How to for CCS for ICD and Procedure mapping

Angel Huang 2023/8/18

Contents

[Package summary 1](#_Toc143253090)

[Download sources 2](#_Toc143253091)

[1. CCS for Procedure (CPT) 2](#_Toc143253092)

[2. CCS for ICD diagnosis code (ICD-9-CM, ICD-10-CM Clinical Modification) 2](#_Toc143253093)

[3. CCSR for ICD diagnosis code (ICD-10-CM Clinical Modification): 2](#_Toc143253094)

[Customized code 2](#_Toc143253095)

[1. CCS for Procedure (CPT) 2](#_Toc143253096)

[2. CCS for ICD diagnosis code (ICD-9-CM, ICD-10-CM Clinical Modification) 3](#_Toc143253097)

[3. CCSR for ICD diagnosis code 3](#_Toc143253098)

# Package summary

* This is a package with Clinical Classifications Software (CCS) mapping to common diagnosis and procedure codes.
* Note that all three CCS are different
* The package includes 3 CCS categorizations:
* **1. CCS PCS**: Procedure categorization which includes groupings for HCPCS/CPT-4, ICD-9 and ICD-10 (beta). 54982 HCPCS/CPT4, 3948 ICD-9, and 80492 ICD-10 codes are aggregated to 244 CCS procedure categories.
* **2. CCS DX**: Diagnosis categorization initially created based on ICD-9 codes. ICD-10 code mappings were later included in the original categories as a beta release. 13726 ICD-9-CM and 72446 ICD-10-CM codes are aggregated to 308 CCS diagnosis categories.
* **3. CCSR DX**: Refined categorization released in 2019 and based on ICD-10 codes. Does not currently include ICD-9 code mappings. 82738 ICD-10-CM diagnosis codes are aggregated to 538 CCSR diagnosis categories.

# Download sources

## CCS for Procedure (CPT)

* To get the updated mapping files, go to this website: <https://hcup-us.ahrq.gov/toolssoftware/ccs_svcsproc/ccssvcproc.jsp>
* Go to the bottom of the page > click on “CCS Services and Procedures License Agreement”
* A white background with text

  Description automatically generated
* Click on “ACCEPT” in the next page
* A screenshot of a computer program

  Description automatically generated
* Download **CCS-Services and Procedures** – this includes the mapping between CPT code and CCS categories

## CCS for ICD diagnosis code (ICD-9-CM, ICD-10-CM Clinical Modification)

* Downloading procedure is similar to CCS\_PCS above, but from links below:
  + <https://hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp> (ICD9)
  + <https://hcup-us.ahrq.gov/toolssoftware/ccs10/ccs10.jsp> (ICD10)
* This is a beta version of mapping categories, we are moving towards using CCSR below.
* But this has both mappings from ICD9 and ICD10.

## CCSR for ICD diagnosis code (ICD-10-CM Clinical Modification):

* Downloading procedure is similar to CCS\_PCS above, but from the link below:
  + <https://hcup-us.ahrq.gov/toolssoftware/ccsr/dxccsr.jsp#download>
* This is a more up-to-date mapping system, officially-recommended over CCS-ICD, kept more of the clinical structure of ICD-10.
* But this only has mappings from ICD10. You would need to map ICD9 to ICD10 first, or map both ICD9 and ICD10 to CCS-ICD, then to CCSR-ICD.

# Customized code

## CCS for Procedure (CPT)

1. Preprocess mapping file: eg. CCS\_services\_procedures\_v2022-1\_052422.csv
   * 1. This file has 3 columns: Code Range, CCS, CCS Label
     2. Note that the first column is a range of CPT codes like '61000-61001', we need to first process it into 1 code per line for easier mapping. This can be done by our customized R code preprocess\_cpt\_ccs\_mapping.R
2. cpt\_ccs\_mapping\_v2022-1.csv is the cleaned-up mapping file with 1 CPT code per line (you can use this mapping file directly if v2022 is good for your analysis)
3. Run process\_procedures.ipynb to add CCS category as a column to your dataframe corresponding to the CPT code
4. Alternatively, you can use the official SAS program CCS\_Services\_Procedures\_Mapping\_Program\_v2022-1.sas
5. Example user case: You can calculate the sum of each CCS category per patient and pivot CCS categories as columns (eg. For predictive modeling purpose)

## CCS for ICD diagnosis code (ICD-9-CM, ICD-10-CM)

* 1. Two mapping files ccs\_dx\_icd9\_dxref\_2015.csv, and ccs\_dx\_icd10cm\_2019\_1.csv are for ICD9 and ICD10, respectively. They map to the same CCS categories.
  2. Run process\_diagnoses.ipynb to add CCS category as a column to your dataframe corresponding to the ICD9 or ICD10 code (you need both ICD code, and ICD code type columns in your dataframe). This code will call ccs.py that does the mapping.
  3. Alternatively, you can use the official SAS program ICD10\_Single\_CCS\_Load\_Program.sas
  4. Example user case: You can calculate the sum of each CCS category per patient and pivot CCS categories as columns (eg. For predictive modeling purpose)

## CCSR for ICD diagnosis code (ICD-10-CM)

* The code is under development, but would be similar to CCS for ICD diagnosis