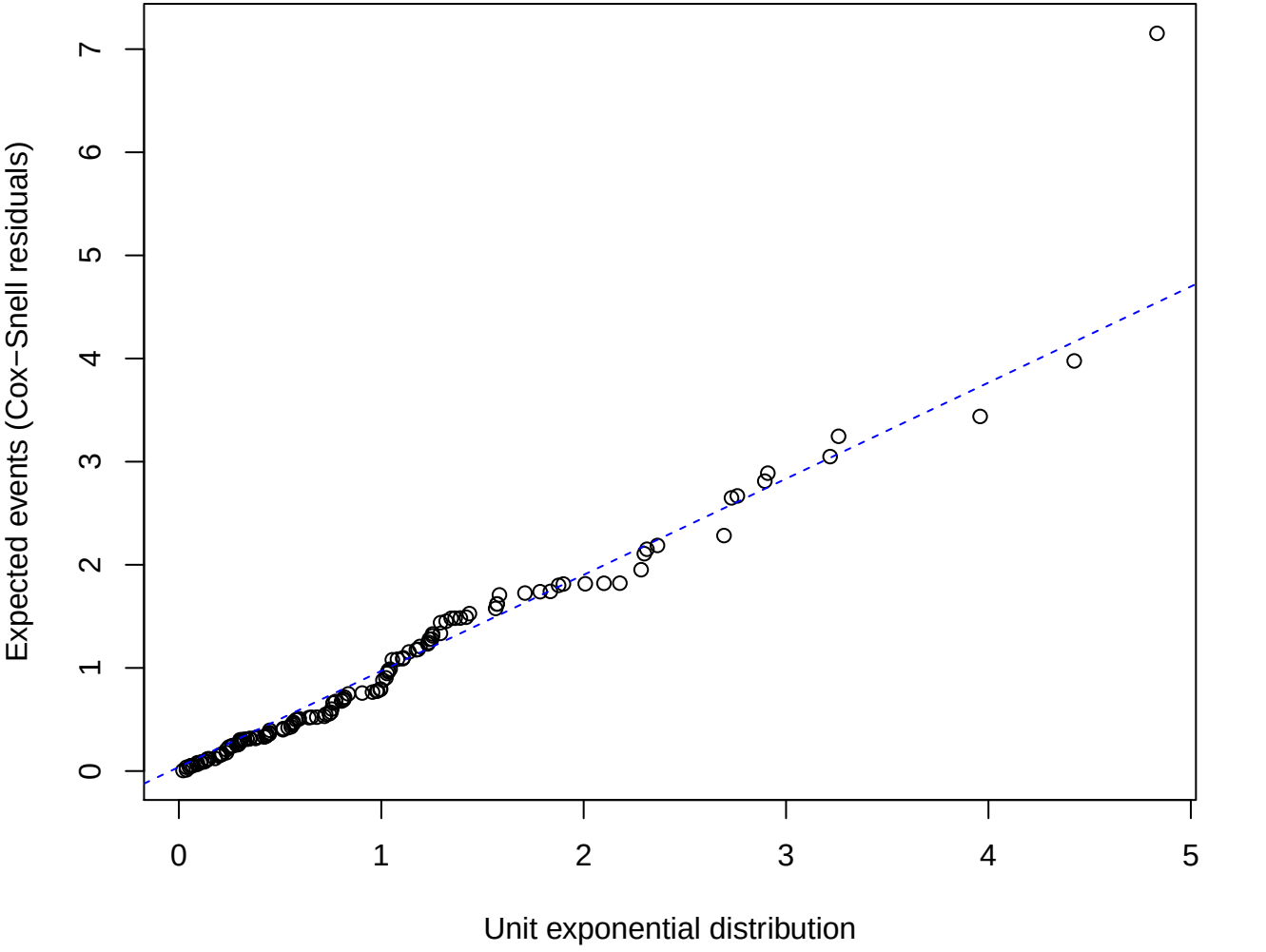
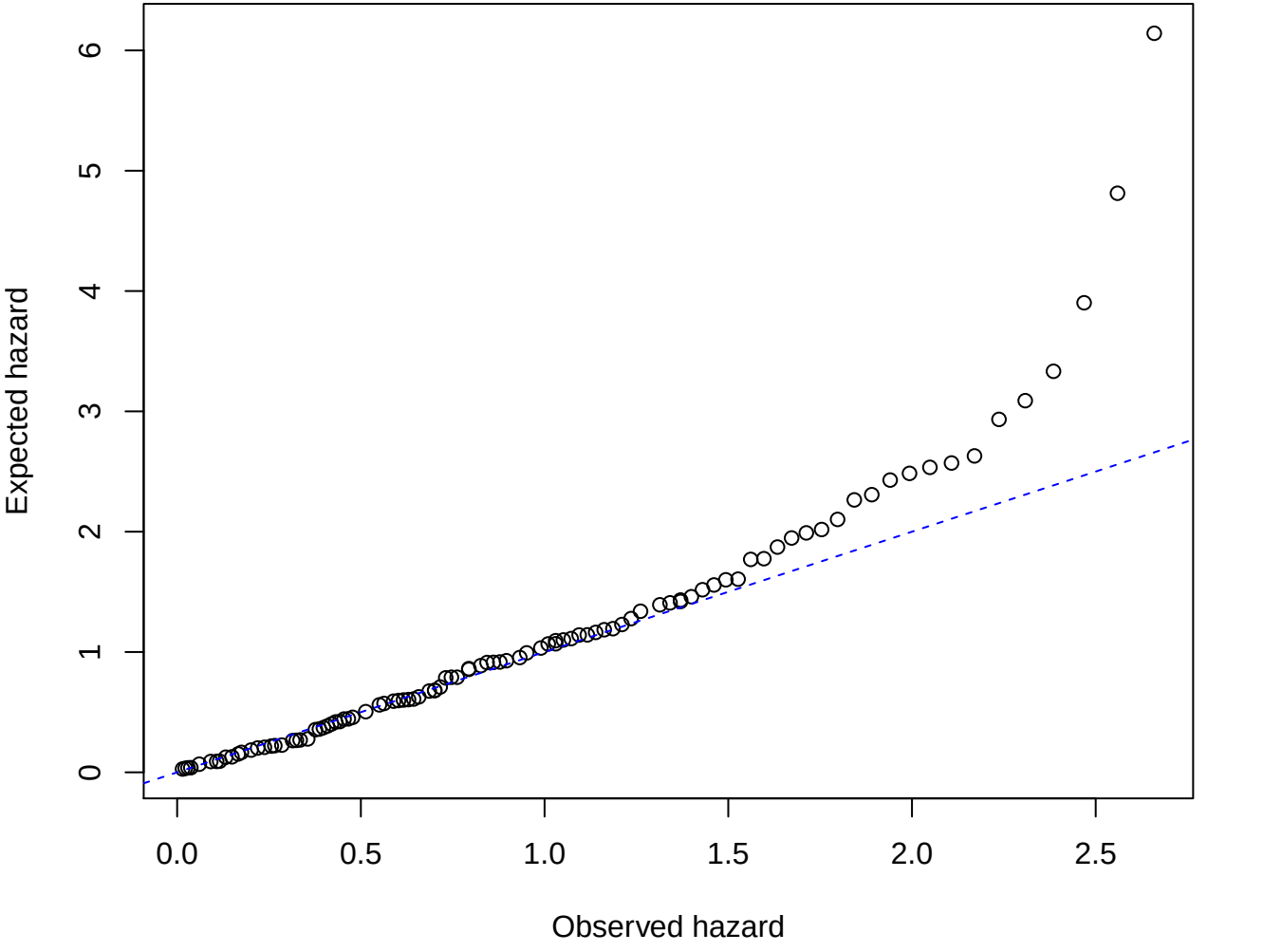
Quantile−quantile plot.
Unit exponential distribution vs. expected events (Cox−Snell residuals).
Should follow line through origin at 45 degrees (blue) if well fit.

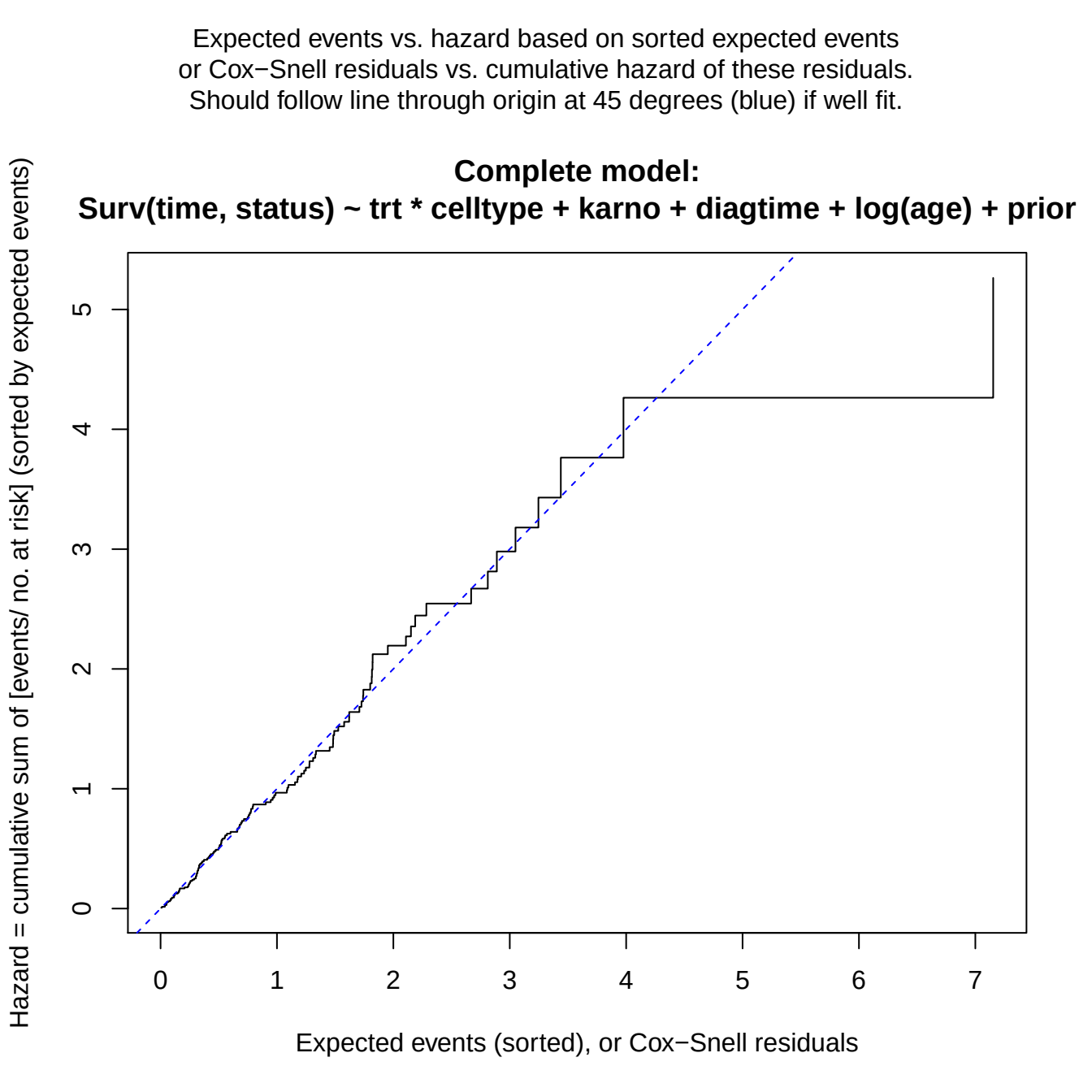
Complete model:
Surv(time, status) ~ trt * celltype + karno + diagtime + log(age) + prior



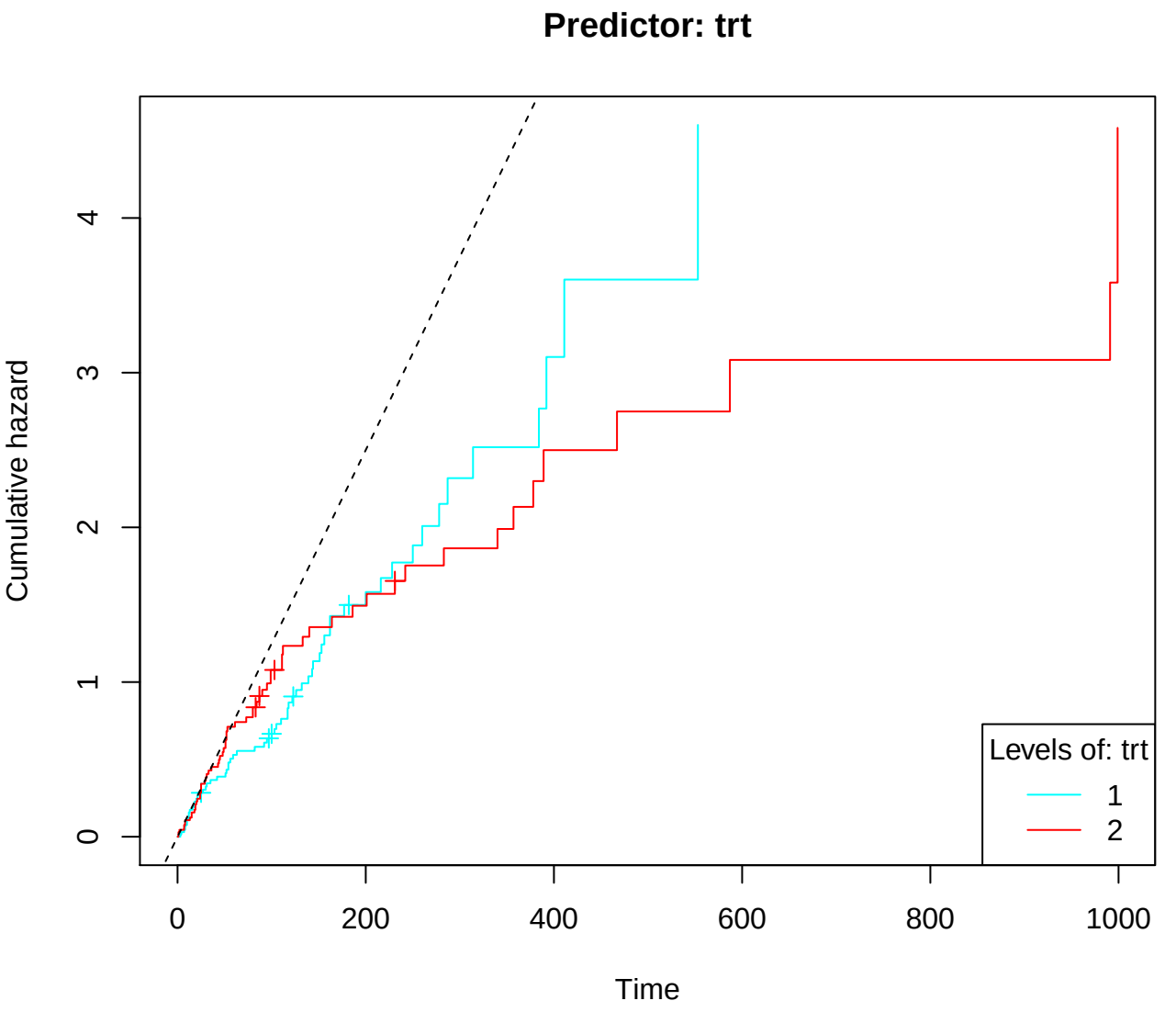
Observed vs. expected hazard.
Should follow line through origin at 45 degrees (blue) if well fit.

Complete model:
Surv(time, status) ~ trt * celltype + karno + diagtime + log(age) + prior

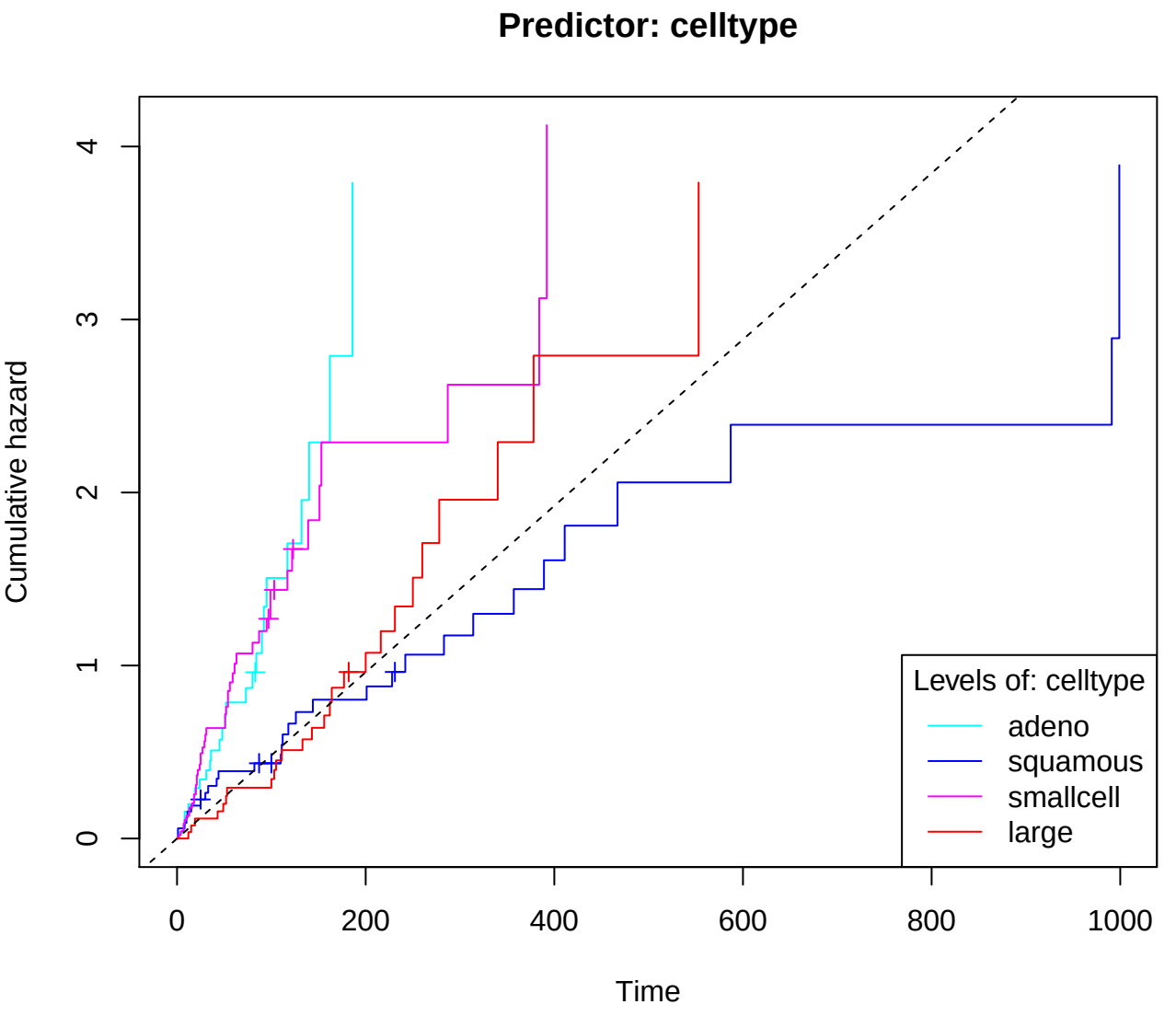



Expected events vs. hazard based on sorted expected events
or Cox−Snell residuals vs. cumulative hazard of these residuals.
Should follow line through origin at 45 degrees (blue) if well fit.
Complete model:
Surv(time, status) ~ trt * celltype + karno + diagtime + log(age) + prior
Hazard = cumulative sum of [events/ no. at risk] (sorted by expected events)
0
1
2
3
4
5
0
1
2
3
4
5
6
7
Expected events (sorted), or Cox−Snell residuals

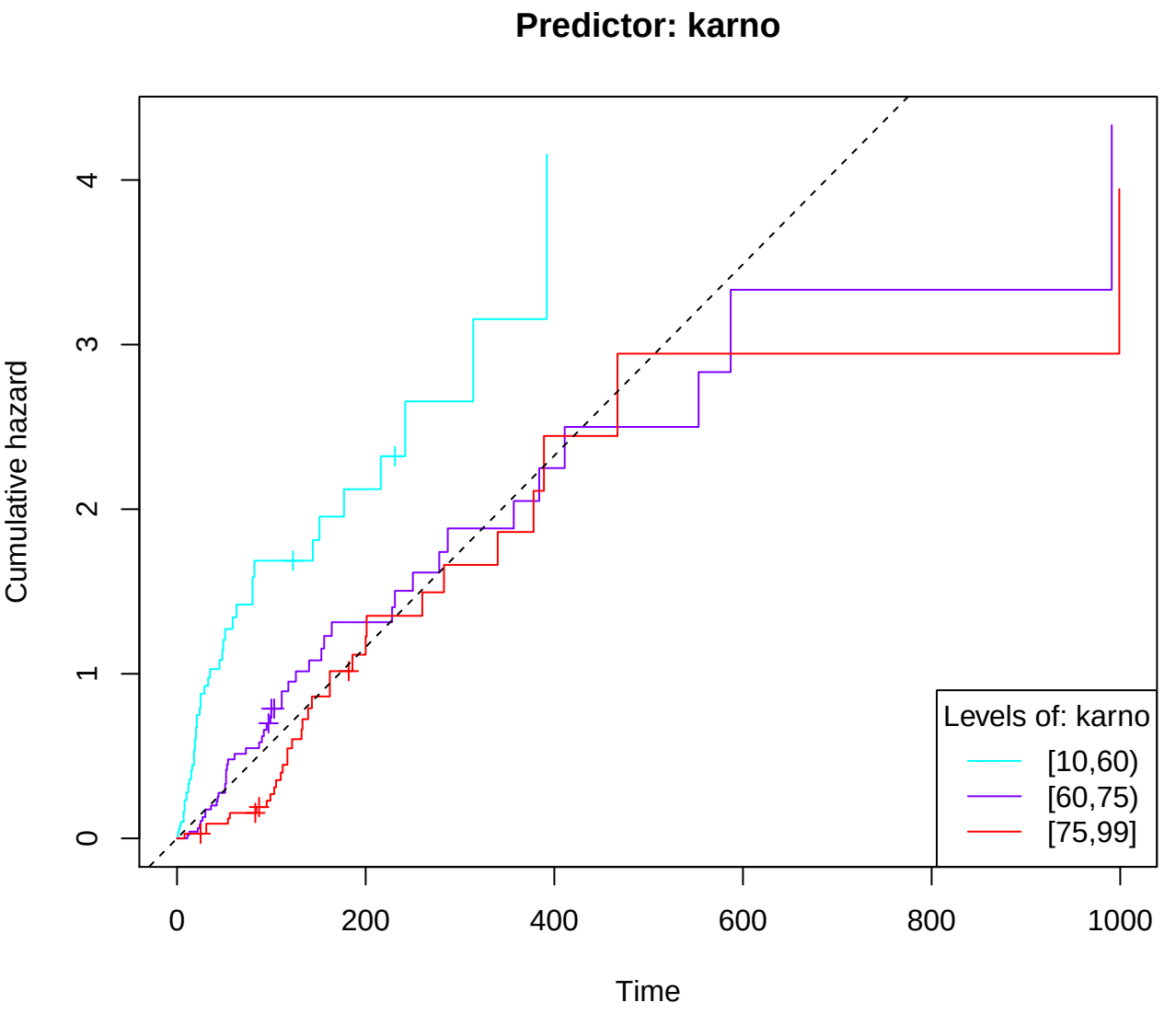
Time vs. hazard, per predictor.
If hazards proportional then curves should be constant multiples of a baseline.
Reference (black) line is 45 degrees.



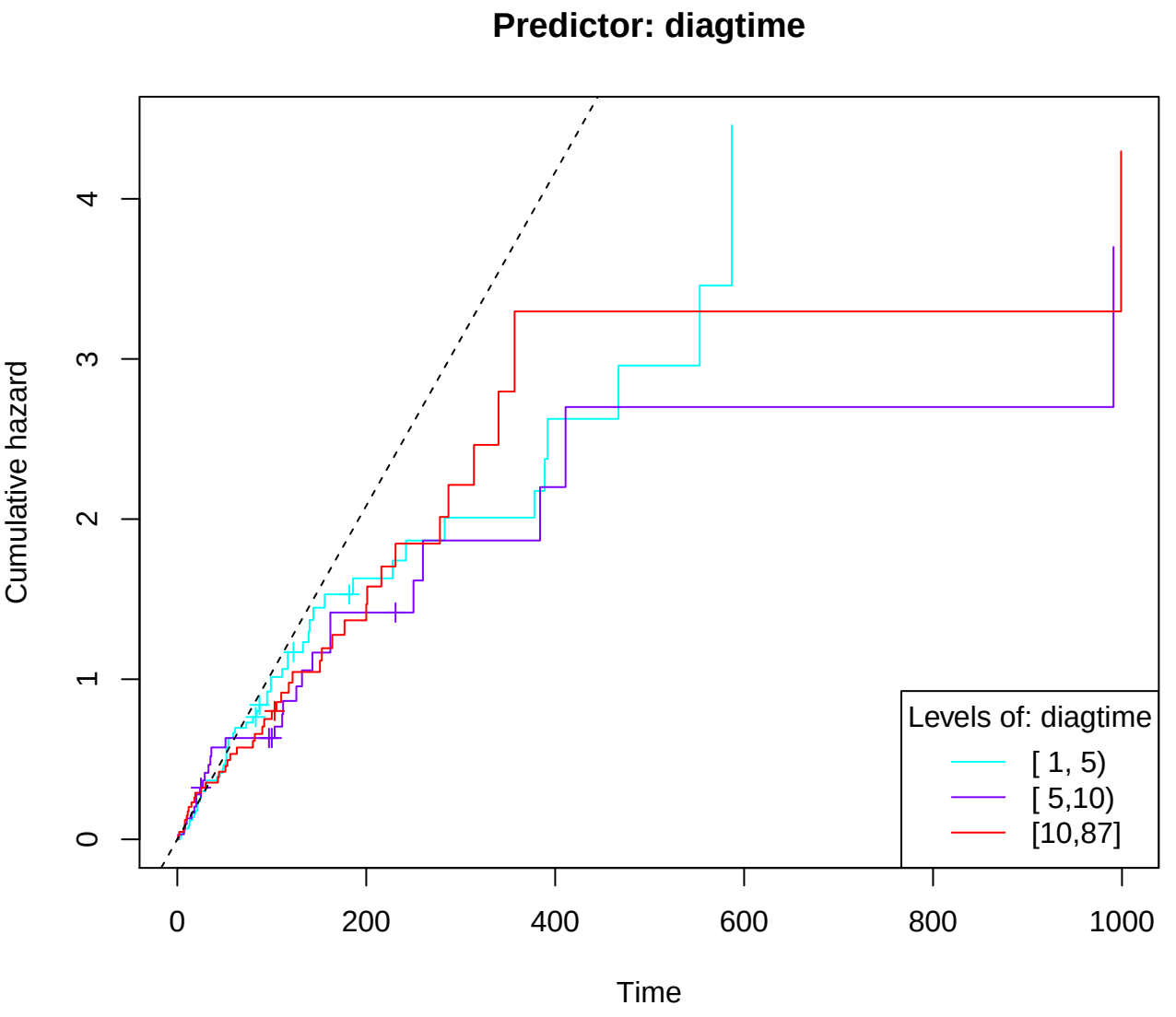
Time vs. hazard, per predictor.
If hazards proportional then curves should be constant multiples of a baseline.
Reference (black) line is 45 degrees.



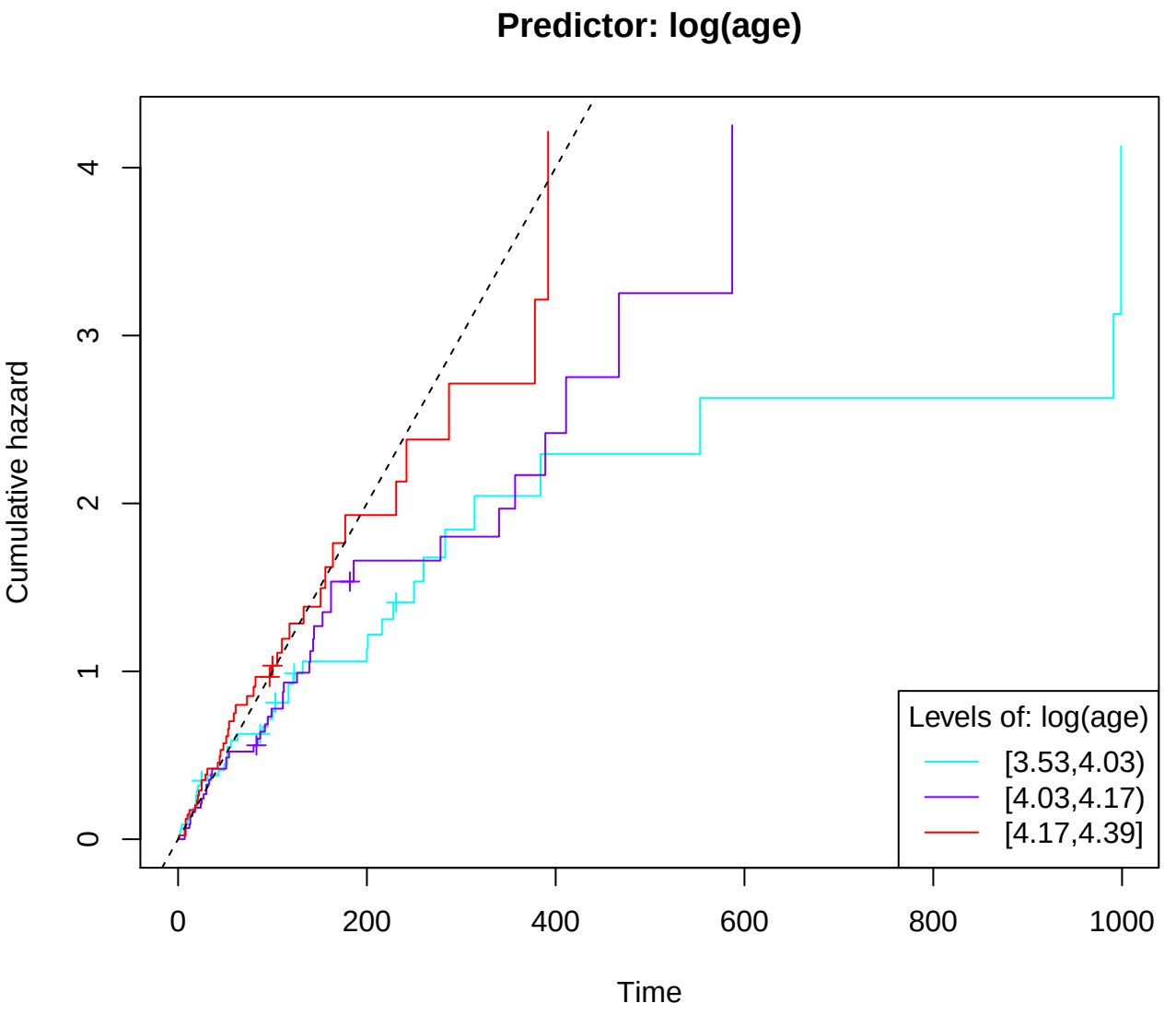
Time vs. hazard, per predictor.
If hazards proportional then curves should be constant multiples of a baseline.
Reference (black) line is 45 degrees.



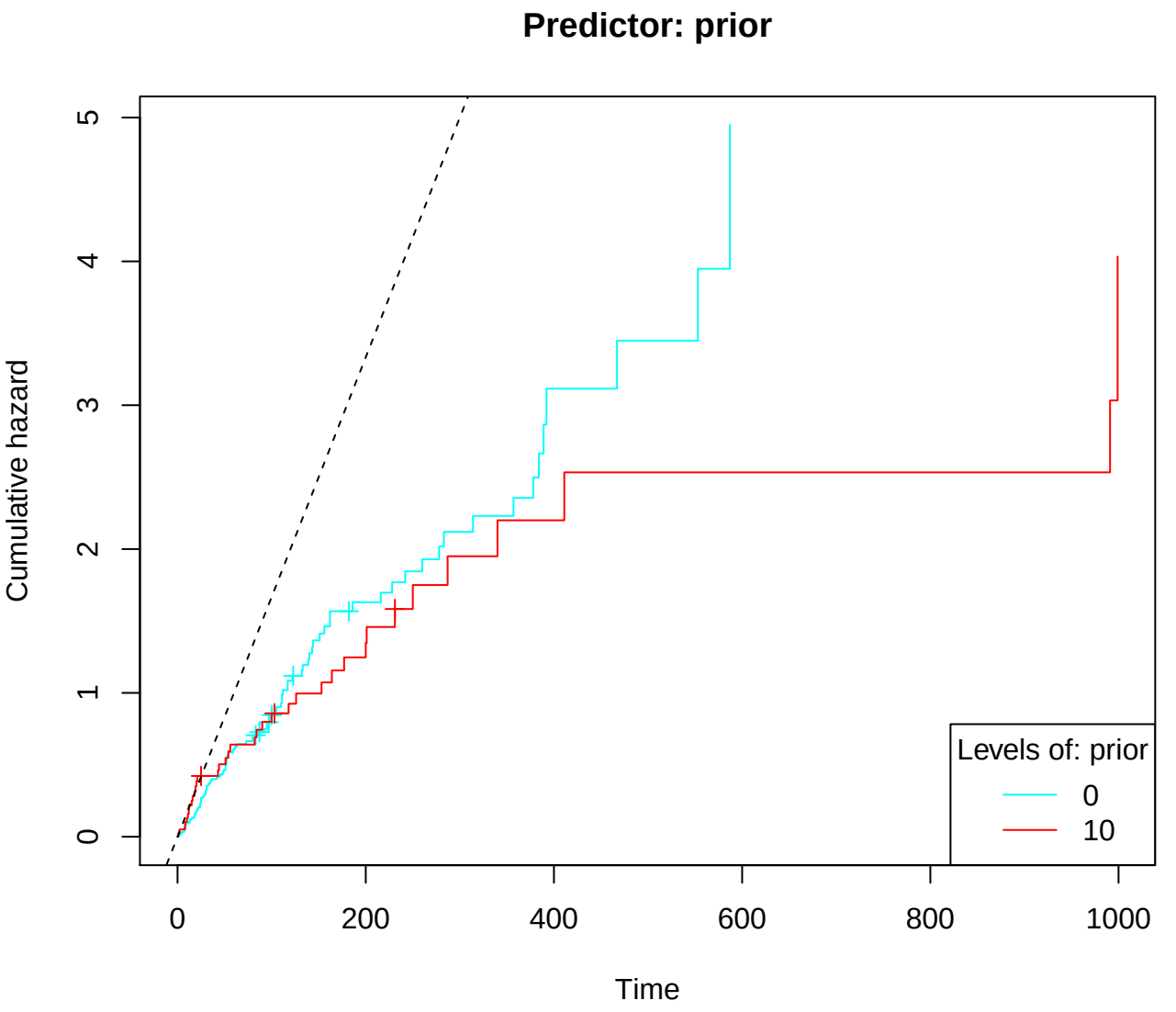
Time vs. hazard, per predictor.
If hazards proportional then curves should be constant multiples of a baseline.
Reference (black) line is 45 degrees.

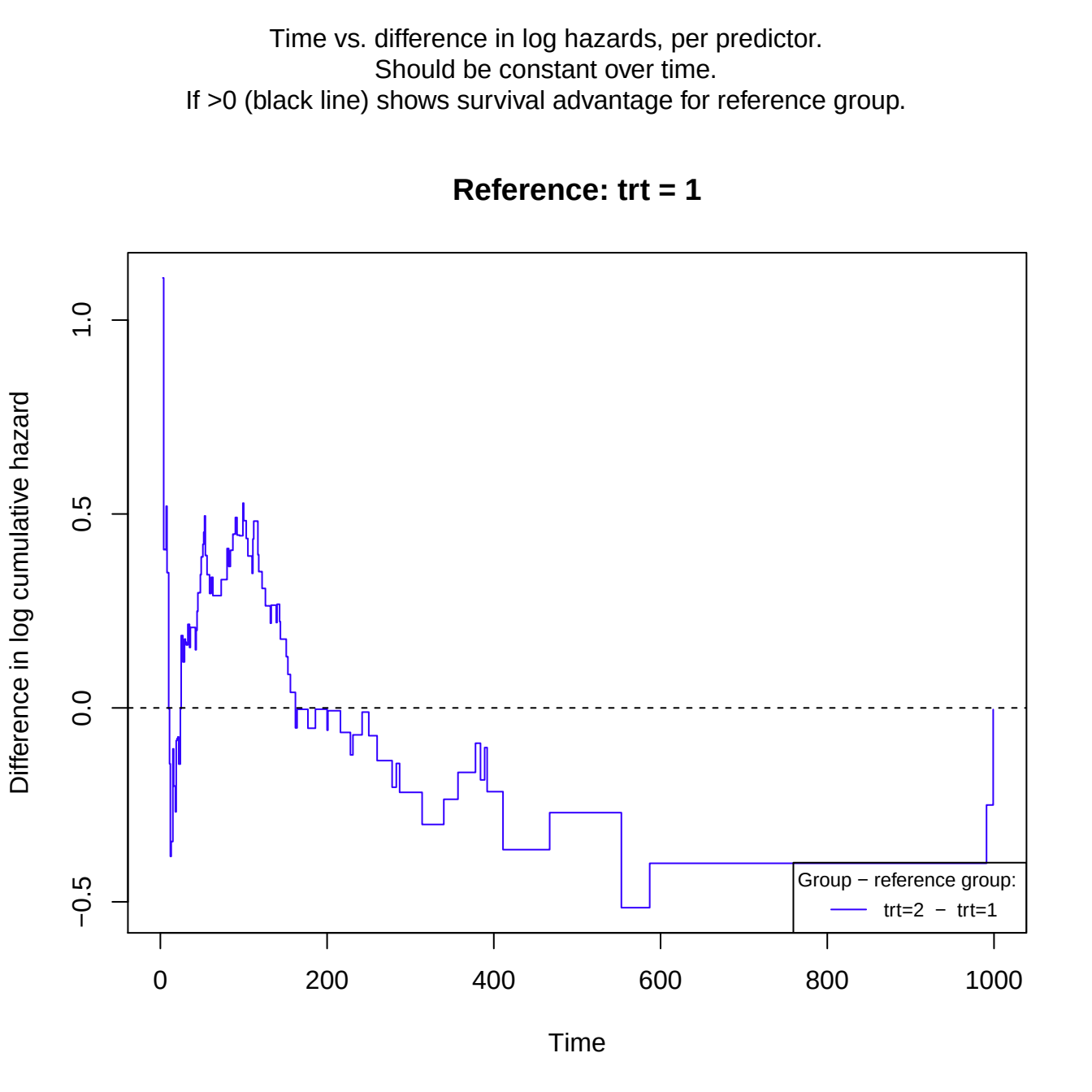


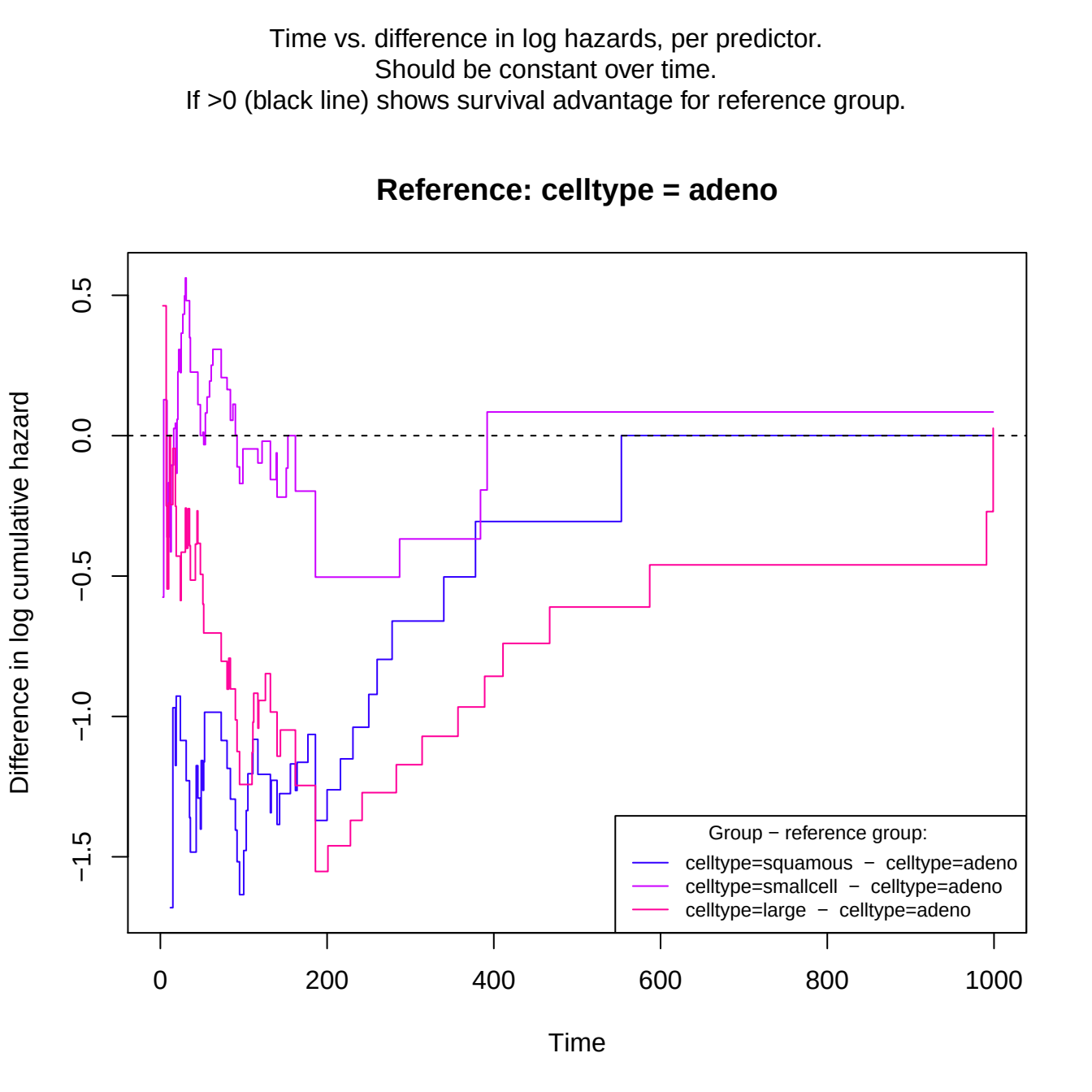
Time vs. hazard, per predictor.
If hazards proportional then curves should be constant multiples of a baseline.
Reference (black) line is 45 degrees.

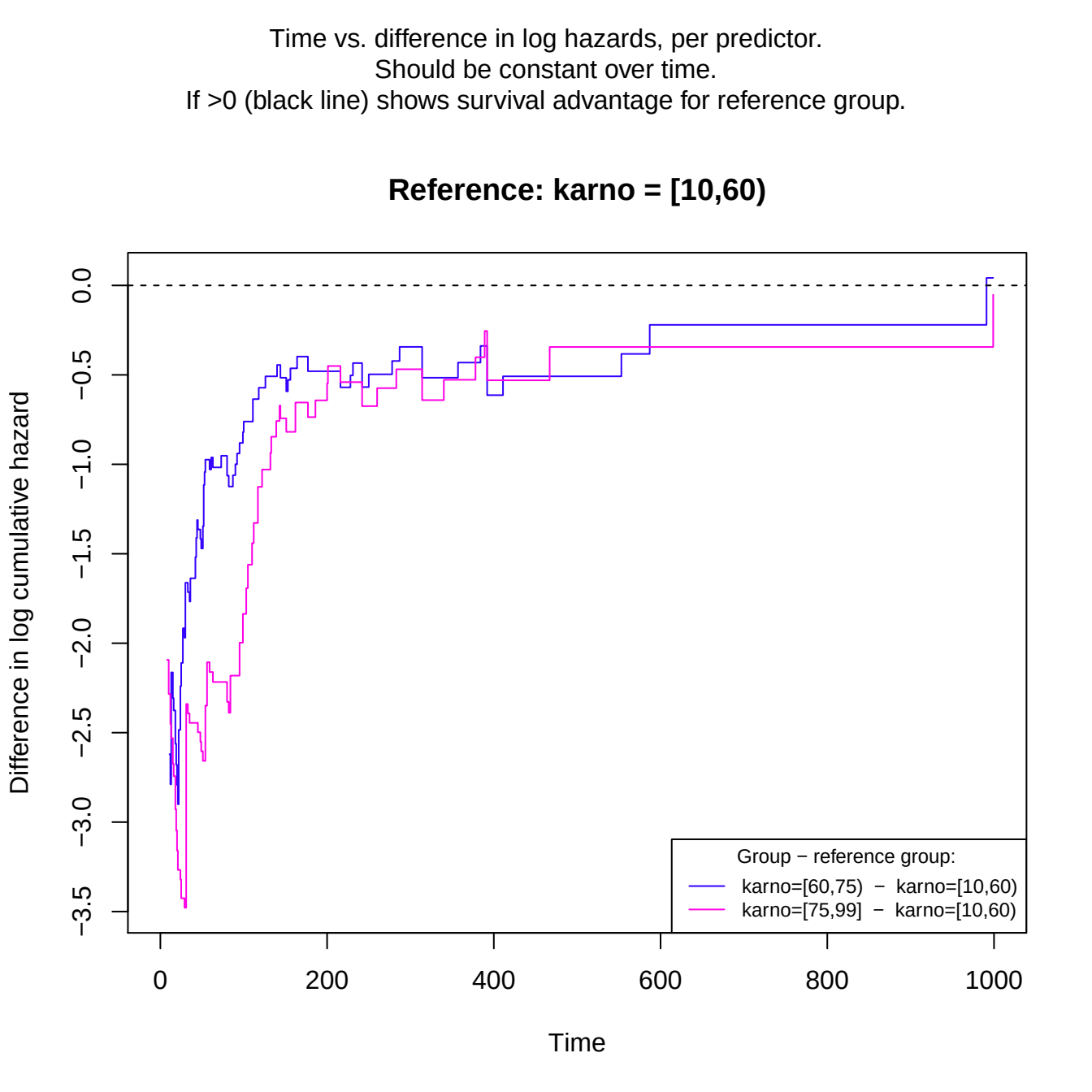


Time vs. hazard, per predictor.
If hazards proportional then curves should be constant multiples of a baseline.
Reference (black) line is 45 degrees.

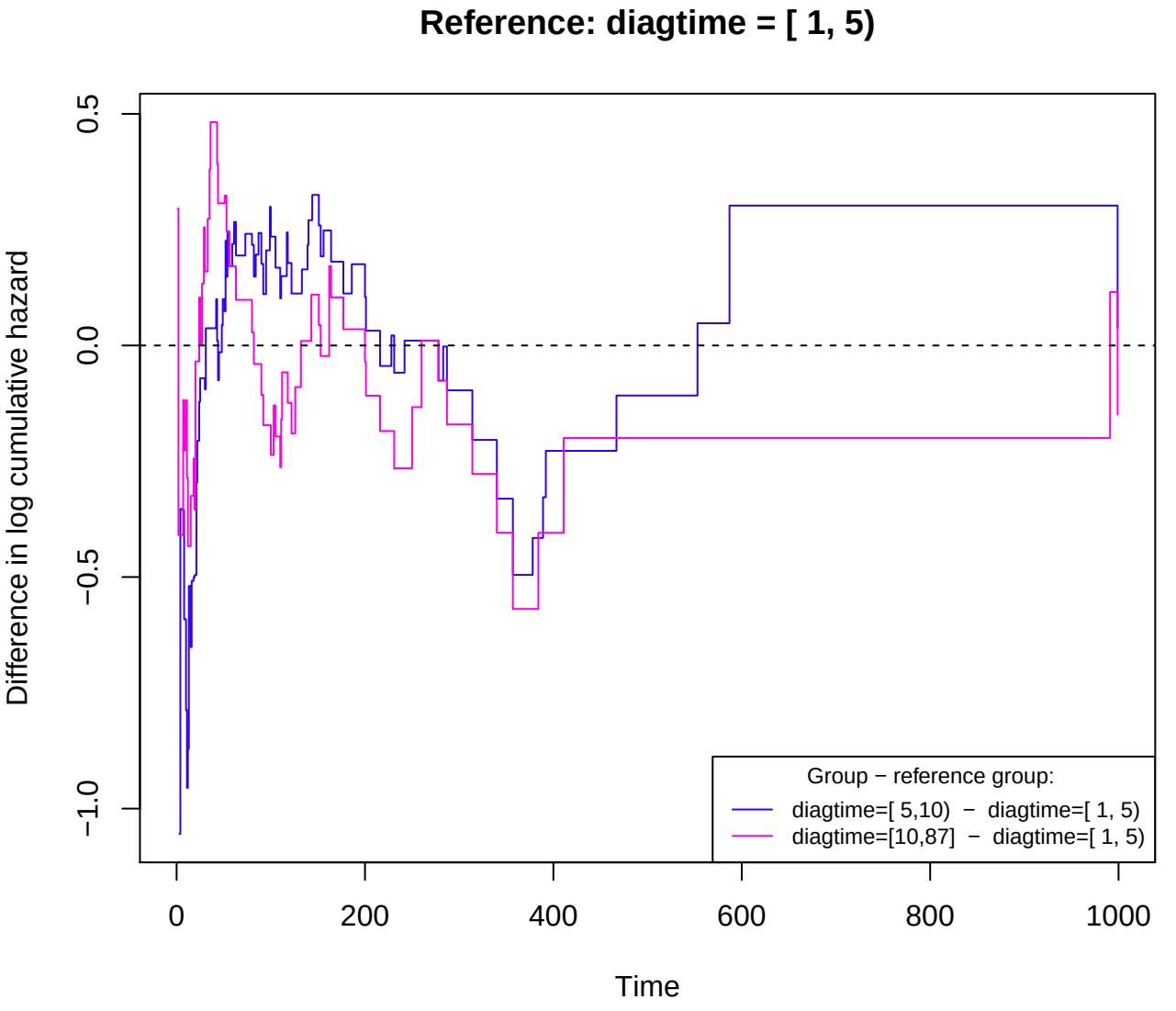


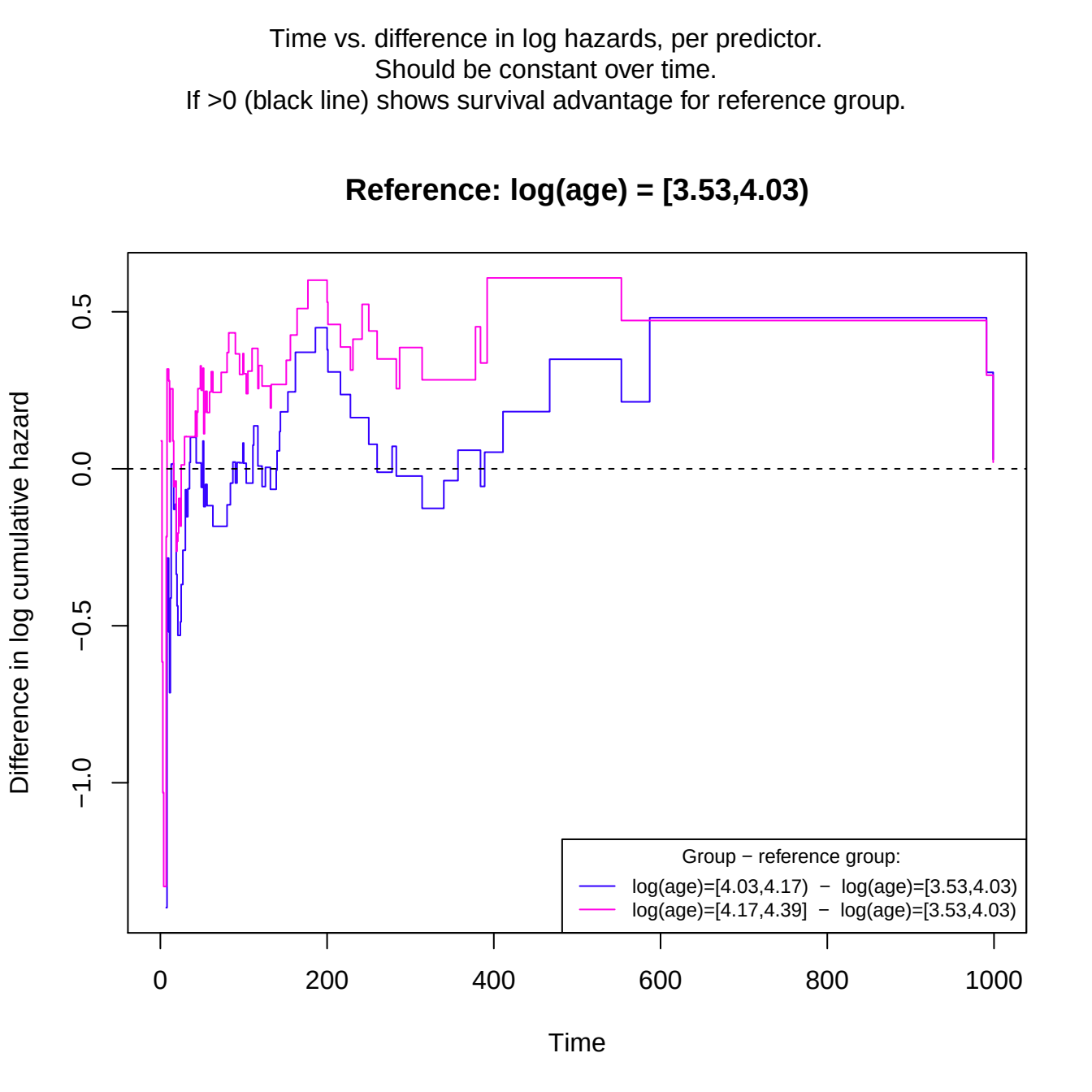

Time vs. difference in log hazards, per predictor.
Should be constant over time.
If >0 (black line) shows survival advantage for reference group.
Reference: trt = 1
Difference in log cumulative hazard
1.0
0.5
0.0
−0.5
0
200
400
600
800
1000
Time
Group − reference group:
trt=2 − trt=1

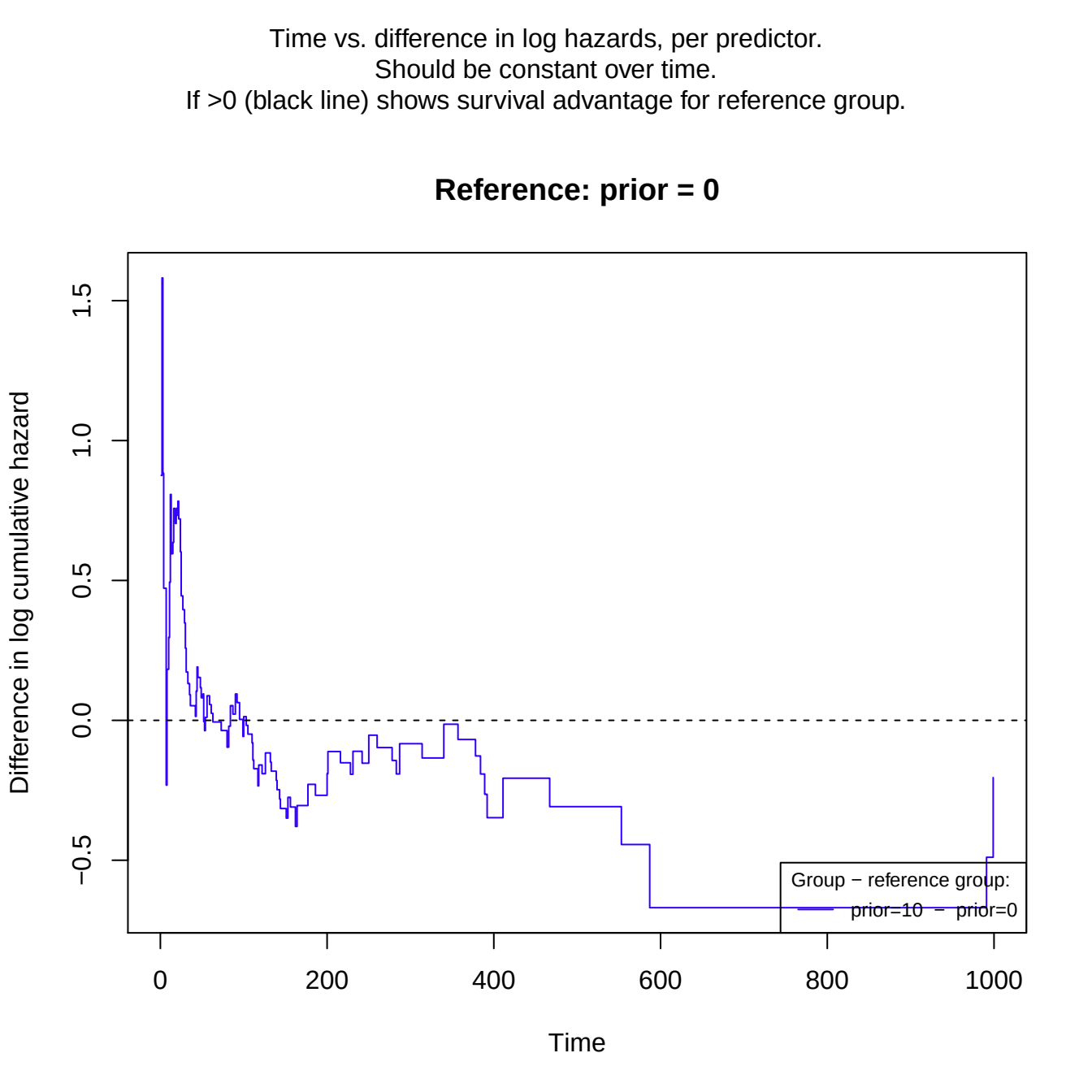

Time vs. difference in log hazards, per predictor.
Should be constant over time.
If >0 (black line) shows survival advantage for reference group.
Reference: celltype = adeno
Difference in log cumulative hazard
0.5
0.0
−0.5
−1.0
−1.5
0
200
400
600
800
1000
Time
Group − reference group:
celltype=squamous − celltype=adeno
celltype=smallcell − celltype=adeno
celltype=large − celltype=adeno


Time vs. difference in log hazards, per predictor.
Should be constant over time.
If >0 (black line) shows survival advantage for reference group.
Reference: karno = [10,60)
Difference in log cumulative hazard
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
−3.0
−3.5
0
200
400
600
800
1000
Time
Group − reference group:
karno=[60,75) − karno=[10,60)
karno=[75,99] − karno=[10,60)

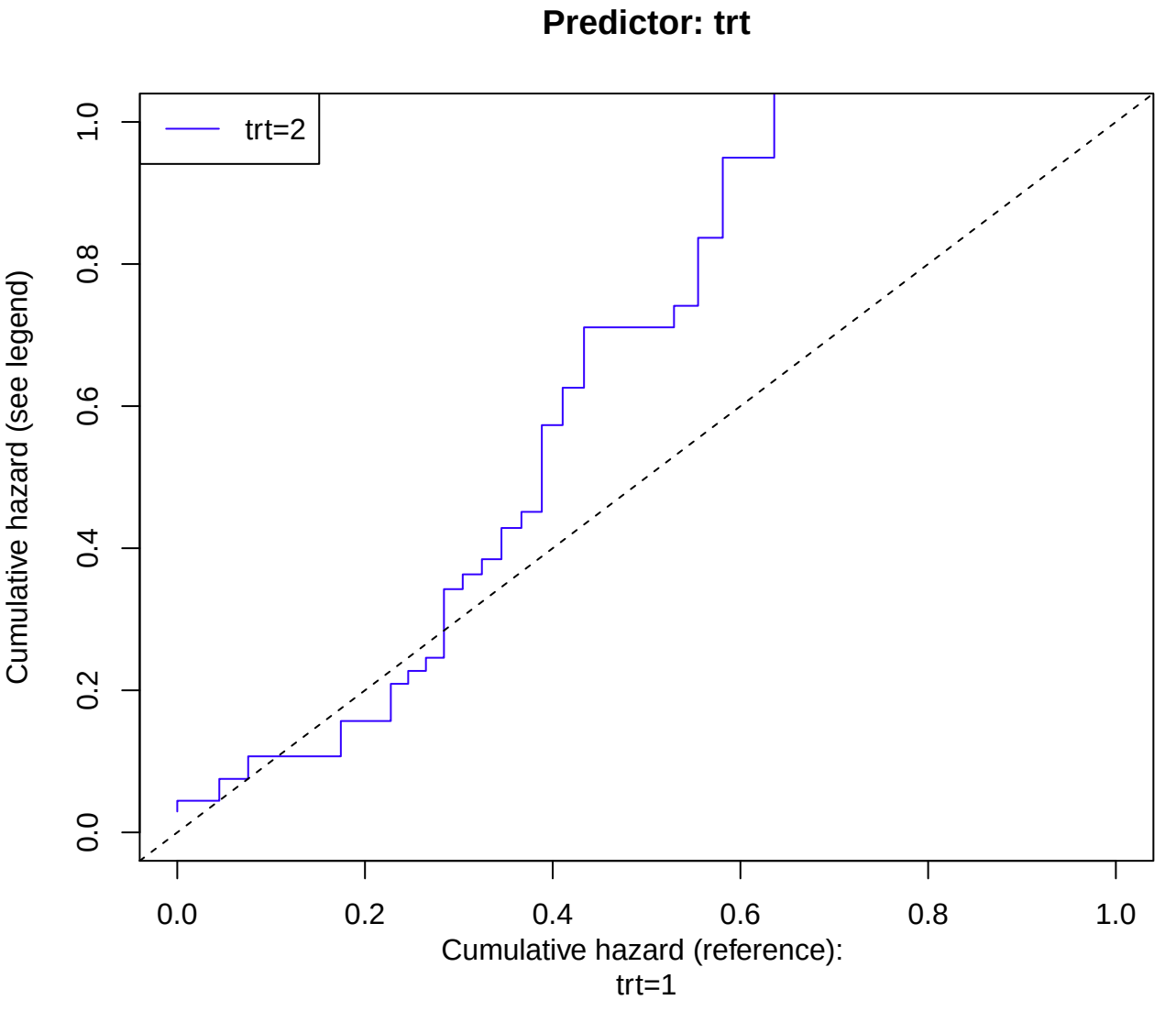
Time vs. difference in log hazards, per predictor.
Should be constant over time.
If >0 (black line) shows survival advantage for reference group.



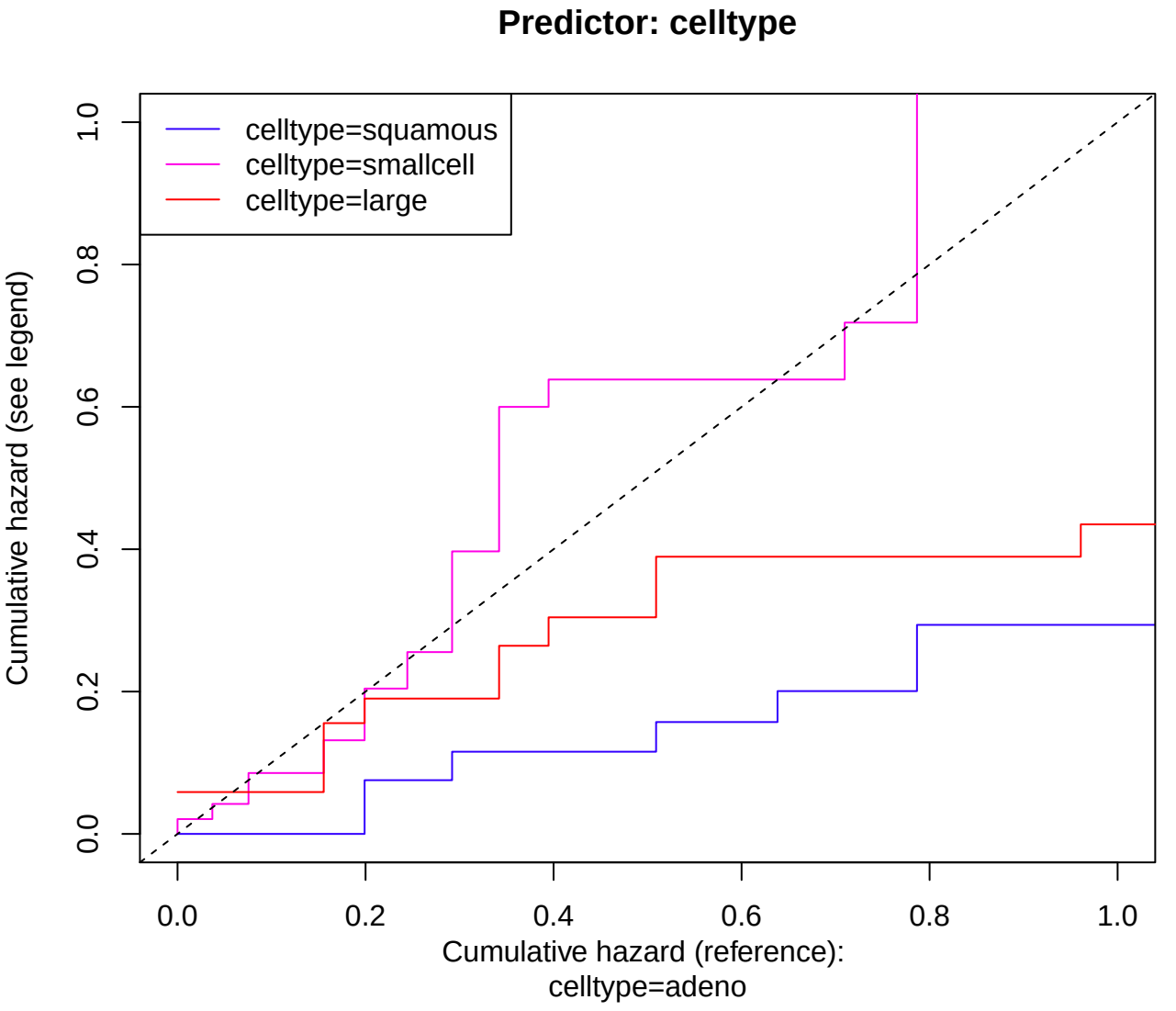

Time vs. difference in log hazards, per predictor.
Should be constant over time.
If >0 (black line) shows survival advantage for reference group.
Reference: log(age) = [3.53,4.03)
Difference in log cumulative hazard
0.5
0.0
−0.5
−1.0
0
200
400
600
800
1000
Time
Group − reference group:
log(age)=[4.03,4.17) − log(age)=[3.53,4.03)
log(age)=[4.17,4.39] − log(age)=[3.53,4.03)


Time vs. difference in log hazards, per predictor.
Should be constant over time.
If >0 (black line) shows survival advantage for reference group.
Reference: prior = 0
Difference in log cumulative hazard
1.5
1.0
0.5
0.0
−0.5
0
200
400
600
800
1000
Time
Group − reference group:
prior=10 − prior=0

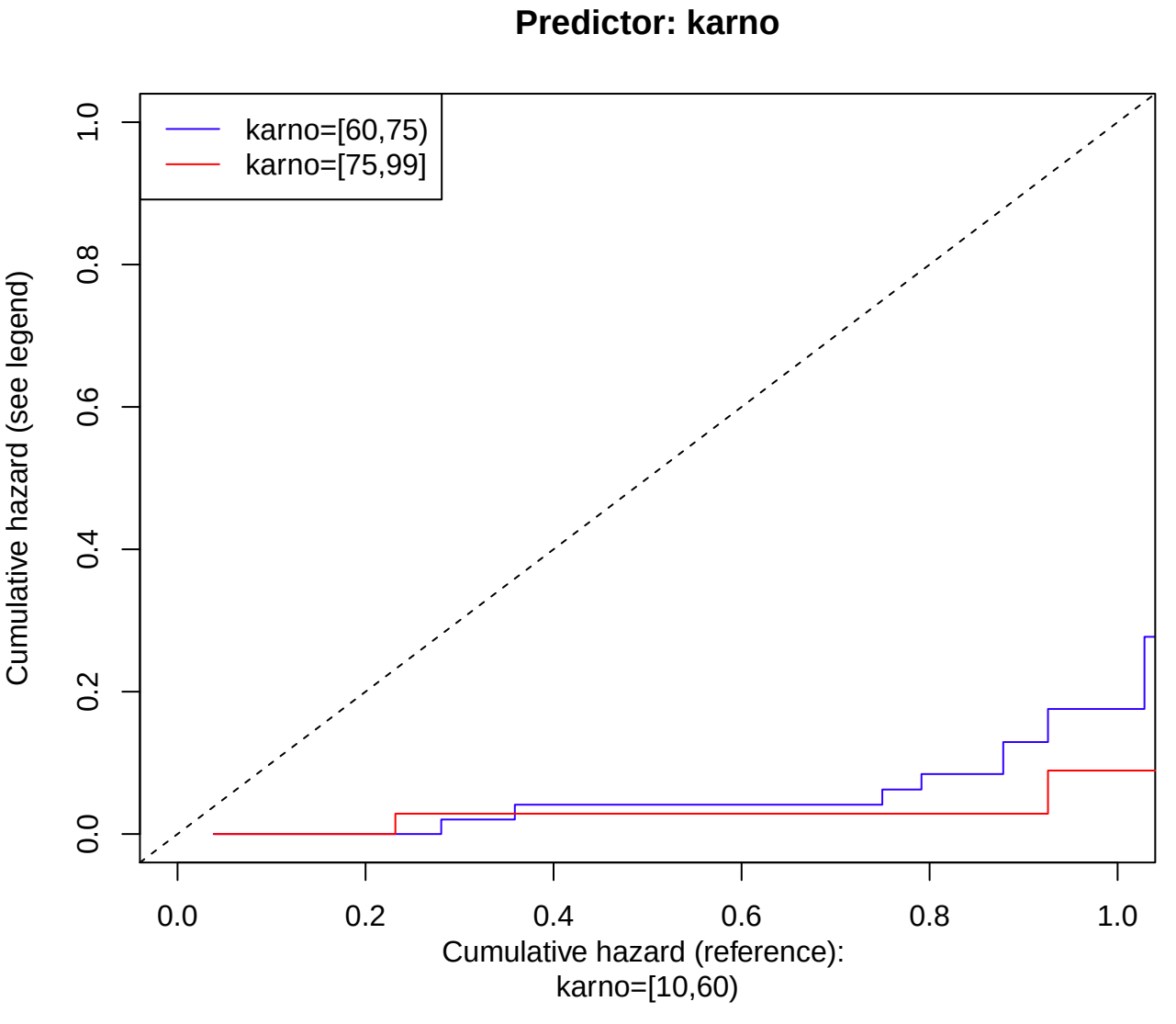
Cumulative hazard vs. reference group. Should be linear plot through origin.
If convex (towards top left) shows ratio of hazards is increasing over time.
Reference line (black) is at 45 degrees.



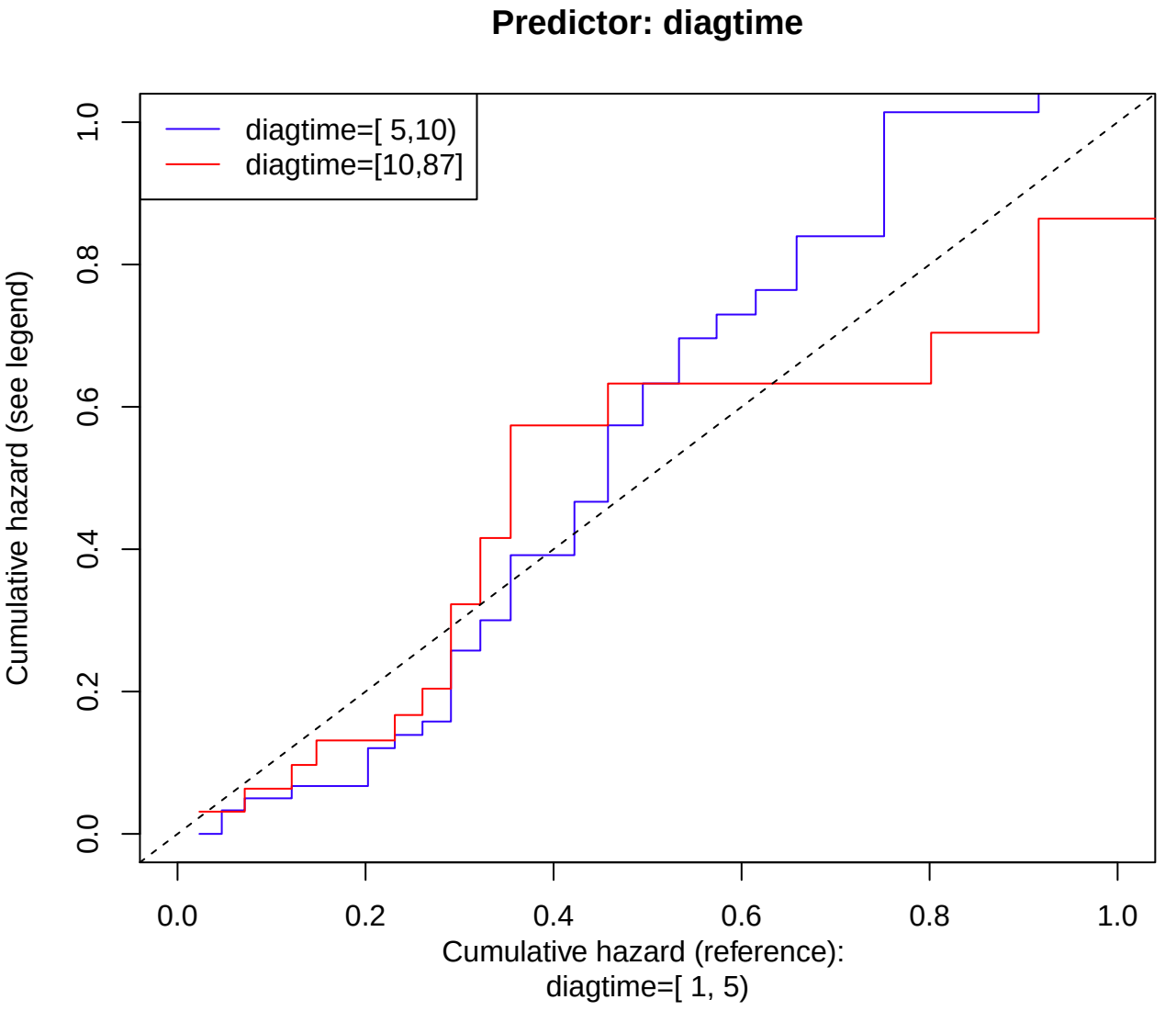
Cumulative hazard vs. reference group. Should be linear plot through origin.
If convex (towards top left) shows ratio of hazards is increasing over time.
Reference line (black) is at 45 degrees.



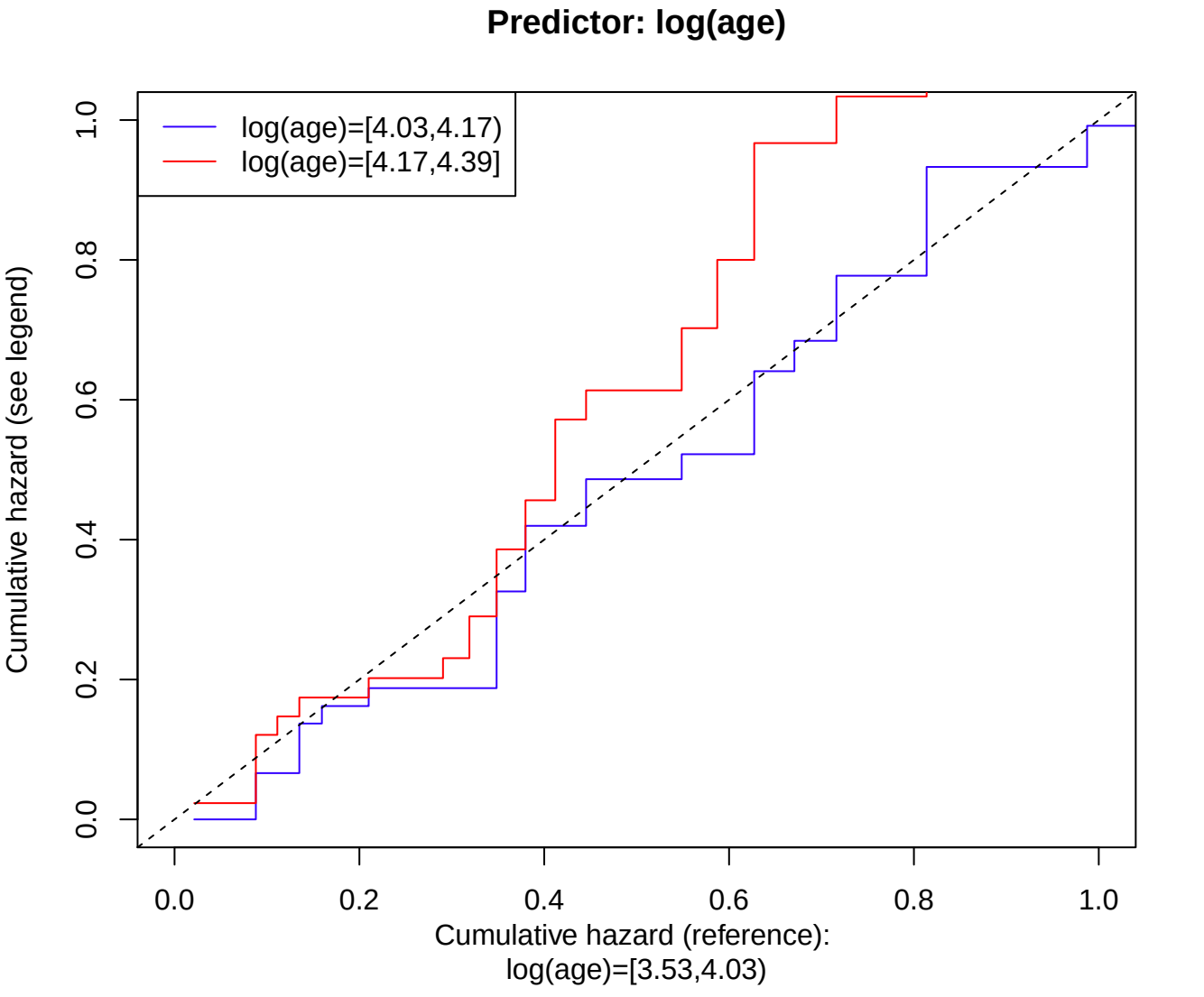
Cumulative hazard vs. reference group. Should be linear plot through origin.
If convex (towards top left) shows ratio of hazards is increasing over time.
Reference line (black) is at 45 degrees.



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.



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.



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.