

Additional file 1 for “Development of a dynamic interactive web tool to enhance understanding of multi-state model analyses: MSMplus”

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Stata code for fitting the multi-state models on the EBMT dataset and for deriving the Summary information and the analysis results input files for the web tool MSMplus using the Stata commands msboxes and predictms.

Code- Stata

```
/* Example of creating json files as input for the MSMplus in Stata*/

/* Install the current editions of merlin and multistate
net install merlin, from ("https://www.mjcrowther.co.uk/code/ merlin")
net install multistate, from ("https://www.mjcrowther.co.uk/code /multistate/")
*/
clear all

// Upload data
import delimited "... path\ebmt.csv", clear
save "ebmt.dta ",replace

// Regenerate the covariates of interest as binary
tab age , gen (ag)

// Check the time and status variables
list id prtime prstat rfstime rfsstat if inlist (id,9,2199),noobs sepby(id)

// Mset the data
msset, id(id) times ( prtime rfstime ) states ( prstat rfsstat ) covariates ( ag2 ag3 )

// Define the transition matrix
mat tmat = r( transmatrix )

// Specify timevar
range tt 0 10 101

// Run the msboxes command
msboxes, transmatrix ( tmat ) id(id) xvalues(0.2 0.7 0.45) yvalues (0.7 0.7 0.2) ///
    statenames("(1)Transplant" "(2)Platelet recovery" "(3)Relapse or death") ///
    transnames("h1" "h2" "h3") freqat (tt) scale (365.25) interactive jsonpath ("$$N \4. Json_files ")

// stset the data for the MSM model
stset _stop , enter ( _start ) failure ( _status =1) scale (365.25)

// Define the transition specific models
```

```

stmerlin ag2 ag3 if _trans ==1 , distribution (rp) df (4)
estimate store m1
stmerlin ag2 ag3 if _trans ==2 , distribution (rp) df (4)
estimate store m2
stmerlin ag2 ag3 if _trans ==3 , distribution (rp) df (4) noorthog
estimates store m3

// Specify user function (optional)
mata:
real matrix ufunc (M)
{
    los2 = ms_user_los (M ,2)
    return ( los1 :+ los2 )
}
End

//Feed the models, time variable, tmat and covariate patterns into predictms
predictms , transmatrix( tmat ) models (m1 m2 m3) timevar (tt) ///
    at1(ag2 0 ag3 0) at2( ag2 0 ag3 1) at3( ag2 1 ag3 1) ///
    probability hazard los visit userfunction(ufunc) simulate latent ///
    diff ratio ci m(200) n(100000) from(1 2) interactive jsonpath("$N\4.Json_files")

```