

Friday, May 04, 2018

In this document *readme.pdf*, we present the R-code that allows reproducing the analysis of the case study (available in the supplementary material) of the following article:

*Flexible and structured survival model for a simultaneous estimation of non-linear and non-proportional effects and complex interactions between continuous variables: performance of this multidimensional penalized spline approach in net survival trend analysis.*

Laurent Remontet, Zoé Uhry, Nadine Bossard, Jean Iwaz, Aurélien Belot, Coraline Danieli, Hadrien Charvat, Laurent Roche and the CENSUR Working Survival Group, Statistical Methods in Medical Research, 2018.

However:

- due to copyright issues, we cannot provide the original real dataset. So, we provide one of the simulated datasets used in the simulation study on cervix uteri cancer data on 10,000 patients. The results may thus differ, to some extent, from those presented in the article.
- For simplicity the PH model is not presented

File / directory	Contents
/data/	Cervix dataset Expected hazard of the general population
/function/	Functions to split the data Modified link function
<b>ana_cervix.R</b>  <i>Must be run first</i>	Core program; this will: i) load the data; ii) split the cervix dataset; iii) and fit the model; and iv) give examples of excess hazard prediction (with CI) and net survival prediction. Fitted model is a gamObject called ' <b>tempmod</b> ' that is used in all the other .R files
Ana_cervix.lis	Results from ana_cervix.R
CI_delta_NS.R	Show examples of prediction of net survival with CI (output in R session only)
CI_delta_Standardized_NS.R	Show examples of prediction of net survival with CI prediction of standardized net survival with CI
FigureS11_Trends_Std_NS.R	Produce the figureS11 in eps format (saved in /res/)
FigureS12_Trends_NS_by_Age.R	Produce the figureS12 in eps format (saved in /res/)
FigureS13_ExcessHazard.R	Produce the figureS13 in eps format (saved in /res/)
/res/	The 3 figures figureS11, figureS12, figureS13 in eps format generated by the FigureS*.R files

CI=confidence intervals

The following versions were used :

R version 3.1.1 (2014-07-10)

Platform: x86\_64-w64-mingw32/x64 (64-bit)

attached base packages:

[1] splines stats graphics grDevices utils datasets methods  
base

other attached packages:

```
[1] relsurv_2.0-9    date_1.2-34      survival_2.37-7  statmod_1.4.21  
mgcv_1.8-3        nlme_3.1-117
```

loaded via a namespace (and not attached):

```
[1] grid_3.1.1      lattice_0.20-29  Matrix_1.2-6    tools_3.1.1
```