**Summary Table – Multivariable Survival Analysis**

**Macro Name:** MULTIPLE\_PHREG

**Created Date/Author:** Feb. 2012/Yuan Liu

**Last Update Date/Person**: Feb, 2016/ Yaqi Jia

**Current Version**: V21

**Working Environment:** SAS 9.4 English version

**Contact**: Dr. Yuan Liu [yliu31@emory.edu](mailto:yliu31@emory.edu)

**Purpose:** To produce a summary table from a multivariable survival model, but the macro itself does not do statistical modeling automatically.

**Notes:** The macro only helps to generate a nice summary table, and cannot be used for statistical modeling. The modeling must be conducted using PROC PHREG before calling this macro. Several tables must be created using ODS OUTPUT when running PROC PHREG (ClassLevelFreq=clfreq nNObs = numobs Type3 = type3 ParameterEstimates = MLEC ModelInfo=modelinf SliceDiffs = slices\_diff (only for interaction model)). The option RL must also be used in the model statement, option PARAM= GLM in CLASS statement, and the option SIMPLE in Proc PHREG statement (see attach example). Variable names must not be more than 20 characters. This macro can be set up to handle models including interaction terms, and in the model fitting step, use SLICE statement to specify how the stratified analysis to be conducted and use ods output SliceDiffs = slices\_diff.

**Parameters:**

|  |  |
| --- | --- |
| **Macro variable** | **Description** |
| OUTPATH | Path for output table to be stored. |
| FNAME | File name for output table. |
| FOOTNOTE | Text of footnote to include in the table (optional). It should be in quotes. This footnote will appear below the footnote containing the number of observations. Leave this field blank if not including an additional footnote. |
| FOOTNOTE2 | Text of second footnote to include in the table (optional). It should be in quotes.  This footnote will appear below all other footnotes. Leave this field blank if not including an additional footnote. |
| TYPE3 | Set to F to suppress type III p-values from being reported in the table (optional). The default value is T. |
| CLNUM | Set to T if you want to see the number of observations for each level of covariates. The default is T. |
| EFFECT | Use to specify the treatment variable in the interaction. Use in combine with SLICEBY and if not empty, VAR should contain a two-way interaction. See example. |
| SLICEBY | Use in combine with EFFECT to specify the stratified variable in the interaction. |
| ORIENTATION | Orientation of the output Word table. Default is portrait, can be changed to landscape. |
| SHORTREPORT | Use in combine with EFFECT and SLICEBY when there is an interaction in the model and set to T to only report the stratified treatment effect. |
| DEBUG | Set to T if running in debug mode (optional). Work datasets will not be deleted in debug mode. This is useful if you are editing the code or want to further manipulate the resulting data sets. The default value is F. |

**Usage Example:**

**DATA** analysis;

input id os\_censor Sex $ Age duration os progress $ trt $;

LABEL os = 'Overall Survival (months)'

progress = 'Progression'

trt = 'Treatment'

duration = 'Duration of Radiation';

DATALINES;

1 1 M 40 44 20 No B

2 1 F 45 46 16 Yes A

3 1 F 40 32 20 No B

4 1 F 47 32 23 No B

5 0 M 41 25 22 No B

6 1 M 54 35 13 No B

7 1 M 48 50 9 Yes A

8 1 M 36 33 12 Yes B

9 0 F 49 51 8 Yes A

10 1 M 49 52 10 Yes A

11 1 M 44 35 12 No A

12 1 M 49 50 8 Yes A

13 1 M 44 44 14 Yes A

14 1 M 50 31 10 Yes A

15 1 M 53 40 15 No B

16 0 M 52 29 20 Yes B

17 1 F 46 45 5 Yes A

18 1 F 37 44 11 Yes A

19 1 M 49 46 13 No B

20 1 M 42 31 11 No A

;

ODS OUTPUT ClassLevelFreq=clfreq ModelBuildingSummary(nowarn)=removed NObs = numobs ParameterEstimates = MLEC ModelInfo=modelinf Type3 = type3;

PROC PHREG DATA = analysis simple;

class trt sex /order=internal param=glm;

model os\*os\_censor(0) = trt sex age duration/rl;

RUN;

TITLE 'Table 4 Multivariable Survival Analysis';

%MULTIPLE\_PHREG(

outpath = C:\Documents and Settings\User\My Documents\,

fname = Table 4 Multivariable Survival Analysis,

footnote = );

TITLE;

**Summary Table Example:**

Table 4 Multivariable Survival Analysis

|  | | | **Overall Survival (months)** | | |
| --- | --- | --- | --- | --- | --- |
|  | | | **----------------------------------------** | | |
| **Covariate** | **Level** | **N** | **Hazard Ratio (95% CI)** | **HR P-value** | **Type3 P-value** |
| Treatment | A | 11 | 5.29 (1.35-20.79) | **0.017** | **0.017** |
| B | 9 | - | - |
|  | | | | | |
| Sex | F | 6 | 0.45 (0.13-1.58) | 0.211 | 0.211 |
| M | 14 | - | - |
|  | | | | | |
| Age |  | 20 | 1.02 (0.91-1.16) | 0.700 | 0.700 |
|  | | | | | |
| Duration of Radiation |  | 20 | 1.05 (0.98-1.14) | 0.185 | 0.185 |
|  | | | | | |
| \*  Number of observations in the original data set = 20. Number of observations used = 20. | | | | | |

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**Log of Updates:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **By** | **Description** | **Version** |
| 6/8/12 | Dana Nickleach (dnickle@emory.edu) | Replaced double quotes with single quotes around 95% CI so that SAS would not try to resolve the macro %CI. Changed lengths of 100 to 96 to avoid wringing in proc report. Set length of parameter and effect to 100 to avoid mismatched length warning. | V2 |
| 6/19/12 | Dana Nickleach (dnickle@emory.edu) | Got rid of leading space in RTF file name | V3 |
| 6/29/12 | Dana Nickleach (dnickle@emory.edu) | Trimmed white space around number of obs in footnote | V4 |
| 7/9/12 | Dana Nickleach (dnickle@emory.edu) | Added error check for variable names longer than 20 characters. The macro will not work correctly with long variable names because the variable names are truncated in the parameter estimate file. | V5 |
| 8/6/12 | Dana Nickleach (dnickle@emory.edu) | Added footnote parameter, fixed spelling of macro name, and at the end of the macro restored options to those in use at the start of the macro. | V6 |
| 8/28/12 | Dana Nickleach (dnickle@emory.edu) | Adjusted proc report to handle a third footnote that runs onto multiple lines (had to control column width). | V7 |
| 9/13/12 | Dana Nickleach (dnickle@emory.edu) | Fixed column width of “level” to prevent wrapping onto next page and added SPANROWS. | V8 |
| 10/23/12 | Dana Nickleach (dnickle@emory.edu) | Fixed proc report ODS listing error, changed “group” to “order” to prevent note, prevented numeric/character conversion, and changed length of plabel to max label length to avoid truncation. | V9 |
| 1/4/12 | Dana Nickleach (dnickle@emory.edu) | Fixed a bug caused by the scenario of using only numeric variables with no labels, added event name to column header, and added the TYPE3 parameter. | V10 |
| 4/8/13 | Dana Nickleach (dnickle@emory.edu) | Added FOOTNOTE2 paramter. | V11 |
| 5/1/13 | Dana Nickleach (dnickle@emory.edu) | Fixed so that it will still work if the outcome variable is not labeled. | V12 |
| 5/3/13 | Dana Nickleach (dnickle@emory.edu) | Removed need for CLIST and DATASET parameters, fixed ordering of variable categories so that the reference group is always printed last, and added DEBUG parameter. | V13 |
| 6/4/13 | Dana Nickleach (dnickle@emory.edu) | Added CONTRAST parameter. | V14 |
| 8/29/13 | Dana Nickleach (dnickle@emory.edu) | Declared macro variables as local. | V15 |
| 2/12/14 | Dana Nickleach (dnickle@emory.edu) | Increased length of level variable to avoid truncation and fixed column width of plabel. | V16 |
| 3/13/14 | Dana Nickleach (dnickle@emory.edu) | Added NOPRINT and ODS EXCLUDE to prevent printing of unnecessary output. | V17 |
| 3/21/14 | Dana Nickleach (dnickle@emory.edu) | Condensed HR and CI into one column. | V18 |
| 7/18/14 | Dana Nickleach (dnickle@emory.edu) | Added numread and numused variables to the final data set for possible use outside of the macro. | V19 |
| 2/6/2015 | Yuan Liu | Remove CONTRAST, and add EFFECT, SLICEBY, SHORTREPORT, and ORIENTATION. Now the macro allows interaction in the model | V20 |
| Feb, 2016 | Yaqi Jia | Add CLNUM, which allows to show frequency of categorical variables in the multivariable model | V21 |