Supporting Statement B for Request for Clearance:

National Hospital Care Survey

OMB No. 0920-0212

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B. Collections of Information Employing Statistical Methods

1. Respondent Universe and Sampling Methods

Hospitals

In 2013, the National Hospital Care Survey (NHCS) universe will consist of all noninstitutional, nonfederal hospitals in the 50 States and District of Columbia which have six or more beds staffed for inpatient use. This survey, which replaces the National Hospital Discharge Survey (NHDS) and the National Hospital Ambulatory Medical Care Survey (NHAMCS), will no longer use average length of stay as an exclusion criterion, thus expanding the frame beyond short stay hospitals. The sampling frame consists of the universe of hospitals listed in the 2010 spring release of the Hospital Market Profiling Solution database available from SDI (formerly known as Verispan and SMG). The sample will be updated every three years.

The NHCS is based on a list, rather than a cluster sample of hospitals that was used for the NHDS and NHAMCS. Sampling strata are defined by hospital service type (general acute care, children's acute care, psychiatric, and other). In addition, the general acute care hospitals will be stratified by bed size groupings (<50 beds, 50-199 beds, 200-499 beds, and 500+ beds),and urbanization level (central city of MSA with 1+ million population, fringe city of MSA with 1+ million population, MSA with < 1 million population, and non-MSA). Within each sampling stratum, a systematic random sample was selected from a list in which hospitals were randomly ordered within cells defined by hospital ownership, region and whether or not the hospital would have been eligible for the 1988 redesign. Consideration of whether or not the hospital would be eligible for the 1988 design was important in order to track trends with the historic NHDS data. For inpatients, all discharges in the sampled hospitals are included.

For the ambulatory component, the hospital sample will be divided into 5 nationally representative panels by first arraying the hospitals in the order of their sampling strata and selection within strata and then systematically assigning every fifth hospital to a panel. The panels will be randomly assigned on a rotating basis to three month data collection periods. The result will be a total of about 400 hospitals in the sample annually with each being included in the sample for only three out of every 15 months. Two and/or three stage samples of ambulatory visits will be selected with hospitals being selected in the first stage. For OPD visits, a three stage design is proposed, with outpatient department (OPD) clinics within hospitals sampled in the second stage and visits selected at the third stage within OPD clinics. For visits to emergency departments (ED) and ambulatory surgery locations (ASLs), a two stage design will be used with visits selected at the second stage within the sample hospitals from all areas where such visits are handled. In addition, no certainty hospitals are defined a priori, and geographic region is not used to define sampling strata.

Freestanding Ambulatory Surgery Centers (FSASCs)

The FSASC universe consists of ambulatory surgery locations that are not affiliated with hospitals and includes those which are regulated by the states, have as their primary business activity the provision of outpatient surgery, or are certified by the Centers for Medicare and Medicaid Services

(CMS) for Medicare participation. The universe includes pain block (pain treatment) facilities but excludes facilities dedicated exclusively to dentistry, podiatry, abortion, family planning, and/or birthing. The sampling frame of FSASCs will be compiled from the most recently available releases of two data bases. One of these is the Freestanding Outpatient Surgery Center Database from IMS Health, Inc. (formerly known as Verispan and SMG) and the other is the Ambulatory Surgery Center "provider of service" file maintained by CMS. The sample will be updated every three years.

Two stage samples of ambulatory surgeries will be selected with FSASCs being selected in the first stage. A stratified list sample of 310 FSASCs will be selected with strata defined by Census region and five surgery specialty groups (ophthalmic, gastrointestinal, multi-specialty, general, and other). The facility sample will be systematically divided into 5 representative panels which, in turn, will be randomly ordered for rotating assignments to reporting periods of three months each. The result will be a total of about 250 FSASCs in the sample annually with each being included in the sample for only three out of every 15 months. Visits selected within the ambulatory units in the second stage. The visit sampling procedures for FSASCs will be similar to those used in non-remote reporting hospitals (see below).

Estimates for inpatient component

The overall objective of the NHCS is to provide national estimates of the utilization of inpatient hospital care and of ambulatory care in hospital EDs, OPD clinics, and ASLs and FSASCs. In order of priority, the annual estimates for the inpatient component are the following:

(1) Discharges and days of care for the following types of hospitals, all with at least 6 staffed inpatient beds, and located in the 50 States and DC:

- nonfederal, noninstitutional hospitals
- general acute care hospitals (universe hospitals other than psychiatric, children's, or long term care)
- hospitals that meet our previous criterion of nonfederal, short-stay and general/children's hospitals -- for trending purposes

(2) Discharges and days of care in the 3 types of hospitals described in (1) above, classified by the urbanization level of their location, i.e.,

- large central cities of metropolitan areas (central city of MSA with 1+million population)
- fringe areas of large central cities (fringe city of MSA with 1+ million population)
- other (medium and small) metropolitan areas (MSA with < 1 million population)
- non-metropolitan areas (non MSA)

(3) Discharges and days of care in the 3 types of hospitals described in (1) above, classified by bed size groups, i.e.,

- Under 50 beds
- 50-199 beds
- 200-499 beds
- 500 beds or more

(4) Facility characteristics for the 3 types of hospitals described in (1) above; the following are

examples of variables for which hospital level estimates are desired (in order of priority):

- Staffed inpatient bed size groups
  - Under 50 beds
  - 50-199 beds
  - 200-499 beds
  - 500 beds or more
- Level of urbanization level where hospital is located (using NCHS classification system)
  - Large central city of metropolitan area
  - Fringe of large central city of metropolitan area
  - Other metropolitan area
  - Non-metropolitan area (includes micropolitan and noncore area)
- Type of ownership
  - Nonprofit
  - Proprietary
  - Government
- Geographic region where hospital is located (i.e., 4 Census regions)
  - Northeast
  - Midwest
  - South
  - West

(5) Discharges and days of care in non-metro, general acute care hospitals with fewer than 50 beds

(6) Discharges and days of care in government-owned, general acute care hospitals

<u>Estimates for hospital-based ambulatory component</u>

In order of priority, the annual estimates for the ambulatory care component are the following:

(1) ED, OPD, and ASL visits for the following types of hospitals, all with at least 6 staffed inpatient beds, and located in the 50 States and DC:

- nonfederal, noninstitutional hospitals
- general acute care hospitals (see definitions below)
- hospitals that meet our previous criterion of nonfederal and general/children's hospitals -- for trending purposes

(2) ED, OPD, and ASL visits to the 3 types of hospitals described in (1) above; the following are examples of variables for which ED, OPD, and ASL level estimates are desired (in order of priority):

- Geographic region where hospital is located
  - Northeast
  - Midwest
  - South
  - West
- Level of urbanization and metropolitan status where hospital is located (using NCHS classification system)

    - Large central city of metropolitan area
    - Fringe of large central city of metropolitan area
    - Other metropolitan area
    - Non-metropolitan area (includes micropolitan and noncore area)
- Annual ED visit volume
    - Under 20,000 visits
    - 20,000-49,999 visits
    - 50,000 visits or more
- Type of ownership
    - Nonprofit
    - Proprietary
    - Government

(3) Facility characteristics for the 3 types of hospitals described in (1) above; the following are examples of variables for which hospital-, ED-, OPD-, and ASL-level estimates are desired (in order of priority):

- Geographic region where hospital is located
    - Northeast
    - Midwest
    - South
    - West
- Level of urbanization and metropolitan status where hospital is located (using NCHS classification system)
    - Large central city of metropolitan area
    - Fringe of large central city of metropolitan area
    - Other metropolitan area
    - Non-metropolitan area (includes micropolitan and noncore area)
- Annual ED visit volume
    - Under 20,000 visits
    - 20,000-49,999 visits
    - 50,000 visits or more
- Type of ownership
    - Nonprofit
    - Proprietary
    - Government

(4) Annual and quarterly visit volumes to the 3 departments (ED, OPD, and ASL) described in (2) above by ambulatory unit (AU) type:

- Emergency service area (ESAs) types
    - General/Adult
    - Pediatric
    - Urgent care/Fast track
    - Psychiatric
    - Other

- Outpatient department clinic specialty types:
  - General medicine
  - Surgery
  - Pediatrics
  - Obstetrics/Gynecology
  - Substance Abuse
  - Other
- Hospital-based ambulatory surgery center location types
  - General surgery
  - Multiple surgical specialties
  - Gastroenterology
  - Ophthalmology
  - Orthopedics
  - Pain management
  - Plastic surgery
  - Other

(5) Hospital AU visits as described in (4) above by AU type; the following are examples of variables for which hospital AU level estimates are desired (in order of priority):

- Geographic region where hospital is located
  - Northeast
  - Midwest
  - South
  - West
- Level of urbanization and metropolitan status where hospital is located (using NCHS classification system)
  - Large central city of metropolitan area
  - Fringe of large central city of metropolitan area
  - Other metropolitan area
  - Non-metropolitan area (includes micropolitan and noncore area)
- Annual ED visit volume (for ESAs only)
  - Under 20,000 visits
  - 20,000-49,999 visits
  - 50,000 visits or more
- Type of ownership
  - Nonprofit
  - Proprietary
  - Government

(6) Annual visit volume estimates for key statistics based on a 10% RSE for a 10% statistic:

- Patient characteristics
  - Age (6 groups)
  - Sex
  - Race (White, Black, Other)

    - Ethnicity (Hispanic/Not Hispanic)
- Hospital characteristics
    - Geographic region
    - Urbanization level (as described in 2)
    - Ownership type
- Visit characteristics
    - Payment type (Private insurance, Medicare, Medicaid, uninsured, other)
    - Triage (ED – 5 levels)
    - Injury
    - Disposition (ED – admit to hospital)

(7) Monthly visit volumes to the 3 departments (ED, OPD, and ASL) described in (2) above

Sampling strata were defined by hospital service type (general acute care, children's acute care, psychiatric, and other). In addition, the general acute care hospitals were stratified by bed size groupings (<50 beds, 50-199 beds, 200-499 beds, and 500+ beds) and urbanization level (central city of MSA with 1+ million population, fringe city of MSA with 1+ million population, MSA with < 1 million population, and non-MSA). Within each sampling stratum, a systematic random sample was selected from a list in which hospitals are randomly ordered within cells defined by ED status (has or does not have an ED), hospital ownership, region and whether or not the hospital would have been eligible for the 1988 NHDS redesign which is important in order to track trends with the NHDS.

The general acute care type stratum includes general acute care and critical access hospitals, as well as surgical, cancer, heart, maternity, orthopedic and other specialty hospitals that typically provide acute care services for the general public. Hospitals classified as part of the other service type stratum include rehabilitation, long-term acute care hospitals, and inpatient facilities for drug and alcohol treatment. Children's psychiatric hospitals are classified in the psychiatric hospital stratum, and children's long-term acute care hospitals are classified in the other stratum. Estimates will be made by stratum, but not for specific service type provided.

Ideally, hospitals will remain in the survey for several years. All elements of the UB-04 administrative database for all inpatient and ambulatory claims during a given calendar year will be submitted electronically by participating hospitals. Electronic data transmission of all UB-04 claims data will be performed for four quarters of three consecutive months each during the data collection year. Data will be transmitted four times per year. In the event that a hospital prefers to schedule data transmission more or less frequently than four times per year, a mutually agreeable time frame will be negotiated.

NCHS plans to analyze all the discharges and visits received from the UB-04 files and make these data available as widely as possible. However, only a sample of discharges will be included in public use files (PUF) because of (1) the sheer size of the data file and computer limitations it would pose for data users and (2) because inclusion of records for the complete population of a hospital's discharges would likely pose an unacceptable risk of disclosing the hospital's identity. From the UB-04 data files which each hospital transmits, NCHS will select at most 50% of the discharge records annually with the percent of each hospital's discharges being reduced as needed to keep the PUF size at 500,000 records or less. For the sample from each hospital, a systematic random sample

will be selected from records which are randomly sorted within cells defined, in order of priority, by (a) patient type [observation cases (length of stay is zero), normal newborns, all others], (b) first two digits of the patient's primary diagnosis, (c) age groupings (<1 year, 1-14 years, 15-44 years, 45-64 years, 65-74 years, 75-84 years, 85 years and over, age unknown), (d) sex, (e) discharge month, and (f) discharge day of week.

Ambulatory visit sampling in all locations

In addition to the collection of electronic UB-04 claims data, more detailed clinical information will be abstracted from the medical record. Within sampling units patient visits will be systematically selected over an assigned reporting period. Sampling units are defined as an ambulatory care unit, such as an emergency service area, clinic, or ASL, from which patient visits are sampled. A visit is defined as a direct, personal exchange between an ambulatory patient and a physician, or a staff member acting under a physician's direction, for the purpose of seeking care and rendering health services. Visits solely for administrative purposes, such as payment of a bill, and visits in which no medical care is provided, such as visits to deliver a specimen, are out-of-scope.

Preliminary reports from the Ambulatory Pre-Test (OMB #0920-0944) show that hospitals are in various stages of EHR adoption and must be given options for inclusion in the NHCS. To accommodate the sampled hospitals' technical capabilities hospitals will be assigned to one of four sampling paths. The four paths are – (1) EHR extraction hospitals where no visit sampling will be performed. (2) remote-reporting hospitals (i.e., hospitals with fully functioning electronic health records (EHRs), that is, all parts of the chart are stored electronically, thereby allowing the contractor to remotely access the medical records from their headquarters), (3) non-remote reporting hospitals with UB-04-based visit sampling, and (4) non-remote reporting hospitals with sign-in sheet based sampling. For the inpatient component, UB-04 claims are the only source of data. However, ambulatory data will come from UB-04 claims and medical record abstraction of a sample of visits. Any ambulatory UB-04 claim collected will be used for sampling ED, OPD, and ASL cases, and to supplement the abstracted ambulatory data.

(1) There is a first path discussed in Supporting Statement A1; however, as mentioned above, no visit sampling will be performed. Attachment F shows how hospitals will be separated into each path.

(2) Remote-reporting hospitals.

Remote reporting hospitals are defined as those with fully electronic medical records, that is, all parts of the chart are stored electronically, thereby allowing the contractor to remotely access the medical records from their headquarters. Contractor staff will perform a 100% review of all ED visits occurring at each hospital on a systematic random sample of, at most, half the days during a 3-month maximum reporting period to identify ALL likely drug-related visits. The exact number of sample days for each hospital will depend on available resources and resources typically required to accomplish the reviews and visit selection and abstraction for individual days. The screener question "Did any substance(s) cause or contribute to this visit?" will be used to identify drug-related visits. In addition to the drug-related ED visit sample (the size of which is unknown at this time), contractor staff will

select a systematic random sample of 100 ED visits which may or may not be drug-related, 200 OPD clinic visits, and 100 ASL visits per hospital during the same time period.

(3) Non-remote reporting hospitals with UB-04 billing data-based sampling.

This method will be used at hospitals which do not permit remote access to their medical records but do transmit electronic billing records for ambulatory care visits to the survey contractor. Systematic random sampling will be used to select visits occurring during a 3 month maximum reporting period from UB-04 billing data. The sample for ED visits will be stratified by drug status ("likely" or "probably" drug related vs. not drug related) on the basis of ICD-9-CM codes to enable oversampling of drug-related cases. The sample size for drug-related ED visits is unknown at this time. Within these ED strata and within the lists of OPD and ASL visits, systematic samples will be selected from lists in which the visits are randomly ordered within cells defined (in order of priority) by age, diagnostic chapter and day of week. The expected yield is 100 ED, 200 OPD, and 100 ASL cases per hospital.
(4) Non-remote reporting hospitals with sign-in sheet based sampling.

This method will be used for hospitals that do not submit electronic UB-04 billing data to the contractor. Contractor staff will use sign-in sheets to select a systematic random sample of visits made during a 3-month maximum reporting period with an expected yield of 100 ED, 200 OPD, and 100 ASL cases per hospital.

The visit sampling procedures for FSASCs will be similar to those used in non-remote reporting hospitals.

2. Procedures for the Collection of Information

For each hospital in the NHCS sample, contractor interviewers will send a letter to the hospital administrator from Edward J. Sondik, PhD, Director, NCHS (Attachment C). The letter describes the purpose of the survey, the authority for data collection, that participation is voluntary and that all collected information is confidential including the identity of the facility [308(d) confidentiality requirements and Confidential Information Protection and Statistical Efficiency Act (PL-107-347)]. It also covers requirements related to Health Insurance Portability and Accountability Act (HIPAA). At no time are the patients contacted to obtain information. Letters of endorsement by the American College of Emergency Physicians, Society for Academic Emergency Medicine, Emergency Nurses Association, American College of Osteopathic Emergency Physicians, American College of Surgeons (ACS), American Health Information Management Association (AHIMA), American Academy of Ophthalmology (AAO), and Society for Ambulatory Anesthesia (SAMBA) will be sought for the mailing. To inform hospitals of the forthcoming integration of the ambulatory component into NHCS, another letter was sent to hospitals from Carol DeFrances, PhD, Team Leader, Hospital Care Team (Attachment D).

A similar letter will also be sent to the FSASC administrator once the new sampling frame is completed and recruitment commences (Attachment E).

Hospital Level

The introductory letters will be followed by a telephone call from contractor staff to verify facility eligibility for the survey and to arrange for an appointment with the chief executive officer, directors of the ED, OPD, and ASLs and whoever is designated as the coordinator for this survey to confirm the eligibility of the hospital through the Initial Hospital Intake Questionnaire (Attachment I). This questionnaire will also collect information on the Point of Contact for the hospital, as well as capability to transmit UB-04 and EHR data, and payment information. At this point, if hospitals require additional information about participating in the survey, a one hour survey presentation has been designed for them in the form of a Recruitment Survey Presentation (Attachment J). Once a hospital agrees to participate and is confirmed as eligible, the contractor staff will conduct the Annual Ambulatory Hospital Interview (Attachment L) for which the responses are entered into the PC tool. Also, each participating hospital will be asked to complete an Annual Inpatient Hospital Interview that will be conducted by telephone or mail, whichever format is less burdensome to the respondent. A web portal may be constructed in the future. This interview collects annual statistics needed for weighting the inpatient component data (Attachment K). Information collected here includes but is not limited to:

- Health Care Systems information
- Questions related to eligibility to reconfirm annually
- General hospital characteristics (e.g., bedsize, service type, and staffing)
- General demographic characteristics of patient population
- Total number of staffed inpatient beds
- Hospital characteristics (e.g., total numbers of admissions, discharges, and live births)
- Capability to transmit UB-04 claims and other discharge related questions (e.g., inclusion of self-pay); hospital characteristics (e.g., total numbers of admissions, discharges, and live births);
- Eligibility (presence of ED, OPD, and/or ASL)
- Electronic health record (EHR) systems
- ED crowding
- Ambulatory unit information (listing of ESAs, clinics, and ASLs and expected number of visits)

The rest of the Induction Interviews, including that of the ambulatory unit (Attachment M) will then be conducted in person to verify facility sampling frame information and induct the sampled ambulatory units. During the meeting, contractor staff will explain the purpose of the survey, describe the data collection methods and length of data collection, and obtain both general descriptive information about the organization of the ED, OPD, and ASLs and specific information needed to sample clinics within OPDs and visits within ambulatory units.

Freestanding ASC Level

UB-04 billing data will provide certain FSASC visit-level information for the NHCS. Abstraction of medical records will be the main source for clinical information at the visit-level.

Discharge level and Visit level

UB-04 billing data will provide both inpatient discharge level and certain ambulatory visit-level information for the NHCS. Abstraction of medical records will be the sources for clinical information at the visit-level only.

UB-04 Data Items:

Hospitals are asked to transmit the UB-04s for all patients (inpatient and ambulatory). Selected data items are shown below. A hard-copy document capturing all the items is in Attachment Q.

- Personal patient identifiers (name, address, medical record number when available, Medicare/Medicaid number, and social security number when its available)
- National Provider Identifier (NPI)
- Patient demographics (sex, birth date, race, and ethnicity when these data are available)
- Point of origin (indicates the point of patient origin for this admission or visit)
- Status/Disposition of the patients at discharge
- Admission/Start of Care date (Admission date for Inpatient Component)
- Statement Covers Period- From/Through (Inpatient Discharge date is derived from the "Through" date)
- Service Dates (Beginning and End dates of an ambulatory visit)
- Admitting diagnosis (Inpatient only)
- Expected sources of payment
- Principal diagnoses
- Other diagnoses
- Principal procedures
- Other procedures
- Financial and billing record data (revenue codes indicating intensive care unit (ICU) utilization)

Modules may be added in the future should an outside agency or organization express an interest and provide funding sufficient to incorporate additional items.

Abstraction of data for ambulatory visits

In addition to the UB-04 claims data, abstraction of medical records will provide visit-level data for the NHCS. The procedures for contractor staff to complete the Patient Record Forms vary by facility. The priority of data collection is as follows:

(1) Hospitals with EHRs

NCHS will submit a list of data elements based on items on the Patient Record form to the hospital. Hospitals will then extract these data elements from their EHRs and transmit a file to the contractor. This will include data from all visits that occurred during a 3-month maximum reporting period.

(2) Remote-reporting hospitals

The sampled ED, OPD, and ASL cases will be abstracted from EHRs onto a laptop PC-based data

collection tool by abstractors at the contractor's headquarters.

(3) Non-remote reporting hospitals with UB-04 billing data-based sampling

The sampled ED, OPD, and ASL cases will be abstracted onto a laptop PC-based data collection tool by contractor abstractors at the hospital.

(4) Non-remote reporting hospitals with Sign-in sheet based sampling

The sampled ED, OPD, and ASL cases will be abstracted onto a laptop PC-based data collection tool by contractor abstractors at the hospital.

For the FSASCs, contractor abstractors will use a laptop PC-based data collection tool to retrospectively abstract data from medical records for each of the sampled visits.

Abstractors will complete all of the electronic Patient Record forms. Patient visit data will be entered for each sample visit using either the ED Patient Record form (PRF) (Attachment R), OPD PRF (Attachment S), or Ambulatory Surgery PRF (Attachment T). Instructions on completing the PRFs and definitions of terms will be provided in the computerized instrument through help screens.

The ambulatory data collected at the visit level include:

- Patient's ZIP Code
- Demographic information (age, gender, race, ethnicity, etc.)
- Source(s) of payment
- Reason for visit
- Cause of injury (ED)
- Substances that contributed to the ED visit
- Diagnosis
- Diagnostic services
- Procedures
- Medications
- Providers
- Disposition
- Lab test results (OPD)

Training

The contractor is responsible for training the field managers and abstractors. They are also responsible for developing training that covers the following topics: inducting facilities (hospitals and FSASCs), confidentiality, Health Insurance Portability and Accountability Act (HIPAA), supervising patient visit sampling, retrieving missing data, and medical record abstraction. For 2013, contract staff will perform all abstraction. In subsequent years, where the facility staff may insist upon performing PRF abstraction, abstractors may train the staff on visit sampling and completion of the computerized PRFs.

The contractor is responsible for writing the field manual which contains the following: the purposes of the survey; interviewing techniques; a description of the NHCS induction questionnaire and related forms; and the procedures for inducting hospitals, conducting hospital visits, sampling clinics, supervising patient visit sampling, and retrieving missing data.

Estimation Procedures

Inpatient Component -- Estimation based on the sampled discharges will involve calculating weights to be used to inflate sampled records to national statistics. Sampling weights will be derived by a multistage estimation procedure that has three basic components: (1) inflation by reciprocals of the probabilities of selection, (2) adjustment for non-response, and (3) calibration based on auxiliary information available from other sources.

For component (1), the overall probability of selection is the product of the probabilities at each stage of sampling, namely, the probability of selecting the hospital and the probability of selecting the record from the hospital's transmitted UB-04 records. The inverse of the overall selection probability is the equivalent to the selection probability of the discharge/visit.

Non-response adjustment will be applied to account for two types of non-response: (1) complete hospital non-response, which occurs when an in-scope, sampled hospital does not transmit any of its records for the targeted time period, and (2) incomplete response within a hospital, which occurs when a hospital provides some, but not all, of the total number of records expected to be collected. In response rate calculations, a sampled hospital will also be treated as a non-respondent if the hospital does not provide at least half of the expected number of its records for the targeted estimates. Estimates of sampling variability will be calculated using a first-order Taylor series approximation as applied in the SUDAAN software package.

Ambulatory Component -- Separate national estimates will be produced for visits to hospital EDs, OPDs, and ASLs, and for visits to FSASCs. The estimation procedure has three basic components: (a) inflation by reciprocals of the sampling selection probabilities, (b) adjustments for nonresponse, and (c) for estimates of visits to EDs, a calibration ratio adjustment. For visits to EDs, the calibration adjustments will be based on ED visit counts recorded in the SDI Healthcare Market Index and SDI's "Second Quarter, Hospital Market Profiling Solution" for hospitals in the NHCS universe. For the ASL and FSASC components of NHCS, the weighting will be similar to that used for visits to EDs described above.

Degree of Accuracy

Inpatient Component -- Preliminary analyses using data from the NHDS and assuming 80 percent of sampled hospitals are in-scope and participate suggest this sample size will be sufficient to produce reliable estimates. Under NCHS guidelines, an estimate is considered reliable if its percent relative standard error (RSE) is less than 30 percent and it is based on a minimum of 30 records.

Depending on the clustering of specific diagnoses or demographic groups within hospital strata, different percent statistics can be estimated at different levels of precision. Hospitalizations for asthma, 1.4% of NHDS discharges, are likely to have a percent RSE of 9.1 while hospitalizations for depression or bipolar disorder, 2.7% of NHDS discharges, are likely to have a percent RSE of

10.7%. These are well within NCHS RSE guidelines for reliability. Even if fewer than expected hospitals participate, reliability would still be acceptable for many groups.

The NHCS will also allow for making facility level estimates. At the facility level, RSEs are likely to be larger than at the discharge level. However, for larger percent statistics, we expect that reliable facility level estimates can be made.

Ambulatory Component -- An objective in the design of the hospital sample is to produce selected estimates of 10% of ambulatory visits to hospitals with RSEs of 10% or less, especially for visits to EDs. Based on experience with non-response in the current NHAMCS, a total sample of fewer than 100 hospitals is needed to yield RSEs of 10% for estimates of 10% of visits for domains defined by patient characteristics (e.g., 10.3% of patients are males 45-64 years of age) or clinical characteristics (e.g., 10.0% of patients had primary diagnosis of respiratory system diseases). The new hospital sample includes 429 hospitals with 24-hour EDs (with an estimated 343 sample ED hospitals rotated into the sample for ambulatory visits annually) and is, thus, expected to meet the precision levels targeted for ED statistics.

Also, based on experience with the current NHAMCS, a total sample of fewer than 200 hospitals is expected to yield a RSE of 10% for an estimate of 9.5% of OPD visits (by patients who are 5-14 years of age). Because 65% of hospitals with EDs in the current NHAMCS have in-scope OPDs, the sample of ED hospitals (or estimated 222 = 0.65*343 OPD hospitals annually) is expected to satisfy the precision objective for OPDs.

Based on experience with the 2006 NSAS (which used a list sample of hospital-based ASLs), a total sample of fewer than 60 hospitals (including non-respondents) is expected to yield a RSE of 10% for an estimated 9.6% of visits (by patients diagnosed with Neoplasms). Because about half of the 2009 NHAMCS hospital sample were found to have ASLs, it is likely that more than 60 hospital-based ASLs will be included among the annual sample of 340 (=12 months*425 hospitals/ 15 panels) hospitals targeted from the strata for general hospitals.

Again based on experience with the 2006 NSAS which used a list sample of FSASCs, an annual total sample of 200 FSASCs is expected to yield RSEs of 30 percent or less for estimates of 18% or less for both visits and procedures. For example, a RSE of 14% is expected for an estimated 9.2% of visits (by patients diagnosed with Neoplasms) and a RSE of 23% is expected for an estimated 15.8% of procedures (endoscopy of the large intestine).

Monitoring Data Collection and Quality Control

The contractor is responsible for overseeing the data collection. An essential part of the data collection effort is quality control which focuses on the completeness of the patient sampling frame, adherence to the sampling procedures, and assurance that a Patient Record Form (PRF) is completely filled out for every sample patient visit. Computerization of the PRF has allowed for automated edits to be built into the instrument, so that keying errors are automatically detected as the abstractor is entering data.

Once a case is completed, the survey data are encrypted and sent to the contractor through a secure

internet connection. All medical and drug coding, as well as all data entry operations, are subject to quality control procedures—specifically, a 10-percent quality control sample of survey records are independently coded. Computer edits for code ranges and inconsistencies are also performed.

For some items, missing values are imputed by randomly assigning a value from PRFs with similar characteristics. For the ED data, imputations for birth year and sex are based on ED volume, geographic region, immediacy with which patient should be seen, and the 3-digit ICD-9-CM code for primary diagnosis. For immediacy, it is based on ED volume, region, and primary diagnosis. For the OPD data, all imputations are based on geographic region, OPD volume by clinic type, and the 3-digit ICD-9-CM code for primary diagnosis. For the ambulatory surgery data, all imputations will be based on geographic region, AS volume, and the 3-digit ICD-9-CM code for primary diagnosis.

Sampling Errors

Standard errors are calculated using a first-order Taylor series approximation method as applied in SUDAAN variance software.

3. Methods to Maximize Response Rates and Deal with Non-response

The credibility of analyses based on the new survey and ultimately of the programs, policies, and decision-making based on those findings rests on achieving an exceptionally high degree of cooperation on an ongoing basis among the sampled facilities.

Response rates will be closely monitored. If the response rate for hospitals fails to reach 80% due to refusals, a nonresponse analysis will be conducted. The goal of the non-response analysis is to determine whether data are missing at random, and whether unit (hospital) non-response negatively impacts survey estimation. Standard formulae will be used to measure the proportion of eligible sampled hospitals that responding hospitals represent. This provides an indicator of potential nonresponse bias. To assess whether systematic bias exists that would threaten the quality of survey estimates, we will examine differences between responding and nonresponding hospitals based on key characteristics. Data on these characteristics will be obtained from the sampling frame (e.g., SDI universe file). Both unweighted and weighted unit (i.e., hospital) response rates will be calculated, as mandated by OMB. Weighted response rates will account for the different probabilities of selection of the sampled hospitals.

A non-responding hospital is an inscope sample hospital which either (a) refuses to participate in the survey and refusal conversion efforts are unsuccessful, or (b) agrees to participate but fails to provide data in a timely fashion to be incorporated in the survey data set. The weights of refusal hospitals will be statistically reallocated to responding hospitals with similar characteristics.

Unit level non-response related to discharges/ambulatory visits within hospitals will also be examined. Discharge/visit units are considered nonresponding if the entire record is missing for an eligible discharge/visit. Weights associated with missing discharge/visit records will be statistically reallocated to other similar discharges/visits within the hospital.

In addition to unit-level non-response analysis, item non-response will be examined, with particular focus on critical data items of broad research or policy significance (e.g., race, ethnicity, diagnosis). Using information from other data collected, respondents and non-respondents will be compared on key characteristics, including, but not limited to, sex, age, diagnoses, and length of hospital stay, when data are available.

In terms of recruitment, facilities will be mailed an introductory letter from Dr. Edward Sondik, Director, CDC/NCHS (Attachment C). In addition, the NCHS Ethics Review Board approval letter (Attachment H) will be given to contract staff to show the respondent upon request. If the respondent is reluctant to participate due to privacy concerns, frequently asked questions and answers will be provided to inform sampled facilities that they may participate and still be in compliance with HIPAA (Attachment U).

For the 2013-2015 inpatient component, NCHS will compensate each of the 500 sampled hospitals, not yet recruited, $500 initially to set-up the processes and procedures to transmit UB-04s to NCHS. Subsequently, hospitals will be compensated $500 after the hospital completes each full year (transmits data for all months in which the hospital was inscope for NHCS) of participation. Hospitals will also be paid $500 annually upon completion of PRFs from all eligible ambulatory units (e.g., ED, OPD, and ASL). Additional costs incurred as a result of participation, including labor or purchase of technology, will also be covered by NCHS on a case-by-case basis.

In addition, a continuing education module was developed to serve as an educational and recruitment tool highlighting the NHCS. This web-based instrument was added to the NHCS participant page on the NCHS Internet site (http://www.cdc.gov/nchs/nhcs/participant.htm). Both the American Health Information Management Association (AHIMA) and Healthcare Information and Management Systems Society (HIMSS) have granted approval of the module, so health information management and health information technology staff from the hospital-community are able to obtain two free continuing education units by completing the NHCS module.

Recruitment has proven to be difficult. As of November 2012, about 80 hospitals have agreed to participate. Hospitals are busy places providing health care services to patients. The time period 2011-2013 is especially hectic for hospitals as they adopt EHR systems, and plan for the conversion from ICD-9-CM to ICD-10-CM, as well as comply with meaningful use and quality measure requirements. Many hospitals are not refusing but are asking to be re-contacted in 6-8 months.

For hospitals willing to participate, other technical or monetary issues posed barriers to participation. For example, although hospitals are required to submit UB-04 claims to CMS in the 837i file format, submission of the UB-04 claims 837i file format to NCHS has been challenging. First, many hospitals use clearinghouses to process and submit their claims to CMS and other providers. In many instances, the $500 payment for each year of data collection is not enough to offset the cost for the clearinghouse charges for constructing a file for NHCS. Second, some hospitals who process their own UB-04 claims do not know how to output the data from their systems for submission for NHCS. Third, hospitals with many patients handle volume by archiving their claims data daily, which makes obtaining the data for this study difficult or costly. With the capabilities of a new contractor, automation of data transmission provides a resolution to the barrier of archived data. Finally, some hospitals that are able to output digital data in-house are not necessary able to output

in 837 format. Although not preferred, other file formats such XML, Excel, and ASCII formats have been accepted.

In response to these challenges, NHCS project staff will continue to provide technical support via email or teleconference. Further, the recruitment strategy for NHCS has evolved from a telephone based approach to a site-visit strategy. This allows the contractors recruiting for NHCS to meet with key staff in the hospitals to address any obstacles or issues that are barriers to participation.

4. Tests of Procedures and Methods to Be Undertaken

In the Fall 2012, an ambulatory pretest (OMB #0920-0944) was conducted to test the feasibility of collecting ambulatory visit data through the NHCS. This pretest tested new questions on drug-and mental illness-related ED visits. In addition, it tested new visit sampling procedures (e.g., collecting UB-04 billing data to use as a sampling frame, identifying drug-related ED visits by ICD-9-CM codes, increasing the reporting period) and abstraction methods (e.g., remote reporting). The results of the pretest were used for the following purposes: to approve, modify or delete the new questions; to establish the sampling procedure(s) for selecting visits; to determine the method(s) of medical record abstraction for visits; to compare the drug-related ED visits identified by reviewing all cases via remote reporting with the drug-related ED visits identified by ICD-9-CM codes using the UB-04 outpatient billing data; to determine if UB-04 outpatient billing data can identify the eligibility of ambulatory units and visits and how much the sample size should be inflated to account for ineligible visits.

The results of the pretest showed that it was feasible to collect data on colonoscopies performed at ambulatory surgery visits and that fielding a full-scale module would be of value to our federal partners.

Finally, the data collection procedures will be monitored during the course of the new survey and appropriate evaluations will be conducted as needed. Reliability studies will be performed on visit data. In the Ambulatory Component, a second abstractor shall reabstract a 10% sample of visits abstracted across all departments. NCHS may also test the effects of reimbursement on hospital participation in the NHCS. A nonsubstantive change package will be submitted when plans are completed.

5. Individuals Consulted on Statistical Aspects and Individuals Collecting and/or Analyzing Data

The statistician responsible for NHCS is:

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The person responsible for the data collection aspects of NHCS is:

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The person responsible for the analytic aspects of NHCS:

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ATTACHMENTS

A: Legislative Authority to Collect Data on Hospital Utilization; Sections 306(a) & (b) of the Public Health Services Act and Section 4302 of the Patient Protection and Affordable Care Act (H.R.3590) (ACA)

B: Federal Register Notice for NHCS

C: Introductory Letter to Hospitals, EDs, OPDs and ASLs

D. Ambulatory Introductory Letter to Hospitals, EDs, OPDs and ASLs

E: Introductory Letter to FSASCs

F: Hospital Ambulatory Data Collection Flow Chart

G: Westat Data Security Plan for NHCS

H: ERB Approval Notice for the NHCS

I: Initial Hospital Intake Questionnaire

J: Recruitment Survey Presentation

K: Annual Inpatient Hospital Interview

L: Annual Ambulatory Hospital Interview

M: Ambulatory Unit Induction Form

N: Quarterly Transmission of UB-04 Data

O: Pulling and Refiling Medical Records

P: FSASC Induction Form

Q: List of UB-04 Elements

R: Emergency Department Patient Record Form

S: Outpatient Department Patient Record Form

T: Ambulatory Surgery Patient Record Form

U: Frequently Asked Questions Brochure

V: Pulling and Refiling FSASC Records

W: FSASCs Quarterly Transmission of UB-04 Data