Model B : Estimation Results

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Estimation results of **Model B**, specified by the following input:

q <- .01  
# transition matrix  
Q <- rbind( c(0, q, 0, q),   
 c(q, 0, q, q),  
 c(0, 0, 0, q),   
 c(0, 0, 0, 0))   
# misclassification matrix  
E <- rbind( c( 0, 0, 0, 0),   
 c( 0, 0, .1, 0),   
 c( 0, 0, 0, 0),  
 c( 0, 0, 0, 0) )  
# transition names  
qnames = c(  
 "Healthy - Mild", # q12  
 # "Healthy - Severe", # q13  
 "Healthy - Dead", # q14  
 "Mild - Healthy", # q21   
 "Mild - Severe", # q23  
 "Mild - Dead", # q24  
 # "Severe - Healthy",# q31  
 # "Severe - Mild", # q32  
 "Severe - Dead" # q34  
)

# Model 1

## Specification

The model was fitted using the following specification of covariates:

# Forward transitions:  
 "1-2" = "age + male + edu\_low\_med + edu\_low\_high"  
 "2-3" = "age + male + edu\_low\_med + edu\_low\_high"  
# Backward transitions:  
 "2-1" = "age"  
# Death transitions:   
 "1-4" = "age + male"  
 "2-4" = "age + male"  
 "3-4" = "age + male"

## Intensities

State 1 State 2 State 3 State 4  
State 1 0.8198935 0.1325005 0.0128773 0.03472874  
State 2 0.3787349 0.4503131 0.1061308 0.06482122  
State 3 0.0000000 0.0000000 0.8236387 0.17636128  
State 4 0.0000000 0.0000000 0.0000000 1.00000000

## Hazards

$age  
 HR L U  
State 1 - State 2 1.080777 1.0677267 1.0939862  
State 1 - State 4 1.085146 1.0543871 1.1168023  
State 2 - State 1 0.979584 0.9654133 0.9939627  
State 2 - State 3 1.055787 1.0326212 1.0794722  
State 2 - State 4 1.066975 1.0148080 1.1218231  
State 3 - State 4 1.071141 1.0470990 1.0957349  
  
$male  
 HR L U  
State 1 - State 2 1.3383578 1.1429501 1.567174  
State 1 - State 4 1.5254411 0.9901823 2.350043  
State 2 - State 1 1.0000000 1.0000000 1.000000  
State 2 - State 3 0.8325447 0.6129781 1.130759  
State 2 - State 4 2.0610765 1.1822137 3.593290  
State 3 - State 4 1.4287728 1.0892843 1.874067  
  
$edu\_low\_med  
 HR L U  
State 1 - State 2 0.7596424 0.4753863 1.213869  
State 1 - State 4 1.0000000 1.0000000 1.000000  
State 2 - State 1 1.0000000 1.0000000 1.000000  
State 2 - State 3 0.8827809 0.4036470 1.930653  
State 2 - State 4 1.0000000 1.0000000 1.000000  
State 3 - State 4 1.0000000 1.0000000 1.000000  
  
$edu\_low\_high  
 HR L U  
State 1 - State 2 0.5719336 0.4038369 0.8100003  
State 1 - State 4 1.0000000 1.0000000 1.0000000  
State 2 - State 1 1.0000000 1.0000000 1.0000000  
State 2 - State 3 0.8474639 0.4823419 1.4889749  
State 2 - State 4 1.0000000 1.0000000 1.0000000  
State 3 - State 4 1.0000000 1.0000000 1.0000000

# Model 2

## Specification

The model was fitted using the following specification of covariates:

# Forward transitions:  
 "1-2" = "age + male + edu\_low\_med + edu\_low\_high"  
 "2-3" = "age + male + edu\_low\_med + edu\_low\_high"  
# Backward transitions:  
 "2-1" = "age"  
# Death transitions:   
 "1-4" = "age + male + edu\_low\_med + edu\_low\_high"  
 "2-4" = "age + male + edu\_low\_med + edu\_low\_high"  
 "3-4" = "age + male + edu\_low\_med + edu\_low\_high"

## Intensities

State 1 State 2 State 3 State 4  
State 1 0.8200399 0.1325274 0.01283998 0.03459277  
State 2 0.3785024 0.4507432 0.10595455 0.06479985  
State 3 0.0000000 0.0000000 0.82690180 0.17309820  
State 4 0.0000000 0.0000000 0.00000000 1.00000000

## Hazards

$age  
 HR L U  
State 1 - State 2 1.0810352 1.0679642 1.0942662  
State 1 - State 4 1.0851747 1.0541584 1.1171036  
State 2 - State 1 0.9798409 0.9656587 0.9942314  
State 2 - State 3 1.0562092 1.0328517 1.0800948  
State 2 - State 4 1.0669022 1.0117297 1.1250835  
State 3 - State 4 1.0732165 1.0487328 1.0982718  
  
$male  
 HR L U  
State 1 - State 2 1.3352491 1.139855 1.564137  
State 1 - State 4 1.5558672 1.004304 2.410349  
State 2 - State 1 1.0000000 1.000000 1.000000  
State 2 - State 3 0.8549199 0.628904 1.162162  
State 2 - State 4 1.9935253 1.119284 3.550613  
State 3 - State 4 1.4556315 1.107118 1.913855  
  
$edu\_low\_med  
 HR L U  
State 1 - State 2 0.7746750 0.4779028 1.255739  
State 1 - State 4 1.3660242 0.2927307 6.374536  
State 2 - State 1 1.0000000 1.0000000 1.000000  
State 2 - State 3 0.8851032 0.3914057 2.001524  
State 2 - State 4 1.0667119 0.1059017 10.744627  
State 3 - State 4 1.1239639 0.5033243 2.509902  
  
$edu\_low\_high  
 HR L U  
State 1 - State 2 0.5892899 0.4103330 0.8462946  
State 1 - State 4 1.0275460 0.2767308 3.8154442  
State 2 - State 1 1.0000000 1.0000000 1.0000000  
State 2 - State 3 0.8221826 0.4573361 1.4780909  
State 2 - State 4 1.4076005 0.2532502 7.8236442  
State 3 - State 4 0.8566714 0.5022316 1.4612500

# Session Info

sessionInfo()

R version 3.3.1 (2016-06-21)  
Platform: x86\_64-w64-mingw32/x64 (64-bit)  
Running under: Windows 10 x64 (build 14393)  
  
locale:  
[1] LC\_COLLATE=English\_United States.1252 LC\_CTYPE=English\_United States.1252 LC\_MONETARY=English\_United States.1252  
[4] LC\_NUMERIC=C LC\_TIME=English\_United States.1252   
  
attached base packages:  
[1] stats graphics grDevices utils datasets methods base   
  
other attached packages:  
[1] msm\_1.6.1 magrittr\_1.5 nnet\_7.3-12 knitr\_1.14   
  
loaded via a namespace (and not attached):  
 [1] Rcpp\_0.12.6 formatR\_1.4 nloptr\_1.0.4 plyr\_1.8.4 tools\_3.3.1 digest\_0.6.10   
 [7] lme4\_1.1-12 evaluate\_0.9 tibble\_1.2 gtable\_0.2.0 nlme\_3.1-128 lattice\_0.20-33   
[13] mgcv\_1.8-14 Matrix\_1.2-7.1 DBI\_0.5 yaml\_2.1.13 parallel\_3.3.1 SparseM\_1.7   
[19] mvtnorm\_1.0-5 expm\_0.999-0 dplyr\_0.5.0 stringr\_1.1.0 MatrixModels\_0.4-1 grid\_3.3.1   
[25] R6\_2.1.3 survival\_2.39-5 rmarkdown\_1.0 minqa\_1.2.4 ggplot2\_2.1.0 car\_2.1-3   
[31] scales\_0.4.0 htmltools\_0.3.5 splines\_3.3.1 MASS\_7.3-45 assertthat\_0.1 pbkrtest\_0.4-6   
[37] testit\_0.5 colorspace\_1.2-6 quantreg\_5.26 stringi\_1.1.1 lazyeval\_0.2.0 munsell\_0.4.3