



**2015 HEALTHCARE COST AND UTILIZATION PROJECT (HCUP) STATE
DATABASES: CHANGE IN STRUCTURE AND DATA ELEMENTS
CAUSED BY TRANSITION TO ICD-10-CM/PCS**

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INTRODUCTION

This document provides an overview of how Healthcare Cost and Utilization Project (HCUP) databases have changed as a result of the introduction of ICD-10-CM. On October 1, 2015, the United States transitioned from using ICD-9-CM to ICD-10-CM/PCS code sets for reporting medical diagnoses and inpatient procedures.¹ ICD-10-CM/PCS 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. Some of the 2015 HCUP State outpatient databases also include ICD-9-CM and ICD-10-PCS procedure codes.

The HCUP State databases are annual, calendar-year files. The introduction of ICD-10 on October 1 means that the 2015 databases include a combination of codes:

- Nine months of the data with ICD-9-CM codes (Jan 1, 2015 to September 30, 2015)
- Three months of data with ICD-10-CM/PCS codes (October 1, 2015 to December 31, 2015).

To alert users to this change in the data, the file structure of the 2015 HCUP State databases differs from the annual files for past and future years in that the first three quarters of data with ICD-9-CM codes are stored separately from the fourth quarter of data with ICD-10-CM/PCS codes. In addition, the names of diagnosis and procedure-related data elements under ICD-10-CM/PCS have been changed to identify the coding scheme.

The HCUP State databases include the State Inpatient Databases (SID), State Emergency Department Databases (SEDD), and State Ambulatory Surgery and Services Databases (SASD). This document outlines the structure of the HCUP State databases in 2015, describes the changes to diagnosis and procedure-related data elements under ICD-10-CM/PCS, and provides resources to aid HCUP data users in using these files and data elements based on ICD-9-CM and ICD-10-CM/PCS codes.

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 emergency department (ED). The SID can be used to investigate questions unique to one State, to compare data from two or more States, to

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

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.

STRUCTURE OF THE 2015 STATE DATABASES

The HCUP State databases are typically calendar-year files including data for discharges from January 1 to December 31 of the year. The 2015 HCUP State databases are split into two separate files based on the discharge date and different coding schemes:

- If the record has a discharge date between January 1, 2015, and September 30, 2015, it is retained in the quarter 1 to quarter 3 (Q1–Q3) file and includes ICD-9-CM data.
- If the record has a discharge date between October 1, 2015, and December 31, 2015, it is retained in the quarter 4 (Q4) file and includes ICD-10-CM/PCS data.

ICD-10-CM/PCS DATA ELEMENTS

Almost all of the diagnosis and procedure-related data elements that are based on ICD-10-CM/PCS data have been renamed. Exceptions include data elements that are based on third-party proprietary software such as diagnosis-related groups (DRGs) and the all patient refined-DRG (APR-DRG). Tables 1–3 provide the list of data element names based on the ICD-9-CM versus ICD-10-CM/PCS coding systems:

- Table 1 includes all data elements based on ICD diagnosis codes.
- Table 2 includes all data elements based on ICD procedure codes.
- Table 3 includes all data elements based on a combination of diagnosis and procedure codes that are not renamed under ICD-10-CM/PCS.

The ICD-9-CM data elements are included in the Q1–Q3 2015 data files, and the ICD-10-CM/PCS data elements are included in the Q4 2015 data files.

Table 1. Names of Data Elements Based on ICD Diagnosis Codes by Discharge Quarter (Q1–Q4)

HCUP Data Element Description ^a	ICD-9-CM Data Element Name (Included in the Q1–Q3 2015 file)	ICD-10-CM Data Element Name (Included in the Q4 2015 file)	HCUP State Database(s)
Diagnosis vector	DXn	I10_DXn	SID, SEDD, SASD
Number of diagnoses	NDX	I10_NDX	SID, SEDD, SASD
Version of ICD diagnosis codes	DXVER (value = 9)	DXVER (value = 10)	SID, SEDD, SASD
Admitting ICD-9-CM diagnosis code	DX_Admitting	I10_DX_Admitting	SID
Reason for visit ICD-9-CM diagnosis	DX_Visit_Reasonn	I10_DX_Visit_Reasonn	SEDD, SASD
CCS for diagnoses	DXCCSn	I10_DXCCSn	SID, SEDD, SASD
MCC for diagnoses	DXMCCSn	I10_DXMCCSn	SID, SEDD, SASD
Comorbidity data elements	CM_<name> There are 29 different comorbidity data elements.	I10_CM_<name>	SID
Chronic flag	CHRONn	I10_CHRONn	SID, SEDD, SASD
Number of chronic conditions	NCHRONIC	I10_NCHRONIC	SID, SEDD, SASD

HCUP Data Element Description^a	ICD-9-CM Data Element Name (Included in the Q1–Q3 2015 file)	ICD-10-CM Data Element Name (Included in the Q4 2015 file)	HCUP State Database(s)
Body system	BODYSYSTEMn	I10_BODYSYSTEMn	SID, SEDD, SASD
Indication of in-hospital birth	HOSPBIRTH	I10_HOSPBIRTH	SID, SEDD, SASD
E codes	ECODEn	I10_ECAUSEn (ICD-10-CM codes beginning with V, W, X, and Y are external cause of morbidity codes.)	SID, SEDD, SASD
Number of E codes	NECODE	I10_NECause	SID, SEDD, SASD
CCS for E codes	E_CCSn	I10_ECauseCCSn	SID, SEDD, SASD
MCC for E codes	E_MCCSn	I10_ECauseMCCSn	SID, SEDD, SASD
Flag for neonatal, maternal, or mixed record	NEOMAT	I10_NEOMAT	SID, SEDD, SASD
Injury flags	INJURY and MULTINJURY	I10_INJURY and I10_MULTINJURY	SID, SEDD, SASD
Flags indicating mechanism for injury	INJURY_<name>	These flags are not assigned for I10 data and therefore are not included in the Q4 files.	SID, SEDD, SASD
Flags indicating intent of injury	INTENT_<name>	These flags are not assigned for I10 data and therefore are not included in the Q4 files.	SID, SEDD, SASD
Service line	SERVICELINE	I10_Serviceline	SID

Abbreviations: CCS, Clinical Classifications Software; E codes, external cause of injury codes; HCUP, Healthcare Cost and Utilization Project; ICD, International Classification of Diseases; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification; MCC, multiple chronic conditions; SASD, State Ambulatory Surgery and Services Databases; SEDD, State Emergency Department Databases; SID, State Inpatient Databases.

^a Detailed descriptions of the HCUP data elements are available on the HCUP User Support Web site under database documentation (<https://www.hcup-us.ahrq.gov/databases.jsp>).

Table 2. Names of Data Elements Based on ICD Procedure Codes by Quarter (Q1–Q4)

HCUP Data Element Description^a	ICD-9-CM Data Element Name (Included in the Q1–Q3 2015 file)	ICD-10-CM Data Element Name (Included in the Q4 2015 file)	HCUP State Database(s)
Procedure vector	PRn	I10_PRn	SID, SEDD, SASD
Number of procedures	NPR	I10_NPR	SID, SEDD, SASD
Version of ICD procedure codes	PRVER (value = 9)	PRVER (value = 10)	SID, SEDD, SASD
Procedure class	PCLASSn	I10_PCLASSn	SID, SEDD, SASD
CCS for procedures	PRCCSn	I10_PRCCSn	SID, SEDD, SASD
MCC for procedures	PRMCCSn	I10_PRMCCSn	SID, SEDD, SASD
Flag for neonatal, maternal, or mixed record	NEOMAT	I10_NEOMAT	SID, SEDD, SASD
Utilization flags	U_<name> There are 30 different utilization flags.	Only 10 of the 30 flags that are assigned based on revenue codes or PRCCS values are renamed: <ul style="list-style-type: none"> • I10_U_BLOOD • I10_U_Cath • I10_U_CTSCAN • I10_U_EKG • I10_U_MHSA • I10_U_MRT • I10_U_PACEMAKER • I10_U_PHYTHERAPY • I10_U_RADTHERAPY • I10_U_STRESS. The other 20 utilization flags are assigned in Q4 using only revenue center codes. ^b	SID, SEDD, SASD
Flag for major operating procedure	ORPROC	I10_ORPROC	SID, SEDD, SASD
Flag indicating ICD and/or CPT procedures on record	PROCTYPE	I10_PROCTYPE	SASD

HCUP Data Element Description^a	ICD-9-CM Data Element Name (Included in the Q1–Q3 2015 file)	ICD-10-CM Data Element Name (Included in the Q4 2015 file)	HCUP State Database(s)
Number of reported ICD-9-CM procedures that qualify as a surgery using a broad definition	HCUP_SURGERY_BROAD_I9	This data element is not assigned for I10 data and therefore is not included in the Q4 files.	SASD
Number of reported ICD-9-CM procedures that qualify as a surgery using a narrow definition	HCUP_SURGERY_NARROW_I9	This data element is not assigned for I10 data and therefore is not included in the Q4 files.	SASD

Abbreviations: CCS, Clinical Classifications Software; CPT®, Current Procedural Terminology; HCUP, Healthcare Cost and Utilization Project; ICD, International Classification of Diseases; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification; MCC, multiple chronic conditions; SASD, State Ambulatory Surgery and Services Databases; SEDD, State Emergency Department Databases; SID, State Inpatient Databases.

^a Detailed descriptions of the HCUP data elements are available on the HCUP User Support Web site under database documentation (<https://www.hcup-us.ahrq.gov/databases.jsp>).

^b The other 20 utilization flags are defined either from revenue center codes or from revenue center codes and ICD-9-CM procedures. The ICD-9 to ICD-10 transition does not affect the definition of utilization flags based solely on revenue center codes. We did not have the ICD-10-CM equivalent codes for the utilization flags that use ICD-9-CM codes in addition to revenue codes when we built the 2015 State databases. Therefore, we did not use the ICD-10-CM procedure codes to trigger these flags in the fourth quarter of 2015.

Table 3. Data Elements Based on ICD Diagnosis and Procedure Codes That Are Not Renamed in the State Inpatient Databases

HCUP Data Element Description^a	ICD-9-CM Data Element Name (Included in the Q1–Q3 2015 file)	ICD-10-CM Data Element Name (Included in the Q4 2015 file)
DRG in use on discharge date	DRG	DRG
DRG, version 32	DRG32	DRG32
DRG in use on discharge date, calculated without POA	DRG_NoPOA	DRG_NoPOA
MDC in effect on discharge date	MDC	MDC
MDC, version 32	MDC32	MDC32
MDC in use on discharge date, calculated without POA	MDC_NoPOA	MDC_NoPOA
All patient refined-DRG	APRDRG	APRDRG

HCUP Data Element Description ^a	ICD-9-CM Data Element Name (Included in the Q1–Q3 2015 file)	ICD-10-CM Data Element Name (Included in the Q4 2015 file)
All patient refined-DRG: risk of mortality subclass	APRDRG_Risk_Mortality	APRDRG_Risk_Mortality
All patient refined-DRG: severity of illness subclass	APRDRG_Severity	APRDRG_Severity

Abbreviations: DRG, diagnosis-related group; HCUP, Healthcare Cost and Utilization Project; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification; MDC, major diagnostic category; POA, present on admission; SID, State Inpatient Databases.

^a Detailed descriptions of the HCUP data elements are available on the HCUP User Support Web site under database documentation (<https://www.hcup-us.ahrq.gov/databases.jsp>).

For a very small percentage of records, the ICD version was inconsistent with the ICD-10 implementation date; that is, there were some records dated after October 1 that included ICD-9 codes and some records dated before October 1 that included ICD-10 codes. The data elements that related to the inconsistent ICD coding were set to invalid, as discussed below.

- Q1–Q3 data that are expected to include ICD-9-CM codes:
 - If the diagnosis version is inconsistent (DXVER=10), then all of the diagnosis-related data elements in Tables 1 and 3 are set to invalid except the following: DXVER stays set to 10 for identification of the record with the inconsistency, and the values of NDX and NECODE are retained to identify the number of codes set to invalid.
 - If the procedure version is inconsistent (PRVER=10), then all of the procedure-related data elements in Tables 2 and 3 are set to invalid except the following: PRVER stays are set to 10 for identification of the record with the inconsistent coding, and the value of NPR is retained to identify the number of codes set to invalid.
- Q4 data that are expected to include ICD-10-CM/PCS codes:
 - If the diagnosis version is inconsistent (DXVER=9), then all of the diagnosis-related data elements in Tables 1 and 3 are set to invalid except the following: DXVER stays are set to 9 for identification of the record with the inconsistency, and the values of NDX and NECODE are retained to identify the number of codes set to invalid.
 - If the procedure version is inconsistent (PRVER=9), then all of the procedure-related data elements in Tables 2 and 3 are set to invalid except the following: PRVER stays are set to 9 for identification of the record with the inconsistent coding, and the value of NPR is retained to identify the number of codes set to invalid.

HCUP STATE DATABASE DOCUMENTATION

Complete documentation of the 2015 HCUP State databases can be found on the HCUP User Support (HCUP-US) Web site at <https://www.hcup-us.ahrq.gov/databases.jsp>. Sections of the documentation that contain specific reference to the new file structure and data elements related to ICD-10-CM/PCS codes are noted below:

- File Specifications for the SID, SASD, and SEDD
 - https://www.hcup-us.ahrq.gov/filespecs/filespecs_search.jsp
- SAS load programs
 - https://www.hcup-us.ahrq.gov/sasload/sasload_search.jsp
- SPSS load programs
 - https://www.hcup-us.ahrq.gov/spssload/spssload_search.jsp
- Stata load programs
 - https://www.hcup-us.ahrq.gov/stataload/stataload_search.jsp
- Availability of data elements by year
 - SID: https://www.hcup-us.ahrq.gov/db/state/siddist/siddist_ddeavailbyyear.jsp
 - SEDD: https://www.hcup-us.ahrq.gov/db/state/sedddist/sedddist_ddeavailbyyear.jsp
 - SASD: https://www.hcup-us.ahrq.gov/db/state/sasddist/sasddist_ddeavailbyyear.jsp
- Summary statistics for all States across all years
 - https://www.hcup-us.ahrq.gov/cdstats/cdstats_search.jsp

Additional resources for evaluating comparability between these coding systems can be found on the HCUP-US Web site under [ICD-10-CM/PCS Resources](#), which includes a link to the HCUP Methods Series Report #2016-02 on this topic titled [Impact of ICD-10-CM/PCS on Research Using Administrative Databases](#).