Biostat 537 HW 2

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2/5/2020

Problem 1

(a)

Maintenance Group Estimates

Time (t)	# at risk (n)	# events (d)	d/n	1-d/n	S(t)	H(t)
9	12	1	0.083	0.917	0.917	0.083
12	11	1	0.091	0.909	0.833	0.174
13	10	0	0.000	1.000	0.833	0.174
18	9	1	0.111	0.889	0.741	0.285
23	8	1	0.125	0.875	0.648	0.410
28	7	0	0.000	1.000	0.648	0.410
31	6	1	0.167	0.833	0.540	0.577
34	5	1	0.200	0.800	0.432	0.777
45	4	1	0.250	0.750	0.324	1.027
48	2	1	0.500	0.500	0.162	1.527
161	1	0	0.000	1.000	0.162	1.527

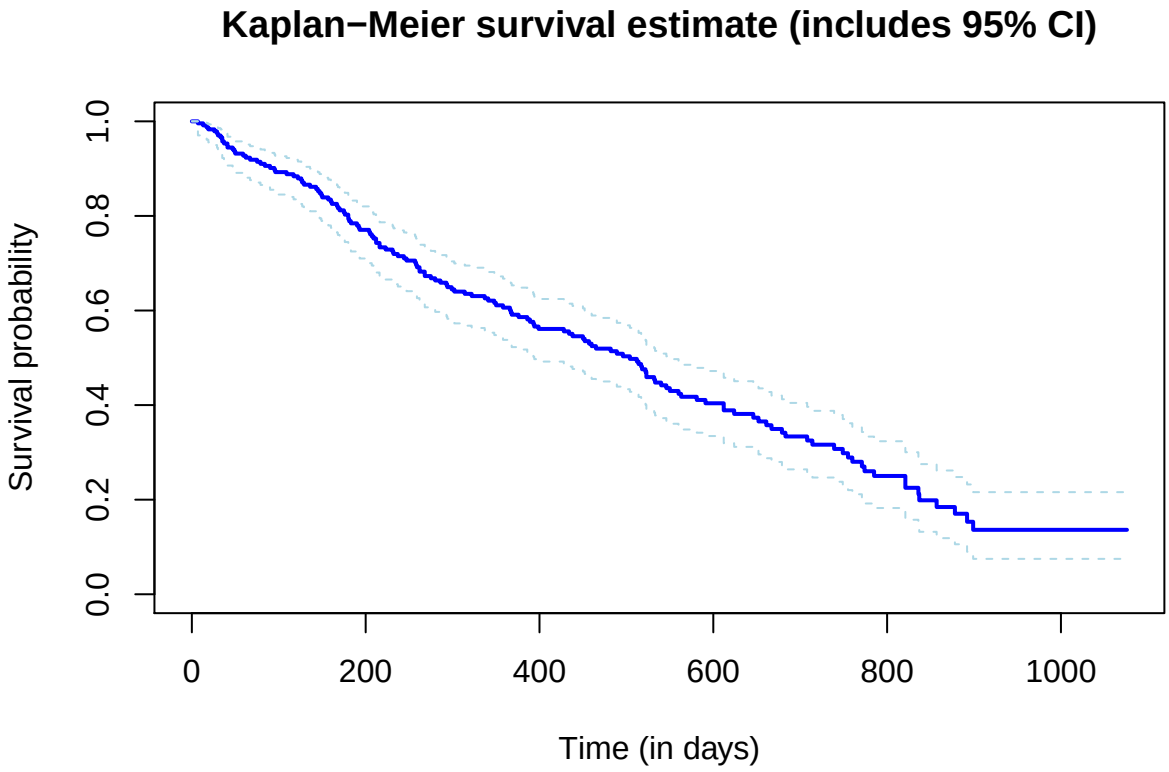
Control Group Estimates

Time (t)	# at risk (n)	# events (d)	d/n	1-d/n	S(t)	H(t)
4	13	1	0.077	0.923	0.923	0.077
5	12	1	0.083	0.917	0.846	0.160
8	11	2	0.182	0.818	0.692	0.342
10	9	0	0.000	1.000	0.692	0.342
12	8	1	0.125	0.875	0.606	0.467
16	7	0	0.000	1.000	0.606	0.467
23	6	1	0.167	0.833	0.505	0.634
27	5	1	0.200	0.800	0.404	0.834
30	4	1	0.250	0.750	0.303	1.084
38	3	1	0.333	0.667	0.202	1.417
43	2	1	0.500	0.500	0.101	1.917
45	1	1	1.000	0.000	0.000	2.917

(b) For the maintenance group, we estimate a 56.8% probability that no relapse will occur by 36 months. For the control group, we estimate a 69.7% probability that no relapse will occur by 36 months.

Problem 2

(a) The estimated probability that no exit will occur by one year is 60.6% (95% CI: 53.8-66.7).



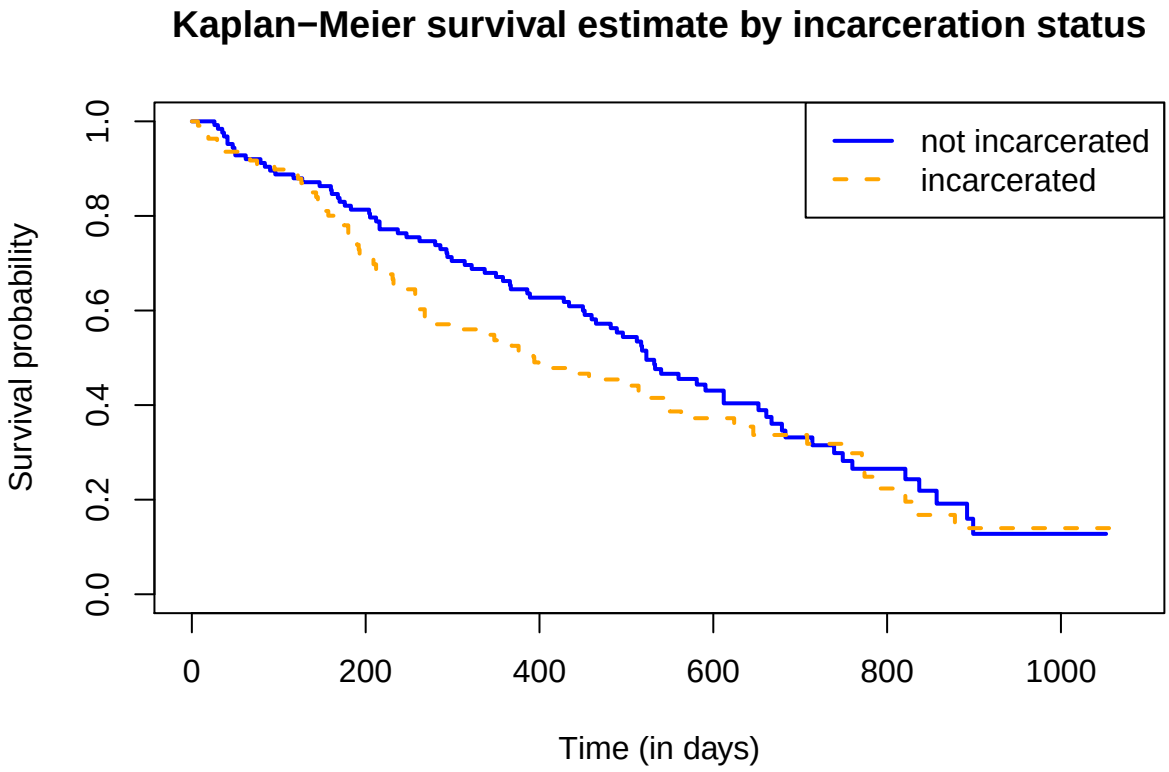
(b) The median time until exit from maintenance is 504 days (95% CI: 394-550).

i. We can obtain the median from looking at the Kaplan-Meier estimator by finding the time where the survival estimate first drops below 0.5. We can estimate the 95% confidence intervals by using the first time period that includes 0.5 in the 95% confidence interval for the lower estimate, and the first time interval that does not include 0.5 that comes after the median time.

ii. the median estimate and 95% confidence intervals using the *survfit* command returns the same results as the examination of the Kaplan-Meier estimators for each time.

(c)

i.

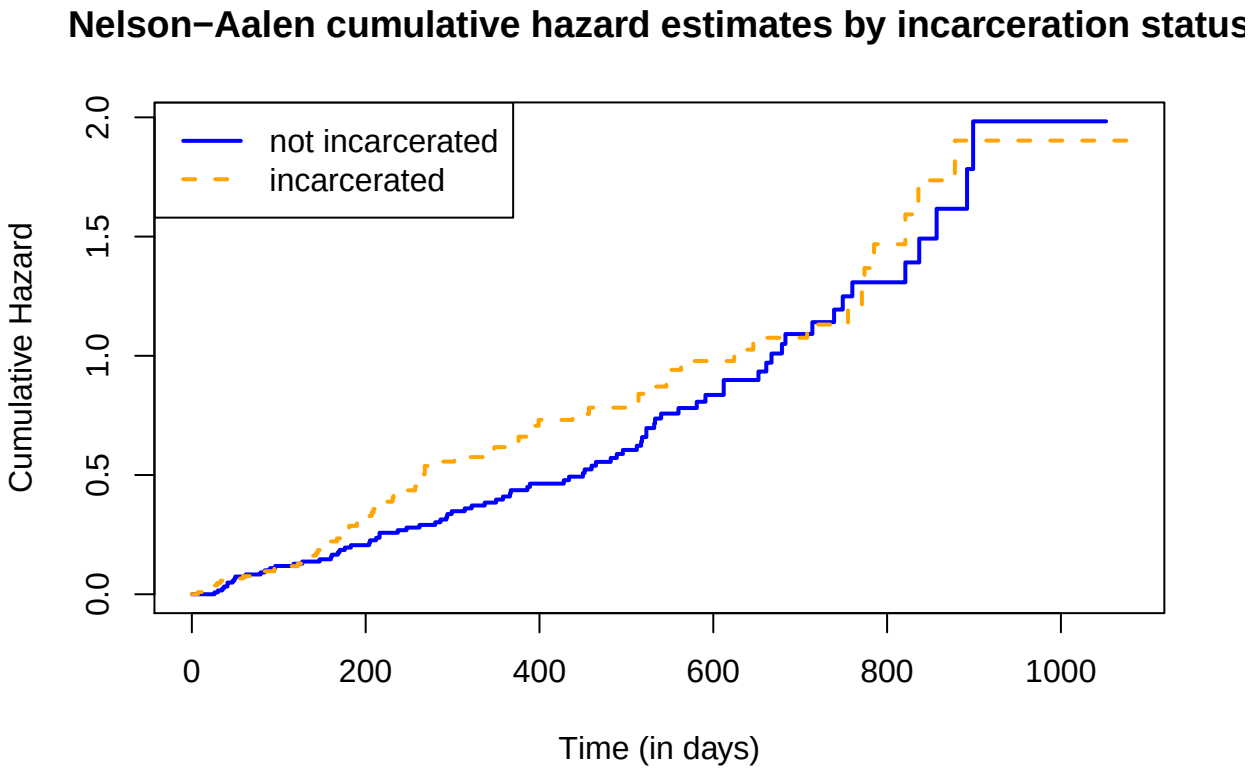


ii. The probability of no exit occuring by 8 months does not significantly differ at the 95% confidence level between those that were incarcerated and those that were not (p=0.077).

iii. Based on the logrank test, the distribution of time until exit from maintenance does not significantly differ by history of incarceration (p=0.3).

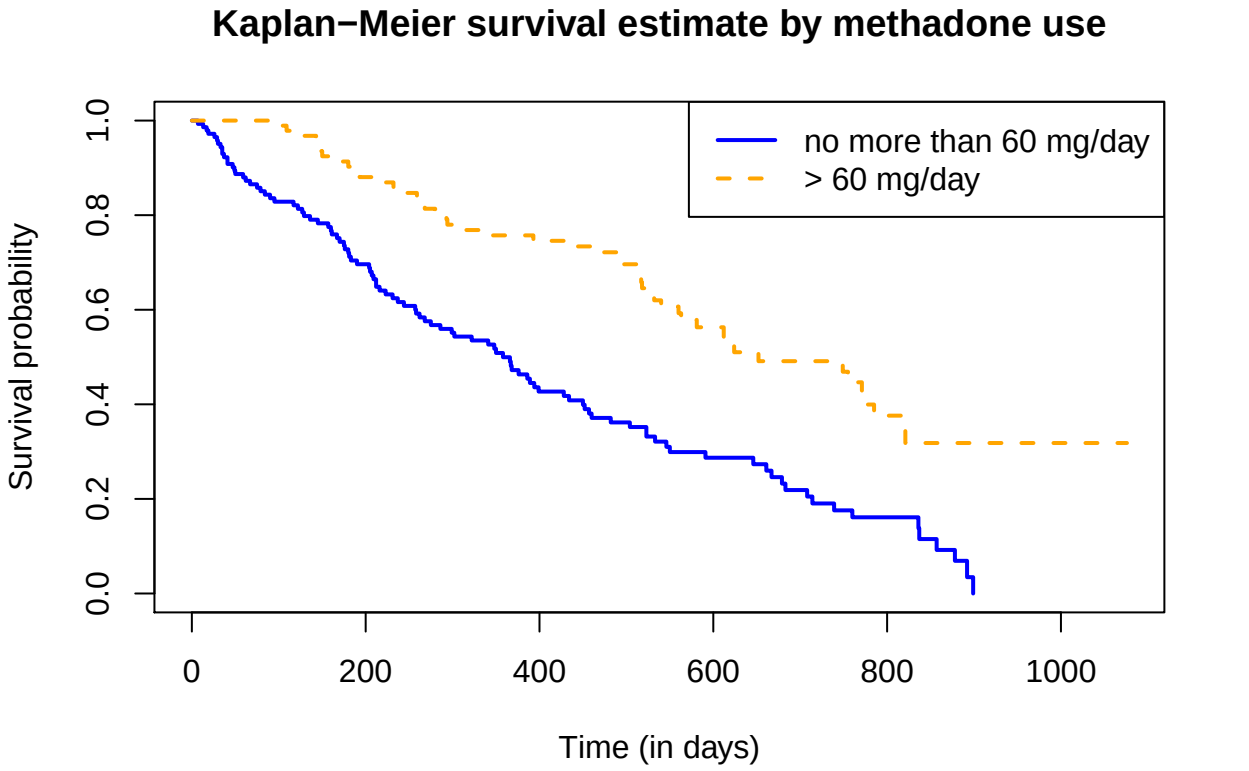
iv. Based on the Wilcoxon-Gehan-Breslow test, the survival time until exit from maintenance does not differ significantly by history of incarceration (p=0.11).

v.



(d)

i.



ii. The probability of no exit occuring by 8 months significantly differs at the 95% confidence level between those that had a methadone dose of less than or equal to 60 mg/day and those that recorded a dose of

more than 60 mg/day (p=1.57 e-5).

iii. Based on the logrank test, the distribution of time until exit from maintenance significantly differs by methadone use (p=3 e-7).

iv. Based on the Wilcoxon-Gehan-Breslow test, the survival time until exit from maintenance differs significantly by methadone use (p=7.29 e-7).

v.