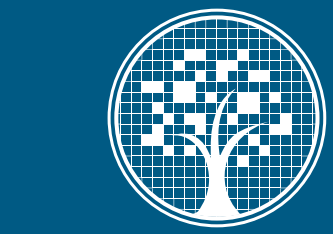

HEALTHCARE COST AND UTILIZATION PROJECT

HCUP Methods Series

Evaluation of the State Ambulatory Surgery Databases Available Through the HCUP Central Distributor, 2005

Report # 2008-08

Agency for Healthcare Research and Quality

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Evaluation of the State Ambulatory Surgery Databases Available through the HCUP Central Distributor, 2005

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EXECUTIVE SUMMARY

Overview

This report evaluates and compares the 2005 State Ambulatory Surgery Database (SASD) available via the HCUP Central Distributor (CD) to the 2005 American Hospital Association (AHA) Annual Survey and the Freestanding Outpatient Surgery Center (FOSC) file maintained by Verispan, LLC. The 15 states that provide 2005 SASD data through the HCUP CD are included in this comparison: California, Colorado, Florida, Iowa, Kentucky, Maryland, Michigan, Nebraska, New Jersey, New York, North Carolina, South Carolina, Utah, Vermont, and Wisconsin. In addition, this report compares the types of surgeries performed and explores the use of ICD-9-CM and CPT codes contained in the 2005 SASD-CD.

Key Findings

The 2005 SASD-CD files contain 15,462,445 records from 15 HCUP states. Eight-eight percent (13,522,781) of these records represent discharges for ambulatory surgery procedures. About 5% of the SASD-CD ambulatory surgery records are also contained in the State Emergency Department Databases (SEDD).

A majority (63.9%) of the facilities contributing data to the SASD-CD are hospital-based. California and Florida contained the greatest number of ambulatory surgery facilities in the 2005 SASD-CD.

Comparisons between the SASD-CD, the AHA Annual Survey, and FOSC data reveal that the SASD contains the greatest number of facilities (2,824) and surgical visits (13,522,781). The AHA data contains information on hospital-based ambulatory surgery facilities, while the FOSC contains information on freestanding centers. A clear advantage of the SASD-CD is that it contains information from both hospital-based and some freestanding centers.

Another clear advantage of the SASD over the other ambulatory surgery data sources is the ability to identify the types of surgical procedures performed during a surgical visit. This report reveals that ambulatory surgery is most likely to be performed in one of five body systems; more than 61% of the total procedures are performed on the digestive, musculoskeletal, integumentary, eye, or nervous systems.

Two different coding systems are used in the SASD; three states use only CPT codes, three states use only ICD-9-CM codes, and nine states employ both coding schemes. On average, the number of CPT codes is higher (2.1 in the core file and 4.4 in the charge detail file) than the number of ICD-9-CM codes (1.6). Although there was agreement between Clinical Classifications Software (CCS) categories for both systems, analysts should use caution when combining data across states using different coding systems.

INTRODUCTION

Ambulatory surgeries have become more common over the past two decades, with the number of ambulatory surgical centers reflecting similar growth. For example, between 1988 and 2005, the number of surgeries reported by Colorado, New Jersey, and New York rose from 0.9 million to 2.3 million.[1] In addition, the last two decades have witnessed a steep rise in the number of surgical centers performing ambulatory surgeries: these facilities have increased from 336 in 1985 to 4,445 in 2005.[2] This dramatic growth in ambulatory surgeries and surgical centers was fueled by cost concerns and emerging medical technologies that made ambulatory surgery more practical.

Ambulatory surgery is defined herein as any surgical procedure performed on the same day a patient is admitted and released from a facility.[3] Ambulatory surgery facilities can include hospital-based or freestanding surgical centers.

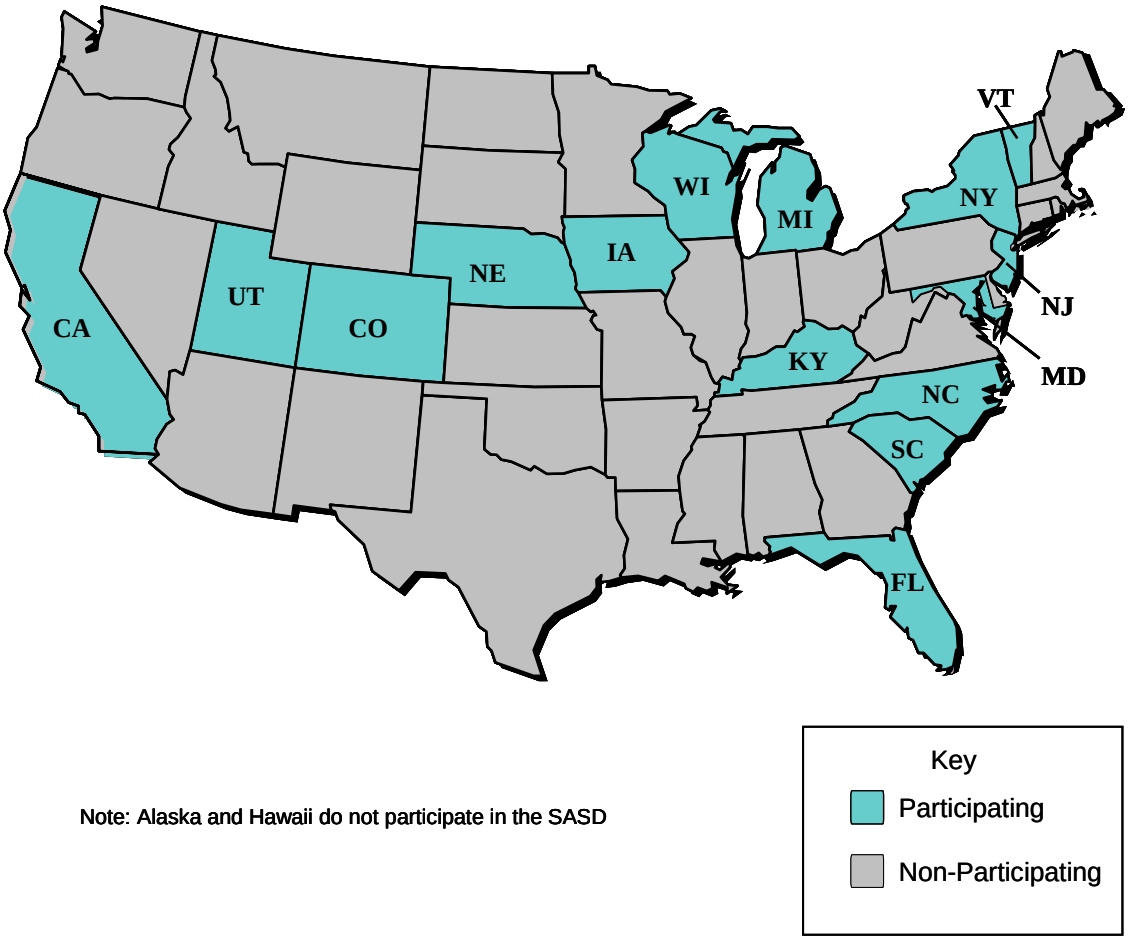
In 1997, the Agency for Healthcare Research and Quality (AHRQ) began collecting ambulatory surgery (AS) data as part of the Healthcare Cost and Utilization Project (HCUP, pronounced "H-Cup"), making public versions of these databases available via the HCUP Central Distributor (CD). This report describes the 2005 State Ambulatory Surgery Databases (SASD) for each of the 15 states that provide AS data to HCUP and make the data available via the HCUP Central Distributor. The report also describes the completeness of the 2005 SASD with respect to ambulatory surgical facilities. The method used to accomplish this evaluation was to compare the SASD counts of ambulatory surgery facilities and visits to corresponding numbers reported in the 2005 American Hospital Association (AHA) Annual Survey Database and the 2005 Freestanding Outpatient Surgery Center (FOSC) file maintained by Verispan, LLC. This report also describes the number of surgeries performed by body system and illustrates how some states use two types of coding systems in their classification of procedures.

[1] Number of records in HCUP SASD files. Accessed at http://www.hcup-us.ahrq.gov/ on May 24, 2006. 2005 data from author's own analysis on November 27, 2007.

[2] Centers for Medicare & Medicaid Services. *2006 CMS Data Compendium*. December 2006. Accessed at http://www.cms.hhs.gov/DataCompendium on November 27, 2007.

[3] State Ambulatory Surgery Databases. Accessed at http://www.hcup-us.ahrq.gov/sasdoverview.jsp on February 6, 2008.

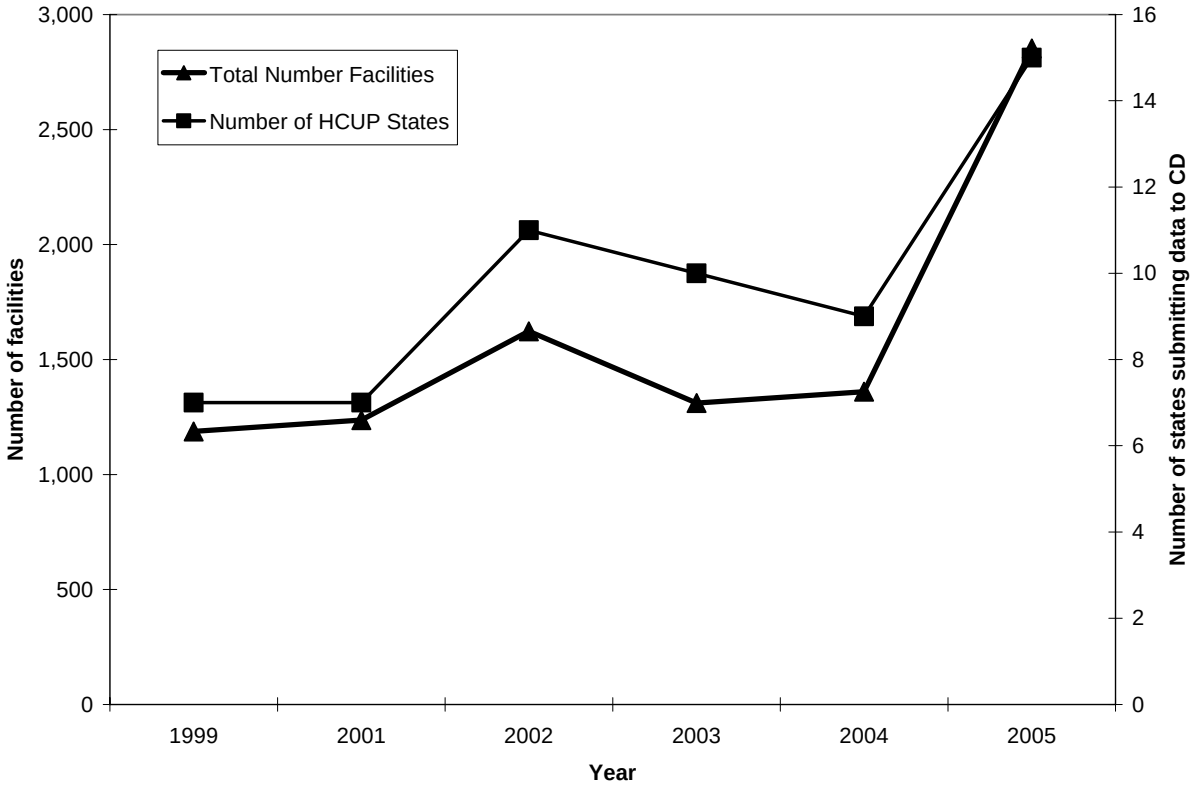
Figure 1: HCUP States with 2005 SASD Databases Available Through the HCUP Central Distributor



Note: Alaska and Hawaii do not participate in the SASD

The 15 states that contributed data to the 2005 HCUP Central Distributor SASD (hereafter SASD-CD) are California, Colorado, Florida, Iowa, Kentucky, Maryland, Michigan, Nebraska, New Jersey, New York, North Carolina, South Carolina, Utah, Vermont, and Wisconsin (Figure 1). Ten states — Connecticut, Georgia, Indiana, Kansas, Minnesota, Missouri, New Hampshire, Ohio, South Dakota, and Tennessee — participated in the 2005 SASD, but did not release the data through the Central Distributor. In addition, nine states currently collect AS data, but did not participate in the 2005 SASD: Hawaii, Illinois, Louisiana, Maine (supplied data for 1999-2001), Montana, Oregon, Oklahoma, Pennsylvania (supplied data for 1999-2003), and Wyoming. Figure 2, below, depicts the continual growth in the number of participating states and the number of facilities in the SASD-CD over the past five years.

Figure 2: Number of HCUP SASD Participating States Available Through the HCUP Central Distributor and Total Number of Facilities, 1999-2005



The first section of this report contains an overview of the 2005 SASD-CD. In the second section, alternative sources of comparative data are considered and it is determined that the two above-mentioned sources, the AHA Annual Survey Database and the FOSC file, are the best comparative databases for our purposes. Consequently, the third section compares the SASD-CD counts to the counts reported by AHA and the FOSC for the 15 states participating in the SASD-CD. The fourth section provides the frequencies of ambulatory surgeries contained in the SASD-CD, by body system. The final section offers some conclusions on the usefulness and potential research value of the 2005 SASD available through the HCUP Central Distributor.

2005 HCUP STATE AMBULATORY SURGERY DATABASES (SASD) AVAILABLE THROUGH THE HCUP CENTRAL DISTRIBUTOR

Ambulatory surgery visit data have been disseminated via the HCUP Central Distributor since in 1997. For 2005, 15 standardized state databases were constructed and made available to the researchers via the HCUP Central Distributor. The 2005 SASD-CD files contain 15,462,445 records. The types of facilities contained in the publicly-available SASD varied across states. States supplied AS records from both hospital-based and hospital-affiliated ambulatory surgery facilities. Select states also supplied AS records from freestanding facilities.

Table 1, below, presents the number of facilities included in each HCUP Central Distributor state SASD file. Facilities were categorized as either: 1) hospital-based, 2) freestanding, or 3) other. Facilities were classified as hospital-based if the facility could be matched to a facility in the 2005 AHA Annual Survey Database (discussed in the next section). Facilities not matched to the AHA survey in states providing freestanding surgical encounters to HCUP were classified

as freestanding. All remaining facilities were classified as "other." In the 2005 SASD-CD, 1,822 ambulatory surgical facilities were hospital-based (63.9%), 1,025 were freestanding facilities (35.9%), and six were classified as "other." Freestanding facilities represented 35.9% of all facilities in the 2005 SASD-CD, up from 30.4% in 2003 and 28.3% in 2004. The two states with the greatest number of ambulatory surgical facilities in the 2005 SASD-CD were California and Florida.

Table 1: Number of Hospital-Based and Freestanding Facilities by State Available Through the HCUP Central Distributor, 2005 SASD-CD

	All SASD Records				Records with Evidence of Ambulatory Surgery			
State	Number of Hospital-Based Facilities	Number of Free-standing[4] Facilities	Number of Other[5] Facilities	Total Number of Facilities	Number of Hospital-Based Facilities	Number of Free-standing Facilities	Number of Other Facilities	Total Number of Facilities
California	372	465	0	837	370	459	0	829
Colorado	71	0	1	72	69	0	1	70
Florida	209	328	0	537	209	315	0	524
Iowa	118	0	0	118	116	0	0	116
Kentucky	100	0	2	102	100	0	2	102
Maryland	48	0	0	48	48	0	0	48
Michigan	137	0	3	140	137	0	3	140
Nebraska	84	0	0	84	84	0	0	84
New Jersey	84	0	0	84	84	0	0	84
New York	222	66	0	288	222	66	0	288
North Carolina	120	34	0	154	120	34	0	154
South Carolina	70	75	0	145	70	72	0	142
Utah	47	17	0	64	47	17	0	64
Vermont	14	0	0	14	14	0	0	14
Wisconsin	126	40	0	166	125	40	0	165
Total	**1,822**	**1,025**	**6**	**2,853**	**1,815**	**1,003**	**6**	**2,824**

Records in the 2005 SASD-CD are defined in the same way as data in the 2004 SASD-CD, which is substantially different from previous years. In an attempt to create uniformly defined outpatient databases, AHRQ approved, starting with the 2004 data, screening the outpatient data provided by the HCUP Partners and assigning records to the SASD or State Emergency Department Databases (SEDD) based on information coded on the record. Records identified as having emergency department services[6] were placed in the SEDD-CD. All other records were placed in the SASD-CD. To ensure that all ambulatory surgery records were included in the SASD-CD, records satisfying the criteria for an ambulatory surgery were included in the SASD files without regard to their origin in an ambulatory surgery or emergency department

[4] A subset of seven states collects data from freestanding facilities (California, Florida, New York, North Carolina, South Carolina, Utah, and Wisconsin).

[5] Other includes counts of facilities that do not match to the AHA file in the states that do not collect data from freestanding ambulatory surgery facilities.

[6] Emergency department services met at least one of the following criteria: 1) emergency department revenue code of 450-459, 2) positive emergency department charge, when revenue center codes were not available, or 3) emergency department CPT code of 99281-99285.

file.[7] Those records that satisfied both ambulatory surgery and emergency department criteria were included in the SASD-CD files, as well as the SEDD-CD files. Table 2 displays the number and percent of records for each state that are included in the SASD-CD, the number and percent of records that meet the AS criteria, and the number and percent of ambulatory surgery records that meet the emergency department criteria.

A majority of records (87.5%) in the SASD-CD meet the AS criteria. Of those, 4.9% also meet the ED criteria.

Table 2: Counts of Record Identified with AS Services and ED Services in the 2005 SASD Available Through the HCUP Central Distributor

State	Total Number of Records in 2005 SASD	Number of SASD Records Identified with AS Services	Percent of SASD Records Identified with AS Services	Number of SASD AS Records also in SEDD	Percent of SASD AS Records also in SEDD
California	2,791,153	2,360,948	84.60%	1,737	0.1%
Colorado	382,475	381,587	99.8%	57,141	15.0%
Florida	2,800,801	2,554,542	91.2%	20,782	0.8%
Iowa	450,273	379,535	84.3%	127	0.0%
Kentucky	781,899	578,404	74.0%	69,421	12.0%
Maryland	923,291	398,769	43.2%	5,256	1.3%
Michigan	1,684,704	1,593,031	94.6%	182,478	11.5%
Nebraska	176,241	157,645	89.4%	9,376	5.9%
New Jersey	400,515	382,383	95.5%	10,369	2.7%
New York	1,515,623	1,502,985	99.2%	131	0.0%
North Carolina	1,576,195	1,347,919	85.5%	201,896	15.0%
South Carolina	686,855	682,077	99.3%	39,801	5.8%
Utah	308,463	296,659	96.2%	4,045	1.4%
Vermont	104,440	89,513	85.7%	7,780	8.7%
Wisconsin	879,517	816,784	92.9%	46,805	5.7%
Total	**15,462,445**	**13,522,781**	**87.5%**	**657,145**	**4.9%**

POTENTIAL COMPARATIVE AMBULATORY SURGERY DATABASES

In order to describe the completeness of the 2005 SASD-CD, three potential comparative databases were identified. These databases are: 1) the Provider of Services (POS) file maintained by the Centers for Medicare and Medicaid Services (CMS), 2) the Freestanding Outpatient Surgery Center (FOSC) file maintained by Verispan, LLC and 3) the Annual Survey Database, fielded and maintained by the American Hospital Association (AHA). All three databases contain only summarized, facility-level data; none contains visit-level data.

Each database encompasses a slightly different set of facilities, as shown in Table 3. In this table, facilities are defined as *hospital-based* only if they are physically connected to main

[7] Ambulatory surgery services met at least one of the following criteria: 1) ICD-9-CM ranges included codes 00.50-86.99 (excluded were procedure codes in the range 88.4-88.59), 2) CPT procedures codes indicating surgery (yearly updates can be downloaded from Centers for Medicare and Medicaid Services (CMS) and generally include 10121-69930, G0105, G0121, and G0260), 3) presence of at least one revenue center code in the following range 036x (operating room services), 037x (anesthesia), or 049x (ambulatory surgical care), or 4) presence of a UB92 bill type of 83 indicating outpatient services.

hospital facilities. All other facilities are considered to be *freestanding*. Regardless of setting, facilities may be operated either by a hospital or by a third party.

Table 3: Comparison of Types of Ambulatory Surgery (AS) Facilities in Each Information Source

Type of Facility	POS[8]	FOSC	AHA
AS facility – hospital-based and controlled	Yes	No	Yes
AS facility – hospital-based with third-party control	Yes	Yes	Yes
AS facility – freestanding with hospital affiliation	Yes	Yes	Yes
AS facility – freestanding with no hospital affiliation	Yes	Yes	No
Services originating at other sites, such as physician offices	Yes	No	No

Provider of Services (POS) File

The CMS POS file lists facilities certified for the Medicare participation. It contains facility name, location information, and specifies the type of provider, but omits service count information. The POS is used for claim adjudication; Medicare reimbursements are made only to listed facilities. Quarterly updates are available with little or no lag time.

While the POS file lists facilities that provide outpatient surgery in all settings, the information is limited to participating Medicare facilities and does not contain counts of surgeries. Consequently, this file was not used for assessing the completeness of the SASD-CD.

Freestanding Outpatient Surgery Center (FOSC) Data

The FOSC profiles freestanding ambulatory surgery centers on an annual basis. Data are collected by Verispan through an annual survey of freestanding outpatient surgery centers and all data are self-reported by the facilities. Verispan attempts to survey all except the most recently opened outpatient surgery centers. In 2005, Verispan estimated that they were able to obtain responses from 85% of existing outpatient surgical centers.[9] This accounted for 2,256 facilities in the 15 HCUP states that provided ambulatory surgery data to the HCUP Central Distributor. Of those, 83.8% (1,891) of these facilities were "profiled" by Verispan, supplying more information than the name and address of the facility. In addition, 47.1% (1,062) of the facilities in the HCUP states supplied information to Verispan on the volume of surgeries performed at the facility in 2005.

The FOSC file does not include identifiers compatible to those on the HCUP or AHA files, so a manual comparison was employed to assign a linkable variable to the FOSC data. Because the FOSC file includes only information on freestanding facilities, and only a subset of seven states collect data from such facilities (California, Florida, New York, North Carolina, South Carolina, Utah, and Wisconsin), manual matching to AHA data was limited to these states.

[8] Note: Coverage is limited to providers reimbursed for Medicare covered services.

[9] E-mail correspondence with Verispan representative on November 26, 2007.

AHA Annual Survey Database

The AHA Annual Survey Database identifies hospital-associated ambulatory surgery facilities. These survey-based data include hospital descriptors and counts of outpatient surgeries from nearly all hospital-affiliated facilities nationwide. Annual updates are generally available toward the end of the year following the survey. AHA data exclude freestanding outpatient surgery facilities lacking a hospital affiliation.

COMPARISONS BETWEEN THE SASD-CD, THE AHA ANNUAL SURVEY, AND FOSC DATA

Table 4 compares 2005 SASD-CD surgical visit[10] counts from the 2005 AHA and FOSC data for 15 states. These counts are limited to the subset of visits that meet the criteria for ambulatory surgery. For each state, the table presents the number of facilities and the number of surgical visits for each combination of data sources.[11] As an example, for California, the first row reveals that 13 facilities were present in all three data sources. For those 13 facilities combined, the SASD-CD reports 75,340 surgical visits, the AHA reports 53,873 surgical visits, and the FOSC reports 12,060 surgical visits. In the case of Colorado, the first row shows one facility was matched to all three data sources. The low frequency of facilities matched in all three data sources in California and Colorado was consistent with the frequency found in other states.

In comparing the three files, the highest number of facility matches was between the SASD-CD and the AHA file, which contains facilities that are hospital-based or hospital-affiliated. The "Totals" portion of Table 4 also demonstrates how the SASD-CD and the AHA files compare. For facilities matched between these two files (the row labeled "SASD+AHA Total" at the bottom of the table), a higher number of SASD-CD surgical visit counts (10,450,203) than AHA surgical visit counts (7,580,219) are noted. One state (New Jersey) had AHA surgical visit counts larger than the SASD counts. Three states (Florida, North Carolina, and South Carolina) had more than twice the number of SASD-CD surgical visits compared to AHA surgical visits.

Fifty-nine facilities matched between the SASD, AHA, and FOSC files. One facility matched exclusively between the AHA file and FOSC file.

Comparing the total number of surgical visits reported for the SASD-CD ("SASD Total" row) with the number of visits in both the AHA and SASD-CD ("SASD+AHA Total" row) implies that the vast majority of SASD-CD visits occurred in hospital-based or hospital-affiliated facilities. Of the 2,824 facilities with ambulatory surgery in the SASD-CD, 1,806 (64.0%) were matched to a facility in the AHA file. Of the 13,522,781 surgical visits in the SASD-CD, 10,450,203 (77.3%) were contained in the 1,806 facilities matched to the AHA file.[12]

It is important to recognize that the facility and discharge totals might possibly double- or even triple-count some units contained in multiple files that could not be matched for an unknown reason.

[10] The term "surgical visit" is used instead of surgeries because multiple surgeries may be performed in one ambulatory surgery visit.

[11] Matching between facilities in the SASD, AHA, and FOSC was not necessarily one-to-one. Many-to-many matching may have occurred.

[12] For the remaining 35 states plus Washington D.C. and Puerto Rico, the AHA survey contained 4,179 facilities and 10,688,235 surgical visits, while the FOSC database contained 1,514 facilities and 5,410,297 surgical visits.

In Table 3 an entry of "-" indicates that the information required to calculate this value was not available. In certain cases, the crosswalk required to compare the FOSC to other data was not prepared. Rows for FOSC and SASD or FOSC and AHA are zeroes in the table because no exclusive matches existed.

Table 4: Number of Facilities and Surgical Visits by State and Data Source Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries

State	Data Source	Number of Facilities	Number of SASD Surgeries	Number of AHA Surgeries	Number of FOSC Surgeries
California	SASD + AHA +FOSC	13	75,340	53,873	12,060
	SASD+AHA	352	1,300,003	1,228,254	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	464	985,605	0	0
	AHA only	82	0	47,404	0
	FOSC only	308	0	0	813,937
	Total	1,219	2,360,948	1,329,531	825,997
Colorado	SASD + AHA +FOSC	1	9,895	6,244	1,500
	SASD+AHA	68	368,317	186,807	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	1	3,375	0	0
	AHA only	24	0	15,140	0
	FOSC only	56	0	0	217,334
	Total	150	381,587	208,191	218,834
Florida	SASD + AHA +FOSC	8	69,782	44,481	12,000
	SASD+AHA	201	1,211,424	778,214	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	315	1,273,336	0	0
	AHA only	66	0	39,650	0
	FOSC only	217	0	0	1,100,305
	Total	807	2,554,542	862,345	1,112,305
Iowa	SASD + AHA +FOSC	0	0	0	0
	SASD+AHA	116	379,535	346,699	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	0	0	0	0
	AHA only	12	0	6,823	0
	FOSC only	17	0	0	78,648
	Total	145	379,535	353,522	78,648

State	Data Source	Number of Facilities	Number of SASD Surgeries	Number of AHA Surgeries	Number of FOSC Surgeries
Kentucky	SASD + AHA +FOSC	2	49,685	41,809	6,000
	SASD+AHA	98	518,704	334,092	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	2	10,015	0	0
	AHA only	33	0	22,687	0
	FOSC only	22	0	0	102,338
	Total	157	578,404	398,588	108,338
Maryland	SASD + AHA +FOSC	1	3,437	2,795	100
	SASD+AHA	47	395,332	354,291	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	0	0	0	0
	AHA only	26	0	11,837	0
	FOSC only	104	0	0	293,162
	Total	178	398,769	368,923	293,262
Michigan	SASD + AHA +FOSC	12	210,884	105,594	13,563
	SASD+AHA	125	1,336,817	657,913	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	1	0	6,389	8,750
	SASD only	3	45,330	0	0
	AHA only	52	0	32,020	0
	FOSC only	47	0	0	204,352
	Total	240	1,593,031	801,916	226,665
Nebraska	SASD + AHA +FOSC	0	0	0	0
	SASD+AHA	84	157,645	132,598	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	0	0	0	0
	AHA only	13	0	12,736	0
	FOSC only	16	0	0	36,648
	Total	113	157,645	145,334	36,648
New Jersey	SASD + AHA +FOSC	0	0	0	0
	SASD+AHA	82	381,559	416,263	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	2	824	0	0
	AHA only	31	0	7,076	0
	FOSC only	91	0	0	360,460
	Total	206	382,383	423,339	360,460

State	Data Source	Number of Facilities	Number of SASD Surgeries	Number of AHA Surgeries	Number of FOSC Surgeries
New York	SASD + AHA +FOSC	1	25,984	14,150	0
	SASD+AHA	221	1,253,478	1,237,477	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	66	223,523	0	0
	AHA only	60	0	34,889	0
	FOSC only	48	0	0	187,703
	Total	396	1,502,985	1,286,516	187,703
North Carolina	SASD + AHA +FOSC	6	109,143	45,704	14,288
	SASD+AHA	114	1,091,985	534,130	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	34	146,791	0	0
	AHA only	37	0	29,243	0
	FOSC only	41	0	0	188,189
	Total	232	1,347,919	609,077	202,477
South Carolina	SASD + AHA +FOSC	1	33,826	13,395	0
	SASD+AHA	67	479,002	271,442	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	74	169,249	0	0
	AHA only	31	0	19,705	0
	FOSC only	36	0	0	156,690
	Total	209	682,077	304,542	156,690
Utah	SASD + AHA +FOSC	8	60,661	62,673	0
	SASD+AHA	39	177,972	106,317	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	17	58,026	0	0
	AHA only	12	0	6,549	0
	FOSC only	18	0	0	45,921
	Total	94	296,659	175,539	45,921
Vermont	SASD + AHA +FOSC	0	0	0	0
	SASD+AHA	14	89,513	57,091	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	0	0	0	0
	AHA only	3	0	1,420	0
	FOSC only	3	0	0	3,700
	Total	20	89,513	58,511	3,700

State	Data Source	Number of Facilities	Number of SASD Surgeries	Number of AHA Surgeries	Number of FOSC Surgeries
Wisconsin	SASD + AHA +FOSC	6	56,492	40,904	0
	SASD+AHA	119	603,788	507,009	0
	SASD+FOSC	0	0	0	0
	AHA+FOSC	0	0	0	0
	SASD only	40	156,504	0	0
	AHA only	26	0	12,310	0
	FOSC only	23	0	0	93,724
	Total	214	816,784	560,223	93,724
Totals	**SASD + AHA +FOSC**	**59**	**705,129**	**431,622**	**59,511**
	SASD+AHA	**1,747**	**9,745,074**	**7,148,597**	**0**
	SASD+FOSC	**0**	**0**	**0**	**0**
	AHA+FOSC	**1**	**0**	**6,389**	**8,750**
	SASD+AHA Total	**1,806**	**10,450,203**	**7,580,219**	**59,511**
	SASD only	**1,018**	**3,072,578**	**0**	**0**
	SASD Total	**2,824**	**13,522,781**	**7,580,219**	**59,511**
	AHA only	**508**	**0**	**299,489**	**0**
	FOSC only	**1,047**	**0**	**0**	**3,883,111**
	Total	**4,380**	**13,522,781**	**7,886,086**	**3,951,372**

TYPES OF SURGERIES CAPTURED BY THE SASD

Table 5 offers insight into the nature of the visit data captured in the 2005 SASD-CD. This table presents the number of surgeries classified by 16 major body systems. This classification was accomplished using AHRQ's Clinical Classification Software (CCS). There are two versions of the software, one for ICD-9-CM procedure codes and another for CPT procedure codes. The ICD-9-CM CCS program aggregates procedure codes into 231 mutually exclusive procedure categories. The CPT CCS program aggregates procedure codes into the same 231 categories plus 13 additional, CPT-specific categories. For this report, these categories were grouped into 16 major body systems. Table 5 provides the number of surgeries by these two coding systems. For both coding systems, all listed procedures are examined. Missing values are ignored.

Table 5: Number of ICD-9-CM and CPT Surgeries by CCS Procedure Category Available through the HCUP Central Distributor, 2005 SASD-CD Ambulaotry Surgeries

Description	ICD-9-CM CCS		CPT CCS	
	Number of Procedure Codes	Percent	Number of Procedure Codes	Percent
Digestive System	3,608,156	23.47	4,419,243	16.58
Musculoskeletal System	1,794,803	11.68	2,075,166	7.79
Miscellaneous Diagnostics and Therapeutic	1,783,545	11.60	8,492,096	31.87
Integumentary System	1,608,733	10.47	1,823,010	6.84
Eye	1,393,652	9.07	1,453,852	5.46
Nervous System	1,089,073	7.09	1,497,548	5.62
Cardiovascular System	1,023,551	6.66	1,030,129	3.87
Nose, Mouth, and Pharynx	793,679	5.16	700,734	2.63
Female Genital System	740,189	4.82	657,985	2.47
Urinary System	527,109	3.43	500,629	1.88
Ear	330,793	2.15	271,267	1.02
Respiratory System	175,272	1.14	224,378	0.84
Male Genital System	165,516	1.08	188,356	0.71
Obstetrical	128,205	0.83	94,779	0.36
Heme and Lymphatic System	104,581	0.68	87,888	0.33
Endocrine System	40,424	0.26	27,380	0.10
HCPCS	0	0	3,065,323	11.50
Invalid or Inconsistent	63,898	0.42	39,715	0.15
Total	**15,371,179**	**100**	**26,649,478**	**100**

* Note: Healthcare Common Procedure Coding System (HCPCS) National Level II codes are often used with CPT codes to enhance their scope. They are not used to categorize procedures in this table because no mapping to CCS exists at the present time.

As shown in Table 5, the rank orderings of the surgery categories are similar, with two notable exceptions. One exception, *Miscellaneous Diagnostics and Therapeutic* procedures, represents 11.6% of the ICD-9-CM procedures compared to approximately 31.9% of the CPT procedures. This result probably reflects the greater emphasis placed on these types of procedures in the CPT system. The second exception, the *HCPCS* category, includes codes focusing on supplies, materials, injections, and services. Although some overlap exists between HCPCS and CPT codes, it is likely that a preponderance of this category represents information not captured by the CPT or ICD-9-CM codes.

Table 5 demonstrates that ambulatory surgery care is strongly concentrated in treatments for only a few body systems. Digestive system-related surgeries account for about 23.5% of the ICD-9-CM based procedures and 16.6% of the CPT based procedures. The top three body systems, not including the *Miscellaneous Diagnostic and Therapeutic* group, account for 45.6% of procedures and the top five (digestive, musculoskeletal, integumentary, eye, and nervous systems) for 61.8% of procedures.

Appendix A contains a large table presenting CCS statistics derived from the ICD-9-CM and CPT procedures for all the HCUP SASD-CD states by body system. In this table, the range of CCS categories included in each column is shown under each column heading. Two additional categories not related to body systems are also presented as columns: *HCPCS* codes, which are only encountered in conjunction with CPT codes, and *Invalid or Inconsistent*. This latter category includes only those surgical visit records with no valid codes and one or more invalid or inconsistent codes. The rows of this table, organized by state, capture the number of times

each body system CCS code appears on a surgical visit record. Because a single record can have more than one procedure, it is important to note that more than one body system code can appear on a single record. The percentages represent the proportion of surgeries from a specific state that included one or more body system codes in a category in relation to the total number of records for that state. Because there may be more than one procedure code per surgical visit record, the sum of the percentages for each state does not add to one.

Appendix A reflects the diversity in the use of both ICD-9-CM and CPT coding by state in the SASD-CD. Some states, such as Kentucky, New Jersey, and South Carolina, use only ICD-9-CM coding in their SASD-CD data. Conversely, California, Iowa and Maryland use only CPT coding. Hence, some states in Appendix A will not have observations for a particular coding system. The remaining nine states, which use both coding systems, have body system values for each coding system. Appendix B contains additional details on the states that use both coding systems.

States that use ICD-9-CM codes on more than half their records, such as Wisconsin, generally have a greater number of observations for ICD-9-CM than CPT codes for a particular body system.[13] For the digestive system (CCS 68-99), for example, Wisconsin has 316,167 procedure codes using the ICD-9-CM coding system compared to 120,806 codes using the CPT coding system. Other states, such as Nebraska, have more CPT codes than ICD-9-CM codes for a particular body system category: 83.1% of Nebraska records use only the CPT coding system. Nebraska has more CPT codes than ICD-9-CM codes for all 16 body system categories.

The influence of the reporting practices and capabilities of the states may be seen by comparing the percentages reported between coding systems for a single category. For example, in North Carolina where the ICD-9-CM and CPT systems each have 12 fields on a record, the percentage of records with digestive codes are nearly equal (28.9% ICD-9-CM vs. 28.5% CPT). In contrast, in Florida where there are five ICD-9-CM field and 10 CPT fields, the percentage of records with digestive codes differs greatly between the two systems (23.4% ICD-9-CM versus 35.6% CPT).

Appendix A shows how the use of these coding systems varies by state. In addition, the high percentage of HCPCS codes in some states, for example New York, means that using both ICD-9-CM and CPT codes may not completely characterize care provided in these states. Analysts should be aware of the utilization of different procedure coding systems during their analyses of SASD-CD data.

COMPARISONS BETWEEN ICD-9-CM CODES AND CPT CODES

Appendix B provides additional information for analysts who are interested in working with SASD-CD data. Comparisons are made between the ICD-9-CM and CPT codes, including direct, record-level comparisons for states that use both systems. The states that use each coding system are identified, and the number of SASD-CD surgical visit records using each system are presented. Similarities and differences between the ICD-9-CM and CPT coding systems are illustrated by comparing CCS categories for both coding systems. The level of agreement between the two systems based on data from states that use both coding systems is also evaluated.

[13] See Table 2 in Appendix B for a report on the percent of records with each type of coding system.

The number of codes reported depends on the file type from which they were obtained. The lowest average number of codes on a surgical visit record was reported using ICD-9-CM. More CPT codes were used, with the average number being higher for the states where these codes were included in the line item charge detail files. These consist of files with surgical visit records providing detailed information about individual charges. For these states, there is no upper limit on the number of codes per surgical visit record.

To obtain a complete view of the procedures performed during a visit, it is generally necessary to refer to both the ICD-9-CM and CPT codes. In some states, including New York and North Carolina, almost every surgical visit record with ICD-9-CM codes also provides CPT codes. For the remainder of the states providing codes in both systems, the coding frequencies are mixed: some surgical visit records contain only ICD-9-CM codes, some surgical visit records contain only CPT codes, and some records contain both types of codes.

When ICD-9-CM and CPT codes are both present on a surgical visit record, they often provide different information. The frequency with which the information provided in the two systems translates to the same set of CCS categories varies widely, ranging from 4.3% to 79.5%, depending on the state.

For surgical visit records with only a single ICD-9-CM and CPT code, the CCS categories matched more than 75% of the time for six of nine states, but fell to 69.1% in the state with the lowest match rate. Seven of the top 10 CCS categories were the same for both systems and there was a high degree of agreement between the CCS categories derived from both systems. The CPT CCS matched the ICD-9-CM CCS more than 90% of the time in seven of 10 categories, and the ICD-9-CM CSS matched the CPT CCS over 90% of the time in six of 10 categories.

CONCLUSION

The types of facilities covered by the 2005 SASD-CD vary substantially across states. By matching SASD-CD facilities with those reported in the AHA and FOSC survey data, it was possible to classify most of the SASD-CD facilities as either hospital-based or freestanding. The SASD-CD from some states appear to be limited mainly to hospital-based facilities, while the SASD-CD from other states also includes a substantial number of freestanding facilities.

The SASD-CD has several advantages over the AHA and FOSC databases. The SASD-CD uses discharge-level data and does not rely on surveys like the AHA and FOSC. In addition, the SASD-CD contains information from both hospital-based and freestanding facilities; the AHA survey only includes hospital-based facilities and the FOSC only freestanding entities. This difference enables the SASD-CD to include more facilities and surgeries than the other two databases.

In terms of the types of surgeries recorded in the SASD-CD files, the greatest proportions of ambulatory surgeries are related to the digestive, musculoskeletal, and integumentary systems.

Overall, the pattern of use by body system appears relatively consistent among states. However, for states like Nebraska, which have low amounts of overlap between ICD-9-CM and CPT coding, reporting of use is split between the two systems. Especially in these cases, information from both coding systems must be utilized to obtain a complete picture of the procedures performed.

The disparity in utilization displayed for the category *Miscellaneous Diagnostic and Therapeutic* procedures (Table A-1) that might be expected given that the different emphasis of this category

of procedures by the coding systems was evident in the data. The percentage of codes reported using ICD-9-CM was in the 0.03% to 34.9% range, while CPT codes ranged from 0.77% to 71.3%. Even for those states with substantial coding in both systems, like Florida, *Miscellaneous Diagnostic and Therapeutic* was coded 7.7% of the time using ICD-9-CM codes and 29.8% of the time with CPT codes.

Using the CCS as a means to compare and combine information from the ICD-9-CM and CPT codes proved to be a fruitful approach. Using it as a grouper allowed consistent comparisons without encountering the problems associated with attempting to translate directly between incompatible coding systems.

This report demonstrated that although a substantial amount of information is duplicated between the two coding systems, there is still an appreciable amount of information that is unique to one or the other set of codes. This is especially important for the *Miscellaneous Diagnostic and Therapeutic* category.

In conclusion, the 2005 SASD-CD is a rich source of ambulatory surgery data, providing information on 13,522,781 ambulatory surgery encounters in 2,824 facilities in 15 states. These files can be useful to a broad range of researchers and policy analysts, especially for state-specific analyses.

APPENDIX A

Comparison of ICD-9-CM and CPT Procedure Code Use by Body System in Select States

APPENDIX A: COMPARISON OF ICD-9-CM AND CPT PROCEDURE CODE USE BY BODY SYSTEM IN SELECT STATES

Table A-1: Number of Procedure Codes by State and Body System, ICD-9-CM CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2005 SASD Ambulatory Surgeries

State	Measure	Nervous System (1-9)		Endocrine System (10-12)	
		ICD-9-CM	CPT	ICD-9-CM	CPT
California	Number of Codes	N/A	272,808	N/A	750
	Percent of State Total	N/A	11.56	N/A	0.03
Colorado	Number of Codes	33,907	30,249	2,348	1,161
	Percent of State Total	8.89	7.93	0.62	0.30
Florida	Number of Codes	96,491	265,471	10,632	8,462
	Percent of State Total	3.78	10.39	0.42	0.33
Iowa	Number of Codes	N/A	33,673	N/A	1,305
	Percent of State Total	N/A	8.87	N/A	0.34
Kentucky	Number of Codes	50,129	N/A	3,021	N/A
	Percent of State Total	8.67	N/A	0.52	N/A
Maryland	Number of Codes	N/A	35,138	N/A	1,159
	Percent of State Total	N/A	8.81	N/A	0.29
Michigan	Number of Codes	92,299	73,111	4,407	2,568
	Percent of State Total	5.79	4.59	0.28	0.16
Nebraska	Number of Codes	2,437	17,886	128	820
	Percent of State Total	1.55	11.35	0.08	0.52
New Jersey	Number of Codes	23,424	N/A	1,054	N/A
	Percent of State Total	6.13	N/A	0.28	N/A
New York	Number of Codes	101,104	93,154	4,523	3,537
	Percent of State Total	6.73	6.20	0.30	0.24
North Carolina	Number of Codes	9,118	108,195	5,892	3,484
	Percent of State Total	0.68	8.03	0.44	0.26
South Carolina	Number of Codes	60,557	N/A	1,832	N/A
	Percent of State Total	8.88	N/A	0.27	N/A
Utah	Number of Codes	22,638	28,503	1,341	1,246
	Percent of State Total	7.63	9.61	0.45	0.42
Vermont	Number of Codes	10,550	9,568	284	195
	Percent of State Total	11.79	10.69	0.32	0.22
Wisconsin	Number of Codes	91,368	44,273	2,499	585
	Percent of State Total	11.19	5.42	0.31	0.07

Table A-1: Number of Procedure Codes by State and Body System, ICD-9-CM CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries (continued)

State	Measure	Eye (13-21)		Ear (22-26)	
		ICD-9-CM	CPT	ICD-9-CM	CPT
California	Number of Codes	N/A	327,477	N/A	39,176
	Percent of State Total	N/A	13.87	N/A	1.66
Colorado	Number of Codes	22,879	15,518	6,152	4,338
	Percent of State Total	6.00	4.07	1.61	1.14
Florida	Number of Codes	192,698	372,557	4,914	37,791
	Percent of State Total	7.54	14.58	0.19	1.48
Iowa	Number of Codes	N/A	35,740	N/A	11,207
	Percent of State Total	N/A	9.42	N/A	2.95
Kentucky	Number of Codes	35,677	N/A	5,927	N/A
	Percent of State Total	6.17	N/A	1.02	N/A
Maryland	Number of Codes	N/A	25,833	N/A	6,093
	Percent of State Total	N/A	6.48	N/A	1.53
Michigan	Number of Codes	103,782	79,359	2,910	23,323
	Percent of State Total	6.51	4.98	0.18	1.46
Nebraska	Number of Codes	1,256	8,373	460	6,047
	Percent of State Total	0.80	5.31	0.29	3.84
New Jersey	Number of Codes	25,125	N/A	9,889	N/A
	Percent of State Total	6.57	N/A	2.59	N/A
New York	Number of Codes	198,338	190,054	1,191	26,793
	Percent of State Total	13.20	12.65	0.08	1.78
North Carolina	Number of Codes	116,845	104,929	1,918	29,092
	Percent of State Total	8.67	7.78	0.14	2.16
South Carolina	Number of Codes	64,593	N/A	14,117	N/A
	Percent of State Total	9.47	N/A	2.07	N/A
Utah	Number of Codes	20,332	27,425	10,025	10,727
	Percent of State Total	6.85	9.24	3.38	3.62
Vermont	Number of Codes	6,334	4,841	1,787	1,308
	Percent of State Total	7.08	5.41	2.00	1.46
Wisconsin	Number of Codes	77,183	36,102	17,961	7,358
	Percent of State Total	9.45	4.42	2.20	0.90

Table A-1: Number of Procedure Codes by State and Body System, ICD-9-CM CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries (continued)

State	Measure	Nose, Mouth, and Pharynx (27-33)		Respiratory System (34-42)	
		ICD-9-CM	CPT	ICD-9-CM	CPT
California	Number of Codes	N/A	84,579	N/A	26,963
	Percent of State Total	N/A	3.58	N/A	1.14
Colorado	Number of Codes	24,941	14,371	6,786	4,368
	Percent of State Total	6.54	3.77	1.78	1.14
Florida	Number of Codes	73,391	75,917	35,074	39,455
	Percent of State Total	2.87	2.97	1.37	1.54
Iowa	Number of Codes	N/A	19,705	N/A	16,554
	Percent of State Total	N/A	5.19	N/A	4.36
Kentucky	Number of Codes	27,627	N/A	9,231	N/A
	Percent of State Total	4.78	N/A	1.60	N/A
Maryland	Number of Codes	N/A	17,624	N/A	17,780
	Percent of State Total	N/A	4.42	N/A	4.46
Michigan	Number of Codes	76,178	49,856	25,498	25,748
	Percent of State Total	4.78	3.13	1.60	1.62
Nebraska	Number of Codes	1,320	10,270	279	4,465
	Percent of State Total	0.84	6.51	0.18	2.83
New Jersey	Number of Codes	24,780	N/A	4,630	N/A
	Percent of State Total	6.48	N/A	1.21	N/A
New York	Number of Codes	78,818	66,974	17,947	20,918
	Percent of State Total	5.24	4.46	1.19	1.39
North Carolina	Number of Codes	72,071	61,562	18,494	16,740
	Percent of State Total	5.35	4.57	1.37	1.24
South Carolina	Number of Codes	33,587	N/A	11,674	N/A
	Percent of State Total	4.92	N/A	1.71	N/A
Utah	Number of Codes	21,605	22,661	2,519	2,472
	Percent of State Total	7.28	7.64	0.85	0.83
Vermont	Number of Codes	3,573	2,715	1,059	1,040
	Percent of State Total	3.99	3.03	1.18	1.16
Wisconsin	Number of Codes	36,557	14,204	9,603	3,695
	Percent of State Total	4.48	1.74	1.18	0.45

Table A-1: Number of Procedure Codes by State and Body System, ICD-9-CM CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries (continued)

State	Measure	Cardiovascular System (43-63)		Heme and Lymphatic System (64-67)	
		ICD-9-CM	CPT	ICD-9-CM	CPT
California	Number of Codes	N/A	26,660	N/A	16,945
	Percent of State Total	N/A	1.13	N/A	0.72
Colorado	Number of Codes	19,634	6,581	4,419	2,943
	Percent of State Total	5.15	1.72	1.16	0.77
Florida	Number of Codes	85,100	91,719	19,843	17,794
	Percent of State Total	3.33	3.59	0.78	0.70
Iowa	Number of Codes	N/A	9,253	N/A	2,551
	Percent of State Total	N/A	2.44	N/A	0.67
Kentucky	Number of Codes	33,741	N/A	4,466	N/A
	Percent of State Total	5.83	N/A	0.77	N/A
Maryland	Number of Codes	N/A	12,878	N/A	5,673
	Percent of State Total	N/A	3.23	N/A	1.42
Michigan	Number of Codes	99,833	58,202	13,797	10,101
	Percent of State Total	6.27	3.65	0.87	0.63
Nebraska	Number of Codes	1,274	3,860	231	1,216
	Percent of State Total	0.81	2.45	0.15	0.77
New Jersey	Number of Codes	19,490	N/A	5,358	N/A
	Percent of State Total	5.10	N/A	1.40	N/A
New York	Number of Codes	81,542	92,041	16,676	12,059
	Percent of State Total	5.43	6.12	1.11	0.80
North Carolina	Number of Codes	63,563	62,748	11,359	8,101
	Percent of State Total	4.72	4.66	0.84	0.60
South Carolina	Number of Codes	47,762	N/A	3,374	N/A
	Percent of State Total	7.00	N/A	0.49	N/A
Utah	Number of Codes	11,469	9,611	2,551	2,320
	Percent of State Total	3.87	3.24	0.86	0.78
Vermont	Number of Codes	2,605	2,263	650	486
	Percent of State Total	2.91	2.53	0.73	0.54
Wisconsin	Number of Codes	37,206	10,066	6,449	2,030
	Percent of State Total	4.56	1.23	0.79	0.25

Table A-1: Number of Procedure Codes by State and Body System, ICD-9-CM CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries (continued)

State	Measure	Digestive System (68-99)		Urinary System (100-112)	
		ICD-9-CM	CPT	ICD-9-CM	CPT
California	Number of Codes	N/A	900,873	N/A	58,717
	Percent of State Total	N/A	38.16	N/A	2.49
Colorado	Number of Codes	86,596	73,938	12,952	10,477
	Percent of State Total	22.69	19.38	3.39	2.75
Florida	Number of Codes	598,940	909,398	85,663	1,083
	Percent of State Total	23.45	35.60	3.35	0.04
Iowa	Number of Codes	N/A	118,491	N/A	12,679
	Percent of State Total	N/A	31.22	N/A	3.34
Kentucky	Number of Codes	189,216	N/A	21,592	N/A
	Percent of State Total	32.71	N/A	3.73	N/A
Maryland	Number of Codes	N/A	107,220	N/A	22,549
	Percent of State Total	N/A	26.89	N/A	5.65
Michigan	Number of Codes	463,547	386,387	72,001	53,537
	Percent of State Total	29.10	24.25	4.52	3.36
Nebraska	Number of Codes	8,095	50,549	597	6,925
	Percent of State Total	5.13	32.07	0.38	4.39
New Jersey	Number of Codes	93,207	N/A	23,413	N/A
	Percent of State Total	24.38	N/A	6.12	N/A
New York	Number of Codes	457,581	427,362	63,532	57,529
	Percent of State Total	30.44	28.43	4.23	3.83
North Carolina	Number of Codes	388,889	383,570	47,917	45,722
	Percent of State Total	28.85	28.46	3.55	3.39
South Carolina	Number of Codes	222,583	N/A	27,803	N/A
	Percent of State Total	32.63	N/A	4.08	N/A
Utah	Number of Codes	97,926	109,996	6,099	6,618
	Percent of State Total	33.01	37.08	2.06	2.23
Vermont	Number of Codes	33,055	27,948	2,797	2,369
	Percent of State Total	36.93	31.22	3.12	2.65
Wisconsin	Number of Codes	316,167	120,806	30,207	11,016
	Percent of State Total	38.71	14.79	3.70	1.35

Table A-1: Number of Procedure Codes by State and Body System, ICD-9-CM CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries (continued)

State	Measure	Male Genital System (113-118)		Female Genital System (119-121, 123-132)	
		ICD-9-CM	CPT	ICD-9-CM	CPT
California	Number of Codes	N/A	38,060	N/A	114,153
	Percent of State Total	N/A	1.61	N/A	4.84
Colorado	Number of Codes	4,992	3,979	15,787	13,266
	Percent of State Total	1.31	1.04	4.14	3.48
Florida	Number of Codes	35,569	44,691	85,710	98,163
	Percent of State Total	1.39	1.75	3.36	3.84
Iowa	Number of Codes	N/A	3,656	N/A	15,056
	Percent of State Total	N/A	0.96	N/A	3.97
Kentucky	Number of Codes	6,711	N/A	28,511	N/A
	Percent of State Total	1.16	N/A	4.93	N/A
Maryland	Number of Codes	N/A	8,383	N/A	34,424
	Percent of State Total	N/A	2.10	N/A	8.63
Michigan	Number of Codes	20,603	17,627	79,039	66,141
	Percent of State Total	1.29	1.11	4.96	4.15
Nebraska	Number of Codes	214	1,795	1,085	5,656
	Percent of State Total	0.14	1.14	0.69	3.59
New Jersey	Number of Codes	10,157	N/A	45,036	N/A
	Percent of State Total	2.66	N/A	11.78	N/A
New York	Number of Codes	30,832	30,089	24,921	114,741
	Percent of State Total	2.05	2.00	1.66	7.63
North Carolina	Number of Codes	13,997	12,668	59,101	54,535
	Percent of State Total	1.04	0.94	4.38	4.05
South Carolina	Number of Codes	8,643	N/A	27,179	N/A
	Percent of State Total	1.27	N/A	3.98	N/A
Utah	Number of Codes	3,452	3,819	11,114	9,739
	Percent of State Total	1.16	1.29	3.75	3.28
Vermont	Number of Codes	1,094	894	3,785	3,055
	Percent of State Total	1.22	1.00	4.23	3.41
Wisconsin	Number of Codes	10,934	3,996	30,854	12,400
	Percent of State Total	1.34	0.49	3.78	1.52

Table A-1: Number of Procedure Codes by State and Body System, ICD-9-CM CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries (continued)

State	Measure	Obstetrical (122, 133-141)		Musculoskeletal System (142-164)	
		ICD-9-CM	CPT	ICD-9-CM	CPT
California	Number of Codes	N/A	1,548	N/A	352,908
	Percent of State Total	N/A	0.07	N/A	14.95
Colorado	Number of Codes	5,550	4,458	51,472	42,890
	Percent of State Total	1.45	1.17	13.49	11.24
Florida	Number of Codes	23,331	24,117	215,904	241,738
	Percent of State Total	0.91	0.94	8.45	9.46
Iowa	Number of Codes	N/A	1,004	N/A	40,930
	Percent of State Total	N/A	0.26	N/A	10.78
Kentucky	Number of Codes	13,432	N/A	58,567	N/A
	Percent of State Total	2.32	N/A	10.13	N/A
Maryland	Number of Codes	N/A	1,262	N/A	53,757
	Percent of State Total	N/A	0.32	N/A	13.48
Michigan	Number of Codes	49,642	29,546	195,442	156,325
	Percent of State Total	3.12	1.85	12.27	9.81
Nebraska	Number of Codes	98	295	3,413	16,611
	Percent of State Total	0.06	0.19	2.16	10.54
New Jersey	Number of Codes	761	N/A	58,999	N/A
	Percent of State Total	0.20	N/A	15.43	N/A
New York	Number of Codes	1,864	3,143	207,868	196,947
	Percent of State Total	0.12	0.21	13.83	13.10
North Carolina	Number of Codes	23,037	22,430	152,034	221,560
	Percent of State Total	1.71	1.66	11.28	16.44
South Carolina	Number of Codes	1,706	N/A	82,925	N/A
	Percent of State Total	0.25	N/A	12.16	N/A
Utah	Number of Codes	256	0	44,135	51,714
	Percent of State Total	0.09	0.00	14.88	17.43
Vermont	Number of Codes	2,805	2,106	11,980	9,772
	Percent of State Total	3.13	2.35	13.38	10.92
Wisconsin	Number of Codes	750	216	109,153	40,304
	Percent of State Total	0.09	0.03	13.36	4.93

Table A-1: Number of Procedure Codes by State and Body System, ICD-9-CM CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries (continued)

State	Measure	Integumentary System (165-175)		Miscellaneous Diagnostics and Therapeutic (176-231)	
		ICD-9-CM	CPT	ICD-9-CM	CPT
California	Number of Codes	N/A	165,233	N/A	311,327
	Percent of State Total	N/A	7.00	N/A	13.19
Colorado	Number of Codes	100,928	83,314	37,830	32,233
	Percent of State Total	26.45	21.83	9.91	8.45
Florida	Number of Codes	223,759	260,947	196,510	759,896
	Percent of State Total	8.76	10.22	7.69	29.75
Iowa	Number of Codes	N/A	34,015	N/A	255,722
	Percent of State Total	N/A	8.96	N/A	67.38
Kentucky	Number of Codes	93,610	N/A	91,990	N/A
	Percent of State Total	16.18	N/A	15.90	N/A
Maryland	Number of Codes	N/A	53,191	N/A	284,302
	Percent of State Total	N/A	13.34	N/A	71.29
Michigan	Number of Codes	307,666	266,229	178,676	248,598
	Percent of State Total	19.31	16.71	11.22	15.61
Nebraska	Number of Codes	6,178	18,981	3,736	111,702
	Percent of State Total	3.92	12.04	2.37	70.86
New Jersey	Number of Codes	42,750	N/A	38,681	N/A
	Percent of State Total	11.18	N/A	10.12	N/A
New York	Number of Codes	129,831	122,118	150,685	785,516
	Percent of State Total	8.64	8.13	10.03	52.26
North Carolina	Number of Codes	204,243	236,452	241,340	186,065
	Percent of State Total	15.15	17.54	17.90	13.80
South Carolina	Number of Codes	96,718	N/A	237,792	N/A
	Percent of State Total	14.18	N/A	34.86	N/A
Utah	Number of Codes	6,417	4,739	102	2,273
	Percent of State Total	2.16	1.60	0.03	0.77
Vermont	Number of Codes	9,467	8,552	17,256	54,832
	Percent of State Total	10.58	9.55	19.28	61.26
Wisconsin	Number of Codes	67,820	33,469	64,886	31,335
	Percent of State Total	8.30	4.10	7.94	3.84

Table A-1: Number of Procedure Codes by State and Body System, ICD-9-CM CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries (continued)

State	Measure	HCPCS		Invalid or Inconsistent	
		ICD-9-CM	CPT	ICD-9-CM	CPT
California	Number of Codes	N/A	29,794	N/A	0
	Percent of State Total	N/A	1.26	N/A	0.00
Colorado	Number of Codes	0	19,190	2	17
	Percent of State Total	0.00	5.03	0.00	0.00
Florida	Number of Codes	0	192,773	54	1
	Percent of State Total	0.00	7.55	0.00	0.00
Iowa	Number of Codes	N/A	113,658	N/A	28
	Percent of State Total	N/A	29.95	N/A	0.01
Kentucky	Number of Codes	0	N/A	163	N/A
	Percent of State Total	0.00	N/A	0.03	N/A
Maryland	Number of Codes	N/A	104,454	N/A	12
	Percent of State Total	N/A	26.19	N/A	0.00
Michigan	Number of Codes	0	115,908	8	5
	Percent of State Total	0.00	7.28	0.00	0.00
Nebraska	Number of Codes	0	51,779	308	0
	Percent of State Total	0.00	32.85	0.20	0.00
New Jersey	Number of Codes	0	N/A	0	N/A
	Percent of State Total	0.00	N/A	0.00	N/A
New York	Number of Codes	0	591,943	2	14
	Percent of State Total	0.00	39.38	0.00	0.00
North Carolina	Number of Codes	0	25,615	0	2,151
	Percent of State Total	0.00	1.90	0.00	0.16
South Carolina	Number of Codes	0	N/A	0	N/A
	Percent of State Total	0.00	N/A	0.00	N/A
Utah	Number of Codes	0	3,042	67	1
	Percent of State Total	0.00	1.03	0.02	0.00
Vermont	Number of Codes	0	31,020	0	3
	Percent of State Total	0.00	34.65	0.00	0.00
Wisconsin	Number of Codes	0	12,696	0	0
	Percent of State Total	0.00	1.55	0.00	0.00

APPENDIX B

Comparison of ICD-9-CM and CPT Procedure Code Use in Select States

APPENDIX B: COMPARISON OF ICD-9-CM AND CPT PROCEDURE CODE USE IN SELECT STATES

The main body of this report concentrates on comparisons between the SASD-CD and other data sources that collect information on the number of facilities and on the number of surgical visit records in each state. This appendix is concerned with comparisons between ICD-9-CM procedure codes and CPT procedure codes among states that employ both coding systems.

The International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) codes were originally developed as a modification of the World Health Organization (WHO) ICD system for statistical and epidemiological research. Eventually they became a means to calculate diagnosis related groups (DRGs) for inpatient prospective payment systems. The ICD-9-CM procedure codes are used to classify surgical procedures and some diagnostic procedures in the inpatient setting. The procedures are organized by body system (e.g., nervous, endocrine, respiratory, digestive, obstetrical procedures, musculoskeletal, etc.). Procedures are coded using approximately 3,500 codes comprised of two main digits followed by a decimal and one or two additional digits.

Current Procedural Terminology (CPT), developed by the American Medical Association (AMA), is a collection of terms and codes to describe medical, surgical, and diagnostic services and procedures performed by physicians in the outpatient setting. Because they were created for physician billing purposes, the CPT codes are significantly more detailed than the ICD-9-CM codes. In addition to a surgery section which parallels the ICD-9-CM procedure codes, the CPT codes are also used for evaluation and management, anesthesia, radiology, lab and pathology, and medicine. CPT codes comprise a major portion of the Health Care Procedure Coding System (HCPCS). Procedures are coded using approximately 8,000 codes comprised of five digits, to which two-digit modifiers may be added to explain unusual circumstances. CPT or HCPCS codes are becoming the standard for outpatient data because they are required for ambulatory patient classification systems, such as the Ambulatory Payment Classification (APC) and the Ambulatory Patient Grouper (APG).

The nine states that use both coding systems are Colorado, Florida, Michigan, Nebraska, New York, North Carolina, Utah, Vermont, and Wisconsin. For users of the SASD-CD, understanding which coding system a state uses is important because there are subtle differences between the two systems.

Table B-1 lists the states that use each coding system. There are two types of records that contain CPT codes: the “core” files and the “charge detail” files. The core file supplies a fixed number of CPT code variables on a single record for each surgical visit. In contrast, the charge detail file may include a CPT code for each individual charge. A single surgical visit is represented by as many records as necessary to supply all of the charge information. As shown in Table B-1, most states that supply CPT codes supply them in a core file along with diagnostic and demographic information. Only two states, Iowa and New York, supply CPT codes solely through the charge detail file.

Table B-1: Use of ICD-9-CM and the CPT Procedure Codes Available through the HCUP Central Distributor, by State

State	ICD-9-CM Procedures	Core File CPT Variables	Charge Detail File CPT Records
California	N/A	X	N/A
Colorado	X	X	N/A
Florida	X	X	N/A
Iowa	N/A	N/A	X
Kentucky	X	N/A	N/A
Maryland	N/A	X	X
Michigan	X	X	N/A
Nebraska	X	X	X
New Jersey	X	N/A	N/A
New York	X	N/A	X
North Carolina	X	X	N/A
South Carolina	X	N/A	N/A
Utah	X	X	N/A
Vermont	X	X	N/A
Wisconsin	X	X	N/A

For states that use both coding systems, the average number of ICD-9-CM codes is 1.6, compared to 2.1 CPT codes in the core file and 4.4 CPT codes in the charge detail file. Thus, there tend to be more CPT codes than ICD-9-CM codes, especially if the CPT codes are derived from the charge detail file.

Among the nine states that employ both coding systems, Table B-2 shows the percentage of records that have: 1) both CPT codes and ICD-9-CM codes, 2) only ICD-9-CM codes, and 3) only CPT codes. For example, in Colorado, 81.3% of the records employ both systems and 18.7% employ only the ICD-9-CM system.

Table B-2: Percent of Surgical Visit Records by Coding System, ICD-9-CM and CPT Available through the HCUP Central Distributor, by State, 2005 SASD, Among All Surgery Visits

State	Number of Surgical Visit Records	Percent with both ICD-9-CM and CPT	Percent ICD-9-CM Only	Percent CPT Only
Colorado	381,587	81.3	18.7	0.0
Florida	2,554,542	73.1	0.0	26.9
Michigan	1,593,031	83.1	16.9	0.0
North Carolina	1,347,919	99.8	0.2	0.0
Nebraska	157,645	16.4	0.5	83.1
New York	1,502,985	98.3	1.3	0.4
Utah	296,659	80.1	4.6	15.4
Vermont	89,513	96.4	3.4	0.2
Wisconsin	816,784	42.0	58.0	0.0

From this point forward, the comparisons between the ICD-9-CM and CPT coding systems are performed by comparing CCS categories. This approach is used because it is not possible to directly compare, or even unambiguously map codes, between the ICD-9-CM and CPT coding systems. The CCS categories serve as a bridge because the categories have the same meaning regardless of the coding system.

Table B-3 shows the percentage of CCS categories that match between the two systems among surgical visits that code procedures using both coding systems (dual coding). As an example, in Colorado 58.7% of the ICD-9-CM CCS categories had matching CPT CCS categories on dually coded records. Conversely, 71.4% of the CPT CCS categories had matching ICD-9-CM CCS categories on dually coded records. The numerator (number of matches) is the same for both coding systems. However, there are fewer CPT codes than ICD-9-CM codes. Therefore, the denominator (number of CPT CCS categories) is smaller, causing a higher match rate for CPT CCS categories compared with ICD-9-CM CCS categories. This effect is particularly evident for Vermont, where each surgical visit record accommodates 25 CPT codes, but only 13 ICD-9-CM codes.

These percentages indicate the extent to which the procedure information overlaps between the two coding systems. For example, Michigan and North Carolina collect dual-coded data from their hospitals and show similar match rates between the two systems. Other states mandate the submission of only CPT codes; consequently, there is often not a matching ICD-9-CM code for each CPT code.

Table B-3: Percent of Records with Matching CCS Categories Among All Surgical Visit Records with Dual Coding Available through the HCUP Central Distributor, by State, 2005 SASD-CD Ambulatory Surgeries

State	Percent of ICD-9-CM CCS Matched	Percent of CPT CCS Matched
Colorado	58.7	71.4
Florida	74.2	38.7
Michigan	59.1	63.4
North Carolina	69.6	68.7
Nebraska	53.2	4.3
New York	69.4	40.6
Utah	74.9	70.1
Vermont	60.3	37.4
Wisconsin	31.9	79.5

To reiterate, among surgical visit records that contain both types of codes, the number of codes differs between the two systems, especially when the CPT codes are derived from the charge detail file. Because no standards exist for the ordering of outpatient procedure codes, from this point forward, all of the comparisons between the ICD-9-CM system and the CPT system are based on the subset of surgical visits that contain exactly one CPT procedure code and one ICD-9-CM procedure code. This subset of surgical visit records was selected to eliminate as much ambiguity as possible when comparing the consistency of procedure coding between the two systems. Although this simplification is necessary to allow direct comparisons of codes, the conclusions reached may not apply to observations where multiple ICD-9-CM and CPT codes appear on a surgical visit record.

Table B-4 gives the rates of CCS matches among only those surgical visit records that have a single ICD-9-CM code and a single CPT code. The CCS categories match when the ICD-9-CM CCS category matches the CPT CCS category for that record.

Of the nine states in Table B-4, six states have match rates in excess of 75%: Colorado, Florida, Michigan, New York, Utah, and Wisconsin.

Table B-4: Percent of Surgical Visit Records with Matching CCS Categories from Among Surgical Visit Records with a Single Procedure Code of Each Type Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries

State	Number of Records with a Single Procedure Code of Each Type	Percent Records with Matching CCS ICD-9-CM and CCS CPT
Colorado	171,137	81.2
Florida	739,928	83.3
Michigan	674,985	79.3
Nebraska	3,079	69.1
North Carolina	817,215	69.1
New York	355,856	83.8
Utah	133,691	83.0
Vermont	12,969	71.9
Wisconsin	223,871	81.2

The nature of the disagreements between the ICD-9-CM codes and the CPT codes on single-procedure surgical visit records, were investigated further by comparing the CPT CCS categories that were paired with the 10 most frequent ICD-9-CM CCS categories.

For each of the top 10 ICD-9-CM CCS groups, Table B-5 presents the top 10 CPT CCS groups that are paired with it. For example, the most common ICD-9-CM CCS group was CCS 76: *Colonoscopy and biopsy*. The same CPT CCS group, CCS 76, was paired with it 94.1% of the time. Several of the other paired CPT CCS groups were *Other bowel diagnostic procedures* (3.1%), *Proctoscopy and anorectal biopsy* (2.2%), *Pathology* (less than 1%), *Other therapeutic procedures* (less than 1%), and *Upper gastrointestinal endoscopy, biopsy* (less than 1%).

Of the 10 most frequent ICD-9-CM CCS groups, seven were paired with the matching CPT CCS category over 90% of the time. This implies that despite the difficulty of directly translating between the two procedure coding systems, there is a strong agreement between the two systems based on the broader CCS classes.

The largest discrepancies occurred for ICD-9-CM CCS categories 95 and 214. Category 95: *Other non-O.R. lower GI therapeutic procedures,* was paired with CPT CCS category 76: *Colonoscopy and biopsy* 94.6% of the time and the matching CCS category less than one percent of the time. The ICD-9-CM CCS category 214: *Traction, splints, and other wound care*, was paired with the matching CPT CCS category only 0.24% of the time and was paired with the CPT CCS category 144: *Treatment, facial fracture or dislocation* 97.6% of the time. Also, the ICD-9-CM CCS category 174: *Other non-O.R. therapeutic procedures on skin and breast* was paired with the matching CPT CCS category 53.3% of the time.

Table B-5: Pairing Between ICD-9-CM CCS and CPT CCS Categories for Top 10 ICD-9-CM Categories, Surgical Visit Records with a Single ICD-9-CM Code and a Single CPT Code Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries

ICD-9-CM CCS				CPT-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
1	558,797	76	76: Colonoscopy and biopsy	1	76	76: Colonoscopy and biopsy	94.11
				2	92	92: Other bowel diagnostic procedures	3.12
				3	77	77: Proctoscopy and anorectal biopsy	2.18
				4	234	234: Pathology	0.18
				5	231	231: Other therapeutic procedures	0.16
				6	70	70: Upper gastrointestinal endoscopy, biopsy	0.15
				7	227	227: Other diagnostic procedures (interview, evaluation, consultation)	0.05
				8	233	233: Laboratory - Chemistry and Hematology	0.01
				9	96	96: Other O.R. lower GI therapeutic procedures	0.00
				10	41	41: Other non-O.R. therapeutic procedures on respiratory system	0.00
2	232,613	70	70: Upper gastrointestinal endoscopy, biopsy	1	70	70: Upper gastrointestinal endoscopy, biopsy	99.22
				2	234	234: Pathology	0.24
				3	69	69: Esophageal dilatation	0.20
				4	76	76: Colonoscopy and biopsy	0.08
				5	231	231: Other therapeutic procedures	0.06
				6	229	229: Nonoperative removal of foreign body	0.04
				7	94	94: Other O.R. upper GI therapeutic procedures	0.03
				8	71	71: Gastrostomy, temporary and permanent	0.03
				9	96	96: Other O.R. lower GI therapeutic procedures	0.02
				10	93	93: Other non-O.R. upper GI therapeutic procedures	0.01
3	205,406	95	95: Other non-O.R. lower GI therapeutic procedures	1	76	76: Colonoscopy and biopsy	94.56
				2	77	77: Proctoscopy and anorectal biopsy	4.15
				3	96	96: Other O.R. lower GI therapeutic procedures	0.42
				4	234	234: Pathology	0.36
				5	231	231: Other therapeutic procedures	0.19
				6	70	70: Upper gastrointestinal endoscopy, biopsy	0.16

ICD-9-CM CCS				CPT-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
				7	95	95: Other non-O.R. lower GI therapeutic procedures	0.07
				8	170	170: Excision of skin lesion	0.03
				9	215	215: Other physical therapy and rehabilitation	0.01
				10	93	93: Other non-O.R. upper GI therapeutic procedures	0.01
4	190,847	15	15: Lens and cataract procedures	1	15	15: Lens and cataract procedures	99.75
				2	20	20: Other intraocular therapeutic procedures	0.23
				3	227	27: Other diagnostic procedures (interview, evaluation, consultation)	0.01
				4	14	14: Glaucoma procedures	0.00
				5	19	19: Other therapeutic procedures on eyelids, conjunctiva, cornea	0.00
				6	5	5: Insertion of catheter or spinal stimulator and injection into spinal canal	0.00
				7	142	142: Partial excision bone	0.00
				8	17	17: Destruction of lesion of retina and choroid	0.00
				9	21	21: Other extraocular muscle and orbit therapeutic procedures	0.00
				10	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.00
5	170,795	171	171: Suture of skin and subcutaneous tissue	1	171	171: Suture of skin and subcutaneous tissue	99.34
				2	227	227: Other diagnostic procedures (interview, evaluation, consultation)	0.47
				3	19	19: Other therapeutic procedures on eyelids, conjunctiva, cornea	0.07
				4	175	175: Other O.R. therapeutic procedures on skin and breast	0.07
				5	231	231: Other therapeutic procedures	0.02
				6	214	214: Traction, splints, and other wound care	0.02
				7	168	168: Incision and drainage, skin and subcutaneous tissue	0.00
				8	169	169: Debridement of wound, infection or burn	0.00
				9	170	170: Excision of skin lesion	0.00
				10	172	172: Skin graft	0.00
6	78,915	5	5: Insertion of catheter or spinal stimulator and injection into spinal canal	1	5	5: Insertion of catheter or spinal stimulator and injection into spinal canal	96.77
				2	1	1: Incision and excision of CNS	2.42
				3	226	226: Other diagnostic radiology and related techniques	0.45
				4	9	9: Other O.R. therapeutic nervous system procedures	0.10
				5	8	8: Other non-O.R. or closed therapeutic nervous system procedures	0.08

ICD-9-CM CCS				CPT-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
				6	181	181: Myelogram	0.04
				7	3	3: Laminectomy, excision intervertebral disc	0.03
				8	224	224: Cancer chemotherapy	0.02
				9	231	231: Other therapeutic procedures	0.02
				10	141	141: Other therapeutic obstetrical procedures	0.01
7	72,684	160	160: Other therapeutic procedures on muscles and tendons	1	160	160: Other therapeutic procedures on muscles and tendons	81.67
				2	162	162: Other O.R. therapeutic procedures on joints	4.38
				3	170	170: Excision of skin lesion	3.87
				4	169	169: Debridement of wound, infection or burn	3.21
				5	164	164: Other O.R. therapeutic procedures on musculoskeletal system	2.17
				6	154	154: Arthroplasty other than hip or knee	1.32
				7	142	142: Partial excision bone	0.82
				8	168	168: Incision and drainage, skin and subcutaneous tissue	0.67
				9	171	171: Suture of skin and subcutaneous tissue	0.52
				10	234	234: Pathology	0.40
8	61,718	214	214: Traction, splints, and other wound care	1	144	144: Treatment, facial fracture or dislocation	97.59
				2	148	148: Other fracture and dislocation procedure	1.91
				3	214	214: Traction, splints, and other wound care	0.24
				4	147	147: Treatment, fracture or dislocation of lower extremity (other than hip or femur)	0.15
				5	162	162: Other O.R. therapeutic procedures on joints	0.03
				6	169	169: Debridement of wound, infection or burn	0.02
				7	146	146: Treatment, fracture or dislocation of hip and femur	0.02
				8	161	161: Other O.R. therapeutic procedures on bone	0.02
				9	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.01
				10	145	145: Treatment, fracture or dislocation of radius and ulna	0.01
9	60,125	30	30: Tonsillectomy and/or adenoidectomy	1	30	30: Tonsillectomy and/or adenoidectomy	98.18
				2	32	32: Other non-O.R. therapeutic procedures on nose, mouth and pharynx	0.81
				3	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.48
				4	234	234: Pathology	0.38
				5	26	26: Other therapeutic ear procedures	0.03

ICD-9-CM CCS				CPT-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
				6	76	76: Colonoscopy and biopsy	0.02
				7	231	231: Other therapeutic procedures	0.02
				8	27	27: Control of epistaxis	0.01
				9	200	200: Nonoperative urinary system measurements	0.01
				10	70	70: Upper gastrointestinal endoscopy, biopsy	0.01
10	58,048	174	174: Other non-O.R. therapeutic procedures on skin and breast	1	174	174: Other non-O.R. therapeutic procedures on skin and breast	53.26
				2	170	170: Excision of skin lesion	11.62
				3	175	175: Other O.R. therapeutic procedures on skin and breast	11.01
				4	168	168: Incision and drainage, skin and subcutaneous tissue	7.38
				5	165	165: Breast biopsy and other diagnostic procedures on breast	6.97
				6	231	231: Other therapeutic procedures	5.86
				7	62	62: Other diagnostic cardiovascular procedures	1.13
				8	5	5: Insertion of catheter or spinal stimulator and injection into spinal canal	0.66
				9	171	171: Suture of skin and subcutaneous tissue	0.31
				10	9	9: Other O.R. therapeutic nervous system procedures	0.27

For each of the top 10 CPT CCS categories, Table B-6 presents the top 10 ICD-9-CM CCS categories that are paired with it. Once again this table includes only those surgical visit records with a single ICD-9-CM code and a single CPT code. In Table B-6, six of the top 10 CPT CCS classifications were paired with the same ICD-9-CM classification at least 90% of the time. The largest discrepancy occurred for CPT CCS category 144: *Treatment, facial fracture or dislocation*, which was paired with ICD-9-CM CCS category 214: *Traction, splints, and other wound care* 91.9% of the time. For the remaining three categories, the CPT CCS category matched the ICD-9-CM CCS category the majority of the time.

Seven of the top 10 CPT CCS categories shown in Table B-6 are also in the top 10 ICD-9-CM CCS categories shown in Table B-5. Both tables have categories 76: *Colonoscopy and biopsy* and 70: *Upper gastrointestinal endoscopy, biopsy* listed as first and second, respectively. However, the third most frequent CPT CCS category, 171: *Suture of skin and subcutaneous tissue* was the fifth most common ICD-9-CM CCS category in Table B-5. ICD-9-CM group 95: *Other non-O.R. lower GI therapeutic procedures*, 214: *Traction, splints, and other wound care,* and 174: *Other non-O.R. therapeutic procedures on skin and breast are* in the top 10 categories for ICD-9-CM codes but not for CPT CCS codes. Conversely, CPT CCS categories 170: *Excision of skin lesion*, 144: *Treatment, facial fracture or dislocation*, and 6: *Decompression peripheral nerve* are in the top 10 categories for CPT CCS, Table B-6, but not for ICD-9-CM CCS codes in Table B-5.

Table B-6: Pairing Between CPT CCS and ICD-9-CM CCS Categories for Top 10 CPT Categories, Surgical Visit Records with a Single ICD-9-CM Code and a Single CPT Code Available through the HCUP Central Distributor, 2005 SASD-CD Ambulatory Surgeries

CPT-CCS				ICD-9-CM-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
1	712,353	76	76: Colonoscopy and biopsy	1	76	76: Colonoscopy and biopsy	71.79
				2	95	95: Other non-O.R. lower GI therapeutic procedures	27.26
				3	77	77: Proctoscopy and anorectal biopsy	0.70
				4	92	92: Other bowel diagnostic procedures	0.16
				5	70	70: Upper gastrointestinal endoscopy, biopsy	0.03
				6	96	96: Other O.R. lower GI therapeutic procedures	0.01
				7	79	79: Local excision of large intestine lesion (not endoscopic)	0.01
				8	231	231: Other therapeutic procedures	0.01
				9	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.00
				10	30	30: Tonsillectomy and/or adenoidectomy	0.00
2	237,431	70	70: Upper gastrointestinal endoscopy, biopsy	1	70	70: Upper gastrointestinal endoscopy, biopsy	97.13
				2	93	93: Other non-O.R. upper GI therapeutic procedures	1.69
				3	76	76: Colonoscopy and biopsy	0.34
				4	92	92: Other bowel diagnostic procedures	0.27
				5	229	229: Nonoperative removal of foreign body	0.19
				6	95	95: Other non-O.R. lower GI therapeutic procedures	0.14
				7	69	69: Esophageal dilatation	0.06
				8	94	94: Other O.R. upper GI therapeutic procedures	0.05
				9	110	110: Other diagnostic procedures of urinary tract	0.05
				10	194	194: Diagnostic ultrasound of gastrointestinal tract	0.03
3	197,902	171	171: Suture of skin and subcutaneous tissue	1	171	171: Suture of skin and subcutaneous tissue	85.52
				2	19	19: Other therapeutic procedures on eyelids, conjunctiva, cornea	6.02
				3	32	32: Other non-O.R. therapeutic procedures on nose, mouth and pharynx	4.83
				4	28	28: Plastic procedures on nose	1.46
				5	26	26: Other therapeutic ear procedures	1.14
				6	175	175: Other O.R. therapeutic procedures on skin and breast	0.29

CPT-CCS				ICD-9-CM-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
				7	160	160: Other therapeutic procedures on muscles and tendons	0.19
				8	132	132: Other O.R. therapeutic procedures, female organs	0.12
				9	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.09
				10	118	118: Other O.R. therapeutic procedures, male genital	0.09
4	191,187	15	15: Lens and cataract procedures	1	15	15: Lens and cataract procedures	99.56
				2	17	17: Destruction of lesion of retina and choroid	0.32
				3	20	20: Other intraocular therapeutic procedures	0.08
				4	32	32: Other non-O.R. therapeutic procedures on nose, mouth and pharynx	0.00
				5	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.00
				6	21	21: Other extraocular muscle and orbit therapeutic procedures	0.00
				7	175	175: Other O.R. therapeutic procedures on skin and breast	0.00
				8	14	14: Glaucoma procedures	0.00
				9	19	19: Other therapeutic procedures on eyelids, conjunctiva, cornea	0.00
				10	23	23: Myringotomy	0.00
5	82,553	5	5: Insertion of catheter or spinal stimulator and injection into spinal canal	1	5	5: Insertion of catheter or spinal stimulator and injection into spinal canal	92.48
				2	8	8: Other non-O.R. or closed therapeutic nervous system procedures	5.41
				3	9	9: Other O.R. therapeutic nervous system procedures	1.06
				4	156	156: Injections and aspirations of muscles, tendons, bursa, joints and soft tissue	0.42
				5	174	174: Other non-O.R. therapeutic procedures on skin and breast	0.23
				6	231	231: Other therapeutic procedures	0.20
				7	226	226: Other diagnostic radiology and related techniques	0.04
				8	3	3: Laminectomy, excision intervertebral disc	0.03
				9	175	175: Other O.R. therapeutic procedures on skin and breast	0.02
				10	163	163: Other non-O.R. therapeutic procedures on musculoskeletal system	0.02
6	65,563	144	144: Treatment, facial fracture or dislocation	1	214	214: Traction, splints, and other wound care	91.87
				2	32	32: Other non-O.R. therapeutic procedures on nose, mouth and pharynx	5.47
				3	144	144: Treatment, facial fracture or dislocation	1.71
				4	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.83
				5	28	28: Plastic procedures on nose	0.03
				6	9	9: Other O.R. therapeutic nervous system procedures	0.03

CPT-CCS				ICD-9-CM-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
				7	164	164: Other O.R. therapeutic procedures on musculoskeletal system	0.03
				8	148	148: Other fracture and dislocation procedure	0.01
				9	170	170: Excision of skin lesion	0.01
				10	31	31: Diagnostic procedures on nose, mouth and pharynx	0.00
7	63,711	170	170: Excision of skin lesion	1	170	170: Excision of skin lesion	69.38
				2	166	166: Lumpectomy, quadrantectomy of breast	11.32
				3	174	174: Other non-O.R. therapeutic procedures on skin and breast	5.31
				4	160	160: Other therapeutic procedures on muscles and tendons	4.41
				5	26	26: Other therapeutic ear procedures	2.28
				6	19	19: Other therapeutic procedures on eyelids, conjunctiva, cornea	1.63
				7	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	1.30
				8	32	32: Other non-O.R. therapeutic procedures on nose, mouth and pharynx	1.12
				9	132	132: Other O.R. therapeutic procedures, female organs	0.94
				10	96	96: Other O.R. lower GI therapeutic procedures	0.65
8	62,347	160	160: Other therapeutic procedures on muscles and tendons	1	160	160: Other therapeutic procedures on muscles and tendons	95.13
				2	162	162: Other O.R. therapeutic procedures on joints	2.62
				3	99	99: Other O.R. gastrointestinal therapeutic procedures	0.73
				4	154	154: Arthroplasty other than hip or knee	0.23
				5	42	42: Other O.R. therapeutic procedures on respiratory system	0.21
				6	170	170: Excision of skin lesion	0.21
				7	161	161: Other O.R. therapeutic procedures on bone	0.19
				8	150	150: Division of joint capsule, ligament or cartilage	0.12
				9	174	174: Other non-O.R. therapeutic procedures on skin and breast	0.09
				10	143	143: Bunionectomy or repair of toe deformities	0.09
9	59,063	30	30: Tonsillectomy and/or adenoidectomy	1	30	30: Tonsillectomy and/or adenoidectomy	99.87
				2	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.09
				3	25	25: Diagnostic procedures on ear	0.01
				4	76	76: Colonoscopy and biopsy	0.00
				5	85	85: Inguinal and femoral hernia repair	0.00

CPT-CCS				ICD-9-CM-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
				6	160	160: Other therapeutic procedures on muscles and tendons	0.00
				7	6	6: Decompression peripheral nerve	0.00
				8	32	32: Other non-O.R. therapeutic procedures on nose, mouth and pharynx	0.00
				9	62	62: Other diagnostic cardiovascular procedures	0.00
				10	86	86: Other hernia repair	0.00
10	52,569	6	6: Decompression peripheral nerve	1	6	6: Decompression peripheral nerve	95.84
				2	9	9: Other O.R. therapeutic nervous system procedures	2.82
				3	149	149: Arthroscopy	1.22
				4	148	148: Other fracture and dislocation procedure	0.07
				5	160	160: Other therapeutic procedures on muscles and tendons	0.02
				6	150	150: Division of joint capsule, ligament or cartilage	0.01
				7	151	151: Excision of semilunar cartilage of knee	0.00
				8	162	162: Other O.R. therapeutic procedures on joints	0.00
				9	166	166: Lumpectomy, quadrantectomy of breast	0.00
				10	19	19: Other therapeutic procedures on eyelids, conjunctiva, cornea	0.00

Summary

Nine states in the SASD-CD employ both ICD-9-CM and CPT codes. Three states (California, Iowa, and Maryland) use only CPT codes, while three other states (Kentucky, New Jersey, and South Carolina) use only ICD-9-CM codes. Among states that employ both coding systems, varying levels of agreement exist between the two. CPT codes may be supplied in the core file or in the charge detail file. On average the number of CPT codes is higher (2.1 in the core file and 4.4 in the charge detail file) than the number of ICD-9-CM codes (1.6). Also, the average number of CPT codes in the charge detail file is higher than the average number of CPT codes in the core file.

Among surgical visit records with a single ICD-9-CM code and a single CPT code, there tends to be a high level of agreement between the CCS categories generated by the two coding systems. However, there are subtle differences between the two systems that result in slightly different classifications for some procedures using the two types of codes. Consequently, analysts should exercise care when combining SASD-CD data across states that use different procedure coding systems.