NHCS™
National Hospital Care Survey

Comparison of Estimates from the 2020 National Hospital Care Survey to the 2020 Nationwide Emergency Department Sample and 2020 National Hospital Ambulatory Medical Care Survey

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Abstract

Starting with the 2020 data year, the National Hospital Care Survey (NHCS) was expanded to create nationally representative data files, joining the National Hospital Ambulatory Medical Care Survey (NHAMCS) and the Nationwide Emergency Department Sample (NEDS) in providing nationally representative data on emergency department utilization. Estimates of selected emergency department (ED) visit outcomes from NHCS were compared and benchmarked against those from NHAMCS and NEDS. Between NHCS and NEDS, and NHCS and NHAMCS, certain differences were found for counts, rates, and percentages on the selected measures, which are believed to be influenced by methodological differences between the data systems. In addition, some statistically significant differences were so small as to not be substantive. Fewer ED visits were self-pay/no charge, Medicare, or Medicaid when using NHCS compared to both NEDS and NHAMCS. When using NHCS, there was a higher percentage of routine discharges among all ED visits compared to NHAMCS. In contrast, there was a lower percentage of routine discharges for all ED visits when compared to NEDS. There was a statistically significant difference in the rate of ED visits for the diagnosis category "external cause codes: intent of injury, accidental/unintentional", across all three data sources. When using NHCS, there was a lower visit rate compared to NEDS; in contrast, there was a higher visit rate compared to NHAMCS. These comparisons show that NHCS is mostly comparable to both NHAMCS and NEDS.

Introduction

The National Hospital Care Survey (NHCS), conducted by the National Center for Health Statistics (NCHS), was initiated in 2011 with the goal of providing reliable and timely health care utilization data for hospital-based settings. Since that time, NHCS has continued to expand its data collection, and in 2020, nationally representative estimates were generated for the first time. Thus, there are three data systems that provide nationally representative data on emergency department (ED) visits in 2020: the NHCS; the Nationwide Emergency Department Sample (NEDS), which is part of the Healthcare Cost and Utilization Project (HCUP), and is sponsored by the Agency for Healthcare Research and Quality (AHRQ); and the National Hospital Ambulatory Medical Care Survey (NHAMCS), which was also conducted by NCHS and was discontinued after the 2022 survey year.

This paper presents a comparative analysis of nationally representative estimates of ED visits from the 2020 NHCS to the 2020 NEDS and 2020 NHAMCS. Outcomes of interest include estimates of ED visits by patient sex and age group, primary expected source of payment, discharge status, and selected Clinical Classification Software Refined (CCSR) categories, an aggregate of *International Classification of Diseases, Tenth Revision, Clinical Modification* (ICD-10-CM) diagnosis codes into clinically meaningful categories (1).

Methods

National Hospital Care Survey (NHCS)

NHCS integrated the National Hospital Discharge Survey (NHDS), which collected inpatient data from 1960-2010, and the National Hospital Ambulatory Medical Care Survey (NHAMCS), which was comprised of three data collection components: emergency departments (ED) (1992-2022), outpatient departments (1992-2017), and ambulatory surgery centers (2009-2017). As an electronic data collection, Unlike the NHDS and NHAMCS, NHCS relies on electronic data collection, both Uniform Billing (UB)-04 administrative claims and electronic health record (EHR) data (2). Although NHCS began in 2011, the 2020 survey year was the first time weights were developed to produce nationally representative estimates (3). Prior NHCS survey years were available to users as a convenience sample under restricted use conditions.

The initial sample for NHCS was constructed in 2011 and consisted of 500 noninstitutional and nonfederal hospitals with at least six staffed inpatient beds in the United States (3). The sample encompasses data from general acute care hospitals and other specialty hospitals, including children's, rehabilitation, psychiatric, and long-term care facilities (3). Due to the addition of newly constructed hospitals within sampled hospital systems, the 2020 sample consisted of 608 hospitals (3).

Data from ED visits collected for 2020 NHCS were used to produce the ED weighted estimates (4). In 2020, NHCS collected over 10 million encounter records (including 7.9 million ED visits) from 205 hospitals with a response rate of 33.7% (4). The weights were developed with a model-based weighting methodology that utilized third-party data sources to develop replicate weights that can be used to produce national estimates with variance estimates. Eight hospitals were excluded from the weighting process due to quality issues with the submitted data (4).

For more detailed information on the data collection procedures and methodology used to produce national estimates for 2020 NHCS, refer to the following documentation: https://www.cdc.gov/nchs/data/nhcs/2020-NHCS-PUF-Tech-Doc-508.pdf. The analyses for this report were conducted using data from restricted-use data files. Information for accessing the restricted-use data files is available at: https://www.cdc.gov/rdc/index.htm. A public use data file is also available, consisting of a 5% sample of all NHCS ED records, with weights developed that allow for nationally representative estimates when using this public use file. Access to the public use file can be found here: https://www.cdc.gov/nchs/nhcs/data/index.html.

Healthcare Cost and Utilization Project (HCUP) Nationwide Emergency Department Sample (NEDS)

Since 2006, NEDS has provided national estimates of hospital ED visit data in the United States (5) using administrative data. NEDS is constructed using a combination of the HCUP State Emergency Department Databases (SEDD) and the State Inpatient Databases (SID), which are collected from participating states that provide hospital billing data, such as UB-04 claims (5).

In 2020, sampling of NEDS included 28 million unweighted ED visits from 995 hospitals from 40 states and the District of Columbia that contributed visit data to NEDS (6). These states accounted for 85% of the total U.S. population and 84% of all ED visits in the United States (6). The sample included in the 2020 NEDS consists of community and non-rehabilitation hospitals from the

American Hospital Association (AHA) Annual Survey Database, which have been defined as "non-federal, short-term, general, and other specialty hospitals open to the public," including pediatric, public, and academic hospitals (6). The following hospitals are generally excluded from the universe: long-term care, psychiatric, long-term care rehabilitation, hospital units of other institutions such as prisons, and federal hospitals. Hospitals reporting fewer than 10 ED visits in the 2020 NEDS were excluded from the sample (6). If an ED in the AHA survey database could not be matched to the ED data provided by the HCUP data source, it was eliminated from the sampling frame (6). NEDS utilizes a 20% stratified probability sampling to select EDs.

The weights of NEDS were developed using hospital-level weights and discharge-level weights. Hospital-level weights were calculated by stratifying EDs based on geographic region, trauma center designation, urban-rural location, teaching status, and ownership type (6). Discharge-level weights followed a similar approach and represented the total number of ED visits from community hospitals in the universe (6). For more information on the methodology used to collect data and produce national estimates from 2020 HCUP NEDS, see: https://hcup-us.ahrq.gov/db/nation/neds/NEDS2020Introduction.pdf.

The estimates used for this report were aggregated counts of select NEDS outcomes, generated March 2025, using interactive tables from HCUPnet, Healthcare Cost and Utilization Project, Agency for Healthcare Research and Quality, Rockville, MD. These interactive tables are available here: https://datatools.ahrq.gov/hcupnet (7).

National Hospital Ambulatory Medical Care Survey (NHAMCS)

NHAMCS was first conducted in 1992 and consisted of an annual probability sample of visits to the EDs of nonfederal, general, and short-stay hospitals in the United States. Data collection occurred in two stages, both conducted by field representatives from the U.S. Census Bureau (8). First, participating hospitals completed an induction survey about characteristics of their facilities and services. Second, field representatives manually abstracted (or collected) data from patient medical records to create a sample of visits during a 4-week reporting period, with a target of approximately 100 medical records to be collected for EDs in each hospital (8).

A total of 484 hospitals were selected for 2020 NHAMCS, of which 386 were in-scope and had eligible EDs (8). Of these, 294 EDs responded, yielding a weighted ED response rate of 76.1%. A

total of 422 emergency service areas (ESAs) were identified from the respondent EDs (8). ESAs are the smallest administrative units of an ED, and can be defined as general, adult, pediatric, urgent care/fast track, psychiatric and other (8). Of these, 204 ESAs 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 provided fewer than half of their expected forms, resulting in a weighted response rate of 46.2%, while the overall weighted response rate (calculated by the ED rate times the ESA rate) was 35.1% (8). Of those participating hospitals, data collected was completed for a total of 14,860 medical records, which were included in 2020 NHAMCS data file. More details on the design, methods, and response rates of 2020 NHAMCS are available here: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHAMCS/doc20-ed-508.pdf.

Variable Definitions

Table 2 provides a comparison table of the outcome measures outlined in the following subsections for each data source.

Emergency Department Visits

In NHCS, ED visits are defined as in-person visits made to the EDs of noninstitutional and nonfederal hospitals that have six or more staffed inpatient beds and offer unscheduled medical care 24 hours, seven days a week. Average length of stay is not used as an exclusion criterion (2,3).

In NEDS, ED visits are defined as visits made to community, non-rehabilitation hospital-owned EDs. The SEDD captures discharge information on ED visits that do not result in a hospital admission (i.e., treat-and-release), while the SID contains hospital admission information from patients who initially visit the ED (5,6). Selection of ED visit records from the SEDD and SID are based on evidence of ED services reported on the patient record (5,6). For the purposes of this analysis, treat-and-release ED visits and ED visits resulting in hospital admission were included in the analyses for Tables 3.1, 3.2, and 4; ED visits resulting in hospital admission were excluded from analyses in Tables 5 and 6.

In NHAMCS, ED visits are defined as visits by patients seeking immediate care and health services from a physician, or a staff member acting under a physician's direction, in a nonfederal, general, and short-stay hospital that provided unscheduled health care 24 hours, seven days a week. Visits solely for administrative purposes, such as bill payments, and in which no medical care was provided, were ineligible (8).

Primary Expected Source of Payment

Primary expected sources of payment in NHCS, NEDS, and NHAMCS were categorized as Medicare, Medicaid, private, self-pay/no charge, and other. Discharges without any payer information were identified as "missing." For NHAMCS, this also included "unknown" payer type. Due to the heterogeneity in the data collection and definition of payer information found among hospitals who submitted data to NHCS via EHRs, primary expected source of payment was standardized across all NHCS data sources when available.

NHAMCS defines Medicaid as Medicaid, Children's Health Insurance Program (CHIP), and state-based programs (8). In NEDS, Medicaid includes fee-for-service Medicaid, managed care Medicaid,

and CHIP. Besides Medicaid, patients covered by a state's CHIP may be included under "private" or "other" payer (9). NHCS does not mention CHIP in its Medicaid definition, and unlike NHAMCS, other government programs (federal/state/local) have a separate standalone category; however, for the purposes of this paper, they have been classified as "other" (10).

NHCS ED visits with a primary expected source of payment classified as "other" include the following payer types: auto insurance (no fault), Department of Corrections, legal liability (personal injury lawsuit), managed care (unspecified) other government (federal/state/local), worker's compensation, other (type unknown), no payment listed, and miscellaneous/other (10). NEDS defines "other" as worker's compensation, disability, Children's Rehab Services, Indian Health Services, Foreign National, Civilian Health and Medical Program of the Uniformed Services (CHAMPUS (TRICARE)), Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA), Title V, and other government programs (11). NHAMCS visits with a primary expected source of payment classified as "other" includes worker's compensation and other (8).

Discharge Status

Discharge status was standardized across all data sources in NHCS and NHAMCS to align with the following discharge categories that are available in NEDS: routine, home health care, and died (7,11).

NHCS defines routine as patients discharged to home or discharged to home or self-care with a planned acute care hospital readmission. In NEDS, a routine discharge is defined as discharged home (12). It is important to note that in NEDS, a court/law enforcement discharge is also included under routine discharges (11), unlike NHCS where court/law enforcement discharge has a separate, standalone category, which was not reported in this paper (10). NHAMCS defines routine discharge as home/residence (8).

NHCS defines home health care as patients discharged to home under care of an organized home health service or discharged/transferred to home under care of an organized home health service organization with a planned acute care hospital inpatient readmission. Discharge data for home health care were not available in NHAMCS, and therefore a comparison to NHCS could not be performed. NEDS uses an ED-specific disposition variable (DISP_ED) to capture high-level discharge status categories (11). Unlike its companion database, the National Inpatient Sample (NIS), which aligns its inpatient discharge status category descriptions for home health care with

the more detailed UB-04 reporting, the supporting documentation for NEDS does not appear to provide a detailed category description for home health care (6,11).

In NHCS, deaths include dead, expired at home, expired in a medical facility, and expired in place unknown. NHAMCS deaths are defined as dead on arrival or died in ED (8) and NEDS deaths are defined as died in ED (11).

Diagnosis Codes

The diagnosis outcomes in this report were derived from ICD-10-CM diagnosis codes. NEDS exclusively collects ICD-10-CM diagnosis codes from claims data sources, with approximately 0.03% of all visits missing an ICD-10-CM code in a visit record (13). NHCS receives diagnosis data from both UB-04 claims and EHR data sources (3) while NHAMCS diagnosis data were abstracted from medical records (8). NHCS and NHAMCS data sources allow for the use of ICD-10-CM codes and other diagnosis coding systems. The process of standardizing the other diagnosis codes collected by NHCS and NHAMCS into ICD-10-CM is described below.

In the NHCS, claims diagnoses are submitted exclusively as ICD-10-CM codes (14). EHR data sources submit medical diagnoses in a variety of coding schemes including ICD-10-CM, ICD-9-CM, Systemized Nomenclature of Medicine Clinical Terms (SNOMED-CT), EHR vendor-specific, and site-specific codes (14). When possible, diagnosis codes that are not submitted as ICD-10-CM codes are translated to equivalent ICD-10-CM codes (14). Codes that could not be mapped to an equivalent ICD-10-CM code were left in their original code system and were excluded from analyses. Approximately 6.2% (95% CI: 3.3%-10.4%) of all NHCS ED visits had a diagnosis code that could not be translated into an ICD-10-CM code. NHCS ED visits were included in the analyses examining diagnoses if they had at least one ICD-10-CM diagnosis code.

NHAMCS visit data were abstracted from patient medical records using an electronic data collection tool administered by field representatives, via an ED Patient Record Form (PRF). The ED PRF collected up to five diagnoses which were entered verbatim; these verbatim text responses were later coded using ICD-10-CM. In addition to the translated ICD-10-CM codes, there are unique codes developed internally by NCHS to account for free-text diagnoses that could not be coded (8). Approximately 97.0% (95% CI: 92.1%-99.3%) of NHAMCS ED visits had a valid ICD-10-CM code.

Every available ICD-10-CM diagnosis code for NHCS and NHAMCS ED visits was mapped to a CCSR clinical category. The CCSR for ICD-10-CM diagnoses aggregates more than 70,000 ICD-10-

CM diagnosis codes into over 530 clinically meaningful categories. Categories are organized across 22 body systems, which follow the structure of the ICD-10-CM diagnosis chapters. ICD-10-CM codes were assigned to at least one CCSR category but could map to multiple categories (1). The top ten all-listed CCSR categories were selected for comparison based on 2020 NEDS estimates and were selected for comparison in Table 6.

Statistical Analysis

All analyses of NHCS data presented in this report were conducted using SAS version 9.4 (SAS Institute, Cary, N.C.). All analyses of NHAMCS data were conducted using SAS version 9.4 (SAS Institute, Care, N.C.) and SAS-callable SUDAAN version 11.0 (RTI International, Research Triangle Park, N.C.). All NEDS estimates and corresponding 95% confidence intervals were taken from interactive HCUPnet tables (https://datatools.ahrq.gov/hcupnet). NHCS and NHAMCS estimates that did not meet NCHS confidentiality requirements were suppressed. All weighted percentages and rates were rounded to the tenth decimal place. ED visit rates presented in this report represent the number of ED visits per 100,000 people in 2020. Visit rates by age group and sex were based on estimates of the U.S. resident population from April 1, 2020 to July 1, 2021 (15-17).

Differences in counts, percentages, and rates estimates between NHCS and NEDS and between NHCS and NHAMCS were tested using two-tailed *t* tests at the $p < 0.05$ level (18). Estimates presented in this report were evaluated for statistical reliability using NCHS standards for presentation of proportions (19) and NCHS standards for presentation of rates and counts (20), where applicable. Estimates that did not meet the standards are either suppressed or presented in the tables with an asterisk. The Kish design effect was calculated to determine the total design effect during application of rates and counts standards (21). The 95% confidence intervals for proportions were calculated using the Korn-Graubard method (19). The 95% confidence intervals for counts were calculated using the log Student's *t* method with adaptations for complex surveys (20). Note that some statistically significant estimates may not be “substantive” or translate to meaningful outcome measures.

Results

Comparison of ED Visits by Patient Sex and Age

Tables 3.1 and 3.2 compare 2020 NHCS estimates to 2020 NEDS and 2020 NHAMCS estimates for all ED visits by sex and six different age groups.

NHCS and NEDS

For total visits, there were no statistically significant differences in the visit counts and rates between NHCS and NEDS estimates (Table 3.1). The differences in visit counts and rates for males and females were not statistically significant. However, the difference in percentages for both sexes was statistically significant, although this percent difference was small in magnitude (less than 1 percentage point). There were no statistically significant differences among the visit counts or rates by patients ages 1-17, 18-44, and 45-64 when comparing national estimates.

Statistically significant differences in counts and rates were found in ED visits for infants (<1 year), and adults ages 65-84, and 85 and older. NHCS had lower estimates of visits by infants compared to NEDS (NHCS: 1.6 million vs. NEDS: 2.1 million). Similarly, NHCS estimates of visits by adults ages 65-84 were lower compared to NEDS (NHCS: 18.2 million vs. NEDS: 22.1 million) and for adults ages 85 and older (NHCS: 4.1 million vs. NEDS: 5.3 million). A statistically significant difference in percentages was found among ED visits by adults ages 18-44, where NHCS had a higher percentage of visits by adults ages 18-44 compared to NEDS by approximately 4% points (NHCS: 41.8% vs. NEDS: 38.1%).

NHCS and NHAMCS

When examining ED visits overall and by patient sex, there were no statistically significant differences between NHCS and NHAMCS in estimates of visit counts and rates. (Table 3.2). Similarly, there were no statistically significant differences in estimates of counts, rates, and percentages, for adults over 45 years by age group. Statistically significant differences were found for patients ages <1, 1-17, and 18-44. For infants (<1 year), visit estimates using NHCS were lower than NHAMCS (NHCS: 1.6 million vs. NHAMCS: 2.5 million). Additionally, the percentage of visits by infants was lower in NHCS (1.4%) than in NHAMCS (1.9%); however, this difference was nominal in magnitude. Similarly, among visits from patients ages 1-17, there was a lower estimate of visit counts using NHCS, compared to NHAMCS (NHCS: 14.1 million vs. NHAMCS: 20.3 million). However, there were no significant differences in percentages from this age group between the two sources.

Among ED visits by patients ages 18-44, there were no significant differences in visit counts or rates when using NHCS compared to NHAMCS. However, there was a difference in percentages (3.7 percentage points) with NHCS reporting a higher percentage of visits (41.8%) compared to NHAMCS (38.1%).

Comparison of ED Visits by Primary Expected Source of Payment

Table 4 compares 2020 NHCS estimates to 2020 NEDS and 2020 NHAMCS estimates for all ED visits by primary expected source of payment.

NHCS and NEDS

There were statistically significant differences in count and percentage estimates from NHCS and NEDS for each source of payment, including Medicare, Medicaid, private, self-pay/no charge, and other. Overall, NHCS had lower estimates for each source of payment compared to NEDS (except for missing). The largest percent difference among the known expected source of payment categories was for Medicare, where the difference in the percent distribution was 9.7 percentage points (NHCS: 15.6% vs NEDS: 25.3%).

Almost one in three (30.2%) ED visits had missing data for primary expected source of payment in NHCS, compared with only 0.2% in NEDS.

NHCS and NHAMCS

When comparing ED visits by primary expected source of payment from NHCS and NHAMCS, there were no differences in estimates found for visits where the primary expected source of payment was private or other payer. However, statistically significant differences were found for visits where the primary expected source of payment was Medicare, Medicaid, and self-pay/no charge. For each of these source of payment categories, the estimates using NHCS were lower compared to NHAMCS, with the largest percentage difference among ED visits where the primary expected source of payment was Medicaid (9.5 percentage points (NHCS: 23.3% vs NHAMCS: 32.8%)).

In NHAMCS, 11.8% of ED visits were missing data for primary expected source of payment, compared to 30.2% of visits missing these data in NHCS.

Comparison of ED Visits by Discharge Status

Table 5 compares 2020 NHCS estimates to 2020 NEDS and 2020 NHAMCS estimates for discharge status among all ED visits. The comparison includes discharge status categories: Routine, Home health care, and Died. Estimates for Other and Missing discharge categories have been added for completeness and are not comparable.

NHCS and NEDS

When examining all ED visits, and ED visits by patient sex and age group, there were no statistically significant differences in the counts of ED visits that resulted in a routine discharge when using NHCS and NEDS. However, percentages were lower from NHCS compared to NEDS for visits by females, males, and by patients ages 18-44, 45-64, 65-84, 85. Among patients ages <1 and 1-17, there were no statistically significant differences in visit count and percentage estimates that resulted in a routine discharge.

For visits that resulted in a home health care discharge, count and percentage estimates were lower from NHCS compared to NEDS, although the difference was less than half of a percentage point (NHCS: 0.2% vs. NEDS: 0.4%). Among ED visits by males and females, and for visits by adults ages 45-64, 65-84, and 85 and older, there were statistically significant, but small (less than 1.5 percentage point) differences in visit counts and percentages that resulted in a discharge to home health care.

For ED visits that resulted in death, statistically significant differences were found among all ED visits, visits by males and females, and visits by each age category. Compared with NEDS, NHCS produced lower count estimates of ED visits resulting in death for all age and sex categories, as well as overall (NHCS: 159,000 vs. NEDS: 232,000), with NHCS capturing close to one-third less of ED deaths compared to NEDS, likely reflecting the methodological differences in variable definitions and sampling. However, the differences in percentage distributions across all subgroups examined were minimal and closely aligned, with a percentage difference always less than or equal to 0.3% percentage points.

NHCS and NHAMCS

When examining all ED visits, and ED visits by patient sex, there were no statistically significant differences in counts of visits resulting in a routine discharge when using NHCS compared to NHAMCS. This finding was similar for all age groups, except for infants (<1 year). NHCS reported a lower visit count for routine discharge among infants (n=1.5 million) compared to NHAMCS (2.2 million).

Statistically significant differences in percentage for routine discharge were found for ED visits overall, and among visits by all patient sex and age groups. NHCS had a higher percentage distribution of routine discharge for all visits and for all sex and age categories compared to using

NHAMCS. ED visits by patients ages 85 and older had the largest difference in percentages for routine discharges (28 percentage points, NHCS: 75.1% vs. NHAMCS: 47.1%). In contrast, visits by patients ages 1-17 had the smallest percentage point difference at 3.6% points.

For ED visits that resulted in death, NHAMCS counts for all ED visits, as well as by patient sex and age categories, did not meet NCHS standards of reliability and were subsequently suppressed. This was also true for the percentage of visits by infants (<1 year) when using NHAMCS. Thus, no comparisons to NHCS counts were made for this discharge status. Regarding percentages of ED visits that resulted in death, there were no statistically significant differences in visits when using NHCS compared to NHAMCS for overall visits or among visits by females and males, nor were there statistically significant differences in percentages between the two data sources among visits by patients ages 1-17, 18-44, 45-64, and 65-84. There was a very small difference in percentage when using NHCS compared to NHAMCS for ED visits that resulted in death by patients ages 85 and older. Here the percentage of visits resulting in death in the ED was higher when using NHCS compared to NHAMCS (NHCS: 0.8% vs. NHAMCS: 0.2%).

Note that home health care discharge data were not available in NHAMCS, and therefore a comparison to NHCS could not be performed.

Comparison of ED Visits by Top Ten CCSR Diagnosis Categories

Table 6 compares 2020 NHCS estimates to 2020 NEDS and 2020 NHAMCS estimates for the top ten CCSR diagnosis categories.

NHCS and NEDS

Of the top ten all-listed CCSR diagnosis categories examined, there were no statistically significant differences found in visit count and rate estimates from NHCS and NEDS for five of the ten categories, including: “tobacco-related disorders,” “abdominal pain and other digestive/abdomen signs and symptoms,” “respiratory signs and symptoms,” “musculoskeletal pain (not low back pain),”and “nonspecific chest pain.” However, statistically significant differences were found in both counts and rates for visits involving the following CCSR diagnosis categories: “external cause codes (intent of injury, accidental/unintentional),” “essential hypertension,” “diabetes mellitus (type 2),” “disorders of lipid metabolism,” and “external cause codes: place of occurrence of the external cause.” For visits with each of these five respective diagnosis categories, NHCS had lower estimated counts and rates compared to NEDS, with the largest difference found in visits that had a

diagnosis category of "external cause codes: intent of injury, accidental/unintentional" (NHCS: 13.4 million vs. NEDS: 19.6 million). This was followed by visits with a diagnosis category of "essential hypertension" (NHCS: 14.3 million vs. NEDS: 18.7 million), and visits with a diagnosis category of "external cause codes: place of occurrence of the external cause" (NHCS: 4.5 million vs. NEDS: 8.4 million).

NHCS and NHAMCS

Among the top ten all-listed CCSR diagnosis categories examined, there were no statistically significant differences found in visit count and rate estimates from NHCS and NHAMCS for four of the ten categories, including: "abdominal pain and other digestive/abdomen signs and symptoms," "respiratory signs and symptoms," "musculoskeletal pain (not low back pain)," and "nonspecific chest pain." Using NHAMCS, the data could not produce estimates for "external cause codes: place of occurrence of the external cause," and therefore, a comparison to NHCS could not be made for this diagnosis category.

Statistically significant differences were found in visit count and rate estimates for the remaining five CCSR categories: "external cause codes (intent of injury, accidental/unintentional)," "essential hypertension," "tobacco-related disorders," "diabetes mellitus (type 2)," and "disorders of lipid metabolism." The counts and rates of visits that had each of these respective diagnoses were higher when using NHCS compared to NHAMCS. The largest magnitude of difference between count estimates was among visits with a CCSR category of "external cause codes: intent of injury, accidental/unintentional" (NHCS: 13.4 million vs. NHAMCS: 1.5 million). This was followed by "tobacco-related disorders" (NHCS: 12.2 million vs. NHAMCS: 2.2 million) and "essential hypertension" (NHCS: 14.3 million vs. NHAMCS: 7.3 million). The smallest differences in count estimates were among visits with a diagnosis category of "diabetes mellitus (type 2)" (NHCS: 6.9 million vs. NHAMCS: 3.5 million) and visits with a diagnosis category of "disorders of lipid metabolism" (NHCS: 6.0 million vs. NHAMCS: 1.9 million).

Summary

The national estimates of total ED visits in 2020 from NHCS, NHAMCS, NEDS were largely comparable. Any differences in the estimates among the data sources were primarily observed at the demographic subgroup level for each outcome measure examined. While no statistically significant differences were found in the total visit counts, rates, and overall percentages between

NHCS and NEDS, and NHCS and NHAMCS, there were statistical differences in either counts, percentages, or rates between estimates made for several of the outcome measures. However, many of these statistically significant differences were small in magnitude.

For instance, small but statistically significant differences were observed in the percentage of ED visits for adults ages 18-44 when comparing NHCS with NEDS (Table 3.1) and NHAMCS (Table 3.2). In addition, differences in visit counts and rates were found in five out of ten CCSR diagnosis categories when comparing NHCS with NEDS, and four categories when comparing NHCS with NHAMCS. For routine discharges, statistically significant differences in percentage distributions were noted, particularly among older adults and children, with NHCS having a higher percentage of routine discharges among children ages 0-17 compared to NHAMCS (Table 5).

Notable statistical differences were found in the distributions for expected primary payer source: NHCS reported the lowest percentage distribution of self-pay/no charge (3.1%) compared to NEDS (12.1%) and NHAMCS (8.1%), and had significantly higher missing primary payer data (30.2% missing in NHCS vs. 0.2% in NEDS and 11.8% in NHAMCS), which likely impacted the comparability of estimates for this outcome measure.

Mortality in the ED was rare (<1% of ED visits resulted in death in each of the three data sources). Nonetheless, when comparing NHCS to NEDS and NHAMCS, statistically significant differences were observed with NHCS reporting substantially fewer deaths in the ED compared to NEDS and NHAMCS (Table 5). The lower estimates seem to be largely driven by the definitional and methodological differences in mortality. Despite the lower counts reported in NHCS, the percentage distribution of deaths closely aligned with both NEDS and NHAMCS (with differences of ≤0.3 percentage points).

NHCS offers several practical strengths that complement, and in some aspects, extend beyond what NEDS and the now discontinued NHAMCS can provide. In terms of hospital universe, NHCS's sampling has a broader national coverage than NEDS, allowing for data collection that is not limited by state participation. In contrast, NEDS relies on state submissions and does not uniformly include data from every state, which could affect representativeness. In addition, NHCS has a wider inclusion criterion for hospital type as it includes encounter data from certain facility types that are generally excluded from NEDS, such as ED data from rehabilitation, psychiatric, and long-term care facilities. A broader scope in hospital type allows for a more complete picture of health

care across diverse hospital-based settings. In terms of data sources, NHCS is more extensive as it allows a broader collection of sources. Finally, in addition to UB-04 claims data, NHCS has a unique advantage in collecting EHR data, which provides a richer level of clinical data than claims-only sources. These features make NHCS a valuable resource for understanding hospital care utilization and patterns in the United States.

Methodological Differences

While 2020 NHCS, 2020 NEDS, and 2020 NHAMCS can all be used by researchers to study ED utilization in the United States, there are methodological differences of which researchers should consider when interpreting estimates. Both NHCS and NEDS collect data from noninstitutional and nonfederal hospitals (3,5); however, NHCS includes data from rehabilitation, psychiatric, and long-term care facilities (3), while NEDS does not. NHAMCS was based on visits made to noninstitutional, nonfederal, general and short-stay hospitals in the US. Unlike NEDS and NHCS, NHAMCS offered a greater level of specificity regarding the types of ED units sampled. Within a NHAMCS hospital's ED, there were different ESAs that could be defined as general, adult, pediatric, urgent care/fast track, psychiatric, and "other" (8). In 2020, NEDS was representative of 85% of the total U.S. population and 84% of all U.S. ED visits from 995 hospitals (6) while NHCS used a sampling strategy to collect nationally representative data from 205 hospitals producing an unweighted response rate of 33.7% (3,4). NHAMCS included visit data from 294 hospitals in 2020, with a weighted response rate of 76.1% (76.2% unweighted) (8).

The data sources collected by each data system can impact the estimates of ED visit outcomes. NHCS collects data from claims and EHR sources, NEDS collects data exclusively from claims sources submitted by states that participate in HCUP, and NHAMCS collects data through patient record abstraction. NHCS EHR data sources lack standardization in primary expected payer data, which may impact payer estimates and could be a source of the large difference in missing payer estimates when comparing NHCS to either NEDS or NHAMCS, as payer information is primarily derived from billing information in administrative claims data. The higher percentage distribution of Medicaid in NHAMCS may have resulted from differences in how each data system defines Medicaid. In NHAMCS, the definition includes state-based programs and CHIP, whereas in both NHCS and NEDS, state-based and other government programs were categorized as "other". Additionally, in NEDS, CHIP may also be captured under "private" or "other." The lack of standardization in EHR data also impacts diagnoses estimates, as the submitted diagnoses can be

in other coding systems in addition to ICD-10-CM. Diagnoses that could not be converted to an ICD-10-CM equivalent remain in their original code system which can impact diagnoses estimates when compared to both NEDS and NHAMCS diagnoses estimates. For free-text diagnoses that could not be translated into ICD-10-CM codes in NHAMCS, NCHS internally developed special codes to account for this, which could also impact diagnoses estimates (8).

There were differences in how diagnoses data were collected among the three data systems. NHCS receives data from two different data sources: UB-04 claims and EHR (3), while NEDS collects data exclusively from claims databases at HCUP participating states (6). The inclusion of EHR data allows NHCS participating hospitals to submit encounter information in both standardized and non-standardized coding systems. The lack of standardization in EHR data, which submit diagnoses in other coding systems in addition to ICD-10-CM, may have impacted diagnoses estimates. While claims diagnosis codes are submitted as ICD-10-CM codes, EHR data sources can submit their diagnosis codes in ICD-10-CM and other coding system formats, resulting in some codes not having an ICD-10-CM equivalent (14). Diagnoses that could not be converted to an ICD-10-CM equivalent remained in their original code system which may have potentially affected diagnoses estimates when compared to estimates from NEDS and NHAMCS. Using a systematic random sample of visits, NHAMCS visit data were abstracted from patient medical charts via an electronic data collection tool (ED PRF). Following abstraction, diagnostic text entries in the ED PRF were coded according to ICD-10-CM (8). For free-text diagnoses that could not be translated into ICD-10-CM codes in NHAMCS, NCHS internally developed special codes to account for this, which could have also impacted diagnoses estimates (8).

Finally, while NHCS had a lower count estimate of ED visits resulting in death than in NEDS (around one-third less), this discrepancy reflects differences in how deaths in the ED are defined by NHCS and NEDS, their sampling methodology, and in the data source used. NHCS deaths are derived from UB-04 billing and EHR-derived discharge data, whereas NEDS death discharge data are solely derived from aggregate UB-04 billing data. Classifications for the "Died in ED" category, includes "dead," "expired at home," "expired in a medical facility," and "expired in place unknown" in NHCS vs. "died in ED" in NEDS. This results in a higher variability in its classification of ED deaths.

In addition, NHCS discharge status entries are not always updated when final death determinations occur, so NHCS may undercount ED deaths compared to registries, such as the National Vital Statistics Systems (NVSS), which rely on certified death certificates as its source.

Unlike NHCS, the NVSS uses death certificates certified by medical examiners to provide the most complete and accurate capture of all deaths and place of death in the US.

Despite the lower count estimates in ED visits resulting in death for NHCS, the percentage distributions between NHCS and NEDS closely aligned, showing a similar distribution pattern. Future work could involve the validation of NHCS deaths by linking patient-level records to the National Death Index (NDI) to assess the sensitivity and specificity of the "died in ED" disposition in EHR and UB-04 records.

Although several differences existed between 2020 NHCS and 2020 NEDS, and 2020 NHCS and 2020 NHAMCS when estimating ED visits, this was not surprising given the various definitional differences in EDs that were included in the respective samples, as well as methodological differences between all three data sources. Data users should note the statistically significant differences from all three data sources, which are suspected to be due in part to the different methodologies used to create each data system.

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Table 1. Universe Characteristics in the National Hospital Care Survey (NHCS), Nationwide Emergency Department Sample (NEDS), and National Hospital Ambulatory Medical Care Survey (NHAMCS): United States, 2020

	NHCS	NEDS	NHAMCS
Hospital Type	Nonfederal, noninstitutional hospitals, short-stay hospitals, general specialty hospitals, such as general acute, rehabilitation, psychiatric, and long-term care facilities and children's hospitals that have six or more staffed inpatient beds	EDs from non-rehabilitation hospitals, community hospitals: nonfederal, short-term, general, and other specialty hospitals open to the public that report ED visits in the AHA Annual Survey Database.	Nonfederal, short-stay, or general hospitals and ambulatory surgery centers. Visits to federal, military, and Veterans Administration hospitals are excluded. Sourced from IQVIA.
Sample Population	608 hospitals	995 hospitals	484 hospitals
Response Rate	33.7% (unweighted)	85% of the total U.S. population and 84% of all ED visits in the U.S.	76.2% (unweighted); 76.1% (weighted)
Sampling Design	National probability sample of encounter-level visits; stratified random sampling	20% sample of hospital-owned EDs, using a stratified, random sampling design.	National probability sample of visits to the ED; multistage probability design with samples of geographic primary sampling units (PSUs), hospitals within PSUs, and patient visits within EDs.
Sampling Frame	Hospital EDs located in the 50 states and the District of Columbia	Hospital EDs located in 40 states and the District of Columbia participate in the Health Care Utilization Project (HCUP).	Hospital EDs located in the 50 states and the District of Columbia
Data Source	EHR and UB-04 claims	Administrative billing data/discharge records	Medical record chart abstraction
Survey-based	Yes	Yes	Yes
Nationally Representative	Yes	Yes	Yes
State-level Analyses	No	No	No

Table 2. Definition of select outcome measures in the National Hospital Care Survey (NHCS), Nationwide Emergency Department Sample (NEDS), and National Hospital Ambulatory Medical Care Survey (NHAMCS): United States, 2020

	NHCS	NEDS	NHAMCS
Emergency department (ED) visit			
ED visit	ED visits are defined as in-person visits made to the EDs of noninstitutional and nonfederal hospitals that have six or more staffed inpatient beds and offer unscheduled care 24 hours, seven days a week. Average length of stay is not used as an exclusion criterion.	ED visits are defined as visits made to community, non-rehabilitation hospital-owned EDs. Selection of ED visit records from the SEDD and SID are based on evidence of ED services reported on the patient record (5,6).	ED visits were defined as visits by patients seeking immediate care and health services from a physician, or a staff member acting under a physician's direction, in a nonfederal, general, and short-stay hospital that provided unscheduled health care 24 hours, seven days a week.
Primary expected source of payment			
Medicare	Medicare	Fee-for-service and managed care Medicare	Medicare
Medicaid	Medicaid	Fee-for-service Medicaid, managed care Medicaid, and CHIP	Medicaid or CHIP or other state-based program
Private	Private Health Insurance	Private insurance (Blue Cross, commercial carriers, and private HMOs and PPOs), CHIP	Private Insurance
Self-pay/no charge	Self-pay, No charge, Charity	Self-pay, No charge, Charity	Self-pay, No charge/Charity
Other	Auto insurance (no fault), Department of Corrections, legal liability (personal injury lawsuit), managed care (unspecified), other government (federal/state/local), worker's compensation, other (type unknown), no payment listed, and miscellaneous/other	Worker's compensation, CHIP, disability, Children's Rehab Services, Indian Health Services, Foreign National, Civilian Health and Medical Program of the Uniformed Services (CHAMPUS (TRICARE)), Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA), Title V, and other government programs	Worker's compensation, Other
Missing	Unavailable/Unknown/Blank	Blank, Missing	Blank, Unknown

Discharge Status			
Routine	Discharged to home; Discharged to home or self-care with a planned acute care hospital inpatient readmission	Routine; Discharged/transferred to court/law enforcement	Home/Residence
Home Health Care	Discharged/transferred to home under care of organized home health service organization with a planned acute care hospital inpatient readmission; Discharged home under care of organized home health service	Home Health Care (HHC)	*(Not applicable)*
Died	Dead; Expired at home; Expired in a medical facility; Expired in place unknown	Died in ED	Dead on Arrival; Died in ED
Diagnosis codes			
Data source type	UB-04 Claims and EHR data sources	UB-04 Claims	Manual abstraction from the medical record by a U.S. Census Bureau field representative into an ED Patient Record Form
Diagnosis coding system	ICD-10-CM, ICD-9-CM, SNOMED-CT, EHR vendor-specific, and site-specific codes	ICD-10-CM	ICD-10-CM

SOURCES: National Center for Health Statistics, National Hospital Care Survey (NHCS), 2020 restricted use files. Agency for Healthcare Research and Quality, Healthcare Utilization Project Nationwide Emergency Department Sample (NEDS), 2020. National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey (NHAMCS), 2020 restricted use files.

Table 3.1. Comparison of emergency department (ED) visit estimates by patient sex and age using National Hospital Care Survey (NHCS) and Nationwide Emergency Department Sample (NEDS) data: United States, 2020

	NHCS Number (in 1,000s)		NEDS Number (in 1,000s)		NHCS Percentage Distribution		NEDS Percentage Distribution		NHCS Rate (per 100,000 people)		NEDS Rate (per 100,000 people)	
	No.	(95% CI)	No.	(95% CI)	%	(95% CI)	%	(95% CI)	Rate	(95% CI)	Rate	(95% CI)
All ED visits	114,562	(104,039-126,149)	123,278	(117,992-128,562)	100.0	…	100.0	…	34,558.5	(31,384.2-38,053.9)	37,187.9	(35,593.4-38,782.4)
Sex												
Female [1]	62,351	(56,712-68,552)	66,369	(63,412-69,326)	54.4	(53.9-54.9)	53.8	(53.6-54.1)	37,272.3	(33,901.0-40,979.0)	39,674.0	(37,906.5-41,411.5)
Male [1]	52,084	(47,129-57,560)	56,899	(54,533-59,265)	45.5	(44.9-46.0)	46.2	(45.9-46.4)	31,716.8	(35,251.1-54,778.0)	34,649.1	(33,208.3-36,089.9)
Age group (years)												
<1 [2,3]	1,626	(1,304-2,026)	2,135	(1,838-2,431)	1.4	(1.1-1.8)	1.7	(1.5-2.0)	43,942.9	(35,251.1-54,778.0)	57,706.7	(46,699.7-65,713.7)
1-17	14,136	(12,343-16,190)	15,719	(14,160-17,279)	12.3	(11.1-13.7)	12.8	(11.6-13.9)	20,044.8	(17,501.7-22,957.5)	22,289.8	(20,078.1-24,501.5)
18-44 [1]	47,881	(43,759-52,391)	46,978	(44,681-49,274)	41.8	(40.3-43.3)	38.1	(37.4-38.8)	40,350.0	(36,876.4-44,150.9)	39,588.7	(37,653.6-41,523.8)
45-64	28,595	(25,802-31,690)	30,983	(29,548-32,418)	25.0	(24.4-25.5)	25.1	(24.7-25.6)	33,970.3	(30,652.4-37,647.3)	36,806.9	(35,102.3-38,511.5)
65-84 [1,2,3]	18,181	(15,790-20,933)	22,125	(21,075-23,175)	15.9	(14.7-17.1)	18.0	(17.5-18.4)	37,549.4	(32,612.6-43,233.5)	45,695.9	(43,527.7-47,864.1)
85 and older [1,2,3]	4,064	(3,416-4,835)	5,335	(5,048-5,622)	3.5	(3.1-4.0)	4.3	(4.2-4.5)	67,508.3	(56,746.6-80,310.8)	88,625.3	(83,859.4-93,391.2)

… Category not applicable.

[1] Statistically significant difference between NHCS and NEDS percentages.

[2] Statistically significant difference between NHCS and NEDS estimates for number of ED visits.

[3] Statistically significant difference between NHCS and NEDS estimates for rate (per 100,000 people) of ED visits.

NOTES: Estimates may not add to 100 due to rounding and/or missing information.

Percentage distributions may not add to 100.0% due to rounding. ED is emergency department. CI is confidence interval. Rates (per 100,000 people) by sex and age group are based on estimates of the U.S. resident population for April 1, 2020 to July 1, 2021 (10-12).
SOURCES: National Center for Health Statistics, National Hospital Care Survey (NHCS), 2020 restricted use files. Agency for Healthcare Research and Quality, Healthcare Utilization Project Nationwide Emergency Department Sample (NEDS), 2020.

Table 3.2. Comparison of emergency department (ED) visit estimates by patient sex and age using National Hospital Care Survey (NHCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) data: United States, 2020

	NHCS Number (in 1,000s)		NHAMCS Number (in 1,000s)		NHCS Percentage Distribution		NHAMCS Percentage Distribution		NHCS Rate (per 100,000 people)		NHAMCS Rate (per 100,000 people)	
	No.	(95% CI)	No.	(95% CI)	%	(95% CI)	%	(95% CI)	Rate	(95% CI)	Rate	(95% CI)
All ED visits	114,562	(104,039-126,149)	131,297	(110,535-155,957)	100.0	…	100.0	…	34,558.5	(31,384.2-38,053.9)	39,606.7	(33,343.9-47,045.8)
Sex												
Female	62,351	(56,712-68,552)	70,076	(58,492-83,955)	54.4	(53.9-54.9)	53.4	(51.8-55.0)	37,272.3	(33,901.0-40,979.0)	41,890.2	(34,965.2-50,186.6)
Male	52,084	(47,129-57,560)	61,220	(51,737-72,441)	45.5	(44.9-46.0)	46.6	(45.0-48.2)	31,716.8	(35,251.1-54,778.0)	37,280.5	(31,505.8-44,113.7)
Age group (years)												
<1 [1,2,3]	1,626	(1,304-2,026)	2,545	(1,978-3,273)	1.4	(1.1-1.8)	1.9	(1.6-2.4)	43,942.9	(35,251.1-54,778.0)	68,795.9	(53,479.8-88,498.5)
1-17 [2,3]	14,136	(12,343-16,190)	20,309	(15,402-26,779)	12.3	(11.1-13.7)	15.5	(12.3-19.1)	20,044.8	(17,501.7-22,957.5)	28,797.7	(21,839.7-37,972.4)
18-44 [1]	47,881	(43,759-52,391)	49,983	(41,679-59,941)	41.8	(40.3-43.3)	38.1	(36.0-40.1)	40,350.0	(36,876.4-44,150.9)	42,120.9	(35,123.2-50,512.6)
45-64	28,595	(25,802-31,690)	31,639	(26,391-37,930)	25	(24.4-25.5)	24.1	(22.7-25.6)	33,970.3	(30,652.4-37,647.3)	37,586.1	(31,351.5-45,060.4)
65-84	18,181	(15,790-20,933)	21,437	(17,759-25,877)	15.9	(14.7-17.1)	16.3	(15.1-17.6)	37,549.4	(32,612.6-43,233.5)	44,275.1	(36,679.3-53,443.9)
85 and older	4,064	(3,416-4,835)	5,384	(4,292-6,755)	3.5	(3.1-4.0)	4.1	(3.6-4.7)	67,508.3	(56,746.6-80,310.8)	89,440.9	(71,299.3-112,198.5)

… Category not applicable.

[1] Statistically significant difference between NHCS and NHAMCS percentages.

[2] Statistically significant difference between NHCS and NHAMCS estimates for number of ED visits.

[3] Statistically significant difference between NHCS and NHAMCS estimates for rate (per 100,000 people) of ED visits.

NOTES: Estimates may not add to 100 due to rounding and/or missing information.
Percentage distributions may not add to 100.0% due to rounding. ED is emergency department. CI is confidence interval. Rates (per 100,000 people) by sex and age group are based on estimates of the U.S. resident population for April 1, 2020 to July 1, 2021 (10-12).
SOURCES: National Center for Health Statistics, National Hospital Care Survey (NHCS), 2020 restricted use files. National Center for Health Statistics, and National Hospital Ambulatory Medical Care Survey (NHAMCS), 2020 restricted use files.

Table 4. Comparison of emergency department (ED) visit estimates by primary expected source of payment using National Hospital Care Survey (NHCS), Nationwide Emergency Department Sample (NEDS), and National Hospital Ambulatory Medical Care Survey (NHAMCS) data: United States, 2020

	NHCS Number (in 1,000s)		NEDS Number (in 1,000s)		NHAMCS Number (in 1,000s)		NHCS Percentage Distribution		NEDS Percentage Distribution		NHAMCS Percentage Distribution	
	No.	(95% CI)	No.	(95% CI)	No.	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Medicare [1,2,3,4]	17,907	(13,996-22,911)	31,169	(29,654-32,684)	28,433	(23,555-34,321)	15.6	(12.3-19.4)	25.3	(24.6-26.0)	21.7	(19.7-23.7)
Medicaid [1,2,3,4]	26,722	(21,080-33,876)	35,755	(33,172-37,799)	43,055	(34,140-54,298)	23.3	(18.2-29.1)	29.0	(27.9-30.1)	32.8	(28.2-37.7)
Private [1,3]	28,611	(24,228-33,787)	36,016	(34,059-37,973)	30,478	(25,506-36,420)	25.0	(21.0-29.3)	29.2	(28.3-30.1)	23.2	(20.9-25.6)
Self-pay/no charge [1,2,3,4]	3,525	(2,348-5,290)	14,934	(13,948-15,921)	10,464	(7,945-13,780)	3.1	(1.9-4.6)	12.1	(11.5-12.7)	8.0	(6.1-10.1)
Other [1,3]	3,248	(2,537-4,157)	5,210	(4,738-5,682)	3,339	(2,529-4,408)	2.8	(2.1-3.7)	4.2	(3.9-4.6)	2.5	(2.0-3.2)
Missing [1,2,3,4]	34,549	(24,632-48,460)	193	(104-283)	15,527	(9,156-26,332)	30.2	(20.9-40.8)	0.2	(0.1-0.2)	11.8	(6.8-18.7)

[1] Statistically significant difference between NHCS and NEDS for number of ED visits.
[2] Statistically significant difference between NHCS and NHAMCS for number of ED visits.
[3] Statistically significant difference between NHCS and NEDS percentages.
[4] Statistically significant difference between NHCS and NHAMCS percentages.
NOTES: Estimates may not add to 100 due to rounding and/or missing information.
CI is confidence interval. ED is emergency department. Based on 114.6 million (95% CI: 104.0-126.1 million) visits using NHCS, 123.3 million (95% CI: 118-128.6) visits using NEDS, and 131.3 million (95% CI: 110.5-156.0) visits using NHAMCS.

SOURCES: National Center for Health Statistics, National Hospital Care Survey (NHCS), 2020 restricted use files. Agency for Healthcare Research and Quality, Healthcare Utilization Project Nationwide Emergency Department Sample (NEDS), 2020. National Hospital Ambulatory Medical Care Survey (NHAMCS), 2020 restricted use files.

Table 5. Comparison of emergency department (ED) visit estimates by discharge status, patient sex, and patient age using National Hospital Care Survey (NHCS), Nationwide Emergency Department Sample (NEDS), and National Hospital Ambulatory Medical Care Survey (NHAMCS) data: United States, 2020

	NHCS Number (in 1,000s)		NEDS Number (in 1,000s)		NHAMCS Number (in 1,000s)		NHCS Percentage Distribution		NEDS Percentage Distribution		NHAMCS Percentage Distribution	
	No.	(95% CI)	No.	(95% CI)	No.	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
All ED visits												
Routine [3,4]	94,676	(86,913-103,131)	96,110	(91,983-100,237)	100,830	(84,861-119,805)	89.0	(85.4-91.5)	93.0	(92.9-93.4)	77.0	(74.3-79.1)
Home health care [1,3]	248	(154-398)	404	(357-451)	…	…	0.2	(0.1-0.4)	0.4	(0.4-0.4)	…	…
Died [1,3]	159	(133-189)	232	(218-246)	*	*	0.1	(0.1-0.2)	0.2	(0.2-0.2)	0.3	(0.1-0.9)
Other	7,364	(6,216-8,724)			29,061	(23,608-35,774)	6.9	(6.1-7.8)			22.0	(19.9-24.4)
Missing	*	*			954	(576-1,580)	*	*			0.7	(0.4-1.2)
Sex												
Female												
Routine [3,4]	52,252	(48,000-56,879)	52,718	(50,377-55,059)	55,306	(46,035-66,443)	90.0	(86.2-92.2)	94.0	(93.6-94.0)	79.0	(76.5-81.2)
Home health care [1,3]	146	(91-233)	238	(211-265)	…	…	0.2	(0.1-0.4)	0.4	(0.4-0.5)	…	…
Died [1,3]	62	(53-73)	92	(86-98)	*	*	0.1	(<0.1-0.2)	0.2	(0.2-0.2)	0.2	(0.1-0.5)
Other	3,612	(3,038-4,295)			14,213	(11,477-17,601)	6.2	(5.4 -7.1)			20.0	(18.1-22.6)
Missing	*	*			414	(233-738)	*	*			0.6	(0.3-1.1)
Male												
Routine [3,4]	42,324	(38,725-46,257)	43,385	(41,568-45,202)	45,525	(38,542-53,772)	88.0	(84.4-90.5)	92.0	(92.1-92.6)	74.0	(71.4-77.1)
Home health care [1,3]	102	(63-165)	166	(146-186)	…	…	0.2	(0.1-0.4)	0.4	(0.3-0.4)	…	…
Died [1,3]	97	(80-118)	139	(131-148)	*	*	0.2	(0.1-0.3)	0.3	(0.3-0.3)	0.5	(0.1-0.6)

Other	3,748	(3,169-4,432)			14,848	(12,013-35,774)	7.8	(6.9-8.7)			24.0	(21.7-27.0)
Missing	*	*			539	(309-941)	*	*			0.9	(0.5-1.5)
Age group (years)												
<1												
Routine [2,4]	1,481	(1,192-1,841)	1,890	(1,626-2,153)	2,190	(1,700-2,821)	96.0	(93.2-97.2)	96.0	(95.7-96.7)	86.0	(77.7-92.1)
Home health care [3]	1	(0-1)	1	(1-1)	…	…	*	*	0.1	(<0.1-0.1)	…	…
Died [1,3]	2	(1-3)	4	(3-4)	*	*	0.1	(<0.1-2.1)	0.2	(0.2-0.2)	*	*
Other	43	(34-55)			322	(176-591)	2.8	(1.9-4.0)			13.0	(6.7-21.1)
Missing	*	*			*	*	1.5	(0.5-3.3)			0.3	(<0.1-1.7)
1-17												
Routine [4]	13,117	(11,425-15,060)	14,514	(13,089-15,939)	18,472	(13,946-24,468)	95.0	(92.3-96.4)	96.0	(95.7-96.3)	91.0	(88.3-93.2)
Home health care	8	(3-20)	8	(6-10)	…	…	0.1	(<0.1-1.0)	0.1	(<0.1-0.1)	…	…
Died [1,3]	2	(2-3)	4	(3-4)	*	*	<0.1	(<0.1-1.5)	<0.1	(<0.1-<0.1)	<0.1	(<0.1-0.02)
Other	458	(377-557)			1,785	(1,237-2,574)	3.3	(2.6-4.1)			8.9	(6.5-11.5)
Missing	*	*			*	*	2.0				0.2	(0.1-0.6)
18-44												
Routine [3,4]	42,034	(38,603-45,771)	40,719	(38,742-42,697)	41,948	(34,839-50,507)	91.0	(87.4-93.3)	95.0	(94.6-95.0)	84.0	(81.8-85.9)
Home health care	43	(28-67)	46	(34-58)	…	…	0.1	(<0.1-0.3)	0.1	(0.1-0.1)	…	…
Died [3]	25	(19-34)	30	(28-33)	*	*	0.1	(<0.1-0.3)	0.1	(0.1-0.1)	0.2	(0.0-0.8)
Other	2,565	(2,222-2,962)			7,551	(6,079-9,380)	5.5	(5.0-6.1)			15.0	(13.1-17.2)
Missing	*	*			372	(213-650)	*	*			0.7	(0.4-1.3)

45-64												
Routine [3,4]	22,966	(21,025-25,085)	23,296	(22,230-24,363)	22,866	(19,112-27,357)	87.0	(83.6-90.5)	93.0	(92.5-93.0)	72.0	(69.0-75.3)
Home health care [1,3]	51	(34-75)	78	(68-88)	…	…	0.2	(0.1-0.4)	0.3	(0.3-0.4)	…	…
Died [1,3]	40	(33-49)	63	(59-67)	*	*	0.2	(<0.1-0.4)	0.3	(0.2-0.3)	0.5	(0.0-1.8)
Other	2,036	(1678-2471)			8,317	(6,623-10,445)	7.7	(6.7-8.9)			26.0	(23.4-29.3)
Missing	*	*			311	(162-598)	*	*			1.0	(0.5-1.8)
65-84												
Routine [3,4]	12,582	(11,175-14,165)	13,152	(12,644-13,760)	12,818	(10,558-15,562)	82.0	(77.5-85.8)	88.0	(87.9-88.7)	60.0	(55.1-64.4)
Home health care [1,3]	96	(50-184)	181	(160-201)	…	…	0.6	(0.3-1.2)	1.2	(1.1-1.3)	…	…
Died [1,3]	63	(54-74)	95	(89-101)	*	*	0.4	(0.3-0.6)	0.6	(0.6-0.7)	0.7	(0.2-2.0)
Other	1,745	(1381-2206)			8,265	(6,538-10,448)	11.0	(9.4-13.6)			39.0	(34.0-43.3)
Missing	877	(438-1756)			*	*	*	*			0.9	(0.3-2.1)
85 and older												
Routine [3,4]	2,428	(2,105-2,800)	2,537	(2,404-2,670)	2,536	(1,974-3,259)	75.0	(70.3-79.4)	81.0	(80.3-81.7)	47.0	(41.6-52.7)
Home health care [1,3]	49	(26-92)	90	(78-102)	…	…	1.5	(0.8-2.7)	2.9	(2.6-3.2)	…	…
Died [13,4]	26	(21-31)	35	(33-38)	*	*	0.8	(0.5-1.2)	1.1	(1.1-1.2)	0.2	(0.0-1.1)
Other	514	(411-642)			2,821	(2,190-3,633)	16.0	(13.4-18.6)			52.0	(46.9-57.8)
Missing	217	(111-424)			*	*	*	*			0.3	(<0.1-1.5)

… Category not applicable.

* Estimate does not meet National Center for Health Statistics standards of reliability.

[1] Statistically significant difference between NHCS and NEDS for number of ED visits.

[2] Statistically significant difference between NHCS and NHAMCS for number of ED visits.

[3] Statistically significant difference between NHCS and NEDS percentages.

[4] Statistically significant difference between NHCS and NHAMCS percentages.

NOTES: Estimates may not add to 100 due to rounding and/or missing information.
ED is emergency department. CI is confidence interval. Based on 102.4 million (95% CI: 93.8-111.8 million) visits using NHCS, 123.3 million (95% CI: 118-128.6) visits using NEDS, and 131.3 million (95% CI: 110.5-156.0) visits using NHAMCS.
Missing and "Other" discharge status estimates for NEDS are unavailable on HCUPnet.

SOURCES: National Center for Health Statistics, National Hospital Care Survey (NHCS), 2020 restricted use files. Agency for Healthcare Research and Quality, Healthcare Utilization Project Nationwide Emergency Department Sample (NEDS), 2020. National Center for Health Statistics, and National Hospital Ambulatory Medical Care Survey (NHAMCS), 2020 restricted use files.

Table 6. Comparison of emergency department (ED) visit estimates with top ten Clinical Classification Software Revised (CCSR) diagnoses categories using National Hospital Care Survey (NHCS), Nationwide Emergency Department Sample (NEDS), and National Hospital Ambulatory Medical Care Survey (NHAMCS) data: United States, 2020

	NHCS Number (in 1,000s)		NEDS Number (in 1,000s)		NHAMCS Number (in 1,000s)		NHCS Rate (per 100,000 people)		NEDS Rate (per 100,000 people)		NHAMCS Rate (per 100,000 people)	
CCSR category (code)	**No.**	**(95% CI)**	**No.**	**(95% CI)**	**No.**	**(95% CI)**	**Rate**	**(95% CI)**	**Rate**	**(95% CI)**	**Rate**	**(95% CI)**
External cause codes: intent of injury, accidental/unintentional (EXT020) [1,2]	13,389	(10,801-16,596)	19,554	(18,684-20,423)	1,509	(1,182-1,927)	4,038.8	(3,258.2-5,006.4)	5,898.5	(5,636.3-6,160.7)	455.3	(356.6-581.3)
Essential hypertension (CIR007) [1,2]	14,295	(11,797-17,323)	18,700	(17,667-19,733)	7,258	(5,122-10,284)	4,312.3	(3,558.7-5,225.6)	5,641.0	(5,329.4-5,952.6)	2,189.3	(1,545.1-3,102.2)
Tobacco-related disorders (MBD024) [3,4]	12,170	(9,847-15,040)	14,514	(13,539-15,488)	2,162	(1,261-3,706)	3,671.1	(2,970.5-4,536.9)	4,378.2	(4,084.2-4,672.2)	652.1	(380.3-1,118.0)
Abdominal pain and other digestive/abdomen signs and symptoms (SYM006)	11,566	(10,419-12,840)	10,817	(10,269-11,366)	11,625	(9,366-14,429)	3,489.0	(3,142.9-3,873.2)	3,263.1	(3,097.7-3,428.5)	3,506.7	(2,825.3-4,352.6)
Diabetes mellitus, Type 2 (END005) [1,2]	6,937	(5,887-8,175)	9,990	(9,450-10,530)	3,531	(2,470-5,046)	2,092.6	(1,775.7-2,466.1)	3,013.6	(2,850.7-3,176.5)	1,065.0	(745.2-1,522.1)
Disorders of lipid metabolism (END010) [1,2]	5,973	(4,640-7,689)	8,664	(8,091-9,237)	1,948	(1,175-3,229)	1,801.9	(1,399.7-2,319.5)	2,613.5	(2,440.6-2,786.4)	587.6	(354.5-974.1)
Respiratory signs and symptoms (SYM013)	8,855	(7,708-10,172)	8,477	(7,980-8,975)	7,668	(6,178-9,516)	2,671.2	(2,325.3-3,068.6)	2,557.2	(2,407.1-2,707.3)	2,313.0	(1,863.8-2,870.5)
External cause codes: place of occurrence of the external cause (EXT027) [5,6]	4,465	(3,060-6,517)	8,350	(7,677-9,024)	…	…	1,347.0	(922.9-1,965.9)	2,519.0	(2,315.7-2,722.3)	…	…

Musculoskeletal pain, not low back pain (MUS010)	8,340	(7,352-9,460)	8,043	(7,593-8,493)	7,601	(6,074-9,511)	2,515.8	(2,217.9-2,853.7)	2,426.3	(2,290.5-2,562.1)	2,292.9	(1,832.3-2,869.2)
Nonspecific chest pain (CIR012)	7,674	(6,925-8,504)	7,427	(7,034-7,820)	7,252	(5,715-9,203)	2,314.9	(2,088.9-2,565.4)	2,240.5	(2,121.9-2,359.1)	2,187.6	(1,723.9-2,776.1)

... Category not applicable.

[1] Statistically significant difference between NHCS and both NEDS and NHAMCS estimates for number of ED visits.

[2] Statistically significant difference between NHCS and both NEDS and NHAMCS estimates for rate (per 100,000 people) of ED visits.

[3] Statistically significant difference between NHCS and NHAMCS estimates for number of ED visits.

[4] Statistically significant difference between NHCS and NHAMCS estimates for rate (per 100,000 people) of ED visits.

[5] Statistically significant difference between NHCS and NEDS estimates for number of ED visits.

[6] Statistically significant difference between NHCS and NEDS estimates for rate (per 100,000 people) of ED visits.

NOTES: Diagnosis categories based on the top ten all-listed CCSR diagnosis categories using NEDS. CI is confidence interval. ED is emergency department. Based on 100.1 million (95% CI: 92.0-109.0 million) visits using NHCS, 123.3 million (95% CI: 118-128.6) visits using NEDS, and 131.3 million (95% CI: 110.5-156) visits using NHAMCS. Rates (per 100,000 people) by sex and age group are based on estimates of the U.S. resident population for April 1, 2020 to July 1, 2021 (10-12).

SOURCES: National Center for Health Statistics, National Hospital Care Survey (NHCS), 2020 restricted use files. Agency for Healthcare Research and Quality, Healthcare Utilization Project Nationwide Emergency Department Sample (NEDS), 2020. National Center for Health Statistics, and National Hospital Ambulatory Medical Care Survey (NHAMCS), 2020 restricted use files.