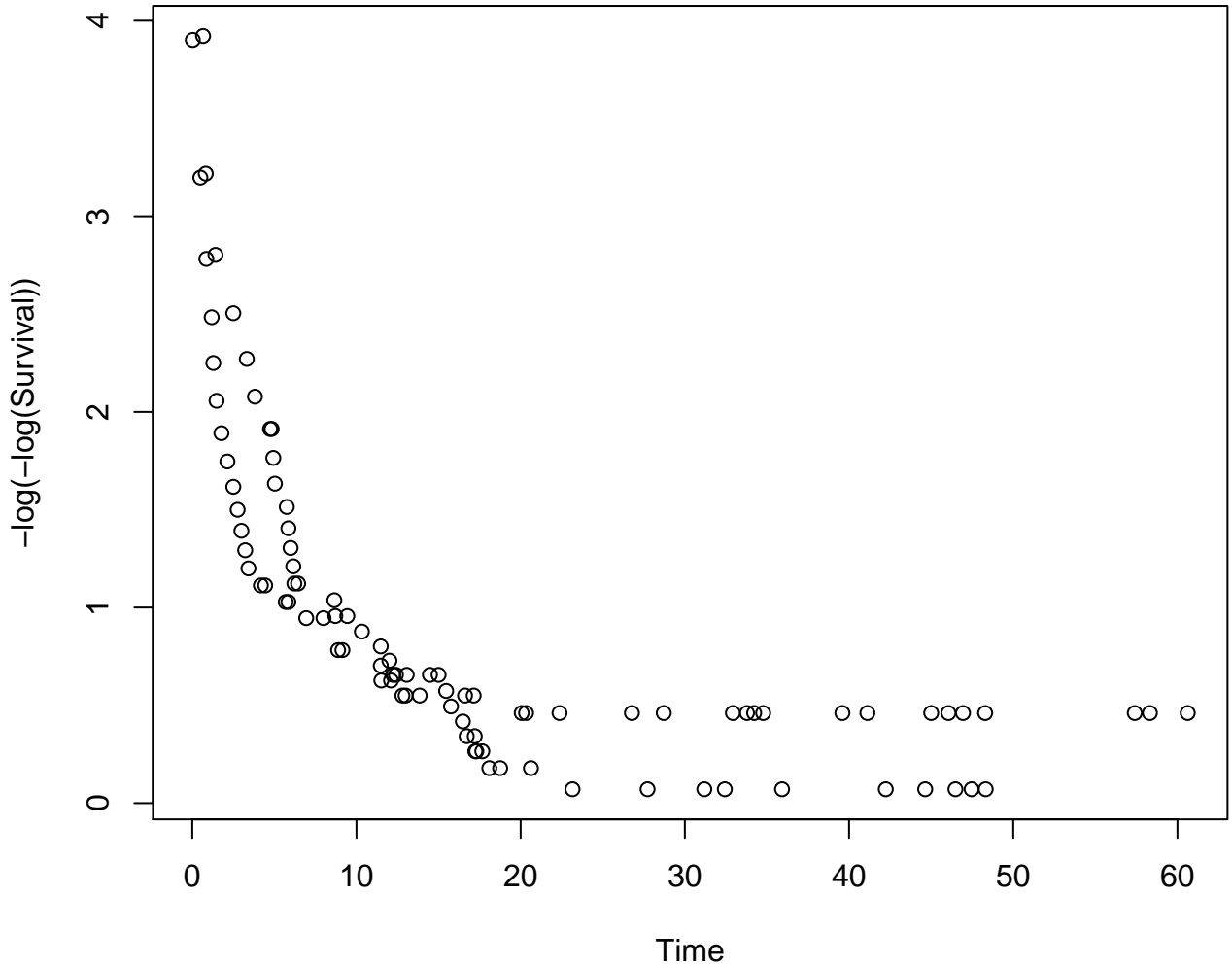


Time vs. $-\log(-\log \text{ survival})$.
Kaplan–Meier curves should be parallel if
proportional–hazards assumption is correct

Complete model:
Surv(time, delta) ~ factor(type)

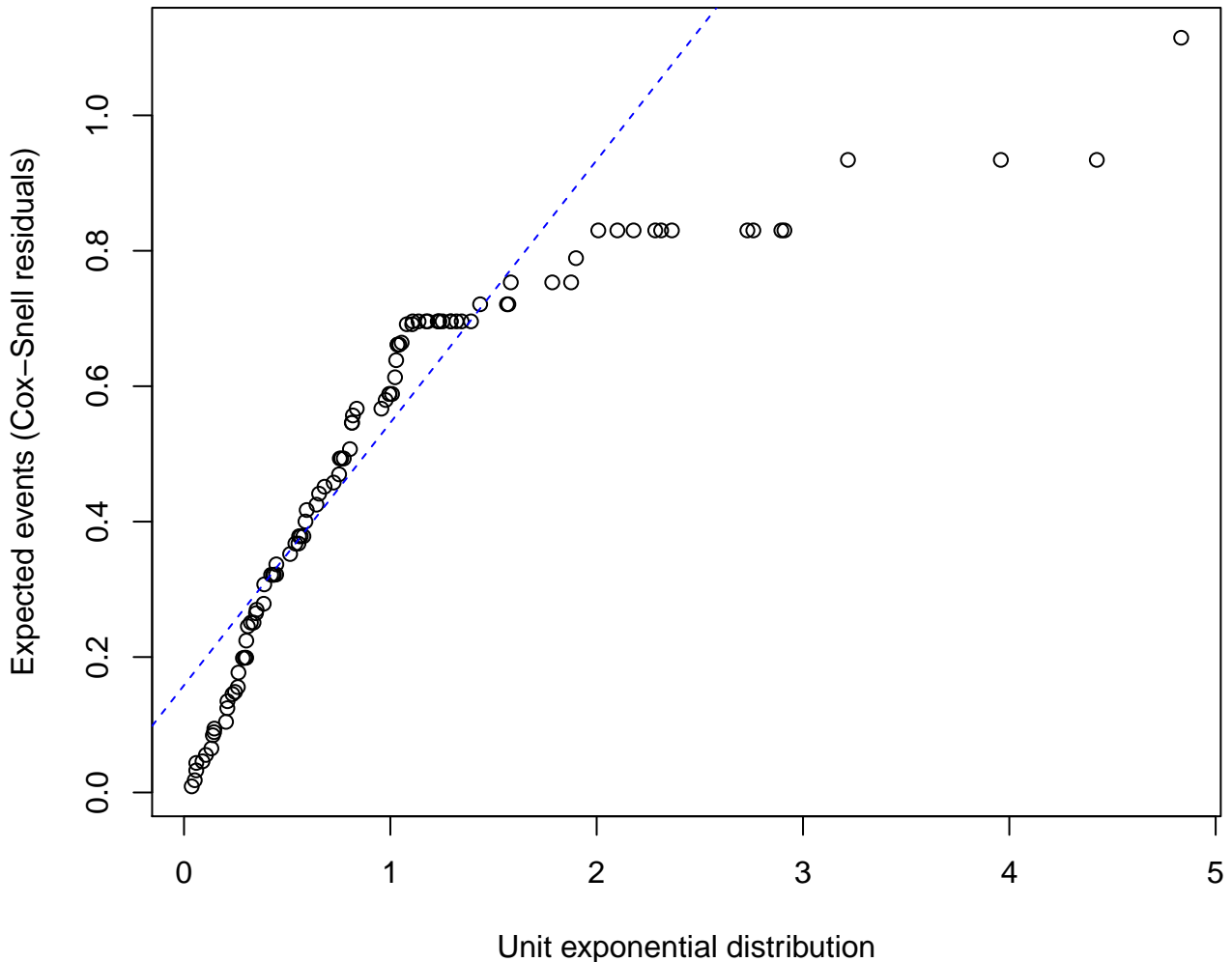


Quantile–quantile plot.

Unit exponential distribution vs. expected events (Cox–Snell residuals).

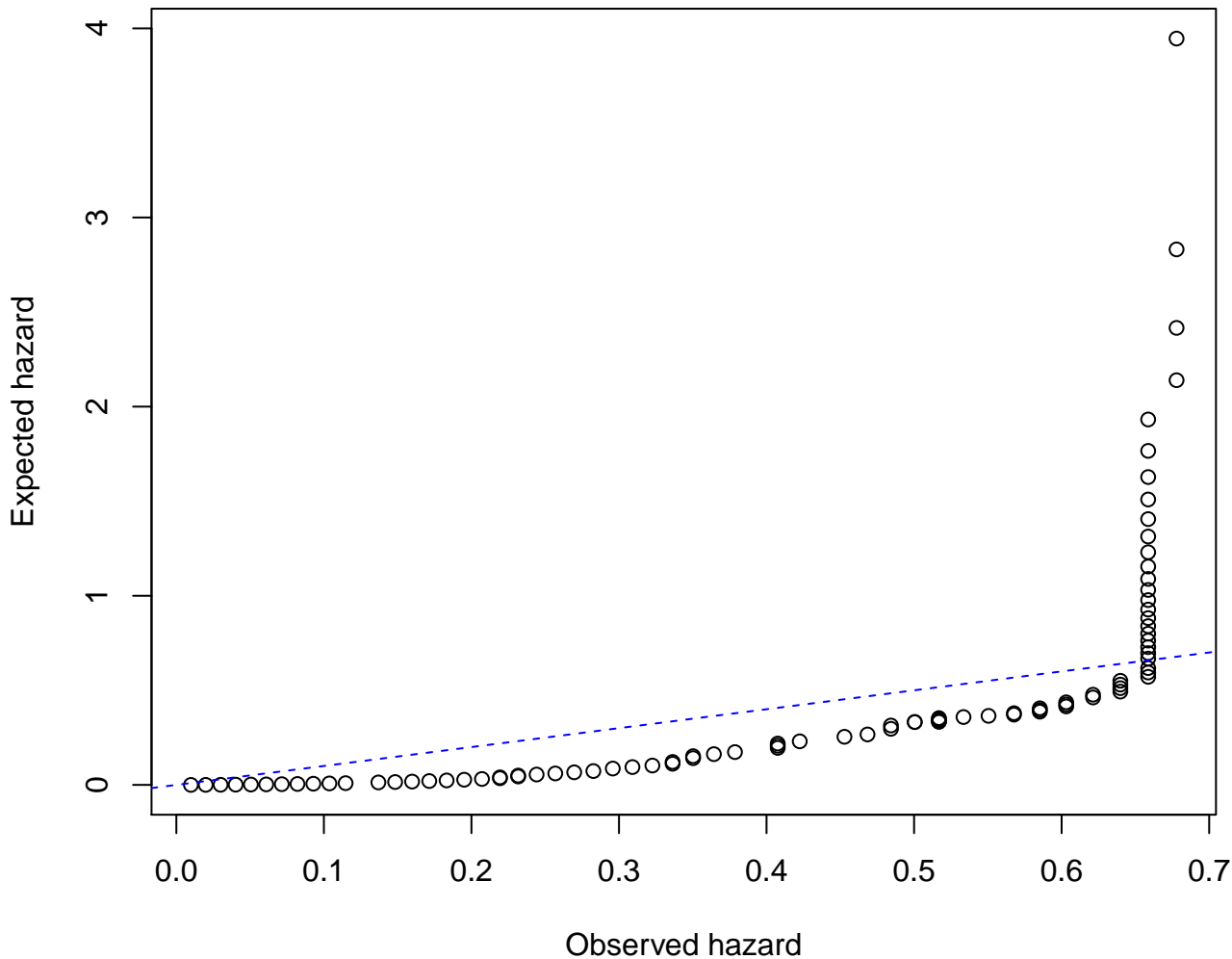
Should follow line through origin at 45 degrees (blue) if well fit.

Complete model:
Surv(time, delta) ~ factor(type)



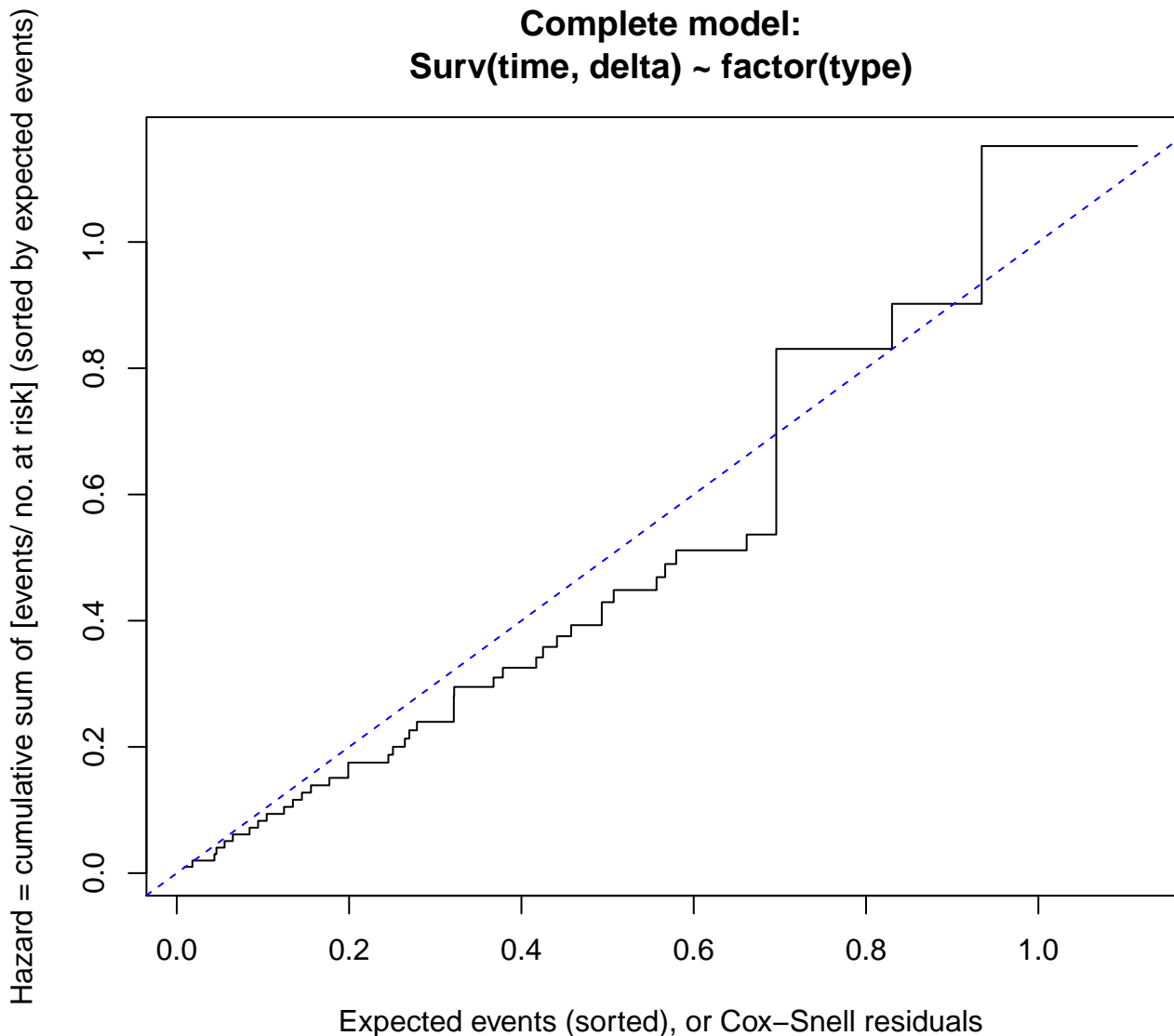
Observed vs. expected hazard.
Should follow line through origin at 45 degrees (blue) if well fit.

Complete model:
Surv(time, delta) ~ factor(type)



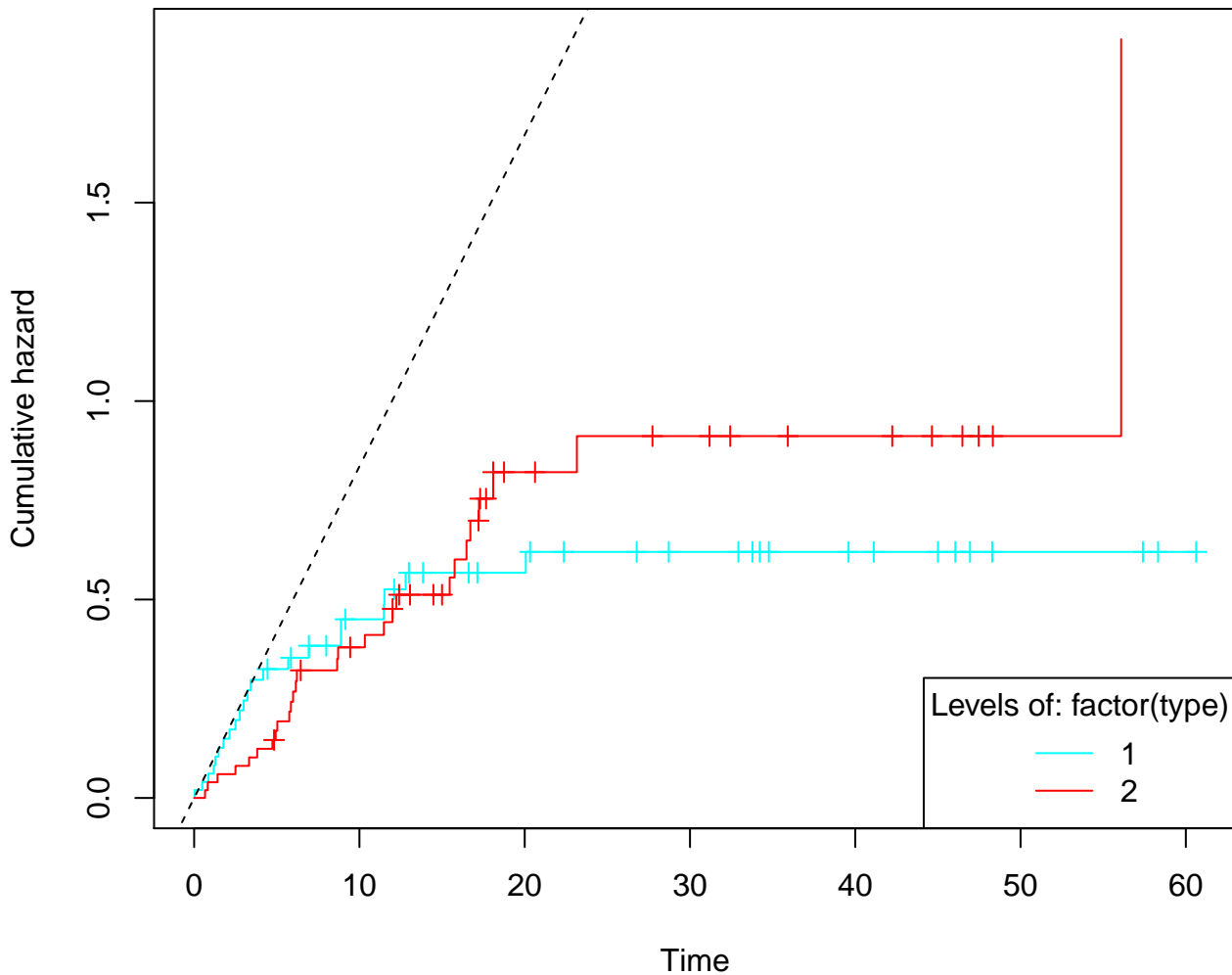
Expected events vs. hazard based on sorted expected events
or Cox–Snell residuals vs. cumulative hazard of these residuals.
Should follow line through origin at 45 degrees (blue) if well fit.

Complete model:
Surv(time, delta) ~ factor(type)



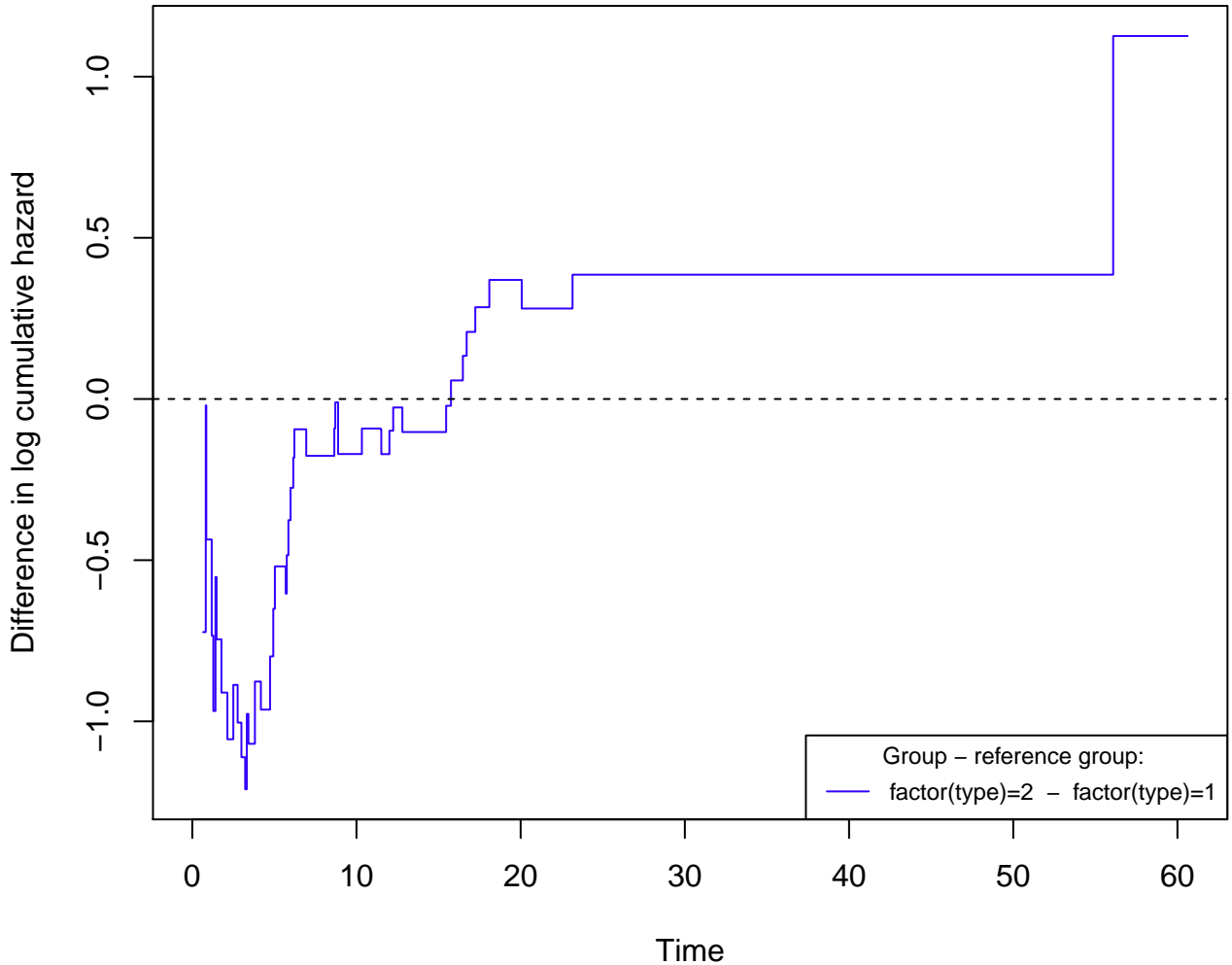
Time vs. hazard, per predictor.
If hazards proportional then curves should be constant multiples of a baseline.
Reference (black) line is 45 degrees.

Predictor: factor(type)



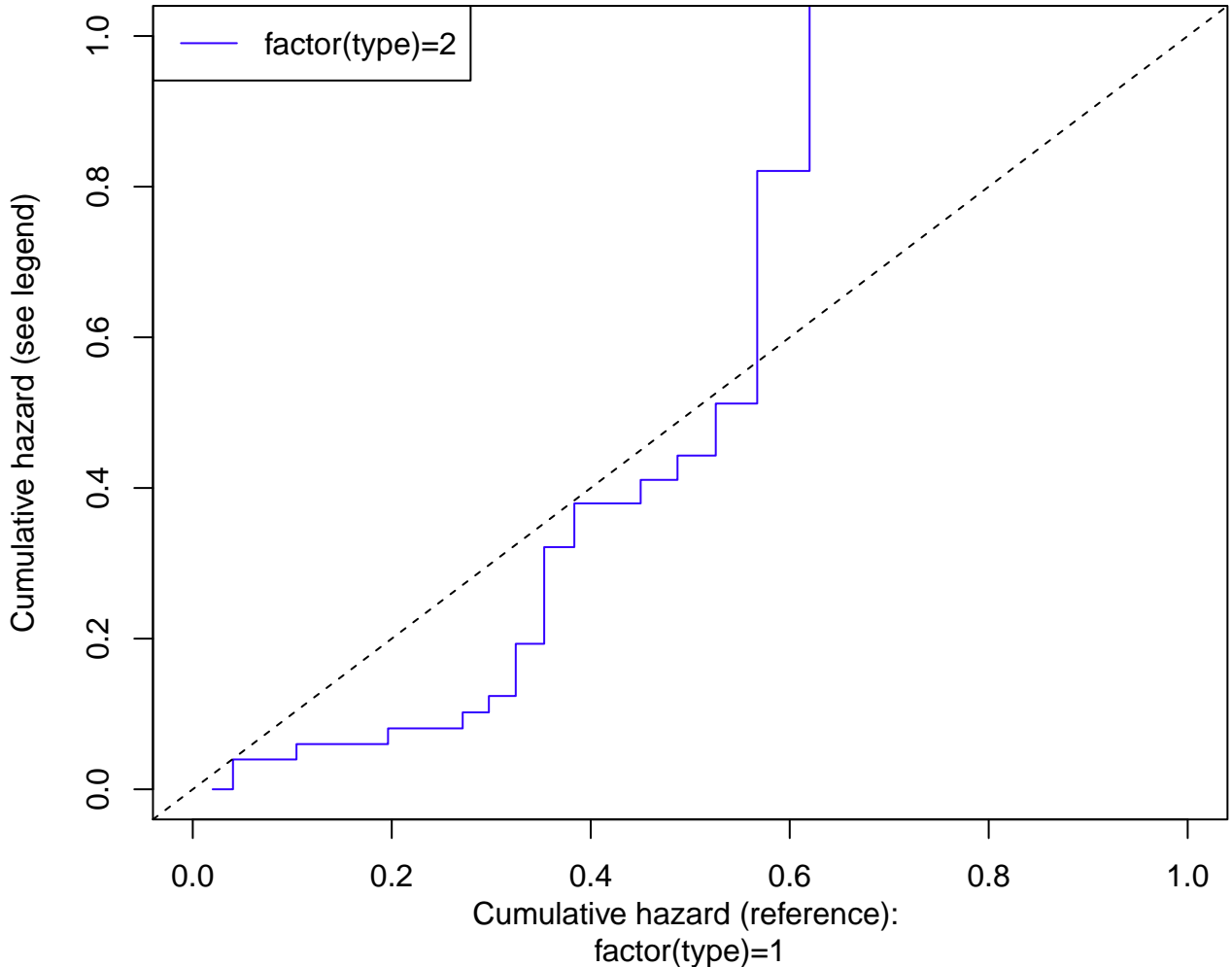
Time vs. difference in log hazards, per predictor.
Should be constant over time.
If >0 (black line) shows survival advantage for reference group.

Reference: factor(type) = 1



Cumulative hazard vs. reference group. Should be linear plot through origin.
If convex (towards top left) shows ratio of hazards is increasing over time.
Reference line (black) is at 45 degrees.

Predictor: factor(type)



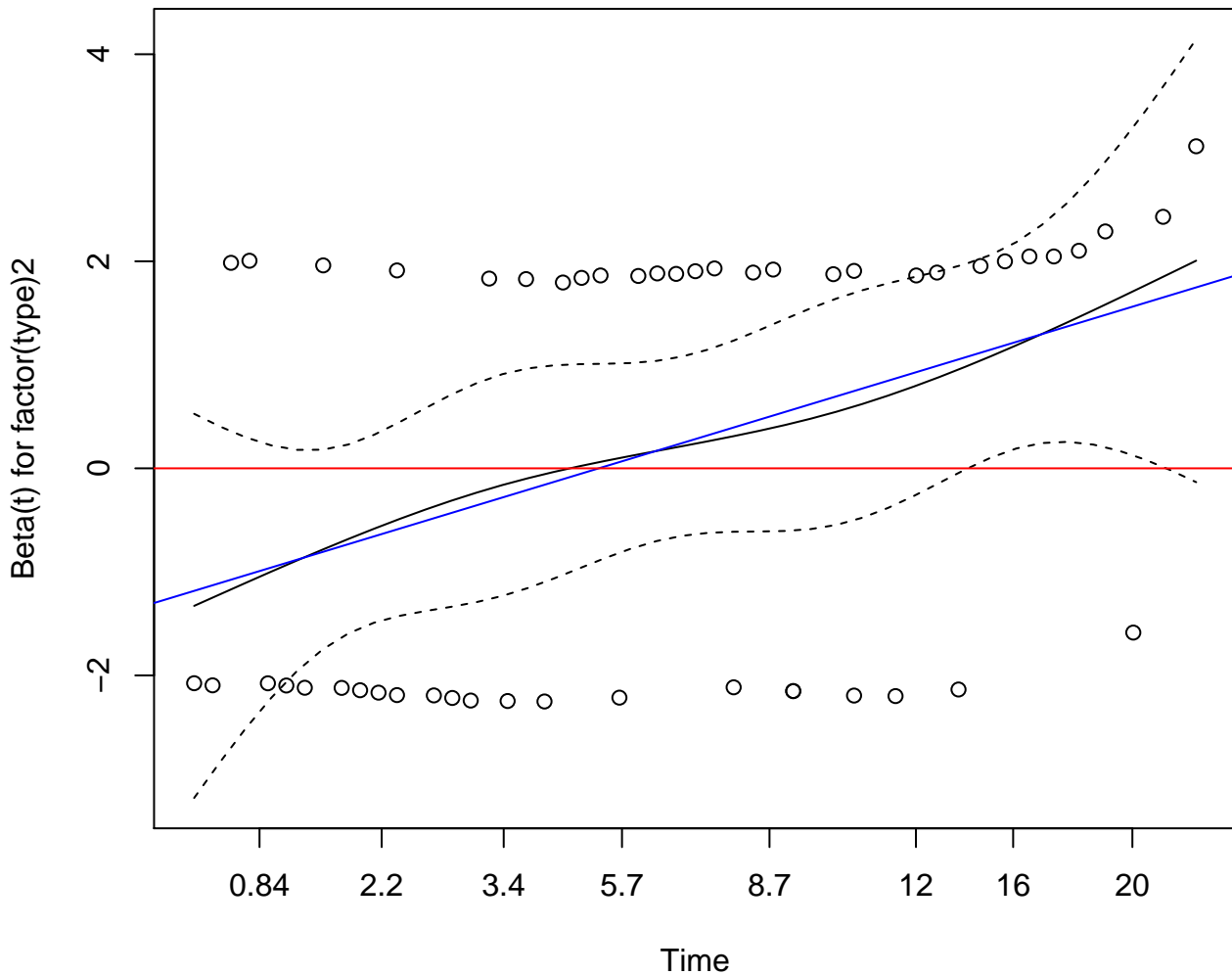
Time vs. scaled Schoenfeld residuals, with smoothed spline (black).

If < 0 (red line), indicates a protective effect.

Regression line (blue) should be horizontal if model well fit.

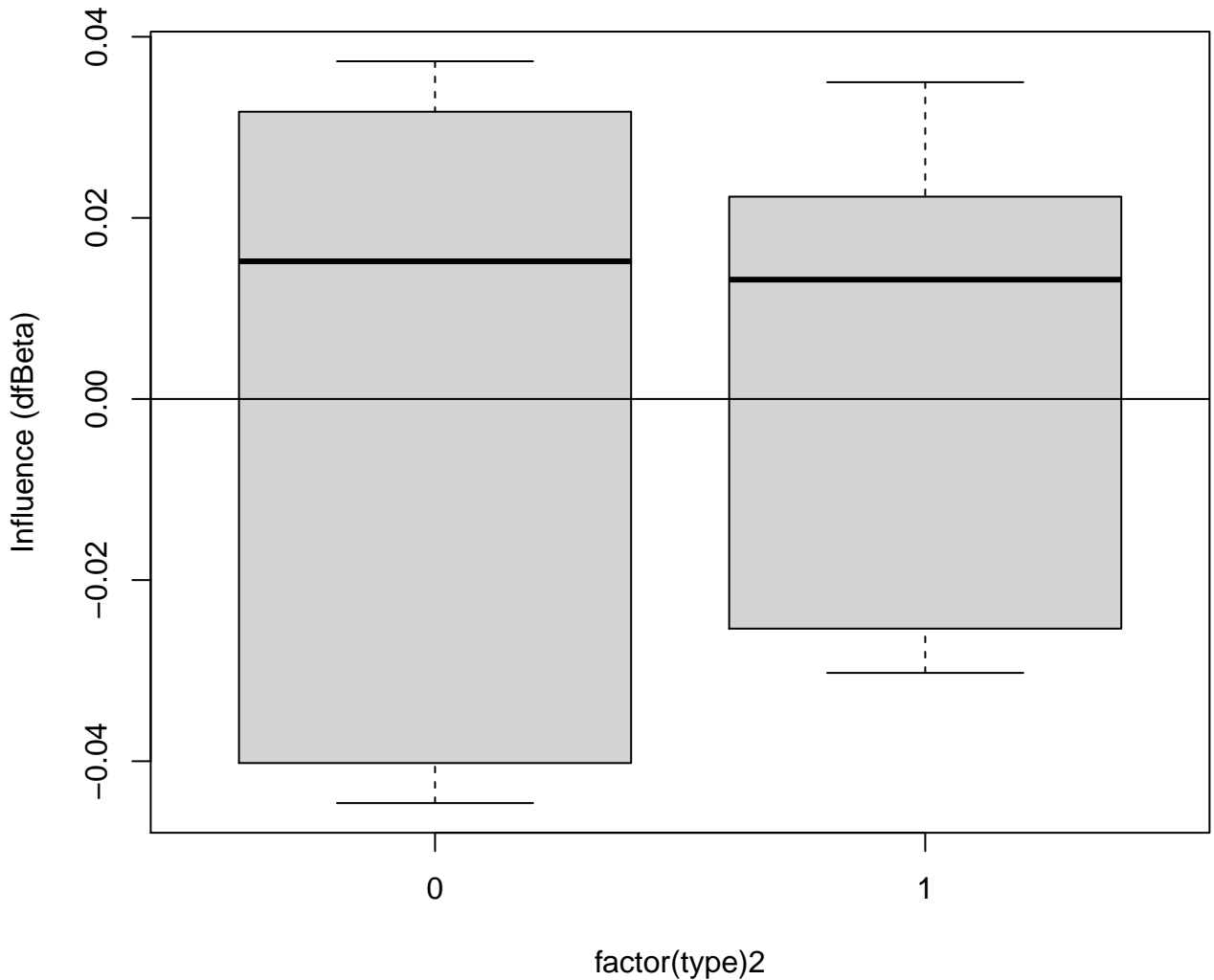
Predictor: factor(type)2

Time transform: km



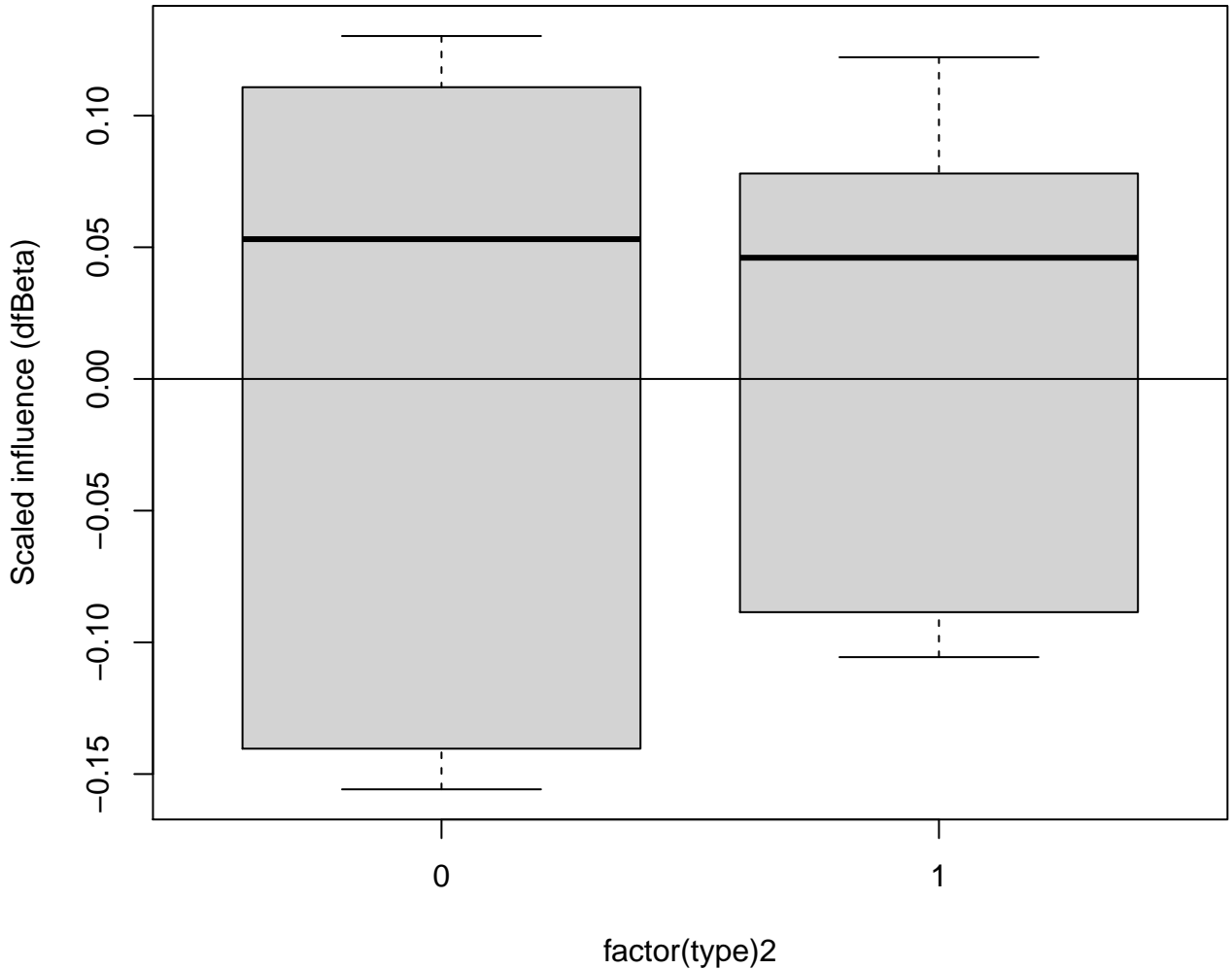
Coefficient vs. jackknife influence.
Change in coefficient if this observation dropped.
Outliers may need to be re-examined

Coefficient: factor(type)2



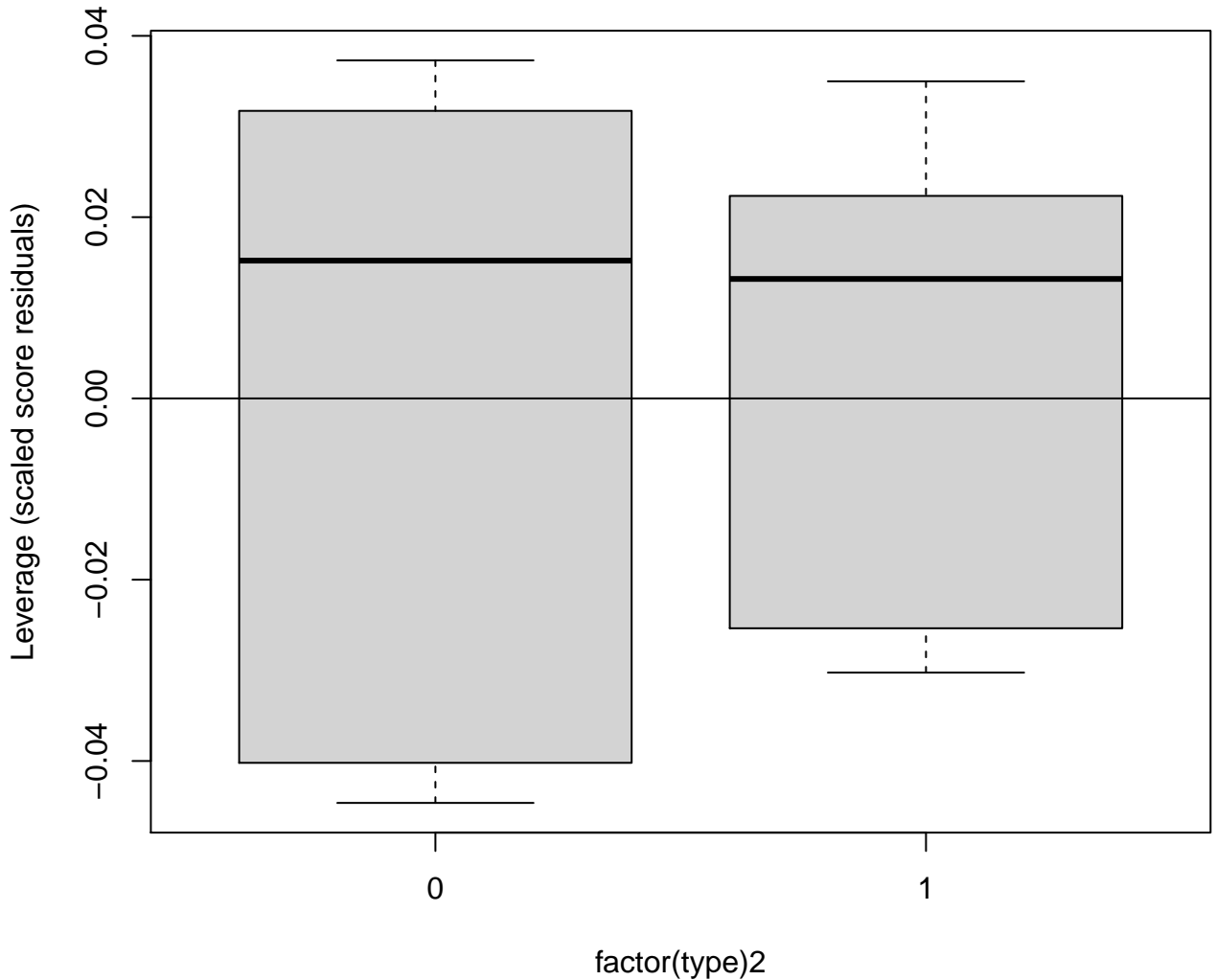
Coefficient vs. jackknife influence scaled by standard error of coefficients.
Change in coefficient if this observation dropped.
Outliers may need to be re-examined

Coefficient: factor(type)2



Coefficient vs. scaled score residuals.
Assesses leverage: influence of observation on a single coefficient.
Outliers may need to be re-examined

Coefficient: factor(type)2



Martingale residuals vs. likelihood displacement residuals.
Assesses influence of observation on coefficient.
Outliers may need to be re-examined.

Coefficient: factor(type)2

