Analysis_ramping

Jonas Gehrlein

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code for fitting Kaplan-Meier and log-rank test and for displaying survival curves for each type of media

```
data <- read.table(here('data','Ramp_4days.csv'), header = TRUE, sep = ";", dec = ",")
head(data)
```

```
##    ï..ID CTmax Temp  X X.1 X.2 X.3 X.4 X.5 X.6 X.7 X.8 X.9 X.10 X.11 X.12
## 1 FG20-1 39.94   20 NA  NA  NA  NA  NA  NA  NA  NA  NA  NA   NA   NA   NA
## 2 FG20-2 40.07   20 NA  NA  NA  NA  NA  NA  NA  NA  NA  NA   NA   NA   NA
## 3 FG13-1    NA   13 NA  NA  NA  NA  NA  NA  NA  NA  NA  NA   NA   NA   NA
## 4 FG13-2 38.68   13 NA  NA  NA  NA  NA  NA  NA  NA  NA  NA   NA   NA   NA
## 5 FG20-3 41.46   20 NA  NA  NA  NA  NA  NA  NA  NA  NA  NA   NA   NA   NA
## 6 FG13-3 39.49   13 NA  NA  NA  NA  NA  NA  NA  NA  NA  NA   NA   NA   NA
```

```
data <- data[,1:3]
data <- data[complete.cases(data),]
```

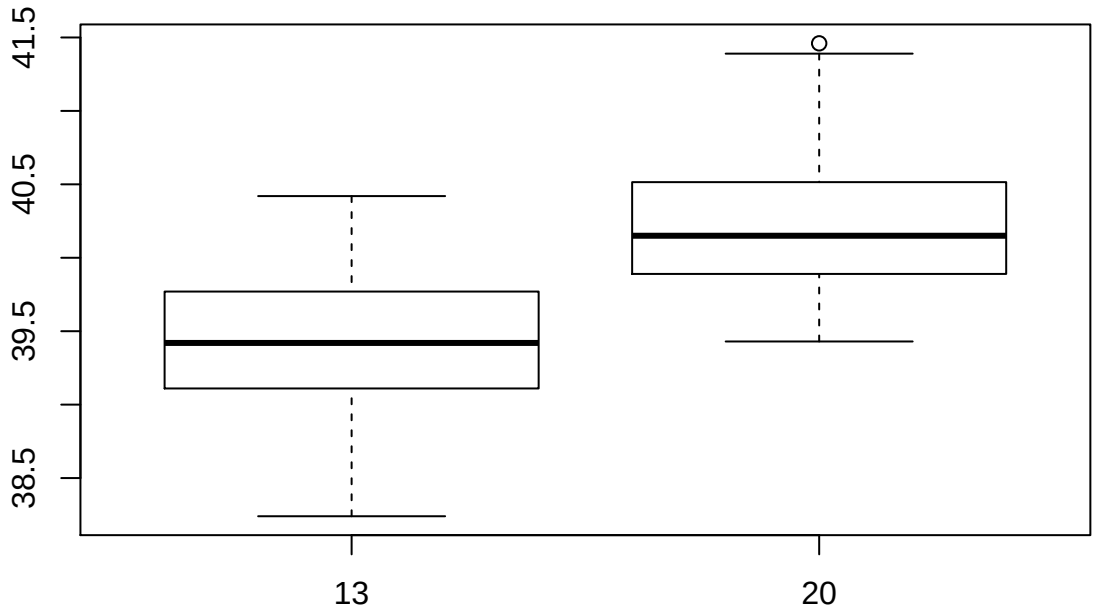
here() should show that your position is in the folder 7.semester else either download 7.semester from github again or create a .Rproj file in the folder on your computer One fly died from water entering the tube and is marked NA so it is removed. Or make a new .Rproj file in the folder 7.semester. There is a problem with the numbers of the so we change that with col.names()

```
colnames(data)<-c('ID',"Ctmax","Temp")
head(data)
```

```
##       ID Ctmax Temp
## 1 FG20-1 39.94   20
## 2 FG20-2 40.07   20
## 4 FG13-2 38.68   13
## 5 FG20-3 41.46   20
## 6 FG13-3 39.49   13
## 7 FG20-4 40.15   20
```

We then compare the two acclimation temperatures first with a boxplot

```
boxplot(data$Ctmax ~ data$Temp)
```



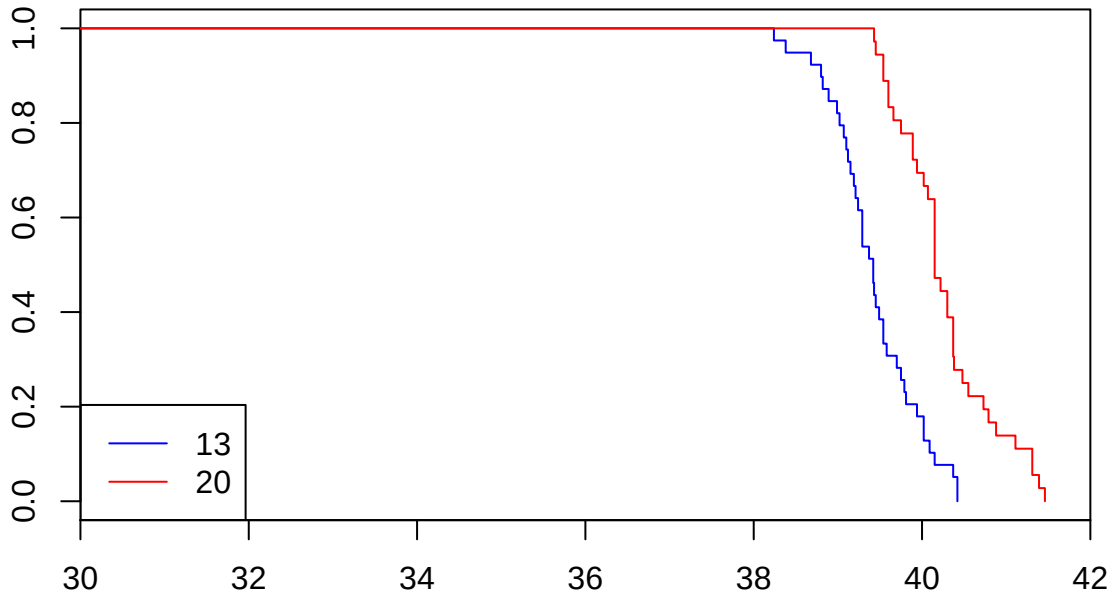

```
t.test(Ctmax ~Temp, data = data)
```

```
##
##  Welch Two Sample t-test
##
## data:  Ctmax by Temp
## t = -6.7059, df = 71.24, p-value = 3.994e-09
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -1.0947426 -0.5929498
## sample estimates:
## mean in group 13 mean in group 20
##         39.42282         40.26667
```

This shows basically no difference between the groups. We try to see what is happening with a survival curve

Then we create a survival object with the survival package and make a kaplan-meier curve

```
data$status <- rep(1,75)
data$Survobj <- with(data,Surv(data$Ctmax, event = data$status))
km <- survfit(Survobj ~ Temp, data = data,conf.type = "log-log")
plot(km, col = c("blue","red"), xlim = c(30,42) )
legend("bottomleft",legend = c("13","20" ), col = c("blue","red"), lwd=1)
```



Which also don‘t show any meaningful difference between the groups Now we test for difference between the curves with both log-rank and gehan-wilcoxon

```
survdiff(Survobj ~Temp, data = data, rho = 0)
```

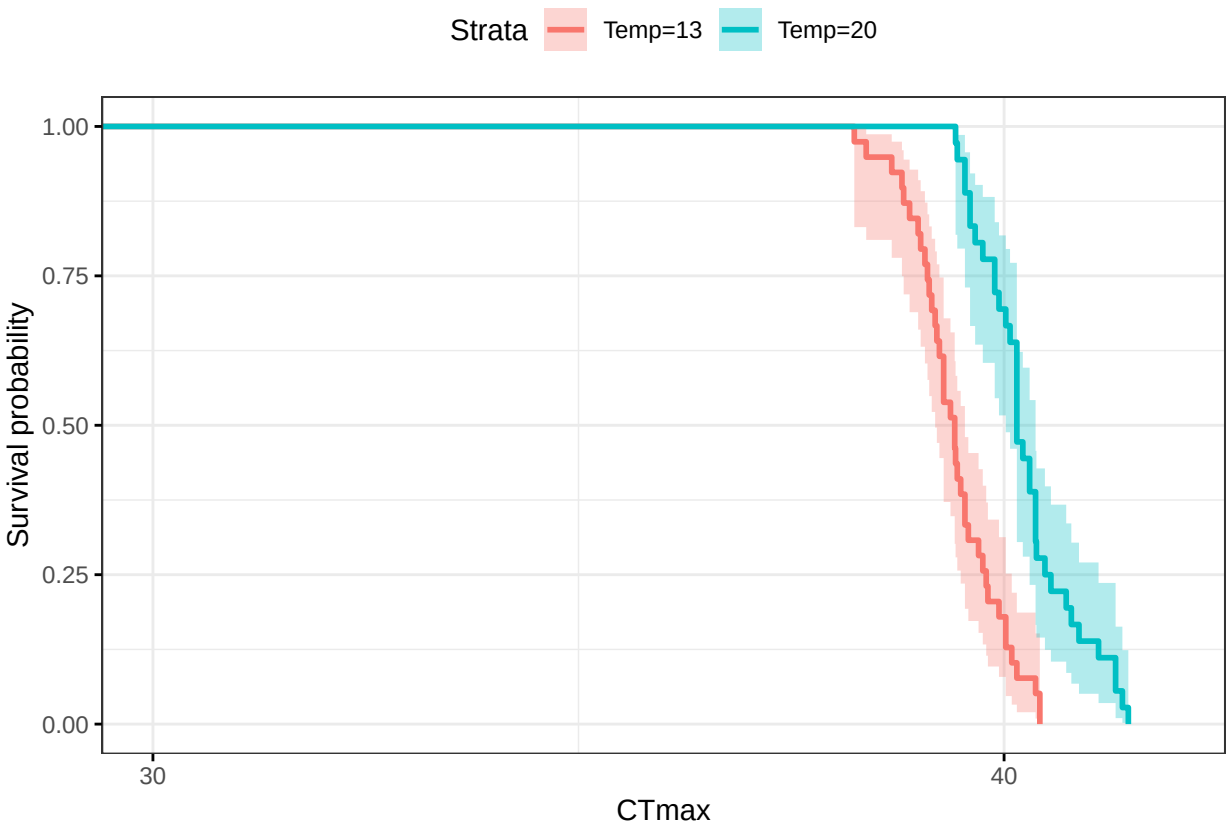
```
## Call:
## survdiff(formula = Survobj ~ Temp, data = data, rho = 0)
##
##          N Observed Expected (O-E)^2/E (O-E)^2/V
## Temp=13 39       39     19.3     20.23      32.2
## Temp=20 36       36     55.7      6.99      32.2
##
##  Chisq= 32.2  on 1 degrees of freedom, p= 1e-08
```

```
survdiff(Survobj ~Temp, data = data, rho = 1)
```

```
## Call:
## survdiff(formula = Survobj ~ Temp, data = data, rho = 1)
##
##          N Observed Expected (O-E)^2/E (O-E)^2/V
## Temp=13 39     26.9     13.1      14.7      33.4
## Temp=20 36     11.7     25.6       7.5      33.4
##
##  Chisq= 33.4  on 1 degrees of freedom, p= 7e-09
```

Which both don‘t find a significant difference between the groups But we can make a nicer survival curve with a different package survminer and add readable confidence intervals

```
ggsurvplot(km,data = data, conf.int = TRUE, ggtheme = theme_bw(),
           xlim = c(30,42), xlab = "CTmax")
```



Whic very clearly shows that the problem is that the two lines are far to close together.