Survival Analysis of OV with Taxol

This is for survival analysis of OV data from TCGA.

Date: 05/05/2015

380 patients have been treated with Taxol.

Time measured by month.

1. Load Data:

```
load("/Users/zhenyu/Downloads/working/Steph/ov/taxol.data.rda")
head(taxol.data)
```

```
##              contact.days death.days days death months taxol taxotere
## TCGA-25-2042          396        396  396  TRUE  13.01  TRUE    FALSE
## TCGA-25-2399          608        608  608  TRUE  19.98  TRUE    FALSE
## TCGA-29-2427         1900         NA 1900 FALSE  62.42  TRUE    FALSE
## TCGA-59-2355           NA         65   65  TRUE   2.14  TRUE    FALSE
## TCGA-59-2363          165         NA  165 FALSE   5.42  TRUE    FALSE
## TCGA-25-2391         1492       1492 1492  TRUE  49.02  TRUE     TRUE
##              carboplatin cisplatin other taxol.prediction      pred
## TCGA-25-2042        TRUE     FALSE  TRUE        -2.455937 -2.455937
## TCGA-25-2399        TRUE     FALSE  TRUE        -3.603826 -3.603826
## TCGA-29-2427        TRUE      TRUE  TRUE        -2.493162 -2.493162
## TCGA-59-2355        TRUE     FALSE FALSE        -3.449695 -3.449695
## TCGA-59-2363        TRUE     FALSE FALSE        -3.116783 -3.116783
## TCGA-25-2391        TRUE     FALSE FALSE        -2.985817 -2.985817
##              quantile
## TCGA-25-2042       Q1
## TCGA-25-2399       Q4
## TCGA-29-2427       Q1
## TCGA-59-2355       Q4
## TCGA-59-2363       Q3
## TCGA-25-2391       Q3
```

```
cat = table(with(taxol.data, paste(taxol, taxotere, carboplatin, cisplatin, other, sep="|")))
cat2 = cbind(rownames(cat), cat)
rownames(cat2)=NULL
colnames(cat2) = c("Taxol|Taxotere|Carboplatin|Cisplatin|Other", "count")
print(cat2)
```

```
##       Taxol|Taxotere|Carboplatin|Cisplatin|Other count
##  [1,] "TRUE|FALSE|FALSE|TRUE|FALSE"              "17"
##  [2,] "TRUE|FALSE|FALSE|TRUE|TRUE"               "9"
##  [3,] "TRUE|FALSE|TRUE|FALSE|FALSE"              "97"
##  [4,] "TRUE|FALSE|TRUE|FALSE|TRUE"               "121"
##  [5,] "TRUE|FALSE|TRUE|TRUE|FALSE"               "29"
```

```
##  [6,] "TRUE|FALSE|TRUE|TRUE|TRUE"                "40"
##  [7,] "TRUE|TRUE|FALSE|TRUE|FALSE"               "3"
##  [8,] "TRUE|TRUE|FALSE|TRUE|TRUE"                "1"
##  [9,] "TRUE|TRUE|TRUE|FALSE|FALSE"               "11"
## [10,] "TRUE|TRUE|TRUE|FALSE|TRUE"                "24"
## [11,] "TRUE|TRUE|TRUE|TRUE|FALSE"                "5"
## [12,] "TRUE|TRUE|TRUE|TRUE|TRUE"                 "23"
```

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2. Predicted sensitivity by death, and one-sided t-test:

```
qplot(death, pred, data=taxol.data, geom=c("boxplot", "jitter"),
   fill=death, main="Predicted Taxol Sensitivity by Death",
   xlab="", ylab="Predicted Taxol Sensitivity")
```

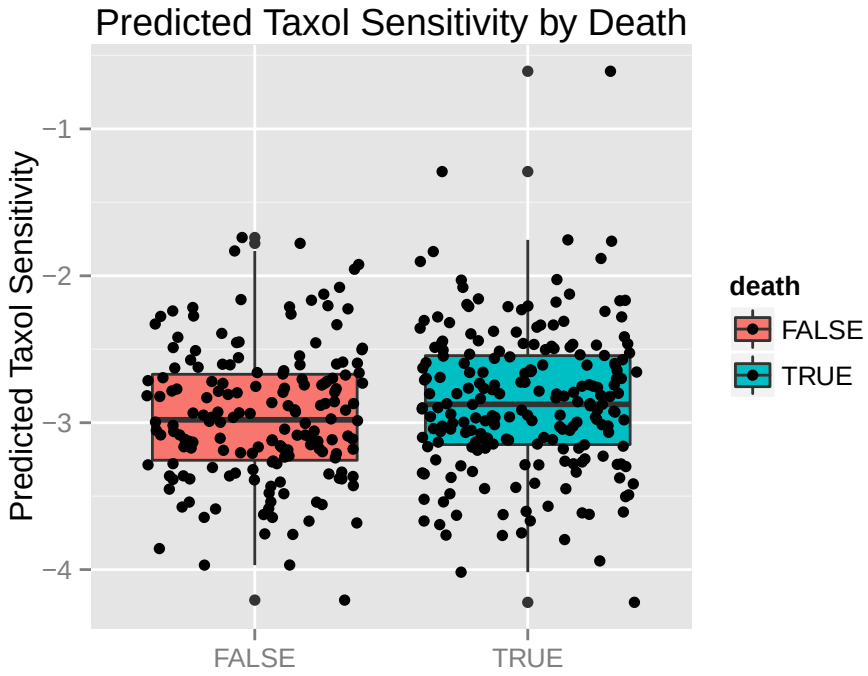

Figure 1:

```
with(taxol.data, t.test(taxol.prediction[death], taxol.prediction[!death], "greater"))
```

```
##
##  Welch Two Sample t-test
##
## data:  taxol.prediction[death] and taxol.prediction[!death]
## t = 1.9609, df = 370.98, p-value = 0.02532
## alternative hypothesis: true difference in means is greater than 0
## 95 percent confidence interval:
##  0.01521272        Inf
```

```
## sample estimates:
## mean of x mean of y
## -2.856808 -2.952432
```

---

3. KM Curve by Sensitivity Quantile:

```
ggsurv(survfit(with(taxol.data, Surv(months,death) ~ quantile)))
```

```
## Loading required package: scales
```

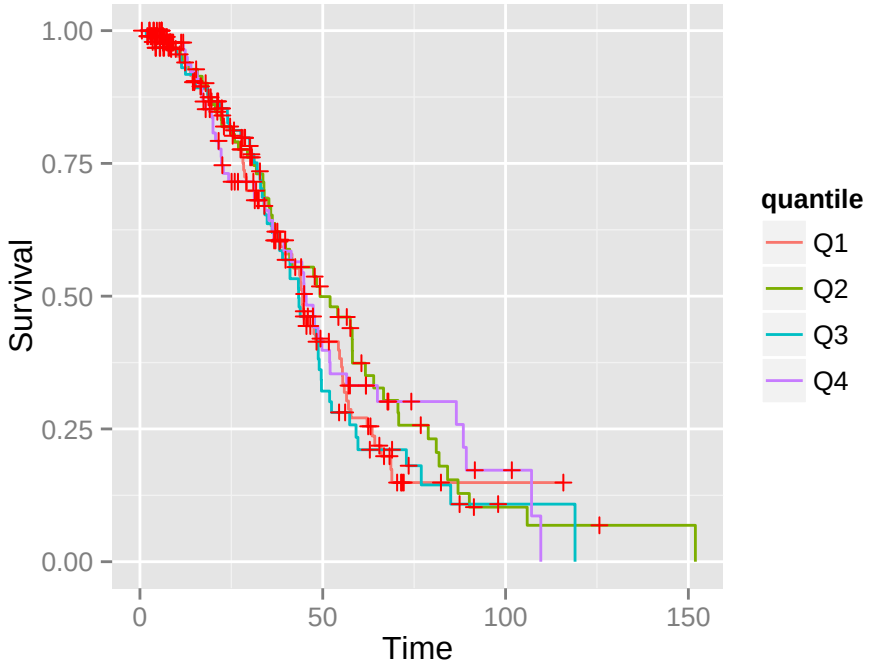

Figure 2:

```
#ggsurv(survfit(surv.data))
#survdiff(surv.data)
```

---

4. KM Curve and Survial test by Q1 and Q4:

```
surv.data = with(taxol.data[which(taxol.data$quantile %in% c("Q1", "Q4")), ], Surv(months,death) ~ quant
ggsurv(survfit(surv.data))
```

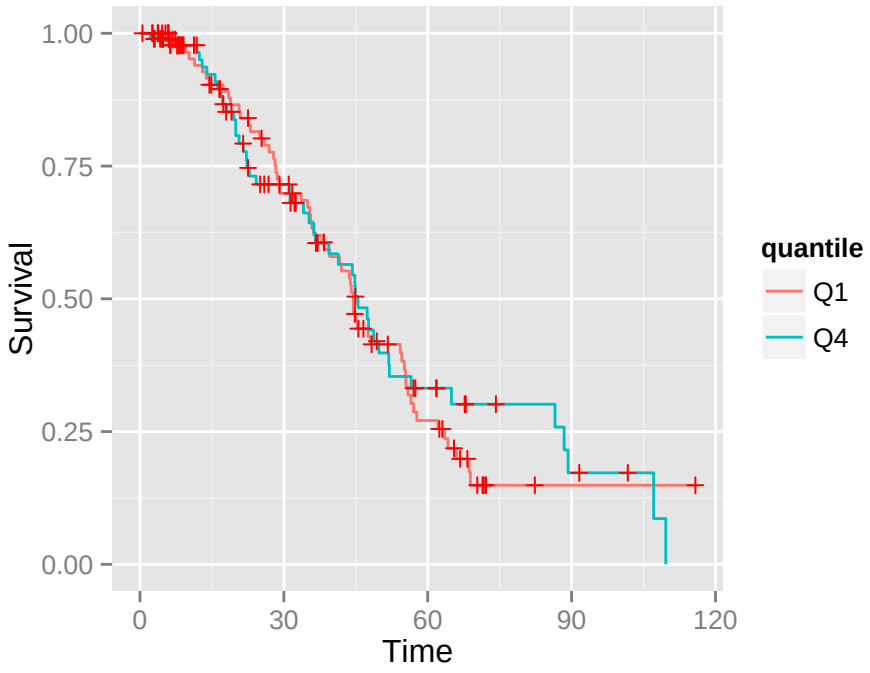

Figure 3:

```
survdiff(surv.data)
```

```
## Call:
## survdiff(formula = surv.data)
##
##                 N Observed Expected (O-E)^2/E (O-E)^2/V
## quantile=Q1 95         60     57.7    0.0882     0.201
## quantile=Q4 95         45     47.3    0.1078     0.201
##
##  Chisq= 0.2  on 1 degrees of freedom, p= 0.654
```