

Supporting Statement B for Request for Clearance:

National Hospital Care Survey

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National Hospital Care Survey

B. Collections of Information Employing Statistical Methods

As described in Supporting Statement A, the National Hospital Care Survey (NHCS) is experiencing significant recruitment issues. For the 2016 data collection, national estimates were not produced due to low response rates. Data were not collected in 2017 due to contractor transition. The 2018 recruitment and data collection is currently underway, and the potential to release an estimate will be assessed at the end of the data collection. For the 2019 data collection year, NCHS will focus recruitment efforts on outreach and benefits for participating hospitals. Rather than focusing on hospitals with 300 or more beds as described in the last clearance, NCHS will focus on all 598 hospitals in the sample in an attempt to get as many hospitals as possible to make a national estimate.

Our plan for 2019-2021 is proposed in Sections B3 and B4, both sections of which have been revised to provide new information on methods to improve participation and new tests of procedures.

1. Respondent Universe and Sampling Methods - Original Design

Hospitals

The NHCS hospital universe consists of all non-institutional, non-federal hospitals in the 50 States and District of Columbia, which have six or more beds staffed for inpatient use. The sampling frame consists of the universe of hospitals listed in the Hospital Market Profiling Solution database available from IMS Healthcare (formerly known as SDI, Verispan and SMG). The initial NHCS hospital sample (for 2011-2013) was selected from the 2010 spring release of the IMS Healthcare file.

For the initial NHCS sample, a stratified random sample of 1,000 hospitals was selected first and, then, that sample was split into two samples of 500 each, with half of each stratum's sample being selected by systematic random sampling for assignment to the two samples. The first or base sample was fielded starting in 2011 and consisted of 500 non-institutional, nonfederal hospitals with six or more staffed inpatient beds. A reserve sample of 500 hospitals was also drawn, in case there is a need for additional hospitals for statistical or analytical reasons. Such a need arose in 2013, when 81 hospitals with 500 or more staffed beds were released from the reserve sample to help with making substance-involved ED visit estimates. The fielded sample was increased from 500 to 581 hospitals.

The sampling frame was updated in 2017 using a 2015 release of the IMS Healthcare file. The NHCS sample was updated to account for newly opened and closed or ineligible hospitals. The updated net increase to the sample was 17 hospitals (15 hospitals that either closed or became ineligible and 32 newly eligible hospitals) resulting in a new sample of 598 hospitals, which is the sample being fielded for the 2018 data year.

The NHCS uses a stratified list sample of hospitals, rather than a cluster sample of hospitals, such as that used for the NHDS and NHAMCS (OMB No. 0920-0278, Exp. Date 06/30/2021). 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 are stratified by 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) and bed size. In the non-MSA stratum, the bed size strata are <50 beds, 50-199 beds, 200-499 beds, and 500+ beds. In the MSA strata, the bed size strata are <50 beds, 50-199 beds, 200-299 beds, 300-499 beds, and 500+ beds. 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 of the NHDS. Consideration of whether or not the hospital would be eligible for the NHDS 1988 design was important in order to track trends with the historic NHDS data. For inpatients, all discharges in the sampled hospitals are included.

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. Participating hospitals are asked to electronically submit all elements of either the UB-04 administrative database for all inpatient and ambulatory claims, a state file, or their electronic health records (EHR) data. Electronic data transmission of all UB-04 claims data or a state file will be performed monthly with one month of data transmitted each month while transmission of EHRs will be performed quarterly with data for three consecutive months transmitted each quarter of the data collection 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.

For public use files (PUFs), NCHS plans to integrate all data types (UB-04 claims, state file data, and EHR data (only elements matching the UB-04 items)) received and to make these data available as widely as possible. The PUF will include a sample of discharges/visits because (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/visits would likely pose an unacceptable risk of disclosing the hospital's and patient's identity. From the UB-04/state file data and EHR data files which each hospital transmits, NCHS PUF files will contain records for at most 500,000 discharges, ED visits, or OPD visits and no more than 50% of the encounters each year. 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
 - i. In discharge file, types are: observation cases (length of stay is zero), normal newborns, all others
 - ii. In ambulatory visit file, types are ED or OPD
- (b) First two digits of the patient's primary diagnosis
- (c) Patient 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) Patient Sex
- (e) Discharge/visit month
- (f) Discharge/visit day of week

Inpatient estimates

The ultimate overall objective of the NHCS is to provide national estimates of the utilization of inpatient hospital care and of ambulatory care in hospital EDs and OPDs. In order of priority, the annual inpatient estimates 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 the District of Columbia:
 - Non-federal, non-institutional hospitals
 - General acute care hospitals (universe hospitals other than psychiatric, children's, or long term care)
 - Hospitals that meet our previous criterion of non-federal, 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) Hospital 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
 - o Under 50 beds
 - o 50-199 beds

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

Ambulatory visit estimates

In order of priority, the annual ambulatory visit estimates are the following:

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

- Non-federal, non-institutional hospitals
- General acute care hospitals (see definitions below)
- Hospitals that meet our previous criterion of non-federal and general/children's hospitals – for trending purposes

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

- Geographic region where hospital is located
 - o Northeast
 - o Midwest
 - o South
 - o West
- Level of urbanization and metropolitan status where hospital is located (using NCHS classification system)
 - o Large central city of metropolitan area
 - o Fringe of large central city of metropolitan area

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

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

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

(4) Annual visit volume estimates for key statistics based on a 10% relative standard error (RSE) for a 10% statistic:

- Patient characteristics
 - o Age (6 groups)
 - o Sex
 - o Race (White, Black, Other)
 - o Ethnicity (Hispanic/Not Hispanic)
- Hospital characteristics
 - o Geographic region

- o Urbanization level (as described in 2)
- o Ownership type
- Visit characteristics
 - o Payment type (Private insurance, Medicare, Medicaid, uninsured, other)
 - o Triage (ED – 5 levels)
 - o Injury
 - o Disposition (ED – admit to hospital)

(5) Annual visit volume estimates for key statistics based on a 15% RSE for a 2% statistic:

- Substance-related visits by major substance and demographic category

(6) Monthly visit volumes to the ED and OPD departments by variables described in (2) above

2. Procedures for the Collection of Information

For each hospital in the NHCS sample, contractor interviewers will send a letter to the hospital administrator addressed from the NCHS Director (Attachment C). The letter describes the purpose of the survey, the authority for data collection, that participation is voluntary and that all collected identifying information is confidential including the identity of the hospital [308(d) confidentiality requirements and Confidential Information Protection and Statistical Efficiency Act (PL-107-347)]. The letter also covers requirements related to the Health Insurance Portability and Accountability Act (HIPAA). At no time are the patients contacted to obtain information. Letters of endorsement by the National Rural Health Association (NRHA), America’s Essential Hospitals, American Psychiatric Nurses Association and the American Health Information Management Association (AHIMA) are used for the mailing during recruitment.

Hospital Level

The introductory letters will be followed by a telephone call from contractor staff to verify hospital eligibility for the survey, and to arrange for an appointment with the chief executive officer and whoever is designated as the coordinator for this survey. During this call, the Initial Hospital Intake Questionnaire (Attachment H) will be administered over the telephone or by paper to verify the hospital’s eligibility, collect information on the Point of Contact for the hospital, ask about capability to transmit UB-04 and EHR data, and payment information. At this point, if the hospital requires additional information about participating in the survey, a one hour survey presentation can be presented with the Recruitment Survey Presentation (Attachment I).

Each eligible sampled hospital regardless of participation is asked to complete an Annual Hospital Interview that will be conducted via a web portal that was developed by the contractor. Any necessary follow up will be conducted by telephone or mail. This interview collects annual statistics needed for weighting the inpatient and ambulatory data (Attachment F). 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., bed size, service type, and staffing)
- Total number of staffed inpatient beds
- Hospital characteristics (e.g., total numbers of admissions, inpatient discharges and ED and OPD visits)
- Capability to transmit EHR and UB-04 claims
- Other discharge and visit related questions (e.g., inclusion of self-pay, worker's compensation, charity)

Inpatient and Ambulatory data collected electronically

Participating hospitals transmit electronic data (either UB-04 billing, a state file or EHR data) for all inpatient and all ambulatory visit-level information for the NHCS.

EHR Data Items:

For the 2019 data collection, NCHS will collect two forms of EHR data.

1. If the participating hospital is seeking Meaningful Use (MU) credit, then they must submit HL7 CDA® documents, as described one of the following the Draft Standard for Trial Use (DSTU) Implementation Guides for the National Health Care Surveys: Release 1 or 1.2.
2. For participating hospitals not seeking MU credit, NCHS will accept Continuity of Care Documents (CCDs), Discharge Summaries, and Transfer Summaries, produced by Certified Electronic Health Record Technology (CEHRT) informed by one of the following implementation guides (IG) available from: HL7 IG for CDA® Release 2: IHE Health Story Consolidation, DSTU Release 1.1 (US Realm) July 2012. HL7 IG for CDA® Release 2: Consolidated CDA Templates for Clinical Notes (US Realm) DSTU Release 2, November 2014. HL7 IG for CDA® Release 2: Consolidated CDA Templates for Clinical Notes DSTU Release 2.1, August 2015.

Because not all clinical data in different EHR systems are collected and stored the same way, NCHS needed to create a standardized format for submission of the National Health Care Survey data to enable automated extraction from the EHR or data repository. Data standards are the important technical underpinning to enable EHRs to share data effectively and efficiently among health care providers and between providers and public health agencies, like NCHS. In collaboration with the Office of the National Coordinator on Health Information Technology (ONC) and multiple NCHS subunits including the Office of Classifications and Public Health Data Standards, the Health Level Seven International (HL7) Implementation Guide for Clinical Document Architecture (CDA®) Release 2: National Health Care Surveys, Release 1 - US Realm was developed to provide a standardized format and streamline the data collection for implementers to submit data to fulfill requirements of the National Health Care Surveys. In 2015, the Implementation Guide was published as a draft

standard for trial use and was described in the 2015 Interoperability Standards Advisory as the best available standard for clinical content and structure.

NCHS also needed to find incentives to encourage providers to provide EHR data during a time when providers already have so many mandatory reporting requirements. Around the same time, the CMS EHR Incentive Program, also known as the “MU” program, already started providing incentives for hospitals and providers to adopt and use certified EHR technology in ways that can improve patient care and meaningfully exchange healthcare information. Working with ONC, NCHS was able to leverage the MU program in 2015 as an incentive for participation by including the National Health Care Surveys as an option for eligible health care providers to meet the specialized registry public health reporting objectives, per the final rule on modifications to MU use in 2015 through 2017⁵ and for Stage 3 MU. This means that eligible professionals, eligible hospitals, or critical access hospitals can submit data to the National Health Care Surveys to meet their public health objectives requirements to receive MU credit from CMS.

Currently, CMS is overhauling and streamlining the EHR Incentive Programs for hospitals as well as for the Advancing Care Information performance category of the [Merit-based Incentive Payment System \(MIPS\)](#), which is one track of the Quality Payment Program. This change will move the programs beyond the existing requirements of meaningful use to a new phase of EHR measurement with an increased focus on interoperability and improving patient access to health information. The EHR Incentive Programs will be renamed to the Promoting Interoperability (PI) Programs for eligible hospitals, Critical Access Hospitals (CAHs), and Medicaid providers. The MIPS Advancing Care Information performance category will be renamed to the Promoting Interoperability performance category for MIPS eligible clinicians.

Select data items are shown below. A hard-copy document capturing all items is in Attachments (D and E).

For inpatient, ED and OPD visits:

- Personal patient identifiers (name, address, medical record number when available, Medicare/Medicaid number, and social security number when it is available)
- Date of birth
- Sex
- Date of admission and discharge
- Encounter number
- Admission diagnosis
- All other diagnoses including E codes and V codes
- Services provided or ordered during the inpatient stay or visit:
 - Diagnostic testing (e.g., lab, imaging, EKG, audiometry, biopsy)
 - Therapeutic procedures, including surgery, and non-medication treatments (e.g. physical therapy, speech therapy, home health care)
- Results of testing or procedures provided or ordered during the admission, as many as are available

- Medications on admission, during hospital stay and at discharge
- National Provider Identifier (physicians and health care providers only)
- Race
- Ethnicity
- Marital Status
- Source(s) of payment

For Inpatient only:

- Priority of admission
- Source of admission (e.g., emergency room)
- Discharge disposition
- Present on Admission (POA) flags for diagnoses
- Any ICU, NICU or CCU use and number of days of care
- Height
- Weight

For ED and OPD:

- Reason for visit
- Results of testing and procedures
- Medications and Immunizations
- Clinician's notes (e.g., physicians', nurses', P.A.s' and C.N.M.s' notes)

UB-04 Data Items/State File Items:

For those hospitals unable to send EHR data, they are asked to transmit the UB-04 data or a state file for all patients (inpatient and ambulatory). Selected data items are shown below. A hard-copy document capturing all the items is in (Attachment D).

- Personal patient identifiers (name, address, medical record number when available, Medicare/Medicaid number, and social security number when it is 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 discharges)
- 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 ICU utilization)

Ambulatory data collected through abstraction

In the previous clearance, hospitals submitting UB-04 claims data, a state file or incomplete EHR data were considered for abstraction of a sample of medical records. However, to reduce the burden on all hospitals and to lower survey costs, abstraction of medical records will no longer be included as part of the design of the NHCS.

Degree of Accuracy

Inpatient: Analyses using data from the NHDS, and assuming 80 percent of sampled hospitals are in-scope and participating, suggest a total sample of 598 hospitals will be sufficient to produce reliable estimates. Under NCHS guidelines, an estimate is considered reliable if the estimate's 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 margins 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 guidelines will also allow for making hospital level estimates. At the hospital level, RSEs are likely to be larger than at the discharge level. However, for larger percent statistics, we expect that reliable hospital level estimates can be made.

Ambulatory: A primary 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 the ED. An exception to this is substance-related ED visits, where annual visit volume estimates for this statistic will be based on a 15% RSE for a 2% statistic. 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 2010 NHAMCS hospital sample includes 488 hospitals of which 357 were in scope with respondent 24-hour EDs, therefore the sample is expected to meet the precision levels targeted for ED statistics.

Also, based on experience with the current NHAMCS, fewer than 200 hospitals are needed 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

227 hospitals in the 2010 NHAMCS have in-scope respondent OPDs, the NHAMCS sample of OPD hospitals is expected to satisfy the precision objective for OPDs.

Monitoring Data Collection and Quality Control

A contractor is responsible for overseeing the data collection. Contractor staff ask hospitals to submit a test file for UB-04 claims, state files, or EHR data. Both types of data will go through pre-processing report or testing and validation procedures to ensure that essential variables are present and in suitable format for the NHCS project. Contractor staff work with hospitals to request any changes or additions to the files submitted.

Sampling Errors

Standard errors are calculated using a first-order Taylor series approximation method¹ as applied in SUDAAN variance software.

3. Methods to Maximize Response Rates and Address Non-response

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

Response rates will be closely monitored. When the response rate for hospitals is less than 80% due to refusals, a non-response 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 method provides an indicator of potential non-response bias. To assess whether systematic bias exists that would threaten the quality of survey estimates, we will examine differences between responding and non-responding hospitals based on key characteristics. Data on these characteristics will be obtained from the sampling frame (e.g., IMS 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 in-scope 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 non-responding if the entire record is missing for

¹ Research Triangle Institute. SUDAAN User's Manual, Release 9.0.1. Research Triangle Park, NC: Research Triangle Institute, 2005

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.

Exploratory Work:

The previous strategy of focusing on the collection of EHR data from hospitals with 300 or more staffed beds did not recruit enough hospitals to make a national estimate. Before developing next steps for recruitment, NCHS conducted some exploratory work to assess hospitals non-response and other avenues to make estimates.

First, NCHS analyzed the type of hospitals by bed size that provided ED data in 2016 out of the sample for 2018. The largest grouping of hospital type and bed size are General Acute Care (GAC) hospitals with 500 beds. These hospitals were oversampled in the original sample because these hospitals will provide the largest number of patient visits. However, not enough hospitals in the sample of this large bed size participated to make an estimate for “large” hospitals. These large GAC hospitals would also be useful in identifying opioid-related hospital visits due to the large visit volume. Of the total 162 large GAC hospitals in the 2018 sample, 108 hospitals had EDs and did not provide ED data in 2016. These non-responding large GAC ED hospitals were analyzed by state to see if there is clustering of non-response. It was found that 40% of the 108 large GAC hospitals with EDs that did not provide data in 2016 are in four states: New York (13 hospitals), Florida (12 hospitals), Texas (10 hospitals), and North Carolina (8 hospitals). Therefore, recruitment strategies for 2018 are focused on hospitals in these states, including targeting any state-level associations or contacts to promote NHCS.

The analysis also found that 20 of the 108 non-responding large GAC ED hospitals are members of hospital networks. Specifically, there are eight different networks with a large number of non-responding GAC ED hospitals. With these results in mind, NCHS has also continued to focus on a site-visit strategy to recruit non-participating hospitals within these networks.

Second, the Division of Research and Methodology (DRM) investigated two approaches to obtain accurate and reliable estimates on health outcomes of interest using NCHS data. Specifically, these included substance-involved ED visits both at national and regional levels. The following options were explored:

For Option A, methodological work was conducted to assess if national estimates with an acceptable standard error could be made by supplementing the original NHCS sample of 581 hospitals with 400 hospitals (out of a total of 900) that registered for MU. The supplement to the sample would hopefully decrease bias and standard errors, thus allowing NHCS to produce reliable

national estimates. Due to the current low response rates in NHCS, the original sampling methodology has yet to produce a reliable national estimates. The major issue with using the MU hospitals to supplement the NHCS sample is that the MU hospitals are not nationally representative. About 15% of hospitals were registered for MU at the time of the study. A staff mathematical statistician developed an estimation methodology that could use the MU hospitals, while still producing national estimates, through probability sampling estimate techniques. DRM created a simulation to test the effects of a methodology on national estimates. Their simulation study shows that there was a small decrease in standard errors, however that decrease would not improve the national estimates significantly.

For Option B, NCHS assessed whether national estimates for NHCS could be made by supplementing with NHAMCS 2014 visit data. NHAMCS is a well-established survey with reasonable response rates. It has a general purpose, but it is not targeted to specific drug-related visits like the Drug Abuse Warning Network (DAWN). Unlike NHCS, NHAMCS also samples visits within sampled hospitals. The investigation showed that the drug-related estimates from NHAMCS are reasonably reliable, yet most of them were significantly lower (in many cases 50% lower) compared with those from DAWN 2011. This is because the current data collection methodology used in NHAMCS is not adequate to capture the information needed to identify all the drug related visits that would be identified if the DAWN methodology were applied in NHAMCS. Therefore, it is doubtful that using NHAMCS data would produce reasonable estimates of drug-related visits, so combining them with NHCS becomes less hopeful.

Based on the exploratory results of Options A and B, neither using MU nor NHAMCS would improve estimates for NHCS significantly.

Recruitment Process:

In terms of recruitment, facilities are mailed an introductory letter from NCHS Director (Attachment C). In addition, the NCHS Ethics Review Board approval letter (Attachment G) is given to contract staff to show the respondent upon request. If the respondent is reluctant to participate due to privacy concerns, a Confidentiality Letter is also provided to inform facilities that they may participate and still be in compliance with HIPAA (Attachment K).

NCHS provides a one-time \$500 incentive to each sampled hospital to set up the electronic data transmission required to participate in the survey. In addition, NCHS provides each sampled hospital \$500 after a full year of EHR, UB-04 data, or a state file is received. The data collection contractor has the primary responsibility for ensuring the monies are distributed to participating hospitals.

In addition, a continuing education module was updated 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 that 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.

For those hospitals willing to participate, other technical or monetary issues have often 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 incentive 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 to 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 the current 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 necessarily able to output in 837i 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.

Recruitment Strategy:

There are two main strategies being employed to increase response rates for 2019-2021: decreasing hospital burden and making additional benefits available to participating hospitals. With regard to reducing burden, NCHS will do so through two activities. First, NCHS entirely eliminated abstraction from the survey design. The elimination of medical record abstraction of a sample of ED and OPD visits from the NHCS design will decrease the overall burden of hospital participation, and thus, increase the likelihood of participation in the survey. Second, NCHS will reduce participation burden by continuing to work with EHR vendors to build user interfaces based on the HL7 CDA Implementation Guide (IG) for the National Health Care Survey. These interfaces can be applied to the hospitals' systems to output an electronic data submission to the NHCS project, greatly minimizing the burden on hospital staff to figure out how to submit data otherwise through a manual approach. To date, 23 EHR vendors have built certified interfaces based on the IG.

NCHS is investigating additional benefits available to participating hospitals such as providing reports back to participating hospitals based on their data submitted. NCHS has previously provided participating hospitals reports of select analyses of their data back to them. However, future plans will allow for these data to become available to participating hospitals through a web portal, which is currently being built with Patient-Centered Outcomes Research Trust Fund (PCORTF) funds. This will allow for faster access and more sophisticated analyses including reporting back a hospital's aggregate post-acute 30-, 60- and 90-day mortality.

Additionally, NCHS is currently exploring the possibility of non-profit hospitals in the sample receiving a tax benefit for participating in the NHCS. On December 31, 2014, the Internal Revenue Service (IRS) published final rules implementing the “Additional Requirements for Charitable Hospitals” section of the Affordable Care Act (ACA). These rules relate to tax-exempt hospitals’ community health needs assessments (CHNAs); financial assistance policies (FAPs); and hospital charges, billing, and collection practices. NCHS consulted with a Healthy Policy professor at the Milken Institute for Public Health at the George Washington University, about how this benefit might be applied to NHCS. This tax benefit could incentivize the 397 non-profit hospitals in the NHCS sample to participate, which accounts for two thirds of the overall sample. Hospitals may be able to offset the cost of participating by indicating that NHCS expenses count towards their CHNA.

MU credit is a continued benefit. As of May 2018, over 1000 eligible hospitals or critical access hospitals have registered with the National Health Care Surveys Registry for MU credit, and of those 111 were in the NHCS sample. NCHS will continue to work with sampled hospitals to obtain EHR data and offer MU credit.

Of the 1,000 eligible hospitals (EHs) or critical access hospitals (CAHs) registered for PI/MU credit through the National Health Care Surveys registry, NCHS estimates that about half of these hospitals participate in the registry due to the direct efforts of NCHS and Westat, the recruitment contractor for the NHCS. These efforts included promoting PI/MU as a participation benefit through various channels such as individual conference calls with sampled hospitals, announcements on the NHCS website, email blasts to NHCS sampled hospitals, webinars, and articles in state hospital association newsletters. Additionally, several states including California and Texas promoted the National Health Care Surveys public health reporting registry through their state websites.

4. Tests of Procedures and Methods to Be Undertaken

NCHS is working on two Patient Center Outcomes Research Trust Fund (PCORTF) projects utilizing NHCS data. The first PCORTF project links NHCS claims and EHR data to the NDI and claims data to the CMS Master Beneficiary Summary File (MBSF) to create new data infrastructures to advance studies on mortality following hospital care and to leverage comorbidities in the CMS data. The goal of this PCORTF project is to improve the linkage of NHCS data to the NDI and enhance NCHS’ ability to identify mortality following a hospital discharge or visit. A comparative analysis will be conducted to compare the EHR link to NDI with that of UB-04 claims.

The second PCORTF project builds on the infrastructure created in the prior PCORTF project. The purpose of this projects is two-fold: 1) to create a new optimized data source that includes enhanced information on the specific opioids involved in ED visits, hospitalizations and deaths, and 2) to develop data collection and reporting tools to support research on hospital encounters involving opioids. The linked NHCS and NDI data created from the prior PCORTF project will be linked to the National Vital Statistics System’s restricted-use mortality files (NVSS-M). The NVSS-M file identifies specific drugs involved with overdose deaths. The project is continuing the work to improve the methods to accurately identify and enumerate substance-involved ED visits. This work

involves refining an algorithm to flag ED visits with evidence of recent substance use related to the reason for visit. Currently, the algorithm is based on the presence of selected medical codes. Future iterations of the algorithm will also utilize other available submitted data, such as laboratory test results and clinical provider notes. Once finalized, the algorithm will be used along with stratification and oversampling techniques to produce nationally representative estimates of substance-involved ED visits. Last, this PCORTF funded project will also enhance the ability to identify opioids-involved in ED visits by using natural language processing to identify specific opioids mentioned in the clinical notes collected from EHR data. Such efforts would provide greater insight on hospital care patterns and risk factors associated with opioid overdose deaths.

NCHS has offered Promoting Interoperability (PI) credit through the CMS Electronic Health Records Incentive Programs for participation in the National Health Care Surveys, of which NHCS is a part. To date, approximately 1,000 eligible hospitals or critical access hospitals have registered with National Health Care Surveys public health reporting registry. About 10% of these hospitals are in the NHCS sample. To invest in EHR data collection, an infrastructure is being created at NCHS to collect, store and process EHR data. Additionally, to show the usefulness of the NHCS data, a hospital report portal is being developed for sampled hospitals to view the data they submitted and see the analytical capabilities of the data, including the reporting back of aggregate 30-, 60- and 90-day post-acute mortality. With PI provisions for public health reporting set to terminate in 2021, NCHS will consider some future methodological work with National Health Care Survey hospital registrants to identify factors that may influence them to continue submitting EHR data to the NHCS after the Incentive Programs expire. NCHS would like this future methodological work to be considered as part of this current OMB submission. Details regarding the methodological work will be subsequently submitted to OMB as soon as they are finalized.

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

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