



**2015 HEALTHCARE COST AND UTILIZATION PROJECT (HCUP)  
NATIONWIDE READMISSIONS DATABASE: 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 the Healthcare Cost and Utilization Project (HCUP) 2015 Nationwide Readmissions Database (NRD) has changed in file structure as a result of the introduction of ICD-10-CM/PCS.<sup>1</sup> On October 1, 2015, the United States transitioned from using ICD-9-CM to ICD-10-CM/PCS code sets for reporting clinical diagnoses and inpatient procedures. 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.

The NRD is a database of all-payer hospital inpatient stays that can be used to generate national estimates of readmissions. Outcomes of interest include national readmission rates, reasons for returning to the hospital for care, and the hospital costs for discharges with and without readmissions. The NRD data files are annual, calendar-year files. The introduction of ICD-10-CM/PCS on October 1 means that the 2015 NRD includes a combination of codes:

- Nine months of the data with ICD-9-CM codes (January 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 ICD coding scheme, the file structure of the 2015 NRD differs from the annual files for other data years. In the 2015 NRD, 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. **Data elements based on the HCUP Tools that are derived from ICD-10-CM/PCS codes are not included in the fourth quarter data, but a beta version of the programs to assign the HCUP Tools are available for download on the [HCUP Tools & Software](#) section of the HCUP-US Web site.**

This document outlines the revised file structure of the HCUP NRD 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.

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<sup>1</sup> 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

## REVISED FILE STRUCTURE OF THE 2015 NATIONWIDE READMISSIONS DATABASE

Because of the transition to ICD-10-CM/PCS on October 1, 2015, the 2015 NRD file structure and the locations of many of the data elements within the files have changed.

- The **Core File** continues to be a single file containing commonly used data elements (e.g., age, expected primary payer, total charges). The difference in 2015 is that data elements based on diagnoses and procedures have been moved out of the Core File and into the Diagnosis and Procedure Groups Files.
- The **Diagnosis and Procedure Groups File** has been split into two files by discharge quarter (Q1–Q3 indicating discharge quarters 1-3 with ICD-9-CM data and Q4 for discharge quarter 4 with ICD-10-CM/PCS data).
  - **Diagnosis and Procedure Groups File for Q1–Q3**—Nine months of 2015 data with data elements based on ICD-9-CM codes (discharges from January 1, 2015 – September 30, 2015). The Q1–Q3 file includes diagnosis and procedure codes in addition to data elements based on ICD-9-CM codes such as Diagnosis-Related Groups (DRGs), Clinical Classification Software (CCS) categories for diagnoses and procedures, and other data elements derived from AHRQ software tools.
  - **Diagnosis and Procedure Groups File for Q4**—Three months of 2015 data with data elements based on ICD-10-CM/PCS codes (discharges from October 1, 2015 – December 31, 2015). The Q4 file includes the ICD-10-CM/PCS diagnosis and procedure codes in data elements with the prefix “I10\_”. Data elements derived from AHRQ software tools are not available in the Q4 file because the ICD-10-CM/PCS versions are still under development.<sup>2</sup>
- The **Disease Severity Measures File** has been split into two files by discharge quarter.
  - **Disease Severity Measures File for Q1–Q3**—Nine months of 2015 data with data elements associated with the 3M All Payer Refined Diagnosis Related Groups (APR-DRGs) and the Elixhauser Comorbidity Software that are based on ICD-9-CM codes (discharges from January 1, 2015 – September 30, 2015)
  - **Disease Severity Measures File for Q4**—Three months of 2015 data with data elements associated with the 3M APR-DRGs based on ICD-10-CM/PCS codes (discharges from October 1, 2015 – December 31, 2015). The Elixhauser Comorbidity Software indicators are not available in the Q4 file because the ICD-10-CM/PCS version of the software is still under development.
- The **Hospital Weights File** continues to include data elements related to hospital characteristics.

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<sup>2</sup> Beta versions of the HCUP Tools & Software for ICD-10-CM/PCS are available on the [HCUP User Support Web site](#).

## DATA ELEMENTS IN THE 2015 NRD RELATED TO ICD-9-CM AND ICD-10-CM/PCS CODES

Almost all of the diagnosis- and procedure-related data elements that are based on ICD-10-CM/PCS data have different data element names than the ICD-9-CM version. Exceptions include data elements that are based on third-party proprietary software such as Diagnosis-Related Groups (DRGs) and the 3M All Patient Refined-DRG (APR-DRG).

No data elements related to diagnosis and procedure codes are included in the 2015 NRD Core or Hospital Files. Tables 1 and 2 provide the list of data element names based on the ICD-9-CM and ICD-10-CM/PCS coding systems and their file location in the 2015 NIS:

- Table 1 includes all data elements based on *diagnosis and procedure codes* in the Diagnosis and Procedure Groups Files.
- Table 2 includes all data elements based on *diagnosis and procedure codes* in the Disease Severity Measures Files.

Complete documentation of the 2015 HCUP NRD can be found on the HCUP User Support (HCUP-US) Web site at <https://www.hcup-us.ahrq.gov/db/nation/nrd/nrddbdocumentation.jsp>.

**Table 1. Names of Data Elements Based on Diagnosis and Procedure Codes in the Diagnosis and Procedure Groups Files, Q1–Q3 with ICD-9-CM Codes and Q4 with ICD-10-CM/PCS Codes**

<b>HCUP Data Element Description<sup>a</sup></b>	<b>ICD-9-CM Data Element Included in the Q1–Q3 Diagnosis and Procedure Groups File</b>	<b>ICD-10-CM/PCS Data Element Included in the Q4 Diagnosis and Procedure Groups File</b>
<b>Data Elements based on Diagnoses Only</b>		
Diagnoses	DX1-DX30	I10_DX1-I10_DX30
Number of diagnoses	NDX	I10_NDX
CCS for diagnoses	DXCCS1-DXCCS30	Not available <sup>b</sup>
MCC for principal diagnosis	DXMCCS1	Not available <sup>b</sup>
Chronic flag	CHRON1-CHRON30	Not available <sup>b</sup>
Number of chronic conditions	NCHRONIC	Not available <sup>b</sup>
Body system	BODYSYSTEM1-BODYSYSTEM30	Not available <sup>b</sup>
External cause diagnoses	ECODE1-ECODE4 (External cause of injury codes)	I10_ECAUSE1-I10_ECAUSE4 (External cause of morbidity codes)
Number of E codes	NECODE	I10_NECause
CCS for external cause	E_CCS1-E_CCS4	Not available <sup>b</sup>
MCC for first external cause	E_MCCS1	Not available <sup>b</sup>
Diagnosis indicating in-hospital birth	HOSPBIRTH	Not available <sup>c</sup>
<b>Data Elements based on Procedures Only</b>		
Procedure vector	PR1-PR15	I10_PR1-I10_PR15
Number of procedures	NPR	I10_NPR
Day of procedure	PRDAY1-PRDAY15	PRDAY1-PRDAY15
CCS for procedures	PRCCS1-PRCCS15	Not available <sup>b</sup>
MCC for first procedure	PRMCCS1	Not available <sup>b</sup>
Procedure class	PCLASS1-PCLASS15	Not available <sup>b</sup>
Flag for major operating procedure	ORPROC	Not available <sup>d</sup>
<b>Data Elements based on Both Diagnoses and Procedures</b>		
DRG version	DRGVER	DRGVER
DRG in use on discharge date	DRG	DRG
DRG in use on discharge date, calculated without POA	DRG_NoPOA	DRG_NoPOA
MDC in effect on discharge date	MDC	MDC

HCUP Data Element Description <sup>a</sup>	ICD-9-CM Data Element Included in the Q1–Q3 Diagnosis and Procedure Groups File	ICD-10-CM/PCS Data Element Included in the Q4 Diagnosis and Procedure Groups File
MDC in use on discharge date, calculated without POA	MDC_NoPOA	MDC_NoPOA
Flag for neonatal, maternal, or mixed record	NEOMAT	Not available <sup>e</sup>
Hospital service line	SERVICELINE	Not available <sup>f</sup>

Abbreviations: CCS, Clinical Classifications Software; DRG, diagnosis-related group; 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; MDC, major diagnostic category.

<sup>a</sup> Detailed descriptions of the HCUP data elements are available on the HCUP User Support Web site under [NRD database documentation](#).

<sup>b</sup> Data elements derived from HCUP software tools are not available on the Q4 file because the ICD-10-CM/PCS versions are under development. If an ICD-10-CM/PCS version of AHRQ software tools are needed, please refer to the [HCUP Tools and Software](#) section of the HCUP-US Web site.

<sup>c</sup> A definition of HOSPBIRTH has not been developed using ICD-10-CM diagnosis codes.

<sup>d</sup> ORPROC is derived from the procedure class which is not available on the Q4 file; therefore, ORPROC also is not available.

<sup>e</sup> A definition of NEOMAT has not been developed using ICD-10-CM/PCS codes.

<sup>f</sup> SERVICELINE is derived from the principal diagnosis CCS and DRGs. Because the diagnosis CCS is not available on the Q4 file, SERVICELINE also is not available.

**Table 2. Names of Data Elements Based on Diagnoses and Procedure Codes in the Disease Severity Measures Files, Q1–Q3 with ICD-9-CM Codes and Q4 with ICD-10-CM/PCS Codes**

HCUP Data Element Description <sup>a</sup>	ICD-9-CM Data Element Included in the Q1–Q3 Disease Severity Measures File	ICD-10-CM/PCS Data Element Included in the Q4 Disease Severity Measures File
Elixhauser Comorbidity Software data elements	CM_<name of comorbidity> There are 29 different comorbidity data elements.	Not available <sup>b</sup>
All patient refined-DRG	APRDRG	APRDRG
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/PCS, International Classification of Diseases, Tenth Revision, Clinical Modification and Procedure Coding System.

<sup>a</sup> Detailed descriptions of the HCUP data elements are available on the HCUP User Support Web site under [NRD database documentation](#).

<sup>b</sup> Data elements derived from HCUP software tools are not available on the Q4 file because the ICD-10-CM/PCS versions are under development. If an ICD-10-CM/PCS version of AHRQ software tools are needed, please refer to the [HCUP Tools and Software](#) section of the HCUP-US Web site.



## STUDYING READMISSIONS USING THE 2015 NRD

The NRD was designed to support many different types of readmission analyses. Analysts can use the information contained in the NRD to define the index event and readmission specific to their topic of interest. Common terminology is first defined:

- *Index event* – the starting point for analyzing repeat hospital visits.
- *Readmission* – a subsequent inpatient admission within a specified time period after discharge of the index stay; readmission may be for a specific cause or any cause.

The index event is typically defined by a combination of clinical and demographic criteria. Inclusion and exclusion criteria should be used to define an index event indicator that identifies NRD discharges as an index event specific to the analysis of interest. The NRD does not include a data element for index events because they are specific to each analysis. The NRD includes the information necessary to define different types of index events.

Deciding which discharge months should be included when qualifying an index event depends on (1) the time that will be allowed for a readmission, and (2) the data year. For example, if studying 30-day readmissions with the 2014 NRD, the index event might be limited to those occurring in the discharge months of January through November. That allows the month of December for 30 days of follow-up.<sup>3</sup> In contrast, defining index events using the 2015 NRD needs to take into consideration the transition to ICD-10-CM/PCS on October 1, 2015. For example, if inclusion criteria for index events are based on ICD-9-CM diagnosis or procedure codes, these codes will only be available for the first nine months of the year. As such, it may be advisable to limit diagnosis- or procedure-specific readmissions analyses to these nine months. Selection of the time period will depend on whether the study is focused on diagnosis- and/or procedure-specific index events and readmissions. Consider three examples:

- Example 1. Index events are not defined by diagnoses and/or procedure codes followed by all-cause 30-day readmissions
  - Index events not defined by ICD-9-CM codes but other criteria (e.g., expected payer, age): Limit the index event to the discharge months of January through November. This allows December to identify all-cause 30-day readmissions.
  - All-cause readmissions: Use discharge months of January through December. Twelve months can be included because all-cause readmissions are not dependent on diagnosis/procedure coding.
- Example 2. Index events defined by diagnoses and/or procedure codes followed by all-cause 30-day readmissions
  - Index events defined by ICD-9-CM codes (e.g., diabetes, hip replacement): Limit the index event to the discharge months of January through September with ICD-9-CM data
  - All-cause readmissions: Use discharge months of January through October. October data with ICD-10-CM/PCS data can be included because all-cause

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<sup>3</sup> Although it would be advantageous to be able to select a more specific date for a cut-off, patient confidentiality concerns limited the available information on the admission and discharge dates to discharge month (data element DMONTH) and discharge year (data element YEAR).

readmissions are not dependent on diagnosis/procedure coding.

- Example 3. Both index events and 30-day readmissions are defined by diagnoses and/or procedure codes
  - Index events defined by ICD-9-CM codes (e.g., diabetes, hip replacement): Limit the index event to the discharge months of January through August with ICD-9-CM data
  - Readmissions based on ICD-9-CM codes (e.g., post-surgical infection): Use discharge months of January through September (with ICD-9-CM codes). October through December should be excluded from consideration unless the ICD-10-CM/PCS codes can be identified that are equivalent to the ICD-9-CM codes used to define readmissions in January through September.

## RESOURCES FOR USING ADMINISTRATIVE DATA WITH ICD-10-CM/PCS DIAGNOSIS AND PROCEDURE CODES

The HCUP-US Web site has a section on [ICD-10-CM/PCS Resources](#) that summarizes key issues for researchers using HCUP and other administrative databases that include ICD-9-CM and ICD-10-CM/PCS coding.

If you are unfamiliar with ICD-10-CM/PCS coding, please refer to the following two documents available on the Web page:

- [A brief introduction to the ICD-10-CM/PCS coding system.](#)
- HCUP Methods Series Report on the [Impact of ICD-10-CM/PCS on Research Using Administrative Databases.](#)

If you are considering using the NRD to examine clinical conditions that will be defined using both ICD-9-CM and ICD-10-CM/PCS coding, please refer to the following important resource:

- [HCUP recommendations for reporting trends using ICD-9-CM and ICD-10-CM/PCS data.](#)

These recommendations apply to calendar year 2015 data (which includes both ICD-9-CM and ICD-10-CM/PCS codes), as well as reporting trends that span the October 1, 2015 transition date (before and after the introduction of ICD10-CM/PCS).

The HCUP [ICD-10-CM/PCS Resources](#) Web page also includes the following short reports with new documents added periodically:

- Examination of trends between ICD-9-CM and ICD-10-CM/PCS for key data elements such as number of diagnoses/procedures and Clinical Classification Software categories.
- Examination of coding for opioid use under ICD-9-CM and ICD-10-CM/PCS.
- Other Federal and State Web resources with information on ICD-10-CM/PCS.