

Stata commands for survival analysis

Aims of a Survival Analysis

- Summarize the distribution of survival times
Tool: Kaplan-Meier estimates (of survival distribution)
- Compare survival distributions between groups
Tool: logrank test
- Investigate predictors of survival
Tool: Cox regression model

```
use leuk.dta
stset time, f(cens)
```

```

failure event: cens != 0 & cens < .
obs. time interval: (0, time]
exit on or before: failure

```

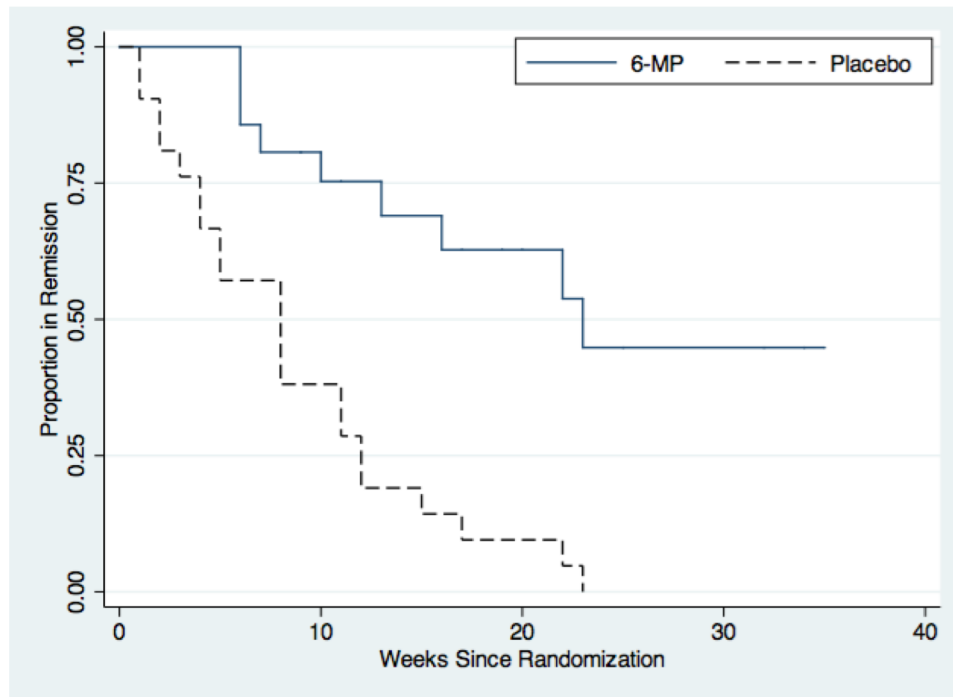
```
42  total observations
  0  exclusions
```

[illegible]

Kaplan-Meier Estimates

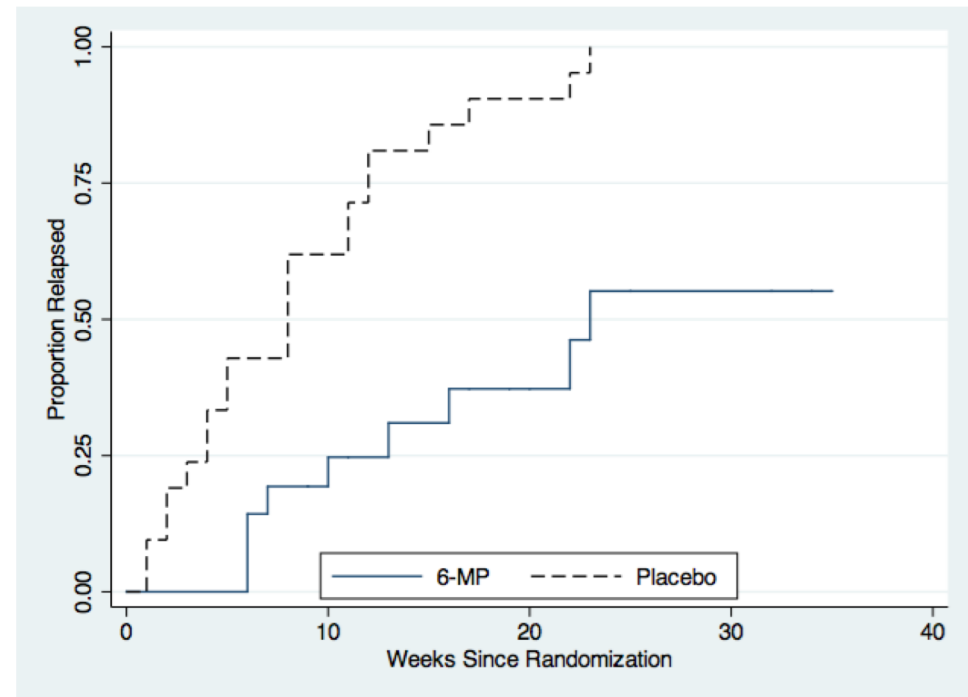
K-M Survival function

`sts graph, by(group)`



Cumulative relapse incidence

`sts graph, by(group) failure`



Median Survival Time

stci, by(group)

failure _d: cens
analysis time _t: time

group	no. of subjects	50%	Std. Err.	[95% Conf. Interval]	
placebo	21	8	1.669046	4	11
6-MP	21	23	2.252304	13	.
total	42	12	1.716577	8	17

Logrank test for ALL data

sts test group

```
failure _d: cens  
analysis time _t: time
```

Log-rank test for equality of survivor functions

group	Events observed	Events expected
6 MP	9	19.25
Placebo	21	10.75
Total	30	30.00

```
chi2(1) = 16.79  
Pr>chi2 = 0.0000
```

Cox Regression

stcox group, nolog

failure _d: cens
analysis time _t: time

Cox regression -- Breslow method for ties

No. of subjects =	42	Number of obs =	42
No. of failures =	30		
Time at risk =	541		
Log likelihood =	-86.379622	LR chi2(1) =	15.21
		Prob > chi2 =	0.0001

_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
group	.2210887	.0905501	-3.68	0.000	.0990706	.4933877

Estimated hazard ratio = 0.22 (3-MP vs placebo)

Two useful post-estimation commands

- **lincom** — linear combinations of estimators

```
lincom -1*group, hr
```

```
( 1)  - group = 0
```

_t		Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
-----+-----						
(1)		4.523072	1.852489	3.68	0.000	2.026804 10.09382

Estimated hazard ratio = 4.52 (placebo vs 3-MP)

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_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
-----+-----						
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Estimated hazard ratio = 4.52 (placebo vs 3-MP)

- **contrast** — contrasts and linear hypothesis tests
more in the next lecture