NUMBER OF DIAGNOSIS AND PROCEDURE CODES REPORTED UNDER ICD-9-CM AND ICD-10-CM/PCS

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TABLE OF CONTENTS

TABLE OF EXHIBITS

EXECUTIVE SUMMARY

This document examines shifts in the number of diagnosis and procedure codes used under the ICD-9-CM and ICD-10-CM/PCS[1] systems from 2013 through 2015. The analysis uses Healthcare Cost and Utilization Project (HCUP) data from State databases that were processed at the time of this report: 24 State Inpatient Databases (SID), 17 State Emergency Department Databases (SEDD), and 16 State Ambulatory Surgery and Services Databases (SASD). The number of diagnosis and procedure codes available in the coding system increased considerably from ICD-9-CM to ICD-10-CM/PCS.[2] As a result, expected to see an increase in the number of codes reported on a hospital record for an inpatient stay, emergency department visit, or ambulatory surgery encounter.

Main Findings

- There was no increase in the mean number of diagnosis codes reported in hospital inpatient or outpatient (emergency department and ambulatory surgery) data from 2014–2015 relative to 2013–2014. Rather, compared with 2013–2014, the rate of increase in the mean number of diagnosis codes reported slowed from 2014–2015. These trends generally were consistent across payer categories.
- For inpatient stays, there was a small decrease in the mean number of procedures reported under ICD-10-PCS. However, there was a considerable increase in the percentage of inpatient stays with an operating room procedure, which increased by 19.8 percent from 2014–2015, compared with a 2.1 percent decrease from 2013–2014. The large increase in the percentage of inpatient stays with an operating room procedure was driven in part by a change in the designation of surgical cases between Medicare Severity Diagnosis Related Group (MS-DRG) Version 33 (effective October 1, 2015, for ICD-10-CM data) and prior MS-DRG versions under ICD-9-CM. These trends generally were consistent across payer categories.
- There has been a shift in outpatient data, from reporting procedures using ICD codes toward reporting procedures using Healthcare Common Procedure Coding System (HCPCS) Current Procedural Terminology (CPT®). In 2015, in the SEDD and SASD, procedures mostly were reported using CPT codes. From 2014–2015, the number of CPT codes in the SEDD and SASD increased by 9.6 and 7.5 percent, respectively.

When using HCUP data that include both ICD-9-CM and ICD-10-CM/PCS codes, researchers may consider looking at the mean number of diagnosis and procedure codes reported across payers and by discharge quarter to identify populations for which the combination of data across the two coding systems may be problematic.

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[1] ICD-9-CM: International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM/PCS: International Classification of Diseases, Tenth Revision, Clinical Modification/Procedure Coding System.

[2] Gibson T, Casto A, Young J, Karnell L, Coenen N. Impact of ICD-10-CM/PCS on Research Using Administrative Databases. HCUP Methods Series Report #2016-02. July 25, 2016. Rockville, MD: Agency for Healthcare Research and Quality. https://www.hcup-us.ahrq.gov/reports/methods/2016-02.pdf.

INTRODUCTION

The purpose of this document is to help Healthcare Cost and Utilization Project (HCUP) users anticipate challenges in using HCUP databases that include both ICD-9-CM and ICD-10-CM/PCS codes.[3] This investigation examines changes in the number of reported diagnosis and procedure codes following transition to the new coding system.

Brief Overview of ICD-9-CM Versus ICD-10-CM/PCS

On October 1, 2015, the United States transitioned from reporting medical diagnoses and inpatient procedures using ICD-9-CM to the ICD-10-CM/PCS code sets. ICD-10-CM consists of two parts:

- ICD-10-CM: diagnosis coding on inpatient and outpatient data
- ICD-10-PCS: procedure coding on inpatient data.

Procedures listed on outpatient data generally are reported using Healthcare Common Procedure Coding System (HCPCS) and Current Procedural Terminology (CPT®) codes.

The number of available diagnosis and procedure codes increased dramatically from the ICD-9-CM system to the ICD-10-CM/PCS system.[4] The number of diagnosis codes increase from about 14,000 under ICD-9-CM to over 68,000 under ICD-10-CM. The number of procedure codes increase from about 4,000 under ICD-9-CM to over 72,000 under ICD-10-PCS. Certain aspects of the ICD-10-CM/PCS system may increase the number of diagnosis and procedure codes that should be used (e.g., codes now designate the left or the right side of the body when describing the location of conditions, injuries, and procedures); however, other aspects of the ICD-10-CM/PCS system may decrease the number of codes that are necessary (e.g., expanded use of codes that combine diagnosis and symptom information).

An overview of key differences between ICD-9-CM and ICD-10-CM/PCS is available on the HCUP-US Web site under ICD-10-CM/PCS Resources. A more detailed comparison of the ICD-9-CM and ICD-10-CM-PCS coding systems is available in the HCUP Methods Series Report #2016-02, Impact of ICD 10-CM/PCS on Research Using Administrative Databases.

Brief Description of the HCUP State Databases

State Inpatient Databases

The SID include discharge-level data on inpatient stays from most, if not all, hospitals in the State. The SID include all types of inpatient stays, including transfers from another acute care hospital and stays that originated in the hospital's emergency department (ED). The SID can be used to investigate questions unique to one State, to compare data from two or more States, to

[3] ICD-9-CM: International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM/PCS: International Classification of Diseases, Tenth Revision, Clinical Modification/ Procedure Coding System.

[4] Gibson T, Casto A, Young J, Karnell L, Coenen N. Impact of ICD-10-CM/PCS on Research Using Administrative Databases. HCUP Methods Series Report #2016-02. July 25, 2016. Rockville, MD: Agency for Healthcare Research and Quality. https://www.hcup-us.ahrq.gov/reports/methods/2016-02.pdf.

conduct market-area variation analyses, and to identify State-specific trends in inpatient care utilization, access, charges, and outcomes.

Starting on October 1, 2015, the SID include ICD-10-CM diagnosis codes and ICD-10-PCS procedure codes.

State Emergency Department Databases

The SEDD include encounter-level data on ED visits that do not result in an inpatient admission to the same hospital. The SEDD contain information from ED encounters from hospital-based EDs, translated into a uniform format to facilitate multistate comparisons and analyses. Researchers and policymakers use the SEDD to investigate access to health care in a changing health care marketplace; to identify State-specific trends in ED utilization, access, charges, and outcomes; and to conduct market-area research and small-area variation analyses.

Starting on October 1, 2015, the SEDD include ICD-10-CM diagnosis codes. Procedures performed in an outpatient setting usually are reported using HCPCS and CPT procedure codes. A few of the fourth quarter 2015 SEDD also have included a small percentage of records with ICD-10-PCS procedure codes. These SEDD also have ICD-9-CM procedure codes reported in the first three quarters of 2015.

State Ambulatory Surgery and Services Databases

The SASD include encounter-level data for ambulatory surgeries. These data also may include various types of outpatient services such as observation stays, lithotripsy, radiation therapy, imaging, chemotherapy, and labor and delivery. The specific types of ambulatory surgery and outpatient services included in each SASD vary by State and data year. All SASD include data from hospital-owned ambulatory surgery facilities. In addition, some States include data from facilities not owned by a hospital.

Starting on October 1, 2015, the SASD include ICD-10-CM diagnosis codes. Procedures performed in an outpatient setting usually are reported using HCPCS and CPT procedure codes. A few of the fourth quarter 2015 SASD also have included a small percentage of records with ICD-10-PCS procedure codes. These SASD have ICD-9-CM procedure codes reported in the first three quarters of 2015.

METHODS

This document presents analyses using data from the SID, SEDD, and SASD for States with databases that were processed at the time of this report. Records were limited to stays and visits at community hospitals that are not rehabilitation or long-term acute care hospitals. Additionally, the SASD data were limited to surgical encounters.[5]

The data sources were the following:

- SID data were from 24 States: Arizona, California, Colorado, Florida, Hawaii, Illinois, Iowa, Kansas, Kentucky, Minnesota, Missouri, Montana, Nebraska, New Jersey, New Mexico, Nevada, North Dakota, Ohio, Oregon, South Dakota, Tennessee, Vermont, Washington, Wisconsin
- SEDD data were from 17 States: Arizona, California, Florida, Hawaii, Iowa, Kansas, Kentucky, Minnesota, Missouri, Nebraska, New Jersey, North Dakota, Ohio, South Dakota, Tennessee, Vermont, Wisconsin
- SASD data were from 16 States: California, Colorado, Florida, Hawaii, Iowa, Kentucky, Minnesota, Missouri, Nebraska, New Jersey, North Dakota, Oregon, South Dakota, Tennessee, Vermont, Wisconsin.

The analysis consisted of calculating the mean number of diagnoses (HCUP data elements NDX and I10_NDX) and ICD procedures (HCUP data elements NPR and I10_NPR) reported on each record during discharge quarter 4 (Q4) (HCUP data element DQTR) for three consecutive years:

- Q4 2015 (ICD-10-CM/PCS)
- Q4 2014 (ICD-9-CM)
- Q4 2013 (ICD-9-CM).

For the SID, the percentage of inpatient stays with at least one operating room (OR) procedure (HCUP data elements ORPROC and I10_ORPROC) also was calculated for each of the three time periods. The identification of an OR procedure was based on the record being in a surgical Medicare Severity Diagnosis Related Group (MS-DRG).[6] In the 2013, 2014, and 2015 SID, the MS-DRG versions were 31, 32, and 33, respectively. For the SEDD and SASD, the mean number of HCPCS/CPT procedures (HCUP data element NCPT) was calculated for each of the three time periods.

Percentage changes in these means from Q4 2014 to Q4 2015 and from Q4 2013 to Q4 2014 then were calculated. Change from Q4 2014 to Q4 2015 may represent changes associated

[5] Surgical encounters were identified using the HCPCS/CPT version of the HCUP Surgery Flag Software that is described and available for download on the HCUP User Support Web site. A SASD record had to have at least one narrow or broad surgical procedure code.

[6] Specifically, the MS-DRG grouper classifies hospital records into groups that are expected to have similar hospital resource use, making a distinction between surgical and medical MS-DRGs. The MS-DRG Definitions Manual provides a list of ICD-10-PCS procedure codes that are considered operating room procedures (https://www.cms.gov/ICD10Manual/version33-fullcode-cms/fullcode_cms/P0033.html) and are used in the surgical MS-DRG assignments. When a specific ICD-10-PCS procedure code is considered "surgical" according to MS-DRGs, it is considered an operating room procedure.

with the introduction of ICD-10-CM/PCS as well as continuation of an existing trend. Therefore, the percentage change from Q4 2013 to Q4 2014 was used as a "baseline" (shown in grey in Figures 1, 3, and 5) to evaluate the change from 2014 to 2015 (shown in blue in Figures 1, 3, and 5). Changes were examined overall and by expected primary payer (HCUP data element PAY1).

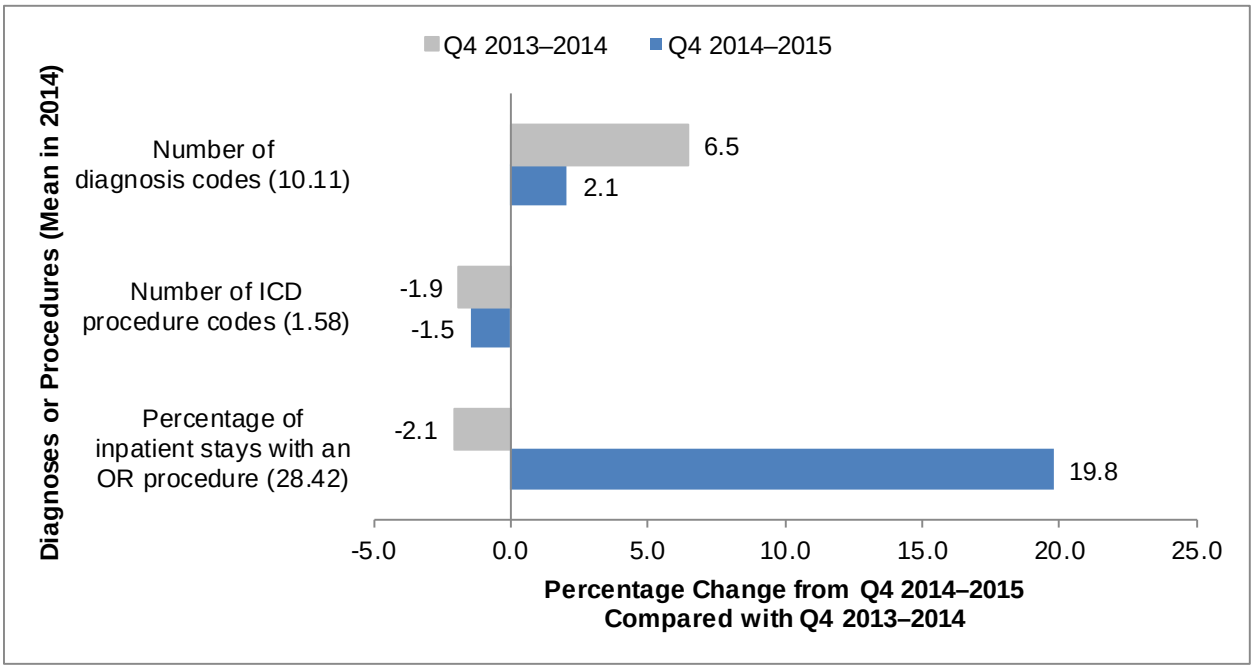
RESULTS

State Inpatient Databases

Overall Results

Figure 1 presents the overall percentage change in the number of diagnosis and procedure codes, as well as the percentage of inpatient stays with an OR procedure in the SID from 2014–2015, compared with percentage changes from 2013–2014.

Figure 1. Overall Percentage Changes in the Number of Diagnosis and Procedure Codes in the SID



Abbreviations: OR, operating room; Q, quarter; SID, State Inpatient Databases.

- Diagnoses: Increased at a slower rate from 2014–2015 compared with 2013–2014
  - 2013–2014: 6.5 percent increase in the mean number of diagnoses per record
  - 2014–2015: 2.1 percent increase in the mean number of diagnoses per record.
- Procedures: Decreased at a slower rate from 2014–2015 compared with 2013–2014
  - 2013–2014: 1.9 percent decrease in the mean number of procedures per record
  - 2014–2015: 1.5 percent decrease in the mean number of procedures per record.

- Inpatient stays with an OR procedure: Increased from 2014–2015, but decreased from 2013–2014
    - 2013–2014: 2.1 percent decrease in the percentage of inpatient stays with an OR procedure
    - 2014–2015: 19.8 percent increase in the percentage of inpatient stays with an OR procedure.

The relatively large increase in the percentage of inpatient stays with an OR procedure between 2014 and 2015 is driven in part by a change in the MS-DRG designation of surgical cases between Version 33 (effective October 1, 2015, for ICD-10-CM data) and prior MS-DRG versions under ICD-9-CM.

Results by Expected Payer

Tables 1 through 3 present the percentage change in the number of diagnosis and procedure codes, as well as the percentage of inpatient stays with an OR procedure in the SID from 2014–2015, compared with changes from 2013–2014, by expected payer.

Table 1. Percentage Changes in the Mean Number of Diagnosis Codes in the SID, by Expected Payer

Expected Primary Payer	Mean Number of Diagnosis Codes			Percentage Change	
	Q4 2013	Q4 2014	Q4 2015	2013–2014	2014–2015
All discharges	9.50	10.11	10.32	6.5	2.1
Medicare	13.26	14.09	14.24	6.2	1.1
Medicaid	6.86	7.54	7.83	9.9	3.9
Privately insured	7.09	7.57	7.75	6.6	2.5
Uninsured	7.55	7.27	7.49	–3.7	3.0

- Like the overall results, for each expected payer except the uninsured, the number of diagnoses increased at a slower rate from 2014–2015 than from 2013–2014.
- For the uninsured population, the number of diagnoses increased from 2014–2015 (by 3.0 percent), compared with a decrease from 2013–2014 (by 3.7 percent).

Table 2. Percentage Changes in the Mean Number of Procedure Codes in the SID, by Expected Payer

Expected Primary Payer	Mean Number of Procedure Codes			Percentage Change	
	Q4 2013	Q4 2014	Q4 2015	2013–2014	2014–2015
All discharges	1.61	1.58	1.56	–1.9	–1.5
Medicare	1.63	1.57	1.52	–3.8	–2.7
Medicaid	1.42	1.42	1.43	–0.1	0.4
Privately insured	1.75	1.74	1.72	–0.7	–0.7
Uninsured	1.35	1.31	1.25	–2.8	–4.2

- Like the overall results, the number of procedures decreased at a slower rate from 2014–2015 than from 2013–2014 for records with an expected payer of Medicare.
- For Medicaid, the number of procedures increased from 2014–2015 (by 0.4 percent), compared with a decrease of 0.1 percent from 2013–2014.

- For individuals with private insurance, the rate of change in procedures was similar from 2014–2015 and 2013–2014 (decreasing by about 0.7 percent over both time periods).
- For the uninsured population, the number of procedures decreased faster from 2014–2015 than from 2013–2014 (4.2 vs. 2.8 percent decrease).

Table 3. Changes in the Percentage of Inpatient Stays With an Operating Room Procedure in the SID, by Expected Payer

Expected Primary Payer	Percentage of Inpatient Stays With an Operating Room Procedure			Percentage Change	
	Q4 2013	Q4 2014	Q4 2015	2013–2014	2014–2015
All discharges	29.03	28.42	34.04	–2.1	19.8
Medicare	26.61	25.64	28.07	–3.6	9.5
Medicaid	22.39	22.66	32.08	1.2	41.6
Privately insured	37.47	36.77	44.13	–1.9	20.0
Uninsured	22.32	22.36	24.30	0.2	8.7

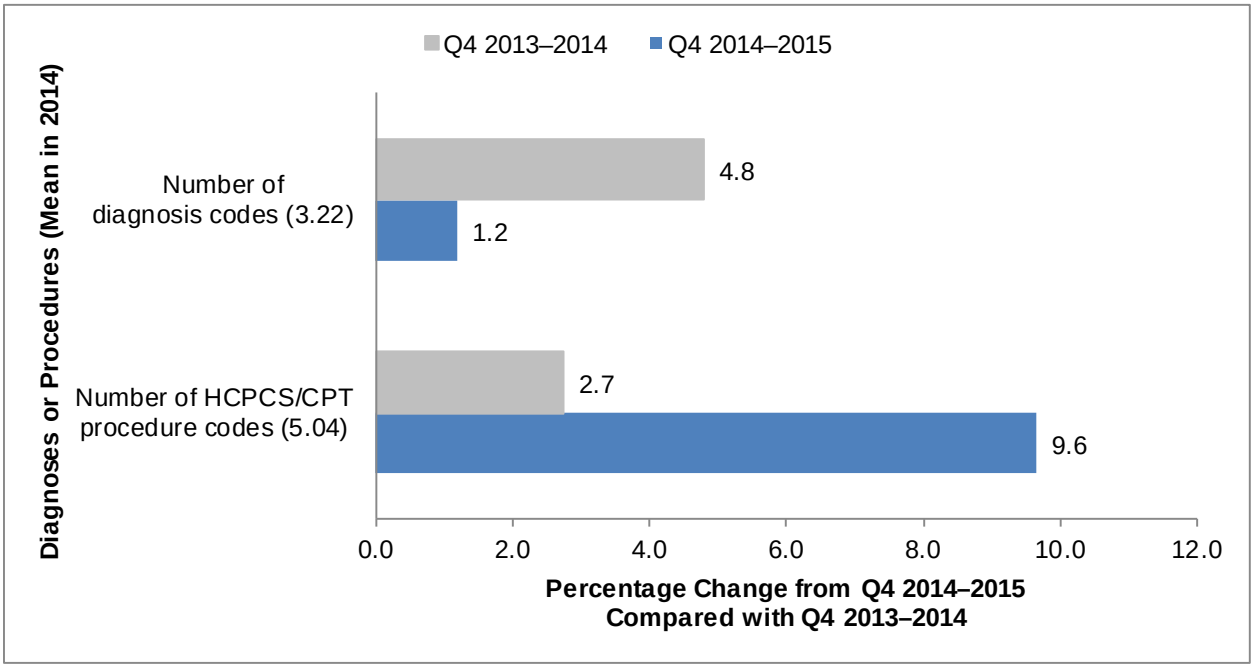
- Like the overall results, the percentage of inpatient stays with an OR procedure increased from 2014–2015. The largest increases were for stays with an expected payer of Medicaid and private insurance.

State Emergency Department Databases

Overall Results

Figure 2 presents the overall percentage change in the number of diagnosis and HCPCS/CPT procedure codes in the SEDD from 2014–2015, compared with changes from 2013–2014. The number of ICD-9-CM and ICD-10-PCS procedure codes is not presented because, starting in 2015, almost no SEDD include these codes.[7]

Figure 2. Overall Percentage Changes in the Mean Number of Diagnosis and HCPCS/CPT Procedure Codes in the SEDD



Abbreviations: CPT, Current Procedural Terminology; HCPCS, Healthcare Common Procedure Coding System; Q, quarter; SEDD, State Emergency Department Databases.

- Diagnosis codes: Increased at a slower rate from 2014–2015 than from 2013–2014
  - 2013–2014: 4.8 percent increase in the mean number of diagnoses per record
  - 2014–2015: 1.2 percent increase in the mean number of diagnoses per record.

- HCPCS/CPT procedure codes: Increased at a faster rate from 2014–2015 than from 2013–2014
  - 2013–2014: 2.7 percent increase in the mean number of procedures per record
  - 2014–2015: 9.6 percent increase in the mean number of procedures per record.

[7] Part of the increase in HCPCS/CPT procedure codes in the SEDD from 2014–2015 could be due to States that provided ICD-9-CM procedure codes to HCUP prior to 2015 and now provide HCPCS/CPT codes.

Results by Expected Payer

Tables 4 and 5 present the percentage change in the mean number of diagnosis and HCPCS/CPT procedure codes in the SEDD from 2014–2015, compared with changes from 2013–2014, by expected payer.

Table 4. Percentage Changes in the Mean Number of Diagnosis Codes in the SEDD, by Expected Payer

Expected Primary Payer	Mean number of Diagnosis Codes			Percentage Change	
	Q4 2013	Q4 2014	Q4 2015	2013–2014	2014–2015
All discharges	3.07	3.22	3.26	4.8	1.2
Medicare	5.10	5.42	5.39	6.2	–0.5
Medicaid	2.52	2.69	2.74	6.5	1.9
Privately insured	2.73	2.85	2.86	4.1	0.4
Uninsured	2.60	2.61	2.63	0.1	1.1

- Like the overall results, for each expected payer group except the uninsured, growth in the mean number of diagnoses slowed during the period 2014–2015 compared with 2013–2014.
- For the uninsured, the mean number of diagnoses increased from 2014–2015 (by 1.1 percent), compared with only a 0.1 percent increase from 2013–2014.

Table 5. Percentage Changes in the Mean Number of HCPCS/CPT Procedure Codes in the SEDD, by Expected Payer

Expected Primary Payer	Mean Number of HCPCS/CPT Procedure Codes			Percentage Change	
	Q4 2013	Q4 2014	Q4 2015	2013–2014	2014–2015
All discharges	4.91	5.04	5.53	2.7	9.6
Medicare	6.92	7.37	7.97	6.4	8.3
Medicaid	3.80	3.96	4.37	4.2	10.5
Privately insured	4.99	5.14	5.64	3.1	9.8
Uninsured	4.75	4.76	5.25	0.1	10.4

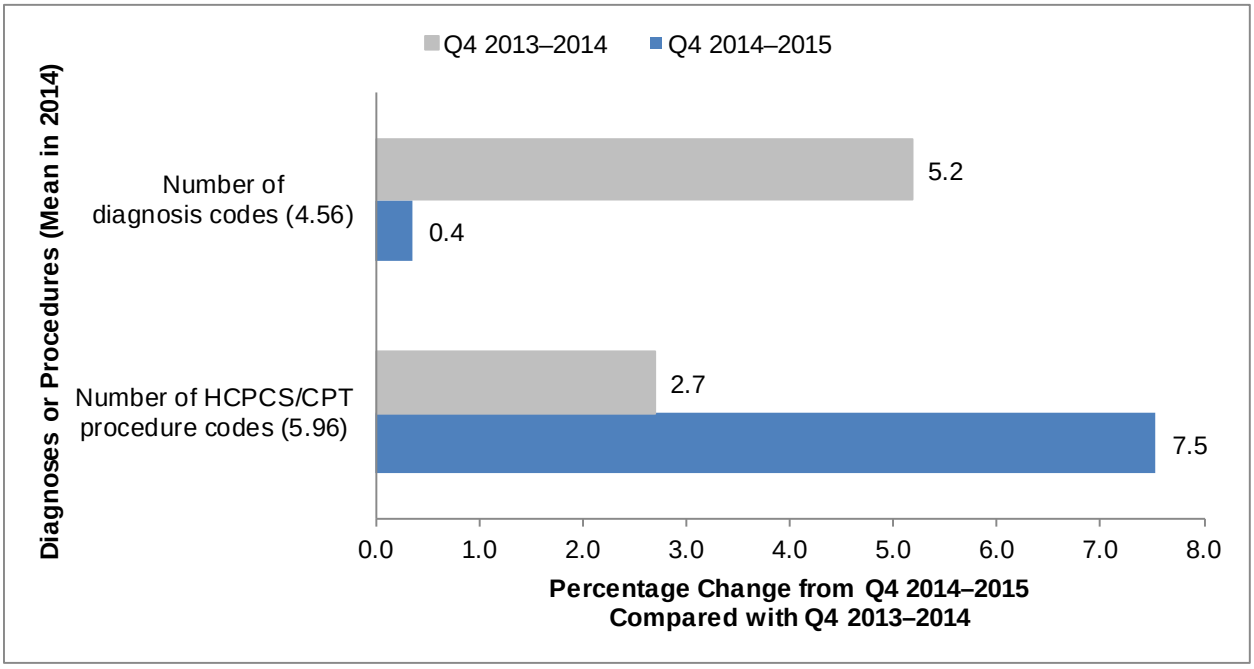
- Like the overall results, the mean number of HCPCS/CPT procedure codes increased at a faster rate for all expected payers from 2014–2015 compared with 2013–2014.

State Ambulatory Surgery and Services Databases

Overall Results

Figure 3 presents the overall percentage change in the mean number of diagnosis and HCPCS/CPT procedure codes in the SASD from 2014–2015 compared with changes from 2013–2014. The number of ICD-9-CM and ICD-10-PCS procedure codes is not presented because almost no SASD include these codes starting in 2015.[8]

Figure 3. Overall Percentage Changes in the Mean Number of Diagnosis and HCPCS/CPT Procedure Codes in the SASD



Abbreviations: CPT, Current Procedural Terminology; HCPCS, Healthcare Common Procedure Coding System; Q, quarter; SASD, State Ambulatory Surgery and Services Databases.

- Diagnosis codes: Increased at a slower rate from 2014–2015 than from 2013–2014
  - 2013–2014: 5.2 percent increase in the mean number of diagnoses per record
  - 2014–2015: 0.4 percent increase in the mean number of diagnoses per record.

- HCPCS/CPT procedure codes: Increased at a faster rate from 2014–2015 than from 2013–2014
  - 2013–2014: 2.7 percent increase in the mean number of procedures per record
  - 2014–2015: 7.5 percent increase in the mean number of procedures per record.

[8] Part of the increase in HCPCS/CPT procedure codes in the SASD from 2014–2015 could be due to States that provided ICD-9-CM procedure codes to HCUP prior to 2015 and now provide HCPCS/CPT codes.

Results by Expected Payer

Tables 6 and 7 present the percentage changes in the number of diagnosis and HCPCS/CPT procedure codes in the SEDD from 2014–2015, compared with changes from 2013–2014, by expected payer.

Table 6. Percentage Changes in the Mean Number of Diagnosis Codes in the SASD, by Expected Payer

Expected Primary Payer	Mean Number of Diagnosis Codes			Percentage Change	
	Q4 2013	Q4 2014	Q4 2015	2013–2014	2014–2015
All discharges	4.34	4.56	4.58	5.2	0.4
Medicare	5.40	5.66	5.66	4.7	0.0
Medicaid	3.58	3.88	3.86	8.4	–0.4
Privately insured	3.85	4.06	4.10	5.4	0.9
Uninsured	3.32	3.47	3.41	4.7	–1.8

- Like the overall results, for each expected payer, growth in the mean number of diagnoses slowed during the period 2014–2015 compared with 2013–2014.

Table 7. Percentage Changes in the Mean Number of HCPCS/CPT Procedure Codes in the SASD, by Expected Payer

Expected Primary Payer	Mean Number of HCPCS/CPT Procedure Codes			Percentage Change	
	Q4 2013	Q4 2014	Q4 2015	2013–2014	2014–2015
All discharges	5.80	5.96	6.40	2.7	7.5
Medicare	5.79	5.99	6.49	3.4	8.4
Medicaid	5.62	5.81	6.11	3.3	5.2
Privately insured	5.78	5.90	6.38	2.2	8.0
Uninsured	6.92	6.87	7.09	–0.7	3.2

- Like the overall results, for all expected payers, growth in the number of HCPCS/CPT procedure codes accelerated from 2014–2015 compared with 2013–2014.

DISCUSSION

Because the number of diagnosis and procedure codes available increased considerably from ICD-9-CM to ICD-10-CM/PCS, we expected to see an increase in the number of codes reported on a hospital record for an inpatient stay, ED visit, or ambulatory surgery encounter. However, there was not an increase in the number of diagnosis codes reported in hospital inpatient or outpatient (ED and ambulatory surgery) data from 2014–2015 relative to 2013–2014. Rather, compared with 2013–2014, the rate of increase in the number of diagnosis codes slowed from 2014–2015, suggesting acclimation to the new coding system.

For inpatient stays, there was a small decrease in the total number of procedures reported under ICD-10-PCS; however, there was a considerable increase in the percentage of inpatient stays with an OR procedure. This large increase is driven in part by a change in the designation of surgical cases between MS-DRG Version 33 (effective October 1, 2015, for ICD-10-CM data) and prior MS-DRG versions under ICD-9-CM. There was some variation by payer categories. These trends generally were consistent across time within payer categories.

When using HCUP data that include both ICD-9-CM and ICD-10-CM/PCS codes, researchers may consider looking at the mean number of diagnosis and procedure codes reported across payers and by discharge quarter to identify populations for which the combination of data across the two coding systems may be problematic.