

Cox Proportional Hazards Model

Test name: Cox Proportional Hazards Model

Dataset: D:/DATA ANALYSIS/H Regression Tests and Models/Cox Proportional Hazards Model/dataset.csv

Rows in original dataset: 649

Columns in original dataset: 33

Rows used in Cox model: 649

Events: 569

Censored / no event: 80

Formula: `survival::Surv(cox_duration, cox_event) ~ age + Medu + Fedu + travelttime + studytime + failures + famrel + freetime + school + sex`

Duration source: Derived from absences + 1

Event source: Pstatus

Predictors used: age, Medu, Fedu, travelttime, studytime, failures, famrel, freetime, school, sex

Model requirements checked:

- Positive duration / follow-up time.
- Binary event indicator where 1 = event and 0 = censored.
- Cox PH model fitted with `survival::coxph`.
- Proportional hazards context saved through `cox.zph`.

Most statistically notable predictor: schoolMS

Hazard ratio: 1.549637

p-value: 4.85e-06

Interpretation guide:

HR > 1 means higher event hazard as the predictor increases.

HR < 1 means lower event hazard as the predictor increases.

Review proportional-hazards evidence before final reporting.

Charts generated: 6

Cox hazard ratios

predictor	coef	hazard_ratio	standard_error	z	p_value	hazard_ratio_ci_lower
age	-0.100331169	0.9045378	0.03663463	-2.73869763	6.168308e-03	0.8418666
Medu	0.024606619	1.0249119	0.05173085	0.47566620	6.343122e-01	0.9260899
Fedu	-0.049355531	0.9518427	0.05048799	-0.97756970	3.282872e-01	0.8621637
traveltime	-0.007347049	0.9926799	0.05911922	-0.12427513	9.010974e-01	0.8840704
studytime	0.150259661	1.1621360	0.05166523	2.90833231	3.633620e-03	1.0502179
failures	-0.132980166	0.8754825	0.08137148	-1.63423550	1.022094e-01	0.7464211
famrel	0.113138835	1.1197874	0.04418139	2.56078063	1.044373e-02	1.0269004
freetime	-0.002202854	0.9977996	0.04135602	-0.05326562	9.575203e-01	0.9201126
schoolMS	0.438020896	1.5496373	0.09582059	4.57126088	4.847983e-06	1.2843028
sexM	0.046681421	1.0477882	0.09169080	0.50911782	6.106696e-01	0.8754395
hazard_ratio_ci_upper	decision_alpha_0_05					
	0.9718745	Statistically significant				
	1.1342790	Not statistically significant				
	1.0508497	Not statistically significant				
	1.1146322	Not statistically significant				
	1.2859807	Statistically significant				
	1.0268594	Not statistically significant				
	1.2210764	Statistically significant				
	1.0820458	Not statistically significant				
	1.8697894	Statistically significant				
	1.2540673	Not statistically significant				

Model fit statistics

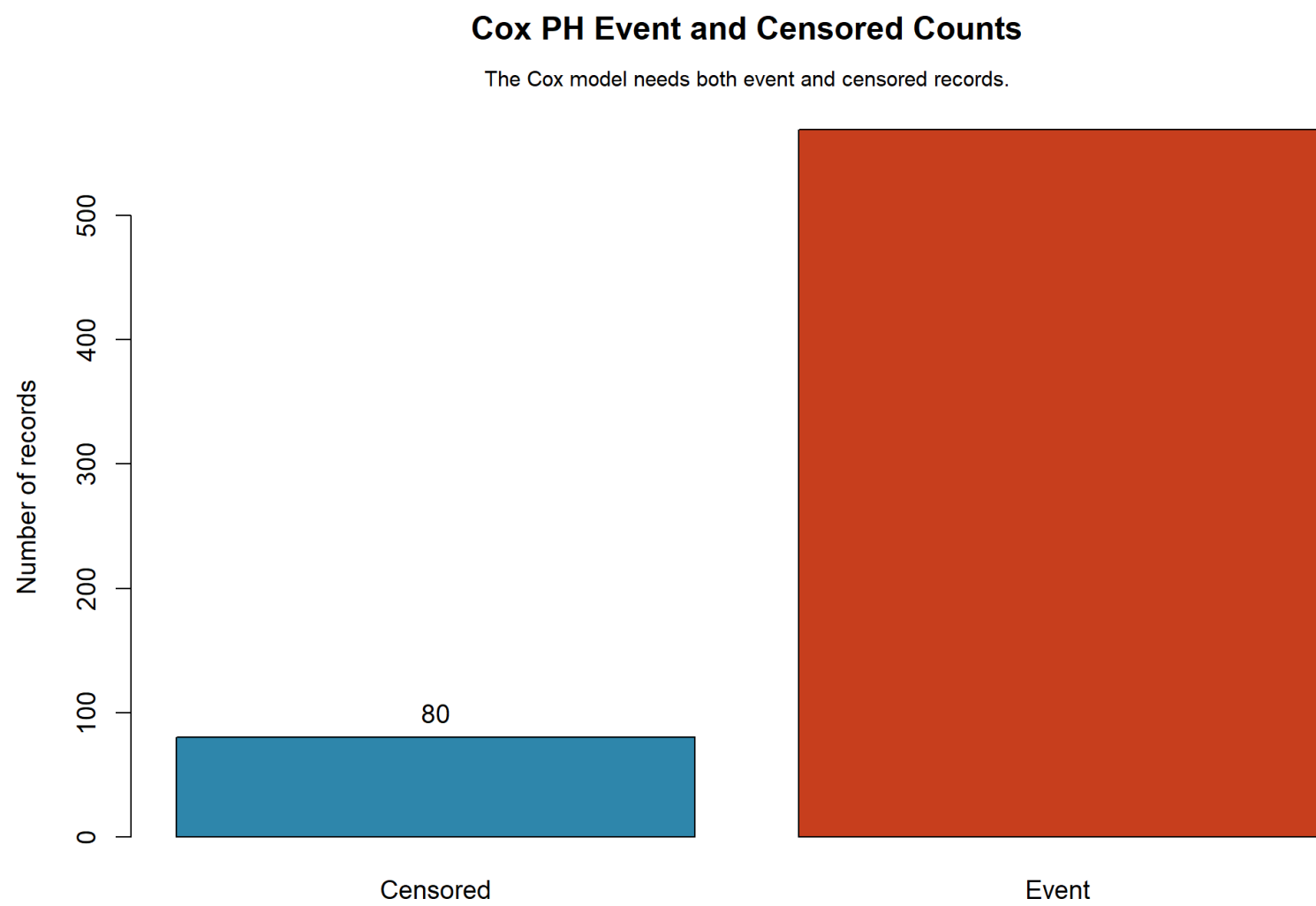
fit_method n_cases events censored					
survival::coxph with Breslow/Efron ties depending on survival package default					
	649	569	80		
predictors_entered	log_likelihood	likelihood_ratio_test	likelihood_ratio_df	likelihood_ratio_p_value	concordance
10	-3132.547	49.7561	10	2.959349e-07	0.6136883
concordance_se					
0.01595288					

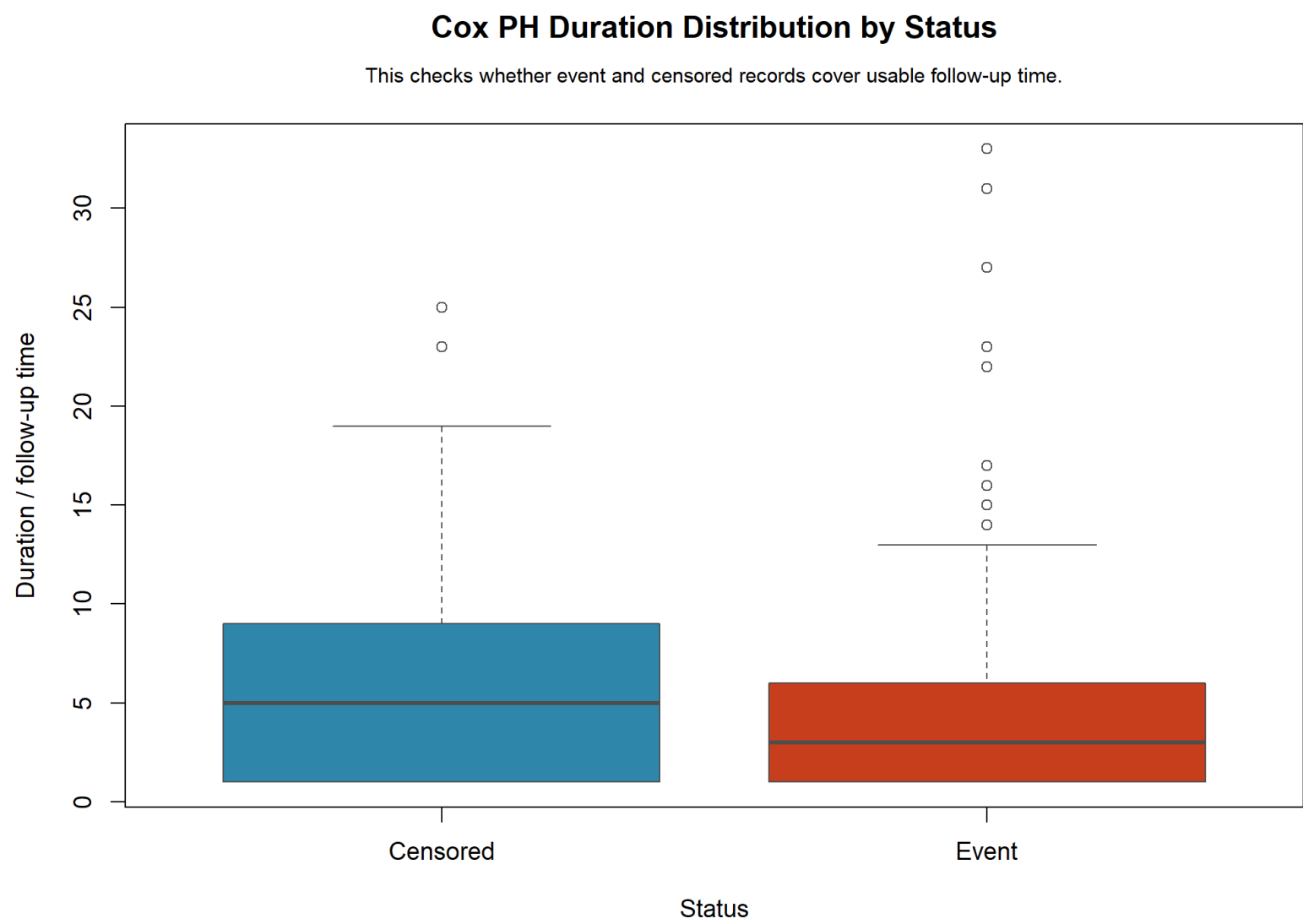
PH assumption context

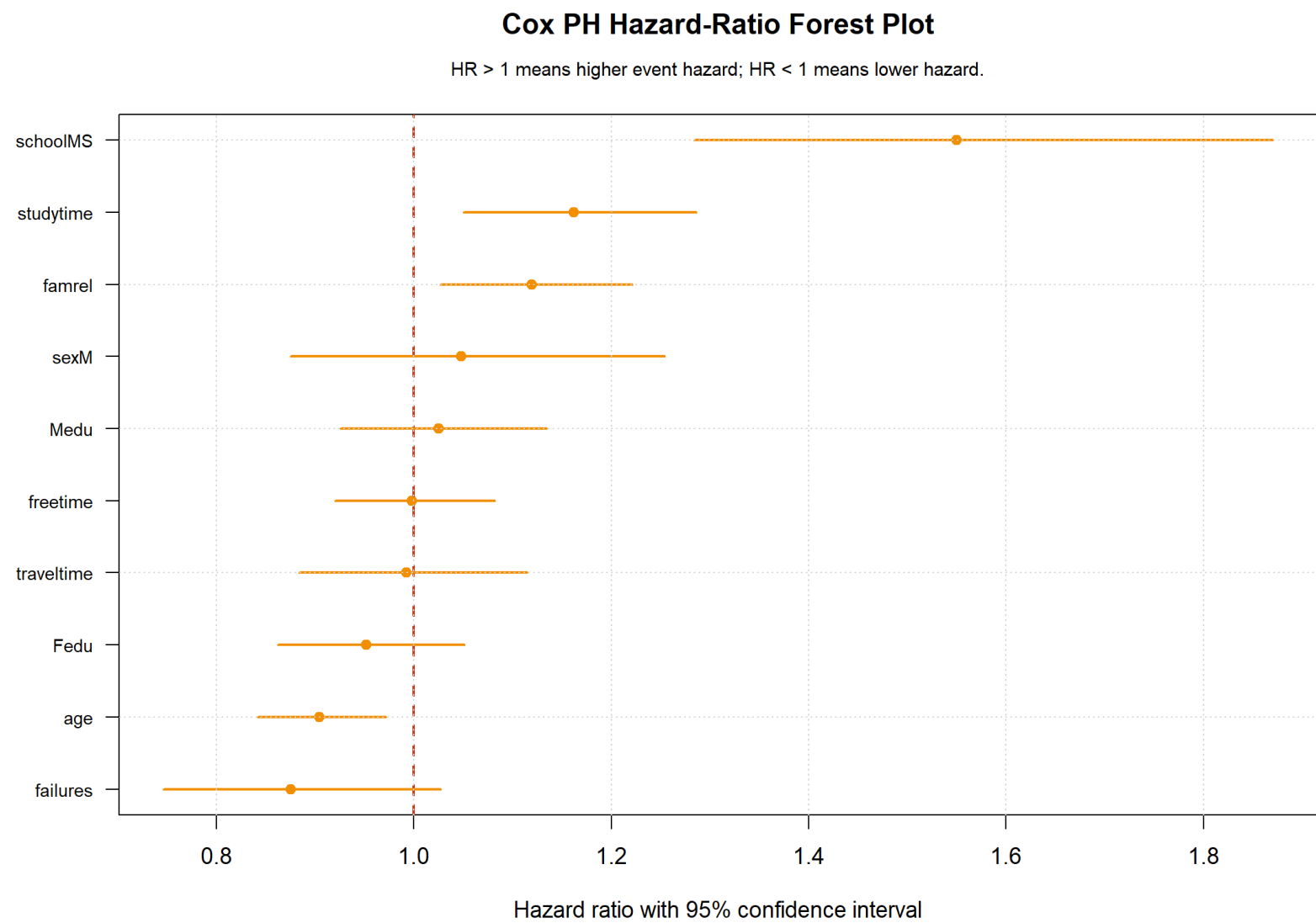
predictor	chisq	df	p_value	note
age	0.462712936	1	0.4963588	Small p-values suggest possible proportional-hazards assumption concerns.
Medu	0.126764415	1	0.7218107	Small p-values suggest possible proportional-hazards assumption concerns.
Fedu	0.002971256	1	0.9565295	Small p-values suggest possible proportional-hazards assumption concerns.
traveltime	2.573012415	1	0.1087006	Small p-values suggest possible proportional-hazards assumption concerns.
studytime	0.027705520	1	0.8678030	Small p-values suggest possible proportional-hazards assumption concerns.
failures	0.618639387	1	0.4315533	Small p-values suggest possible proportional-hazards assumption concerns.
famrel	2.375316704	1	0.1232666	Small p-values suggest possible proportional-hazards assumption concerns.
freetime	0.373499672	1	0.5411028	Small p-values suggest possible proportional-hazards assumption concerns.
school	1.139490322	1	0.2857601	Small p-values suggest possible proportional-hazards assumption concerns.
sex	0.116722965	1	0.7326162	Small p-values suggest possible proportional-hazards assumption concerns.
GLOBAL	6.722937925	10	0.7513168	Small p-values suggest possible proportional-hazards assumption concerns.

Event and duration summary

	status	n	mean_duration	median_duration	min_duration	max_duration
	Censored	80	6.112500	5	1	25
	Event	569	4.455185	3	1	33
	Overall	649	4.659476	3	1	33

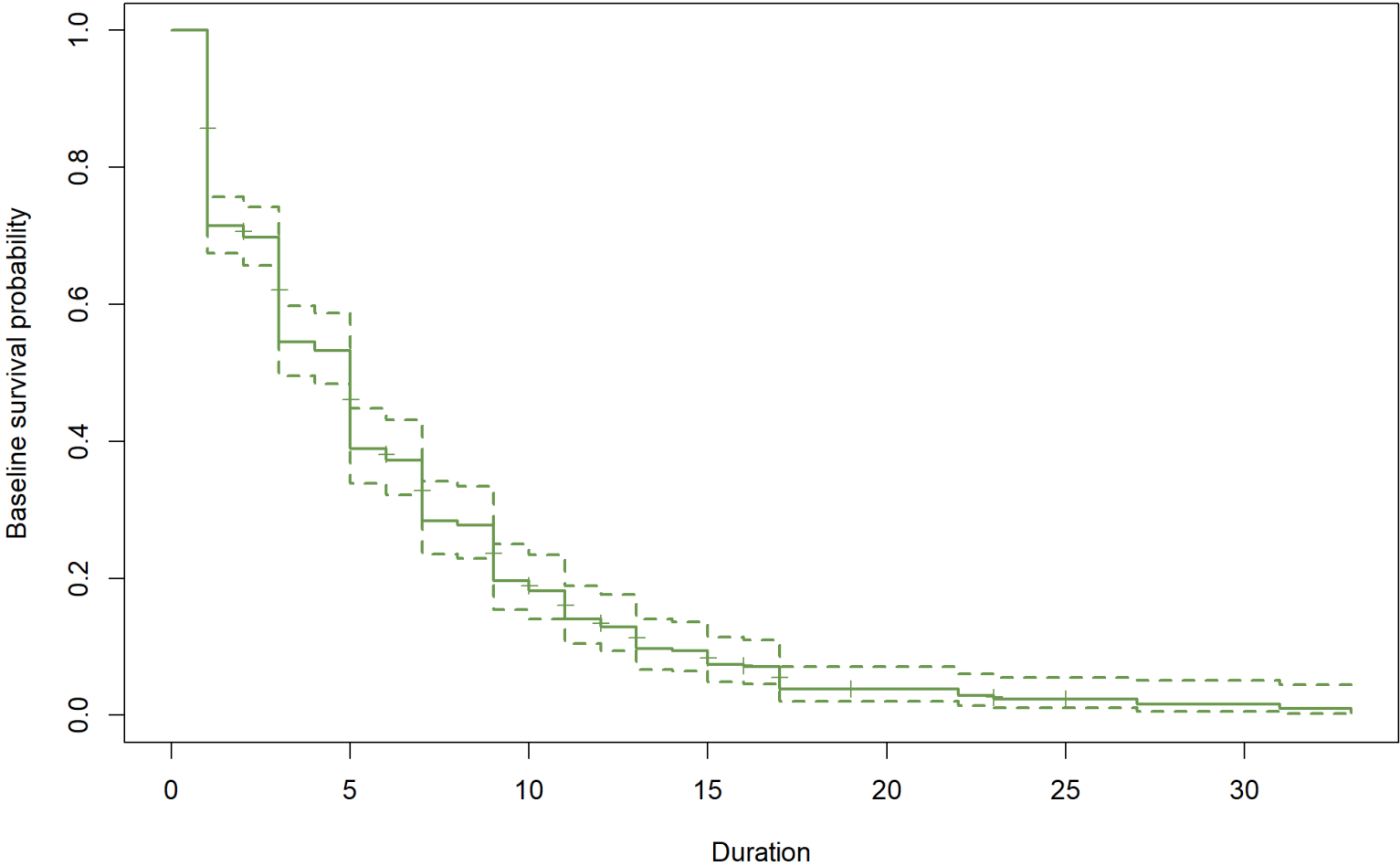






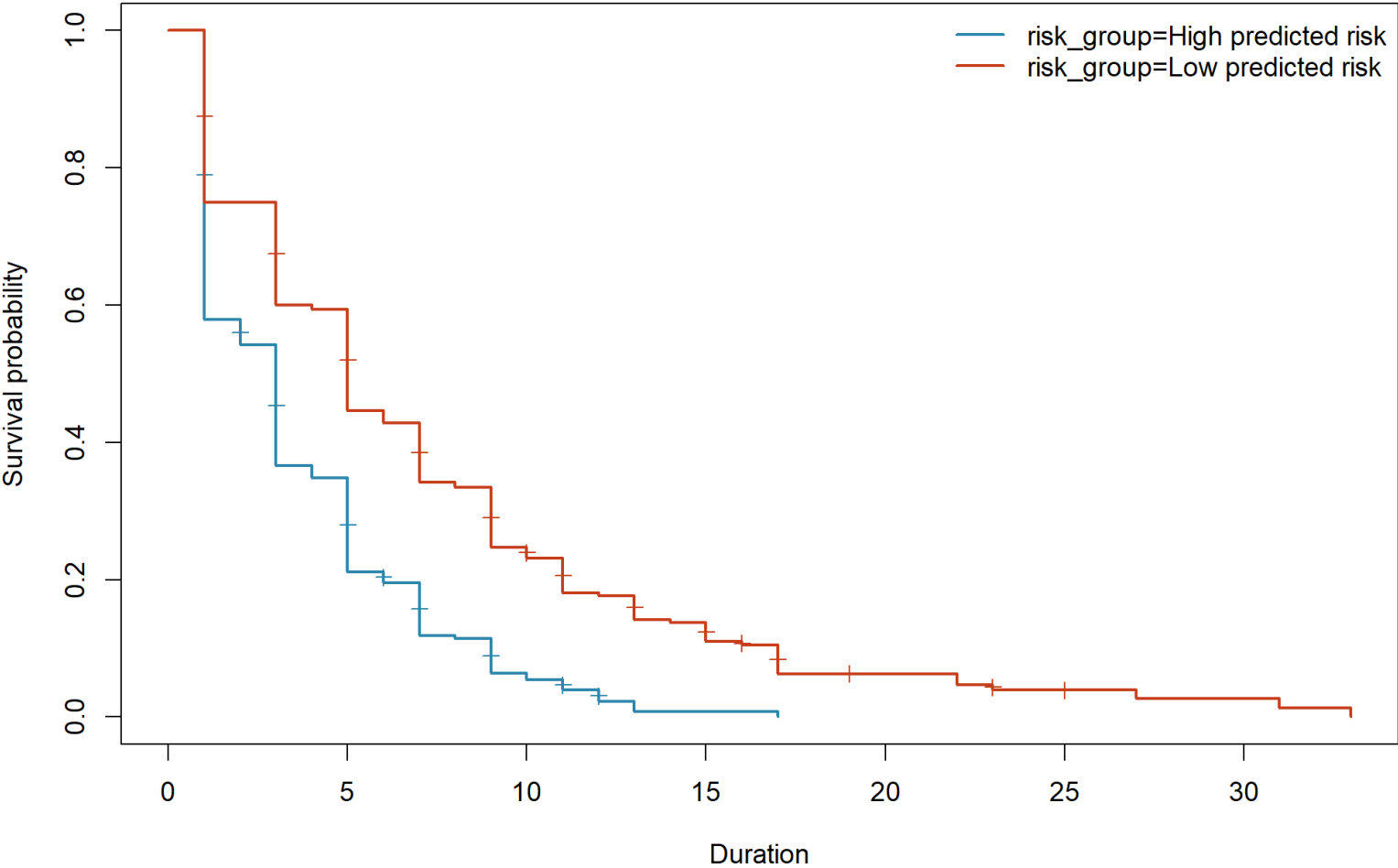
Cox PH Baseline Survival Curve

Baseline survival is estimated from the fitted Cox proportional hazards model.



Kaplan-Meier Survival by Predicted Risk Group

Risk groups are formed from the fitted Cox model median linear predictor.



Cox PH Scaled Schoenfeld Residual Check

A flat residual trend supports the proportional hazards assumption.

