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1996 Summary: National Hospital Discharge Survey

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Abstract

Objectives—This report presents national estimates of the use of non-Federal short-stay hospitals in the United States during 1996. Numbers and rates of discharges, diagnoses, and procedures are shown by age and sex. Discharges are also shown by geographic region of hospital. Average lengths of stay are presented for discharges and selected diagnostic categories.

Methods—The estimates are based on medical abstract data collected through the National Hospital Discharge Survey for 1996. The survey has been conducted annually by the National Center for Health Statistics since 1965. Diagnoses and procedures presented are coded according to the *International Classification of Diseases, 9th Revision, Clinical Modification,* or ICD–9–CM.

Results—In 1996, there were an estimated 30.5 million discharges of inpatients, excluding newborn infants, from non-Federal, short-stay hospitals in the United States. The discharge rate was 116 per 1,000 population and the average length of stay was 5.2 days. Five diagnostic categories accounted for more than a million discharges. These were heart disease, delivery, malignant neoplasms, pneumonia, and psychoses. There were 40.4 million procedures performed on hospital inpatients during the same year. About three-fourths of all procedures were in four ICD–9–CM chapters: miscellaneous diagnostic and therapeutic procedures, obstetrical procedures, operations on the cardiovascular system, and operations on the digestive system.

Keywords: inpatients • diagnoses • procedures • ICD–9–CM

Introduction

This report presents data from the 1996 National Hospital Discharge Survey (NHDS). The survey has been conducted continuously by the National Center for Health Statistics (NCHS) since 1965. National estimates of hospital use derived from the NHDS are published for each calendar year by NCHS. This report provides an overview of the 1996 data, including the number and rate of discharges and average lengths of stay by the age and sex of patients and by geographic region of hospital. Average lengths of stay are also presented for selected diagnostic categories. Estimates for the number and rate of selected procedures performed on hospital inpatients are shown by age and sex. More detailed data from the NHDS are published in Series 13 of *Vital and Health Statistics*, which includes two reports on trends in hospital use (1,2).

The NHDS is the principal source for national data on the characteristics

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of patients discharged from non-Federal short-stay hospitals. Data from the NHDS are used to examine important topics of interest in public health (3–7) and for a variety of activities by governmental, scientific, academic, and commercial institutions.

Estimates of the number of procedures shown in this report are for inpatients only. Data on ambulatory surgery are available from the National Survey of Ambulatory Surgery (NSAS), also conducted by NCHS. The NSAS was conducted from 1994 through 1996 and covers hospital-based and free-standing ambulatory surgery centers. Data from this survey are now available (8–11).

Information on ambulatory procedures is also collected in two other NCHS surveys. The National Ambulatory Medical Care Survey obtains information on procedures ordered or performed during visits to physicians' offices (12). The National Hospital Ambulatory Medical Care Survey collects data on procedures ordered or performed during visits to hospital outpatient and emergency departments (13,14).

Methods

Data source

The National Hospital Discharge Survey (NHDS) collects data from a sample of inpatient records acquired from a national sample of hospitals. Persons with multiple discharges during the year may be sampled more than once, resulting in estimates for discharges, not persons. Only hospitals with an average length of stay of fewer than 30 days for all patients, general hospitals, or children's general hospitals are included in the survey. Federal, military, and Department of Veterans Affairs hospitals, as well as hospital units of institutions (such as prison hospitals), and hospitals with fewer than six beds staffed for patient use, are excluded.

Prior to 1988, the NHDS utilized a two-stage design, but in 1988 the survey was redesigned (15). Beginning in 1988, all hospitals with 1,000 beds or more or 40,000 discharges or more annually were included in the sample with certainty, while the remaining sample of hospitals was based on a stratified three-stage design. The first stage consisted of a selection of 112 primary sampling units (PSU's) that comprise a probability sample of PSU's used in the 1985–94 National Health Interview Survey (16). The second stage consists of a selection of noncertainty hospitals from the sampled PSU's. At the third stage, a sample of discharges within hospitals is selected by a systematic random sampling technique. The sampling frame for hospitals drawn under the new design has been the SMG Hospital Market Database (17–19).

For 1996, the sample consisted of 525 hospitals, 18 of which were found to be out of scope (ineligible) because they had gone out of business or otherwise failed to meet the criteria for the NHDS universe. Of the 507 in-scope (eligible) hospitals, 480 (94.7 percent) responded to the survey. Data were collected for approximately 282,000 discharges from the 480 responding hospitals.

Two data collection procedures were used in the survey. One was a manual system in which sample selection and medical transcription from the hospital records to abstract forms were performed by the hospital's staff or by staff of the U.S. Bureau of the Census on behalf of NCHS. Completed forms were sent to NCHS for coding, editing, and post-survey weighting adjustments.

The other data collection procedure was an automated system in which NCHS purchased machine-readable medical record data from commercial organizations, State data systems, hospitals, or hospital associations. Records from these sources were systematically sampled by NCHS. In 1996, approximately 38 percent of respondent hospitals provided data through the automated system.

The medical abstract form and the automated data tapes contain items that relate to the personal characteristics of the patient. These items include birth date (or age), sex, race, ethnicity, marital status, ZIP code, and expected sources of payment. Administrative items such as admission and discharge dates, discharge status, and medical record number were also included. Medical information about patients includes diagnoses, surgical and nonsurgical operations and procedures, and dates of surgery. (The medical record number, date of birth, and ZIP code are confidential information not available to the public.) Medical data are coded according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM) (20). Definitions of the terms used in this report can be found in the National Hospital Discharge Survey Annual Summary for 1993 (21).

For the manual data collection, an ongoing quality control program was undertaken on the coding and entering of data from abstracts to machine-readable form. Approximately 5 percent of the abstracts are independently recoded by an NHDS coder, with discrepancies resolved by the chief coder. The overall error rate for records manually coded by NCHS for the 1996 data year was 3.0 percent for medical (ICD–9–CM) coding and keying and 0.6 percent for demographic coding and keying.

Estimation

Because of the complex multistage design of the NHDS, the survey data must be inflated or weighted in order to produce national estimates. The estimation procedure produces essentially unbiased national estimates and has three basic components: (a) inflation by reciprocals of the probabilities of sample selection, (b) adjustment for nonresponse, and (c) population weighting ratio adjustments. These three components of the final weight are described in more detail in earlier reports (1,2). Information about the standard errors of statistics for the 1996 NHDS is in the Technical notes of this report.

Use of tables

Discharges are shown in this report by first-listed diagnosis. This is the principal diagnosis if it is specified on the medical record. If the principal diagnosis is not specified, the diagnosis listed first on the face sheet or discharge

summary of the medical record is used. Estimates of procedures, including surgical or nonsurgical operations, diagnostic procedures, and special treatments reported on the medical record, are also published. Up to four procedures were coded for each discharge. All-listed procedures include all occurrences of the procedure coded regardless of the order on the medical record.

The diagnoses and procedures appear in separate tables of this report, presented by chapter of ICD–9–CM. Within these chapters, subcategories of diagnoses or procedures are shown. These specific categories were selected primarily because of their large estimates or because they are of special interest. Although diagnoses assigned ICD–9–CM codes E800–E999 (Supplementary classification of external causes of injury and poisoning) were included in the NHDS, these diagnoses were excluded from this report. Data for newborn infants, defined as patients admitted to a hospital by birth, were also excluded from this report.

Because of low reliability, estimates of less than 5,000 are not presented. For these estimates, only an asterisk (*) appears in the tables. These estimates generally have a relative standard error of more than 30 percent or are based on a sample of fewer than 30 cases. Estimates of 5,000–9,000 are preceded by an asterisk (*) to indicate that they are generally based on fewer than 60 cases and also have low reliability.

Estimates have been rounded to the nearest thousand. Therefore, figures within tables do not always add to the totals. Rates and average lengths of stay were calculated from unrounded figures and may not precisely agree with rates or average lengths of stay calculated from rounded data.

The population estimates used in computing rates are for the U.S. civilian population, including institutionalized persons, as of July 1, 1996. These estimates were provided by the U.S. Bureau of the Census and are consistent with the population estimates published in *Current Population Reports*, Series P-25.

Results

Patient and hospital characteristics

- In 1996, there were an estimated 30.5 million discharges of inpatients, excluding newborn infants, from short-stay non-Federal hospitals in the United States (table 1).
- The discharge rate was 116 per 1,000 population and the average length of stay was 5.2 days in 1996 (table 1).
- The discharge rate per 1,000 population was 94 for males and 136 for females. Males had an average length of stay of 5.8 days compared with 4.9 days for females.
- Persons 65 years of age and over accounted for 38 percent of all discharges.
- The discharge rate per 1,000 population ranged from 129 in the Northeast region to 98 in the West. The average length of stay ranged

Table 1. Number, rate, and average length of stay for discharges from short-stay hospitals by age, region, and sex: United States, 1996

[Discharges of inpatients from non-Federal hospitals. Excludes newborns]

Selected characteristic	Both sexes	Male	Female
		Number in thousands	
Total	30,545	12,110	18,435
Age			
Under 15 years	2,207	1,240	967
15–44 years	10,325	2,831	7,495
45–64 years	6,294	3,138	3,156
65 years and over	11,718	4,901	6,817
Region			
Northeast	6,665	2,807	3,859
Midwest	7,107	2,880	4,226
South	11,085	4,289	6,796
West	5,688	2,134	3,553
		Rate per 1,000 population	
Total	115.7	94.1	136.2
Age			
Under 15 years	38.2	42.0	34.3
15–44 years	87.0	47.7	126.1
45–64 years	117.2	120.8	113.8
65 years and over	346.1	353.1	341.2
Region			
Northeast	129.4	112.9	144.8
Midwest	114.7	95.3	133.0
South	120.0	95.9	142.6
West	97.9	73.9	121.6
		Average length of stay in days	
Total	5.2	5.8	4.9
Age			
Under 15 years	4.6	4.6	4.5
15–44 years	3.8	5.5	3.2
45–64 years	5.3	5.5	5.2
65 years and over	6.5	6.4	6.6
Region			
Northeast	6.2	6.6	5.9
Midwest	5.0	5.4	4.7
South	5.2	5.8	4.8
West	4.5	5.1	4.1

from 6.2 days in the Northeast region to 4.5 days in the West.

Diagnoses

- Approximately half of all first-listed diagnoses were in four ICD–9–CM chapters: diseases of the circulatory system, supplementary classifications (including females with deliveries), diseases of the respiratory system, and diseases of the digestive system (table 2).
- Five diagnostic categories accounted for more than a million discharges. These were heart disease (4.2 million), delivery (3.8 million), malignant neoplasms (1.4 million), pneumonia (1.2 million), and psychoses (1.2 million).
- For persons 65 years of age and over, there were 804 discharges per 10,000 population with a first-listed diagnosis of heart disease (table 3).
- The average length of stay was 5.2 days for heart disease, 2.2 days for delivery, 7.0 days for malignant neoplasms, 9.8 days for psychoses, and 6.5 days for pneumonia (table 4).

Procedures

- During 1996, 40.4 million procedures were performed on hospital inpatients (table 5).
- About three-fourths of all procedures were in four ICD–9–CM chapters: miscellaneous diagnostic and therapeutic procedures, obstetrical procedures, operations on the cardiovascular system, and operations on the digestive system.
- Frequent procedures for males were arteriography and angiocardiography, cardiac catheterization, respiratory therapy, diagnostic ultrasound, and computerized axial tomography.
- Frequent procedures for females were episiotomy, repair of current obstetric laceration, fetal EKG and fetal monitoring, and cesarean section.

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Table 2. Number of discharges from short-stay hospitals, by first-listed diagnosis, sex, and age: United States, 1996

[Discharges of inpatients from non-Federal hospitals. Excludes newborn infants. Diagnostic groupings and code numbers are based on the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM)]

Category of first-listed diagnosis and ICD–9–CM code	Total	Sex		Age			
		Male	Female	Under 15 years	15–44 years	45–64 years	65 years and over
	Number in thousands						
All conditions	30,545	12,110	18,435	2,207	10,325	6,294	11,718
Infectious and parasitic diseases 001–139	845	412	434	153	225	135	332
Septicemia 038	355	156	199	19	43	57	236
Neoplasms 140–239	1,805	693	1,112	40	327	611	826
Malignant neoplasms 140–208,230–234	1,374	626	748	29	142	458	745
Malignant neoplasm of large intestine and rectum 153–154,197.5	155	69	86	*	*8	38	109
Malignant neoplasm of trachea, bronchus, and lung 162,176.4,197.0,197.3	210	118	93	*	13	73	122
Malignant neoplasm of breast 174–175,198.81	125	*	123	*	15	54	56
Benign neoplasms and neoplasms of uncertain behavior and unspecified nature 210–229,235–239	431	67	364	11	186	153	81
Endocrine, nutritional and metabolic diseases, and immunity disorders 240–279	1,272	519	753	155	250	305	563
Diabetes mellitus 250	503	233	270	24	120	161	198
Volume depletion 276.5	434	162	272	110	58	58	208
Diseases of the blood and blood-forming organs 280–289	333	143	191	53	88	65	128
Mental disorders 290–319	1,943	1,004	939	81	1,145	401	315
Psychoses 290–299	1,212	569	643	36	664	256	255
Alcohol dependence syndrome 303	206	158	48	*	140	56	10
Diseases of the nervous system and sense organs 320–389	512	225	287	89	138	99	187
Diseases of the central nervous system 320–349	302	128	174	41	101	61	99
Diseases of the ear and mastoid process 380–389	75	37	38	33	*8	10	24
Diseases of the circulatory system 390–459	6,107	3,101	3,006	25	413	1,706	3,963
Heart disease 391–392.0,393–398,402,404,410–416,420–429	4,239	2,216	2,023	18	252	1,248	2,721
Acute myocardial infarction 410	825	496	329	*	42	282	500
Coronary atherosclerosis 414.0	1,041	626	416	*	47	414	578
Other ischemic heart disease 411–413,414.1–414.9	396	204	192	*	32	139	224
Cardiac dysrhythmias 427	618	290	328	*6	45	140	427
Congestive heart failure 428.0	870	377	493	*	29	153	686
Cerebrovascular disease 430–438	955	437	518	*	40	187	727
Diseases of the respiratory system 460–519	3,238	1,544	1,694	653	450	584	1,550
Acute respiratory infections 460–466	317	163	154	196	40	30	51
Chronic disease of tonsils and adenoids 474	27	14	13	20	*6	*	–
Pneumonia 480–486	1,202	574	628	190	140	173	699
Asthma 493	474	195	279	195	132	88	59
Diseases of the digestive system 520–579	2,906	1,295	1,612	205	746	757	1,198
Ulcers of the stomach and small intestine 531–534	193	104	89	*	30	57	104
Appendicitis 540–543	235	140	95	61	127	31	15
Inguinal hernia 550	57	48	*9	9	*9	11	28
Noninfectious enteritis and colitis 555–558	276	110	166	61	82	49	84
Cholelithiasis 574	386	115	271	*	118	126	139
Diseases of the genitourinary system 580–629	1,673	526	1,146	69	590	413	600
Calculus of kidney and ureter 592	176	107	69	*	85	64	26
Hyperplasia of prostate 600	106	106	. . .	–	*	21	85
Complications of pregnancy, childbirth, and the puerperium[1] 630–677	536	. . .	536	*	534	*	. . .
Abortions and ectopic and molar pregnancies 630–639	108	. . .	108	*	108	*	. . .
Diseases of the skin and subcutaneous tissue 680–709	452	236	216	45	126	120	162
Cellulitis and abscess 681–682	324	176	148	29	95	92	107
Diseases of the musculoskeletal system and connective tissue 710–739	1,506	638	868	37	370	430	668
Arthropathies and related disorders 710–719	563	213	350	13	78	127	345
Intervertebral disc disorders 722	340	183	157	*	156	131	52
Congenital anomalies 740–759	167	92	75	114	25	19	*8
Certain conditions originating in the perinatal period 760–779	152	90	63	152	–	–	–
Symptoms, signs, and ill-defined conditions 780–799	302	140	162	52	114	75	61
Injury and poisoning 800–999	2,550	1,277	1,273	223	865	485	977
Fractures, all sites 800–829	1,012	421	591	71	263	154	523
Fracture of neck of femur 820	349	80	269	*	*9	22	316
Intracranial injuries (excluding those with skull fracture) 850–854	141	91	50	20	56	18	46
Open wounds 870–897	124	95	30	15	73	22	14
Supplementary classifications V01–V82	4,246	177	4,069	59	3,919	88	180
Females with deliveries V27	3,830	. . .	3,830	10	3,817	*	. . .

* Figure does not meet standard of reliability or precision. . . . Category not applicable. – Quantity zero.

[1]First-listed diagnosis for females with deliveries is coded V27, shown under ''Supplementary classifications.''

Table 3. Rate of discharges from short-stay hospitals, by first-listed diagnosis, sex, and age: United States, 1996

[Discharges of inpatients from non-Federal hospitals. Excludes newborn infants. Diagnostic groupings and code numbers are based on the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM)]

Category of first-listed diagnosis and ICD–9–CM code	Total	Sex		Age			
		Male	Female	Under 15 years	15–44 years	45–64 years	65 years and over
	Rate per 10,000 population						
All conditions	1,157.0	941.0	1,362.5	382.4	869.6	1,172.2	3,460.7
Infectious and parasitic diseases 001–139	32.0	32.0	32.0	26.5	19.0	25.2	98.0
Septicemia 038	13.5	12.1	14.7	3.3	3.7	10.5	69.6
Neoplasms 140–239	68.4	53.9	82.2	6.9	27.6	113.9	244.0
Malignant neoplasms 140–208,230–234	52.1	48.7	55.3	5.1	11.9	85.3	220.1
Malignant neoplasm of large intestine and rectum 153–154,197.5	5.9	5.4	6.4	*	*0.7	7.1	32.0
Malignant neoplasm of trachea, bronchus, and lung 162,176.4,197.0,197.3	8.0	9.1	6.9	*	1.1	13.5	36.1
Malignant neoplasm of breast 174–175,198.81	4.7	*	9.1	*	1.2	10.0	16.5
Benign neoplasms and neoplasms of uncertain behavior and unspecified nature 210–229,235–239	16.3	5.2	26.9	1.8	15.7	28.5	23.9
Endocrine, nutritional and metabolic diseases, and immunity disorders 240–279	48.2	40.4	55.7	26.9	21.0	56.7	166.3
Diabetes mellitus 250	19.1	18.1	20.0	4.2	10.1	30.0	58.4
Volume depletion 276.5	16.4	12.6	20.1	19.1	4.9	10.8	61.4
Diseases of the blood and blood-forming organs 280–289	12.6	11.1	14.1	9.1	7.4	12.0	37.9
Mental disorders 290–319	73.6	78.0	69.4	14.0	96.5	74.7	93.0
Psychoses 290–299	45.9	44.2	47.5	6.2	56.0	47.7	75.5
Alcohol dependence syndrome 303	7.8	12.3	3.6	*	11.8	10.4	2.9
Diseases of the nervous system and sense organs 320–389	19.4	17.5	21.2	15.3	11.7	18.4	55.2
Diseases of the central nervous system 320–349	11.4	9.9	12.9	7.0	8.5	11.3	29.3
Diseases of the ear and mastoid process 380–389	2.8	2.9	2.8	5.7	*0.7	1.9	7.0
Diseases of the circulatory system 390–459	231.3	241.0	222.2	4.4	34.8	317.7	1,170.4
Heart disease 391–392.0,393–398,402,404,410–416,420–429	160.6	172.2	149.5	3.1	21.2	232.5	803.6
Acute myocardial infarction 410	31.3	38.5	24.4	*	3.5	52.5	147.7
Coronary atherosclerosis 414.0	39.4	48.6	30.7	*	4.0	77.2	170.8
Other ischemic heart disease 411–413,414.1–414.9	15.0	15.9	14.2	*	2.7	25.8	66.2
Cardiac dysrhythmias 427	23.4	22.5	24.2	*1.0	3.8	26.1	126.0
Congestive heart failure 428.0	33.0	29.3	36.4	*	2.4	28.5	202.7
Cerebrovascular disease 430–438	36.2	33.9	38.3	*	3.3	34.8	214.7
Diseases of the respiratory system 460–519	122.6	120.0	125.2	113.2	37.9	108.8	457.8
Acute respiratory infections 460–466	12.0	12.7	11.4	34.0	3.4	5.6	14.9
Chronic disease of tonsils and adenoids 474	1.0	1.1	1.0	3.5	*0.5	*	–
Pneumonia 480–486	45.5	44.6	46.4	33.0	11.8	32.3	206.3
Asthma 493	17.9	15.1	20.6	33.8	11.1	16.4	17.4
Diseases of the digestive system 520–579	110.1	100.6	119.1	35.6	62.8	141.1	353.7
Ulcers of the stomach and small intestine 531–534	7.3	8.1	6.6	*	2.5	10.6	30.8
Appendicitis 540–543	8.9	10.9	7.0	10.6	10.7	5.8	4.6
Inguinal hernia 550	2.2	3.8	*0.6	1.6	*0.8	2.0	8.2
Noninfectious enteritis and colitis 555–558	10.5	8.6	12.3	10.5	6.9	9.2	24.9
Cholelithiasis 574	14.6	8.9	20.0	*	9.9	23.5	41.1
Diseases of the genitourinary system 580–629	63.4	40.9	84.7	12.0	49.7	76.9	177.3
Calculus of kidney and ureter 592	6.7	8.3	5.1	*	7.1	11.9	7.6
Hyperplasia of prostate 600	4.0	8.2	. . .	0.0	*	3.8	25.0
Complications of pregnancy, childbirth, and the puerperium[1] 630–677	20.3	. . .	39.6	*	44.9	*	. . .
Abortions and ectopic and molar pregnancies 630–639	4.1	. . .	8.0	*	9.1	*	. . .
Diseases of the skin and subcutaneous tissue 680–709	17.1	18.3	16.0	7.7	10.6	22.3	47.8
Cellulitis and abscess 681–682	12.3	13.7	10.9	5.1	8.0	17.1	31.7
Diseases of the musculoskeletal system and connective tissue 710–739	57.0	49.6	64.1	6.4	31.2	80.1	197.4
Arthropathies and related disorders 710–719	21.3	16.6	25.9	2.3	6.6	23.7	101.8
Intervertebral disc disorders 722	12.9	14.3	11.6	*	13.2	24.4	15.5
Congenital anomalies 740–759	6.3	7.1	5.6	19.8	2.1	3.6	*2.3
Certain conditions originating in the perinatal period 760–779	5.8	7.0	4.6	26.4	–	–	–
Symptoms, signs, and ill-defined conditions 780–799	11.4	10.9	12.0	9.0	9.6	14.0	18.0
Injury and poisoning 800–999	96.6	99.2	94.1	38.6	72.8	90.3	288.7
Fractures, all sites 800–829	38.3	32.7	43.7	12.4	22.2	28.7	154.5
Fracture of neck of femur 820	13.2	6.2	19.9	*	*0.7	4.0	93.4
Intracranial injuries (excluding those with skull fracture) 850–854	5.3	7.0	3.7	3.5	4.8	3.4	13.6
Open wounds 870–897	4.7	7.4	2.2	2.6	6.2	4.0	4.2
Supplementary classifications V01–V82	160.8	13.7	300.7	10.2	330.0	16.5	53.1
Females with deliveries V27	145.1	. . .	283.0	1.7	321.5	*	. . .

* Figure does not meet standard of reliability or precision. – Quantity zero. . . . Category not applicable. 0.0 Quantity more than zero but less than 0.05.

[1]First-listed diagnosis for females with deliveries is coded V27, shown under ''Supplementary classifications.''

Table 4. Average length of stay for discharges from short-stay hospitals, by first-listed diagnosis, sex, and age: United States, 1996

[Discharges of inpatients from non-Federal hospitals. Excludes newborn infants. Diagnostic groupings and code numbers are based on the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM)]

Category of first-listed diagnosis and ICD–9–CM code	Total	Sex		Age			
		Male	Female	Under 15 years	15–44 years	45–64 years	65 years and over
	Average length of stay in days						
All conditions	5.2	5.8	4.9	4.6	3.8	5.3	6.5
Infectious and parasitic diseases 001–139	7.4	7.8	7.0	3.9	8.4	8.2	8.0
Septicemia 038	8.5	8.6	8.4	5.6	9.0	9.3	8.4
Neoplasms 140–239	6.2	7.1	5.6	7.8	4.6	5.7	7.1
Malignant neoplasms 140–208,230–234	7.0	7.3	6.7	8.7	6.8	6.5	7.2
Malignant neoplasm of large intestine and rectum 153–154,197.5	9.8	9.2	10.3	*	*12.2	8.4	10.1
Malignant neoplasm of trachea, bronchus, and lung 162,176.4,197.0,197.3	7.0	7.1	7.0	*	7.0	6.5	7.4
Malignant neoplasm of breast 174–175,198.81	3.0	*	3.0	*	3.7	2.7	3.0
Benign neoplasms and neoplasms of uncertain behavior and unspecified nature 210–229,235–239	3.7	5.4	3.4	5.2	3.0	3.6	5.4
Endocrine, nutritional and metabolic diseases, and immunity disorders 240–279	5.3	5.6	5.1	2.9	4.3	5.7	6.2
Diabetes mellitus 250	6.3	6.9	5.8	3.3	4.8	7.0	7.1
Volume depletion 276.5	4.5	4.4	4.6	2.2	3.7	5.0	5.8
Diseases of the blood and blood-forming organs 280–289	4.9	4.7	5.2	3.3	5.9	4.7	5.1
Mental disorders 290–319	8.5	8.0	9.1	11.2	7.7	8.4	10.7
Psychoses 290–299	9.8	9.1	10.4	11.1	9.0	9.8	11.6
Alcohol dependence syndrome 303	6.9	6.7	7.5	*	7.1	5.7	9.0
Diseases of the nervous system and sense organs 320–389	5.1	5.4	4.8	3.8	4.6	5.7	5.7
Diseases of the central nervous system 320–349	6.5	7.1	6.0	4.8	5.0	7.5	8.0
Diseases of the ear and mastoid process 380–389	2.6	2.6	2.7	2.5	*2.2	2.4	3.0
Diseases of the circulatory system 390–459	5.5	5.3	5.8	6.0	4.3	4.9	5.9
Heart disease 391–392.0,393–398,402,404,410–416,420–429	5.2	5.0	5.5	6.6	3.9	4.6	5.6
Acute myocardial infarction 410	6.3	6.0	6.6	*	4.4	5.6	6.8
Coronary atherosclerosis 414.0	4.7	4.5	4.9	*	3.0	4.0	5.3
Other ischemic heart disease 411–413,414.1–414.9	3.4	3.4	3.5	*	2.2	3.0	3.9
Cardiac dysrhythmias 427	3.9	3.6	4.2	*2.8	3.4	3.5	4.1
Congestive heart failure 428.0	6.0	5.7	6.3	*	4.6	5.7	6.2
Cerebrovascular disease 430–438	6.7	6.4	6.9	*	6.8	6.7	6.6
Diseases of the respiratory system 460–519	5.9	5.9	5.9	3.4	4.8	6.1	7.3
Acute respiratory infections 460–466	3.3	3.1	3.6	3.0	2.7	3.6	5.0
Chronic disease of tonsils and adenoids 474	1.6	1.5	1.7	1.7	*1.1	*	–
Pneumonia 480–486	6.5	6.6	6.3	3.8	5.7	6.6	7.3
Asthma 493	3.6	3.2	3.9	2.7	3.6	4.4	5.6
Diseases of the digestive system 520–579	5.1	5.2	5.0	3.4	4.1	4.8	6.2
Ulcers of the stomach and small intestine 531–534	6.0	5.7	6.4	*	5.7	4.9	6.8
Appendicitis 540–543	3.5	3.5	3.6	3.5	3.0	4.1	7.1
Inguinal hernia 550	2.7	2.5	*3.3	1.6	*1.9	2.4	3.4
Noninfectious enteritis and colitis 555–558	5.1	5.6	4.8	2.5	5.0	5.6	6.9
Cholelithiasis 574	4.0	5.2	3.5	*	2.8	3.3	5.7
Diseases of the genitourinary system 580–629	4.1	4.4	4.0	4.1	3.0	3.6	5.6
Calculus of kidney and ureter 592	2.3	2.2	2.5	*	2.1	2.2	3.0
Hyperplasia of prostate 600	3.5	3.5	. . .	0.0	*	2.9	3.7
Complications of pregnancy, childbirth, and the puerperium[1] 630–677	2.5	. . .	2.5	*	2.5	*	. . .
Abortions and ectopic and molar pregnancies 630–639	1.8	. . .	1.8	*	1.8	*	. . .
Diseases of the skin and subcutaneous tissue 680–709	6.3	6.1	6.5	3.8	5.1	6.5	7.7
Cellulitis and abscess 681–682	5.6	5.2	6.1	3.2	4.5	6.1	6.9
Diseases of the musculoskeletal system and connective tissue 710–739	4.8	4.4	5.0	3.7	3.6	4.1	5.8
Arthropathies and related disorders 710–719	5.0	4.4	5.3	3.6	4.0	4.6	5.4
Intervertebral disc disorders 722	3.1	2.9	3.2	*	2.8	2.8	4.5
Congenital anomalies 740–759	6.5	6.7	6.3	7.5	4.8	3.2	*6.9
Certain conditions originating in the perinatal period 760–779	10.1	9.8	10.6	10.1	–	–	–
Symptoms, signs, and ill-defined conditions 780–799	3.3	3.8	2.8	2.3	3.2	2.9	4.8
Injury and poisoning 800–999	5.4	5.3	5.6	3.8	4.4	5.3	6.8
Fractures, all sites 800–829	5.9	5.6	6.1	3.6	4.6	5.1	7.0
Fracture of neck of femur 820	7.4	8.0	7.3	*	*7.1	6.5	7.5
Intracranial injuries (excluding those with skull fracture) 850–854	6.7	6.5	6.9	4.3	5.4	7.5	9.0
Open wounds 870–897	3.3	3.1	3.9	3.1	3.1	3.5	4.1
Supplementary classifications V01–V82	2.7	8.0	2.5	4.4	2.2	6.8	11.1
Females with deliveries V27	2.2	. . .	2.2	2.8	2.2	*	. . .

* Figure does not meet standard of reliability or precision. – Quantity zero. . . . Category not applicable. 0.0 Quantity more than zero but less than 0.05.

[1]First-listed diagnosis for females with deliveries is coded V27, shown under ''Supplementary classifications.''

Table 5. Number of all-listed procedures for discharges from short-stay hospitals, by procedure category, sex, and age: United States, 1996

[Discharges of inpatients from non-Federal hospitals. Excludes newborn infants. Procedure groupings and code numbers are based on the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM)]

Procedure category and ICD–9–CM code	Total	Sex		Age			
		Male	Female	Under 15 years	15–44 years	45–64 years	65 years and over
	Number in thousands						
All procedures	40,397	15,997	24,400	1,950	14,603	9,302	14,542
Operations on the nervous system 01–05	937	431	506	199	317	196	225
Spinal tap 03.31	310	157	153	137	80	39	54
Operations on the endocrine system 06–07	101	29	71	*	33	37	28
Operations on the eye 08–16	188	94	95	10	35	44	99
Operations on the ear 18–20	58	35	23	35	13	*	*6
Operations on the nose, mouth, and pharynx 21–29	323	189	135	69	121	72	61
Tonsillectomy with or without adenoidectomy 28.2–28.3	36	19	17	24	9	*	*
Operations on the respiratory system 30–34	1,038	582	456	57	172	298	511
Bronchoscopy with or without biopsy 33.21–33.24,33.27	305	178	127	18	42	90	155
Operations on the cardiovascular system 35–39	5,444	3,231	2,213	164	544	1,882	2,853
Removal of coronary artery obstruction and insertion of stent(s) 36.0	666	452	214	*	37	307	322
Coronary artery bypass graft[1] 36.1	598	424	175	*	20	242	335
Cardiac catheterization 37.21–37.23	1,161	704	457	14	90	496	561
Insertion, replacement, removal, and revision of pacemaker leads or device 37.7–37.8	341	171	170	*	9	46	283
Shunt or vascular bypass 39.0–39.2	193	108	85	*	17	56	116
Hemodialysis 39.95	413	205	209	*	73	143	195
Operations on the hemic and lymphatic system 40–41	348	169	179	19	62	115	152
Operations on the digestive system 42–54	4,976	2,152	2,824	218	1,206	1,247	2,305
Endoscopy of small intestine with or without biopsy 45.11–45.14,45.16	841	396	445	12	133	211	485
Endoscopy of large intestine with or without biopsy 45.21–45.25	490	200	290	*	63	109	313
Partial excision of large intestine 45.7	226	101	125	*	28	57	138
Appendectomy, excluding incidental 47.0	263	146	117	64	144	36	18
Cholecystectomy 51.2	448	142	306	*	136	147	160
Repair of inguinal hernia 53.0–53.1	77	63	14	12	11	14	40
Lysis of peritoneal adhesions 54.5	338	69	269	*	149	84	101
Operations on the urinary system 55–59	1,016	510	506	34	245	298	439
Cystoscopy with or without biopsy 57.31–57.33	208	130	78	*5	35	49	118
Operations on the male genital organs 60–64	302	302	. . .	29	15	66	192
Prostatectomy 60.2–60.6	203	203	. . .	–	*	48	153
Operations on the female genital organs 65–71	2,096	. . .	2,096	9	1,272	575	240
Oophorectomy and salpingo-oophorectomy 65.3–65.6	475	. . .	475	*	211	206	56
Bilateral destruction or occlusion of fallopian tubes 66.2–66.3	342	. . .	342	–	341	*	–
Hysterectomy 68.3–68.7,68.9	591	. . .	591	*	309	217	64
Dilation and curettage of uterus 69.0	83	. . .	83	*	66	12	*
Repair of cystocele and rectocele 70.5	151	. . .	151	–	35	62	54
Obstetrical procedures 72–75	6,540	. . .	6,540	18	6,519	*	. . .
Episiotomy with or without forceps or vacuum extraction 72.1,72.21,72.31,72.71,73.6	1,294	. . .	1,294	*	1,290	*	. . .
Artificial rupture of membranes 73.0	729	. . .	729	*	727	*	. . .
Cesarean section 74.0–74.2,74.4,74.99	835	. . .	835	*	832	*	. . .
Fetal EKG (scalp) and fetal monitoring, not otherwise specified 75.32,75.34	895	. . .	895	*	892	*	. . .
Repair of current obstetric laceration 75.5–75.6	1,061	. . .	1,061	*	1,059	*	. . .
Operations on the musculoskeletal system 76–84	3,134	1,546	1,589	165	960	841	1,168
Partial excision of bone 76.2–76.3,77.6–77.8	231	120	111	11	86	84	50
Open reduction of fracture with internal fixation 79.3	432	170	262	17	128	82	205
Excision or destruction of intervertebral disc 80.5	288	164	124	*	134	117	36
Total hip replacement 81.51	138	57	81	–	*8	35	95
Total knee replacement 81.54	245	88	157	–	*	59	181
Operations on the integumentary system 85–86	1,290	572	718	78	402	360	450
Mastectomy 85.4	89	*	87	*	10	36	42
Debridement of wound, infection, or burn 86.22,86.28	340	195	146	17	98	96	130
Skin graft 86.6–86.7	93	52	40	*8	31	23	30
Miscellaneous diagnostic and therapeutic procedures 87–99	12,604	6,155	6,449	841	2,687	3,263	5,813
Computerized axial tomography 87.03,87.41,87.71,88.01,88.38	995	493	502	46	225	228	496
Pyelogram 87.73–87.75	154	84	70	*	52	49	49
Arteriography and angiocardiography using contrast material 88.4–88.5	1,964	1,165	799	16	171	812	965
Diagnostic ultrasound 88.7	1,177	501	676	43	252	264	617
Circulatory monitoring 89.6	337	168	170	12	49	81	195
Radioisotope scan 92.0–92.1	298	126	172	*6	47	87	159
Respiratory therapy 93.9,96.7	1,085	554	532	221	152	224	489

* Figure does not meet standard of reliability or precision. – Quantity zero. . . . Category not applicable.

[1]The number of discharges with a coronary artery bypass graft was 367,000.

Table 6. Rate of all-listed procedures for discharges from short-stay hospitals, by procedure category, sex, and age: United States, 1996

[Discharges of inpatients from non-Federal hospitals. Excludes newborn infants. Procedure groupings and code numbers are based on the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM)]

Procedure category and ICD–9–CM code	Total	Sex		Age			
		Male	Female	Under 15 years	15–44 years	45–64 years	65 years and over
	Rate per 100,000 population						
All procedures	15,302.0	12,430.7	18,033.1	3,379.2	12,299.0	17,323.8	42,946.2
Operations on the nervous system 01–05	355.0	334.8	374.3	345.2	267.0	365.8	663.4
Spinal tap 03.31	117.5	122.2	113.0	237.3	67.3	73.5	159.1
Operations on the endocrine system 06–07	38.1	22.7	52.8	*	27.8	68.5	83.1
Operations on the eye 08–16	71.3	72.8	69.9	18.1	29.8	81.6	291.1
Operations on the ear 18–20	22.0	27.4	17.0	60.4	10.8	*	*19.1
Operations on the nose, mouth, and pharynx 21–29	122.5	146.6	99.6	119.7	102.2	133.3	181.4
Tonsillectomy with or without adenoidectomy 28.2 28.3	13.5	14.6	12.5	41.3	7.8	*	*
Operations on the respiratory system 30–34	393.4	452.4	337.2	99.0	145.1	554.2	1,510.6
Bronchoscopy with or without biopsy 33.21–33.24,33.27	115.6	138.2	94.1	31.7	35.8	166.7	457.4
Operations on the cardiovascular system 35–39	2,062.0	2,510.7	1,635.2	284.8	457.8	3,505.9	8,426.4
Removal of coronary artery obstruction and insertion of stent(s) 36.0	252.4	351.2	158.4	*	30.9	571.5	950.3
Coronary artery bypass graft[1] 36.1	226.6	329.1	129.2	*	17.1	451.3	989.2
Cardiac catheterization 37.21–37.23	439.7	546.8	337.8	23.7	75.8	923.1	1,658.0
Insertion, replacement, removal, and revision of pacemaker leads or device 37.7–37.8	129.3	133.2	125.6	*	8.0	84.8	836.4
Shunt or vascular bypass 39.0–39.2	73.0	83.6	62.9	*	14.6	103.4	342.2
Hemodialysis 39.95	156.6	158.9	154.3	*	61.2	266.9	576.0
Operations on the hemic and lymphatic system 40–41	131.7	131.4	132.1	32.6	52.2	214.8	447.9
Operations on the digestive system 42–54	1,885.0	1,672.2	2,087.4	378.2	1,015.9	2,322.8	6,806.5
Endoscopy of small intestine with or without biopsy 45.11–45.14,45.16	318.7	307.7	329.2	20.7	112.1	393.4	1,432.6
Endoscopy of large intestine with or without biopsy 45.21–45.25	185.7	155.6	214.4	*	53.1	203.6	924.3
Partial excision of large intestine 45.7	85.6	78.5	92.4	*	23.6	107.1	407.6
Appendectomy, excluding incidental 47.0	99.4	113.3	86.3	111.1	121.6	67.1	53.3
Cholecystectomy 51.2	169.8	110.6	226.0	*	114.7	273.8	474.0
Repair of inguinal hernia 53.0–53.1	29.3	49.3	10.3	20.5	9.4	26.9	117.6
Lysis of peritoneal adhesions 54.5	128.2	53.7	199.0	*	125.3	157.3	298.4
Operations on the urinary system 55–59	385.0	396.7	373.9	59.8	206.4	555.5	1,295.4
Cystoscopy with or without biopsy 57.31–57.33	78.7	100.7	57.8	*9.1	29.3	91.8	349.6
Operations on the male genital organs 60–64	114.3	234.5	. . .	50.6	12.4	123.2	565.9
Prostatectomy 60.2–60.6	76.7	157.4	. . .	–	*	89.9	453.3
Operations on the female genital organs 65–71	793.9	. . .	1,549.0	15.7	1,071.6	1,070.6	707.5
Oophorectomy and salpingo-oophorectomy 65.3–65.6	180.0	. . .	351.2	*	178.1	384.4	165.5
Bilateral destruction or occlusion of fallopian tubes 66.2–66.3	129.7	. . .	253.0	–	287.5	*	–
Hysterectomy 68.3–68.7,68.9	223.8	. . .	436.6	*	260.4	404.9	187.7
Dilation and curettage of uterus 69.0	31.4	. . .	61.4	*	55.4	22.5	*
Repair of cystocele and rectocele 70.5	57.2	. . .	111.6	–	29.1	115.5	160.8
Obstetrical procedures 72–75	2,477.4	. . .	4,833.6	31.3	5,490.3	*	. . .
Episiotomy with or without forceps or vacuum extraction 72.1,72.21,72.31,72.71,73.6	490.3	. . .	956.6	*	1,086.1	*	. . .
Artificial rupture of membranes 73.0	276.3	. . .	539.0	*	612.0	*	. . .
Cesarean section 74.0–74.2,74.4,74.99	316.3	. . .	617.2	*	701.1	*	. . .
Fetal EKG (scalp) and fetal monitoring, not otherwise specified 75.32,75.34	339.0	. . .	661.4	*	751.0	*	. . .
Repair of current obstetric laceration 75.5–75.6	401.9	. . .	784.1	*	891.6	*	. . .
Operations on the musculoskeletal system 76–84	1,187.2	1,201.0	1,174.0	286.2	808.7	1,565.6	3,450.0
Partial excision of bone 76.2–76.3,77.6–77.8	87.5	93.4	82.0	19.5	72.6	156.5	146.4
Open reduction of fracture with internal fixation 79.3	163.5	131.9	193.5	29.1	107.8	152.4	605.2
Excision or destruction of intervertebral disc 80.5	109.0	127.3	91.5	*	112.8	218.2	105.4
Total hip replacement 81.51	52.2	44.3	59.7	–	*6.9	64.7	279.9
Total knee replacement 81.54	92.9	68.6	115.9	–	*	110.7	535.1
Operations on the integumentary system 85–86	488.7	444.7	530.6	135.5	338.2	670.9	1,329.5
Mastectomy 85.4	33.6	*	64.7	*	8.6	67.3	124.8
Debridement of wound, infection, or burn 86.22,86.28	129.0	151.4	107.7	30.3	82.2	178.3	382.8
Skin graft 86.6–86.7	35.1	40.7	29.8	*13.9	26.1	43.7	89.5
Miscellaneous diagnostic and therapeutic procedures 87–99	4,774.5	4,782.9	4,766.5	1,457.5	2,262.8	6,077.6	17,168.5
Computerized axial tomography 87.03,87.41,87.71,88.01,88.38	377.0	383.2	371.0	79.9	189.4	424.6	1,465.3
Pyelogram 87.73–87.75	58.3	65.1	51.9	*	43.6	91.5	144.0
Arteriography and angiocardiography using contrast material 88.4–88.5	744.0	905.1	590.9	27.8	143.9	1,512.8	2,850.2
Diagnostic ultrasound 88.7	445.7	389.2	499.4	75.2	212.4	491.4	1,822.4
Circulatory monitoring 89.6	127.8	130.3	125.5	20.8	41.2	151.1	577.1
Radioisotope scan 92.0–92.1	112.9	98.2	126.9	*9.9	39.5	161.5	469.1
Respiratory therapy 93.9,96.7	411.2	430.3	392.9	383.4	127.6	417.4	1,442.8

* Figure does not meet standard of reliability or precision. – Quantity zero. . . . Category not applicable.

[1]The rate per 100,000 population of discharges with a coronary artery bypass graft was 138.9.

Technical notes

The standard error is primarily a measure of sampling variability that occurs by chance because only a sample rather than the entire universe is surveyed. Estimates of sampling variability were calculated with SUDAAN software, which takes into account the complex sample design. A description of the software and the approach it uses has been published (22). The parameters for relative standard error curves for the 1996 National Hospital Discharge Survey are presented in table I. The relative standard error of an estimate X, RSE (X), may be estimated from the formula:

$$\text{RSE}\,(X) = \sqrt{a + b/X}$$

where a and b are as defined in table I. When RSE (X) is multiplied by 100, the relative standard error is then expressed as a percent of the estimate.

Table I. Estimated parameters for approximate relative standard error equations for National Hospital Discharge Survey statistics by selected characteristics: United States, 1996

Selected characteristic	Number of discharges or first-listed diagnoses		Number of procedures	
	a	b	a	b
Total	0.00135	355.278	0.00265	367.004
Sex				
Male	0.00153	328.232	0.00347	330.761
Female	0.00157	384.999	0.00278	331.207
Age				
Under 15 years	0.01700	229.443	0.01858	236.345
15–44 years	0.00158	322.959	0.00398	298.470
45–64 years	0.00147	321.327	0.00373	293.436
65 years and over	0.00157	340.854	0.00252	277.559
Region				
Northeast	0.00437	213.840	0.00668	234.728
Midwest	0.01253	384.988	0.00821	154.838
South	0.00358	350.427	0.00441	270.511
West	0.00519	389.105	0.00829	369.526

Suggested citation

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