coxph_present

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Fit coxph model

- Fit a Cox proportional hazard model with initial tumor number and size as covariates.

Table 1: Coefficients

term	estimate	exp_est	std.error	statistic	p.value
treatmentpyridoxine	-0.341	0.711	0.322	-1.059	0.290
treatmentthiotepa	-0.551	0.576	0.313	-1.763	0.078
number	0.252	1.287	0.065	3.886	0.000
size	0.059	1.061	0.074	0.795	0.427

- Treatment thiotepa and initial tumor number is statistically significant
- The thiotepa treatment help decrease the hazard, thus improving the prognosis of bladder cancer
- The initial tumor number increases the hazard, thus the prognosis worse, for subjects with more tumors at the beginning

Fit coxph model

Test statistics

Table 2: Global statistical significance

test_name	statistic_value	p_value
log	14.937	0.005
sc	17.745	0.001
wald	16.550	0.002

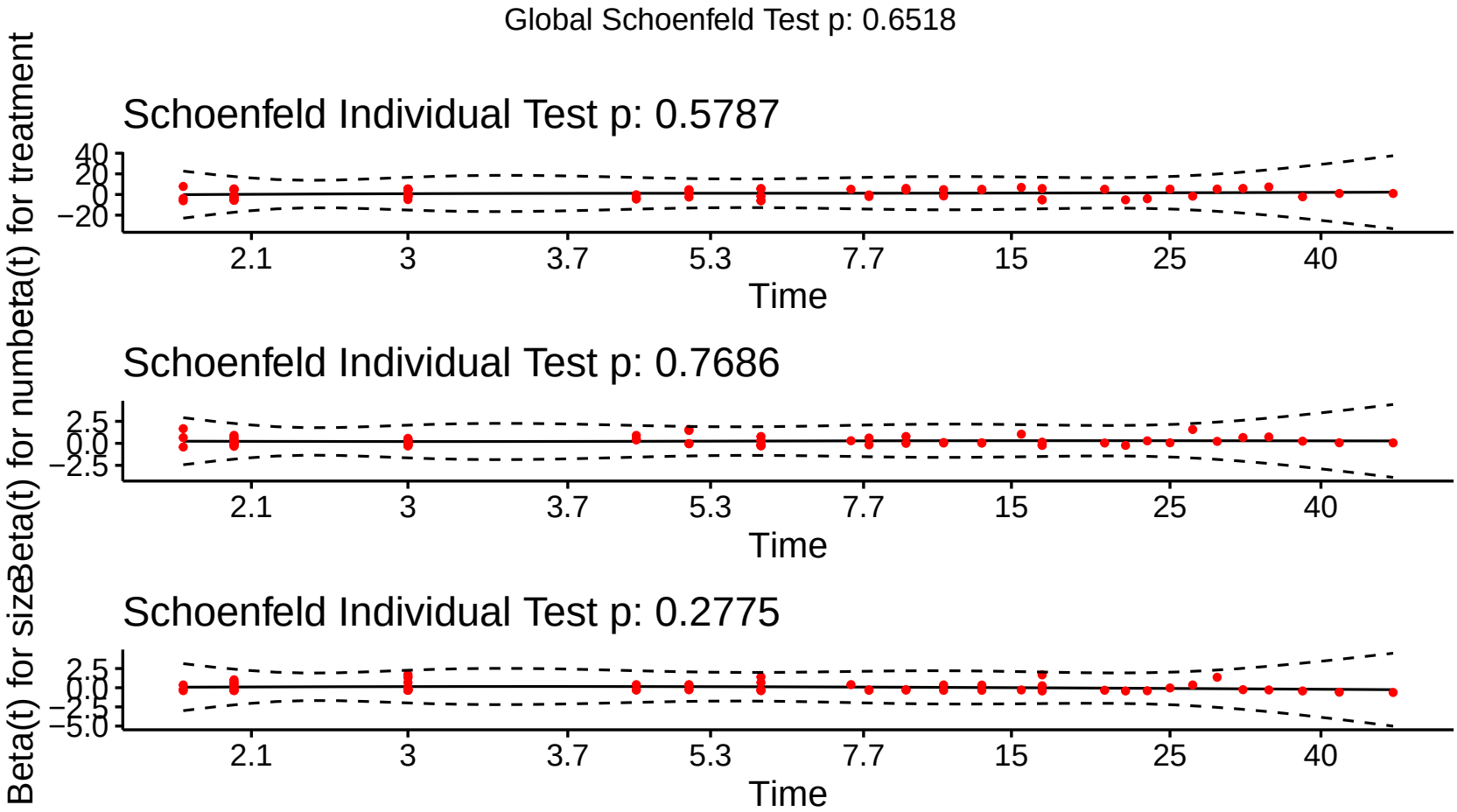
- the output gives p-values for three alternative tests for overall significance of the model: The likelihood-ratio test, score log-rank statistics, and Wald test.
- These three methods are asymptotically equivalent

Check assumption

	chisq	df	p
treatment	1.094	2	0.579
number	0.087	1	0.769
size	1.179	1	0.277
GLOBAL	2.460	4	0.652

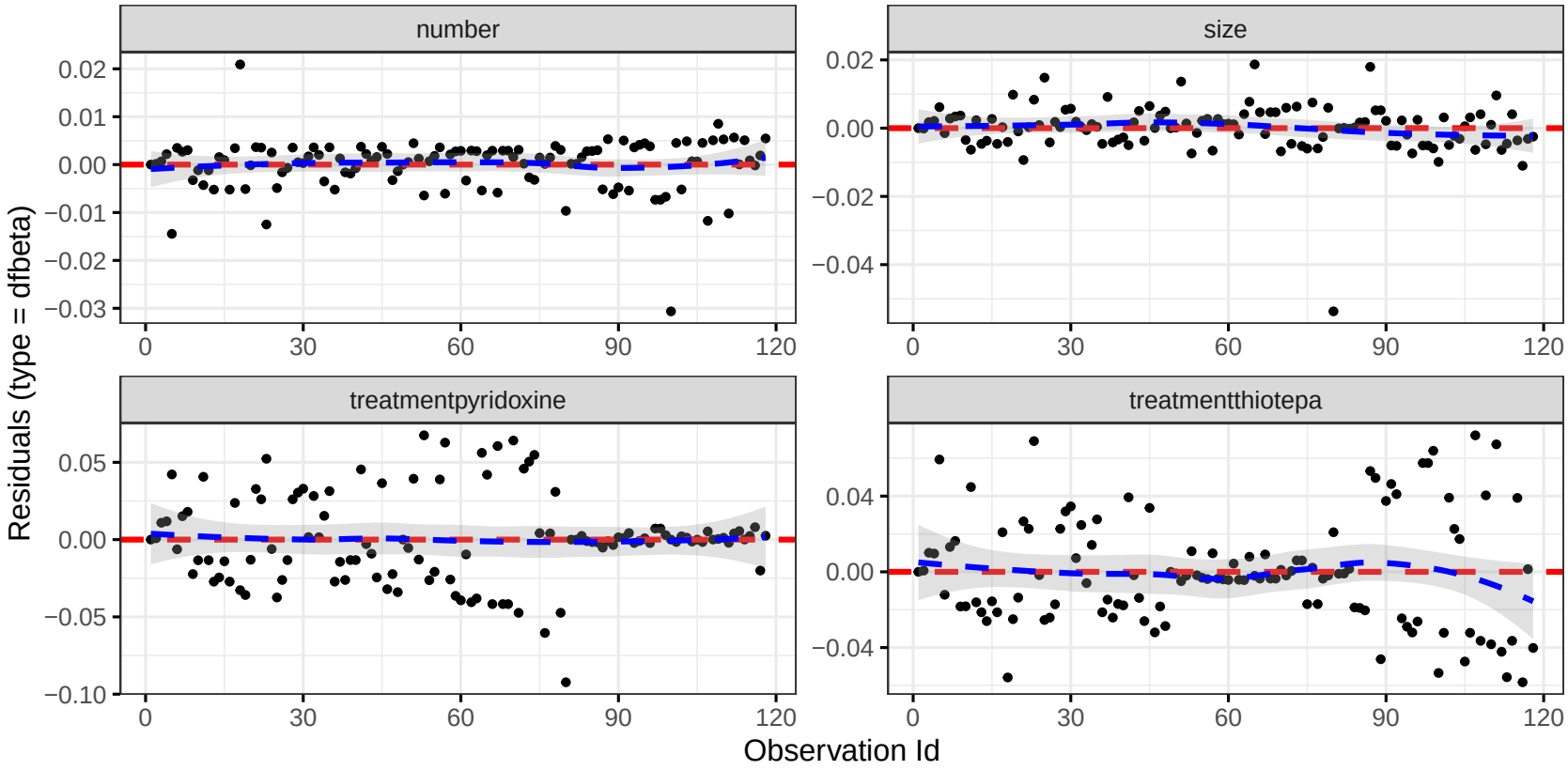
- From the output above, the test is not statistically significant for each of the covariates, and the global test is also not statistically significant.
- Therefore, we can assume the proportional hazards.

Check assumption



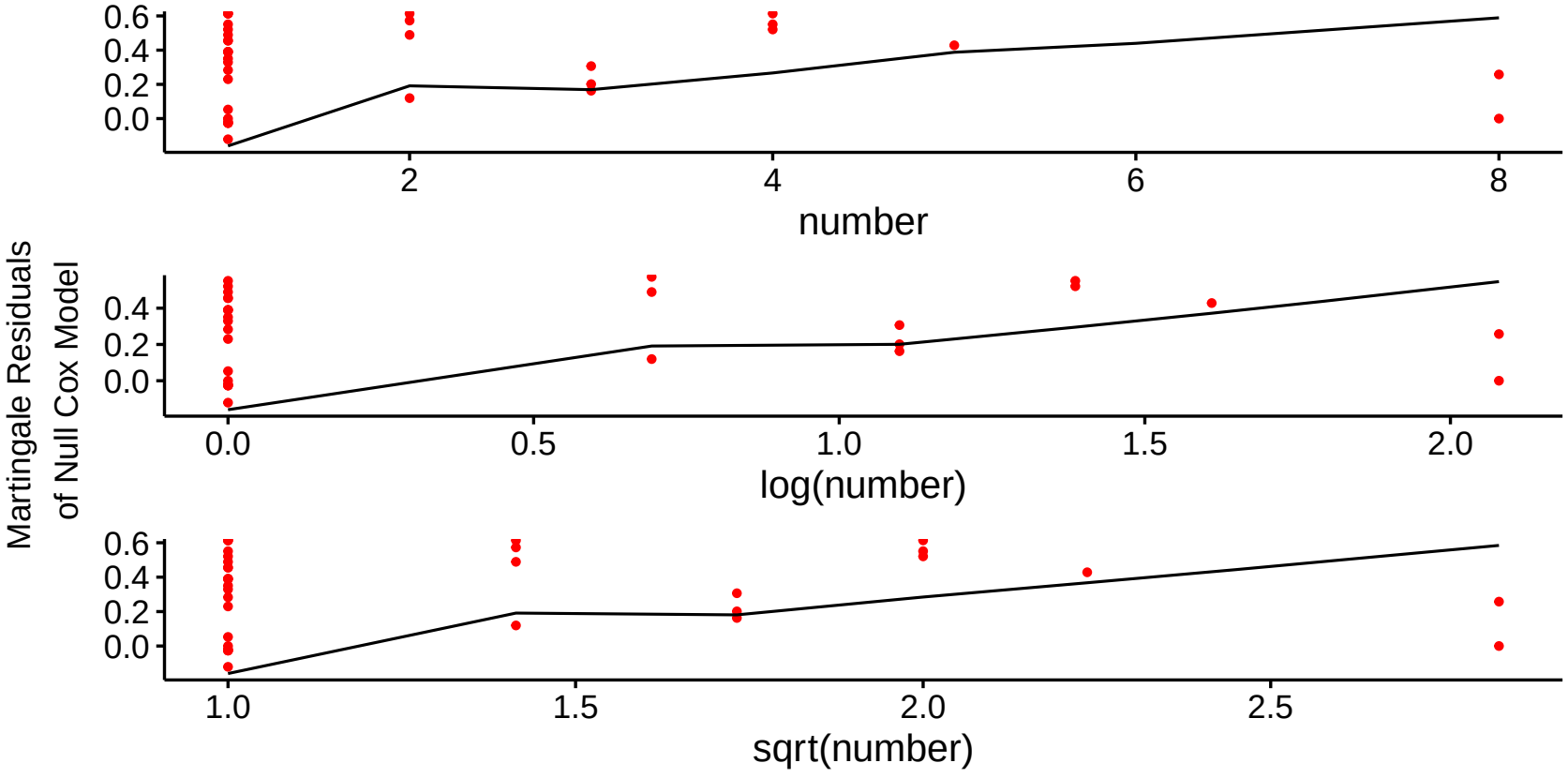
- Systematic departures from a horizontal line are indicative of non-proportional hazards, since proportional hazards assumes that estimates do not vary much over time.
- From the graphical inspection, there is no pattern with time.

check influential observation



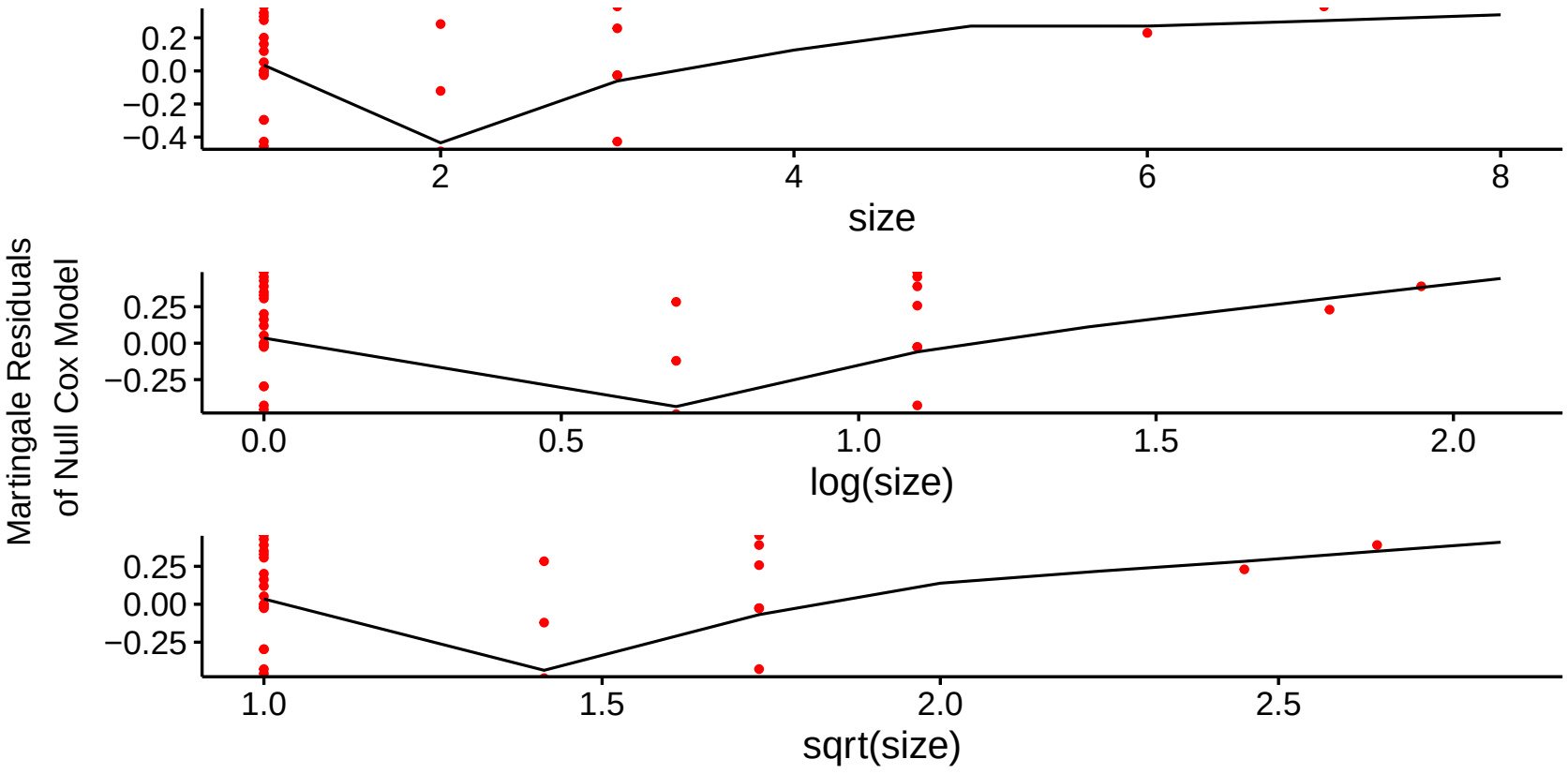
- Plots the estimated changes in the regression coefficients upon deleting each observation in turn
- The index plots above demonstrate that none of the observations are particularly influential on their own.

Testing non linearity



- The plot display graphs of continuous covariates against residuals of null cox proportional hazards model.
- It appears that, there's slight non-linearity for the initial tumor number here.

Testing non linearity



- It appears that, there's non-linearity for the initial tumor size here.