

## JHU-NJU Survival Analysis

### Lab 3 (July 20, 2011)

## 1 PBC Data

NAME: PBC Data (PBC.DAT) SIZE: 418 observations, 20 variables

SOURCE: Counting Processes and Survival Analysis by T. Fleming, D. Harrington, (1991), published by John Wiley and Sons.

BASIC DATA DESCRIPTION: Mayo Clinic trial in primary biliary cirrhosis (PBC) of the liver conducted between 1974 and 1984. A total of 424 PBC patients, referred to Mayo Clinic during that ten-year interval, met eligibility criteria for the randomized placebo controlled trial of the drug D-penicillamine. Censoring was due to liver transplantation.

### The Data

**X** The number of days between registration and the earlier of death, liver transplantation, or study analysis time in July, 1986.

**D** 1 if X is time to death, 0 if time to censoring

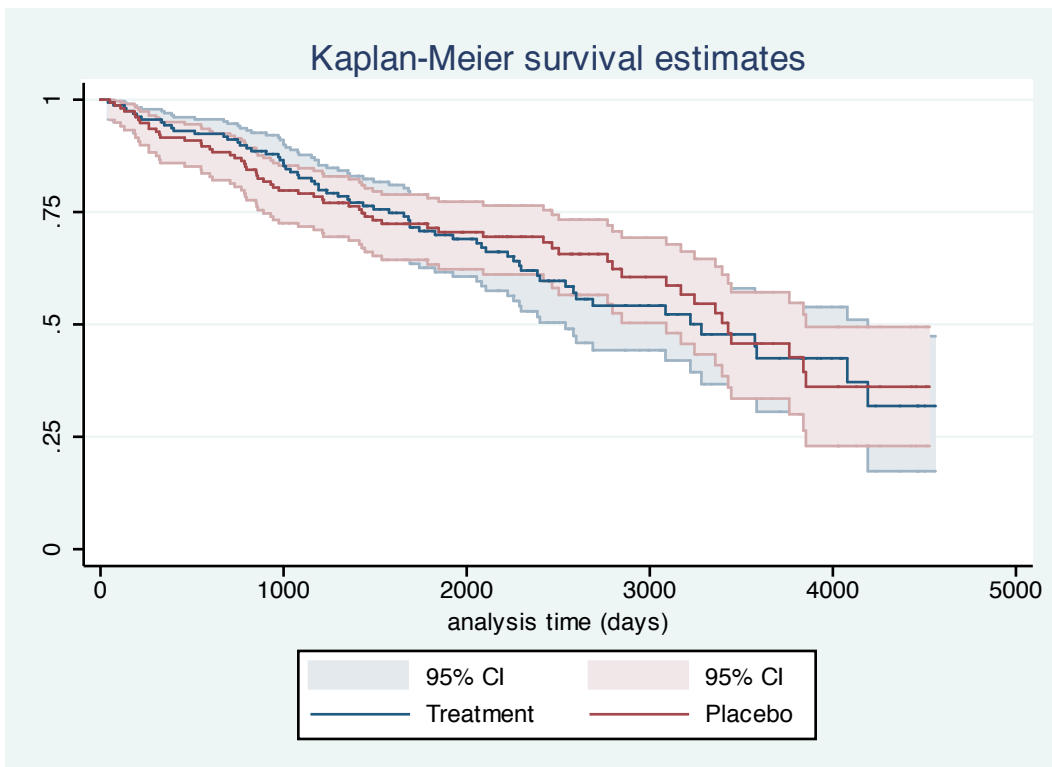
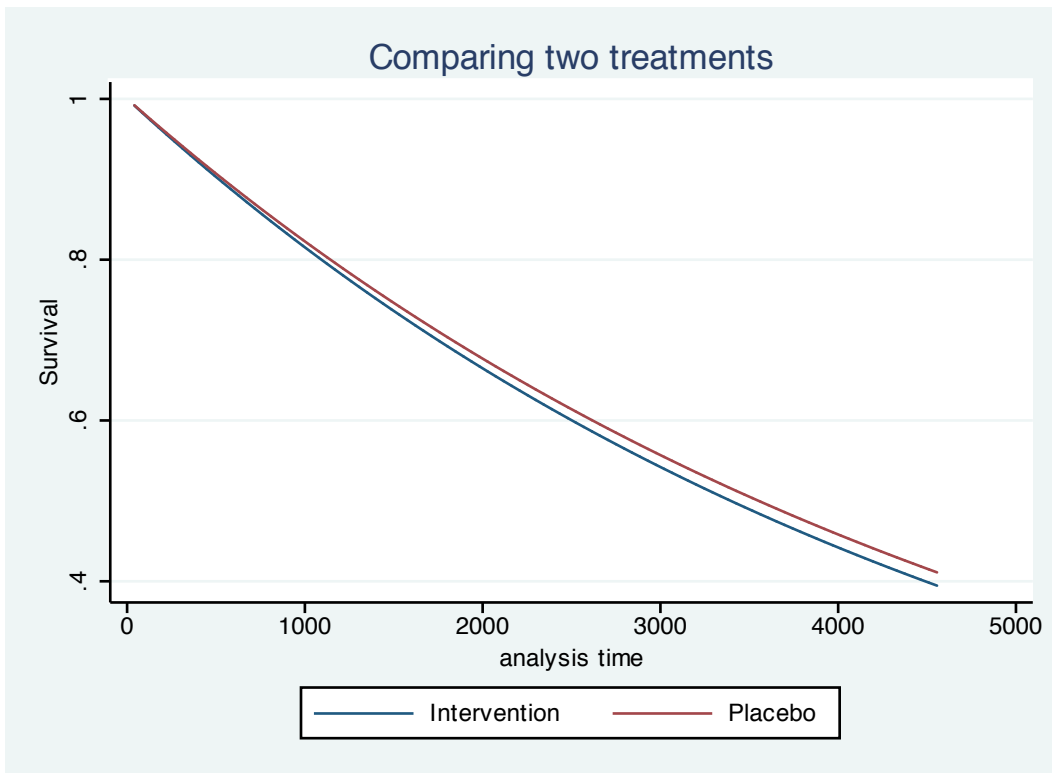
**Z1** Treatment Code, 1 = D-penicillamine, 2 = placebo.

Stata 11.1 File Edit Data Editor Graph

X[1] 400

	X	D	Z1
1	400	1	1
2	4500	0	1
3	1012	1	1
4	1925	1	1
5	1504	0	2
6	2503	1	2
7	1832	0	2
8	2466	1	2
9	2400	1	1
10	51	1	2
11	3762	1	2
12	304	1	2
13	3577	0	2
14	1217	1	2
15	3584	1	1
16	3672	0	2
17	769	1	2
18	131	1	1
19	4232	0	1
20	1356	1	2
21	3445	0	2
22	673	1	1
23	264	1	2
24	4079	1	1
25	4127	0	2

## 2 Comparing treatment groups



## 2.1 Comparing the medians

Recall the MLEs for both groups using the exponential model:

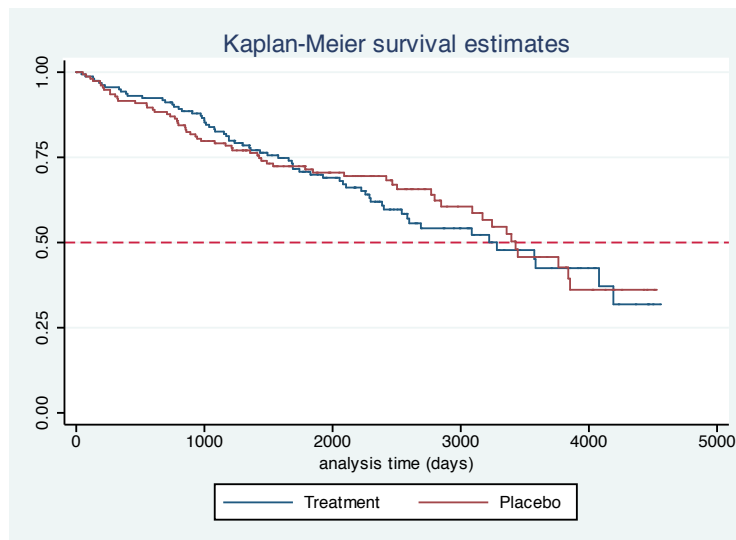
Intervention (group 1):  $\hat{\theta}_1 = .0002041$

Placebo (group 2):  $\hat{\theta}_2 = .0001951$

- How can we find the median survival time?

Median, Intervention (group 1): 3396.1

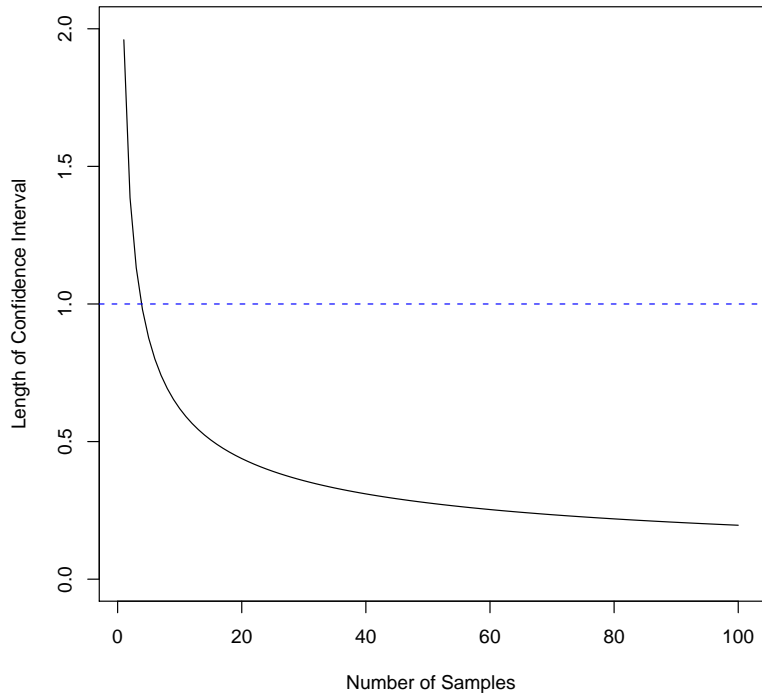
Median, Placebo (group 2): 3552.8



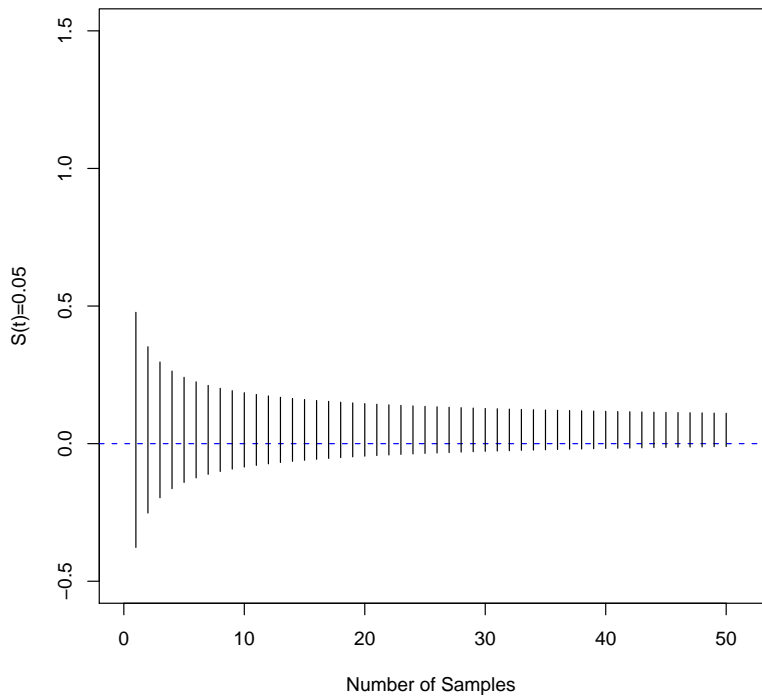
## 3 Confidence Intervals for $S(t)$

Using the Normal approximation:

**CI length for Different Sample Sizes,  $S(t) = 0.5$**



**$S(t) = 0.05$  CIs for Different Sample Sizes**



## 4 Appendix: STATA Code

```
*Plot Kaplan Meier curves and 95% CI
```

```
sts graph, by (Z1) gwood
```

```
*Plot Kaplan Meier Curves with line for 50% survival
```

```
sts graph, by (Z1) yline(0.5, lpattern(dash))
```