Title

> **icd10pcs —** ICD-10-PCS procedure codes

Description

icd10pcs is a suite of commands for working with ICD-10-PCS procedure codes from U.S. federal fiscal year 2016 to the present. To see the current version of the ICD-10-PCS procedure codes and any changes that have been applied, type icd10pcs query.

icd10pcs check, icd10pcs clean, and icd10pcs generate are data management commands. icd10pcs check verifies that a variable contains defined ICD-10-PCS procedure codes and provides a summary of any problems encountered. icd10pcs clean standardizes the format of the codes. icd10pcs generate can create a binary indicator variable for whether the code is in a specified set of codes, a variable containing a corresponding higher-level code, or a variable containing the description of the code.

icd10pcs lookup and icd10pcs search are interactive utilities. icd10pcs lookup displays descriptions of the codes specified on the command line. icd10pcs search looks for relevant ICD-10-PCS procedure codes from keywords given on the command line.

Quick start

Determine whether ICD-10-PCS procedure codes in proc1 are invalid and store reasons in invalid
    icd10pcs check proc1, generate(invalid)

Standardize display of codes in proc2 to add a period and left-align codes
    icd10pcs clean proc2, replace

Check that the codes in proc3 conform to ICD-10-PCS formatting rules, and if so, create main as the corresponding three-character category code
    icd10pcs generate main = proc3, category check

Generate descr4 as the current short description of procedure code in proc4
    icd10pcs generate descr4 = proc4, description

Look up current descriptions for procedure codes 081.23J4 through 081.Y3Z3
    icd10pcs lookup 081.23J4/081.Y3Z3

Look up codes where the description from FFY-2016 contains the word "foot"
    icd10pcs search foot, version(2016)

Menu

Data > ICD codes > ICD-10-PCS

Syntax

Verify that variable contains defined codes

   icd10pcs check *varname* [*if*] [*in*] [, *checkopts*]

Clean variable and verify format of codes

   icd10pcs clean *varname* [*if*] [*in*], {<u>gen</u>erate(*newvar*) | replace} [*cleanopts*]

Generate new variable from existing variable

   icd10pcs <u>gen</u>erate *newvar* = *varname* [*if*] [*in*], <u>categ</u>ory [check]

   icd10pcs <u>gen</u>erate *newvar* = *varname* [*if*] [*in*], <u>desc</u>ription [*genopts*]

   icd10pcs <u>gen</u>erate *newvar* = *varname* [*if*] [*in*], <u>r</u>ange(*codelist*) [check]

Display code descriptions

   icd10pcs <u>look</u>up *codelist* [, version(*#*)]

Search for codes from descriptions

   icd10pcs <u>sear</u>ch ["]*text*["] [["]*text*["] ...] [, *searchopts*]

Display ICD-10-PCS version

   icd10pcs <u>q</u>uery

codelist is one of the following:

icd10code	(the particular code)
icd10code∗	(all codes starting with)
icd10code/icd10code	(the code range)

or any combination of the above, such as 041.E09P 2W3∗ BQ2L/BQ2LZZZ.

checkopts	Description
<u>fmt</u>only	check only format of the codes
<u>sum</u>mary	frequency of each invalid or undefined code
<u>l</u>ist	list observations with invalid or undefined ICD-10-PCS codes
<u>gen</u>erate(*newvar*)	create new variable marking invalid codes
version(*#*)	fiscal year to check codes against; default is version(2017)

cleanopts	Description
* <u>generate</u>(*newvar*)	create new variable containing cleaned codes
* <u>replace</u>	replace existing codes with the cleaned codes
check	check that variable contains ICD-10-PCS codes before cleaning
<u>nodots</u>	format codes without a period

*Either generate() or replace is required.

genopts	Description
<u>addcode</u>(begin|end)	add code to the beginning or end of the description
<u>nodots</u>	format codes without a period; must specify addcode()
check	check that variable contains ICD-10-PCS codes before generating new variable
long	use long description rather than short
version(#)	select description from fiscal year #; default is version(2017)

searchopts	Description
or	match any keyword
<u>matchcase</u>	match case of keywords
version(#)	search description from fiscal year #; default is all

Options

Options are presented under the following headings:

> *Options for icd10pcs check*
> *Options for icd10pcs clean*
> *Options for icd10pcs generate*
> *Option for icd10pcs lookup*
> *Options for icd10pcs search*

Options for icd10pcs check

fmtonly tells `icd10pcs check` to verify that the codes fit the format of ICD-10-PCS procedure codes but not to check whether the codes are defined.

summary specifies that `icd10pcs check` should report the frequency of each invalid or undefined code that was found in the data. Codes are displayed in descending order by frequency. summary may not be combined with list.

list specifies that `icd10pcs check` list the observation number, the invalid or undefined ICD-10-PCS procedure code, and the reason the code is invalid or whether it is an undefined code. list may not be combined with summary.

generate(*newvar*) specifies that `icd10pcs check` create a new variable containing, for each observation, 0 if the observation contains a defined code. Otherwise, it contains a number from 1 to 11 if the code is invalid, 77 if the code is valid only for a previous version, 88 if the code is valid only for a later version, 99 if the code is undefined, or missing if the code is missing. The positive numbers indicate the kind of problem and correspond to the listing produced by `icd10pcs check`.

version(*#*) specifies the version of the codes that `icd10pcs check` should reference. *#* indicates the federal fiscal year for the codes. For example, use 2016 for federal fiscal year 2016 (FFY-2016), which is October 1, 2015 to September 30, 2016. `icd10pcs` supports all years after the United States officially adopted ICD-10-PCS. The appropriate value of *#* should be determined from the data source. The default is version(2017).

Warning: The default value of version() will change over time so that the most recent codes are used. Using the default value rather than specifying a specific version may change results after a new version of the codes is introduced.

Options for icd10pcs clean

generate(*newvar*) and replace specify how the formatted values of *varname* are to be handled. You must specify either generate() or replace.

generate() specifies that the cleaned values be placed in the new variable specified in *newvar*.

replace specifies that the existing values of *varname* be replaced with the formatted values.

check specifies that `icd10pcs clean` should first check that *varname* contains codes that fit the format of ICD-10-PCS procedure codes. Specifying the check option will slow down `icd10pcs clean`.

nodots specifies that the period be removed in the final format.

Options for icd10pcs generate

category, description, and range(*codelist*) specify the contents of the new variable that `icd10pcs generate` is to create. You do not need to `icd10pcs clean` *varname* before using `icd10pcs generate`; it will accept any supported format or combination of formats.

category specifies to extract the three-character category code from the ICD-10-PCS procedure code. The resulting variable may be used with the other `icd10pcs` subcommands.

description creates *newvar* containing descriptions of the ICD-10-PCS procedure codes.

range(*codelist*) creates a new indicator variable equal to 1 when the ICD-10-PCS procedure code is in the range specified, equal to 0 when the ICD-10-PCS procedure code is not in the range, and equal to missing when *varname* is missing.

addcode(begin | end) specifies that the code should be included with the text describing the code. Specifying addcode(begin) will prepend the code to the text. Specifying addcode(end) will append the code to the text.

nodots specifies that the code that is added to the description should be formatted without a period. nodots may be specified only if addcode() is also specified.

check specifies that `icd10pcs generate` should first check that *varname* contains codes that fit the format of ICD-10-PCS procedure codes. Specifying the check option will slow down the generate subcommand.

long specifies that the long description of the code be used rather than the short (abbreviated) description.

version(*#*) specifies the version of the codes that `icd10pcs generate` should reference. *#* indicates the federal fiscal year for the codes. For example, use 2016 for federal fiscal year 2016 (FFY-2016), which is October 1, 2015 to September 30, 2016. `icd10pcs` supports all years after the United States officially adopted ICD-10-PCS. The appropriate value of *#* should be determined from the data source. The default is version(2017).

Warning: The default value of version() will change over time so that the most recent codes are used. Using the default value rather than specifying a specific version may change results after a new version of the codes is introduced.

Option for icd10pcs lookup

version(#) specifies the version of the codes that icd10pcs lookup should reference. # indicates the federal fiscal year for the codes. For example, use 2016 for federal fiscal year 2016 (FFY-2016), which is October 1, 2015 to September 30, 2016. icd10pcs supports all years after the United States officially adopted ICD-10-PCS. The appropriate value of # should be determined from the data source. The default is version(2017).

Warning: The default value of version() will change over time so that the most recent codes are used. Using the default value rather than specifying a specific version may change results after a new version of the codes is introduced.

Options for icd10pcs search

or specifies that ICD-10-PCS procedure codes be searched for descriptions that contain any word specified with icd10pcs search. The default is to list only descriptions that contain all the words specified.

matchcase specifies that icd10pcs search should match the case of the keywords given on the command line. The default is to perform a case-insensitive search.

version(#) specifies the version of the codes that icd10pcs search should reference. # indicates the federal fiscal year for the codes. For example, use 2016 for federal fiscal year 2016 (FFY-2016), which is October 1, 2015 to September 30, 2016. icd10pcs supports all years after the United States officially adopted ICD-10-PCS.

By default, descriptions for all versions are searched, meaning that codes that changed descriptions and that have descriptions in multiple versions that contain the search terms will be duplicated. To ensure a list of unique code values, specify the version number.

Remarks and examples   stata.com

Remarks are presented under the following headings:

If you have not yet read *Introduction to ICD coding* in [D] **icd**, please do so before using the icd10pcs commands.

Introduction

The general format of an ICD-10-PCS procedure code is a three-character category code followed by four alpha-numeric characters after an (implied) period. The full codes are always seven characters long and may be any combination of letters and numbers.

Some examples of ICD-10-PCS procedure codes are 081 (Eye, Bypass) and 0GT.D0ZZ (Resection of Aortic Body, Open Approach). Many datasets record (and some people write) codes without the period; for example, the code 090.KXZZ may appear as 090KXZZ. The icd10pcs commands understand both ways of recording codes. The commands are also insensitive to codes recorded with or without leading and trailing blanks and are case insensitive.

All the following are acceptable formats to record codes in Stata:

```
03R
        0jj
    00f53zz
    0TL.C0ZZ
     091
```

Important note: What constitutes a valid code changes between versions. For the rest of this entry, a defined code is any code that is currently valid, was valid at some point since the ICD-10-CM/PCS coding system was introduced, or has a meaning as a grouping of codes. The list of valid codes and their associated descriptions is from the U.S. Centers for Medicare and Medicaid Services (CMS).

To view the current version of the ICD-10-PCS procedure codes in Stata, its source, and a log of changes that have been made to the list of ICD-10-PCS procedure codes since the icd10pcs commands were implemented, type

```
. icd10pcs query
ICD-10-PCS Procedure Code Version and Change Log
  Note
     Stata obtains the ICD-10-PCS dataset from the Centers for Medicare and
        Medicaid Services website.
  FY 2017 version
     Between 2016 and 2017:
        3827 codes added, 12 codes deleted, 738 code descriptions changed.
```
   (*output omitted*)

Managing datasets with ICD-10-PCS codes

The icd10pcs suite of commands has three data management commands. icd10pcs check verifies that the ICD-10-PCS procedure codes in *varname* are valid. icd10pcs clean standardizes the format of ICD-10-PCS procedure codes in *varname*. And icd10pcs generate produces a new variable from an existing variable containing ICD-10-PCS procedure codes.

Examples in this section use hosp2015.dta, a fictional sample of inpatient hospital discharges in Washington state from July 2015 to December 2015. The data were simulated based on the Comprehensive Hospital Abstract Reporting System (CHARS); see http://www.doh.wa.gov/Dataand StatisticalReports/HealthcareinWashington/HospitalandPatientData/HospitalDischargeDataCHARS. Examples analyzing the diagnosis codes for this dataset can be found in [D] **icd10cm**.

```
. use http://www.stata-press.com/data/r15/hosp2015
(Fictional WA hospital discharges)
```

icd10pcs check is the primary subcommand for validating ICD-10-PCS procedure codes. However, if you just want to verify that the codes conform to the formatting rules for ICD-10-PCS procedure, you can use the check option with icd10pcs clean or icd10pcs generate.

▷ Example 1: Checking for valid code values

You use `icd10pcs check` just like you do `icd10cm check`. Because the data are from federal fiscal year 2016, we specify `version(2016)`.

In example 1 of [D] **icd10cm**, we found that we needed to account for the date of the admission when we used the `icd10cm` commands. The same is true of the `icd10pcs` commands because the two systems were implemented simultaneously. We preemptively exclude records before October 2015 here.

```
. drop if dmonth < tm(2015m10)
(1,955 observations deleted)

. icd10pcs check proc1, version(2016)
(proc1 contains defined codes; 594 missing values)
```

We find that there are no errors in the coding of the `proc1` variable and that 594 records in our dataset did not have any procedure at all.

◁

If we wanted to check codes in more than one procedure variable, we could use a `foreach` loop or `reshape` our data; see *Working with multiple codes* in [D] **icd**. With large datasets, it is generally faster to use a loop.

It is a good idea to begin with `icd10pcs check` and fix any potential problems before proceeding to other `icd10pcs` commands. The `icd10pcs check` command with the `generate()` or `list` option is also useful for tracking down problems when any of the other `icd10pcs` commands tell you that the variable "contains invalid codes".

`icd10pcs clean` formats the variable to ensure consistency and to make subsequent output from other commands such as `list` and `tabulate` look better. `icd10pcs clean` also can be used to verify that the codes in a variable conform to the ICD-10-CM format, without checking to see whether the codes are defined.

▷ Example 2: Cleaning an existing variable

We standardize all the ICD-10-PCS procedure codes in `proc1` to include a period after the third character. We specify the `replace` option rather than the `generate()` option so that the values in `proc1` are replaced with their formatted values.

```
. icd10pcs clean proc1, replace
variable proc1 was str7 now str8
(1,980 real changes made)
```

`icd10pcs clean` reports that 1,980 values were replaced. If we wanted to standardize to a format without the period, we could have specified the `nodots` option.

◁

Aside from validating values of codes, the `icd10pcs` command is primarily used to create inputs for other Stata commands. For example, in example 5 of [D] **icd9**, we show how to graph the frequency of category codes with descriptions, and in example 3 of [D] **icd10cm**, we show how to graph summary statistics by diagnosis.

▷ Example 3: Creating an indicator for common procedures

If we use `tabulate` on the primary procedure code (proc1) the same way we did for the primary diagnosis in example 2, we find that the three most frequent primary procedure codes in our data are 10E0XZZ, 10D00Z1, and 0SRC0J9. Suppose we want to know the average billed amount (`billed`) for all admissions that had one of these procedure codes in the primary procedure field.

Our first step is to create an indicator for whether one of these codes is present in proc1. Then, we summarize `billed` over the three top values of proc1 by using `tabulate`; see [R] **tabulate, summarize()**.

```
. icd10pcs generate top3 = proc1, range(10E0XZZ 10D00Z1 0SRC0J9)
. tabulate proc1 if top3==1, summarize(billed) freq means
```

	Summary of Amount billed ($1,000s)	
Procedure 1	Mean	Freq.
0SR.C0J9	60.62	40
10D.00Z1	27.55	92
10E.0XZZ	14.05	180
Total	24.00	312

We find that the highest average billed amount for the top three codes is for ICD-10-PCS procedure code 0SR.C0J9. There are 40 discharges in our dataset with this code as their principal procedure, and their average billed amount is about $60,620.

◁

Interactive utilities

`icd10pcs lookup` and `icd10pcs search` are interactive tools. You can use them without having any ICD-10-PCS procedure data in memory.

`icd10pcs lookup` lists the descriptions of codes given on the command line, and `icd10pcs search` looks for relevant ICD-10-PCS procedure codes from the specified keywords. The two commands complement each other.

▷ Example 4: Finding procedure code descriptions

Suppose we wanted to find the short descriptions of the most frequent codes in our dataset. We can supply `icd10pcs lookup` with the same list of codes we used in example 3.

```
. icd10pcs lookup 10E0XZZ 10D00Z1 0SRC0J9

    0SR.C0J9 Replace of R Knee Jt with Synth Sub, Cement, Open Approach
    10D.00Z1 Extraction of POC, Low Cervical, Open Approach
    10E.0XZZ Delivery of Products of Conception, External Approach
```

We see, for example, that ICD-10-PCS procedure code 0SR.C0J9 is for a type of knee replacement surgery.

◁

Using `icd10pcs search` is similar to using `icd10cm search`. See example 4 in [D] **icd10cm**.

Stored results

icd10pcs check stores the following in r():

Scalars
r(e#)	number of errors of type #
r(esum)	total number of errors
r(miss)	number of missing values
r(N)	number of nonmissing values

icd10pcs clean stores the following in r():

Scalars
r(N)	number of changes

icd10pcs lookup and icd10pcs search store the following in r():

Scalars
r(N_codes)	number of codes found

Acknowledgments

Also see

[D] **icd** — Introduction to ICD commands

[D] **icd9p** — ICD-9-CM procedure codes

[D] **icd10cm** — ICD-10-CM diagnosis codes