

## **ABSTRACT**

This material provides documentation for users of the public use micro-data files of the 2010 National Hospital Ambulatory Medical Care Survey (NHAMCS) Ambulatory Surgery (AS) component. NHAMCS is a national probability sample survey of visits to hospital outpatient and emergency departments, and to ambulatory surgery locations in the hospital and in ambulatory surgery centers independent of hospitals, conducted by the National Center for Health Statistics (NCHS). The survey is a component of the National Health Care Surveys, which measure health care utilization across a variety of health care providers. The two micro-data files produced from 2010 NHAMCS for outpatient department records and for emergency department records are contained in separate documentation and have already been released.

This document begins with a summary of the differences between the 2006 National Survey of Ambulatory Surgery (NSAS) and the 2010 National Hospital Ambulatory Medical Care Survey AS Patient Record Forms. The last time national data on ambulatory surgery was gathered was for the 2006 NSAS.

Section I provides a description of the National Hospital Ambulatory Medical Care Survey Ambulatory Surgery Component and includes information on the background and scope of the survey, the sample, field activities, data collection and processing procedures, medical coding, confidentiality, variance, comparing data over time, and population estimates.

Section II provides a detailed description of the contents of the survey's public use data file by location.

Section III contains marginal data for selected items on the public use file.

The appendix contains sections on sampling errors and variance estimation, a definition of ambulatory surgery, and instructions that were used to complete selected items on the Patient Record Forms.

## Summary of the Differences between the 2006 National Survey of Ambulatory Surgery (NSAS) and the 2010 National Hospital Ambulatory Medical Care Survey Ambulatory Surgery Component (NHAMCS AS) Patient Record Forms

The 2010 NHAMCS AS public use micro-data file was designed to include many of the data items included in the micro-data file for the 2006 NSAS. Both the 2006 NSAS and the 2010 NHAMCS AS component gathered Patient Record Form data on the date of the visit, and on the demographic, clinical and administrative characteristics of the patients. Also, in both, were the types of anesthesia and the providers of anesthesia, times in the operating room, in surgery and in postoperative care, symptoms present during or after procedures, discharge disposition, and follow-up information. The names of some of these variables were changed and the category responses were sometimes altered based upon our review of the responses to the earlier survey. Each of the variables mentioned in this paragraph are on the public use file, as is a new item on whether or not oxygen was administered.

Some NSAS data items which were not included in the NHAMCS AS file were charge data, surgery flag data (SGFLAG) and procedure class data (PD1CLASS). In the 2006 NSAS the charge data were often missing and when provided were difficult to interpret because there is no uniform way that facilities define charges. The surgery flag data and procedure class data can be obtained in an updated form by using the free software from the Agency for Healthcare Research and Quality available at

<https://www.hcup-us.ahrq.gov/toolssoftware/surgflags/surgeryflags.jsp> and  
<https://www.hcup-us.ahrq.gov/toolssoftware/procedure/procedure.jsp>

The layout for the NHAMCS AS micro data file is different from the NSAS layout mainly because the ambulatory surgery survey became a part of NHAMCS and it uses that survey's layout and often content so it would parallel that of the NHAMCS OPD and ED components which began in 1992. Also due to this merging of surveys, additional variables were included in NHAMCS AS that were not in NSAS. These include external cause of injury data, and up to 12 prescription (RX) and over-the-counter (OTC) drugs and anesthetics that were ordered, supplied or administered during the visit or at discharge. These data items are not available on this public use file but are available through the NCHS Research Data Center (RDC) with an approved plan of study and with a signed confidentiality agreement. Information on how to request data from the RDC can be found at

<https://www.cdc.gov/rdc/>

The same electronic medical record data items which gathered data for the facilities which participated in the emergency department and outpatient department components of the survey were gathered for the NHAMCS AS component but these data are also only available from the Research Data Center.

MSA/non-MSA data were included in the 2006 NSAS file but this variable is not included in the 2010 NHAMCS AS. Release of geographical data about the respondents is more limited in later years due to the greater potential for matching files with external data sources containing identifying information. Sometimes there was a need to combine response categories due to confidentiality concerns.

## Table of Contents

	Page
Abstract.....	1
Summary of the Differences between the 2006 National Survey of Ambulatory Surgery (NSAS) and the 2010 National Hospital Ambulatory Medical Care Survey Ambulatory Surgery Component (NHAMCS AS) Patient Record Forms.....	2
Table of Contents.....	4
List of Tables.....	5
I. Description of the NHAMCS AS .....	6
A. Background and Introduction .....	6
B. Sample design.....	7
C. Data collection procedures .....	9
D. Field training and quality control .....	10
E. Confidentiality.....	10
F. Data processing .....	11
G. Medical coding .....	12
H. Variance estimation procedures .....	13
I. Patient visit weight .....	13
J. Hospital code and patient code.....	14
K. Issues to consider when comparing 2006 NSAS and 2010 NHAMCS AS Data.....	14
L. Years of Data Collection.....	15
M. Population figures.....	15
References.....	24
II. Record Format of the NHAMCS AS Micro-Data File.....	25
III. Marginal Data .....	34
A. Ambulatory surgery visits and procedures .....	34
Appendix.....	38
A. Relative standard errors.....	38
B. Definition of ambulatory surgery in NHAMCS AS.....	40
C. Instructions for Completing Selected Items on the Patient Record Forms.....	40
D. Contact information.....	43

List of Tables

Table I. U.S. population estimates used in computing annual visit rates for the National Hospital Ambulatory Medical Care Survey, by age, race, and sex: July 1, 2010.....17

Table II. U.S. population estimates used in computing annual visit rates for the National Hospital Ambulatory Medical Care Survey, by ethnicity, age, race, and sex: July 1, 2010  
.....20

## I. DESCRIPTION OF THE NATIONAL HOSPITAL AMBULATORY MEDICAL CARE SURVEY- AMBULATORY SURGERY COMPONENT

### A. BACKGROUND AND INTRODUCTION

The National Hospital Ambulatory Medical Care Survey (NHAMCS) was initiated in 1992 to learn more about the ambulatory care rendered in hospital emergency and outpatient departments (EDs and OPDs) in the United States. NHAMCS is conducted by the Ambulatory and Hospital Care Statistics Branch of the Division of Health Care Statistics, National Center for Health Statistics (NCHS). A complete description of NHAMCS is contained in the publication entitled, "Plan and Operation of the National Hospital Ambulatory Medical Care Survey" (1). OPD and ED 2010 public use data files have been released previously.

In 2009, NHAMCS was expanded to include ambulatory surgery in hospitals, and in 2010, it was again expanded to include ambulatory surgery visits to facilities independent of hospitals known as ambulatory surgery centers (ASCs). Previously, in 1994-1996 and in 2006, the National Survey of Ambulatory Surgery (NSAS) gathered data from hospital-based ambulatory surgery centers (HBASCs) and from facilities independent of hospitals then called freestanding ambulatory surgery centers (FSASCs). The terms HBASCs and FSASCs are no longer in use since Medicare, and other insurers following Medicare's lead, changed the reimbursement categories for these services. Hospitals' ambulatory surgery is now called hospital outpatient department (HOPD) surgery or hospital ambulatory surgery. Facilities independent of hospitals which specialize in ambulatory surgery are now known as ASCs.

Much of the information contained in this documentation pertains only to the ambulatory surgery (AS) component of the 2010 NHAMCS. As noted above, only the AS data file is being released at this time. In 2010, there were 26,961 Patient Record forms (PRFs) provided by facilities that participated in the AS portion of NHAMCS.

Please note the following important points concerning analysis of NHAMCS data on this micro-data file:

#### **PATIENT VISIT WEIGHT**

Micro-data file users should be fully aware of the importance of the "patient visit weight" and how it must be used. Information about the patient visit weight is presented on page 13. If more information is needed, the staff of the Ambulatory and Hospital Care Statistics Branch can be consulted by calling (301) 458-4600.

#### **RELIABILITY OF ESTIMATES**

Users should also be aware of the reliability or unreliability of certain estimates, particularly smaller estimates. The Ambulatory and Hospital Care Statistics Branch considers an estimate to be reliable if it has a relative standard error of 30 percent or less (i.e., the standard error is no more than 30 percent of the estimate). Therefore, it is important to know the value of the lowest possible estimate in this survey that is considered reliable, so as not to present data in a journal article or paper that may be unreliable. Most data file users can obtain an adequate working knowledge of relative standard errors from the information presented in the Appendix. It should be noted that estimates based on fewer than 30 records are also considered unreliable, regardless of the magnitude of the relative standard error. If you would like more information, do not hesitate to consult the staff of the Ambulatory and Hospital Care Statistics Branch.

## B. SAMPLE DESIGN

This section summarizes the design of the NHAMCS AS component. For additional information about the NHAMCS design see

[ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Dataset\\_Documentation/NHAMCS/doc/2010.pdf](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHAMCS/doc/2010.pdf)

Independent samples of hospitals and ambulatory surgery centers were drawn for the 2010 NHAMCS AS component.

### Hospitals

The NHAMCS AS hospital sample was selected as it has been in the OPD and ED components. A multi-stage probability design was used. First, geographic sampling units were selected, followed by hospitals with varying selection probabilities. After this, patient visits in all locations which the hospital identified as providing ambulatory surgery were sampled.

The hospital universe includes noninstitutional hospitals exclusive of Federal, military, and Department of Veterans Affairs hospitals, located in the 50 States and the District of Columbia. Only short-stay hospitals (hospitals with an average length of stay for all patients of less than 30 days) or those whose specialty was general (medical or surgical) or children's general are included in the survey. These hospitals must also have six beds or more staffed for inpatient use. The 2010 NHAMCS hospital sample frame was constructed from the products of SDI's "Healthcare Market Index", updated July 15, 2006, and its "Hospital Market Profiling Solution, Second Quarter, 2006 (2)". These products were formerly known as the SMG Hospital Market Database.

In 2010, the sample consisted of 488 hospitals of which 74 were found to be out-of-scope (ineligible) because they went out of business or otherwise failed to meet the criteria for the NHAMCS universe. Of the 414 in-scope (eligible) hospitals, there were 275 hospitals with eligible ambulatory surgery locations. Of these 275 hospitals with ambulatory surgery, 227 participated, yielding an unweighted hospital ambulatory surgery response rate of 82.6 percent and a weighted response rate of 90.9 percent. All of the 321 ambulatory surgery locations within the 227 participating hospitals were selected for sampling, and 281 of these fully or adequately (at least half of the number of expected patient record forms filled out) responded. The resulting hospital ambulatory surgery location sample response rate was 87.5 percent unweighted, and 86.9 percent weighted. The overall hospital response rate was 72.3 percent unweighted and 79.0 percent weighted. In all, 18,469 PRFs with data on visits for ambulatory surgery were submitted from hospitals.

## Ambulatory Surgery Centers

The universe for the ambulatory surgery center (ASC) portion of the 2010 NHAMCS was made up of freestanding facilities included in the 2006 NSAS sample. This sample was drawn in 2005 from a universe consisting of facilities listed in the 2005 Verispan (later called SDI and then IMS Health) Freestanding Outpatient Surgery Center Database (3) or the Centers for Medicare and Medicaid Services' Medicare Provider-of-Services (POS) file (4). Using both of these sources resulted in a list of facilities that were regulated or licensed by the States and those certified by the Centers for Medicare & Medicaid Services (CMS) for Medicare participation. More details about the 2006 NSAS sample have been published (5).

Selection of the 2010 ASC sample began with the NSAS 2006 stratified list sample of 472 FS-ASCs, which had strata defined by 17 facility specialty group and four geographic regions. Of this NSAS sample, 74 were out of scope leaving 398 inscope facilities from which to select the 2010 NHAMCS ASC sample. Requirements for the 2010 ASC sample were that the sample be selected from the NHAMCS geographic sampling units to the extent possible, and have strata defined by five specialty groups (ophthalmic, gastrointestinal, multi-specialty, general and other) formed by collapsing the 17 specialty group strata used in the 2006 NSAS sample.

All of the inscope 2006 NSAS sample facilities located within the NHAMCS geographic sampling units were selected. That yielded only 216 facilities. In order to achieve the desired yield of 246 facilities, a stratified list sample of 30 facilities was selected from the 2006 NSAS sample outside of the NHAMCS geographic sampling units, with strata defined by the four regions and the five collapsed surgery specialty groups.

There were 149 inscope (eligible) ASCs and, of this number, 109 responded to the survey for an unweighted response rate of 73.2%, and a weighted response rate of 70.2%. In all, 8,492 PRFs were submitted for ASCs.

The overall response rate for hospitals combined with ASCs was 72.2% unweighted and 79.0% weighted. The combined number of PRFs from both of these settings was 26,961.

The NHAMCS sampled facilities for the ambulatory surgery component were selected using a multi-stage probability design with facilities having varying selection probabilities. Patient visits to locations in the hospital where ambulatory surgery was provided, and to entire ASCs, were selected using systematic random sampling procedures.

Within sampled hospitals, a sample of ambulatory surgery visits was selected from all of the ambulatory surgery locations identified by the survey's hospital contact. These locations included main or general operating rooms, dedicated ambulatory surgery units, cardiac catheterization laboratories, and rooms for endoscopy, laparoscopy, laser procedures, and pain block. Locations within hospitals dedicated exclusively to abortion, dentistry, podiatry, family planning, birthing, or small procedures were excluded, but these

procedures were included if performed within in-scope locations. ASCs specializing in abortion, dentistry, podiatry, family planning, birthing, or small procedures were out-of-scope, but these procedures were included if performed in in-scope ASCs. In ASCs, the sample was drawn from all visits.

To minimize response burden for hospitals and ambulatory surgery centers, the samples were divided into 16 nationally representative panels and those panels were randomly ordered for rotation over reporting periods of four weeks each. Within the reporting periods, patient visits are systematically selected. The visit lists may be sign-in sheets or appointment lists. A minimum of 30 visits is targeted for each hospital location. The total targeted number of ambulatory surgery visit forms to be completed in each hospital, and in each ambulatory surgery center, is 100. In facilities or hospitals with volumes higher than these desired figures, visits are sampled by a systematic procedure which selects every nth visit after a random start. Visit sampling rates are determined from the expected number of patients to be seen during the reporting period and the desired number of completed visit forms.

### C. DATA COLLECTION PROCEDURES

Sample selection and abstraction of information from medical records onto PRFs were performed by facility staff or U.S. Census Bureau personnel acting on behalf of NCHS. A PRF for each sampled visit is filled out. A visit is defined as a direct, personal exchange between a physician, or a staff member operating under a physician's direction, for the purpose of seeking ambulatory surgery. Visits solely for administrative purposes and visits in which no medical care was provided are out of scope.

The PRF for the NHAMCS 2010 AS component can be found at this location

[http://www.cdc.gov/nchs/data/ahcd/nhamcs100asc\\_2010.pdf](http://www.cdc.gov/nchs/data/ahcd/nhamcs100asc_2010.pdf)

It contains items relating to the personal characteristics of the patients, such as age, sex, race, and ethnicity; and administrative items, such as date of procedure, expected sources of payment, discharge disposition, and follow-up information. Medical information gathered includes times in the operating room, in surgery, and in postoperative care; provider and type of anesthesia; symptoms present during or after the procedure; and up to five diagnoses and seven procedures, which were coded according to the *International Classification of Diseases, 9th Revision, Clinical Modification*, or ICD-9-CM (6). Information on up to 12 new or continuing prescription and over-the-counter drugs that were ordered, supplied or administered during the visit or at discharge was also gathered. These were coded using the Multum Lexicon, a proprietary drug classification system used by NCHS. More information about this system is available (7). Data on these drugs are not included in this public use file but they can be obtained from the NCHS Research Data Center. Data on types of anesthesia are included in responses to another data item and these data

are included in this public use file. Patient date of birth and ZIP Code are confidential information and are not available to the public. In addition, region of the country and MSA/non-MSA are not included in the public use file in order to protect the confidentiality of the responding facilities and their patients. Data files containing these variables are available through the NCHS Research Data Center.

#### D. FIELD TRAINING AND QUALITY CONTROL

The U.S. Bureau of the Census was the data collection agent for the 2010 NHAMCS. Census Headquarters staff were responsible for overseeing the data collection process, training the Census Regional Office staff, and writing the field manual. Regional Office staff were responsible for training the field representatives (FRs) and monitoring facility data collection activities. FRs inducted the facilities and trained the hospital staff on visit sampling and completion of the PRFs. Data for sampled visits were recorded on paper-based PRFs. The AS PRF was designed to reflect the type of care provided in the ambulatory surgery locations or facilities. The Patient Record Forms can be found at this web address

[www.cdc.gov/nchs/data/ahcd/nhamcs100asc\\_2010.pdf](http://www.cdc.gov/nchs/data/ahcd/nhamcs100asc_2010.pdf)

#### E. CONFIDENTIALITY

In April 2003, the Privacy Rule of the Health Insurance Portability and Accountability Act (HIPAA) was implemented to establish minimum Federal standards for safeguarding the privacy of individually identifiable health information. No personally identifying information, such as patient's name or address or Social Security number, is collected in NHAMCS. Data collection is authorized by Section 306 of the Public Health Service Act (Title 42, U.S. Code, 242k). All information collected is held in the strictest confidence according to law [Section 308(d) of the Public Health Service Act (42, U.S. Code, 242m(d))] and the Confidential Information Protection and Statistical Efficiency Act (Title 5 of PL 107-347). The NHAMCS protocol has been approved by the NCHS Research Ethics Review Board. Waivers of the requirements to obtain informed consent of patients and patient authorization for release of patient medical record data by health care providers have been granted.

Census Bureau FRs have been trained on how the Privacy Rule allows facilities to make disclosures of protected health information without patient authorization for public health purposes and for research that has been approved by a Research Ethics Review Board. Facilities were encouraged to accept a data use agreement between themselves and NCHS/CDC, since the Privacy Rule allows facilities to disclose limited data sets (i.e., data sets with no direct patient identifiers) for research and public health purposes if such an agreement exists. Such practices have been continued annually.

Assurance of confidentiality is provided to all facilities according to Section 308 (d) of the Public Health Service Act (42 USC 242m). Strict procedures are utilized to prevent disclosure of

NHAMCS data. All information which could identify the facilities is confidential and seen only by persons engaged in NHAMCS, and is not disclosed or released to others for any other purpose. Names and other identifying information for individual patients are never removed from the facility.

Prior to release of the public use data files, NCHS conducts extensive disclosure risk analysis to minimize the chance of any inadvertent disclosure. In some cases, selected characteristics may have been masked on the public use file to minimize the potential for disclosure. Furthermore, outlier values for certain variables such as age were bottom and top coded in accordance with NCHS confidentiality requirements. Masking was performed in such a way as to cause minimal impact on the data; data users who wish to use unmasked data can apply to the NCHS Research Data Center.

## F. DATA PROCESSING

Edits - At NCHS, the data file underwent multiple consistency and edit checks. SRA, the NCHS contractor, edited and coded verbatim entries which required medical coding (diagnosis and procedures). A 5% quality control sample of survey records was independently keyed and coded.

Item nonresponse rates - generally low (less than 5 percent), but levels of nonresponse varied among different variables. The instances of variables with nonresponse, or with “unknown” marked as a response on more than 5% of the records, are noted below:

Time data – a number of records had blank fields for the time variables.

Time into operating room - 11.6% blank  
Time out of operating room - 12.6% blank

Time surgery began - 10.4 % blank  
Time surgery ended - 10.8% blank

Time into postoperative care - 21.1% blank  
Time out of postoperative care - 18.1% blank

ETHUN – Ethnicity unimputed – blank for 17.7% of the records  
RACEUN – Race unimputed – blank for 14.4% of the records  
OXYGEN – if oxygen was administered during the visit – Blank for 4.7% of the records. Unknown for another 10.9% of the records.  
ASCDISP – Disposition upon discharge – Unknown for 5.3%  
FUSURG – Did someone attempt to follow-up with the patient within 24 hours after surgery? – Unknown for 34.2%.

FUDK – What was learned from the attempted followup? Answered by 12,921 respondents but the response was “unable to reach the patient” in the case of 25.5%, and “unknown” for 30.9%. Since this item allowed multiple responses these percents may not be mutually exclusive.

### Imputation

On the NHAMCS AS file, four items were imputed: patient’s age (1.6 percent), sex (1.1 percent), race (14.4 percent), and ethnicity (17.7 percent). Age and sex were imputed using a hot deck method. Starting with 2010 data, the imputation of patient race and ethnicity was performed using a model-based single, sequential regression method. In addition to imputing missing data, masking was required for some facilities in order to protect respondent confidentiality.

## G. MEDICAL CODING AND QUALITY CONTROL

### Diagnosis and Procedure Codes

The Diagnosis and Procedure data from the AS PRFs were coded according to the International Classification of Diseases, 9<sup>th</sup> Revision, Clinical Modification (ICD-9-CM) (15).

For 2010 AS data, the ICD-9-CM codes are provided in the format of the true ICD-9-CM codes:

The true ICD-9-CM codes are not prefixed or zero filled on the public use file. For example, 38100 = 381.00 = Acute nonsuppurative otitis media, unspecified.

For diagnostic codes there is an implied decimal between the third and fourth digits. For inapplicable fourth or fifth digits, a dash has been inserted. For example, 4011- = 401.1 = Essential hypertension, benign.

For procedure codes there is an implied decimal between the second and third digits. For inapplicable fourth digits, a dash has been inserted.

True supplementary classification codes are not prefixed or zero filled. For example, V700- = V70.0 = Routine general medical examination at a health care facility.

In addition to the diagnostic codes from the ICD-9-CM, the following unique codes in the diagnostic fields were developed by NHAMCS staff:

- V990- = noncodable diagnosis, insufficient information for coding, illegible diagnosis
- V991- = left before being seen, patient walked out, not seen by doctor, left against medical advice
- V992- = transferred to another facility, sent to see specialist
- V993- = HMO will not authorize treatment
- V997- = entry of "none," "no diagnosis," "no disease," "healthy"
- V998- = entry of "not applicable", "N/A", "not available" or "blank"
- 9 = field is blank (in contrast to an actual entry of "blank")

A maximum of five diagnoses were coded in sequence. A maximum of seven procedures were coded in sequence.

The above medical coding, and the keying operations, by SRA, were subject to quality control procedures. The contractor randomly selected a sample of records which were independently recoded and compared. An independent verification procedure was used to review and adjudicate all records with coding discrepancies. Error rates, which were reported to NCHS, were low. If needed, problems were reviewed and adjudicated at NCHS.

#### H. VARIANCE ESTIMATION PROCEDURES

**Sampling errors** . Statistics from the NHAMCS were derived by a multistage estimation procedure that produced essentially unbiased estimates. The estimation procedure had three basic components: (a) inflation by reciprocals of the probabilities of sample selection, (b) adjustment for nonresponse, and (c) population weighting ratio adjustments.

#### I. PATIENT VISIT WEIGHT

The "patient visit weight" is a vital component in the process of producing national estimates from sample data and its use should be clearly understood by all data file users. The statistics contained on the data file reflect only a sample of patient visits-- not a complete count of all such visits that occurred in the United States. Each record on the AS file represents one visit in the sample of 26,961 visits. In order to obtain national estimates from the sample, each record is assigned an inflation factor called the "patient visit weight."

By aggregating the "patient visit weights" on the 27,006 sample records (including 45 dummy records added for more precise variance estimation) for 2010, the user should obtain the total of 28.6 million estimated visits made by patients who had ambulatory surgery in hospitals and ASCs in the United States.

**IMPORTANT:** Estimates produced from the 2010 AS public use file may differ somewhat from estimates produced from NCHS in-house files. This is because of adjustments required for the public use data as part of the disclosure avoidance process. Certain variables on a limited number

of records were masked for confidentiality purposes.

The marginal tables in Section III contain data on numbers of records for selected variables as well as the corresponding national estimated number of visits obtained by aggregating the "patient visit weights" on those records.

#### J. HOSPITAL CODE AND PATIENT CODE

The purpose of these codes is to allow for greater analytical depth by permitting the user to link individual PRFs on the public use file with individual hospitals or ASCs. This linkage will enable users to conduct more comprehensive analysis without violating the confidentiality of patients or facilities. Hospital and facility codes are randomly assigned each year and may be different on the AS, OPD and ED files.

To uniquely identify a record, both the hospital code and the patient code must be used. Patient codes are merely a sequential numbering of the visits recorded by the hospital or facility and alone will not uniquely identify visit records. In order to do so, both the unique 3-digit hospital or facility code and the 3-digit patient code must be used.

#### K. ISSUES TO CONSIDER WHEN COMPARING 2006 NSAS AND 2010 NHAMCS AS COMPONENT DATA

Limited resources did not permit updating the ASC frame for the 2010 NHAMCS and so the NSAS 2006 sample, based on ASCs in existence in 2005, was used. To minimize the bias in aggregate annual estimates, an adjustment ratio was included in the survey weights to account for changes in ASC facility numbers over this time period. But the 2010 ASC sample can only represent facilities which existed in 2005. Under the assumption that the characteristics of ambulatory surgery visits probably do not vary with facility age, the sample should enable measuring the 2010 characteristics (if not numbers) of ambulatory visits. To the extent that there were differences in the ASCs which existed in 2005 compared to those in existence in 2010, these differences would not have been fully captured by the 2010 NHAMCS (8).

As stated earlier, ambulatory surgery in 2006 was often provided in HBASCs (then a separate Medicare payment category), or in specific procedure rooms. After Medicare changed its ambulatory surgery payment category to HOPD in 2008, hospitals no longer had HBASCs. Especially in the first year of NHAMCS ambulatory surgery data collection (in 2009 when only hospital data were gathered), some of the NHAMCS hospital contacts had difficulty identifying in-scope procedures comparable to those included in NSAS. In some hospitals there was greater dispersion of these procedures throughout outpatient departments than in others, including to locations within medical clinics. Census Bureau and NCHS staff provided further guidance and training about how to make the distinction between procedures in and out of scope for the NHAMCS ambulatory surgery component

of the survey. Due to these issues we believe, especially in 2009, that there was undercounting of in-scope hospital ambulatory surgery procedures.

The period from 2006 to 2010 was a time of rapid and numerous changes in the health care system which makes comparison of data from various times difficult. This would apply to comparisons of NSAS 2006 to NHAMCS 2010 ambulatory surgery data. More information about the various difficulties of gathering and comparing data on ambulatory surgery from these two time periods and surveys is available (9). An examination of ambulatory surgery from various data sources, including Medicare, American Hospital Association (AHA), and NHAMCS has been undertaken to see the ways in which these different data sources agree and disagree about what occurred in ambulatory surgery during the years from 2006 to 2010 (10).

#### L. YEARS OF DATA COLLECTION

Annual ambulatory surgery data comparable to the 2010 data were gathered for 2011 and 2012. Ambulatory surgery data from hospitals were gathered annually from 2009 to the present (2016). Among the options being explored for future data collection are the use of claims data and the use of electronic health record data.

#### M. POPULATION FIGURES

This section provides estimates of the civilian population of the United States as of July 1, 2010. These figures are based on the results of the 2000 Census and were obtained from the U.S. Bureau of the Census, Population Division. All estimates are rounded to thousands, so each total may not equal the sum of the parts.

The base population used in computing annual visit rates is presented in Table I and Table II. The estimates of age, sex, race, ethnicity, and geographic region for the civilian noninstitutionalized population of the U.S. are from special tabulations developed by the Population Division, U.S. Census Bureau using the July 1, 2010 set of state population estimates, and reflect Census 2000 data. More information may be obtained from the Census website at [www.census.gov](http://www.census.gov).

Population estimates for race groups in the 2010 NHAMCS are based on data from the 2000 U.S. Census in which respondents were able to indicate more than one race category. Specific race denominators reflect persons with a single race identification, and a separate denominator is available for persons with more than one race designation. For a description of differences in the collection of race data as well as population denominators used for producing visit rates by race prior to 2002, please see the 2009 NHAMCS Public Use File Documentation at

[cdc.gov/pub/Health\\_Statistics/NCHS/Dataset\\_Documentation/NHAMCS/doc09.pdf](http://cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHAMCS/doc09.pdf)

Data indicate that multiple races are recorded for a patient less frequently in medical records compared to their numbers in the general population. The 2010 population estimates indicate that 1.8 percent of the total population identify themselves as being of multiple races. In contrast, multiple race patients account for only 0.3 percent of weighted AS visits (based on known race data only). Differences may exist because facility staff are less likely to know and record multiple race preferences for patients, and not because, after age-adjusting, persons with multiple races make fewer visits to ASs. This implies that the visit rates by race populations calculated for 2010 are probably slight overestimates for the single race categories and underestimates for the multiple race category.

Table I. U.S. population estimates used in computing annual visit rates for the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey, by selected characteristics: July 1, 2010

Race and sex	Age in years					
	All ages	Under 1	1-4	5-14	15-24	25-34
All races	303,627,880	4,143,409	17,112,952	40,692,618	42,287,436	40,748,206
Male	148,996,703	2,118,444	8,745,418	20,805,042	21,516,935	20,356,886
Female	154,631,177	2,024,965	8,367,534	19,887,576	20,770,501	20,391,320
White Only	241,589,629	3,062,411	12,708,859	30,882,023	32,552,787	31,680,709
Male	119,605,862	1,567,042	6,507,300	15,828,312	16,722,635	16,075,310
Female	121,983,767	1,495,369	6,201,559	15,053,711	15,830,152	15,605,399
Black Only	38,612,382	639,392	2,608,281	5,996,347	6,379,758	5,485,220
Male	17,979,151	325,607	1,323,590	3,039,054	3,103,890	2,537,584
Female	20,633,231	313,785	1,284,691	2,957,293	3,275,868	2,947,636
Asian Only	14,257,664	194,283	821,303	1,840,374	1,758,178	2,316,772
Male	6,875,418	99,498	417,467	932,706	890,124	1,116,854
Female	7,382,246	94,785	403,836	907,668	868,054	1,199,918
NHOPI* Only	580,140	10,222	41,853	94,120	92,451	96,551
Male	292,245	5,254	21,507	48,341	46,612	49,548
Female	287,895	4,968	20,346	45,779	45,839	47,003
AIAN* Only	3,153,877	63,602	248,226	501,364	527,018	477,870
Male	1,567,696	32,377	125,930	254,848	264,648	243,574
Female	1,586,181	31,225	122,296	246,516	262,370	234,296
Multiple Races	5,434,188	173,499	684,430	1,378,390	977,244	691,084
Male	2,676,331	88,666	349,624	701,781	489,026	334,016
Female	2,757,857	84,833	334,806	676,609	488,218	357,068

\*NHOPI is Native Hawaiian/Other Pacific Islander. AIAN is American Indian/Alaska Native.

Geographic Region totals		Metropolitan Statistical Area totals	
Northeast	54,581,911	MSA	256,865,184
Midwest	65,894,750	Non-MSA	46,762,696
South	112,027,614		
West	71,123,605		

SOURCE: These are U.S. Bureau of the Census postcensal estimates of the civilian noninstitutionalized population of the United States as of July 1, 2010. The estimates of age, sex, race and region are from special tabulations developed by the Population Division, U.S. Census Bureau using the July 1, 2010 set of state population estimates, and reflect

Census 2000 data. More information may be obtained from the Census website at [www.census.gov](http://www.census.gov). The 2010 MSA population estimates are based on data from the 2010 National Health Interview Survey (NHIS), National Center for Health Statistics, compiled according to the Office of Management and Budget's definition of core-based statistical areas as of December 2009. See [www.census.gov/population/www/estimates/metrodef.html](http://www.census.gov/population/www/estimates/metrodef.html) for more about MSA definitions.

Table I. U.S. population estimates used in computing annual visit rates for the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey, by selected characteristics: July 1, 2010 - con.

---

Race and sex	Age in years				
	35-44	45-54	55-64	65-74	75 and over
All races	39,837,315	44,058,729	35,836,894	21,190,077	17,720,244
Male	19,603,284	21,546,241	17,258,658	9,844,099	7,201,696
Female	20,234,031	22,512,488	18,578,236	11,345,978	10,518,548
White Only	31,396,791	35,791,642	29,919,092	18,092,370	15,502,945
Male	15,714,254	17,723,363	14,588,626	8,502,801	6,376,219
Female	15,682,537	18,068,279	15,330,466	9,589,569	9,126,726
Black Only	5,032,968	5,349,816	3,780,546	1,950,095	1,389,959
Male	2,237,511	2,431,213	1,680,279	812,262	488,161
Female	2,795,457	2,918,603	2,100,267	1,137,833	901,798
Asian Only	2,435,901	1,992,757	1,480,682	811,191	606,223
Male	1,174,768	946,483	678,491	372,320	246,707
Female	1,261,133	1,046,274	802,191	438,871	359,516
NHOPI* Only	83,595	72,917	47,866	24,622	15,943
Male	42,433	36,439	23,447	11,796	6,868
Female	41,162	36,478	24,419	12,826	9,075
AIAN* Only	401,158	407,730	290,190	146,525	90,194
Male	201,971	198,399	139,466	69,120	37,363
Female	199,187	209,331	150,724	77,405	52,831
Multiple Races	486,902	443,867	318,518	165,274	114,980
Male	232,347	210,344	148,349	75,800	46,378
Female	254,555	233,523	170,169	89,474	68,602

---

Table II. U.S. population estimates used in computing annual visit rates for the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey, by ethnicity, age, race, and sex: July 1, 2010

Race and sex	Age in years					
	All ages	Under 1	1-4	5-14	15-24	25-34
<b>HISPANIC</b>						
All races	48,984,363	1,073,320	4,448,080	9,139,432	8,239,554	8,007,928
Male	25,179,227	548,388	2,270,859	4,677,661	4,416,051	4,320,669
Female	23,805,136	524,932	2,177,221	4,461,771	3,823,503	3,687,259
White Only	44,947,997	948,344	3,943,744	8,299,812	7,567,912	7,406,795
Male	23,162,380	484,611	2,013,708	4,249,868	4,077,158	4,011,677
Female	21,785,617	463,733	1,930,036	4,049,944	3,490,754	3,395,118
Black Only	1,969,836	59,874	251,657	390,265	319,032	285,548
Male	961,936	30,593	128,220	198,441	159,315	141,677
Female	1,007,900	29,281	123,437	191,824	159,717	143,871
Asian Only	332,374	8,919	36,126	69,178	54,925	51,344
Male	165,581	4,567	18,674	35,542	27,551	26,124
Female	166,793	4,352	17,452	33,636	27,374	25,220
NHOPI* Only	130,902	2,848	11,697	25,914	23,191	23,343
Male	68,782	1,458	6,003	13,270	12,078	13,361
Female	62,120	1,390	5,694	12,644	11,113	9,982
AIAN* Only	814,966	24,563	90,223	148,251	137,548	134,325
Male	427,402	12,461	45,646	75,824	71,199	74,489
Female	387,564	12,102	44,577	72,427	66,349	59,836
Multiple Races	788,288	28,772	114,633	206,012	136,946	106,573
Male	393,146	14,698	58,608	104,716	68,750	53,341
Female	395,142	14,074	56,025	101,296	68,196	53,232

SOURCE: These are U.S. Bureau of the Census postcensal estimates of the civilian noninstitutionalized population of the United States as of July 1, 2010. They were developed by the Population Division, U.S. Census Bureau using the July 1, 2010 set of state population estimates, and reflect 2000 U.S. Census data. More information may be obtained from the Census website at [www.census.gov](http://www.census.gov).

Table II. U.S. population estimates used in computing annual visit rates for the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey, by ethnicity, age, race, and sex: July 1, 2010 - con.

---

HISPANIC					
	Age in years				
Race and sex	35-44	45-54	55-64	65-74	75 and over
All races	6,947,094	5,225,960	3,137,937	1,610,133	1,154,925
Male	3,615,686	2,621,351	1,517,254	729,207	462,101
Female	3,331,408	2,604,609	1,620,683	880,926	692,824
White Only	6,442,199	4,836,976	2,908,138	1,506,048	1,088,029
Male	3,365,501	2,432,546	1,408,577	682,508	436,226
Female	3,076,698	2,404,430	1,499,561	823,540	651,803
Black Only	254,276	196,943	118,519	56,159	37,563
Male	118,372	92,084	54,624	24,585	14,025
Female	135,904	104,859	63,895	31,574	23,538
Asian Only	43,556	33,793	20,206	8,930	5,397
Male	21,448	16,366	9,319	3,955	2,035
Female	22,108	17,427	10,887	4,975	3,362
NHOPI* Only	18,964	13,068	6,973	3,028	1,876
Male	10,373	6,617	3,445	1,411	766
Female	8,591	6,451	3,528	1,617	1,110
AIAN* Only	109,910	87,472	49,385	20,599	12,690
Male	61,137	46,176	25,207	9,950	5,313
Female	48,773	41,296	24,178	10,649	7,377
Multiple Races	78,189	57,708	34,716	15,369	9,370
Male	38,855	27,562	16,082	6,798	3,736
Female	39,334	30,146	18,634	8,571	5,634

---

Table II. U.S. population estimates used in computing annual visit rates for the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey, by ethnicity, age, race, and sex: July 1, 2010 – con.

---

NON-HISPANIC Race and sex	Age in years					
	All ages	Under 1	1-4	5-14	15-24	25-34
All races	254,643,517	3,070,089	12,664,872	31,553,186	34,047,882	32,740,278
Male	123,817,476	1,570,056	6,474,559	16,127,381	17,100,884	16,036,217
Female	130,826,041	1,500,033	6,190,313	15,425,805	16,946,998	16,704,061
White Only	196,641,632	2,114,067	8,765,115	22,582,211	24,984,875	24,273,914
Male	96,443,482	1,082,431	4,493,592	11,578,444	12,645,477	12,063,633
Female	100,198,150	1,031,636	4,271,523	11,003,767	12,339,398	12,210,281
Black Only	36,642,546	579,518	2,356,624	5,606,082	6,060,726	5,199,672
Male	17,017,215	295,014	1,195,370	2,840,613	2,944,575	2,395,907
Female	19,625,331	284,504	1,161,254	2,765,469	3,116,151	2,803,765
Asian Only	13,925,290	185,364	785,177	1,771,196	1,703,253	2,265,428
Male	6,709,837	94,931	398,793	897,164	862,573	1,090,730
Female	7,215,453	90,433	386,384	874,032	840,680	1,174,698
NHOPI* Only	449,238	7,374	30,156	68,206	69,260	73,208
Male	223,463	3,796	15,504	35,071	34,534	36,187
Female	225,775	3,578	14,652	33,135	34,726	37,021
AIAN* Only	2,338,911	39,039	158,003	353,113	389,470	343,545
Male	1,140,294	19,916	80,284	179,024	193,449	169,085
Female	1,198,617	19,123	77,719	174,089	196,021	174,460
Multiple Races	4,645,900	144,727	569,797	1,172,378	840,298	584,511
Male	2,283,185	73,968	291,016	597,065	420,276	280,675
Female	2,362,715	70,759	278,781	575,313	420,022	303,836

---

--

Table II. U.S. population estimates used in computing annual visit rates for the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey, by ethnicity, age, race, and sex: July 1, 2010 - con.

---

-

Race and sex	Age in years				
	35-44	45-54	55-64	65-74	75 and over
<b>NON-HISPANIC</b>					
All races	32,890,221	38,832,769	32,698,957	19,579,944	16,565,319
Male	15,987,598	18,924,890	15,741,404	9,114,892	6,739,595
Female	16,902,623	19,907,879	16,957,553	10,465,052	9,825,724
White Only	24,954,592	30,954,666	27,010,954	16,586,322	14,414,916
Male	12,348,753	15,290,817	13,180,049	7,820,293	5,939,993
Female	12,605,839	15,663,849	13,830,905	8,766,029	8,474,923
Black Only	4,778,692	5,152,873	3,662,027	1,893,936	1,352,396
Male	2,119,139	2,339,129	1,625,655	787,677	474,136
Female	2,659,553	2,813,744	2,036,372	1,106,259	878,260
Asian Only	2,392,345	1,958,964	1,460,476	802,261	600,826
Male	1,153,320	930,117	669,172	368,365	244,672
Female	1,239,025	1,028,847	791,304	433,896	356,154
NHOPI* Only	64,631	59,849	40,893	21,594	14,067
Male	32,060	29,822	20,002	10,385	6,102
Female	32,571	30,027	20,891	11,209	7,965
AIAN* Only	291,248	320,258	240,805	125,926	77,504
Male	140,834	152,223	114,259	59,170	32,050
Female	150,414	168,035	126,546	66,756	45,454
Multiple Races	408,713	386,159	283,802	149,905	105,610
Male	193,492	182,782	132,267	69,002	42,642
Female	215,221	203,377	151,535	80,903	62,968

---

-

## REFERENCES

1. McCaig LF, McLemore T. Plan and Operation of the National Hospital Ambulatory Medical Care Survey, National Center for Health Statistics. Vital and Health Statistics 1(34).1994.
2. Verispan LLC. Healthcare Market Index, Updated July 15, 2006, and its “Hospital Market Profiling Solution, Second Quarter”. Chicago: Healthcare Information Specialists. 2006.
3. Verispan LLC. Freestanding Outpatient Surgery Centers Database. Chicago: Healthcare Information Specialists. 2005.
4. Centers for Medicare and Medicaid Services. Provider of Services File. Baltimore, MD. 2005.
5. Cullen KA, Hall MJ, Golosinskiy A. Ambulatory surgery in the United States, 2006. National health statistics reports; no 11. Revised. Hyattsville, MD: National Center for Health Statistics. 2009. Available from  
<http://www.cdc.gov/nchs/data/nhsr/nhsr011.pdf>
6. CDC. International Classification of Diseases, Ninth Revision, Clinical Modification. 6<sup>th</sup> ed. 2006. Available from: <http://www.cdc.gov/nchs/icd/icd9cm.htm>
7. Lexicon Multum from Cerner Multum, Inc. Available from:  
<http://www.multum.com/lexicon.html>
8. Shimizu I. Sampling design for the 2010-12 National Hospital Ambulatory Medical Care Survey. Proceedings from the 2011 JSM Annual Meeting. Alexandria, VA: American Statistical Association. 2012. Available from the NHAMCS information line.
9. Hall MJ. The challenges of gathering and interpreting national data on ambulatory surgery over time. Proceedings from the 2013 JSM Annual Meeting. Alexandria, VA: American Statistical Association. 2014. Available from the NHAMCS information line.
10. Hall MJ. Comparison of national data on ambulatory surgery from CDC’s National Hospital Ambulatory Medical Care Survey, Medicare, the American Hospital Association and SDI. Proceedings from the 2014 JSM Annual Meeting. Alexandria, VA: American Statistical Association. Available from the NHAMCS information line.

Information concerning additional reports using NHAMCS data that have been published or are scheduled for publication through NCHS may be obtained from the Ambulatory and Hospital Care Statistics Branch Information Line by calling (301) 458-4600.

## II. RECORD FORMAT OF THE 2010 NHAMCS AMBULATORY SURGERY MICRO-DATA FILE

This data file contains 27,006 records, including 45 records with a weight included for variance computation.

For each item on the record, the user is provided with a sequential item number, field length, file location, and brief description of the item along with valid codes. The first two items (SETTYPE and FACTYPE) are from the sampling frames. The other items are derived from the Ambulatory Surgery Patient Record Form.

ITEM NO.	FIELD LENGTH	FILE LOCATION	[ITEM NAME] DESCRIPTION AND CODES
1	2	1-2	<p>[SETTYPE] SETTING TYPE</p> <p>This item is intended for use when combining data from the National Ambulatory Medical Care Survey (NAMCS) or NHAMCS-OPD or ED public use files with AS data.</p> <p>1 = Physician Office (NAMCS) (only on NAMCS file)            2 = Outpatient Department (NHAMCS-OPD)            3 = Emergency Department (NHAMCS-ED)            4 = Ambulatory Surgery location or center (NHAMCS AS)</p>
2	2	3-4	<p>[FACTYPE] TYPE OF FACILITY</p> <p>1=hospital (formerly referred to as hospital-based), 2=ambulatory surgery center (formerly referred to as free-standing).</p>
PATIENT INFORMATION			
3	2	5-6	<p>[VMONTH] Month of visit</p> <p>01= January            02= February            03= March            04= April            05= May            06= June            07= July            08= August            09= September            10= October            11= November            12= December</p>
4	4	7-10	<p>[VYEAR] Year of visit</p>

			2009= year 2009 2010= year 2010
5	3	11-13	[AGE] Patient age in years (derived from date of birth and date of visit).  000 -Under 1 year 001-084 – 1 year to 84 years old 085 – 85 years and over Ages 85 and over were combined into one category to protect confidentiality.
6	2	14-15	[AGEREC] Patient age in years recoded (derived from date of birth and date of visit).  00= less than 1 year 01= 1 to 14 years old 02= 15-24 years old 03= 25-44 years old 04= 45-64 years old 05= 65-74 years old 06= 75-84 years old 07= 85 years and over
7	2	16-17	[AGER] Patient age in years recoded (derived from date of birth and date of visit).  1= less than 15 years old 2= 15-24 years old 3= 25-44 years old 4= 45-64 years old 5= 65-74 years old 6= 75 years and older
8	2	18-19	[SEX] Patient sex  1=Female 2=Male
9	2	20-21	[ETHUN] ETHNICITY (UNIMPUTED) This variable is NOT imputed. Ethnicity data were missing on 17.7% of AS records. An imputed ethnicity variable (ETHNIC) can be found in columns 213-214.  -9= Blank 1 = Hispanic or Latino 2 = Not Hispanic or Latino
10	2	22-23	[RACEUN] RACE (UNIMPUTED) This variable is NOT imputed. Race data were missing on 14.4% of AS records. An imputed race variable (RACER) can be found in columns 211-212. -9 = Blank 1 = White only

2 = Black/African American only  
 3-6 = Other  
 Other race categories were combined in one category to protect confidentiality.

FOR THE EXPECTED SOURCE OF PAYMENT CATEGORIES, DIRECTIONS WERE TO MARK ALL THAT APPLY.

11	2	24-25	[PAYPRIV] EXPECTED SOURCE OF PAYMENT: PRIVATE INSURANCE 0 = No 1 = Yes
12	2	26-27	[PAYMCARE] EXPECTED SOURCE OF PAYMENT: MEDICARE 0 = No 1 = Yes
13	2	28-29	[PAYMCAID] EXPECTED SOURCE OF PAYMENT: MEDICAID or CHIP/SCHIP 0 = No 1 = Yes
14	2	30-31	[PAYWKCMP] EXPECTED SOURCE OF PAYMENT: WORKER'S COMPENSATION 0 = No 1 = Yes
15	2	32-33	[PAYSELF] EXPECTED SOURCE OF PAYMENT: SELF PAY 0 = No 1 = Yes
16	2	34-35	[PAYNOCHG] EXPECTED SOURCE OF PAYMENT: NO CHARGE 0 = No 1 = Yes
17	2	36-37	[PAYOTH] EXPECTED SOURCE OF PAYMENT: OTHER 0 = No 1 = Yes
18	2	38-39	[PAYDK] EXPECTED SOURCE OF PAYMENT: UNKNOWN 0 = No 1 = Yes

TIME DATA

19	2	40-41	[ORINHR] Time into operating room (hour) 0-23= 0 to 23 hour -9=blank
20	2	42-43	[ORINMIN] Time into operating room (minute) 0-59= 0 to 59 minute -9=blank
21	2	44-45	[ORINTIME] Time into operating room (type) 1=Military 2=a.m. 3=p.m. -9=blank
22	2	46-47	[SURBHR] Time surgery began (hour) 0-23= 0 to 23 hour -9=blank
23	2	48-49	[SURBMIN] Time surgery began (minute) 0-59= 0 to 59 minute -9=blank
24	2	50-51	[SURBTIME] Time surgery began (type) 1=Military 2=a.m. 3=p.m. -9=blank
25	2	52-53	[SUREHR] Time surgery ended (hour) 0-23= 0 to 23 hour -9=blank
26	2	54-55	[SUREMIN] Time surgery ended (minute) 0-59= 0 to 59 minute -9=blank
27	2	56-57	[SURETIME] Time surgery ended (type) 1=Military 2=a.m. 3=p.m. -9=blank
28	2	58-59	[OROUTHR] Time out of operating room (hour) 0-23= 0 to 23 hour -9=blank
29	2	60-61	[OROUTMIN] Time out of operating room (minute) 0-59= 0 to 59 minute -9=blank
30	2	62-63	[OROUTTIME] Time out of operating room (type) 1=Military 2=a.m. 3=p.m. -9=blank
31	2	64-65	[POINHR] Time into postoperative care (hour) 0-23= 0 to 23 hour -9=blank
32	2	66-67	[POINMIN] Time into postoperative care (minute) 0-59= 0 to 59 minute -9=blank
33	2	68-69	[POINTIME] Time into postoperative care (type) 1=Military 2=a.m. 3=p.m. -9=blank
34	2	70-71	[POUTHR] Time out of postoperative care (hour) 0-23= 0 to 23 hour -9=blank
35	2	72-73	[POUTMIN] Time out of postoperative care (min) 0-59= 0 to 59 minute -9=blank
36	2	74-75	[POUTIME] Time out of postoperative care (type) 1=Military 2=a.m. 3=p.m. -9=blank

DIAGNOSES – character variables entered as \$CHAR5.

37	6	76-80	[DIAG1] PRIMARY DIAGNOSIS # 1 (ICD-9-CM) There is an implied decimal between the third and fourth digits; for inapplicable fourth or fifth digits, a dash is inserted.
----	---	-------	--

-9 = Blank (no entry made)  
0010[-] – V9199 = 001.0[0]-V998

V991- = left before being seen, patient walked out, not seen by doctor, left against

medical advice

V992- = transferred to another facility, sent to see specialist

V993- = HMO will not authorize treatment

V997- = entry of "none," "no diagnosis," "no disease," "healthy"

V998- = entry of “not applicable”, “N/A”, “not available” or “blank”  
 -9 = field is blank (in contrast to an actual entry of “blank”)

38	6	81-85	[DIAG2] DIAGNOSIS # 2 (ICD-9-CM) There is an implied decimal between the third and fourth digits; for inapplicable fourth or fifth digits, a dash is inserted. See DIAGNOSIS #1 for details.
39	6	86-90	[DIAG3] DIAGNOSIS # 3 (ICD-9-CM) There is an implied decimal between the third and fourth digits; for inapplicable fourth or fifth digits, a dash is inserted. See DIAGNOSIS #1 for details.
40	6	91-95	[DIAG4] DIAGNOSIS # 4 (ICD-9-CM) There is an implied decimal between the third and fourth digits; for inapplicable fourth or fifth digits, a dash is inserted. See DIAGNOSIS #1 for details.
41	6	96-100	[DIAG5] DIAGNOSIS # 5 (ICD-9-CM) There is an implied decimal between the third and fourth digits; for inapplicable fourth or fifth digits, a dash is inserted. See DIAGNOSIS #1 for details.

PROCEDURES - character variables entered as \$CHAR4.

42	5	101-104	[PROC1] Primary diagnostic or surgical procedure There is an implied decimal between the second and third digits; for inapplicable fourth digit, a dash is inserted.  0001-9999 = 'Valid range' -9= Blank
43	5	105-108	[PROC2] Other diagnostic or surgical procedure There is an implied decimal between the second and third digits; for inapplicable fourth digit, a dash is inserted.  0001-9999 = 'Valid range' -9= Blank
44	5	109-112	[PROC3] Other diagnostic or surgical procedure There is an implied decimal between the second and third digits; for inapplicable fourth digit, a dash is inserted.  0001-9999 = 'Valid range' -9= Blank
45	5	113-116	[PROC4] Other diagnostic or surgical procedure There is an implied decimal between the second and third digits; for inapplicable fourth digit, a dash is inserted.  0001-9999 = 'Valid range' -9= Blank

46	5	117-120	[PROC5] Other diagnostic or surgical procedure. There is an implied decimal between the second and third digits; for inapplicable fourth digit, a dash is inserted.  001-9999 = 'Valid range' -9= Blank
47	5	121-124	[PROC6] Other diagnostic or surgical procedure There is an implied decimal between the second and third digits; for inapplicable fourth digit, a dash is inserted.  0001-9999 = 'Valid range' -9= Blank
48	5	125-128	[PROC7] Other diagnostic or surgical procedure There is an implied decimal between the second and third digits; for inapplicable fourth digit, a dash is inserted.  0001-9999 = 'Valid range' -9= Blank

## OXYGEN AND ANESTHESIA

49	2	129-130	[OXYGEN] Was oxygen administered during this visit? 1 = Yes, 2=No, -8 = Unknown
----	---	---------	--

## TYPE OF ANESTHESIA

1=Yes, 2= entire item blank – Mark all that apply.

50	2	131-132	[NOANES] Type(s) of anesthesia: None
51	2	133-134	[GENLANES] General anesthesia
52	2	135-136	[IVSED] IV sedation
53	2	137-138	[MAC] Monitored anesthesia care
54	2	139-140	[TOPLOC] Topical/local
55	2	141-142	[EPIDURAL] Regional - epidural
56	2	143-144	[SPINAL] Regional – spinal
57	2	145-146	[RETROBUL] Regional – retrobulbar
58	2	147-148	[PERIBUL] Regional - peribulbar
59	2	149-150	[OTHBLOCK] Regional – other block
60	2	151-152	[OTHANES] Other Anesthesia

## PROVIDER(S) OF ANESTHESIA

0 = No, 1 = Yes – Mark all that apply.

61	2	153-154	[ANESPHYS] Anesthesiologist
62	2	155-156	[CRNA] Certified registered nurse anesthetist
63	2	157-158	[SURGOTH] Surgeon/Other physician
64	2	159-160	[PROVDK] Providers of anesthesia: Unknown

## SYMPTOM(S) PRESENT DURING OR AFTER PROCEDURE

0='Box is not marked'  
 1='Box is marked'  
 2='Entire item blank'  
 Mark all that apply.

65	2	161-162	[NOSYMP] Symptom(s) present during or after procedure: None
66	2	163-164	[APNEA] Apnea
67	2	165-166	[BLEED] Bleeding/Hemorrhage
68	2	167-168	[DIFFWAKE] Difficulty waking up
69	2	169-170	[DYSRHY] Dysrhythmia/Arrhythmia
70	2	171-172	[HTNHBP] Hypertension/High blood pressure
71	2	173-174	[HYPOLBP] Hypotension/Low blood pressure
72	2	175-176	[HYPOXIA] Hypoxia
73	2	177-178	[INCONT] Incontinence
74	2	179-180	[NAUSEA] Nausea
75	2	181-182	[VOMIT] Vomiting
76	2	183-184	[OTHSYMP] Other symptoms

## VISIT DISPOSITION

77	2	185-186	[ASCDISP] Disposition upon discharge 1= Routine discharge to customary residence 2= Discharge to observation status 3= Discharge to post-surgical/recovery care facility 4= Admitted to hospital as inpatient 5= Referred to ED 6= Surgery terminated 7 = Other -8= Unknown -9= Blank
----	---	---------	--

## FOLLOWUP INFORMATION

78	2	187-188	[FUSURG] a. Did someone attempt to follow-up within 24 hours after surgery? 1=yes 2=no -8= unknown -9=blank
----	---	---------	--

b. What was learned from this followup? (Mark all that apply).

0=box is not marked 1=box is marked -7 =not applicable

79	2	189-190	[REACHNO] Unable to reach patient
80	2	191-192	[PROBNO] Patient reported no problems
81	2	193-194	[PROBCARE] Patient reported problems and sought medical care
82	2	195-196	[PROVADV] Patient reported problems and was advised by AS staff to seek medical care
83	2	197-198	[PROVNOFU] Patient reported problems, but no followup medical care was needed
84	2	199-200	[OTHFU] Other
85	2	201-202	[FUDK] Unknown

\*\*\*\* DATA IMPUTATION FLAGS - THE FOLLOWING FIELDS SHOW WHETHER DATA WERE IMPUTED TO REPLACE BLANKS \*\*\*\*

IMPUTED FIELDS

0 = Not imputed

1 = Imputed

86	2	203-204	[BDATEFL] Patient birth date
87	2	205-206	[SEXFL] Patient sex
88	2	207-208	[[RACERFL] Patient race
89	2	209-210	[ETHNICFL] Patient ethnicity

DERIVED VARIABLES

90	2	211-212	[RACER] RACE (WITH MISSING DATA IMPUTED- MODEL BASED)
----	---	---------	---

1 = White

2 = Black

3 = Other

91	2	213-214	[ETHNIC] ETHNICITY WITH MISSING DATA IMPUTED (MODEL-BASED)
----	---	---------	--

1 = Hispanic or Latino

2 = Not Hispanic or Latino

92	2	215-216	[PAYTYPER] RECODED PRIMARY EXPECTED SOURCE OF PAYMENT FOR THIS VISIT (Using this hierarchy of payment categories: Medicare, Medicaid or CHIP, Private Insurance, Worker's Compensation, Self-Pay, No Charge/Charity, Other, Unknown)
----	---	---------	--

NOTE change in hierarchy starting in 2008 relative to previous years. In 2005-2007, dual-eligible Medicare and Medicaid recipients had been grouped under Medicaid; this was changed to Medicare starting in 2008. See page 2 of the 2009 NHAMCS Public Use Data File Documentation for more information. Researchers can also create their own hierarchy as desired.

-9 = Blank

-8 = Unknown

1 = Private insurance

2 = Medicare

3 = Medicaid or CHIP

4 = Worker's compensation

5 = Self-pay

6 = No charge/Charity

7 = Other

93	2	217-218	[NOPAY] Computes whether at least one expected source of Payment is marked
----	---	---------	--

0= At least one source of payment is recorded

1= All sources of payment are blank

94	2	219-220	[TOTPROC] Total number of diagnostic and surgical procedures 0-7 – Valid range -9 - Blank
95	3	221-223	[HOSPCODE] HOSPITAL CODE A unique masked facility code assigned to all the records from a particular hospital or ambulatory surgery center. Both settings, that is hospitals and ambulatory surgery centers, have a HOSPCODE .  001-361= Valid range
96	3	224-226	[PATCODE] PATIENT CODE - A sequential count of individual records from a particular facility.  001-207= Valid range
97	6	227-232	[RECNUM] – Facility code (HOSPCODE) followed by patient code (PATCODE) - \$CHAR6. 001001-361207 = valid range

#### NHAMCS DESIGN VARIABLES

Masked design variables are CSTRATM and CPSUM. They can be used to estimate variance with SUDAAN's with-replacement (WR) option, as well as with Stata, SPSS, SAS, and other statistical software packages utilizing an ultimate cluster model for variance estimation. These variables and their use are described more fully in the "Relative Standard Errors" section of this document.

98	11.6	233-243	[PATWT] PATIENT VISIT WEIGHT (rounded) A right-justified integer developed by NCHS staff for the purpose of producing national estimates from sample data. 21-8671='Valid range'
99	8	244-251	[CSTRATM] CLUSTRED PSU STRATUM MARKER (masked) 20110201-40510308 = "valid range"
100	6	252-257	[CPSUM] CLUSTERED PSU MARKER (masked) 3-105475= 'valid range'

### III. MARGINAL DATA

There were 27,006 unweighted records in the file but 45 records were included for variance estimation purposes and these records have a WEIGHT value. These 45 records are not included in the data below.

#### A. AMBULATORY SURGERY PATIENT VISITS

FACILITY TYPE (FACTYPE)	Records	Weighted Estimates	Percent
Total	26,961	28,588,475	100.00
1- Hospital-based (hospital)	18,489	15,676,286	54.83
2 – Freestanding (ambulatory surgery center)	8,492	12,912,189	45.17
PATIENT SEX (SEX)			
Total	26,961	28,588,475	100.00
1 – Female	15,327	16,480,707	57.65
2 – Male	11,634	12,107,768	42.35
PATIENT AGE			
Total	26,961	28,588,475	100.00
1 - Under 15 years	1,811	1,811,918	6.34
2 - 15-44 years	6,548	6,426,417	22.48
3 - 45-64 years	10,119	10,910,734	38.16
4 - 65-74 years	4,711	5,300,679	18.54
5- 75 years and over	3,772	4,138,727	14.48

## PATIENT RACE (RACER) – imputed

1 - White only	22,728	25,104,320	87.81
2 - Black only	2,802	2,362,221	8.26
3 – Other	1,431	1,121,934	3.92
	26,961	28,588,475	100.00

## PATIENT ETHNICITY (ETHNIC) - imputed

1 – Hispanic or Latino	2,801	3,317,441	11.60
2 –Not Hispanic or Latino	24,160	25,271,034	88.40
TOTAL	26,961	28,588,475	100.00

PRIMARY EXPECTED SOURCE OF PAYMENT FOR THIS VISIT (PAYTYPER) – RECODED using this hierarchy of payment categories: Medicare, Medicaid or CHIP, Private Insurance, Worker’s Compensation, Self-Pay, No Charge/Charity, Other, Unknown.

Researchers can also create their own hierarchy if desired.

## Total

1 - Total	26,961	28,588,475	100.0
2 - Private insurance	13,650	14,523,149	50.80
3 - Medicare	7,988	8,754,668	30.62
3 - Medicaid or CHIP/SCHIP	2,507	2,283,844	7.99
4 - Worker’s compensation	453	460,530	1.61
5 - Self-pay	854	1,196,419	4.19

6.- No charge	148	83,259	0.29
7 - Other	534	652,408	2.28
-8 – Unknown	608	420,058	1.47
-9 – Blank	219	214,140	0.75

## VISIT DISPOSITION (ASCDISP)

Total	26,961	28,588,475	100.00
1 - Routine discharge to customary residence	24,038	26,014,237	91.00
2 - Discharge to observation status	445	560,174	1.96
3 - Discharge to post-surgical/recovery care facility	262	163,628	0.57
4 - Admitted to hospital as inpatient	561	544,464	1.90
5 - Referred to ED	20	16,853	0.06
6 - Surgery terminated	41	29,256	0.10
7 - Other	109	78,710	0.28
8 - Unknown	1,485	1,181,153	4.13

## B. AMBULATORY SURGERY NUMBERS OF PROCEDURES BY ICD-9-CM CHAPTERS - from all listed PROC 1-7

	Unweighted procedures	Weighted procedures	Percent
Operations on the Nervous System	2,700	4,226,073	8.76
Operations on the Endocrine System	76	85,032	0.18
Operations on the Eye	3,182	7,879,542	16.33
Operations on the Ear	664	1,053,946	2.18
Operations on the Nose, Mouth, and Pharynx	1,397	2,407,303	4.99
Operations on the Respiratory System	244	282,150	0.58
Operations on the Cardiovascular System	865	930,463	1.93
Operations on the Hemic and Lymphatic System	217	243,704	0.50

Operations on the Digestive System	7,530	10,045,197	20.81
Operations on the Urinary System	1,310	1,349,161	2.80
Operations on the Male Genital Organs	567	525,338	1.09
Operations on the Female Genital Organs	1,518	1,765,788	3.66
Obstetrical Procedures	31	19,469	0.04
Operations on the Musculoskeletal System			
	3,911	7,074,135	14.66
Operations on the Integumentary System	2,334	4,340,234	8.99
Miscellaneous Diagnostic and and Therapeutic Procedure	4,422	5,855,868	12.13
Procedures and Interventions Not Elsewhere Classified	129	79,885	0.37
Total	31,097	48,263,288	100.00

## APPENDIX

### A. RELATIVE STANDARD ERRORS

The standard error is primarily a measure of sampling variability that occurs by chance because only a sample rather than the entire universe is surveyed. The relative standard error (RSE) of the estimate is obtained by dividing the standard error by the estimate itself.

In the past, NHAMCS micro-data file documentation contained formulas for approximating relative standard errors based on generalized variance curves as well as tables showing lowest reliable estimates based on curve coefficients. Using computer software like SUDAAN to produce standard errors will, in general, yield results that are more accurate than those produced using generalized variance curves. This is especially true for clustered variables like race, provider seen, or expected source of payment. However, standard errors produced with such software using masked design variables, while a substantial improvement over generalized variance curve results, will not always be as accurate as those produced using unmasked data. Data files containing unmasked variables are confidential and are only available through the NCHS Research Data Center. Two masked variables, CSTRATM and CPSUM, were developed so that programs that use an ultimate cluster model can be run. Ultimate cluster variance estimates depend only on the first stage of the sample design, so that only first-stage cluster and first-stage stratum identification are required.

Examples using CSTRATM and CPSUM in SUDAAN's 1-stage WR (with replacement) design option, SAS's PROC SURVEYMEANS, Stata, and SPSS applications are presented below.

It should be noted that public use file data users are urged to combine data from the AS, ED, and OPD components of NHAMCS in order to ensure that all hospitals were included (since hospitals were sampled prior to the selection of AS locations, EDs and OPDs) to get the best variance estimation. There may be in the public use files hospitals with some but not all of the three settings (AS locations, EDs, OPDs), and if only one file were used, not all hospitals would be accounted for when calculating variances. Studies in this area with later ED data indicate that SUDAAN's with-replacement (WR) option (using an ultimate cluster design) would yield standard errors that were on average slightly more conservative than the majority of those produced with internal data using SUDAAN's without-replacement (WOR) option. Since this type of analysis has not been performed using the AS data, the recommendation remains that the data user combine AS, ED and OPD data when computing variances.

#### SUDAAN 1-stage WR (With-Replacement) Option

The program below provides a with-replacement ultimate cluster (1-stage) estimate of standard errors for a cross-tabulation with a dataset called COMB1.

```
PROC CROSSTAB DATA=AS1 DESIGN=WR FILETYPE=SAS;  
NEST CSTRATM CPSUM/MISSUNIT;
```

### SAS - PROC SURVEYMEANS

```
PROC SURVEYMEANS DATA=AS1;  
CLUSTER CPSUM;  
STRATA CSTRATM;
```

### Stata - For use with ultimate cluster design option:

The pweight (PATWT), strata (CSTRATM), and PSU (CPSUM) are set with the svyset command as follows:

#### Stata 8:

```
svyset [pweight=patwt], psu(cpsum) strata(cstratm)
```

#### Stata 9 and later:

```
svyset cpsum [pweight=patwt], strata(cstratm)
```

### SPSS

To obtain variance estimates which take the sample design into account, IBM SPSS Inc.'s Complex Samples module can be used. This description applies to version 21.0. From the main menu, first click on 'Analyze', then 'Complex Samples', then 'Prepare for Analysis'. The 'Analysis Preparation Wizard' can be used to set CSTRATM as the stratum variable, CPSUM as the cluster variable, and PATWT as the weighting variable. The WR design option may be chosen. This will create the PLAN FILE syntax, which should resemble the code below, where PLAN FILE reflects the location you have selected to store the file on your computer:

#### CSPLAN ANALYSIS

```
/PLAN FILE='DIRECTORY\PLANNAME.CSAPLAN'  
/PLAN VARS ANALYSISWEIGHT=PATWT  
/PRINT PLAN  
/DESIGN STAGELABEL='ANY LABEL' STRATA=CSTRATM CLUSTER=CPSUM  
/ESTIMATOR TYPE=WR.
```

After creating the plan file, various analyses can be selected from the 'Complex Samples' menu. This is an example of a crosstabulation with options selected for counts, percents, and standard errors, with missing data (if any) included:

#### CSTABULATE

```
/PLAN FILE='DIRECTORY\PLANNAME.CSAPLAN'
```

```

/TABLES VARIABLES = AGER BY SEX
/CELLS POPSIZE ROWPCT COLPCT
/STATISTICS SE COUNT
/MISSING SCOPE = TABLE CLASSMISSING = INCLUDE.

```

Since the ultimate cluster procedures discussed above compute Taylor series variance estimates, results should be identical. Results differ, however, when a single case stratum, or singleton, is present on the data file because each software package treats such cases differently. Please contact the Ambulatory and Hospital Care Statistics branch if more information is needed on this point.

**B. DEFINITION OF AMBULATORY SURGERY IN NHAMCS AS** - Surgery procedures performed in locations within hospitals, identified by hospital staff, and including but not limited to those performed in the general or main operating room, satellite operating room, cystoscopy room, endoscopy room, cardiac catheterization lab, laser procedures room, and pain block room. For in-scope ambulatory surgery centers, all procedures performed are in-scope.

In addition to being listed by physicians on the medical record as procedures, included services may be referred to as surgical or nonsurgical operations or special treatments.

This report also does not include ambulatory surgery performed in physicians' offices or in independent screening or testing centers.

### C. INSTRUCTIONS FOR COMPLETING SELECTED ITEMS ON THE PATIENT RECORD FORMS

To further explain how data were gathered for the following variables, the instructions given to data abstractors are provided below:

#### Ethnicity

Ethnicity refers to a person's national or cultural group.

There are two categories for ethnicity, "Hispanic or Latino" and "Not Hispanic or Latino".

Abstractors were asked to use knowledge of the patient or the information in the medical record to answer this item. If the patient's ethnicity was not known and was not obvious, the abstractor was instructed to enter the category which in their judgment was most appropriate. Abstractors were instructed to not determine the patient's ethnicity from his/her last name.

The definitions of the categories are listed below.

Ethnicity	Definition
-----------	------------

1 Hispanic or Latino	A person of Cuban, Mexican, Puerto Rican, South or Central American or other Spanish culture or origin, regardless of race.
2 Not Hispanic or Latino	All other persons.

## Race - Mark all that apply

Abstractors were advised to enter all appropriate categories based on observation, knowledge of the patient, or the information in the medical record. If the patient's race was not known or not obvious, the abstractor was instructed to enter the category or categories which in their judgment was (were) most appropriate. Abstractors were instructed not to determine the patient's race from their last name.

Race	Definition
1 White	A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
2 Black or African American	A person having origins in any of the black racial groups of Africa.
3 Asian	A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
4. Native Hawaiian or Other Pacific Islander	A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
5. American Indian or Alaska Native	A person having origins in any of the original peoples of North America, and who maintains cultural identification through tribal affiliation or community recognition.

Expected source(s) of payment for this visit - Mark all that apply.

Expected source(s) of Payment	Definition
1 Private insurance	(PAYPRIV) Charges paid in-part or in-full by a private insurer (e.g., Blue Cross/Blue Shield) either directly to the hospital or reimbursed to the patient. Include charges covered under a private insurance sponsored prepaid plan.
2 Medicare	(PAYMCARE) Charges paid in-part or in-full by a Medicare plan. Includes payments directly to the hospital as well as payments reimbursed to the patient. Include charges covered under a Medicare sponsored prepaid plan.
3 Medicaid or CHIP	(PAYMCAID) Charges paid in-part or in-full by a Medicaid plan. Includes payments made directly to the hospital as well as payments reimbursed to the patient.  Include charges covered under a Medicaid sponsored prepaid plan or the Children's Health Insurance Program (CHIP).
4 Worker's compensation	(PAYWKCMP) Includes programs designed to enable employees injured on the job to receive financial compensation regardless of fault.
5 Self-pay	(PAYSELF) Charges, to be paid by the patient or patient's family, which will not be reimbursed by a third party. "Self-pay" includes visit for which the patient is expected to be ultimately responsible for most of the bill, even though the patient never actually pays it. DO NOT enter "Self-pay" for a copayment or deductible.
6 No charge/Charity	(PAYNOCHG) Visits for which no fee is charged (e.g., charity, special research or teaching). Do not include visits paid for as part of a total package (e.g., prepaid plan visits, post-operative visits included in a surgical fee, and pregnancy visits included in a flat fee charged for the entire pregnancy). Enter the payment category or categories that indicate how the services were originally paid.
7 Other	(PAYOTH) Other sources of payment not covered by the above categories, such as TRICARE, state and local governments, private charitable organizations, and other liability insurance (e.g., automobile collision policy coverage).
8. Unknown	(PAYDK) The patient's payment source is not known.

### Time of visit

Abstractors were asked to record the hour, minutes, and AM/PM/Military time indicator for the following times: time into the operating room, time surgery began, time surgery ended, time out of the operating room, time into postoperative care, and time out of postoperative care. For example, 600 with AM checked would be entered for 6:00 A.M., and 600 with PM checked would be entered for 6:00 P.M. An alternative way that 6 P.M. could be entered is 1800 with military checked which means 18:00 military time.

---

### CONTACT INFORMATION

Questions concerning NHAMCS AS data should be directed to:  
Centers for Disease Control and Prevention  
National Center for Health Statistics  
Division of Health Care Statistics  
Ambulatory and Hospital Care Statistics  
Branch  
3311 Toledo Road, 3<sup>rd</sup> floor  
Hyattsville, Maryland 20782

Phone: 301.458.4321 or  
301-458-4600

Or visit the NHAMCS website at

[www.cdc.gov/nchs/ahcd/about\\_ahcd.htm](http://www.cdc.gov/nchs/ahcd/about_ahcd.htm)