

Data Quality Reports, Analytic Reports, and Calculated New Fields

If requested, per year, SSS will develop two new reports and make changes to three existing reports. SSS will assist the HCA in developing these reports which are important sources of information for hospitals in the data correction process, and which are important for the HCA in evaluating the quality and completeness of submitted data. If applicable, SSS will also propose and create new analytic reports that summarize key utilization, access, cost, and quality indicators. If requested, SSS will create new calculated fields from the existing fields that are already collected.

Annual/Routine Tasks

SSS will complete the following annual/routine tasks per the contract:

1. Submit an annual report
2. Revise edit checks and/or lookup tables based on updates to the following code sets (all edit checks/lookup tables should be based on codes/rules valid as of the discharge date):
 - o NUBC coding standards – review NUBC updates quarterly to identify relevant changes prior to next year data collection
 - o Zip Codes
 - o NPI
 - o Diagnosis and procedure codes
 - o Exempt from POA diagnosis list
3. Update edit checks, as requested by HCA, prior to each data collection year to address identified data quality issues
4. Implement the DRG grouper and weights effective for discharge date
5. Perform year end activities including archiving the database and reconciliation entries, and exporting data quality reports from the data collection year

End of Contract Activities

At the request of the HCA, SSS will destroy all data and document the destruction per NIST Special Publication 800-88.

Assumptions

In order for SSS to stay within scope and on schedule for deliverables, the following lists of assumptions (by task area) are made:

<p>Additional/ Changes to Data Quality Reports and Analytic Reports</p>	<ol style="list-style-type: none"> 1. If requested, SSS will plan for three modifications to current data quality reports and for the development of two new data quality reports. 2. If requested, SSS will plan for the creation of five new analytic reports. 3. These reports will be able to run on existing system data or on new data from some point forward. Existing batches will not have to be reimported or revalidated to prepare data for a new report. 4. The specifications for these reports will be finalized and approved by HCA before they are given to the development team. An Excel spreadsheet will be used to document the changes, with a space for approval by the HCA. 5. There will be a minimal need for additional input forms to drive these reports (such as the reconciliation form). 6. SQL Server Reporting Services will continue to be used as the tool to create, deploy, and manage data quality reports.
<p>Calculated New Fields</p>	<ol style="list-style-type: none"> 1. If new fields are requested, SSS will calculate them from fields that are already collected. 2. There will be minimal need to purchase new software or data to calculate new fields.
<p>Support and Training</p>	<ol style="list-style-type: none"> 1. SSS will continue to provide the high level of to ensure files are correctly formatted and will assist with reporting and maneuvering around the system 2. SSS utilizes a trouble-ticket system for streamlined tracking and reporting of bugs. The HCA, hospitals, and hospital vendors will report issues and request technical assistance by contacting the SSS Help Desk (HDSSSupport@s-3.com or 866-843-1083).
<p>Browsers</p>	<p>As new browsers come out, or new versions of an existing browser are released, the system may behave differently than it does on tested browsers. Although the system's behavior can't be predicted in advance, SSS will test, fix, and enhance the system against any new browsers or new releases of browsers.</p>
<p>New Tasks</p>	<p>One new task per year, continue with any of these tasks from the previous year: reviewing and revising expected sources of payment, re-identification of patients, tracking patients within and between hospitals, additional enhancement of the NPI field.</p>

West Virginia Hospital Data Submission System

Year 2 Timeline

ID	Task Name	Start	Finish	September	October	November	December	January	February	March	April
1	New contract year begin, estimate	Fri 10/20/17	Fri 10/20/17								
◆ New contract year begin, estimate											
2	Assist hospitals 2017 data (continued from previous year)	Fri 10/20/17	Mon 10/22/18								
Assist hospitals 2017 data											
3	HDSS performance monitoring	Fri 10/20/17	Fri 10/19/18								
HDSS performance monitoring											
4	Accept data from hospitals	Fri 10/20/17	Fri 10/19/18								
Accept data from hospitals											
5	Map ICD10 data for master datasets	Fri 10/20/17	Fri 10/19/18								
Map ICD10 data for master datasets											
6	End of Year Activities 2017 data	Fri 6/15/18	Mon 7/2/18								
End of Year Activities 2017 data											
7	Begin 2018 data collection year	Tue 7/3/18	Tue 7/3/18								
Begin 2018 data collection year											
8	Analytical reports (timing is flexible)	Fri 10/20/17	Mon 10/22/18								
Analytical reports (timing is flexible)											
9	Data quality reports (timing is flexible)	Fri 10/20/17	Sat 10/20/18								
Data quality reports (timing is flexible)											
10	Calculated new fields (timing is flexible)	Fri 10/20/17	Mon 10/22/18								
Calculated new fields (timing is flexible)											
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Fri 10/20/17	Sat 10/20/18								
A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)											
12	Contract year 1 end	Sat 10/20/18	Sat 10/20/18								

West Virginia Hospital Data Submission System

Year 2 Timeline

ID	Task Name	Start	April	May	June	July	August	September	October	November
1	New contract year begin, estimate	Fri 10/20/17								
2	Assist hospitals 2017 data (continued from previous year)	Fri 10/20/17	2017 data (continued from previous year)							
3	HDSS performance monitoring	Fri 10/20/17	HDSS performance monitoring							
4	Accept data from hospitals	Fri 10/20/17	Accept data from hospitals							
5	Map ICD10 data for master datasets	Fri 10/20/17	ICD10 data for master datasets							
6	End of Year Activities 2017 data	Fri 6/15/18	End of Year Activities 2017 data							
7	Begin 2018 data collection year	Tue 7/3/18	Begin 2018 data collection year							
8	Analytical reports (timing is flexible)	Fri 10/20/17	Analytical reports (timing is flexible)							
9	Data quality reports (timing is flexible)	Fri 10/20/17	Data quality reports (timing is flexible)							
10	Calculated new fields (timing is flexible)	Fri 10/20/17	Calculated new fields (timing is flexible)							
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Fri 10/20/17	re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)							
12	Contract year 1 end	Sat 10/20/18	Contract year 1 end 10/20							

West Virginia Hospital Data Submission System

Year 2 Timeline

ID	Task Name	Start	November	December	January	February	March	April	May	June
1	New contract year begin, estimate	Fri 10/20/17								
2	Assist hospitals 2017 data (continued from previous year)	Fri 10/20/17								
3	HDSS performance monitoring	Fri 10/20/17								
4	Accept data from hospitals	Fri 10/20/17								
5	Map ICD10 data for master datasets	Fri 10/20/17								
6	End of Year Activities 2017 data	Fri 6/15/18								
7	Begin 2018 data collection year	Tue 7/3/18								
8	Analytical reports (timing is flexible)	Fri 10/20/17								
9	Data quality reports (timing is flexible)	Fri 10/20/17								
10	Calculated new fields (timing is flexible)	Fri 10/20/17								
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Fri 10/20/17								
12	Contract year 1 end	Sat 10/20/18								

West Virginia Hospital Data Submission System

Year 3 Timeline

ID	Task Name	Start	Finish	September	October	November	December	January	February	March	Apr
1	New contract year begin, estimate	Mon 10/22/18	Mon 10/22/18		10/22 ◆ New contract year begin, estimate						
2	Assist hospitals 2018 data (continued from previous year)	Sat 10/20/18	Tue 10/22/19								Assist hospitals 2018 dat
3	HDSS performance monitoring	Mon 10/22/18	Sat 10/19/19								HDSS perfo
4	Accept data from hospitals	Mon 10/22/18	Mon 10/21/19								Accept da
5	Map ICD10 data for master datasets	Mon 10/22/18	Sat 10/19/19								Map ICD10 dat
6	End of Year Activities 2018 data	Mon 6/17/19	Tue 7/2/19								
7	Begin 2019 data collection year	Wed 7/3/19	Wed 7/3/19								
8	Analytical reports (timing is flexible)	Sun 10/20/19	Tue 10/22/19								
9	Data quality reports (timing is flexible)	Sat 10/20/18	Sun 10/20/19								Data quality rep
10	Calculated new fields (timing is flexible)	Sat 10/20/18	Mon 10/21/19								Calculated new f
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Mon 10/22/18	Mon 10/21/19								A new task: could be re-identification of patients, tracking of pati
12	Contract year 1 end	Sun 10/20/19	Sun 10/20/19								

West Virginia Hospital Data Submission System

Year 3 Timeline

ID	Task Name	Start	April	May	June	July	August	September	October	November
1	New contract year begin, estimate	Mon 10/22/18								
2	Assist hospitals 2018 data (continued from previous year)	Sat 10/20/18	Assist hospitals 2018 data (continued from previous year)							
3	HDSS performance monitoring	Mon 10/22/18	HDSS performance monitoring							
4	Accept data from hospitals	Mon 10/22/18	Accept data from hospitals							
5	Map ICD10 data for master datasets	Mon 10/22/18	Map ICD10 data for master datasets							
6	End of Year Activities 2018 data	Mon 6/17/19	End of Year Activities 2018 data							
7	Begin 2019 data collection year	Wed 7/3/19	Begin 2019 data collection year							
8	Analytical reports (timing is flexible)	Sun 10/20/19	Analytical reports (timing is flexible)							
9	Data quality reports (timing is flexible)	Sat 10/20/18	Data quality reports (timing is flexible)							
10	Calculated new fields (timing is flexible)	Sat 10/20/18	Calculated new fields (timing is flexible)							
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Mon 10/22/18	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)							
12	Contract year 1 end	Sun 10/20/19	Contract year 1 end 10/20							

West Virginia Hospital Data Submission System

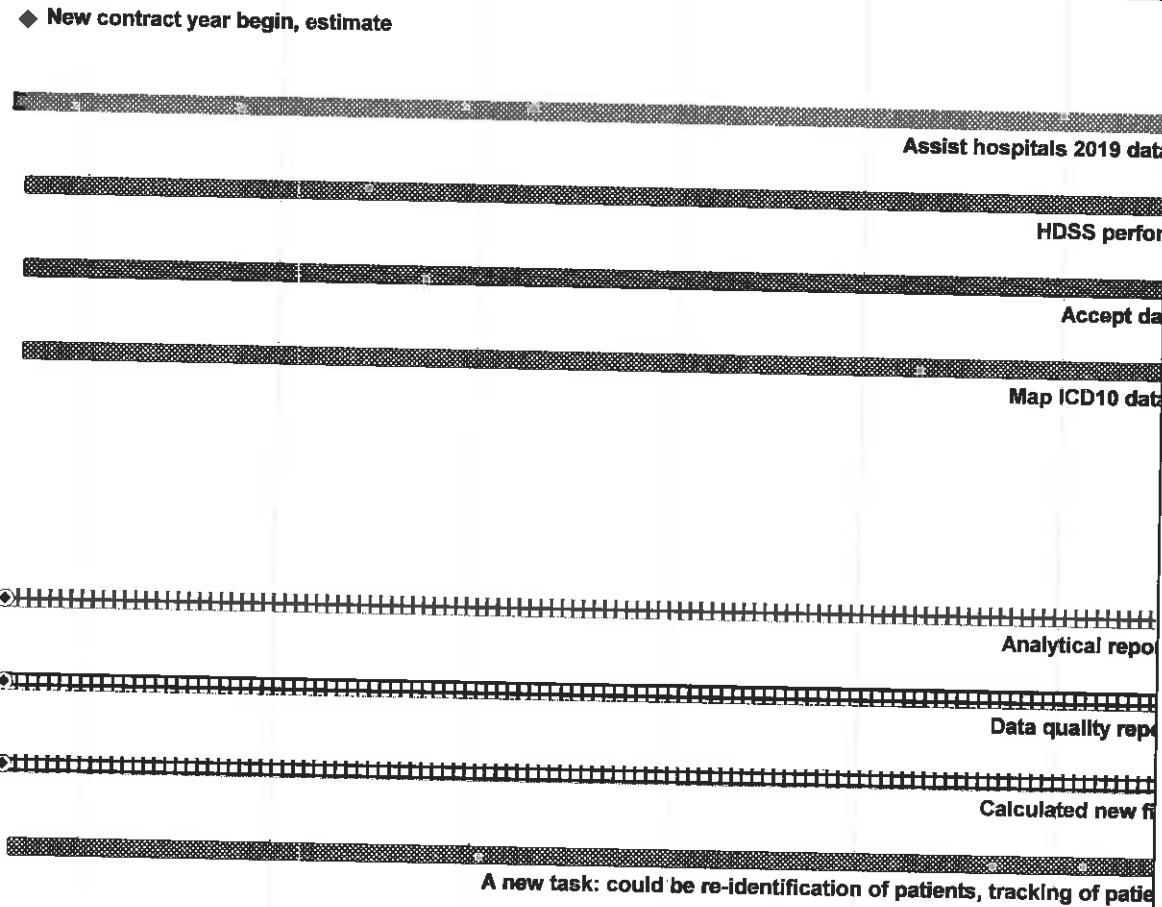
Year 3 Timeline

ID	Task Name	Start	November	December	January	February	March	April	May	June
1	New contract year begin, estimate	Mon 10/22/18								
2	Assist hospitals 2018 data (continued from previous year)	Sat 10/20/18								
3	HDSS performance monitoring	Mon 10/22/18								
4	Accept data from hospitals	Mon 10/22/18								
5	Map ICD10 data for master datasets	Mon 10/22/18								
6	End of Year Activities 2018 data	Mon 6/17/19								
7	Begin 2019 data collection year	Wed 7/3/19								
8	Analytical reports (timing is flexible)	Sun 10/20/19								
9	Data quality reports (timing is flexible)	Sat 10/20/18								
10	Calculated new fields (timing is flexible)	Sat 10/20/18								
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Mon 10/22/18								
12	Contract year 1 end	Sun 10/20/19								

West Virginia Hospital Data Submission System

Year 4 Timeline

ID	Task Name	Start	Finish	September	October	November	December	January	February	March	April
1	New contract year begin, estimate	Tue 10/22/19	Tue 10/22/19								
2	Assist hospitals 2019 data (continued from previous year)	Sun 10/20/19	Thu 10/22/20								
3	HDSS performance monitoring	Tue 10/22/19	Mon 10/19/20								
4	Accept data from hospitals	Tue 10/22/19	Wed 10/21/20								
5	Map ICD10 data for master datasets	Tue 10/22/19	Mon 10/19/20								
6	End of Year Activities 2019 data	Wed 6/17/20	Thu 7/2/20								
7	Begin 2020 data collection year	Fri 7/3/20	Fri 7/3/20								
8	Analytical reports (timing is flexible)	Sun 10/20/19	Wed 10/21/20								
9	Data quality reports (timing is flexible)	Sun 10/20/19	Wed 10/21/20								
10	Calculated new fields (timing is flexible)	Sun 10/20/19	Wed 10/21/20								
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Mon 10/21/19	Wed 10/21/20								
12	Contract year 1 end	Tue 10/20/20	Tue 10/20/20								



West Virginia Hospital Data Submission System

Year 4 Timeline

ID	Task Name	Start	April	May	June	July	August	September	October	November
1	New contract year begin, estimate	Tue 10/22/19								
2	Assist hospitals 2019 data (continued from previous year)	Sun 10/20/19	2019 data (continued from previous year)							
3	HDSS performance monitoring	Tue 10/22/19	HDSS performance monitoring							
4	Accept data from hospitals	Tue 10/22/19	Accept data from hospitals							
5	Map ICD10 data for master datasets	Tue 10/22/19	ICD10 data for master datasets							
6	End of Year Activities 2019 data	Wed 6/17/20	End of Year Activities 2019 data							
7	Begin 2020 data collection year	Fri 7/3/20	Begin 2020 data collection year							
8	Analytical reports (timing is flexible)	Sun 10/20/19	Analytical reports (timing is flexible)							
9	Data quality reports (timing is flexible)	Sun 10/20/19	Data quality reports (timing is flexible)							
10	Calculated new fields (timing is flexible)	Sun 10/20/19	Calculated new fields (timing is flexible)							
11	A new task: could be re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)	Mon 10/21/19	re-identification of patients, tracking of patients, source of payer revision, or enhancement of NPI (timing is flexible)							
12	Contract year 1 end	Tue 10/20/20	Contract year 1 end ◆							