

Analysis of chemotherapy trial for colon cancer

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```
knitr::opts_chunk$set(echo = FALSE)
```

[Rmd cheatsheet][<https://www.rstudio.com/wp-content/uploads/2015/02/rmarkdown-cheatsheet.pdf>]

Description of data

These are data from one of the *first* successful trials of adjuvant chemotherapy for colon cancer. **Levamisole** is a low-toxicity compound previously used to treat worm infestations in animals; 5-FU is a moderately toxic (as these things go) chemotherapy agent. There are two records per person, one for recurrence and one for death

Format													
id:	id												
study:	1 for all patients												
rx:	Treatment - Obs(ervation), Lev(amisole), Lev(amisole)+5-FU												
sex:	1=male												
age:	in years												
obstruct:	obstruction of colon by tumour												
perfor:	perforation of colon												
adhere:	adherence to nearby organs												
nodes:	number of lymph nodes with detectable cancer												
time:	days until event or censoring												
status:	censoring status												
differ:	differentiation of tumour (1=well, 2=moderate, 3=poor)												
extent:	Extent of local spread (1=submucosa, 2=muscle, 3=serosa, 4=contiguous structures)												
surg:	time from surgery to registration (0=short, 1=long)												
node4:	more than 4 positive lymph nodes												
etype:	event type: 1=recurrence,2=death												

Figure 1: info

##	id	study	rx	sex	age	obstruct	perfor	adhere	nodes	status	differ	extent
## 1	1	1	Lev+5FU	1	43	0	0	0	5	1	2	3
## 2	1	1	Lev+5FU	1	43	0	0	0	5	1	2	3

```

## 3 2      1 Lev+5FU 1 63      0      0      0      1      0      2      3
## 4 2      1 Lev+5FU 1 63      0      0      0      1      0      2      3
## 5 3      1      Obs 0 71      0      0      1      7      1      2      2
## 6 3      1      Obs 0 71      0      0      1      7      1      2      2
##      surg node4 time etype
## 1      0      1 1521      2
## 2      0      1 968      1
## 3      0      0 3087      2
## 4      0      0 3087      1
## 5      0      1 963      2
## 6      0      1 542      1

```

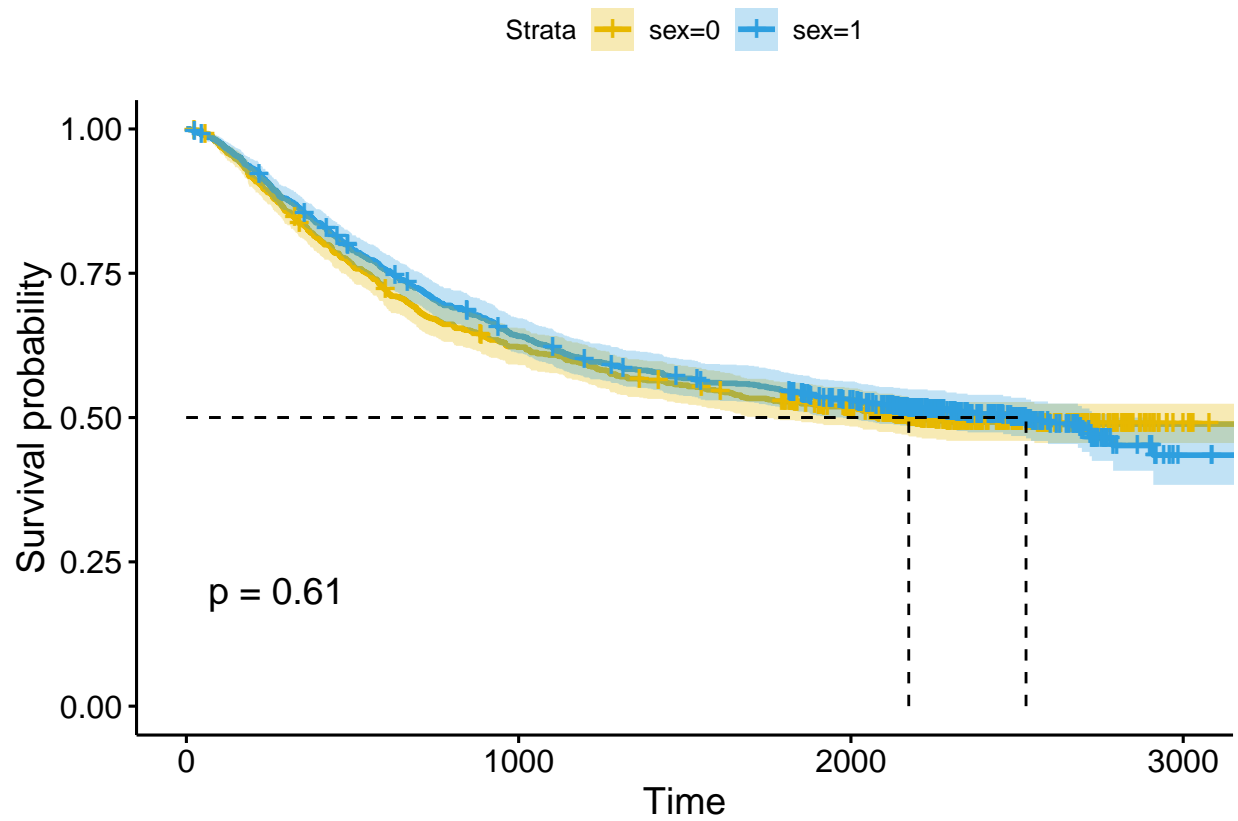
The data set consisted of 1858 records. A summary of the data set is presented in the table below.

```

##      id      study      rx      sex      age
## Min.      : 1      Min.      :1      Obs      :630      Min.      :0.000      Min.      :18.00
## 1st Qu.:233      1st Qu.:1      Lev      :620      1st Qu.:0.000      1st Qu.:53.00
## Median :465      Median :1      Lev+5FU:608      Median :1.000      Median :61.00
## Mean      :465      Mean      :1      Mean      :0.521      Mean      :59.75
## 3rd Qu.:697      3rd Qu.:1      3rd Qu.:1.000      3rd Qu.:69.00
## Max.      :929      Max.      :1      Max.      :1.000      Max.      :85.00
##
##      obstruct      perfor      adhere      nodes
## Min.      :0.0000      Min.      :0.00000      Min.      :0.0000      Min.      : 0.00
## 1st Qu.:0.0000      1st Qu.:0.00000      1st Qu.:0.0000      1st Qu.: 1.00
## Median :0.0000      Median :0.00000      Median :0.0000      Median : 2.00
## Mean      :0.1938      Mean      :0.02906      Mean      :0.1453      Mean      : 3.66
## 3rd Qu.:0.0000      3rd Qu.:0.00000      3rd Qu.:0.0000      3rd Qu.: 5.00
## Max.      :1.0000      Max.      :1.00000      Max.      :1.0000      Max.      :33.00
##
##                                     NA's      :36
##      status      differ      extent      surg
## Min.      :0.0000      Min.      :1.000      Min.      :1.000      Min.      :0.0000
## 1st Qu.:0.0000      1st Qu.:2.000      1st Qu.:3.000      1st Qu.:0.0000
## Median :0.0000      Median :2.000      Median :3.000      Median :0.0000
## Mean      :0.4952      Mean      :2.063      Mean      :2.887      Mean      :0.2659
## 3rd Qu.:1.0000      3rd Qu.:2.000      3rd Qu.:3.000      3rd Qu.:1.0000
## Max.      :1.0000      Max.      :3.000      Max.      :4.000      Max.      :1.0000
##
##      NA's      :46
##      node4      time      etype
## Min.      :0.0000      Min.      : 8      Min.      :1.0
## 1st Qu.:0.0000      1st Qu.: 566      1st Qu.:1.0
## Median :0.0000      Median :1855      Median :1.5
## Mean      :0.2745      Mean      :1538      Mean      :1.5
## 3rd Qu.:1.0000      3rd Qu.:2331      3rd Qu.:2.0
## Max.      :1.0000      Max.      :3329      Max.      :2.0
##
##

```

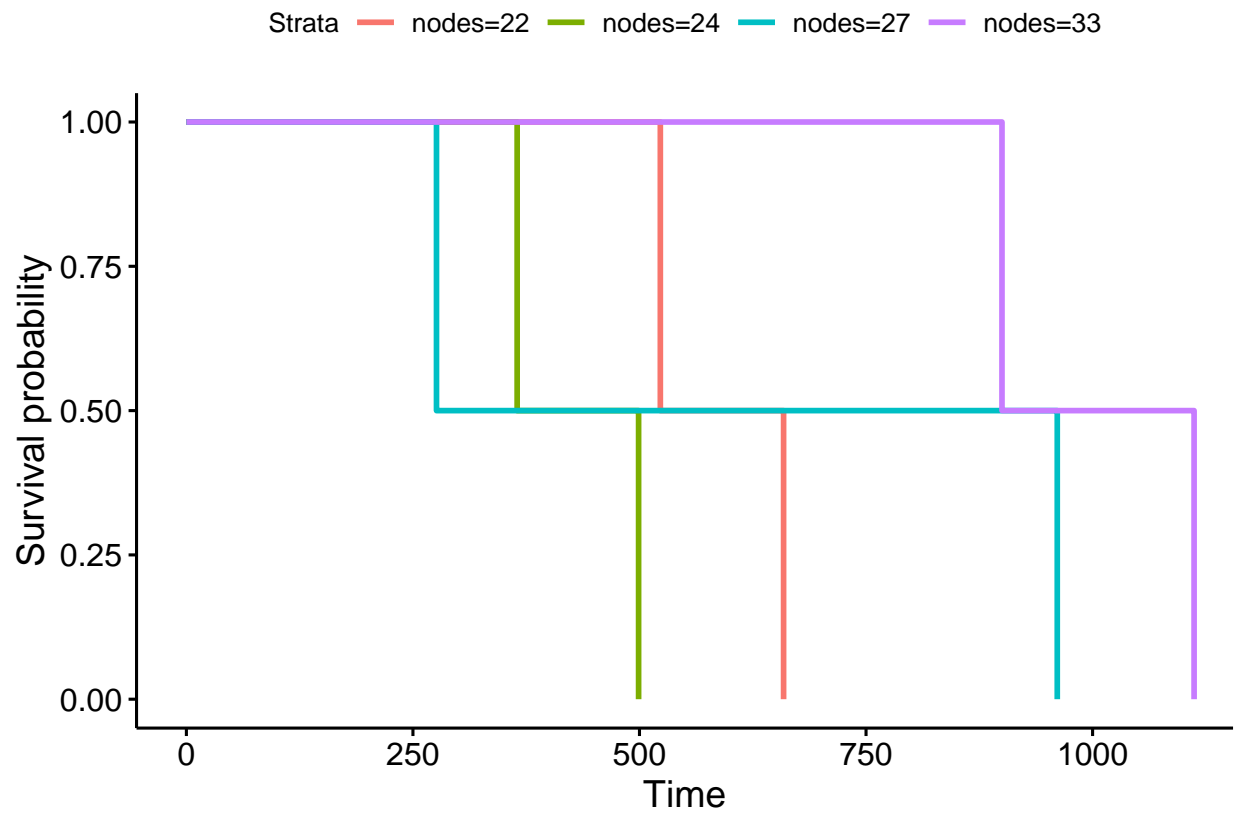
Survival rates between sex



The median survival time for sex=1 (Male group) is 2200 days, while it is 2500 days for sex=2 (Female).

survival differences by nodes more than 20

It is also interesting to find out if survival rates of treatment differ between patients with more than 20 nodes



Conclusion

There is no difference in death between males and females