

[6] studbookR: Survival analyses

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Introduction

The package `survival` is one on the standard packages in the R software. This package includes four core survival analysis routines. The following routines are supported (through wrapper functions) in `studbookR`:

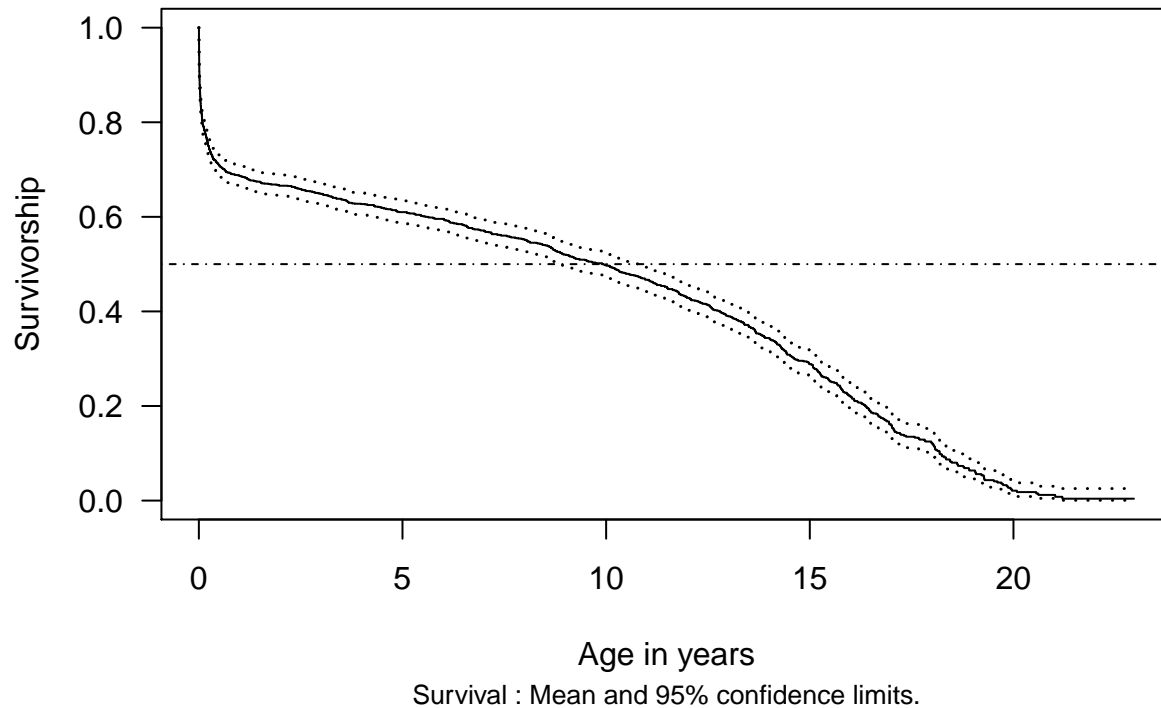
- Kaplan-Meier Product Limit Estimator
- Cox Proportional Hazard Regression

Kaplan-Meier Product Limit Estimator

```
studbook.survival(analysis='survival',method='kaplan',sex='all',unknown='include')
```

```
## =====
## Kaplan-Meier estimator for survival
## =====
##
## Sex      : all
## Unknown  : include
## Age range: [0-Inf] (days)
## Formula  : survival.object ~ 1
##
## Call: survfit(formula = as.formula(formula.km), data = survival.data,
##      subset = subset, na.action = na.omit)
##
##           n      events    *rmean *se(rmean)    median    0.95LCL
##      1737.0    1148.0    3233.4      68.2    3622.0    3238.0
##      0.95UCL
##      3941.0
##      * restricted mean with upper limit = 8380
##
##
## * Last age group in Kaplan-Meier estimator
##      time risk event survivorship
## 1061 8380     1     0 0.003997212
```

Kaplan–Meier estimator for survival



```
## [1] FALSE
```

Cox Proportional Hazard Regression

```
studbook.survival(analysis='survival',method='cox',sex='all',unknown='include',
                  cluster='NONE',group='G')
```

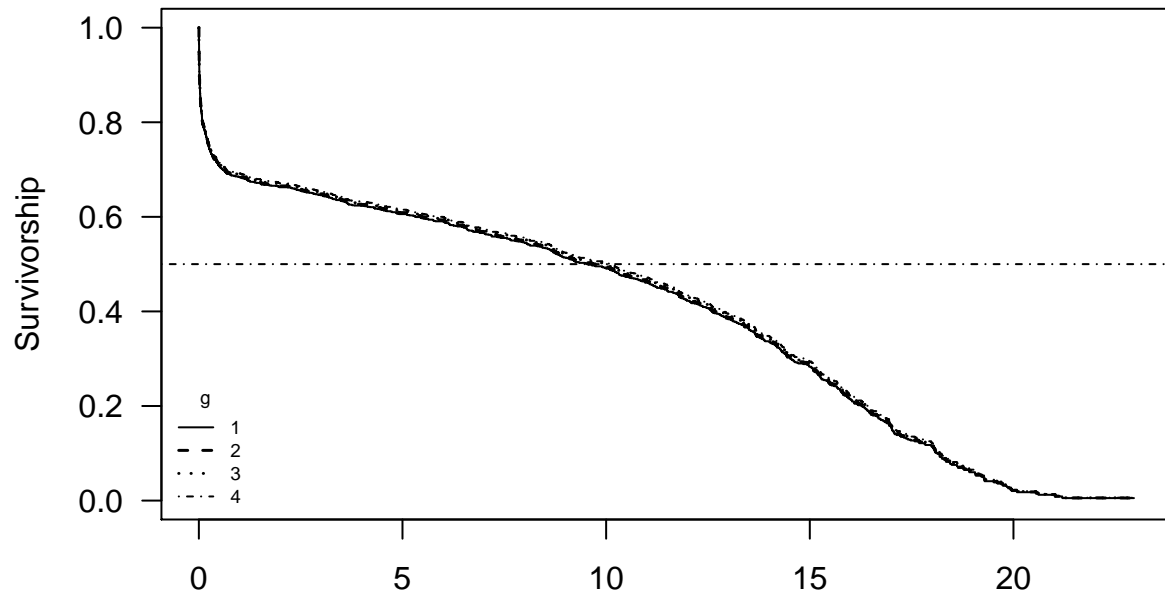
```
## =====
## Cox proportional hazard regression on survival
## =====
##
## Sex      : all
## Unknown  : include
## Age range: [0-Inf] (days)
## Group    : generations
## Formula  : survival.object ~ G
##
## Call:
## survival::coxph(formula = as.formula(formula.cox), data = survival.data,
##   subset = subset, control = survival::coxph.control(eps = 1e-11,
##     iter.max = 40))
##
## n= 1793, number of events= 1180
##
##      coef exp(coef) se(coef)      z Pr(>|z|)
## G -0.01028  0.98977  0.02087 -0.492   0.622
##
```

```

## exp(coef) exp(-coef) lower .95 upper .95
## G 0.9898 1.01 0.9501 1.031
##
## Concordance= 0.496 (se = 0.01 )
## Rsquare= 0 (max possible= 1 )
## Likelihood ratio test= 0.24 on 1 df, p=0.6222
## Wald test = 0.24 on 1 df, p=0.6224
## Score (logrank) test = 0.24 on 1 df, p=0.6224
##
##
## Therneau-Grambsch test for constant HR
## rho chisq p
## G -0.0721 5.74 0.0166
## * Survival predictions
## Median survival
## Call: survfit(formula = cox.rs, newdata = predict.frame)
##
## n events median 0.95LCL 0.95UCL
## 1 1793 1180 3481 3058 4042
## 2 1793 1180 3553 3177 3956
## 3 1793 1180 3643 3242 3942
## 4 1793 1180 3682 3259 4028
##
## * First and last two age groups in predicted values
## age 1 2 3 4
## 1 1 0.96634 0.966675 0.967010 0.967342
## 2 2 0.94353 0.944093 0.944649 0.945199
## 1092 7738 0.00524 0.005529 0.005831 0.006146
## 1093 8380 0.00524 0.005529 0.005831 0.006146

```

Cox proportional hazard regression on survival



Survival differences between generation groups.

```
## [1] FALSE
```