title: “Survival Analysis Report”

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output:

word_document

```
knitr::opts_chunk$set(echo = TRUE, warning = FALSE, message = FALSE)
# Install if missing: install.packages(c("survival", "survminer"))
library(survival)
library(survminer)
```

```
## Loading required package: ggplot2
```

```
## Loading required package: ggpubr
```

```
##
## Attaching package: 'survminer'
```

```
## The following object is masked from 'package:survival':
##
##     myeloma
```

```
data(lung)
```

```
## Warning in data(lung): data set 'lung' not found
```

```
# Status: 1=censored, 2=dead. We convert to 0/1 for standard R convention.
lung$status <- lung$status - 1

head(lung)
```

```
##   inst time status age sex ph.ecog ph.karno pat.karno meal.cal wt.loss
## 1    3  306      1  74   1       1       90       100     1175      NA
## 2    3  455      1  68   1       0       90        90     1225      15
## 3    3 1010      0  56   1       0       90        90       NA      15
## 4    5  210      1  57   1       1       90        60     1150      11
## 5    1  883      1  60   1       0      100        90       NA       0
## 6   12 1022      0  74   1       1       50        80      513       0
```

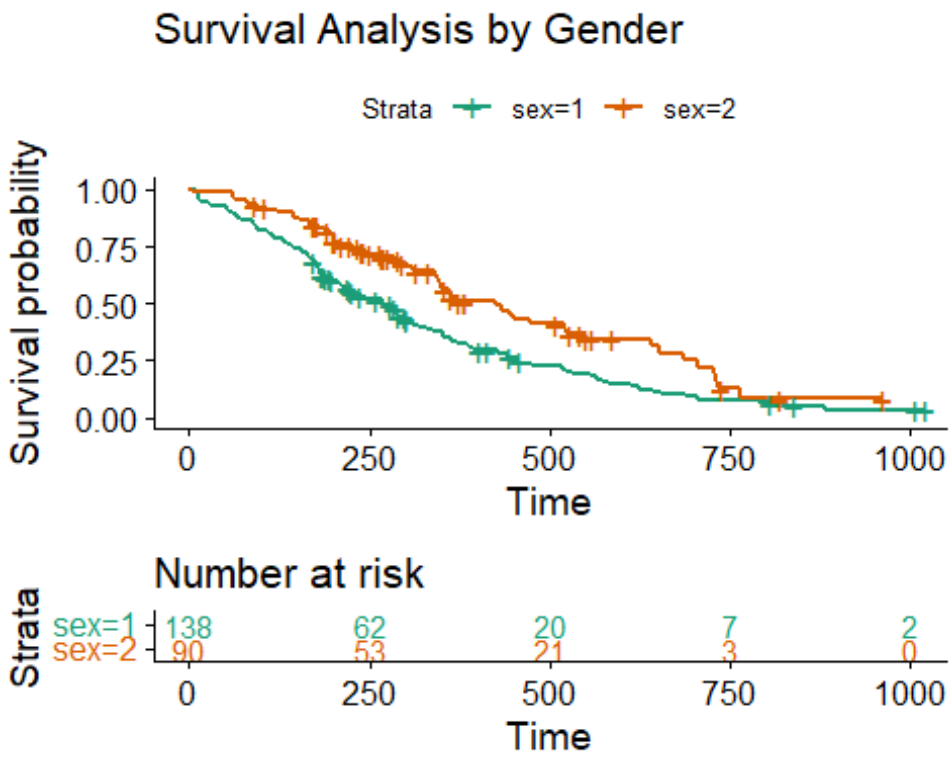
```
# Fit survival curves
fit <- survfit(Surv(time, status) ~ sex, data = lung)

# Visualize with ggsurvplot
ggsurvplot(
  fit,
  data = lung,
  risk.table = TRUE,

  risk.table.fontsize = 4,
    risk.table.height = 0.30,
```

```
  risk.table.col = "strata",
  palette = "Dark2",
  title = "Survival Analysis by Gender"
)
```

```
## Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
## ℹ Please use `linewidth` instead.
## ℹ The deprecated feature was likely used in the ggpubr package.
##   Please report the issue at
<https://github.com/kassambara/ggpubr/issues>.
## This warning is displayed once per session.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.
```

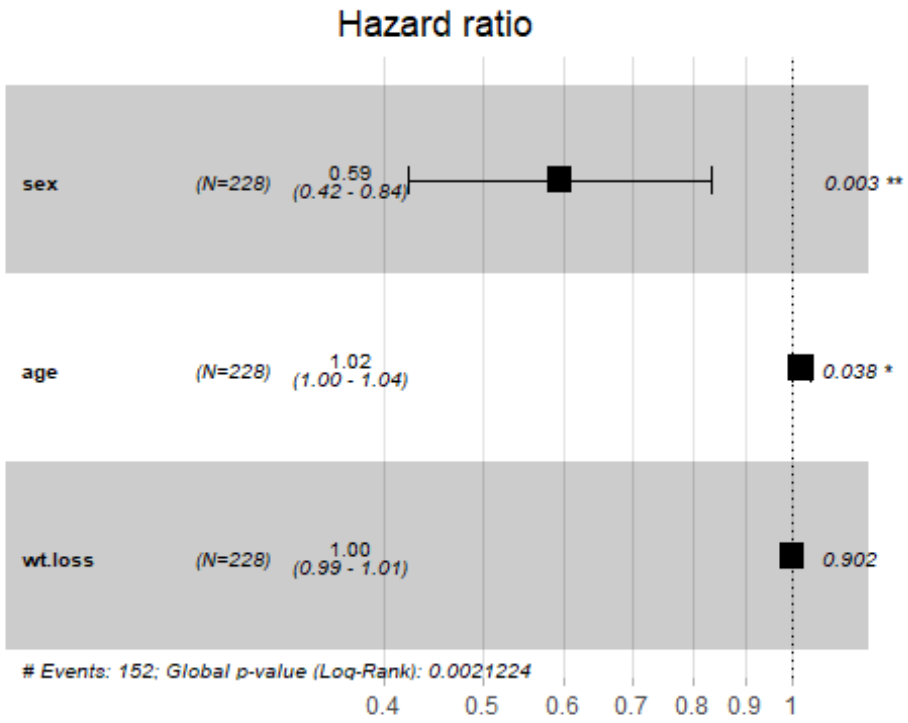



```
res.cox <- coxph(Surv(time, status) ~ sex + age + wt.loss, data = lung)
summary(res.cox)
```

```
## Call:
## coxph(formula = Surv(time, status) ~ sex + age + wt.loss, data = lung)
##
##   n= 214, number of events= 152
##    (14 observations deleted due to missingness)
##
##               coef  exp(coef)   se(coef)      z Pr(>|z|)
## sex     -0.5210319  0.5939074  0.1743541 -2.988   0.0028 **
## age      0.0200882  1.0202913  0.0096644  2.079   0.0377 *
```

```
## wt.loss  0.0007596  1.0007599  0.0061934  0.123   0.9024
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##          exp(coef) exp(-coef) lower .95 upper .95
## sex         0.5939     1.6838    0.4220    0.8359
## age         1.0203     0.9801    1.0011    1.0398
## wt.loss     1.0008     0.9992    0.9887    1.0130
##
## Concordance= 0.612  (se = 0.027 )
## Likelihood ratio test= 14.67  on 3 df,   p=0.002
## Wald test            = 13.98  on 3 df,   p=0.003
## Score (logrank) test = 14.24  on 3 df,   p=0.003
```

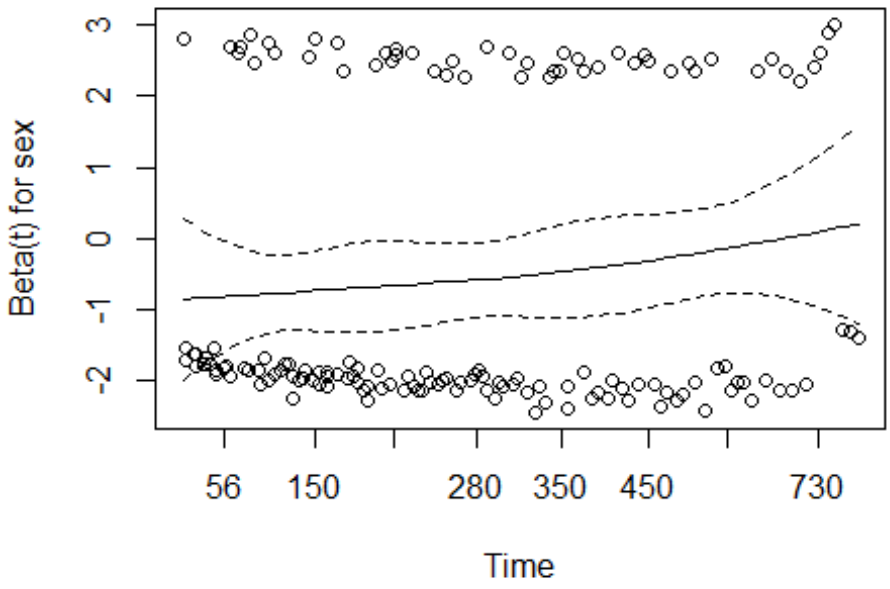
```
ggforest(res.cox, data = lung)
```

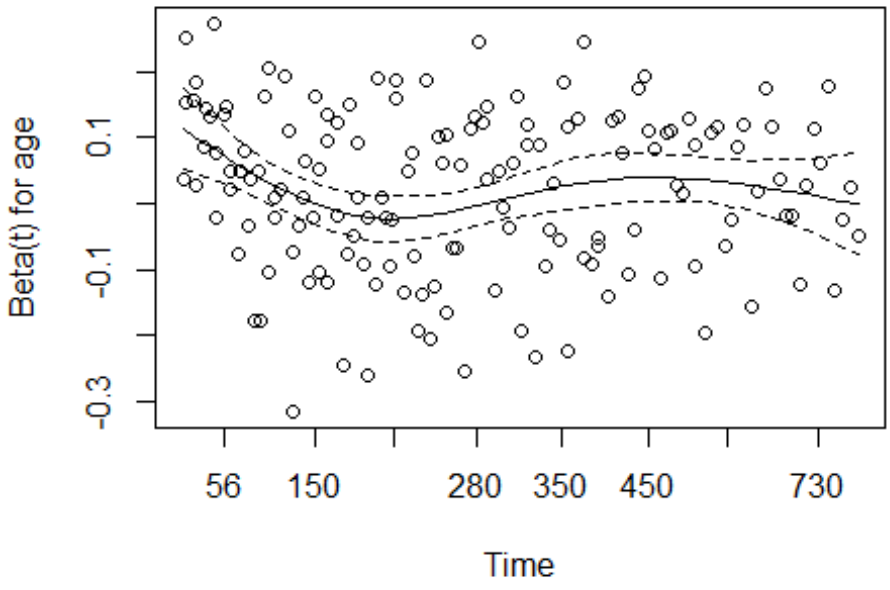


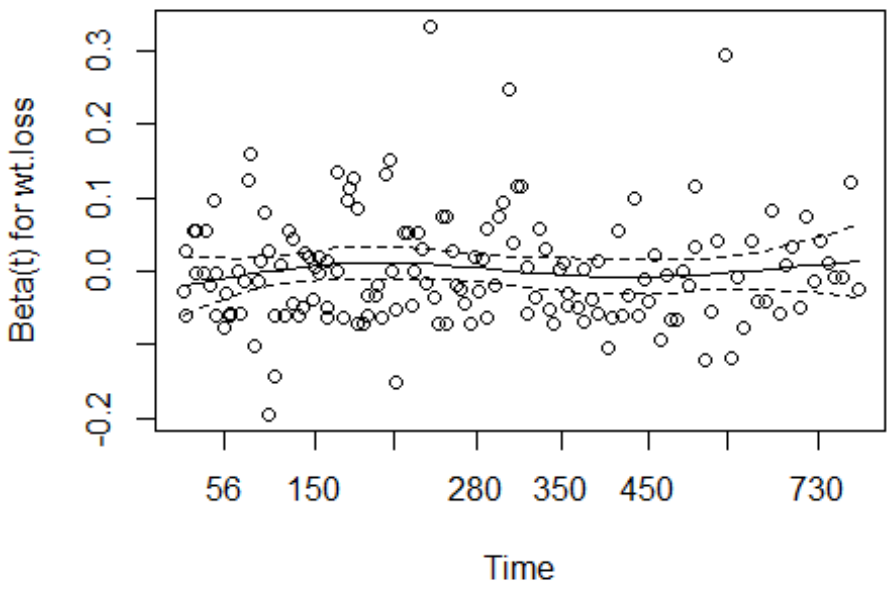

```
test.ph <- cox.zph(res.cox)
print(test.ph)
```

```
##          chisq df    p
## sex     2.5489  1 0.11
## age     0.5077  1 0.48
## wt.loss 0.0144  1 0.90
## GLOBAL  3.0051  3 0.39
```

```
plot(test.ph)
```


Beta(t) for sex
3
2
1
0
-1
-2
56
150
280
350
450
730
Time


Beta(t) for age
0.1
-0.1
-0.3
56
150
280
350
450
730
Time


Beta(t) for wt.loss
-0.2
0.0
0.1
0.2
0.3
56
150
280
350
450
730
Time