SepSupporting Statement B: for Revision Request for Clearance:

NATIONAL AMBULATORY MEDICAL CARE SURVEY

OMB No. 0920-0234

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Table of Contents

[1. Respondent Universe and Sampling Methods 3](#_Toc81386638)

[2. Procedures for the Collection of Information 6](#_Toc81386639)

[3. Methods to Maximize Response Rates and Deal with Nonresponse 11](#_Toc81386640)

[4. Tests of Procedures or Methods to be Undertaken 12](#_Toc81386641)

[5. Individuals Consulted on Statistical Aspects and Individuals Collecting and/or Analyzing Data 12](#_Toc81386642)

List of Attachments

Attachment A - Authorizing Legislative

Attachment B1 - 60-day Federal Register Notice (FRN)

Attachment B2 – 60-day FRN Public Comment

Attachment C1 - Traditional Office-based Physician Induction Interview

Attachment C2 - Draft Ambulatory Care Provider Interview (ACPI)

Attachment D – Tracing Questionnaire

Attachment E1 – Approved NAMCS Provider Facility Interview

Attachment E2 – Draft NAMCS Provider Facility Interview

Attachment F – Electronic Health Record (EHR) Variable List

Attachment G – EHR Implementation guide

Attachment H – EHR Implementation guide templates

Attachment I1 – Approved Health Center (HC) Facility Interview

Attachment I2 – Marked Proposed Health Center (HC) Facility Interview

Attachment I3 – Draft Health Center (HC) Facility Interview

Attachment J – Set-up Fee Questionnaire

Attachment K – 2020 Board of Scientific Counselors (BSC) NAMCS Workgroup Summary

Attachment L – Consultants for NAMCS

Attachment M – NAMCS ERB Protocol Approval Letter

Attachment N1 – NAMCS Health Center Introductory Letter

Attachment N2 – 2023-2025 NAMCS Provider Introductory Letters

Attachment O1 – 2021-2022 NAMCS EHR Record Pulling Burden

Attachment O2 – 2023-2024 NAMCS EHR Record Pulling Burden

Attachment P – 2021 NAMCS Endorsing Organizations

**B. Collections of Information Employing Statistical Methods**

# 1. Respondent Universe and Sampling Methods

The National Ambulatory Medical Care Survey (NAMCS) is being redesigned starting with the 2023 data collection year. The universe was expanded in 2021 to broaden its eligibility for participation among physicians, and in 2023 will begin to also include selected advanced practice providers. Further, the historic NAMCS sampling methodology that linked physician and visit data collection has now been modified. Details are provided below.

The new target universe represents three major components: (a) ambulatory care providers submitting provider-specific interview data (Provider Interview Component), (b) ambulatory care providers submitting electronic data (Provider Electronic Component), and (c) Health Centers (HCs) which have EHR systems and will submit data in this format (Health Center Component).

NAMCS defines ambulatory care providers in two ways: (a) non-federally employed physicians (excluding those in the specialties of radiology and pathology) practicing in the United States and classified as engaging in “office-based patient care,” and (b) advanced practice providers providing similar care. Advanced practice providers have historically been defined in NAMCS as nurse practitioners (NPs), physician assistants/physician associates (PAs), and certified nurse midwives (CNMs). The goal is to start with the inclusion of PAs in 2023, and in successive survey years expand to NPs and possibly other types of advanced practice providers (e.g., CNMs), as methodological research and funds permit. These two provider types (physicians and advanced practice providers) will be utilized for the Provider Interview Component (employing a mixed-mode methodology) described below. Further, of these two provider types, currently only physicians will be selected to the sample that will submit electronic records as described in the Provider Electronic Component section.

The projected sample sizes (summarized in Table 1) for the ambulatory care providers in the Provider Interview Component are 5,000 physicians and 5,000 advanced practice providers in 2023; up to 10,000 physicians and 20,000 advanced practice providers in 2024; and up to 20,000 physicians and 40,000 advanced practice providers in 2025. The sample size for the ambulatory care providers who provide electronic data will remain at 3,000 physicians for each sample year. Throughout this submission, physicians are primarily discussed as the providers who will submit electronic data; however, if feasible we may include as part of this annual 3,000 provider sample both physicians and advanced practice providers. The projected sample sizes for the HC Component is 100 HCs in 2022 (lowered from 110 per previously approved package due budget restraints), 150 HCs in 2023, 200 HCs in 2024, and 250 HCs in 2025. HCs recruited into the survey will continue to provide EHR data for a minimum of five years, as long as they are willing to continue to participate.

Table 1-Annual and Annualized NAMCS Sample Counts

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | CY2023 | CY2024 | CY2025 | Annualized Average |
| Physicians (no visit data collected)1 | 5,000 | 10,000 | 20,000 | 11,667 |
| Advanced Practice Providers (no visit data collected)1 | 5,000 | 20,000 | 40,000 | 21,667 |
| Ambulatory Care Providers who submit electronic data (currently physician only) | 3,000 | 3,000 | 3,000 | 3,000 |
| Health Centers | 150 | 200 | 250 | 200 |

1Providers added in 2024 and 2025 if funds become available.

Increases in annual NAMCS sample sizes were justified in response to waning participation rates. Further, increases in sample sizes can be beneficial at the analytical stage as seen from the analysis below. Specifically, minimum differences in percent estimates based on different sample sizes were calculated assuming a Type-1 error rate of 0.05 and 80% power. As shown in Table 2, as the annual sample sizes increases, the minimum percent difference needed to determine a significant difference decreases (e.g., for physicians, in 2023 it is 2.57%; in 2024 it is 1.82%; and in 2025 it is 1.29%). This trend was observed across the three provider samples that increased in size from 2023 to 2025.

Table 2. Minimum Detectable Differences Expressed as a Percent for Differences in Proportion That Can Be Detected at 5% Level of Significance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Population | Calendar Year | Total Sample Size | Detectable Difference (%) |   |
| Physicians (no visit data collected)1 |
|  | 2023   | 5,000 | 2.57 |   |
|  | 2024   | 10,000 | 1.82 |   |
|  | 2025 | 20,000 | 1.29 |  |
| Advanced Practice Providers (no visit data collected)1 |
|  | 2023 | 5,000 | 2.57 |   |
|  | 2024 | 20,000 | 1.29 |   |
|  | 2025 | 40,000 | 0.91 |  |
| Ambulatory Care Providers (who submit electronic visit data; currently physicians only) |   |
|  | 2023-2025 | 3,000 | 3.32 |   |
| Health Centers  |   |
|  | 2023 | 150 | 6.73 |   |
|  | 2024 | 200 | 5.55 |   |
|  | 2025 | 250 | 5.15 |  |

1For physicians and advanced practice providers, the differences are based on assumptions that sample yields (accounting for eligible responses out of the total sample) are 29%.

Note: Differences are significant at p≤0.05 assuming a 2-fold impact from stratification, clustering, and weighting on parameter variance estimates versus simple random sample variance estimates (design effect ratio). These differences are believed conservative because design effects observed for most, but not all, estimates from prior NAMCS samples are less than 2.

Details on the universe and sampling methods of these components are provided below. The total component sample sizes represent an ideal maximum number but are dependent upon available resources.

Provider Interview Component

Both physicians and PAs will be sampled for the Provider Interview Component of NAMCS. These providers will submit the Ambulatory Care Provider Interview (ACPI) (**Attachment C2**). Physicians will consist of non-federally employed physicians practicing in the United States who were classified by the American Medical Association (AMA) or the American Osteopathic Association (AOA) as being in “office-based, patient care” and those classified by AMA as being “hospital employed” (as a proxy for hospital-owned office-based practices). Although the current selection of physicians will utilize a definition of “office-based” in 2023-2025, the survey is exploring criteria of this definition and may choose to modify selection parameters in successive years. The addition of anesthesiologists and “unclassified” physicians to the sampling frame in 2021 will be continued, where the “unclassified” group includes physicians from eligible specialty groups whose primary type of practice and present employment are unknown. If it is determined that the modified office-based selection criteria used in 2023 showed little or no differential positive impact on response rates, we will examine alternative ways to define an eligible NAMCS physician in subsequent survey years. Physician assistants will consist of licensed PAs engaged in direct patient care as defined by the American Academy of Physician Associates (AAPA). As mentioned above, ambulatory care providers may be expanded in 2024-2025 to include other types of advanced practice provider (e.g., NPs, CNMs) as funds become available and methodological research permits. To generate estimates representative of these universes, NAMCS will annually draw a sample of ambulatory care physicians and advanced practice providers. These samples will be stratified with strata defined by the four U.S. Census regions. Furthermore, the physician samples will include stratification based on the 17 MD physician specialty/DO groups. A separate stratum for anesthesiologists and a stratum for “unclassified” physicians will continue to be included in the physician samples for 2023-2025; with the total specialty groupings now totaling 17. From each appropriate sampling stratum, systematic random sampling will be used to select physicians and advanced practice providers from a list in which the physicians/advance practice providers are sorted (in order of priority) by Census division and MSA status (i.e., in MSA vs. not-in MSA, where MSA is Metropolitan Statistical Areas defined by the OMB). Finally, this sampling design facilitates representative annual provider estimates by the four U.S. Census regions, as well as for the nation.

Provider Electronic Component

This request currently focuses on electronic data as defined by EHRs because registry participation will be linked to EHR data submissions in 2023. However, future data years might include the collection of other forms of electronic visit-related data. For 2023-2025, NAMCS will continue to sample physicians from the National Health Care Surveys Registry to generate estimates of visits to that physician population. The Registry includes other advanced practice providers, and as mentioned above, there may be a combination of physicians and advance practice providers in this sample of 3,000. Physicians who registered with the Registry will be identified in the AMA/AOA universe. Those registered physicians identified in the AMA/AOA universe will then be sampled; however, some advanced practice providers may be included as part of this sample of 3,000 providers. This sample will be separate from the sample drawn for the ACPI but will mirror the criteria utilized for physician selection in the ACPI (described above). Physicians sampled from the Registry will have a full year of visit data collected through submission of EHR data via the National Health Care Surveys’ Health Level Seven International (HL7) Implementation Guide (IG) for Clinical Document Architecture (CDA®) Release 1, Release 1.2, or Release 3. These physicians will also be asked to complete the Provider Facility Interview (PFI) (**Attachment E2**) to ensure that (a) they are eligible for NAMCS participation, and (b) all data needed to create weighted national visit estimates is obtained.

In future data years, NAMCS will also be exploring the possibility of (a) collecting data from advanced practice providers, large medical conglomerates, and practices, and (b) obtaining other types of electronic data from third party entities such as IQVIA, the American Board of Family Medicine, Premier, Inc., and others to supplement NAMCS visit data.

Health Center Component

As in 2021, this NAMCS sampling component consists of HCs which have and utilize EHR systems. The HC universe includes three different types of HCs: (a) HCs that receive grant funds from the federal government through Section 330 of the Public Health Service Act; (b) look-alike HCs who meet all the requirements to receive 330 grant funding, but do not actually receive a grant; and (c) Urban Indian Health Centers (to be included in future survey years). The list of federally funded HCs (330 grant) and look-alike HCs is provided by the Health Resources and Services Administration (HRSA) and the Urban Indian Health Centers list would be provided by the Indian Health Service.

The 2023-2025 HC component will use a stratified list sample of HCs with EHR systems. The strata will be defined by Census region and MSA status (MSA vs. non-MSA). From each sampling stratum, systematic random sampling will be used to select HCs from a list in which the eligible HCs are arrayed by Census division and (when Urban Indian Health Centers would be included) HC type. The sampled HCs will continue in the survey until a new sample is drawn, which we anticipate will be in a minimum of 5 years.

From each HC selected, NAMCS will collect available electronic records for all visits in a 12-month period. In 2022, 100 HCs were sampled, and a planned increase to 150 HCs will represent the sample for 2023. Further, there is potential of increasing the sample to 200 HCs in 2024, and 250 HCs in subsequent years. This sample will be used to produce estimates of HC visits with electronic records for the nation and the four Census regions. A limited amount of data on HC characteristics will also be collected for weighting and analytic purposes.

# 2. Procedures for the Collection of Information

Provider Interview Component

For the first time, the 2023-2025 NAMCS data collection will implement a sequential, mixed-mode of administration using both a self-administered web-based survey, and a self-administered paper-based mail survey. The recruitment and fielding methods follow best practices by using Dillman’s Tailored Design Method,[[1]](#footnote-3) with some modifications for the population of interest. The U.S. Census Bureau will oversee all components of ambulatory care provider data collection for at least the 2023 data year, with the data collection agents for future years of the ambulatory care provider data to be determined. Following clearance, recruitment will begin with mail and/or email invitations to participate in NAMCS via self-administered web-based survey. Respondents could receive additional invitations, paper self-administered questionnaires, emails, thank-you/reminder information cards, and other public relations materials dependent on their response status.

Please see **Attachment N2** for draft copies of the proposed letters. At any point during the steps of the administration of NAMCS described above, providers can refuse, decide to complete the survey on the web, or simply wait and complete the mailed paper-based version. After the first email and continuing throughout the stages described below, who receives contact from NCHS will be modified based on specific provider feedback (i.e., responding to email or calling the Telephone Questionnaire Assistance phone number).

Selected content groupings included on the ACPI are shown below with the full listing of all questions found in **Attachment C2**:

* Physician specialty
* Provision of outpatient care
* Number and types of physical locations providing care
* Reporting location facility characteristics
* Workforce, revenue, and compensation
* COVID-19 impact
* EHR and telemedicine
* Health equality and language barriers
* Pain treatment and treatment with opioids (physicians only)
* Professional Autonomy (PAs only)
* Provider demographics

Provider Electronic Component

Participating physicians whose visit data are collected through submission of EHR data will transmit that data directly via the NCHS Healthcare Electronic Health Records (HEHR) system in the format of the National Health Care Surveys’ IG. This IG was created in collaboration with the Office of the National Coordinator for Health Information Technology (ONC) and multiple NCHS subunits including the Office of Classifications and Public Health Data Standards. This standard was created to address the diversity of EHR systems’ data collection and storage. It also allows for automated extraction from the EHR or data repository.

For sampled physicians who registered with the National Health Care Surveys Registry, the data collection contractor for NAMCS will initiate contact with the physician’s organizational contact. The initial letter sent informs the organizational contact that provider(s) from their organization have been sampled for participation in NAMCS and reminds the organization of the physicians’ willingness to submit electronic data for NAMCS when requested in order to meet the public health reporting objectives of PI/MIPs on Stage 3 (**Attachment N2**). To receive credit and remain in good standing, the registered physician is required to respond to the initial letter within 30 calendar days from the date sent.

Sampled EHR physicians are asked to complete a Provider Facility Interview (PFI) (**Attachment E2**). The questions on the PFI form represent a modified version of the NAMCS ACPI. Once the PFI is completed, it is reviewed to verify the physician’s eligibility for NAMCS. Physician data collected on the PFI is also necessary to weight EHR data and make nationally representative visit estimates. Eligible physicians are invited to begin the process of testing and validation of their EHR systems and their ability to send EHR via the IG **(Attachments G** and **H**).

Once the results of testing and validation show that specific transmission and compatibility guidelines are met, the physician is then invited to the production phase of NAMCS EHR data collection. Electronic visit data will be submitted by the organizational contact or the physicians themselves (although we anticipate a very small number of physicians will be performing this task themselves). EHR visit data are expected to be delivered to the survey contractor within 30 days of the physician receiving their invitation to the production phase.

Select data items collected from EHRs are shown below. A full listing of all the variables can be found in **Attachment F**:

* Personal patient identifiers (EHR only: name, address, medical record number when available, Medicare/Medicaid number, and social security number when it is available)
* Date of birth
* Sex
* Date of visit
* Encounter number
* Diagnoses
* Services provided or ordered during the visit, including:
	+ 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)
* National Provider Identifier (physicians and health care providers only)
* Race
* Ethnicity
* Marital Status
* Source(s) of payment
* Reason for visit
* Results of testing and procedures
* Medications and Immunizations
* Clinical notes (e.g., from physicians, nurses, physician assistants, and certified nurse midwives)

For sampled NAMCS physicians where a name match to the PI registry could not be established (i.e., they did not register with the National Health Care Surveys Registry), further methodological procedures will be developed that will allow NCHS to accept submissions of their EHR data based on the most current NHCS IG.

Health Center Component

Starting in 2021, and continuing throughout 2025, HCs selected to participate in NAMCS will be sent an introductory letter or email (**Attachment N1**) and information packet prior to being contacted by phone and/or email. The letter will describe the purpose of the survey and authority for data collection, that participation is voluntary and that all collected identifying information is confidential. When sent, these letters may be accompanied by endorsement letter(s) from specialty medical colleges and/or professional associations relevant to the sampled HC, an informational/motivational insert, or other public relations materials.

The revised HC Facility Interview questionnaire may be collected using electronic data collection methods (e.g., web portal) (See **Attachment I1** for the currently approved questionnaire and **Attachment I3** for the proposed draft questionnaire). During the initial interview with the HC director, a research analyst completes the HC Facility Interview questionnaire. The major purpose of the Facility Interview questionnaire is to gather information to assist in weighting of the collected visit data. Once the Facility Interview questionnaire is completed, NCHS will work with the HC to set up data extraction. HCs will also be required to use the IG or a custom extract for data submission. A one-time set-up fee of up to $10,000 will be given to every participating HC.

Selected content groupings included on the draft HC Facility Interview questionnaire are shown below with the full listing of all the questions found in **Attachment I3.**

* Initial confirmation and basic HC characteristics
* HC director contact information
* Health center characteristics
* EHR use/characteristics
* Impact of COVID-19
* Set up reimbursement for participation

As mentioned in Supporting Statement A, a sampled HC will be asked to submit directly to NCHS a full 12 months of EHR data according to the National Health Care Surveys’ IG or utilizing a custom extract. Further, EHRs are transmitted through the HEHR platform. This is the same mechanism for collection as described in the “Provider Electronic Component” section above and selected EHR data items are listed in that section. For the full list of data items please see **Attachment F**.

Monitoring Data Collection and Quality Control

NCHS will continue to be responsible for overseeing the data collection for each NAMCS component. NCHS staff or contractor staff will ask each HC or physician to first submit a test file. The data will go through testing and validation procedures to ensure that essential variables are present and are in a suitable format for NAMCS. NCHS or its contractor will work with the HCs or physicians who submit EHR data to make any needed changes or additions to the files submitted.

Estimation Procedures

National and Census regional provider and visit estimates will be produced based on three fundamental sources of data: (a) private non-federal office-based physicians, (b) advanced practice providers (i.e., PAs in 2023, possibly expand to additional provider types in 2024-2025) providing direct patient medical care, and (c) HCs designated as 330 grant-supported federally funded qualified health centers, federally qualified look-alikes, and (eventually) Urban Indian Health Centers. The estimation procedure has four basic components: (a) inflation by reciprocals of the selection probabilities, (b) adjustments for nonresponse, (c) calibration ratio adjustment, and (d) weight smoothing. Please note, visit estimates will only be produced for the population of visits seen by physicians registered with the National Health Care Surveys Registry and the population of HC visits with electronic records. Further, we recognize that once externally sourced EHR data are incorporated as a NAMCS data source, we will then need to review current statistical methods to determine and apply the most effective path to generate visit estimators.

Similar to prior survey years of NAMCS, the annual sample size has the statistical power needed to generate representative estimates for four Census regions. NAMCS data can also be used to make national estimates of office-based physicians, selected advance practice providers, and associated medical practices. These estimates are unbiased and based on a complex sampling design with multistage estimation. Physician and other provider weights will be used to produce national estimates of office-based physicians and associated advanced practice providers by characteristics of the providers (e.g., sex, age, and specialty) and their medical practices (e.g., numbers of providers in the practice, ownership, and types and numbers of patient encounters in last full week of practice). The NAMCS physician/advance practice provider sampling weight can also be modified to produce a national medical practice estimator (e.g., practice size, breadth of specialization, and selected diagnostic and therapeutic services available onsite). Data from the NAMCS samples are weighted by the inverse of selection probabilities with non-response adjustments done at least within U.S. Census region and, when feasible within physician specialty groups and/or MSA status. Calibration adjustment factors are used to adjust estimated physician/PA total counts to known physician/PA total counts appropriate for each sample.

Each year, NCHS publishes weighted response rates by a variety of physician characteristics available from the sampling frame and the physicians themselves. Future publications will also include response rates by various PA (and potentially other advance practice providers, where applicable) characteristics. Additional information concerning the 2023-2025 nonresponse is described below in “Section 3: Methods to Maximize Response Rates and Deal with Nonresponse.”

*Sampling Errors*

The standard error is primarily a measure of the sampling variability that occurs by chance because only a sample rather than an entire universe is surveyed. Estimates of the sampling variability are calculated using Taylor series approximations in SUDAAN, which consider the complex sampling design of NAMCS. A description of the software and its approach has been published elsewhere.[[2]](#footnote-4) Similar to SUDAAN, other statistical software is available that allows calculations of sampling variability in a similar manner and could be used as an alternative to SUDAAN.

# 3. Methods to Maximize Response Rates and Deal with Nonresponse

The 2023-2025 ACPI has undergone cognitive testing by the Collaborating Center for Questionnaire Design and Evaluation Research (CCQDER) within NCHS. Suggested modifications have been incorporated in the latest attached version of the ACPI. The respondent is expected to take 30 minutes to complete either the paper or web-based questionnaire.

NAMCS uses multiple methods for maximizing physician response. The medical community, including the AMA, AOA, and advance practice groups, is informed and consulted about the study. In 2021, NAMCS received nineteen endorsement letters from various major medical societies and professional organizations used for enlisting sampled physicians (**Attachment P**). The newly 2023-2025 proposed NAMCS survey procedure (Provider Interview Component/mixed-mode) is designed to minimize the time required of physicians and advanced practice providers to participate and therefore increase response rate. Past physicians selected in traditional NAMCS samples (not including HCs) were excluded from possible selection again for the following two years. This will continue in 2023, and we will apply this exclusion criteria for sampled PAs beginning 2024.

In 2023, NAMCS will use multiple types of contact (i.e., letters, emails, survey packets, and information cards) to help convince the physician, advanced practice provider, and gatekeeper of the importance in participating in NAMCS. Recruitment tools will answer questions that physicians, advanced practice providers, and HC administrators may have on why they should participate, describes how the Privacy Rule permits visit data collection for NAMCS (physicians in electronic (registry) data component and HC administrators only), and provides a link to the NAMCS participant website.[[3]](#footnote-5)

A direct incentive that should influence responses positively is that sampled physicians who are selected to submit EHR data and are linked to the National Health Care Surveys Registry are eligible to receive appropriate credit through the Centers for Medicare and Medicaid Services after providing data through submission of EHRs. Also, if funds permit and modifications to the NAMCS methodology support, a one-time monetary set-up fee might be provided in future data years for providers participating through submitting EHR data.

Prior observation of nonresponse cases in NAMCS found that a substantial portion of interviews break-off at the initial contact, or stage of the telephone screener (43%) and often the refusal is from the office staff rather than the physician or HC facility director. Each year in our annual statistical report, we describe weighted characteristics of NAMCS physician respondents and non-respondents on numerous variables, including age, gender, geographic region, metropolitan statistical area (MSA) status, type of doctor, specialty, specialty type, type of practice, and annual visit volume. In 2016 a nonresponse bias report about the 2012 NAMCS estimates was published as a *Vital Health Statistics* report,[[4]](#footnote-6) which found after adjustment for nonresponse by MSA status, Census division or targeted state, and physician specialty categories, no or minimal biases (<2.0% points) were observed by these characteristics between physician estimates based on the full eligible physician sample and physician estimates based on either of the two NAMCS respondent types (Induction Interview respondents and those who completed the Induction and submitted visit data).

As mentioned, we will continue to create statistical reports; however, we will now focus on describing weighed characteristics of physicians, PAs, and HCs. Given the newly proposed 2023-2025 methodology, we hope to identify any new distributions of nonresponse characteristics in order to devise additional corrective survey measures.

# 4. Tests of Procedures or Methods to be Undertaken

No tests of procedures are anticipated. The currently proposed 2023 NAMCS Provider Induction has been cognitively tested with suggestions implemented, and the HC survey questions and procedures are the same as the 2022 NAMCS (OMB No. 0920-0234).

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

The statistician responsible for the survey sample design is:

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The current data collection agents are the U.S. Census Bureau (ambulatory care provider component) and Booz Allen Hamilton (HC component), and the contacts for these two organizations are as follows:

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1. The Tailored Design Method (TDM), also known as the Dillman survey method, is regarded as the standard for mail surveys. TDM includes steps such as sending a personalized letter, the questionnaire with return postage, a follow-up postcard, and multiple packets to non-respondents. [↑](#footnote-ref-3)
2. Research Triangle Institute. SUDAAN User’s Manual, Release 9.0.1. Research Triangle Park, NC: Research Triangle Institute, 2005. [↑](#footnote-ref-4)
3. <https://www.cdc.gov/nchs/ahcd/namcs_participant.htm>. [↑](#footnote-ref-5)
4. <https://www.cdc.gov/nchs/data/series/sr_02/Sr02_171.pdf>. [↑](#footnote-ref-6)