Measure of Quality of Informed Consent Documents for Hospital-Performed, Elective Procedures 2017 SAS Pack Software Documentation

Submitted by Yale-New Haven Health Services Corporation/Center for Outcomes Research & Evaluation (YNHHSC/CORE)

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February 2018

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1. Introduction

This document describes the details for implementing the 2017 quality of informed consent documents for hospital-performed elective procedures measure SAS package (SAS pack) created to produce the Centers for Medicare and Medicaid Services' (CMS') informed consent document quality score. The SAS pack provides hospital-level informed consent document quality score.

The 2017 quality of informed consent documents SAS pack is comprised of three SAS programs and two SAS format files. The part1 program is used to select the hospital-performed elective procedures and the part2 program is used to calculate the informed consent document quality scores from the ACCESS data files which contain the evaluation of the informed consent documents through abstraction tool. The SAS macro file and SAS format files are called by these programs. The programs are:

- Informed_consent_v1.0_part1.sas
- Informed_consent_v1.0_part2.sas
- IC_Macros.sas
- CCS_ten_formats.sas7cat
- LABEL_Formats.sas7cat

The programs can be run for one year or multiple years of data and requires specific data sets and formats as explained in Section **Error! Reference source not found.**. This document provides examples of both the input files Yale New Haven Health Services Corporation – Center for Outcomes Research and Evaluation (CORE) derived from CMS claims data and the output data sets that can be expected once the programs have run successfully.

Note that the data created by CORE were derived for the purpose of developing this measure and serve only as an example of how data could be constructed for implementation of this measure.

2. System requirements

The computer system needed to run the SAS pack should meet the following hardware and software basic requirements:

- Operating System: Microsoft Windows XP Professional or later versions
- Statistical Software: SAS 9.3.0 or later versions
- Hardware: Minimum 96 GB RAM and Minimum 100 GB hard drive space

3. Input data sources

The quality of informed consent documents for hospital-performed elective procedures measure SAS package utilizes pre-processed CMS administrative data to select elective procedures. The following data sources are used in the SAS pack:

a) Medicare Provider Analysis and Review (MedPAR) data file
   - Containing Medicare Part A inpatient claims, to select elective procedures

b) Medicare Denominator file
   - Medicare FFS enrollment, demographic information

The following provides more details about the data sources that are used in the quality of informed consent documents for hospital-performed elective procedures SAS pack.

3.1 Medicare Provider Analysis and Review (MedPAR) data file.

This file includes beneficiary demographic characteristics, diagnosis and surgery information, and use of hospital or skilled nursing facilities (SNF) resources. The record unit for the MedPAR data file is at the patient discharge level. **Table 1** shows the SAS file data structure for the MedPAR data file using the 2016 MedPAR data file (Medpar_2016) as an example.

Table 1. Variables and attributes of the MedPAR data file

Variable	Type	Len	Label
CNTY	Char	3	MEDPAR Beneficiary Residence SSA Standard County Code
DETH	Num	8	Date of Death
DOB	Num	8	Date of Birth
HICNO	Char	11	Beneficiary Identification Number
MEDPAR_ADMSN_DT	Num	8	MEDPAR Admission Date
MEDPAR_BENE_AGE_CNT	Num	8	MEDPAR Beneficiary Age Count
MEDPAR_BENE_BLOOD_DDCTBL_AMT	Num	8	MEDPAR Beneficiary Blood Deductible Liability Amount
MEDPAR_BENE_DSCHRG_STUS_CD	Char	1	MEDPAR Beneficiary Discharge Status Code
MEDPAR_BENE_IDENT_CD	Char	2	MEDPAR Beneficiary Identification Code
MEDPAR_BENE_IP_DDCTBL_AMT	Num	8	MEDPAR Beneficiary Inpatient Deductible Liability Amount
MEDPAR_BENE_MDCR_STUS_CD	Char	2	MEDPAR Beneficiary Medicare Status Code
MEDPAR_BENE_MLG_CNTCT_ZIP_CD	Char	5	MEDPAR Beneficiary Mailing Contact Zip Code
MEDPAR_BENE_PRMRY_PYR_AMT	Num	8	MEDPAR Beneficiary Primary Payer Amount
MEDPAR_BENE_PRMRY_PYR_CD	Char	1	MEDPAR Beneficiary Primary Payer Code
MEDPAR_BENE_PTA_COINSRNC_AMT	Num	8	MEDPAR Beneficiary Part A Coinsurance Liability Amount
MEDPAR_BENE_RACE_CD	Char	1	MEDPAR Beneficiary Race Code
MEDPAR_BENE_RSDNC_SSA_STATE_CD	Char	2	MEDPAR Beneficiary Residence SSA Standard State Code
MEDPAR_BENE_SEX_CD	Char	1	MEDPAR Beneficiary Sex Code
MEDPAR_CRNRY_CARE_IND_CD	Char	1	MEDPAR Coronary Care Indicator Code
MEDPAR_DGNS_CD1-MEDPAR_DGNS_CD25	Char	7	MEDPAR Diagnosis Code #1-MEDPAR Diagnosis Code #25
MEDPAR_DGNS_CD_CNT	Num	8	MEDPAR Claim Present on Admission Diagnosis Code Count
MEDPAR_DRG_CD	Num	8	MEDPAR DRG Code
MEDPAR_DRG_OUTLIER_PMT_AMT	Num	8	MEDPAR DRG Outlier Approved Payment Amount
MEDPAR_DRG_OUTLIER_STAY_CD	Num	8	MEDPAR DRG/Outlier Stay Code
MEDPAR_DRG_PRICE_AMT	Num	8	MEDPAR DRG Price Amount
MEDPAR_DSCHRG_DSTNTN_CD	Num	8	MEDPAR Discharge Destination Code
MEDPAR_DSCHRG_DT	Num	8	MEDPAR Discharge Date
MEDPAR_ICU_IND_CD	Char	1	MEDPAR Intensive Care Unit (ICU) Indicator Code
MEDPAR_IME_AMT	Num	8	MEDPAR Indirect Medical Education (IME)

Variable	Type	Len	Label
			Amount
MEDPAR_IP_ADMSN_TYPE_CD	Char	1	MEDPAR Inpatient Admission Type Code
MEDPAR_IP_DSPRPRTNT_SHR_AMT	Num	8	MEDPAR Inpatient Disproportionate Share Amount
MEDPAR_LOS_DAY_CNT	Num	8	MEDPAR Length of Stay Day Count
MEDPAR_MDCR_PMT_AMT	Num	8	MEDPAR Medicare Payment Amount
MEDPAR_PASS_THRU_AMT	Num	8	MEDPAR Total Pass Through Amount
MEDPAR_PRVDR_NUM_SPCL_UNIT_CD	Char	1	MEDPAR Provider Number Special Unit Code
MEDPAR_PRVDR_STATE_CD	Num	8	MEDPAR Provider State Code
MEDPAR_SRC_IP_ADMSN_CD	Char	1	MEDPAR Source Inpatient Admission Code
MEDPAR_SRGCL_PRCDR_CD1-MEDPAR_SRGCL_PRCDR_CD25	Char	7	MEDPAR Surgical Procedure Code #1-MEDPAR Surgical Procedure Code #25
MEDPAR_SRGCL_PRCDR_CD_CNT	Num	8	MEDPAR Surgical Procedure Code Count
MEDPAR_SRGCL_PRCDR_DT_CNT	Num	8	MEDPAR Surgical Procedure Performed Date Count
MEDPAR_SRGCL_PRCDR_PRFRM_DT1-MEDPAR_SRGCL_PRCDR_PRFRM_DT25	Num	8	MEDPAR Surgical Procedure Performed Date #1-MEDPAR Surgical Procedure Performed Date #25
MEDPAR_SS_LS_SNF_IND_CD	Char	1	MEDPAR Short Stay/Long Stay/SNF Indicator Code
MEDPAR_STAY_FINL_ACTN_CLM_CNT	Num	8	MEDPAR Stay Final Action Claims Count
MEDPAR_TOT_CHRG_AMT	Num	8	MEDPAR Total Charge Amount
MEDPAR_TOT_CVR_CHRG_AMT	Num	8	MEDPAR Total Covered Charge Amount
MEDPAR_TOT_PPS_CPTL_AMT	Num	8	MEDPAR Total PPS Capital Amount
PRVID	Char	6	MEDPAR Provider Number

3.2 CMS Medicare Denominator file

The CMS Medicare denominator file combines Medicare beneficiary entitlement status information from administrative enrollment records with third-party payer information and GHP enrollment information. The Denominator file contains data on all Medicare beneficiaries enrolled and/or entitled in a given year. **Table 2** shows the SAS file data structure for the Denominator file using the 2016 Denominator file (Denoma_2016) as an example.

Table 2. Variables and attributes of the Medicare Denominator file

Variable	Type	Len	Label
Y16AGE	Num	4	AGE
Y16AMO	Num	4	HI Coverage
Y16ATRM	Char	1	Part A Termination Code
Y16BIC	Char	2	ORIGINAL BIC
Y16BMO	Num	4	SMI Coverage
Y16BTRM	Char	1	Part B Termination Code
Y16BUY1- Y16BUY12	Char	1	Medicare Entitlement/Buy indicator
Y16BUYM	Num	4	State Buy-In Coverage
Y16CNTY	Char	3	County Code
Y16CREC	Char	1	Current reason for Entitlement Code
Y16DETH	Num	8	Date of Death (SAS Date)
Y16DOB	Num	8	Date of Birth
Y16DOBS	Num	8	Y16 UNIQUE OBSNO
Y16DOD	Char	8	Date of Death (CHAR)
Y16ESRD	Char	1	ESRD Indicator
Y16F00	Char	1	
Y16HICNO	Char	11	HIC Number
Y16HMO1-Y16HMO12	Char	1	HMO Indicator
Y16HMOM	Num	4	HMO Coverage
Y16MSCD	Char	2	Medicare Status Code
Y16OREC	Char	1	Original Reason for Entitlement

Variable	Type	Len	Label
Y16RACE	Char	1	Race
Y16RFRN	Num	4	Beneficiary Enrollment Reference Year
Y16SEX	Char	1	SEX
Y16STATE	Char	2	State Code
Y16VDOD	Char	1	Valid Date of Death Switch
Y16ZIP	Char	9	Zip Code of Residence

4. SAS Pack Structure

There are three programs and two SAS format files that make up the quality of informed consent documents for hospital-performed elective procedures SAS pack. The program *IC_Macros.SAS contains* SAS macros that are used in the main program part 1 *Informed_consent_v1.0_part1.SAS*. These macros provide several functions for looking for hospital-performed elective procedures, selecting 150 elective procedures which are proportional to the total number of elective procedures in each procedure category for every hospital.

The first section of the main program part 1 *Informed_consent_v1.0_part1.SAS* is where the user can edit the SAS code in order to select the year(s) to be run. The file directories that contain the input data sets and the SAS format files, as well as where the selected elective procedure data sets are to be stored, can be modified in this section. Appendix A displays the section of this program where these changes are made. Within the first section is where the macro programs are called as well with a %INCLUDE statement. The bulk of this program is devoted to select 150 elective procedures and obtain the patients' demographic and procedure information for each hospital. This involves applying inclusion and exclusion criteria. All temporary files are deleted.

The first section of the main program part 2 *Informed_consent_v1.0_part2.SAS* is where the user can edit the SAS code. The file directories that contain the evaluation of informed consent documents by abstraction tool (ACCESS data file) and the hospital informed consent document quality score to be stored can be modified in this section. Appendix B displays the section of this program where these changes are made. The bulk of this program is devoted to import the ACCESS data file and calculate the hospital informed consent document quality score.

5. Output Data

The quality of informed consent documents for hospital-performed elective procedures measure SAS pack creates two permanent output files in SAS data set format. These files will be written to the directory the user designates in the first section of the main program part 1 and part 2. The files are as follows:

1) Selected elective procedure sample (Selected_sample.sas7bdat)
2) Hospital informed consent document quality score (Hospital_scores.sas7bdat)

Appendix C provides variable lists for each of these files. The selected elective procedure sample file contains the patients' demographic and procedure information. **Figure 1** shows a portion of this file.

Figure 1. A Section of the selected elective procedure sample file (Selected_sample.sas7bdat)

Procedure category	HIC number	Provider ID	ICD-10 procedure code	Date of birth	Gender	Y16.9 BENE RACECD	Admission date	Discharge date	Procedure date	Procedure description
1			00U20JZ	08/11/1954	2	2	10/31/2016	11/04/2016	10/31/2016	Supplement Dura Mater with Synth Sub, Open Approach
1			01NB0ZZ	04/18/1939	2	1	03/01/2016	03/05/2016	03/01/2016	Release Lumbar Nerve, Open Approach
1			0RT30ZZ	10/12/1949	1	1	07/08/2016	07/09/2016	07/08/2016	Resection of Cervical Vertebral Disc, Open Approach
1			00BT0ZZ	10/26/1950	1	1	07/28/2016	08/06/2016	07/28/2016	Excision of Spinal Meninges, Open Approach
1			0SB24ZZ	03/12/1948	1	1	11/09/2016	11/12/2016	11/11/2016	Excision of Lumbar Vertebral Disc, Perc Endo Approach
1			0ST20ZZ	11/15/1935	1	1	10/26/2016	10/31/2016	10/26/2016	Resection of Lumbar Vertebral Disc, Open Approach
1			0RB30ZZ	11/02/1962	2	1	12/05/2016	12/06/2016	12/05/2016	Excision of Cervical Vertebral Disc, Open Approach
1			00U20JZ	06/01/1954	1	1	02/08/2016	02/15/2016	02/11/2016	Supplement Dura Mater with Synth Sub, Open Approach
1			0SB20ZZ	10/10/1950	1	1	07/13/2016	07/19/2016	07/14/2016	Excision of Lumbar Vertebral Disc, Open Approach
3			0CBT8ZX	01/20/1951	1	1	04/23/2016	04/30/2016	04/29/2016	Excision of Right Vocal Cord, Endo, Diagn

The hospital informed consent document quality score file contains the calculated quality scores. **Figure 2** shows a portion of this file.

Figure 2. A Section of hospital informed consent document quality score file (Hospital_scores.sas7bdat)

Hospital ID	Mean of IC scores	Percentage of IC scores greater or equal to 5 (%)	Percentage of IC scores greater or equal to 10 (%)
	3.8333333333	66.666666667	3.3333333333
	4.7	83.333333333	3.3333333333
	6.52	84	4
	3.4	20	0
	9	96.666666667	33.333333333

6. SAS Pack Usage

The following steps outline the procedures for running the quality of informed consent documents for hospital-performed elective procedures measure SAS pack:

1. Change the SAS programs, input file and result file directory paths as needed.
2. Use the %INCLUDE statement to incorporate the SAS Macros program.
3. Run the main program part 1 and part 2.

7. Appendices

7.1 Appendix A: SAS program part 1 sample

```
*************************************************************************************************;
*** Informed consent (V1.0) part1
*** ;
***Programmer: Haikun Bao
***;
***Created on: 01/22/2018
***;
********************************************************************************** ******************;


*************************************************************************************************;
***Specify various file pathes
***;
*************************************************************************************************;
%let path1=Y:\MedPAR\2016; /*raw data files path, must be changed*/
%let path2=Y:\Denominator\2016; /*raw data files path, must be changed*/

%let path3=H:\DOC\Informed consent\SAS pack ICD10\Formats; /*format file path to save formats, must be
changed*/
%let path4=H:\DOC\Informed consent\SAS pack ICD10\data; /*permanent output files path, must be changed*/
%let path5=H:\DOC\Informed consent\SAS pack ICD10; /*All the SAS program files path, must be changed*/


LIBNAME mpar16 "&path1";
LIBNAME den16  "&path2";
LIBNAME FORMAT "&path3";

LIBNAME PF "&path4";

options fmtsearch=(FORMAT.CCS_10_formats  FORMAT.Label_formats);

/*include all the MACROs*/
%include "&path5\IC_Macros.sas";
```

7.2 Appendix B: SAS program part 2 sample

```
*************************************************************************************;
*** Informed consent (V1.0) part2
***;
***Programmer: Haikun Bao
***;
***Created on: 01/22/2018
***;
*************************************************************************************;


*************************************************************************************;
```

```
***Specify various file pathes
***;
*******************************************************************************************;
%let path1=H:\DOC\Informed consent\SAS pack ICD10; /*ACCESS data file of reviewed IC forms
with abstraction tool,
                                                    raw data files path, must be changed*/
%let path2=H:\DOC\Informed consent\SAS pack ICD10\data; /*permanent output files path, must be
changed*/
LIBNAME PF "&path2";


***import ACCESS data file to SAS;
LIBNAME Database ACCESS "&path1.\IC_forms.accdb"; /*the ACCESS data file name
                                        "IC_forms.accdb" must be changed*/
DATA RawData;
  SET Database.tbl_AbstractionTool;
RUN;
```

7.3 Appendix C: Variable names in Output files

Table 3. Variables found in Selected_sample.sas7bdat:

Variable	Type	Len	Format	Label
HICNO	Char	11		HIC number
PRVID	Char	6		Provider ID
Admsn_dt	Num	8	MMDDYY10.	Admission date
Cat	Num	8		Procedure category
Dob	Num	8	MMDDYY10.	Date of birth
Dsch_dt	Num	8	MMDDYY10.	Discharge date
Prcdr	Char	7		ICD-10 procedure code
Proc_dt	Num	8	MMDDYY10.	Procedure date
Proc_label	Char	550		Procedure description
Race	Char	1		Y16.9 BENE RACECD
Sex	Char	1		Gender

Table 4. Variables found in Hospital_scores.sas7bdat:

Variable	Type	Len	Label
hospID	Char	25	Hospital ID
mean_score	Num	8	Mean of IC scores
perct10_score	Num	8	Percentage of IC scores greater or equal to 10 (%)
perct5_score	Num	8	Percentage of IC scores greater or equal to 5 (%)