



Universidade Federal de Rondônia  
Departamento de Matemática e Estatística  
Bacharelado em Estatística

Edimar  
Jossivana Macedo  
Douglas Vinícius

# Relatório do Trabalho de Análise de Sobrevivência

Ji-Paraná  
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Jossivana Macedo  
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Relatório apresentado à Disciplina de Análise  
de Sobrevivência do Curso de Bacharelado  
em Estatística, da Universidade Federal de  
Rondônia - UNIR, para obtenção de aprovação.

Orientador:  
Prof. Dr.

Ji-Paraná  
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# Lista de Figuras

# 1. Introdução

Iniciando...rsrsrs

## 2. Descrição do Banco de Dados

## 3.

### 3.1 Carregar os dados

Esse primeiro bloco de código carrega os pacotes necessários, juntamente com o veteran conjunto de dados do survivalpacote que contém dados de um estudo randomizado de dois tratamentos para câncer de pulmão.

```
library(survival)
library(ranger)
library(ggplot2)
library(dplyr)
library(ggfortify)
#-----
data(veteran)
head(veteran)
```

##	trt	celltype	time	status	karno	diagtime	age	prior
## 1	1	squamous	72	1	60	7	69	0
## 2	1	squamous	411	1	70	5	64	10
## 3	1	squamous	228	1	60	3	38	0
## 4	1	squamous	126	1	60	9	63	10
## 5	1	squamous	118	1	70	11	65	10
## 6	1	squamous	10	1	20	5	49	0

### 3.2 Estimador de Kaplan-Meier

```
# Kaplan Meier Survival Curve
km <- with(veteran, Surv(time, status))
head(km, 80)
```

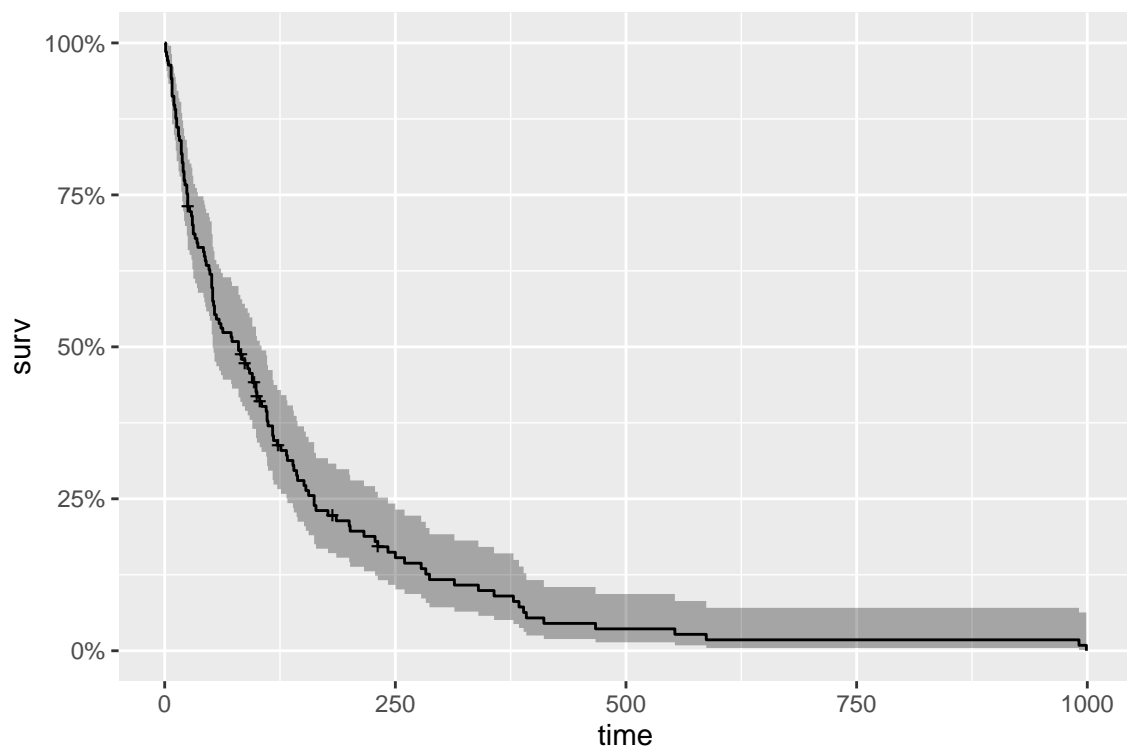
## [1]	72	411	228	126	118	10	82	110	314	100+	42	8	144	25+	11
## [16]	30	384	4	54	13	123+	97+	153	59	117	16	151	22	56	21
## [31]	18	139	20	31	52	287	18	51	122	27	54	7	63	392	10
## [46]	8	92	35	117	132	12	162	3	95	177	162	216	553	278	12
## [61]	260	200	156	182+	143	105	103	250	100	999	112	87+	231+	242	991
## [76]	111	1	587	389	33										

```
km_fit <- survfit(Surv(time, status) ~ 1, data=veteran)
summary(km_fit, times = c(1,30,60,90*(1:10)))
```

```
## Call: survfit(formula = Surv(time, status) ~ 1, data = veteran)
##
##   time n.risk n.event survival std.err lower 95% CI upper 95% CI
##    1     137      2   0.985  0.0102   0.96552   1.0000
##   30      97     39   0.700  0.0392   0.62774   0.7816
```

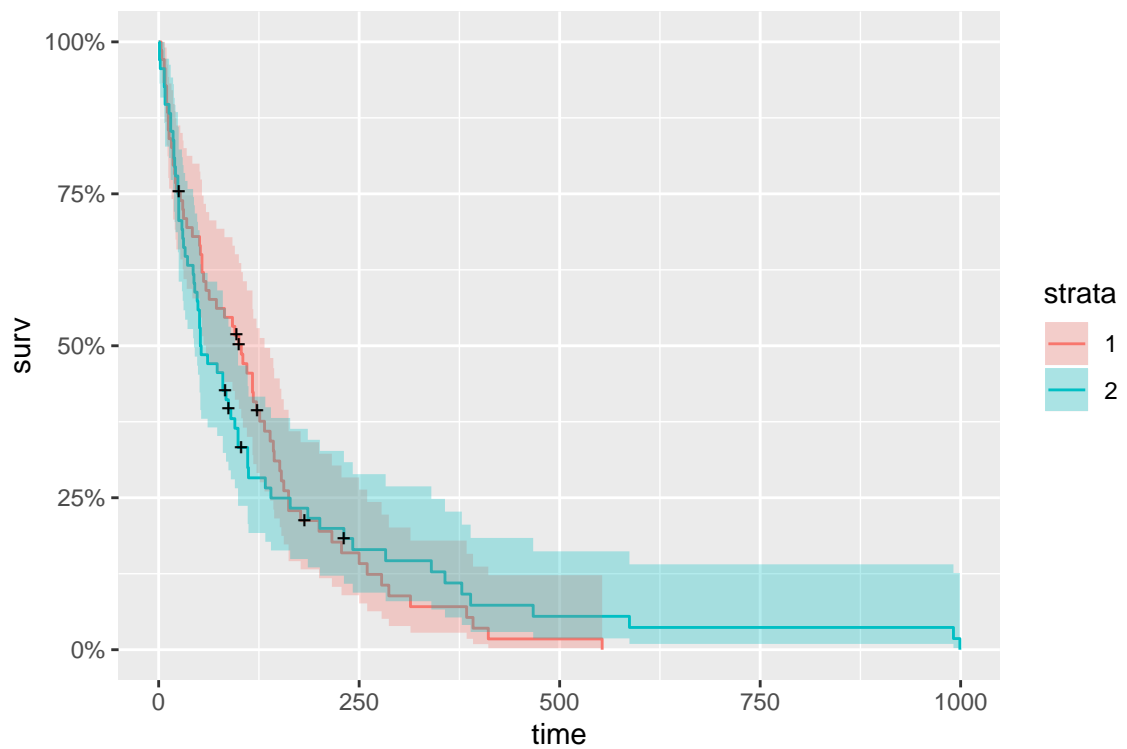
```
##      60      73      22      0.538 0.0427      0.46070      0.6288
##      90      62      10      0.464 0.0428      0.38731      0.5560
##     180      27      30      0.222 0.0369      0.16066      0.3079
##     270      16       9      0.144 0.0319      0.09338      0.2223
##     360      10       6      0.090 0.0265      0.05061      0.1602
##     450       5       5      0.045 0.0194      0.01931      0.1049
##     540       4       1      0.036 0.0175      0.01389      0.0934
##     630       2       2      0.018 0.0126      0.00459      0.0707
##     720       2       0      0.018 0.0126      0.00459      0.0707
##     810       2       0      0.018 0.0126      0.00459      0.0707
##     900       2       0      0.018 0.0126      0.00459      0.0707
```

```
autoplot(km_fit)
```



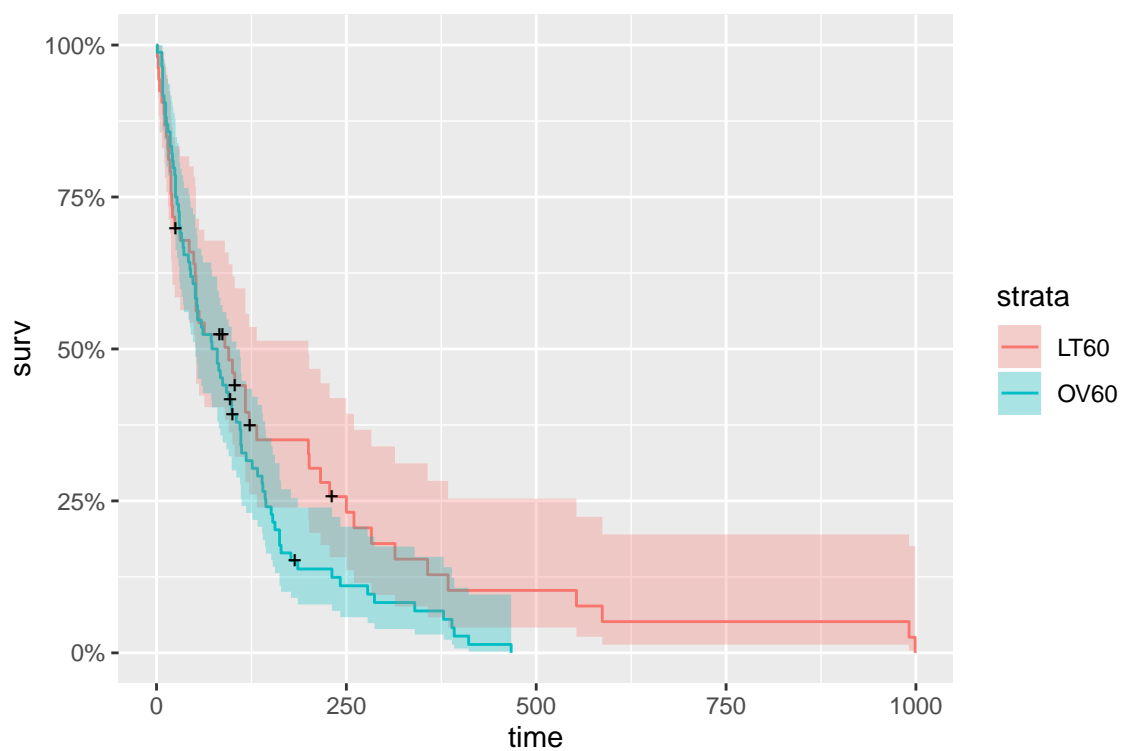
```
km_trt_fit <- survfit(Surv(time, status) ~ trt, data=veteran)
autoplot(km_trt_fit)
```





```
vet <- mutate(veteran, AG = ifelse((age < 60), "LT60", "OV60"),
              AG = factor(AG),
              trt = factor(trt, labels=c("standard", "test")),
              prior = factor(prior, labels=c("NO", "Yes")))

km_AG_fit <- survfit(Surv(time, status) ~ AG, data=vet)
autoplot(km_AG_fit)
```

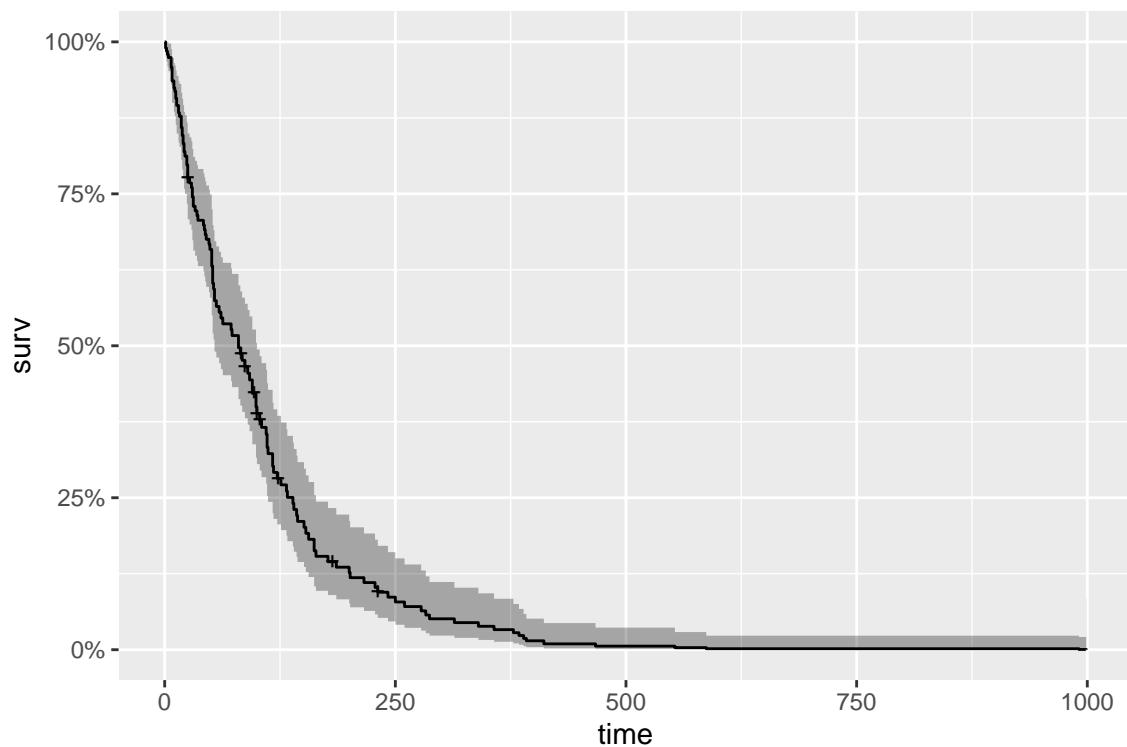


### 3.3 Modelo de Riscos Proporcionais de Cox

```
# Fit Cox Model
cox <- coxph(Surv(time, status) ~ trt + celltype + karno + diagtime + age + priorYes, data = vet)
summary(cox)

## Call:
## coxph(formula = Surv(time, status) ~ trt + celltype + karno +
##       diagtime + age + prior, data = vet)
##
## n= 137, number of events= 128
##
##              coef exp(coef) se(coef)      z Pr(>|z|)
## trttest          2.946e-01  1.343e+00  2.075e-01  1.419  0.15577
## celltypesmallcell 8.616e-01  2.367e+00  2.753e-01  3.130  0.00175 **
## celltypeadeno    1.196e+00  3.307e+00  3.009e-01  3.975  7.05e-05 ***
## celltypelarge    4.013e-01  1.494e+00  2.827e-01  1.420  0.15574
## karno            -3.282e-02  9.677e-01  5.508e-03 -5.958  2.55e-09 ***
## diagtime         8.132e-05  1.000e+00  9.136e-03  0.009  0.99290
## age              -8.706e-03  9.913e-01  9.300e-03 -0.936  0.34920
## priorYes         7.159e-02  1.074e+00  2.323e-01  0.308  0.75794
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##              exp(coef) exp(-coef) lower .95 upper .95
## trttest          1.3426      0.7448    0.8939    2.0166
## celltypesmallcell 2.3669      0.4225    1.3799    4.0597
## celltypeadeno    3.3071      0.3024    1.8336    5.9647
## celltypelarge    1.4938      0.6695    0.8583    2.5996
## karno            0.9677      1.0334    0.9573    0.9782
## diagtime         1.0001      0.9999    0.9823    1.0182
## age              0.9913      1.0087    0.9734    1.0096
## priorYes         1.0742      0.9309    0.6813    1.6937
##
## Concordance= 0.736 (se = 0.021 )
## Likelihood ratio test= 62.1 on 8 df, p=2e-10
## Wald test              = 62.37 on 8 df, p=2e-10
## Score (logrank) test = 66.74 on 8 df, p=2e-11

cox_fit <- survfit(cox)
#plot(cox_fit, main = "cph model", xlab="Days")
autoplot(cox_fit)
```



```
aa_fit <-aareg(Surv(time, status) ~ trt + celltype +
               karno + diagtime + age + prior ,
               data = vet)

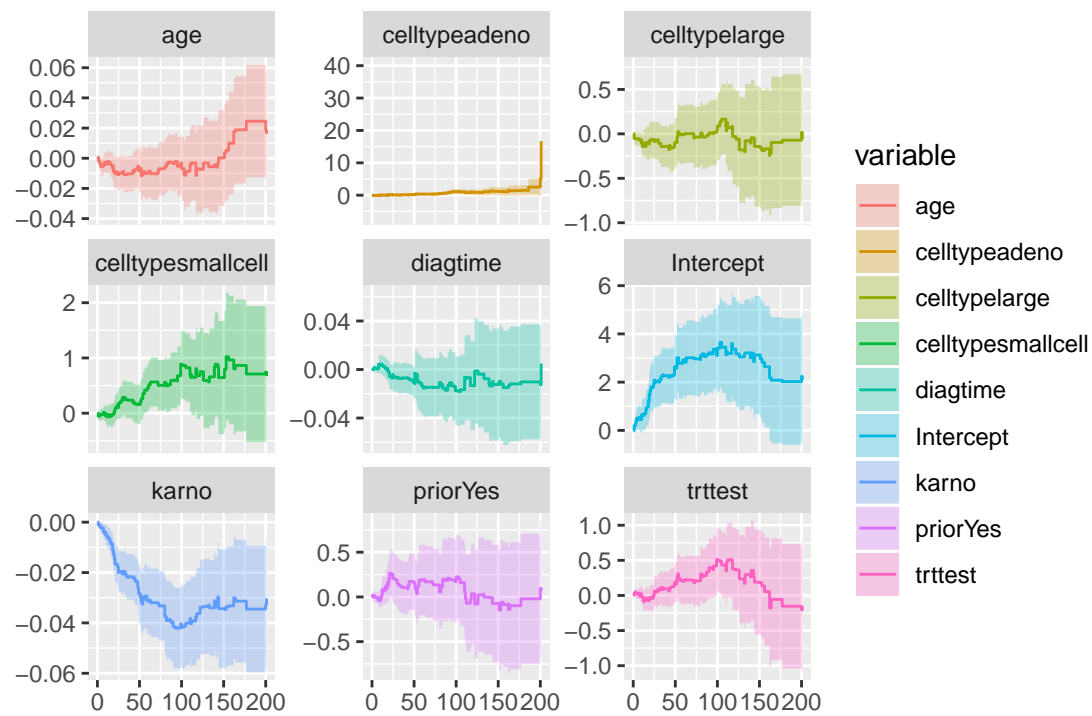
aa_fit

## Call:
## aareg(formula = Surv(time, status) ~ trt + celltype + karno +
##       diagtime + age + prior, data = vet)
##
## n= 137
## 75 out of 97 unique event times used
##
##
```

	slope	coef	se(coef)	z	p
## Intercept	0.083400	3.81e-02	1.09e-02	3.490	4.79e-04
## trttest	0.006730	2.49e-03	2.58e-03	0.967	3.34e-01
## celltypesmallcell	0.015000	7.30e-03	3.38e-03	2.160	3.09e-02
## celltypeadeno	0.018400	1.03e-02	4.20e-03	2.450	1.42e-02
## celltypelarge	-0.001090	-6.21e-04	2.71e-03	-0.229	8.19e-01
## karno	-0.001180	-4.37e-04	8.77e-05	-4.980	6.28e-07
## diagtime	-0.000243	-4.92e-05	1.64e-04	-0.300	7.65e-01
## age	-0.000246	-6.27e-05	1.28e-04	-0.491	6.23e-01
## priorYes	0.003300	1.54e-03	2.86e-03	0.539	5.90e-01

```
##
## Chisq=41.62 on 8 df, p=1.6e-06; test weights=aalen

#summary(aa_fit) # provides a more complete summary of results
autoplot(aa_fit)
```



## 4. Resultados e Discussões

## 5. Considerações Finais