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A Comparison of Emergency Department Visit Data from the National Hospital Ambulatory Medical Care Survey and the National Hospital Care Survey: 2020

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Abstract

Objective—This report describes similarities and differences in estimates on emergency department (ED) visits that use the discontinued National Hospital Ambulatory Medical Care Survey (NHAMCS) and the active National Hospital Care Survey (NHCS), which may be helpful to researchers as they transition to using NHCS data.

Methods—Nationally representative estimates were derived from data collected in the 2020 NHAMCS and the 2020 NHCS. NHAMCS was an annual national probability sample survey of ED visits at nonfederal, noninstitutional short-stay hospitals in the United States. NHCS is an annual national probability sample survey of ED visits and inpatient discharges at nonfederal, noninstitutional hospitals in the United States with six or more staffed inpatient beds.

Results—No statistically significant differences were found in the overall number or rate of ED visits when comparing data from NHAMCS and NHCS. Differences were noted for visits by children younger than age 1 and ages 1-17, which were lower in NHCS than NHAMCS, especially for visits by boys. Comparing diagnosis and visit disposition data was complicated by differences in survey methodology, including data collection methods, item definitions and categories, and response rates. Methods were developed to enable comparisons while taking these differences into consideration. Overall, patterns of visits by primary diagnoses, assessed by International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) chapter headings, appeared to be generally similar in both surveys, although some differences were noted. Disposition data were analyzed but, because of differences in data collection and coding, did not support meaningful comparisons between the two surveys. Additional analysis was conducted which compared results from public use files and restricted files for both surveys. No statistically significant differences were found for the variables analyzed.

Conclusions—Both similarities and differences were found when comparing NHAMCS and NHCS data on ED visits. Researchers should take note of these and consider methodological differences between the surveys when interpreting their own results.

Introduction

The National Center for Health Statistics (NCHS) conducted two long-running surveys related to hospital care, beginning with the National Hospital Discharge Survey (NHDS) in 1960. NHDS collected data on a sample of hospital inpatient discharges and was fielded annually through 2010. The National Hospital Ambulatory Medical Care Survey (NHAMCS) was a survey of hospital emergency department (ED) visits, conducted annually from 1992 through 2022.

In 2011, in an effort to streamline data collection across these settings and surveys and to prioritize data collection from electronic health records (EHR), NCHS launched the National Hospital Care Survey (NHCS) which collects data on both inpatient and ED encounters. Both NHCS and NHAMCS collected data on hospital ED visits from 2011 through 2022, but 2020 marked the first year that national ED estimates were released using NHCS data and could be compared with NHAMCS. Both surveys are described in more detail below.

National Hospital Ambulatory Medical Care Survey

The National Hospital Ambulatory Medical Care Survey (NHAMCS) was a national multi-stage probability sample survey of visits at hospital emergency departments (ED) conducted by NCHS from 1992 through 2022. From 1992 through 2017, NHAMCS also included a component on hospital outpatient department visits, and from 2009 through 2017, a component on ambulatory surgery visits.

NHAMCS surveyed the emergency departments of noninstitutional general and short-stay hospitals located in the 50 States and the District of Columbia, excluding federal, military, and Veterans Administration hospitals. Since 2018, a three-stage probability design was used, including samples of area primary sampling units (PSUs), hospitals within PSUs, and patient visits within the emergency service areas (ESAs) of each ED. Additional information about the NHAMCS sampling design and survey methodology is available (1,2). Data collection was performed by the U.S. Census Bureau. Census field representatives (FRs) conducted induction interviews with each participating hospital to learn more about the hospital's characteristics and services. They also carried out visit sampling and abstraction of visit data from hospital medical records. Sampled data were weighted to produce nationally representative estimates. Response rates are included in the technical documentation that accompanies each year's NHAMCS public use file (3).

NHAMCS was fielded for the last time in 2022. An important factor in the decision to sunset the survey was the large-scale use of EHR by hospitals and wide availability of electronic hospital encounter data. With hospitals and health care providers storing and sharing data electronically, there is the ability for public health organizations to leverage these electronic data to enhance the understanding of hospital care through the collection of larger amounts of data, as well as the ability to link these data to external sources. NHCS, with its focus on large-scale hospital data collection through electronic medical records, was originally planned as the successor to NHAMCS, and this goal was achieved when NHAMCS completed its run in 2022. Although NHAMCS has ended its data collection, NHCS continues to collect and disseminate data about ED visits, as described in more detail below.

National Hospital Care Survey

As a continuation and integration of two historical surveys, NHCS collects inpatient and ED data from a nationally representative sample of U.S. hospitals sourced from EHR and Uniform Billing (UB-04) administrative claims data (4). NHCS is an annual national probability sample survey of noninstitutional, nonfederal hospitals in the 50 states and District of Columbia that have six or more staffed inpatient beds (5). NHCS collects data from participating hospitals for all ED visits and inpatient discharges from January 1 to December 31. These data include information on patient demographics, diagnoses, services received and visit disposition or discharge status. In addition, NHCS collects personally identifiable information (PII) such as patient name, date of birth, and Social Security Number to track patients across hospital settings and during an episode of care by linking records within the same hospital. Prior to 2020, low response rates prevented NHCS data from being used to make nationally representative estimates of health care utilization in the inpatient and ED setting. However, unweighted NHCS data have been used to conduct a variety of studies (6-9).

For the first time since NHCS began data collection, the 2020 data file was weighted to be nationally representative and as a result NCHS released public use data files from the data collected in the 2020 NHCS (10). Prior to 2020, there were several challenges to achieving nationally representative estimates. NHCS is voluntary and hospitals are not mandated to participate. Also, hospitals reported that it is costly and time intensive to send UB-04 administrative claims (subsequently, Claims) or EHR data to NCHS. Hospital recruitment was pivotal in persuading hospitals to participate even under these circumstances.

Even at the inception of NHCS in 2011, some hospitals did not have the capability to electronically transmit Claims data (known as 837i files) to entities outside of Centers for Medicare & Medicaid Services (CMS). Therefore, NCHS began to accept non-837 formats (CSV, Excel, XML, ASCII, text, fixed column) of Claims data. In order to provide hospitals with additional options to submit Claims-like data, NCHS began to accept Vizient data by the 2015 survey year. Vizient is a large, provider-driven healthcare performance improvement organization which submits data similar to Claims data on behalf of some participating hospitals. Also, NCHS allowed hospitals to send Claims and EHR data on timetables that were suitable for them (daily, monthly, and quarterly feeds).

Starting in the 2020 survey year, EHR ED data from the American College of Emergency Physicians (ACEP) were purchased to bolster the number of hospitals submitting data. The data purchased were for sampled hospitals who did not participate via Claims, Vizient, or EHR. Purchasing these data from ACEP resulted in 53 additional hospitals.

In the 2019 NHCS, the response rate was 18.7%. The combined efforts described above resulted in a higher response rate of 33.7% for the 2020 NHCS (15 additional Claims hospitals, 9 additional Vizient hospitals, and 9 additional EHR hospitals participated in the survey compared with 2019). In addition, the purchase of the Premier Health Database to develop weights was pivotal for the production of national estimates (11).

Goals of this Report

This report assesses the comparability of ED visit estimates that are based on data collected in NHAMCS and NHCS. While each survey was designed to provide national estimates of ED visit data, there are important differences in survey methodology which should be considered when using these data. Data are compared for selected characteristics, and a detailed discussion of the similarities and differences between the surveys which may have implications for data analysis is presented. It is hoped that this report will help to facilitate the transition for researchers who were accustomed to using NHAMCS ED data as they move to using NHCS data. Differences between the public use and restricted data files are also presented.

Methods

Data Sources

Table A summarizes key characteristics of each survey. They are described in more detail below.

Table A. Comparison of the 2020 National Hospital Ambulatory Medical Care Survey and the 2020 National Hospital Care Survey, by selected characteristics

Selected characteristics	NHAMCS	NHCS
Data collection mode	Hospital and emergency department induction interviews, followed by manual abstraction of visit data from patient medical records, by U.S. Census Bureau field staff.	Administrative data collection of hospital UB-04 administrative claims or Electronic Health Record (EHR) data, additional data from the American College of Emergency Physicians (ACEP), and Vizient, Inc.
Target population	Emergency department visits to nonfederal short-stay and general hospitals in the 50 states and District of Columbia with average length of stay less than 30 days and at least six staffed inpatient beds.	Hospital inpatient discharges and ED visits to nonfederal noninstitutional hospitals with six or more staffed inpatient beds in the United States.
Ineligible population	Emergency department visits to federal, military, and Veterans Administration hospitals, hospitals with average length of stay of 30 days or more, or hospitals with less than six staffed inpatient beds.	Hospital inpatient discharges and ED visits to federal hospitals, institutional hospitals, or hospitals with less than six staffed inpatient beds.
Sampling design	Multi-stage probability design with samples of primary sampling units (PSUs) based on geography, hospitals within PSUs, and patient visits within each emergency service area (ESA) within the sampled hospital's emergency department.	Stratified random sample of eligible hospitals.
Variance and standard error estimation	Ultimate cluster design model using masked sampling design variables CSTRATM and CPSUM for public use data file.	Jackknife variance estimation.
Base weight	PATWT for visit estimates, EDWT for ED estimates.	Restricted use data file: ENCWGT_BASE Public use data file: PUF_ENCWGT_BASE
Replicate weights	Not applicable.	Restricted use data file: ENCWGT_1 – ENCWGT122 Public use data file: PUF_ENCWGT_1 – PUF_ENCWGT100
Presentation standards		Same as NHAMCS.

	Proportions or percentages: https://www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf Rates and counts: https://www.cdc.gov/nchs/data/series/sr_02/sr02-200.pdf	
Unweighted total sample size	14,860 ED visits	Restricted use data file: 7,960,956 ED visits Public use data file: 388,753 ED visits
Weighted total sample size	131,297,000 ED visits	114,562,000 ED visits
Number of sampled hospitals	484	608
Response rate (unweighted)	36.8%	33.7%
Age missingness before imputation	0.03% unweighted, 0.04% weighted	0.4% unweighted, 0.4% weighted
Age missingness after imputation	0% unweighted, 0% weighted	0.1% unweighted, 0.1% weighted
Sex missingness before imputation	0.9% unweighted, 1.5% weighted	0.5% unweighted, 0.4% weighted
Sex missingness after imputation	0% unweighted, 0% weighted	0.2% unweighted, 0.1% weighted
Imputation	A hot-deck method based on 3-digit International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) codes for primary diagnosis, triage level, ED volume, and geographic region.	A hot-deck method based on 3-digit International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) codes for primary diagnosis. If no primary diagnosis, first-listed is used (relevant for ACEP).
Diagnosis data collection	Verbatim text abstracted by Census staff from medical records, later coded using ICD-10-CM by NCHS medical coders.	As provided by data source, usually as ICD-10-CM codes, but could also include SNOMED-CT, ICD-9-CM, and vendor- and site-specific codes.
Number of diagnoses collected	Up to 5.	Up to 25 for Claims or Vizient data, unlimited for EHR or ACEP data.
First-listed diagnosis definition	Field staff were instructed to report the diagnosis most closely related to patient's principal reason for visit.	Primary diagnosis as indicated by hospital or data source.
First-listed diagnosis missingness	1.0% unweighted, 2.3% weighted	24.8% unweighted, 20.0% weighted
Missing all diagnosis information	1.0% unweighted, 2.3% weighted	8.2% unweighted, 4.8% weighted
Percentage of ED records reporting a first-listed diagnosis only	43.3% unweighted, 42.1% weighted	13.5% unweighted, 15.1% weighted
Percentage of ED records reporting two diagnoses only	25.1% unweighted, 25.0% weighted	15.0% unweighted, 16.6% weighted
Percentage of ED records reporting three diagnoses only	13.0% unweighted, 12.9% weighted	12.1% unweighted, 13.1% weighted
Percentage of ED records reporting four diagnoses only	7.1% unweighted, 7.0% weighted	10.3% unweighted, 10.9% weighted
Percentage of ED records reporting five diagnoses only	10.5% unweighted, 10.7% weighted	8.5% unweighted, 8.8% weighted
Percentage of ED records reporting more than five diagnoses	None.	32.3% unweighted, 30.7% weighted
Visit disposition data collection (see Appendix Table V for a detailed comparison of this item between NHAMCS and NHCS)	Visit disposition is a 'check all that apply' item on the survey instrument (Patient Record form).	A single discharge status is available for each encounter.
Visit disposition missingness	0.6% unweighted, 0.7% weighted	7.8% unweighted, weighted percentage does not meet National Center for Health Statistics standards of reliability

NOTES: ED is emergency department. NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey.

NHAMCS

The 2020 NHAMCS used a three-stage probability design with samples of PSUs, hospitals within PSUs, and patient visits within ESAs. An ED was eligible (or in-scope) if it provided unscheduled health care 24 hours a day, seven days a week. If an ED was not staffed 24 hours daily, it was considered ineligible (or out of scope) for NHAMCS. Emergency services provided under the "hospital as landlord" arrangement (where a hospital rents space for the provision of emergency services) were also eligible for the study. ESAs are the smallest administrative units of an ED where separate patient statistics are kept. For the purpose of the survey, ESAs were defined as general, adult, pediatric, urgent care/fast track, psychiatric, and "other." An ESA could be located on the hospital grounds or operated off-site by the hospital. ESAs operated by the hospital, but staffed under contract by independent physicians, were eligible. Within each hospital, all ESAs within an in-scope ED were selected with certainty, regardless of whether the individual ESA was open 24 hours a day.

In 2020, of the 484 sampled hospitals, 98 were found to be ineligible due to closing or other reasons. Of the 386 hospitals that were eligible for the survey, 294 responded (that is, reported their total numbers of ESAs and visits), for an unweighted hospital response rate of 76.2% (76.1% weighted). A total of 422 ESAs were identified from the respondent EDs. Of these, 204 responded fully or adequately by providing forms for at least half of their expected sample visits based on the total number of visits they had during their reporting period, and 22 responded minimally (i.e., provided fewer than half of their expected visits). The resulting unweighted ESA sample response rate was 48.3% (46.2% weighted), and the overall unweighted ESA response rate (i.e., ED rate times ESA rate) was 36.8% (35.1% weighted). Response rates have been adjusted to exclude minimal participants. More information about the 2020 NHAMCS survey methodology and response rate calculation is available elsewhere (2).

Visit sampling rates were determined from the number of visits seen during the reporting period and the desired number of completed Patient Record Forms (or PRFs, the automated instrument used to collect visit information). During 2020, electronic PRFs were completed for 14,860 ED visits, yielding an overall estimate of 131,297,000 ED visits made in the United States. Because of the COVID-19 pandemic, data collection procedures for the National Health Care Surveys, including NHAMCS, were adapted to ensure data collection continued. These changes are described elsewhere (12).

NHCS

The 2020 NHCS used a national probability sample of noninstitutional, nonfederal hospitals in the 50 states and District of Columbia that have six or more staffed inpatient beds (4). The initial sampling frame was constructed in 2011 and consisted of 6,622 eligible hospitals. Unlike NHAMCS, average length of stay is not used as an exclusion criterion in NHCS. This allows for the inclusion of hospitals with an average length of stay of more than 30 days. Hospitals with the most staffed inpatient beds or discharges were not selected with certainty. Also, no geographic PSUs were used. General acute care hospitals were stratified by bed size and metropolitan statistical area (MSA). Equal probability is used for general acute care hospitals and probability proportional to bed size is used for non-general acute

care hospitals (children's, psychiatric, long-term acute care, and rehabilitation). An initial sample of 1,000 hospitals was selected and split into two samples: a base sample of 500 hospitals and a reserve sample of 500 hospitals. In 2011, the base sample was fielded and in 2013, 81 hospitals with 500 or more inpatient staffed beds were moved from the reserve sample into the base sample. Every three years, the sample and frame and updated to include newly constructed hospitals. Due to the addition of newly sampled birth hospitals, the 2020 base sample consists of 608 hospitals and the frame includes 6,906 hospitals.

From sampled hospitals, NHCS collects a year's worth of administrative claims and EHR data resulting from ED visits. The ED visits themselves are not sampled. Data are transmitted electronically and processed directly from the hospital or a third-party. In the 2020 NHCS, 205 of the 608 sampled hospitals provided ED visit or inpatient discharge data, for an unweighted response rate of 33.7%. Of the 205 hospitals that responded, 200 hospitals submitted ED data for an unweighted total of 7,960,956 visits, representing a weighted total of 114,562,000 visits. These include patients who were treated and released from the ED as well as those who were admitted to the inpatient department from the ED. Participating hospitals could provide their data through one of four data sources: Claims, Vizient, EHR, and ACEP. All data sources contain information on patient sex and age, hospital setting, length of inpatient stay, and discharge status (4). Claims are the accepted electronic standard for hospital billing as mandated by the Centers for Medicare & Medicaid Services and contain up to 25 diagnosis and procedure codes. Vizient is a member-driven health care services company which collects health care utilization data from hospitals. Claims and Vizient data are similar with a few exceptions: Vizient data include laboratory and medication information, PII is not included, and exact encounter dates are defaulted to the first of the month. EHR data contain an unlimited number of diagnosis and procedure codes, laboratory and medication information, and unstructured clinical notes. EHR data are collected in the format of HL7 CDA® R2 Implementation Guide: National Health Care Surveys Release 1, DSTU Release 1.2 – US Realm (4). Additional information about these data sources can be found elsewhere (4,5). EHR and ACEP data are similar with a few exceptions: ACEP only collects ED visit data, ACEP data do not contain PII, and ACEP does not collect information on primary diagnosis.

In order to produce nationally representative estimates of ED visits, base weights were developed with a model-based weighting methodology that used third-party data sources, and replicate weights were developed to produce variance estimates. Seven of the 200 hospitals that submitted ED data were excluded from the production of weights due to data quality issues. Analyses for this report were conducted using restricted-use data files which are available through the NCHS Research Data Center. Additional information on the NHCS methodology is available elsewhere (13).

Measures

Each survey's data elements were reviewed to identify items for comparison. The items initially selected for analysis were patient age, patient sex, diagnoses, and visit disposition (referred to as discharge status in NHCS). See Appendix I, Table I for a detailed summary of the data items used in this report based on restricted data and see Appendix I, Table II for a corresponding summary based on public use file data for researchers who wish to compare them easily across both surveys.

NHAMCS

All data were collected by U.S. Census Bureau FRs, who abstracted data from medical records using the PRF. Data were collected for a randomly selected sample of visits during a 4-week reporting period from each ESA within the hospital's ED.

Patient age was calculated by NCHS staff based on the patient's date of birth and date of ED visit. In a small number of cases, exact date of birth was not reported and only age (in months, days, or years) was provided. Age was missing for 0.03% of unweighted records (0.04% of weighted records) and sex was missing for 0.9% of unweighted records (1.5% of weighted records); in such cases, age and sex were imputed using a hot-deck method based on 3-digit International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) codes for primary diagnosis, triage level, ED volume, and geographic region (14).

In NHAMCS, up to five diagnoses could be collected for each visit. (These should not be confused with the patient's expressed reason for the visit, which was collected as a separate verbatim text item and coded to a maximum of five reasons using an NCHS internal classification system (15). Patient reason for visit in NHAMCS is independent of provider diagnosis and is therefore not included in the current study.)

For the first-listed diagnosis in NHAMCS, considered to be the primary one, Census staff were instructed that it should be the diagnosis most closely related to the patient's reason for the visit. Up to 4 other diagnoses related to the visit, including chronic conditions, could be included. Diagnoses were entered as verbatim text by Census staff; verbatim text entries were converted to ICD-10-CM codes by medical coders during data processing. First-listed diagnosis was missing for 1.0% of unweighted records (2.3% of weighted records).

Visit disposition was collected as a 'check all that apply' item, with the following categories: no follow-up planned, return to ED, return or refer to physician or clinic for follow-up, left without being seen, left before treatment complete, left against medical advice, dead on arrival, died in ED, return or transfer to nursing home, transfer to psychiatric hospital, transfer to non-psychiatric hospital, admit to this hospital, admit to observation unit then hospitalized, admit to observation unit then discharged, and other visit disposition. Disposition was missing for 0.6% of unweighted records (0.8% of weighted records).

NHCS

Patient age is derived from the patient date of birth and the encounter start date. Similar to NHAMCS, in some cases, exact date of birth was not reported and only age (in months, days, or years) was provided. Imputation for missing patient age was attempted in 0.4% of unweighted ED records, and, for

0.1% of the records, age was still missing after imputation was attempted. Imputation for missing patient sex was attempted in 0.5% of unweighted ED records, and, for 0.2% of the records, sex was still missing after imputation was attempted. Diagnoses were often submitted as ICD-10-CM codes but also appeared as codes from the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) and the Systematized Nomenclature of Medicine—Clinical Terms (SNOMED-CT), as well as vendor- and site-specific codes (16). Diagnosis codes that were not submitted as ICD-10-CM codes were translated to ICD-10-CM when possible (16). Approximately 86% of SNOMED-CT and ICD-9-CM diagnosis codes were translated to ICD-10-CM.

All visit diagnoses are present on a record. All data sources contain information on patient sex and age, hospital setting, length of inpatient stay, and discharge status (4). Claims and Vizient data contain up to 25 diagnosis codes. EHR data (coming from EHR submission and ACEP data sources) contain an unlimited number of diagnosis codes. Many visit records had an indicator to note that a diagnosis was "primary" or "reason for visit". NHCS's primary diagnosis is similar to NHAMCS's first-listed diagnosis; both reflect an official diagnosis from a health care provider, and both should be related to the patient's most important reason for the visit. All NHCS data sources except ACEP provided information on primary diagnosis. However, 22.5% of EHR records, 1.3% of Vizient records, and less than 0.1% of Claims records (unweighted) did not have a reported primary diagnosis. Records that indicated "reason for visit" were excluded from analysis since these codes represent the patient's self-reported diagnoses. These codes represent why a patient decided to go to the ED but are not official diagnoses from a health care provider. Subsequently, "diagnosis" will refer to non-reason for visit records. Overall, 8.2% of unweighted NHCS ED visit records were missing diagnosis information and 24.8% were missing an indicator for primary diagnosis.

Visit disposition is referred to as discharge status in NHCS. Unlike NHAMCS, only one visit disposition is reported for each ED visit. Visit disposition values were standardized across all data sources to the following categories: routine to home, admitted as inpatient, left against medical advice, transfer to short term facility, transfer to long term facility, court or law enforcement, dead, other health care facility, other discharge not otherwise specified, hospice care - home or medical facility, home health, invalid code, unknown, and missing. Visit disposition was invalid, unknown, or missing for 7.8% of unweighted ED visits.

Data Analysis

This report mainly reflects original, non-masked data for both NHCS and NHAMCS, which corresponds with other NCHS publications based on these surveys. Researchers can replicate these results by using restricted data files in the NCHS Research Data Center. In addition, public use files are available for both surveys. It is important to note that the NHCS public use file contains only 5% of the entire NHCS dataset, which minimizes disclosure risks for hospitals and provides a more manageable file size for data users. To assist public use data file users in understanding possible differences between restricted and PUF data, two tables are presented on patient age and sex, one using restricted data and one using public use file data (See Results).

Emergency department visits are described by patient age and sex, yielding basic points of comparison between the two surveys. Diagnosis, which is a key research item, is explored in some detail. For the other variable common to both surveys on the 2020 public use data files, visit

disposition, comparisons were explored but were complicated by differences in data collection between NHAMCS and NHCS. These methodological differences were sufficiently pronounced to suggest that data based on this variable might not be comparable. A detailed description of these differences in the collection and processing of visit disposition between NHAMCS and NHCS is included in Appendix II.

Statistical Analysis

For NHAMCS and NHCS, estimated counts, their standard errors, percentages, and their Korn–Graubard 95% confidence intervals are presented. All weighted counts were rounded to the nearest thousand, while weighted percentages and rates were rounded to the first decimal place. Differences between NHAMCS and NHCS count and percentage estimates were assessed for statistical significance using a two-sided *t*-test at the $p<0.05$ level. For NHAMCS, all analyses were conducted using SAS-callable SUDAAN 11.0.3 (RTI International, Research Triangle Park, N.C.) and SAS version 9.4 (SAS Institute, Cary, N.C.) to account for the complex sampling design. For NHCS, all analyses were conducted using SAS version 9.4 (SAS Institute, Cary, N.C.).

For both NHAMCS and NHCS data, reliability for percentages was determined according to NCHS data presentation standards for proportions (17), and percentages that did not meet these NCHS standards are indicated only by an asterisk in the tables. For both NHAMCS and NHCS data, reliability of counts and rates was determined according to NCHS data presentation standards for counts and rates (18) which involved the calculation of the Kish design effect (19). Visit rates in Tables 2 and 3 represent the number of visits per 100 persons in 2020. The rates are based on estimates of the U.S. civilian noninstitutionalized population as of July 1, 2020, Vintage 2022, from the U.S. Census Bureau, Population Division National Population by Characteristics: 2020-2023 (20). The estimates were developed from a base that integrates the 2020 Census, Vintage 2020 estimates, and 2020 Demographic Analysis estimates. More information about the methodology of the population estimates is available from the U.S. Census Bureau (21).

It should be noted here that 2020 NHAMCS estimates of rates presented in this report may differ slightly from those published in the 2020 NHAMCS web tables (22). This is because a newer vintage of U.S. Census Bureau estimates for the civilian noninstitutionalized population was produced after the web tables were released; all rates in this report were calculated using this newer vintage.

Results

A summary of all statistically significant findings is presented in Table B. Detailed results are presented after the table.

Table B. Summary of data differences between the 2020 National Hospital Ambulatory Medical Care Survey and the 2020 National Hospital Care Survey, for selected variables

Table	Measure	Higher in NHAMCS	Higher in NHCS
1	Number and rate of visits by infants (under 1 year)	X	
1	Number and rate of visits by children ages 1-17	X	
1	Number and rate of visits by male infants (under 1 year)	X	
1	Number and rate of visits by male children ages 1-17	X	
1	Number and rate of visits by female children ages 1-17	X	
1	Percent of visits by 18-44 years		X
1	Percent of visits by females 18-44 years		X
3	Number and percent of visits with primary diagnosis of:		
3	Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified	X	
3	Codes for special purposes		X
3	Diseases of the circulatory system	X	
3	Diseases of the digestive system	X	
3	Mental, behavioral and neurodevelopmental disorders	X	
3	Diseases of the respiratory system	X	
3	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	X	
3	Number of visits with primary diagnosis of:		
3	Diseases of the musculoskeletal system and connective tissue	X	
3	Diseases of the skin and subcutaneous tissue	X	
3	Injury and poisoning	X	
3	Diseases of the genitourinary system	X	
4	Number and percent of visits with any-listed (up to 5) diagnoses of:		
4	Endocrine, nutritional, and metabolic diseases		X
4	Mental, behavioral and neurodevelopmental disorders		X
4	Diseases of the nervous system		X
4	Diseases of the circulatory system		X
4	Percent of visits with any-listed (up to 5) diagnoses of:		
4	Diseases of the musculoskeletal system and connective tissue		X
4	Pregnancy, childbirth and the puerperium		X
4	Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified		X

5	Number and percent of visits with any-listed (up to 5 NHAMCS and unlimited NHCS) diagnoses:		
5	Neoplasms		X
5	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism		X
5	Endocrine, nutritional, and metabolic diseases		X
5	Mental, behavioral and neurodevelopmental disorders		X
5	Diseases of the nervous system		X
5	Diseases of the circulatory system		X
5	Diseases of the musculoskeletal system and connective tissue		X
5	Percent of visits with any-listed (up to 5 NHAMCS and unlimited NHCS) diagnoses:		
5	Certain infectious and parasitic diseases		X
5	Diseases of the eye and adnexa		X
5	Diseases of the respiratory system		X
5	Diseases of the digestive system		X
5	Diseases of the skin and subcutaneous tissue		X
5	Diseases of the genitourinary system		X
5	Pregnancy, childbirth and the puerperium		X
5	Symptoms, signs, and abnormal clinical and laboratory findings not elsewhere classified		X
5	Codes for special purposes		X
6	Number and percent of visits with any-listed (up to 5) diagnoses:		
6	Essential hypertension		X
6	Unspecified nausea, vomiting, diarrhea		X
6	Dyspnea and respiratory abnormalities		X
6	Type 2 diabetes mellitus or unspecified		X
6	Percent of visits with any-listed (up to 5) diagnoses:		
6	Abdominal pain		X
6	Chest pain		X
6	Headache		X
6	Number of visits by females <18 with any-listed (up to 5) diagnoses of:		
6	Open wound of head	X	
6	Number and percent of visits by females 18-64 with any-listed (up to 5) diagnoses of:		
6	Unspecified nausea, vomiting, diarrhea		X
6	Essential hypertension		X
6	Headache		X
6	Percent of visits by females 18-64 with any-listed (up to 5) diagnoses of:		
6	Abdominal pain		X
6	Chest pain		X
6	Number and percent of visits by females 65 and older with any-listed (up to 5) diagnoses of:		

6	Pneumonia due to infectious organism	X	
6	Essential hypertension		X
6	Percent of visits by females 65 and older with any-listed (up to 5) diagnoses of:		
6	Chest pain		X
6	Number of visits by males <18 with any-listed (up to 5) diagnoses of:		
6	Abdominal pain	X	
6	Percent of visits by males <18 with any-listed (up to 5) diagnoses of:		
6	Asthma, excluding chronic obstructive asthma		X
6	Number and percent of visits by males 18-64 with any-listed (up to 5) diagnoses of:		
6	Unspecified nausea, vomiting, diarrhea		X
6	Essential hypertension		X
6	Percent of visits by males 18-64 with any-listed (up to 5) diagnoses of:		
6	Chest pain		X
6	Abdominal pain		X
6	Number and percent of visits by males 65 and older with any-listed (up to 5) diagnoses of:		
6	Essential hypertension		X
6	Type 2 diabetes mellitus or unspecified		X
6	Percent of visits by males 65 and older with any-listed (up to 5) diagnoses of:		
6	Heart failure, non-hypertensive		X
6	Bronchiectasis, emphysema and other chronic obstructive pulmonary disease, including chronic obstructive asthma		X

NOTES: NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey. All differences are significant at the $p < 0.05$ level.
SOURCES: National Center for Health Statistics, 2020 National Hospital Ambulatory Medical Care Survey and 2020 National Hospital Care Survey.

Patient Sex and Age

Table 1 presents data on ED visits by patient sex and age. (Note: These data reflect the full NHCS dataset. For a comparison with public use file data, see Table 2.) The overall estimate of ED visits from NHAMCS was 131.3 million in 2020, or 40.2 visits per 100 people annually, compared with 114.6 million, or 35.1 visits per 100 people annually from NHCS. These differences were not statistically significant.

NHAMCS estimates of ED visits and visit rates by infants (younger than 1 year) and children ages 1-17 years were significantly higher than corresponding estimates from NHCS. According to NHAMCS data, about 2.5 million ED visits were made by infants in 2020, accounting for 1.9% of all ED visits and a visit rate of 69.4 visits per 100 infants. The corresponding estimates from NHCS were 1.6 million visits, accounting for 1.4% of all ED visits and a visit rate of 44.3 visits per 100 infants. The NHAMCS estimate for children ages 1-17 was 20.3 million visits, accounting for 15.5% of all ED visits and a visit rate of 29.2 visits per 100 children. In comparison, the NHCS estimate for children ages 1-17 was 14.1

million, accounting for 12.3% of all ED visits and a visit rate of 20.3 visits per 100 children. When analyzed by sex and age, the difference in number of visits as well as the visit rate for male infants was significant between NHAMCS and NHCS, but the difference was not significant for female infants. Among children ages 1-17, differences were significant for both sexes. No other significant differences by sex and age group were found when comparing visit estimates between NHAMCS and NHCS data.

When comparing percentage estimates of ED visits by age, no significant differences were found except among visits by adults ages 18-44 years. The percentage of ED visits estimated by NHAMCS (38.1%) was lower than the corresponding NHCS percentage (41.8%). This difference appeared to be related to a lower percentage of visits by women 18-44 years estimated by NHAMCS (21.8%) compared with NHCS (24.3%). No differences were found between NHAMCS and NHCS when comparing the percentages of visits by age among males.

A companion table which mirrors Table 1 has been provided which compares NHAMCS and NHCS public use data by patient age and sex (Table 2). No statistically significant differences were found when comparing restricted and public use file data for either NHAMCS or NHCS. An additional discussion of the differences between the NHCS public use file and the restricted file is available (5).

Diagnosis

With regard to diagnosis, the main differences concerning data collection have been stated earlier. Briefly, NHAMCS collected up to five diagnoses per visit, based on the abstraction of textual information from medical records by U.S. Census Bureau FRs. This information was then coded by medical coders using ICD-10-CM. Each record had a first-listed, or primary, diagnosis which Census staff collected to reflect the diagnosis most closely related to the patient's reason for the visit, as well as up to 4 other diagnoses related to the visit, including chronic conditions. NHCS diagnosis data from Claims or Vizient could include up to 25 diagnosis codes per visit, while diagnosis data from EHRs could be unlimited. Primary diagnosis is not reported for hospitals for which ACEP is the data source.

In order to attempt comparisons, three approaches were used as shown in Tables 3, 4, and 5. In each table, diagnoses were grouped into major disease categories for both surveys, with these categories reflecting ICD-10-CM chapters. In Table 3, the primary, or first-listed, diagnosis was used for each survey. In Table 4, up to five diagnosis fields (the maximum that could be collected) were included for NHAMCS and the first five diagnosis fields were included for NHCS. These diagnoses were each grouped into a major disease category and counted individually, so that one visit which had diagnoses occurring in different major disease categories were counted in each category. However, if the same major disease category occurred multiple times in the same record, it was only counted once. Because more than one major disease category is possible for each visit, the number of visits by major disease category will exceed the total number of visits. In Table 5, the totality of diagnosis information (up to five fields) was shown for NHAMCS (as in Table 4) but was compared with the totality of diagnosis information (up to 25 fields for Claims or Vizient data; unlimited number of fields for EHR or ACEP data) in NHCS.

In order to look at diagnoses in more detail than the broader groupings used in Tables 3-5, Table 6 shows differences with regard to selected diagnosis groups. As in Table 4, diagnoses for up to five diagnosis fields were included in NHAMCS, and the first five diagnosis fields were included for NHCS. But instead of grouping by major disease category (reflecting chapters from ICD-10-CM),

diagnoses were grouped using a more granular classification system designed to present clinically meaningful estimates. This classification scheme, the NCHS Diagnosis Master Category List, was originally developed for use with 2016 NHAMCS data and has been updated for each subsequent year (23). It is the same classification system used in the production of diagnosis tables for the annual NHAMCS ED summary web tables (22). Estimates for ten frequently listed diagnosis groups found among NHAMCS ED visits are compared with corresponding estimates for NHCS ED visits; comparisons are also made for five frequently occurring diagnosis groups by patient sex and age group. Diagnoses were counted using the same method as Table 4.

When considering diagnosis data, it is important to keep in mind that 43.3% of unweighted NHAMCS ED records reported a first-listed diagnosis only, while an additional 25.1% reported two diagnoses, 13.0% reported three diagnoses, 7.1% reported 4 diagnoses, and 10.5% reported five diagnoses (corresponding weighted percentages are 42.1%, 25.0%, 12.9%, 7.0%, and 10.7%, respectively). In contrast, 8.2% of NHCS ED records were missing diagnosis information, 13.5% included a single diagnosis, 15.0% reported 2 diagnoses, 12.1% reported 3 diagnoses, 10.3% reported 4 diagnoses, 8.5% reported 5 diagnoses, and 32.3% included more than five diagnoses (corresponding weighted percentages are 4.8%, 15.1%, 16.6%, 13.1%, 10.9%, 8.8%, and 30.7%, respectively). This is also shown in Table A.

Because of the importance of the diagnosis data, further consideration can be given to the way in which the data were collected and how this varies between surveys. In NHAMCS, FRs were instructed with detailed guidelines regarding the collection of the first-listed diagnosis (2). These guidelines covered topics such as tentative, provisional, or definitive diagnoses, and “problem” terms. For the remaining four diagnosis fields, FRs were instructed to include diagnoses or conditions recorded in the medical record as being related to the current visit, including chronic conditions or diseases (e.g., hypertension, depression). FRs were able to see clinical notes and provided, in many cases, up to 100 characters of text describing the patient’s diagnoses. Verbatim text was later coded by NCHS medical coders using the ICD-10-CM. In some cases, FRs entered specific ICD-10-CM codes in diagnosis fields, but this was not common, and in most cases the FRs provided detailed text which could be used advantageously by the medical coders. Special coding conventions were developed by NCHS to classify entries that could not otherwise be coded. These include entries of “none”, “no diagnosis”, “no disease”, “healthy”, illegible entries, or entries indicating that the patient either left before being seen, walked out, eloped, or left against medical advice. These are grouped as “Uncodable Entries” in Tables 3-5. The category of “Blank or unknown” in Tables 3-5 refers to records with no diagnosis entry made.

In contrast, in NHCS, diagnosis data were present on electronic medical records but often without information regarding whether the diagnosis was a current diagnosis, active problem, or a past condition. Overall, 24.8% of unweighted NHCS records were missing information on whether the diagnosis was primary for the visit and 8.2% of unweighted NHCS records were missing diagnosis data. Both the diagnosis code and code system are collected in NHCS records. Virtually all diagnosis data from Claims, Vizient, and ACEP hospitals used ICD-10-CM codes, while the majority of diagnosis data from EHR hospitals used SNOMED-CT. In some cases, ICD-9-CM codes were found; both these and SNOMED-CT were translated to equivalent ICD-10-CM codes. Codes that could not be translated to an equivalent ICD-10-CM code (e.g., SNOMED-CT and ICD-9-CM codes that had no equivalent ICD-10-CM code, and vendor- and site-specific codes) are shown as “Uncodable entries” in Tables 3-5. “Blank or unknown” refers to records with no diagnosis data. The majority of “Blank or unknown”

records come from ACEP hospitals (95.9% unweighted), while a smaller percentage comes from Vizient hospitals (4.1% unweighted). There may be a variety of reasons for why these records are missing diagnosis information: the patients could have left before being seen, walked out, eloped, or left against medical advice; the patient may not have received a diagnosis during the visit; or there may have been an error in data collection where diagnosis information was not stored for the record. Despite this speculation, the reason why these records have no diagnosis information is ultimately unknown.

Results for Primary (or first-listed) diagnosis

Table 3 presents data on ED visits by primary diagnosis, grouped according to major disease category. “Symptoms, signs, and abnormal clinical findings not elsewhere classified” was the most frequent major disease category according to NHAMCS data, accounting for about one-quarter (24.7%) of all ED visits. It was followed by “Injury, poisoning and certain other consequences of external causes” at 17.4% of visits. For NHCS, these categories were also prominent but accounted for 18.5% and 15.6% of ED visits, respectively. All other major disease categories each accounted for less than 10% of ED visits in both surveys. One notable difference, however, is that data on primary diagnosis were missing for 20.0% of weighted NHCS ED visits (24.8% of unweighted) but were available for almost all NHAMCS ED visits.

Using the available data to compare estimates of primary diagnosis between NHAMCS and NHCS, many of the differences found were significant. Both number and percentage of ED visits were significantly higher in NHAMCS compared with NHCS for these major disease categories as a primary diagnosis: symptoms, signs, and abnormal clinical and laboratory findings; diseases of the circulatory system; diseases of the digestive system; mental, behavioral, and neurodevelopmental disorders; diseases of the respiratory system; and diseases of the blood and blood-forming organs. However, number and percentage were higher in NHCS for codes for special purposes, which includes COVID. Differences in number of visits only (that is, no differences were found when comparing by percentage of visits) were found for diseases of the musculoskeletal system; diseases of the skin and subcutaneous tissue; injury and poisoning; and diseases of the genitourinary system. In each case, the NHAMCS estimate exceeded the NHCS estimate. No significant differences were noted in the categories of infectious and parasitic diseases; neoplasms; endocrine, nutritional, and metabolic disorders; diseases of the nervous system; diseases of the eye and adnexa; diseases of the ear and mastoid process; and pregnancy, childbirth, and the puerperium.

Results for any-listed diagnoses (up to five diagnoses)

Table 4 presents data on ED visits using all of the diagnosis fields available in NHAMCS, where up to five diagnoses could be reported for each visit. These are compared with data on the first five listed diagnosis fields listed in the NHCS data, as explained more fully in the Methods section.

For NHAMCS, the percentage of ED visits with a symptom, sign, or abnormal clinical or laboratory finding diagnosis was 37.7% when all five possible diagnosis fields were included. Visits with a diagnosis within the circulatory system group accounted for 11.6% of all-listed diagnoses, reflecting, in some cases, common conditions like hypertension listed as a concomitant diagnosis rather than the primary reason for seeking care in the ED. Likewise, the percentage of visits with an endocrine disease

diagnosis, which includes diabetes, was 8.4% when all diagnoses were included. Visits with a diagnosis of a mental health disorder were 10.2% when all diagnoses were considered. These results can be contrasted with those in Table 3, which only evaluated primary diagnosis.

Similar to NHAMCS, NHCS data based on the first five diagnoses on the record yielded different results compared with data based on the primary or first-listed diagnosis only. However, these results also differed from NHAMCS for a number of categories.

The percentage of NHCS ED visits with a diagnosis of a symptom, sign, or abnormal clinical or laboratory finding was 41.2% when the first five diagnoses were included. Visits with a diagnosis within the circulatory system group accounted for 18.9% for the first five diagnoses. The percentage of visits with an endocrine disease diagnosis was 14.8% when the first five diagnoses were included. Visits with a diagnosis of a mental health disorder were 18.4% when the first five diagnoses were considered. It should be kept in mind that the order of diagnoses on the NHCS record does not imply any kind of hierarchy, nor does it imply that all of the diagnoses were related to the current ED encounter. They could be carried over in the electronic health record from prior encounters. In NHAMCS, all collected diagnoses are supposed to be related to the current visit, including chronic conditions if any.

The greater frequency of diagnoses recorded in NHCS data compared with NHAMCS data can be seen in the higher numbers and percentages for certain diagnostic categories in Table 4. NHCS estimates of both number and percentage of ED visits when up to five diagnoses were considered were significantly higher than NHAMCS estimates for the categories of endocrine, metabolic and nutritional disorders; mental, behavioral, and neurodevelopmental disorders, diseases of the nervous system; and diseases of the circulatory system. Significantly higher percentages of visits, but not significantly higher numbers of visits, were also noted in NHCS data for diseases of the musculoskeletal system; pregnancy, childbirth, and the puerperium; and symptom, signs, and abnormal clinical and laboratory findings. No differences in either numbers of visits or percentages of visits were found between NHCS and NHAMCS for certain infectious and parasitic diseases, neoplasms, diseases of the blood and blood-forming organs, diseases of the eye and adnexa; diseases of the ear and mastoid process; diseases of the respiratory system, diseases of the digestive system; diseases of the skin and subcutaneous tissue; diseases of the genitourinary system; injury and poisoning, or codes for special purposes.

Results for any-listed diagnoses

Table 5 illustrates the difference between the totality of the diagnosis data available in NHAMCS (up to five diagnoses) compared with NHCS (more than five diagnoses). For NHAMCS, diagnosis data are once again displayed as in Table 5, where all of the five possible fields are included. For NHCS, all possible diagnosis fields are included in the table, not just the first five. The percentage of NHCS ED visits which included a symptom, sign, or abnormal clinical or laboratory finding diagnosis was 43.9% when all diagnoses were considered. Mental disorders accounted for 22.9% of visits. As would be expected, there were increases in each category, but an important finding is that these percentages are much larger when compared with NHAMCS data. This may not be that surprising, however, considering that NHCS can capture many more diagnoses than NHAMCS.

NHCS estimated significantly higher numbers and percentages of ED visits when all diagnoses on the electronic health record are considered, compared with NHAMCS data based on up to a maximum of five reported diagnoses, for the categories of neoplasms; blood and blood-forming organs; endocrine,

nutritional and metabolic disorders; mental, behavioral and neurodevelopmental disorders; diseases of the nervous system, diseases of the circulatory system, and diseases of the musculoskeletal system. NHCS estimated significantly higher percentages of ED visits only (no differences were noted in numbers of visits) for the categories of infectious and parasitic diseases; diseases of the eye and adnexa; diseases of the respiratory system; diseases of the digestive system; diseases of the skin and subcutaneous tissue; diseases of the genitourinary system; pregnancy, childbirth, and the puerperium; symptoms, signs and abnormal clinical and laboratory findings; and codes for special purposes. No differences were noted in numbers and percentages of ED visits when comparing all diagnoses in the NHCS data with up to five diagnoses in the NHAMCS data for diseases of the ear and mastoid process, and injury and poisoning.

Categories with the largest differences in this table included mental, behavioral and neurodevelopmental disorders, which occurred for 22.9% of NHCS visits compared with 10.2% of NHAMCS visits; diseases of the circulatory system (22.7% of NHCS visits compared with 11.6% of NHAMCS visits); and endocrine, nutritional, and metabolic disorders (19.5% of NHCS visits compared with 8.4% of NHAMCS visits).

Results for diagnosis groups

Table 6 presents data on ED visits by selected frequently listed diagnosis groups, both overall and by sex and age categories. These diagnosis groups were selected by first identifying the most prominent diagnosis groups using NHAMCS data. For each of these diagnosis groups, corresponding estimates were generated with NHCS data. If NHCS data were run without regard to this selection, the results could be different. In Table 6, diagnoses for up to five diagnosis fields are included for NHAMCS, and the first five diagnosis fields are included for NHCS. Diagnoses were grouped using the NCHS Diagnosis Master Category List as described in the Methods section. Because one visit may include more than one diagnosis group, the sum of diagnoses will exceed the total number of visits in the survey year.

For NHAMCS, abdominal pain and chest pain accounted for 7.0% and 5.7%, respectively, of the diagnoses at ED visits overall, reflecting ICD-10-CM “R” chapter codes, and were the most frequently reported symptomatic complaints. Other symptomatic complaints among those occurring most frequently were “unspecified nausea, vomiting, and diarrhea” (4.6%), “dyspnea and respiratory abnormalities” (2.7%), and headache (2.5%). Essential hypertension was listed among the diagnoses at 5.5% of visits, but this more often reflects hypertension as a concomitant chronic condition (listed in the second through fifth diagnosis field) rather than the primary diagnosis for the visit.

For a comparison of 2020 ED visits looking at primary diagnosis grouped by diagnosis category, see the 2020 ED web tables (22). Comparing NHAMCS data in the current table with Table 11 in the 2020 NHAMCS ED web tables can serve to highlight the different picture one gets when analyzing the primary diagnosis for each visit versus including up to five diagnoses per visit. Researchers using NHCS data may be challenged when trying to conduct a similar comparison because one in five weighted visits is missing an indicator for primary diagnosis.

Comparing NHCS data with NHAMCS data for overall visits in Table 6, NHCS estimates of both number and percentage of ED visits were significantly higher than NHAMCS estimates for essential hypertension; unspecified nausea, vomiting, and diarrhea; dyspnea and other respiratory abnormalities;

and Type 2 diabetes mellitus. Significant differences in percentage of ED visits only were found for abdominal pain, chest pain, and headache. No statistically significant differences were noted for pneumonia, urinary tract infection, or alcohol-related disorders. The largest percentage point differences were noted for two common chronic conditions, essential hypertension and diabetes mellitus.

Results in Table 6 are also shown by sex and age for frequently listed diagnoses. Among visits by females younger than 18 years, no statistically significant differences were found between the two datasets for diagnoses of abdominal pain; unspecified nausea, vomiting and diarrhea; fever; and influenza. The number of diagnoses for open wound of head at NHAMCS ED visits by females younger than 18 was slightly higher than the corresponding number for NHCS ED visits, but the percentages were not significantly different. Among visits by women ages 18-64, NHCS estimates of both numbers and percentages of visits were significantly higher than NHAMCS numbers and percentages of visits for each diagnosis listed with the exceptions of abdominal pain and chest pain, for which only the percentage estimates were higher. Among visits by women age 65 and older, no statistical differences were noted for urinary tract infection and abdominal pain. NHAMCS estimates for number and percentage of visits with a diagnosis of pneumonia were significantly higher than corresponding NHCS estimates. NHCS estimates for number and percentage of visits were significantly higher than NHAMCS estimates for essential hypertension, and the NHCS percentage estimate was significantly higher than the NHAMCS percentage estimate for chest pain.

Among visits by males younger than age 18, no significant differences were noted between NHAMCS and NHCS estimates for open wound of head, fever of other and unspecified origin, and unspecified nausea, vomiting, and diarrhea. In contrast, the NHAMCS visit estimate for abdominal pain was higher but the NHCS percentage estimate for asthma was higher. Among visits by men 18-64 years of age, both NHCS numbers of visits and percentage estimates were higher than NHAMCS numbers of visits and percentage estimates for essential hypertension and unspecified nausea, vomiting, and diarrhea. NHCS percentage estimates only were higher for chest pain and abdominal pain. No differences were found for alcohol-related disorders. Among visits by men age 65 and older, NHCS numbers of visits and percentage estimates were higher for essential hypertension and Type 2 diabetes mellitus. NHCS percentage estimates but not numbers of visits were higher than NHAMCS percentage estimates for heart failure and bronchiectasis, emphysema and other chronic obstructive pulmonary disease. No differences were found for pneumonia.

Discussion

This report compared estimates of ED visits using two national datasets: the 2020 National Hospital Ambulatory Medical Care Survey and the 2020 National Hospital Care Survey. The overall NHAMCS ED visit estimate was 131.3 million visits, which was statistically similar to the NHCS ED visit estimate of 114.6 million visits. Note that the standard errors of NHAMCS ED estimates have increased over the years. In 2010, for example, the overall ED visit estimate from NHAMCS was 129.8 million visits with a standard error of 6.2 million visits. The 95% confidence interval ranged from 118.1 million visits to 142.7 million visits. In 2020, the standard error for the 131.3 million visit estimate was 11.3 million visits and the confidence interval was proportionately wider, ranging from 110.5 million visits to 156.0 million visits. Survey nonresponse increased over the same time period. The numbers of sampled visits submitted from responding NHAMCS hospitals was especially low in 2020, in part

related to the difficulty in data collection during the COVID-19 pandemic when data for only 14,860 sampled visits were collected from about 175 hospitals. In contrast, data were collected for nearly 35,000 sampled visits from 350 hospitals in the 2010 NHAMCS.

The overall NHCS estimate of 114.6 million visits had a standard error of 5.6 million, with a confidence interval ranging from 103.4 million visits to 125.7 million visits. Estimates were based on 7,960,956 records obtained from 200 hospitals.

Even with the above consideration, statistically significant differences were found among estimates of visits and rates by the youngest age groups – infants younger than age 1 and children ages 1-17 – although significant differences were not found when comparing percentages of visits for these groups. The NHAMCS sample includes multiple children's hospitals, and these accounted for approximately 5% of all ED records (unweighted) in the 2020 data. In contrast, the NHCS dataset included only a small number of specialty hospitals of which fewer than 10 were children's hospitals (4). Records from children's hospitals accounted for 2.9% of all NHCS ED records (unweighted).

Data on visit disposition are not directly comparable between NHAMCS and NHCS because of differences in data sources and collection methods as explained in the Methods section. These differences are discussed in greater detail in Appendix II.

In addition to being compared with each other, NHAMCS and NHCS ED data can be compared with other ED data sources. These include the Nationwide Emergency Department Sample (NEDS), part of the Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project, which was used as a construct control for calibrating the 2020 NHCS visit-level weights. A separate comparison of data from NHCS, NHAMCS, and NEDS is available on the NHCS website (24).

For more than 30 years, NHAMCS collected data on emergency department visits through medical record abstraction by U.S. Census Bureau field agents who sampled approximately 100 ED visits from each sampled hospital over a 4-week reporting period in order to allow for the production of nationally representative estimates. The survey covered a wide range of patient and visit characteristics, including patient demographics, patient's reason for visit, services and procedures ordered or provided during the visit, provider's diagnosis, medications, and other items. NHAMCS yielded a rich resource for health care researchers and others but was challenged in recent years with declining response rates and the difficulty in obtaining data through in-person field abstraction.

NHCS collects a complete calendar year's worth of data from participating hospitals, with the result that millions of encounters are obtained annually. This produces a robust dataset which can be used to analyze a variety of conditions, including those not covered as completely in NHAMCS. There are differences between NHAMCS and NHCS data as shown above, and researchers need to be mindful of the differences in survey methodology and data collection which could impact the estimates. In addition, fewer variables are currently available for analysis in NHCS compared with NHAMCS public use data files.

NHCS was able to produce national estimates for the first time in 2020, as well as releasing a public use data file based on a 5% sample of visit records. The 5% sample produces estimates that are similar to the original restricted dataset (5). If data users wish to access original data, they can do

so through the NCHS Research Data Center at www.cdc.gov/rdc. For more information about what is available on the RDC file, please see: https://www.cdc.gov/rdc/data/b1/2019-2020-NHCS-RDC-Data-Dictionary-508.pdf.

To summarize, both similarities and differences were found when comparing NHAMCS and NHCS data on ED visits. Researchers should take note of these and consider methodological differences between the surveys when interpreting their own results.

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Detailed Tables

Table 1. Emergency department visits, by patient age and sex, comparing two data sources: United States, 2020

	NHAMCS						NHCS					
Patient characteristic	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval	Number of visits per 100 people[1]	95% Confidence Interval	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval	Number of visits per 100 people[1]	95% Confidence Interval
All visits	131,297	11,295	100.0	…	40.2	(33.8-47.7)	114,562	5,632	100.0	…	35.1	(31.6-38.5)
Age group (years)[2]												
Younger than 1[3,4]	2,545	319	1.9	(1.6-2.4)	69.4	(53.9-89.2)	1,626	183	1.4	(1.1-1.8)	44.3	(34.4-54.2)
1–17[3,4]	20,309	2,794	15.5	(12.3-19.1)	29.2	(22.1-38.4)	14,136	979	12.3	(11.1-13.7)	20.3	(17.5-23.1)
18–44[5]	49,983	4,546	38.1	(36.0-40.1)	42.8	(35.7-51.3)	47,881	2,199	41.8	(40.3-43.3)	41	(37.2-44.7)
45–64	31,639	2,867	24.1	(22.7-25.6)	38.1	(31.8-45.7)	28,595	1,499	25	(24.4-25.5)	34.4	(30.8-38.0)
65–74	12,875	1,279	9.8	(8.9-10.8)	40.1	(32.9-48.9)	10,790	711	9.4	(8.8-10.0)	33.6	(29.2-38.0)
75 and older	13,947	1,433	10.6	(9.5-11.9)	65.4	(53.2-80.4)	11,455	962	10	(9-11.1)	53.7	(44.8-62.7)
Missing[2]	…	…	…	…	…	…	*	…	0.1	(0.0-0.4)	*	…
Sex and age group (years)[2]												
Female total	70,076	6,338	53.4	(51.8-55.0)	42.3	(35.3-50.7)	62,351	3,016	54.4	(53.9-54.9)	37.7	(34.1-41.3)
Younger than 1	1,049	157	0.8	(0.6-1.1)	58.5	(43.4-78.9)	753	86	0.7	(0.5-0.8)	42	(32.4-51.6)
1–17[3,4]	9,872	1,301	7.5	(6.1-9.2)	.29.0	(22.3-37.8)	6,968	488	6.1	(5.5-6.7)	20.5	(17.6-23.3)
18–44[5]	28,653	2,854	21.8	(20.3-23.5)	49.1	(40.3-59.9)	27,858	1,247	24.3	(23.4-25.3)	47.8	(43.5-52.0)
45–64	16,133	1,610	12.3	(11.4-13.2)	38.4	(31.4-46.8)	14,576	758	12.7	(12.5-13.0)	34.7	(31.1-38.2)
65–74	6,571	672	5	(4.5-5.6)	38.7	(31.6-47.4)	5,602	377	4.9	(4.6-5.2)	33	(28.6-37.4)
75 and older	7,799	798	5.9	(5.2-6.8)	63.2	(51.5-77.5)	6,588	503	5.8	(5.3-6.3)	53.4	(45.3-61.5)
Missing	…	…	…	…	…	…	*	…	*	*	*	…
Male total	61,220	5,143	46.6	(45.0-48.2)	38	(32.1-44.9)	52,084	2,657	45.5	(44.9-46.0)	32.3	(29.0-35.6)
Younger than 1[3,4]	1,496	238	1.1	(0.9-1.5)	79.8	(58.1-109.6)	872	97	0.8	(0.6-0.9)	46.5	(36.3-56.7)
1–17[3,4]	10,437	1,570	7.9	(6.1-10.2)	29.3	(21.7-39.6)	7,166	493	6.3	(5.6-6.9)	20.1	(17.4-22.9)
18–44	21,329	1,828	16.2	(15.1-17.4)	36.4	(30.7-43.2)	19,998	989	17.5	(16.7-18.2)	34.2	(30.8-37.5)

45–64	15,505	1,357	11.8	(10.9-12.8)	37.8	(31.7-45.0)	14,004	759	12.2	(11.8-12.6)	34.1	(30.5-37.8)
65–74	6,304	674	4.8	(4.3-5.4)	41.6	(33.6-51.5)	5,182	337	4.5	(4.3-4.8)	34.2	(29.8-38.6)
75 and older	6,148	739	4.7	(4.0-5.4)	68.5	(53.7-87.2)	4,857	464	4.2	(3.7-4.8)	54.1	(43.8-64.3)
Missing	…	…	…	…	…	…	*	…	0	(0.0-0.0)	*	…

... Category not applicable.
0.0 quantity is greater than zero but less than 0.05.
*Estimate does not meet National Center for Health Statistics standards of reliability. Count estimates are not presented if they are unreliable based on the procedure specified in "National Center for Health Statistics Data Presentation Standards for Rates and Counts" (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02-200.pdf). Proportion estimates are not presented if they are unreliable based on the procedure specified in "National Center for Health Statistics Data Presentation Standards for Proportions" (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf).
[1]Visit rates by age group and sex are based on estimates of the U.S. civilian noninstitutionalized population as of July 1, 2020, Vintage 2022, from the U.S. Census Bureau, Population Division National Population by Characteristics: 2020-2023. The estimates are developed from a base that integrates the 2020 Census, Vintage 2020 estimates, and 2020 Demographic Analysis estimates. For population estimates methodology statements, see http://www.census.gov/programs-surveys/popest/technical-documentation/methodology.html. For a description of the Civilian Noninstitutionalized Population, see Population Estimates Terms and Definitions at http://www.census.gov/programs-surveys/popest/about/glossary.html.
[2]For NHCS, age imputation was attempted in 0.3% of unweighted records; 0.1% of records were still missing age after imputation was attempted. Sex imputation was attempted in 0.3% of unweighted records; 0.2% of unweighted records were still missing sex after imputation. For imputation methodology, see: https://www.cdc.gov/nchs/data/nhcs/2020-NHCS-PUF-Tech-Doc-508.pdf.
[3]Statistically significant difference between NHAMCS and NHCS estimates for number of visits per 1000 people ($p < 0.05$).
[4]Statistically significant difference between NHAMCS and NHCS estimates for number of visits per 100 people ($p < 0.05$).
[5]Statistically significant difference between NHAMCS and NHCS percentages ($p < 0.05$).
NOTES: NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey. Numbers may not add to totals due to rounding.
SOURCES: National Center for Health Statistics, 2020 National Hospital Ambulatory Medical Care Survey and 2020 National Hospital Care Survey.

Table 2. Emergency department visits, by patient age and sex, comparing two public use file data sources: United States, 2020

	NHAMCS						NHCS					
Patient characteristic	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval	Number of visits per 100 people[1]	95% Confidence Interval	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval	Number of visits per 100 people[1]	95% Confidence Interval
All visits	131,297	11,751	100.0	…	40.2	(33.7-48.0)	114,595	5,627	100.0	...	35.1	(31.9-38.6)
Age group (years)[2]												
Younger than 1	2,545	328	1.9	(1.6-2.4)	69.4	(53.7-89.6)	1,631	181	1.4	(1.1-1.8)	44.4	(35.8-55.3)
1–17	20,309	2,811	15.5	(12.3-19.1)	29.2	(22.2-38.4)	14,134	980	12.3	(11.1-13.7)	20.3	(17.7-23.2)
18–44	49,983	4,784	38.1	(36.0-40.2)	42.8	(35.4-51.7)	47,891	2,192	41.8	(40.4-43.2)	41	(37.5-44.8)
45–64	31,639	2,986	24.1	(22.7-25.6)	38.1	(31.6-45.9)	28,608	1,500	25	(24.4-25.5)	34.4	(31.1-38.2)
65–74	12,875	1,255	9.8	(8.9-10.8)	40.1	(33.0-48.6)	10,790	706	9.4	(8.9-10.0)	33.6	(29.5-38.2)
75 and older	13,947	1,494	10.6	(9.5-11.8)	65.4	(52.9-80.9)	11,462	959	10	(9.0-11.1)	53.8	(45.6-63.4)
Missing[2]							*	…	0.1	(0.0-0.4)	*	…
Sex and age group (years)[2]												
Female total	70,076	6,622	53.4	(51.7-55.0)	42.3	(35.1-51.1)	62,372	3,014	54.4	(53.9-54.9)	37.7	(34.3-41.4)
Younger than 1	1,049	165	0.8	(0.6-1.1)	58.5	(42.8-79.9)	758	84	0.7	(0.4-1.0)	42.3	(34.0-52.5)
1–17	9,872	1,316	7.5	(6.1-9.1)	29	(22.3-37.8)	6,951	498	6.1	(5.4-6.8)	20.4	(17.8-23.5)
18–44	28,653	3,002	21.8	(20.2-23.5)	49.1	(39.9-60.5)	27,876	1,239	24.3	(23.4-25.2)	47.8	(43.8-52.2)
45–64	16,133	1,636	12.3	(11.5-13.2)	38.4	(31.4-46.9)	14,592	759	12.7	(12.4-13.0)	34.7	(31.3-38.4)
65–74	6,571	700	5	(4.4-5.6)	38.7	(31.3-47.8)	5,600	374	4.9	(4.6-5.2)	33	(28.9-37.6)
75 and older	7,799	831	5.9	(5.2-6.8)	63.2	(51.2-78.1)	6,587	499	5.7	(5.3-6.3)	53.4	(46.0-62.0)
Missing							*	…	-	(0.0-0.1)	*	…
Male total	61,220	5,315	46.6	(45.0-48.3)	38	(32.0-45.1)	52,092	2,655	45.5	(44.9-46.0)	32.3	(29.2-35.7)
Younger than 1	1,496	238	1.1	(0.9-1.5)	79.8	(58.2-109.4)	873	98	0.8	(0.5-1.1)	46.5	(37.4-58.0)
1–17	10,437	1,574	7.9	(6.1-10.2)	29.3	(21.7-39.5)	7,179	487	6.3	(5.6-6.9)	20.1	(17.6-23.0)
18–44	21,329	1,910	16.2	(15.2-17.4)	36.4	(30.5-43.5)	19,989	992	17.4	(16.7-18.2)	34.1	(31.0-37.6)
45–64	15,505	1,433	11.8	(10.9-12.8)	37.8	(31.5-45.4)	13,996	758	12.2	(11.8-12.6)	34.1	(30.7-37.9)
65–74	6,304	627	4.8	(4.3-5.4)	41.6	(34.2-50.7)	5,184	335	4.5	(4.2-4.8)	34.2	(30.1-38.8)
75 and older	6,148	776	4.7	(4.0-5.4)	68.5	(53.3-87.9)	4,864	466	4.2	(3.7-4.9)	54.2	(44.9-65.4)

Missing	…	…	…	…	…	…	*	…	-	(0.0-6.5)	*	…

... Category not applicable.
0.0 quantity is greater than zero but less than 0.05.
*Estimate does not meet National Center for Health Statistics standards of reliability. Count estimates are not presented if they are unreliable based on the procedure specified in "National Center for Health Statistics Data Presentation Standards for Rates and Counts" (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02-200.pdf). Proportion estimates are not presented if they are unreliable based on the procedure specified in “National Center for Health Statistics Data Presentation Standards for Proportions” (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf).
[1]Visit rates by age group and sex are based on estimates of the U.S. civilian noninstitutionalized population as of July 1, 2020, Vintage 2022, from the U.S. Census Bureau, Population Division National Population by Characteristics: 2020-2023. The estimates are developed from a base that integrates the 2020 Census, Vintage 2020 estimates, and 2020 Demographic Analysis estimates. For population estimates methodology statements, see http://www.census.gov/programs-surveys/popest/technical-documentation/methodology.html. For a description of the Civilian Noninstitutionalized Population, see Population Estimates Terms and Definitions at http://www.census.gov/programs-surveys/popest/about/glossary.html.
[2]For NHCS, age imputation was attempted in 0.3% of unweighted records; 0.1% of records were still missing age after imputation was attempted. Sex imputation was attempted in 0.3% of unweighted records; 0.2% of unweighted records were still missing sex after imputation. For imputation methodology, see: https://www.cdc.gov/nchs/data/nhcs/2020-NHCS-PUF-Tech-Doc-508.pdf.
NOTES: NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey. Numbers may not add to totals due to rounding.
SOURCES: National Center for Health Statistics, 2020 National Hospital Ambulatory Medical Care Survey and 2020 National Hospital Care Survey, public use data files.

Table 3. Primary (or first-listed) diagnosis at emergency department visits, by major disease category, comparing two data sources: United States, 2020

	NHAMCS				NHCS			
Major disease category and ICD 10 CM code range[1]	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval
All visits	131,297	11,295	100.0	…	114,562	5,632	100.0	…
Certain infectious and parasitic diseases (A00-B99)	3,237	388	2.5	(2.1-2.9)	2,420	190	2.1	(1.8-2.4)
Neoplasms (C00-D49)	490	144	0.4	(0.2-0.6)	268	34	0.2	(0.2-0.3)
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50-D89)[2,3]	858	170	0.7	(0.4-0.9)	470	51	0.4	(0.3-0.5)
Endocrine, nutritional, and metabolic diseases (E00-E89)	1,958	221	1.5	(1.2-1.8)	1,483	127	1.3	(1.1-1.5)
Mental, behavioral and neurodevelopmental disorders (F01-F99)[2,3]	6,216	671	4.7	(4.0-5.6)	4,059	395	3.5	(2.9-4.3)
Diseases of the nervous system (G00-G99)	2,066	264	1.6	(1.3-1.9)	1,908	142	1.7	(1.4-1.9)
Diseases of the eye and adnexa (H00-H59)	1,138	236	0.9	(0.6-1.3)	767	64	0.7	(0.6-0.8)
Diseases of the ear and mastoid process (H60-H95)	1,653	269	1.3	(0.9-1.7)	1,155	95	1.0	(0.9-1.2)
Diseases of the circulatory system (I00-I99)[2,3]	5,350	651	4.1	(3.5-4.7)	3,365	347	2.9	(2.4-3.5)
Diseases of the respiratory system (J00-J99)[2,3]	11,597	1,445	8.8	(7.5-10.3)	7,918	593	6.9	(6.0-7.9)
Diseases of the digestive system (K00-K95)[2,3]	7,950	761	6.1	(5.4-6.7)	5,564	401	4.9	(4.3-5.5)
Diseases of the skin and subcutaneous tissue (L00-L99)[2]	3,969	443	3.0	(2.6-3.5)	2,818	213	2.5	(2.1-2.8)
Diseases of the musculoskeletal system and connective tissue (M00-M99)[2]	9,145	1,040	7.0	(6.0-8.0)	6,668	498	5.8	(5.0-6.7)
Diseases of the genitourinary system (N00-N99)[2]	6,739	701	5.1	(4.4-5.9)	5,160	366	4.5	(3.9-5.1)
Pregnancy, childbirth and the puerperium (O00-O9A)	2,441	382	1.9	(1.4-2.4)	2,570	178	2.2	(1.9-2.6)
Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)[2,3]	32,482	2,968	24.7	(23.0-26.5)	21,227	1,372	18.5	(16.1-21.1)
Injury, poisoning and certain other consequences of external causes (S00-T88)[2]	22,822	2,013	17.4	(16.1-18.7)	17,835	1,183	15.6	(13.6-17.7)

Codes for special purposes (U00-U85)[2,3,4]	1,455	299	1.1	(0.8-1.6)	2,112	113	1.8	(1.7-2.0)
All other diagnoses[5]	6,758	681	5.1	(4.4-5.9)	3,471	344	3.0	(2.5-3.7)
Uncodable entries[6]	*	…	*	…	*	…	0.4	(0.1-0.8)
Blank or unknown	*	...	*	...	22,885	6,230	20.0	(10.9-32.1)

... Category not applicable.
*Estimate does not meet National Center for Health Statistics standards of reliability. Count estimates are not presented if they are unreliable based on the procedure specified in "National Center for Health Statistics Data Presentation Standards for Rates and Counts" (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02-200.pdf). Proportion estimates are not presented if they are unreliable based on the procedure specified in "National Center for Health Statistics Data Presentation Standards for Proportions" (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf).
[1]ICD-10-CM code ranges are based on the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD–10–CM). However, certain codes have been combined in this table to better describe the utilization of ambulatory care services.
[2]Statistically significant difference between NHAMCS and NHCS estimates for number of emergency department visits ($p < 0.05$).
[3]Statistically significant difference between NHAMCS and NHCS percentages ($p < 0.05$).
[4]For NHAMCS, the only code in this category is U07.1 for COVID-19. For NHCS, this category includes U07.0 for vaping-related disorder and U07.1 for COVID-19.
[5]This category includes certain conditions originating in the perinatal period (P00-P96), congenital malformations, deformations and chromosomal abnormalities (Q00-Q99), external causes of morbidity (V00-Y99), and factors influencing health status and contact with health services (Z00-Z99).
[6]For NHAMCS, this category includes illegible diagnosis, left before being seen, walked out, eloped, left against medical advice, and entries of "none," "no diagnosis," "no disease," and "healthy" as the only entry in the diagnosis item. For NHCS, uncodable entries include any non-ICD-10-CM diagnosis codes.
NOTES: NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey. Numbers may not add to totals due to rounding. For NHAMCS, up to five diagnoses related to the current visit could be recorded by the data abstractor. The first-listed diagnosis was considered to be the primary one. For NHCS, there was no limit to the number of diagnoses that could be included in the electronic health record and there was no order of precedence. For some visits, the primary diagnosis could not be determined, and the first-listed diagnosis was used as a proxy.
SOURCES: National Center for Health Statistics, 2020 National Hospital Ambulatory Medical Care Survey and 2020 National Hospital Care Survey.

Table 4. Any-listed diagnoses (up to five) at emergency department visits, by major disease category, comparing two data sources: United States, 2020

	NHAMCS				NHCS			
Major disease category and ICD 10 CM code range[1]	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval
All visits	131,297	11,295	100.0	…	114,562	5,632	100.0	…
Certain infectious and parasitic diseases (A00-B99)	5,746	622	4.4	(3.8-5.0)	5,511	338	4.8	(4.5-5.2)
Neoplasms (C00-D49)	1,368	202	1.0	(0.8-1.3)	1,524	115	1.3	(1.2-1.5)
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50-D89)	3,093	494	2.4	(1.8-3.0)	3,481	232	3.0	(2.8-3.3)
Endocrine, nutritional, and metabolic diseases (E00-E89)[2,3]	11,075	1,478	8.4	(6.8-10.3)	16,942	1,389	14.8	(13.1-16.6)
Mental, behavioral and neurodevelopmental disorders (F01-F99)[2,3]	13,376	1,429	10.2	(8.8-11.8)	21,042	1,608	18.4	(15.9-21.1)
Diseases of the nervous system (G00-G99)[2,3]	5,138	638	3.9	(3.3-4.6)	6,828	394	6.0	(5.5-6.4)
Diseases of the eye and adnexa (H00-H59)	1,606	261	1.2	(0.9-1.6)	1,716	93	1.5	(1.4-1.6)
Diseases of the ear and mastoid process (H60-H95)	2,383	351	1.8	(1.4-2.3)	2,102	111	1.8	(1.7-2.0)
Diseases of the circulatory system (I00-I99)[2,3]	15,266	2,027	11.6	(9.6-13.9)	21,610	1,876	18.9	(16.4-21.5)
Diseases of the respiratory system (J00-J99)	18,756	2,246	14.3	(12.5-16.2)	18,779	1,220	16.4	(15.1-17.8)
Diseases of the digestive system (K00-K95)	12,478	1,194	9.5	(8.7-10.4)	12,012	599	10.5	(9.8-11.2)
Diseases of the skin and subcutaneous tissue (L00-L99)	5,585	551	4.3	(3.8-4.8)	5,139	254	4.5	(4.3-4.7)
Diseases of the musculoskeletal system and connective tissue (M00-M99)[3]	13,240	1,422	10.1	(8.9-11.4)	15,463	748	13.5	(12.7-14.3)
Diseases of the genitourinary system (N00-N99)	12,971	1,426	9.9	(8.6-11.3)	12,216	613	10.7	(10.1-11.2)
Pregnancy, childbirth and the puerperium (O00-O9A)[3]	2,530	394	1.9	(1.5-2.5)	3,220	160	2.8	(2.6-3.0)
Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)[3]	49,485	4,533	37.7	(35.3-40.1)	47,207	2,215	41.2	(39.1-43.3)
Injury, poisoning and certain other consequences of external causes (S00-T88)	26,961	2,350	20.5	(19.1-22.0)	23,881	1,024	20.8	(20.0-21.7)
Codes for special purposes (U00-U85)[4]	2,372	434	1.8	(1.3-2.5)	2,791	137	2.4	(2.3-2.6)

All other diagnoses[5]	19,148	2,245	14.6	(12.3-17.2)	41,664	2,617	36.4	(33.0-39.8)
Uncodable entries[6]	*	…	*	…	*	...	0.0	(0.0-0.0)
Blank or unknown	*	...	*	...	10,713	2,455	9.4	(5.7-14.2)

... Category not applicable.
0.0 Quantity more than zero but less than 0.05.
*Estimate does not meet National Center for Health Statistics standards of reliability. Count estimates are not presented if they are unreliable based on the procedure specified in "National Center for Health Statistics Data Presentation Standards for Rates and Counts" (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02-200.pdf). Proportion estimates are not presented if they are unreliable based on the procedure specified in “National Center for Health Statistics Data Presentation Standards for Proportions” (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf).
[1]ICD-10-CM code ranges are based on the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD–10–CM). However, certain codes have been combined in this table to better describe the utilization of ambulatory care services.
[2]Statistically significant difference between NHAMCS and NHCS estimates for number of emergency department visits ($p < 0.05$).
[3]Statistically significant difference between NHAMCS and NHCS percentages ($p < 0.05$).
[4]For NHAMCS, the only code in this category is U07.1 for COVID-19. For NHCS, this category includes U07.0 for vaping-related disorder and U07.1 for COVID-19.
[5]This category includes certain conditions originating in the perinatal period (P00-P96), congenital malformations, deformations and chromosomal abnormalities (Q00-Q99), external causes of morbidity (V00-Y99), and factors influencing health status and contact with health services (Z00-Z99).
[6]For NHAMCS, this category includes illegible diagnosis, left before being seen, walked out, eloped, left against medical advice, and entries of "none," "no diagnosis," "no disease," and "healthy" as the only entry in the diagnosis item. For NHCS, uncodable entries include any non-ICD-10-CM diagnosis codes.

NOTES: NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey. Numbers may not add to totals due to rounding. For NHAMCS, up to five diagnoses related to the current visit could be recorded by the data abstractor. The first-listed diagnosis was considered to be the primary one. For NHCS, there was no limit to the number of diagnoses that could be included in the electronic health record and there was no order of precedence. For some visits, the primary diagnosis could not be determined, and the first-listed diagnosis was used as a proxy.
SOURCES: National Center for Health Statistics, 2020 National Hospital Ambulatory Medical Care Survey and 2020 National Hospital Care Survey.

Table 5. Any-listed diagnoses at emergency department visits, by major disease category, comparing two data sources: United States, 2020

	NHAMCS				NHCS			
Major disease category and ICD 10 CM code range[1]	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval
All visits	131,297	11,295	100.0	…	114,562	5,632	100.0	…
Certain infectious and parasitic diseases (A00-B99)[2]	5,746	622	4.4	(3.8-5.0)	6,388	417	5.6	(5.1-6.0)
Neoplasms (C00-D49)[2,3]	1,368	202	1.0	(0.8-1.3)	2,003	140	1.7	(1.6-1.9)
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50-D89)[2,3]	3,093	494	2.4	(1.8-3.0)	5,411	349	4.7	(4.3-5.1)
Endocrine, nutritional, and metabolic diseases (E00-E89)[2,3]	11,075	1,478	8.4	(6.8-10.3)	22,389	1,743	19.5	(17.4-21.8)
Mental, behavioral and neurodevelopmental disorders (F01-F99)[2,3]	13,376	1,429	10.2	(8.8-11.8)	26,179	1,952	22.9	(19.8-26.2)
Diseases of the nervous system (G00-G99)[2,3]	5,138	638	3.9	(3.3-4.6)	9,374	545	8.2	(7.5-8.9)
Diseases of the eye and adnexa (H00-H59)[2]	1,606	261	1.2	(0.9-1.6)	2,132	116	1.9	(1.7-2.0)
Diseases of the ear and mastoid process (H60-H95)	2,383	351	1.8	(1.4-2.3)	2,325	116	2.0	(1.9-2.2)
Diseases of the circulatory system (I00-I99)[2,3]	15,266	2,027	11.6	(9.6-13.9)	26,058	2,098	22.7	(20.0-25.6)
Diseases of the respiratory system (J00-J99)[2]	18,756	2,246	14.3	(12.5-16.2)	21,296	1,359	18.6	(17.1-20.2)
Diseases of the digestive system (K00-K95)[2]	12,478	1,194	9.5	(8.7-10.4)	14,963	769	13.1	(12.1-14.0)
Diseases of the skin and subcutaneous tissue (L00-L99)[2]	5,585	551	4.3	(3.8-4.8)	5,726	278	5.0	(4.8-5.2)
Diseases of the musculoskeletal system and connective tissue (M00-M99)[2,3]	13,240	1,422	10.1	(8.9-11.4)	18,260	895	15.9	(14.9-17.0)
Diseases of the genitourinary system (N00-N99)[2]	12,971	1,426	9.9	(8.6-11.3)	14,633	721	12.8	(12.1-13.4)
Pregnancy, childbirth and the puerperium (O00-O9A)[2]	2,530	394	1.9	(1.5-2.5)	3,268	162	2.9	(2.6-3.1)
Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)[2]	49,485	4,533	37.7	(35.3-40.1)	50,285	2,350	43.9	(41.5-46.3)
Injury, poisoning and certain other consequences of external causes (S00-T88)	26,961	2,350	20.5	(19.1-22.0)	24,969	1,063	21.8	(20.9-22.7)
Codes for special purposes (U00-U85)[2,4]	2,372	434	1.8	(1.3-2.5)	2,901	141	2.5	(2.4-2.7)
All other diagnoses[5]	19,148	2,245	14.6	(12.3-17.2)	57,238	3,691	50.0	(45.1-54.8)
Uncodable entries[6]	*	…	*	…	4.3	1.5	0.0	(0.0-0.0)
Blank or unknown	*	...	*	...	11,959	2,656	10.4	(6.5-15.7)

... Category not applicable.
0.0 Quantity more than zero but less than 0.05.
*Estimate does not meet National Center for Health Statistics standards of reliability. Count estimates are not presented if they are unreliable based on the procedure specified in "National Center for Health Statistics Data Presentation Standards for Rates and Counts" (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02-200.pdf). Proportion estimates are not presented if they are unreliable based on the procedure specified in "National Center for Health Statistics Data Presentation Standards for Proportions" (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf).
[1]ICD-10-CM code ranges are based on the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD–10–CM). However, certain codes have been combined in this table to better describe the utilization of ambulatory care services.
[2]Statistically significant difference between NHAMCS and NHCS percentages ($p < 0.05$).
[3]Statistically significant difference between NHAMCS and NHCS estimates for number of emergency department visits ($p < 0.05$).
[4]For NHAMCS, the only code in this category is U07.1 for COVID-19. For NHCS, this category includes U07.0 for vaping-related disorder and U07.1 for COVID-19.
[5]This category includes certain conditions originating in the perinatal period (P00-P96), congenital malformations, deformations and chromosomal abnormalities (Q00-Q99), external causes of morbidity (V00-Y99), and factors influencing health status and contact with health services (Z00-Z99).
[6]For NHAMCS, this category includes illegible diagnosis, left before being seen, walked out, eloped, left against medical advice, and entries of "none," "no diagnosis," "no disease," and "healthy" as the only entry in the diagnosis item. For NHCS, uncodable entries include any non-ICD-10-CM diagnosis codes.

NOTES: NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey. Numbers may not add to totals due to rounding. For NHAMCS, up to five diagnoses related to the current visit could be recorded by the data abstractor. The first-listed diagnosis was considered to be the primary one. For NHCS, there was no limit to the number of diagnoses that could be included in the electronic health record and there was no order of precedence. For some visits, the primary diagnosis could not be determined, and the first-listed diagnosis was used as a proxy.
SOURCES: National Center for Health Statistics, 2020 National Hospital Ambulatory Medical Care Survey and 2020 National Hospital Care Survey.

Table 6. Selected diagnosis groups at emergency department visits, by diagnosis group and patient's sex and age, comparing two data sources: United States, 2020

	NHAMCS				NHCS			
Patient characteristic and diagnosis group[1]	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent distribution	95% Confidence Interval
All visits								
Abdominal pain[2]	9,181	988	7.0	(6.2-7.8)	9,824	568	8.6	(7.8-9.4)
Chest pain[2]	7,493	881	5.7	(5.1-6.4)	8,583	462	7.5	(7.0-8.0)
Essential hypertension[2,3]	7,200	1,265	5.5	(4.0-7.2)	16,422	1,604	14.3	(12.1-16.8)
Unspecified nausea, vomiting, diarrhea[2,3]	6,034	685	4.6	(3.9-5.4)	8,018	448	7.0	(6.2-7.8)
Pneumonia due to infectious organism	3,681	499	2.8	(2.4-3.3)	2,853	243	2.5	(2.2-2.8)
Dyspnea and respiratory abnormalities[2,3]	3,574	398	2.7	(2.3-3.1)	5,281	374	4.6	(4.0-5.3)
Type 2 diabetes mellitus or unspecified[2,3]	3,514	634	2.7	(1.9-3.6)	8,802	729	7.7	(6.7-8.7)
Urinary tract infection, site not specified	3,298	342	2.5	(2.2-2.9)	3,000	298	2.6	(2.2-3.0)
Headache[2]	3,234	447	2.5	(1.9-3.1)	4,229	286	3.7	(3.2-4.2)
Alcohol related disorders, excluding alcohol-related dementia and chronic alcoholic liver disease	2,912	380	2.2	(1.8-2.7)	3,112	262	2.7	(2.4-3.1)
Female by age group (years)								
Younger than 18								
Abdominal pain	798	175	7.3	(5.2-9.9)	524	36	6.8	(6.2-7.4)
Unspecified nausea, vomiting, diarrhea	748	164	6.9	(4.7-9.6)	621	53	8.0	(7.0-9.1)
Fever of other and unknown origin	651	121	6.0	(4.5-7.7)	564	57	7.3	(6.1-8.7)
Open wound of head[3]	478	106	4.4	(2.9-6.3)	263	20	3.4	(3.2-3.6)
Influenza	466	149	4.3	(2.1-7.6)	348	39	4.5	(3.9-5.2)
18-64								
Abdominal pain[2]	4,463	546	10.0	(8.6-11.4)	5,064	304	11.9	(10.9-13.0)
Chest pain[2]	2,901	394	6.5	(5.5-7.5)	3,653	192	8.6	(8.1-9.2)
Unspecified nausea, vomiting, diarrhea[2,3]	2,440	333	5.4	(4.4-6.7)	3,716	236	8.8	(7.8-9.8)
Essential hypertension[2,3]	2,158	455	4.8	(3.4-6.6)	4,767	431	11.2	(9.5-13.1)
Headache[2,3]	1,542	229	3.4	(2.7-4.4)	2,234	155	5.3	(4.7-5.9)
65 and older								
Essential hypertension[2,3]	1,553	287	10.8	(7.6-14.7)	3,857	474	31.6	(26.0-37.7)
Urinary tract infection, site not specified	1,045	149	7.3	(5.8-9.0)	832	104	6.8	(5.9-7.8)
Pneumonia due to infectious organism[2,3]	957	152	6.7	(5.3-8.3)	590	59	4.8	(4.4-5.3)

Abdominal pain	896	136	6.2	(4.9-7.7)	814	61	6.7	(5.9-7.6)
Chest pain[2]	818	150	5.7	(4.3-7.4)	966	69	7.9	(7.3-8.6)
Male by age group (years)								
Younger than 18								
Open wound of head	728	134	6.1	(4.6-7.9)	491	32	6.1	(5.7-6.5)
Fever of other and unknown origin	707	134	5.9	(4.2-8.1)	591	58	7.4	(6.1-8.7)
Unspecified nausea, vomiting, diarrhea	620	154	5.2	(3.2-7.8)	560	49	7.0	(6.1-7.9)
Abdominal pain[3]	563	108	4.7	(3.6-6.1)	336	23	4.2	(3.8-4.6)
Asthma, excluding chronic obstructive asthma[2]	382	86	3.2	(2.0-4.8)	522	112	6.5	(4.3-9.3)
18-64								
Chest pain[2]	2,667	372	7.2	(6.0-8.7)	2,946	153	8.7	(8.1-9.3)
Essential hypertension[2,3]	2,258	374	6.1	(4.6-8.0)	4,742	424	13.9	(11.9-16.2)
Abdominal pain[2]	1,981	266	5.4	(4.3-6.7)	2,540	155	7.5	(6.8-8.2)
Alcohol related disorders, excluding alcohol-related dementia and chronic alcoholic liver disease	1,943	280	5.3	(4.1-6.7)	1,959	184	5.8	(5.0-6.6)
Unspecified nausea, vomiting, diarrhea[2,3]	1,173	170	3.2	(2.4-4.1)	1,995	114	5.9	(5.2-6.6)
65 and older								
Essential hypertension[2,3]	1,204	237	9.7	(6.7-13.4)	2,979	409	29.7	(24.0-35.9)
Pneumonia due to infectious organism	911	155	7.3	(5.5-9.4)	619	73	6.2	(5.5-6.9)
Type 2 diabetes mellitus or unspecified[2,3]	804	193	6.5	(4.0-9.7)	1,815	176	18.1	(15.8-20.5)
Heart failure, non-hypertensive[2]	766	177	6.2	(3.9-9.2)	1,056	91	10.5	(9.4-11.7)
Bronchiectasis, emphysema and other chronic obstructive pulmonary disease, including chronic obstructive asthma[2]	710	146	5.7	(4.0-7.8)	952	93	9.5	(8.4-10.7)

[1]Diagnosis groups are based on the International Classification of Diseases, 10th Revision, Clinical Modification (ICD–10–CM). Codes have been combined in this table according to the National Center for Health Statistics Diagnosis Master Category List. The most frequent diagnosis groups were generated using NHAMCS data and then these groups were assessed using NHCS data. The results could be different if NHCS data were used to generate the most frequent diagnosis groups. Codes that were combined to form a category which represented an adjacent category and titled with "other" were omitted from the lists in this table. For example, the category "Other symptoms, signs, abnormal findings and ill defined conditions" was not included. For a list of ICD–10–CM codes corresponding to a specific diagnosis group, refer to the Diagnosis Master Category List document, available from: https://www.cdc.gov/nchs/ahcd/ahcd_research_tools.htm.
[2]Statistically significant difference between NHAMCS and NHCS percentages ($p < 0.05$).
[3]Statistically significant difference between NHAMCS and NHCS estimates for number of emergency department visits ($p < 0.05$).
NOTES: NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey. Numbers may not add to totals due to rounding. For NHAMCS, up to five diagnoses related to the current visit could be recorded by the data abstractor. For NHCS, there was no limit to the number of diagnoses that could be included in the electronic health record and there was no order of precedence. In this table, all NHAMCS and NHCS diagnoses were included.
SOURCES: National Center for Health Statistics, 2020 National Hospital Ambulatory Medical Care Survey and 2020 National Hospital Care Survey.

Appendix I. A comparison of selected variables from the 2020 National Hospital Ambulatory Medical Care Survey and the 2020 National Hospital Care Survey restricted and public use data files

This section includes two tables which provide detailed information on the variables used in this report. Table I compares the 2020 NHAMCS and 2020 NHCS restricted use data files for the variables in common, displaying specific variable descriptions, names, and ranges, in addition to notes with further information. Table II shows the same information but for the 2020 NHAMCS and 2020 NHCS public use data files.

Table I. Comparison of selected variables from the restricted files of the 2020 National Hospital Ambulatory Medical Care Survey and the 2020 National Hospital Care Survey available in the National Center for Health Statistics Research Data Center

Variable Description	NHAMCS	NHCS	Comments
Patient sex	SEX 1=Female 2=Male	PATIENT.SEX 1=Male 2=Female 3=Unknown -9=Missing	
Patient age	AGE 0-120 (years)	PATIENT.AGE 0-120 PATIENT.AGE_UNIT 1=Years 2=Months 3=Days	For NHCS, the values in AGE represent either days, months, or years. The variable AGE_UNIT must be used with this variable. To achieve patient age in years: If AGE_UNIT = 2, divide by 12 months. If AGE_UNIT = 3, divide by 365 days.
Diagnosis	DIAG1-DIAG5 -9 - Missing ICD-10-CM codes: 'A000---' – 'Z9989--' Special NCHS codes: ‘ZZZ0---’ = Noncodable, illegible ‘ZZZ1---’ = Left before being seen, walked out, left against medical advice ‘ZZZ2---’ = Transferred to another facility, sent to specialist ‘ZZZ3---' = Insurance/HMO will not authorize treatment ‘ZZZ4---’ = Entry of "none", "no diagnosis", "no disease", "healthy" ‘ZZZ5---’ = Entry of "Not applicable", "Not available", "NA" or "Blank"	CONDITIONS.CONDITION_CODE (Range N/A) CONDITIONS.CONDITION_CODE SYS_NAME “ICD-9" = ICD-9-CM "ICD-10"= ICD-10-CM "SNOMED-CT" = SNOMED-CT "Hospital Custom" = Custom code system for that hospital "Unknown" = Code system not provided CONDITIONS.CONDITION_TYPE “Active Problem” = A list of health issues "Cause Injury Poisoning" = Diagnosis associated with an injury, poisoning, or adverse effect "Diagnosis" = Indicates a diagnosis code "Discharge" = Diagnosis at time of discharge "Reason" = Indicates a reason for visit code CONDITIONS.DIAGNOSIS_TYPE “Admitting Diagnosis” = Diagnosis upon admission “Diagnosis” = Diagnosis associated	For NHAMCS and NHCS, there is an implied decimal between the third and fourth digits. For NHAMCS, a dash is inserted for inapplicable digits. To identify primary diagnosis or first-listed diagnosis, use the CONDITION_CODE value where DIAGNOSIS_TYPE = "Primary" for NHCS and use DIAG1 for NHAMCS. For NHCS, CONDITION_TYPE = "Reason" records are excluded from the analysis since reason for visit codes represent the patient's self-reported conditions. For NHAMCS, up to 5 reasons for the visit, as reported by the patient or patient surrogate, were collected from the medical record and coded using an NCHS internal classification system (15). These data are independent of provider's diagnosis and are excluded from the analysis for that reason.

		with the visit but not the primary diagnosis “Primary” = Diagnosis responsible for a patient’s hospital visit “Reason” = Patient's reason for visit	
Visit Disposition	NODISP - No answer to item NOFU - No follow-up planned RETRNED - Return to ED RETREFFU - Return/Refer to physician/clinic for follow-up LWBS - Left without being seen LBTC - Left before treatment complete LEFTAMA - Left against medical advice DOA - Dead on arrival DIEDED - Died in ED TRANNH - Return/transfer to nursing home TRANPSYC - Transfer to psychiatric hospital TRANOTH - Transfer to non-psychiatric hospital ADMITHOS - Admit to this hospital OBSHOS - Admit to observation unit, then hospitalized OBSDIS - Admit to observation unit, then discharged OTHDISP - Other disposition 0 = No 1 = Yes	ENCOUNTER.DISCSTAT 1=Routine to home 3=Admitted as inpatient 4=Left against medical advice 5=Transfer to short term facility 6=Transfer to long term facility 7=Court/Law enforcement 8=Dead 9=Other health care facility 10=Other discharge not otherwise specified 11=Hospice care - home or medical facility 12=Home health -5=Invalid code -7=Unknown -9=Missing	For NHAMCS, visit disposition is a "check all that apply" item with multiple categories. Each category can take values of 0 or 1. For NHCS, the variable is referred to as "discharge status". A single category is checked for each encounter. See Appendix Table III for a mapping scheme used to assess similarities and differences between these items.

NOTES: NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey.
SOURCES: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, National Hospital Care Survey, 2020.

Table II. Comparison of selected variables from the public use files of the 2020 National Hospital Ambulatory Medical Care Survey and the 2020 National Hospital Care Survey available in the National Center for Health Statistics Research Data Center

Variable Description	NHAMCS	NHCS	Comments
Patient sex	SEX 1=Female 2=Male	SEX -9 = Missing 1 = Male 2 = Female	For NHAMCS, all records with missing sex are imputed. For NHCS, all records with missing sex are subject to imputation, but missing values can still result after imputation is attempted.
Patient age	AGE 0-94 (years) 95 = 95 years and older	AGE -9 = Missing 0-85 (years) 86 = 86 years and older	For NHAMCS, all records with missing age are imputed. For NHCS, all records with missing age are subject to imputation, but missing values can still result after imputation is attempted.
Diagnosis	'DIAG1-DIAG5 '-9 ' = Missing 'A000' –'Z998' NCHS special codes: 'ZZZ0' = Noncodable, illegible 'ZZZ1' = Left before being seen, walked out, left against medical advice 'ZZZ2' = Transferred to another facility, sent to specialist 'ZZZ3' = Insurance/HMO will not authorize treatment 'ZZZ4' = Entry of "none", "no diagnosis", "no disease", "healthy" 'ZZZ5' = Entry of "Not applicable", "Not available", "NA" or "Blank"	DX1-DX30 '-9 ' = Missing 'A000' –'Z998'	Only ICD-10-CM diagnosis codes were included. There is an implied decimal between the third and fourth digits. Only the first four digits of the diagnosis codes are included to minimize disclosure risks. To identify primary diagnosis or first-listed diagnosis, use DIAG1 for NHAMCS and DX1 for NHCS. For NHCS, reason for visit records were excluded from the PUF since reason for visit codes represent the patient's self-reported conditions. For NHAMCS, up to 5 reasons for the visit, as reported by the patient or patient surrogate, were collected from the medical record and coded using an NCHS internal classification system (15). These data are independent of provider's diagnosis and are excluded from the analysis for that reason.

Visit Disposition	NODISP - No answer to item NOFU - No follow-up planned RETRNED - Return to ED RETREFFU - Return/Refer to physician/clinic for follow-up LWBS - Left without being seen LBTC - Left before treatment complete LEFTAMA - Left against medical advice DOA - Dead on arrival DIEDED - Died in ED TRANNH - Return/transfer to nursing home TRANPSYC - Transfer to psychiatric hospital TRANOTH - Transfer to non-psychiatric hospital ADMITHOS - Admit to this hospital OBSHOS - Admit to observation unit, then hospitalized OBSDIS - Admit to observation unit, then discharged OTHDISP - Other disposition 0 = No 1 = Yes	DISCHARGE_STATUS 1=Routine to home 2=Left against medical 3=Transfer to short term facility 4=Transfer to long term facility 5=Home health care 6=Hospice care - home or medical facility 7=Other 8=Dead -9=Missing	For NHAMCS, visit disposition is a "check all that apply" item with multiple categories. Each category can take values of 0 or 1. For NHCS, the variable is referred to as "discharge status". A single category is checked for each encounter. See Appendix Table III for a mapping scheme used to assess similarities and differences between these items.

NOTES: NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey
SOURCES: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, National Hospital Care Survey, 2020
NOTES

Appendix II. Methodological differences in visit disposition data in the 2020 National Hospital Ambulatory Medical Care Survey and the 2020 National Hospital Care Survey

This section presents detailed information on the challenges in assessing differences in visit disposition data from NHAMCS and NHCS.

Visit disposition (referred to as “discharge status” in NHCS) data presented a challenge for interpretation of differences because it is collected differently for each survey as described in the Methods section. In NHAMCS there are 15 possible categories, and multiple categories can be selected for each visit.

For NHCS, visit disposition is standardized from 73 unique categories across all data sources to 14 categories, and only one disposition is reported for each visit.

In order to examine visit disposition between these two surveys, visit disposition was standardized to six categories: routine to home, admit to this hospital, left against medical advice, died, other, and missing. As NHAMCS allowed for multiple dispositions to be reported for each visit, it was first necessary to create a recoded version of the NHAMCS visit disposition category, in order to select a “primary” category for each record. To achieve this, the following hierarchy was used in the following order:

- Died in the ED, DOA (Dead on Arrival) was mapped to “Died”
- Admit to this hospital, admit to observation unit, then hospitalized was mapped to “Admit to this hospital”
- Return/transfer to nursing home, transfer to psychiatric hospital, transfer to non-psychiatric hospital, other was mapped to “Transfer to other health care facility”
- Left against medical advice, left before treatment complete, left without being seen was mapped to “Left against medical advice”
- Return to ED, return/refer to physician/clinic for follow-up, admit to observation unit, then discharged, no follow-up planned was mapped to “Routine to home”
- Other disposition was mapped to “Other”
- No disposition listed was mapped to “Missing”

For example, if “no follow-up planned” and “admit to this hospital” were both reported as visit disposition categories for a NHAMCS ED visit, then “admit to this hospital” would be selected as the primary visit disposition category and would then be mapped to “admit to this hospital” For NHCS, visits that were admitted to the inpatient department (referred to as “ED-to-IP” encounters) and visits that had a visit disposition of “admitted as inpatient” were mapped to “admit to this hospital.” ED-to-IP encounters could be identified in two of the four data sources (Claims and EHR) and contain data collected from the patient’s ED visit and inpatient discharge. The visit disposition of ED-to-IP

encounters reflects the outcome of the patient's inpatient stay, not their ED visit. Due to this, all ED-to-IP encounters' visit dispositions were standardized to "admit to this hospital" to reflect the outcome of the patient's ED visit. The "transfer to other health care facility" category includes transfer to short term facility, transfer to long term facility, and other health care facility. The "other" visit disposition status includes the following categories: court or law enforcement, other discharge not otherwise specified, hospice care at home or at a medical facility, and home health. The "missing" visit disposition status includes the following categories: invalid code, unknown, and missing. Visits with a visit disposition of "dead" were mapped to "died," and "routine to home" and "left against medical advice" were mapped directly to the final visit disposition categories of the same name.

Table III summarizes how the 15 NHAMCS and the 14 NHCS visit disposition categories were mapped to the seven final visit disposition categories of routine to home, admit to this hospital, transfer to a health care facility, left against medical advice, died, other, and missing.

Table III. Mapping used with visit disposition data from the 2020 National Hospital Ambulatory Medical Care Survey and the 2020 National Hospital Care Survey to produce a standardized disposition measure

NHAMCS primary visit disposition category, recoded based on a hierarchy[1]	NHCS visit disposition category	New standardized disposition category assignment
…	Routine to home	Routine to home
Return to ED	…	Routine to home
Return/refer to physician/clinic for follow-up	…	Routine to home
Admit to observation unit, then discharged	…	Routine to home
No follow-up planned	…	Routine to home
Admit to this hospital	Admitted as inpatient	Admit to this hospital
Admit to observation unit, then hospitalized	Visits that transferred to inpatient department (regardless of reported visit disposition category)	Admit to this hospital
Left against medical advice	Left against medical advice	Left against medical advice
Left before treatment complete	…	Left against medical advice
Left without being seen	…	Left against medical advice
Died in the ED	Dead	Died
DOA (dead on arrival)	…	Died
Return/Transfer to nursing home	…	Transfer to other health care facility
…	Transfer to short term facility	Transfer to other health care facility
Transfer to psychiatric hospital	…	Transfer to other health care facility
Transfer to non-psychiatric hospital	…	Transfer to other health care facility
…	Transfer to long term facility	Transfer to other health care facility
…	Court or law enforcement	Other
…	Other health care facility	Other
…	Hospice care at home or at a medical facility	Other

…	Home health	Other
Other visit disposition	Other discharge not otherwise specified	Other
No disposition listed	Unknown	Missing
…	Invalid code	Missing
…	Missing	Missing

... Category not in survey.
[1]More than one disposition category was possible in NHAMCS, but not in the NHCS. Therefore, a primary disposition category was created for NHAMCS, based on this hierarchy: Died in ED or DOA (dead on arrival); admit to this hospital or admit to observation unit, then hospitalized; return/transfer to nursing home, transfer to psychiatric hospital, transfer to non-psychiatric hospital; left against medical advice, left without being seen, or left before treatment was complete; return to ED, return/refer to physician/clinic for follow-up, no follow-up planned, or admit to observation unit, then discharged; other disposition; and no disposition listed. For example, if a visit had disposition categories of both return to ED and admit to this hospital, admit to this hospital took precedence as the primary disposition, based on the hierarchy, and it was mapped to "Admit to this hospital" for comparison with NHCS data. If return to ED was the only disposition category reported, or any other categories reported were below it in the hierarchy, it was given a primary disposition of return to ED and mapped to "Routine to home" for comparison purposes.
NOTES: NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey.

Table IV presents data on ED visits by visit disposition (referred to as discharge status in NHCS). Using the hierarchy and mapping described in Appendix II, Table I, 100.8 million NHAMCS ED visits (76.8%) resulted in a routine discharge home, compared with 94.7 million NHCS ED visits (82.6%). Although the count estimate was not statistically different, the percentage difference was significantly higher in the NHCS data. Both the number and percentage of ED visits resulting in admission to the current hospital were significantly higher for NHAMCS compared with NHCS (14.2% and 8.2%, respectively). This was also the case for number and percentage of visits with a disposition of “left against medical advice”. The percentage of visits categorized with a disposition of “transfer to other health care facility” did not differ significantly between NHAMCS (3.7%) and NHCS (2.9%). Visits with a disposition status of “dead” accounted for 0.3% of NHAMCS visits, compared with 0.1% of NHCS visits which was not statistically different.

Overall, visit disposition, or discharge status, varied for each category except “routine to home”. The percentage of ED visits resulting in hospital admission in NHCS appeared low compared with NHAMCS data (8.3% compared with 13.7%, respectively). This is likely due to the fact that only 0.8% of unweighted ED visits from Vizient hospitals were recorded as being admitted to the hospital, compared to 18.2% for Claims, 11.0% for ACEP, and 9.5% for EHR hospitals. Overall, visit disposition was missing for 7.8% of unweighted NHCS ED records compared with 0.6% of unweighted NHAMCS ED records. Because NHAMCS data rely on abstraction from medical records by U.S. Census Bureau field staff, which in turn are partly based on self-report by the patient, there is the potential for bias and reporting errors. However, it was also possible, through data quality checks to identify some of these issues and make appropriate edits. With NHCS, however, the data submitted from hospitals are considered to be final and no subsequent modification was made to any data element. Some implausible combinations of characteristics may exist, and researchers should be aware of such possibilities when conducting their analyses.

Table IV. Number and percent distribution of emergency department visits, by visit disposition, comparing two data sources: United States, 2020

	NHAMCS				NHCS			
Disposition	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent Distribution	95% confidence interval	Number of visits (in 1,000s)	Standard error (in 1,000s)	Percent Distribution	95% confidence interval
All visits	131,297	11,295	100.0	…	114,562	5,632	100.0	…
Routine to home[1]	100,830	8,690	76.8	74.3-79.1	94,676	4,132	82.6	79.5-85.4
Admit to this hospital[2]	18,590	2,082	14.2	12.4-16.1	9,414	1,138	8.2	6.8-9.8
Transfer to other health care facility[3]	4,848	682	3.7	3.0-4.5	3,297	214	2.9	2.6-3.2
Left against medical advice[4]	3,682	551	2.8	2.2-3.5	1,974	133	1.7	1.5-1.9
Died[5]	452	248	0.3	0.1-1.0	159	14	0.1	0.1-0.2
Other[6]	1,941	546	1.5	0.8-2.5	738	81	0.6	0.5-0.8
Missing[7]	954	243	0.7	0.4-1.2	*	…	*	*

... Category not applicable.
*Estimate does not meet National Center for Health Statistics standards of reliability. Count estimates are not presented if they are unreliable based on the procedure specified in "National Center for Health Statistics Data Presentation Standards for Rates and Counts" (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02-200.pdf). Proportion estimates are not presented if they are unreliable based on the procedure specified in "National Center for Health Statistics Data Presentation Standards for Proportions" (available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf).
[1]Includes NHAMCS visit dispositions of Return or refer to physician or clinic for follow-up; Return to emergency department; Admit to observation unit, then discharged, and No follow up planned. Includes NHCS visit disposition of Routine to home.
[2]Includes NHAMCS visit dispositions of Admit to this hospital; and Admit to observation unit, then hospitalized. Includes NHCS visit disposition of Admitted as inpatient. For NHCS, also includes any visits that transferred to inpatient department (regardless of reported visit disposition category).
[3]Includes NHAMCS visit dispositions of Return/transfer to nursing home; Transfer to psychiatric hospital; and Transfer to non-psychiatric hospital. Includes NHCS visit dispositions of Transfer to short term facility, Transfer to long term facility, and Transfer to other health care facility.
[4]Includes NHAMCS visit dispositions of Left against medical advice; Left before treatment complete; and Left without being seen. Includes NHCS visit disposition of Left against medical advice.
[5]Includes NHAMCS visit dispositions of DOA (dead on arrival); and Died in ED.
[6]Includes NHAMCS visit disposition Other disposition. Includes NHCS visit dispositions of Court or law enforcement, hospice care at home or at a medical facility, home health, and Other discharge not otherwise specified.
[7]Includes NHCS visit dispositions of invalid code, unknown, and missing.
NOTES: NHAMCS is National Hospital Ambulatory Medical Care Survey. NHCS is National Hospital Care Survey. Numbers may not add to totals due to rounding. For NHAMCS, disposition of ED visit was originally collected with a "check all that apply" format. Because the NHCS only collected a single disposition for each ED visit, NHAMCS data were recoded using a hierarchy which assigned a single disposition for each visit in order to make comparisons with NHCS data. Please see "Methods" section for more information about how this was accomplished along with caveats for interpreting disposition differences between the two datasets.
SOURCES: National Center for Health Statistics, 2020 National Hospital Ambulatory Medical Care Survey and 2020 National Hospital Care Survey.

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