Colon Cancer

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Contents

1 RRPlot and the Colon data set

1.0.1 Libraries

```
library(survival)
library(FRESA.CAD)
```

```
## Loading required package: Rcpp
```

```
## Loading required package: stringr
```

```
## Loading required package: miscTools
```

```
## Loading required package: Hmisc
```

```
##
## Attaching package: 'Hmisc'
```

```
## The following objects are masked from 'package:base':
##
##     format.pval, units
```

```
## Loading required package: pROC
```

```
## Type 'citation("pROC")' for a citation.
```

```
##
## Attaching package: 'pROC'
```

```
## The following objects are masked from 'package:stats':
##
##     cov, smooth, var
```

```
#library(corrplot)
#source("~/GitHub/FRESA.CAD/R/RRPlot.R")
#source("~/GitHub/FRESA.CAD/R/PoissonEventRiskCalibration.R")
op <- par(no.readonly = TRUE)
pander::panderOptions('digits', 3)
```

```
#pander::panderOptions('table.split.table', 400)
pander::panderOptions('keep.trailing.zeros',TRUE)
```

1.1 The data set

```
data(cancer)
colon <- subset(colon,etype==1)
colon$etype <- NULL
rownames(colon) <- colon$id
colon$id <- NULL
colon <- colon[complete.cases(colon),]
time <- colon$time
status <- colon$status
data <- colon
data$time <- NULL
data$study <- NULL
table(data$status)
```

0 1 442 446

```
dataColon <- as.data.frame(model.matrix(status~.*age,data))
dataColon$`(Intercept)` <- NULL
dataColon$time <- time/365
dataColon$status <- status
colnames(dataColon) <-str_replace_all(colnames(dataColon),":","_")
colnames(dataColon) <-str_replace_all(colnames(dataColon),"\\.","_")
colnames(dataColon) <-str_replace_all(colnames(dataColon),"\\+","_")
data <- NULL

trainsamples <- sample(nrow(dataColon),0.7*nrow(dataColon))
dataColonTrain <- dataColon[trainsamples,]
dataColonTest <- dataColon[-trainsamples,]


pander::pander(table(dataColonTrain$status))
```

0	1
316	305

```
pander::pander(table(dataColonTest$status))
```

0	1
126	141

1.2 Modeling

```
ml <- BSWiMS.model(Surv(time,status)~1,data=dataColonTrain,NumberofRepeats = 10)
```

[++++++++++++++++++++++++++]..

```
sm <- summary(ml)
pander::pander(sm$coefficients)
```

Table 3: Table continues below

	Estimate	lower	HR	upper	u.Accuracy
age_node4	6.05e-03	1.004	1.006	1.009	0.620
age	-2.07e-02	0.970	0.979	0.989	0.514
rxLev_5FU_age	-3.11e-03	0.995	0.997	0.998	0.570
rxLev_5FU	-2.36e-01	0.696	0.790	0.896	0.570
node4	1.81e-01	1.079	1.198	1.330	0.620
age_extent	4.46e-03	1.002	1.004	1.007	0.525
age_nodes	1.00e-04	1.000	1.000	1.000	0.622
extent	1.60e-01	1.061	1.174	1.298	0.548
nodes	4.24e-02	1.012	1.043	1.076	0.628
differ	7.37e-08	1.000	1.000	1.000	0.533

Table 4: Table continues below

	r.Accuracy	full.Accuracy	u.AUC	r.AUC	full.AUC
age_node4	0.595	0.621	0.616	0.596	0.620
age	0.612	0.625	0.513	0.609	0.624
rxLev_5FU_age	0.630	0.645	0.573	0.627	0.644
rxLev_5FU	0.623	0.621	0.573	0.621	0.619
node4	0.631	0.642	0.616	0.631	0.640
age_extent	0.625	0.625	0.526	0.623	0.624
age_nodes	0.609	0.634	0.619	0.608	0.633
extent	0.632	0.645	0.554	0.630	0.644
nodes	0.632	0.645	0.625	0.629	0.644
differ	0.491	0.533	0.527	0.500	0.527

	IDI	NRI	z.IDI	z.NRI	Delta.AUC	Frequency
age_node4	0.02955	0.4220	4.90	6.14	0.023108	1.0
age	0.02207	0.1873	4.23	2.35	0.015136	1.0
rxLev_5FU_age	0.01911	0.2930	4.08	3.97	0.016553	1.0
rxLev_5FU	0.01574	0.2930	3.67	3.97	-0.001565	1.0
node4	0.01328	0.3635	3.47	5.38	0.009490	1.0
age_extent	0.01388	0.1295	3.33	2.30	0.000977	1.0
age_nodes	0.01328	0.2245	3.23	2.93	0.024832	1.0
extent	0.01233	0.0673	3.12	1.07	0.013901	1.0
nodes	0.00827	0.1884	2.76	2.45	0.014472	1.0
differ	0.00656	0.1089	1.85	1.80	0.027215	0.4

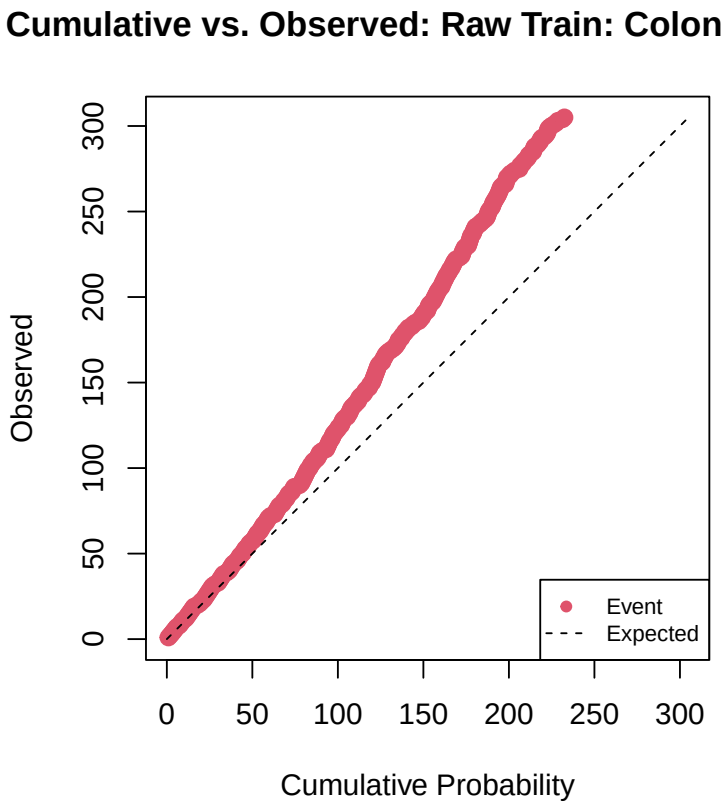
1.3 Cox Model Performance

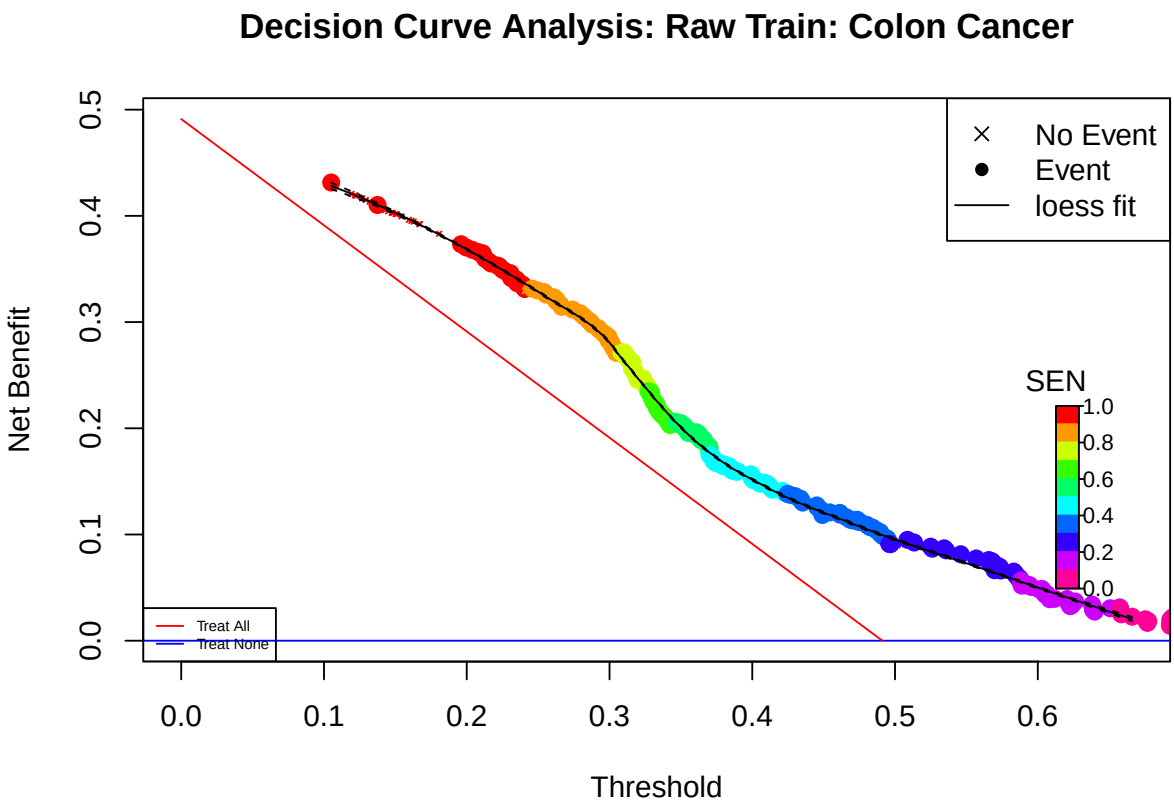
Here we evaluate the model using the RRPlot() function.

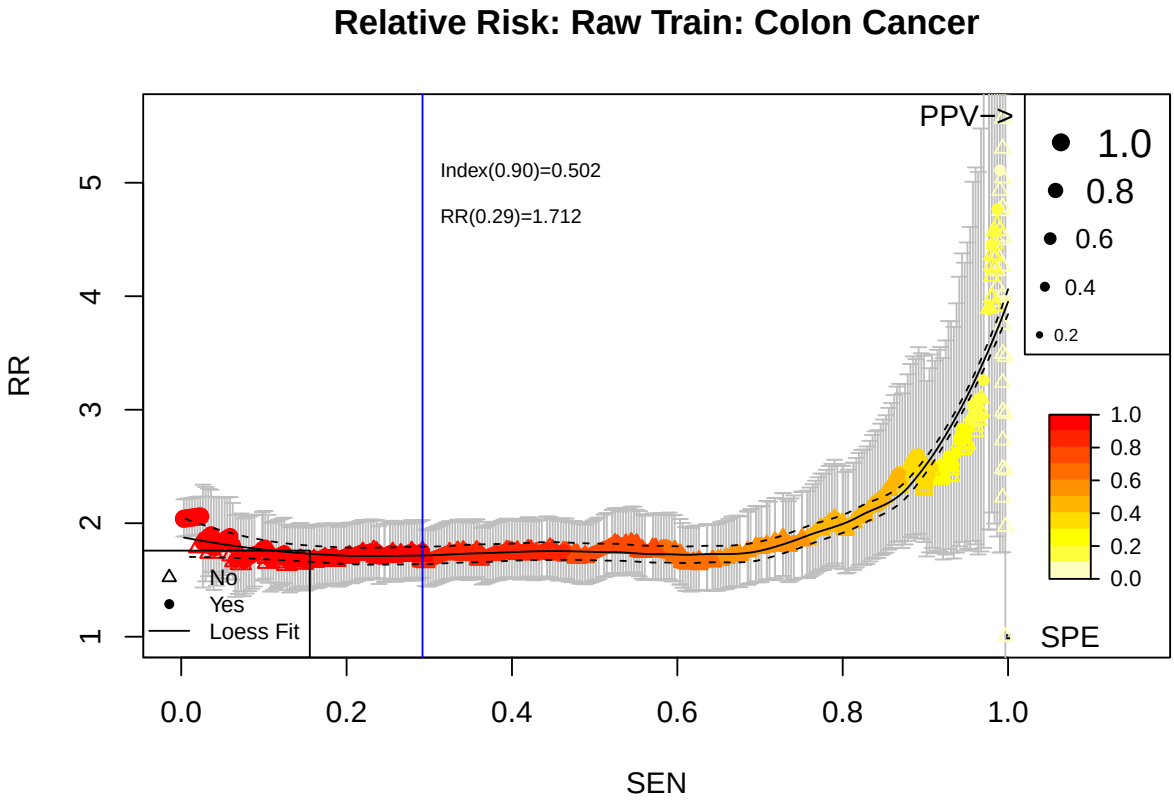
1.3.1 The evaluation of the raw Cox model with RRPlot()

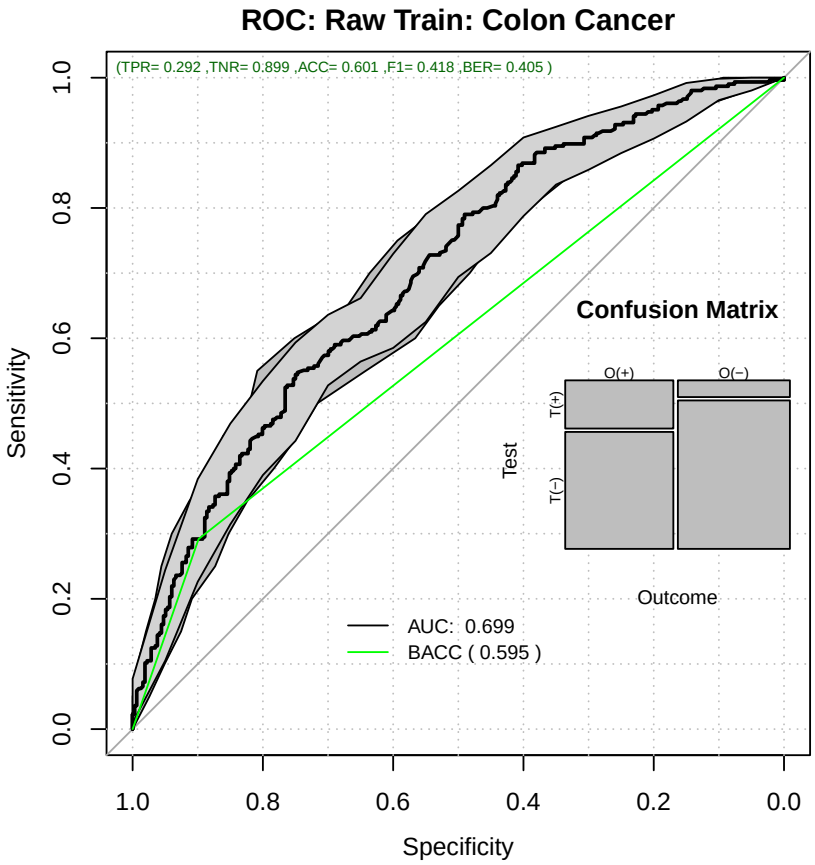
Here we will use the predicted event probability assuming a baseline hazard for events withing 5 years

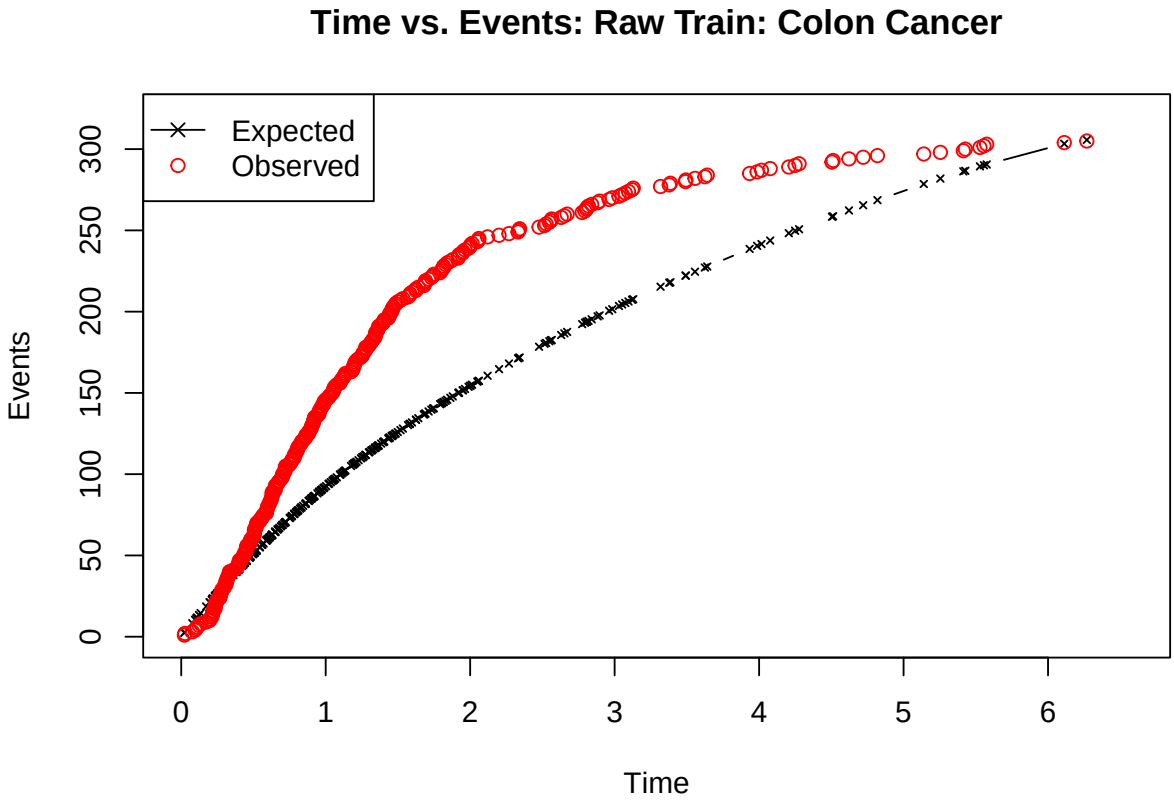
```
index <- predict(ml,dataColonTrain)
timeinterval <- 2*mean(subset(dataColonTrain,status==1)$time)

h0 <- sum(dataColonTrain$status & dataColonTrain$time <= timeinterval)
h0 <- h0/sum((dataColonTrain$time > timeinterval) | (dataColonTrain$status==1))

rdata <- cbind(dataColonTrain$status,ppoisGzero(index,h0))

rrAnalysisTrain <- RRPlot(rdata,atProb=c(0.90),
                      timetoEvent=dataColonTrain$time,
                      title="Raw Train: Colon Cancer",
                      ysurvlim=c(0.00,1.0),
                      riskTimeInterval=timeinterval)
```

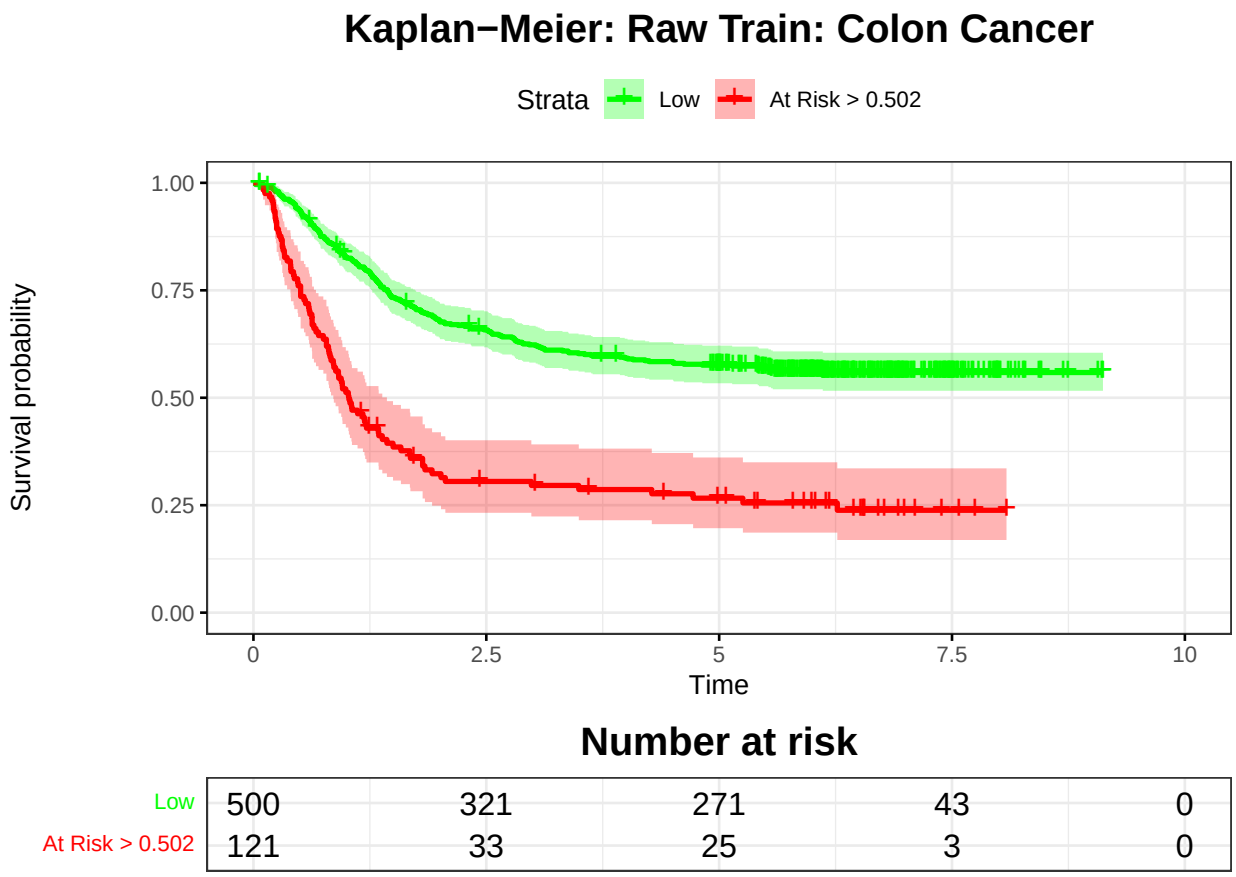



Decision Curve Analysis: Raw Train: Colon Cancer
Net Benefit
0.0
0.1
0.2
0.3
0.4
0.5
Threshold
0.0
0.1
0.2
0.3
0.4
0.5
0.6
No Event
Event
loess fit
SEN
1.0
0.8
0.6
0.4
0.2
0.0
Treat All
Treat None


Relative Risk: Raw Train: Colon Cancer
PPV–>
Index(0.90)=0.502
RR(0.29)=1.712
1.0
0.8
0.6
0.4
0.2
1.0
0.8
0.6
0.4
0.2
0.0
No
Yes
Loess Fit
SPE
RR
SEN
1
2
3
4
5
0.0
0.2
0.4
0.6
0.8
1.0


ROC: Raw Train: Colon Cancer
(TPR= 0.292 ,TNR= 0.899 ,ACC= 0.601 ,F1= 0.418 ,BER= 0.405)
Sensitivity
1.0
0.8
0.6
0.4
0.2
0.0
Specificity
1.0
0.8
0.6
0.4
0.2
0.0
Confusion Matrix
O(+)
O(−)
T(+)
T(−)
Test
Outcome
AUC: 0.699
BACC (0.595)


Time vs. Events: Raw Train: Colon Cancer
Expected
Observed
Events
0
50
100
150
200
250
300
0
1
2
3
4
5
6
Time



1.3.2 Uncalibrated Performance Report

```
pander::pander(t(rrAnalysisTrain$keyPoints),caption="Threshold values")
```

Table 6: Threshold values

	@:0.9	@MAX_BACC	@MAX_RR	@SPE100
Thr	0.502	0.361	0.204	0.105
RR	1.685	1.832	4.768	1.000
SEN	0.292	0.548	0.987	1.000
SPE	0.896	0.747	0.104	0.000
BACC	0.594	0.647	0.546	0.500

```
pander::pander(t(rrAnalysisTrain$OERatio),caption="O/E Ratio")
```

Table 7: O/E Ratio

est	lower	upper
0.998	0.889	1.12

```
pander::pander(t(rrAnalysisTrain$OE95ci),caption="O/E Ratio")
```

Table 8: O/E Ratio

mean	50%	2.5%	97.5%
1.39	1.39	1.36	1.41

```
pander::pander(t(rrAnalysisTrain$OAcum95ci),caption="O/Acum Ratio")
```

Table 9: O/Acum Ratio

mean	50%	2.5%	97.5%
1.27	1.27	1.26	1.27

```
pander::pander(rrAnalysisTrain$c.index$cstatCI,caption="C. Index")
```

mean.C Index	median	lower	upper
0.67	0.67	0.638	0.699

```
pander::pander(t(rrAnalysisTrain$ROCAnalysis$aucs),caption="ROC AUC")
```

Table 11: ROC AUC

est	lower	upper
0.699	0.659	0.74

```
pander::pander((rrAnalysisTrain$ROCAnalysis$sensitivity),caption="Sensitivity")
```

Table 12: Sensitivity

est	lower	upper
0.292	0.241	0.346

```
pander::pander((rrAnalysisTrain$ROCAnalysis$specificity),caption="Specificity")
```

Table 13: Specificity

est	lower	upper
0.899	0.86	0.93

```
pander::pander(t(rrAnalysisTrain$thr_atP),caption="Probability Thresholds")
```

Table 14: Probability Thresholds

90%	at_max_BACC	at_max_RR	atSPE100
0.502	0.361	0.204	0.105

```
pander::pander(t(rrAnalysisTrain$RR_atP),caption="Risk Ratio")
```

Table 15: Risk Ratio

est	lower	upper
1.71	1.48	1.98

```
pander::pander(rrAnalysisTrain$surdif,caption="Logrank test")
```

Table 16: Logrank test Chisq = 69.007475 on 1 degrees of freedom, p = 0.000000

	N	Observed	Expected	(O-E)^2/E	(O-E)^2/V
class=0	500	216	264.8	9.0	69
class=1	121	89	40.2	59.3	69

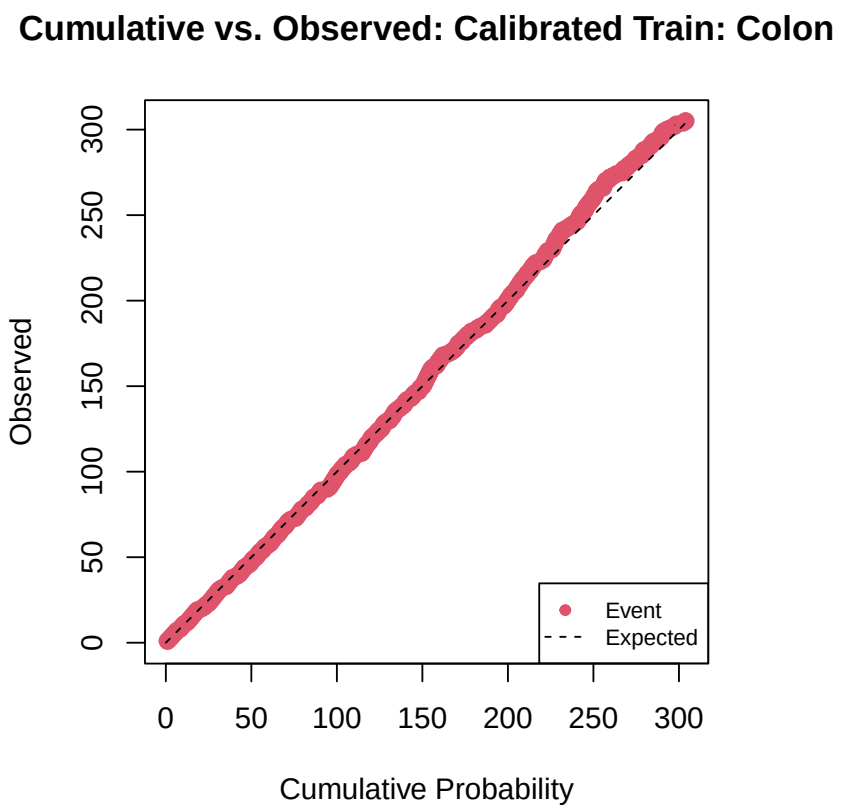
1.3.3 Cox Calibration

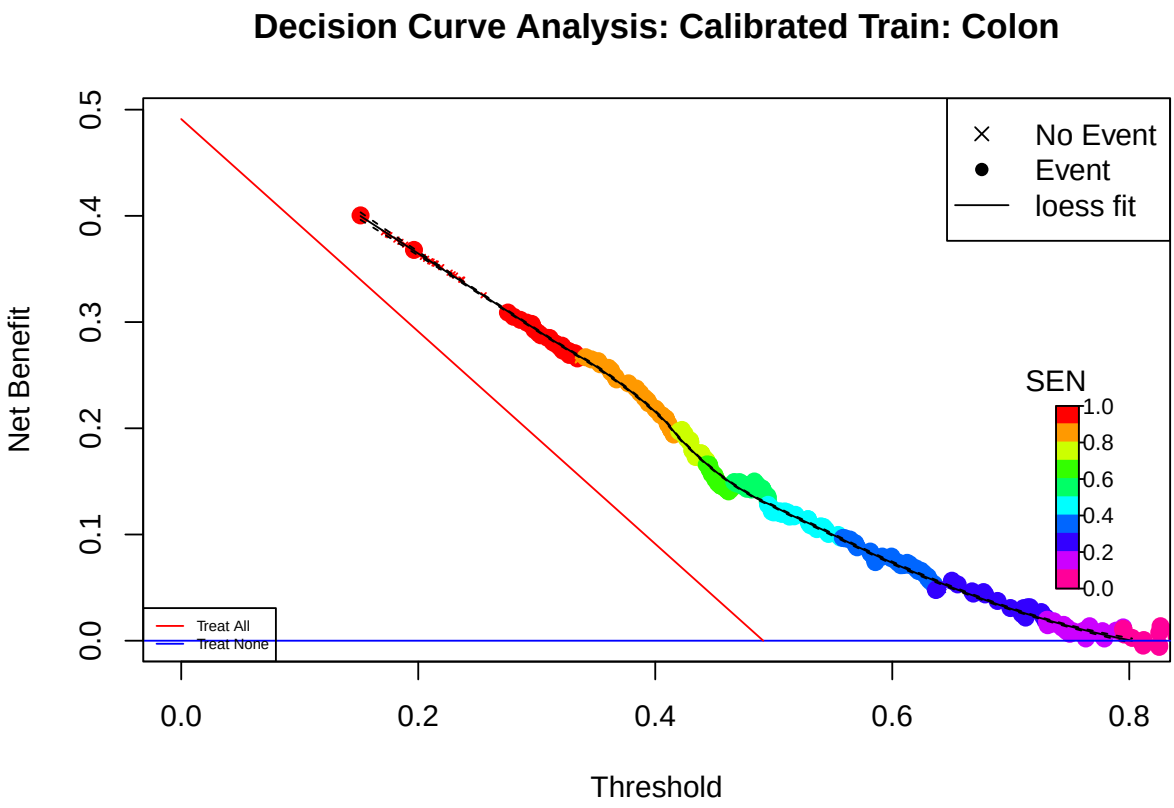
```
op <- par(no.readonly = TRUE)


calprob <- CoxRiskCalibration(ml,dataColonTrain,"status","time")

pander::pander(c(h0=calprob$h0,
                 Gain=calprob$hazardGain,
                 DeltaTime=calprob$timeInterval),
               caption="Cox Calibration Parameters")
```

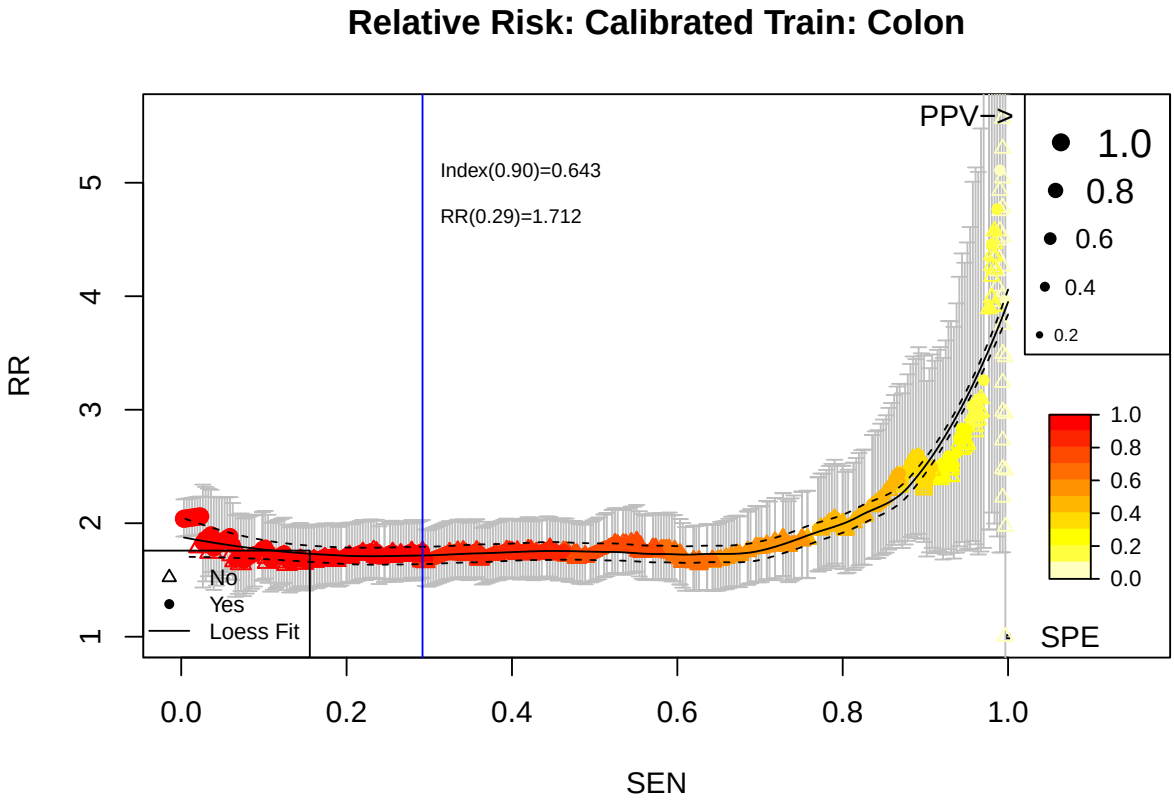
h0	Gain	DeltaTime
0.651	1.48	2.97

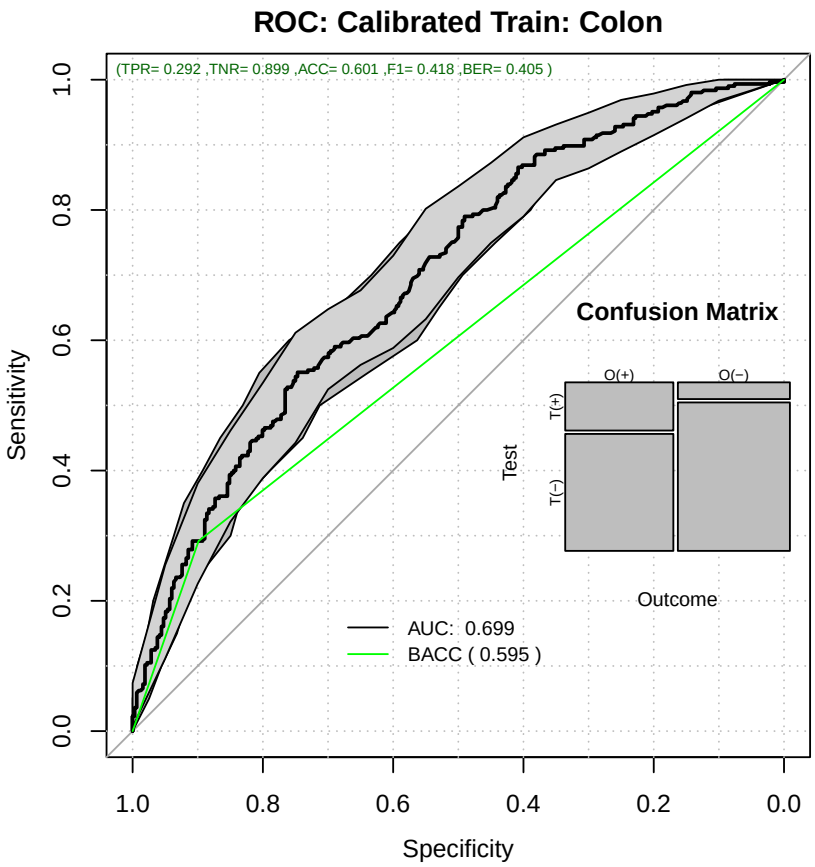
1.3.4 The RRplot() of the calibrated model

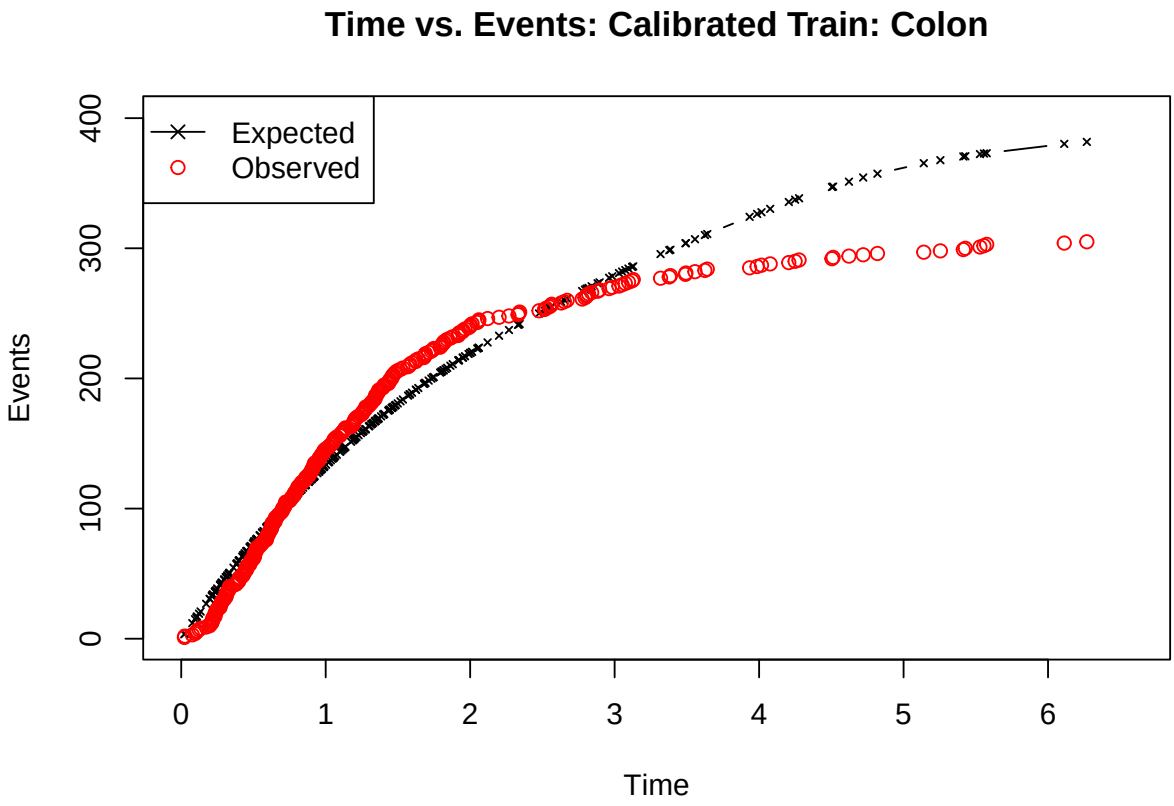
```
h0 <- calprob$h0
timeinterval <- calprob$timeInterval;

rdata <- cbind(dataColonTrain$status,calprob$prob)


rrAnalysisTrain <- RRPlot(rdata,atProb=c(0.90),
                      timetoEvent=dataColonTrain$time,
                      title="Calibrated Train: Colon",
                      ysurvlim=c(0.00,1.0),
                      riskTimeInterval=timeinterval)
```

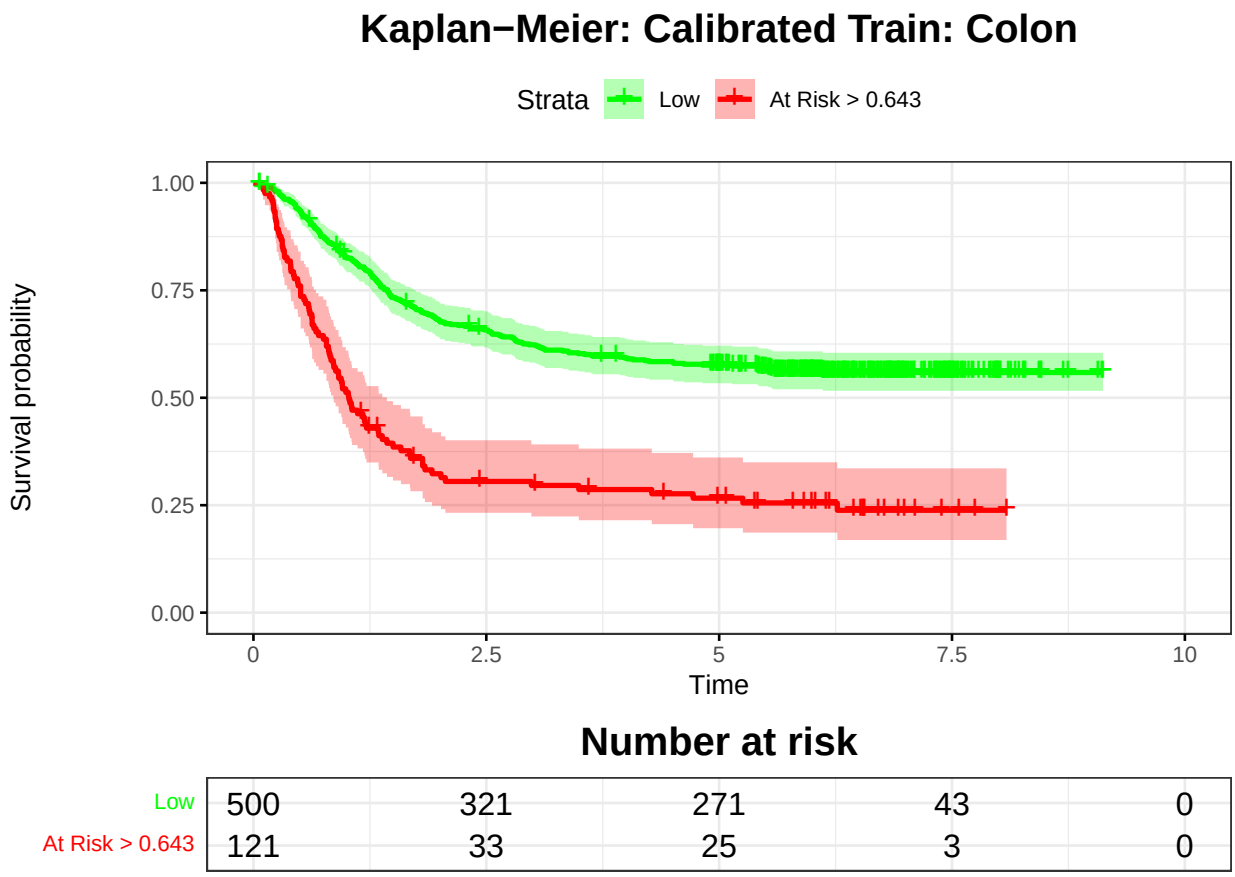

Cumulative vs. Observed: Calibrated Train: Colon
Observed
0
50
100
150
200
250
300
Event
Expected
0
50
100
150
200
250
300
Cumulative Probability


Decision Curve Analysis: Calibrated Train: Colon
Net Benefit
Threshold
0.0
0.1
0.2
0.3
0.4
0.5
0.0
0.2
0.4
0.6
0.8
No Event
Event
loess fit
SEN
1.0
0.8
0.6
0.4
0.2
0.0
Treat All
Treat None


Relative Risk: Calibrated Train: Colon
PPV–>
Index(0.90)=0.643
RR(0.29)=1.712
1.0
0.8
0.6
0.4
0.2
1.0
0.8
0.6
0.4
0.2
0.0
No
Yes
Loess Fit
SPE
RR
SEN
1
2
3
4
5
0.0
0.2
0.4
0.6
0.8
1.0


ROC: Calibrated Train: Colon
(TPR= 0.292 ,TNR= 0.899 ,ACC= 0.601 ,F1= 0.418 ,BER= 0.405)
Sensitivity
Specificity
1.0
0.8
0.6
0.4
0.2
0.0
Confusion Matrix
O(+)
O(−)
T(+)
T(−)
Test
Outcome
AUC: 0.699
BACC (0.595)


Time vs. Events: Calibrated Train: Colon
Expected
Observed
Events
0
100
200
300
400
0
1
2
3
4
5
6
Time



1.3.5 Calibrated Train Performance

```
pander::pander(t(rrAnalysisTrain$keyPoints),caption="Threshold values")
```

Table 18: Threshold values

	@:0.9	@MAX_BACC	@MAX_RR	@SPE100
Thr	0.643	0.484	0.286	0.151
RR	1.685	1.844	4.768	1.000
SEN	0.292	0.551	0.987	1.000
SPE	0.896	0.747	0.104	0.000
BACC	0.594	0.649	0.546	0.500

```
pander::pander(t(rrAnalysisTrain$OERatio),caption="O/E Ratio")
```

Table 19: O/E Ratio

est	lower	upper
0.799	0.712	0.894

```
pander::pander(t(rrAnalysisTrain$OE95ci),caption="O/E Ratio")
```

Table 20: O/E Ratio

mean	50%	2.5%	97.5%
0.973	0.973	0.956	0.991

```
pander::pander(t(rrAnalysisTrain$OAcum95ci),caption="O/Acum Ratio")
```

Table 21: O/Acum Ratio

mean	50%	2.5%	97.5%
1.01	1.01	1	1.01

```
pander::pander(rrAnalysisTrain$c.index$cstatCI,caption="C. Index")
```

mean.C Index	median	lower	upper
0.67	0.67	0.641	0.698

```
pander::pander(t(rrAnalysisTrain$ROCAnalysis$aucs),caption="ROC AUC")
```

Table 23: ROC AUC

est	lower	upper
0.699	0.659	0.74

```
pander::pander((rrAnalysisTrain$ROCAnalysis$sensitivity),caption="Sensitivity")
```

Table 24: Sensitivity

est	lower	upper
0.292	0.241	0.346

```
pander::pander((rrAnalysisTrain$ROCAnalysis$specificity),caption="Specificity")
```

Table 25: Specificity

est	lower	upper
0.899	0.86	0.93

```
pander::pander(t(rrAnalysisTrain$thr_atP),caption="Probability Thresholds")
```

Table 26: Probability Thresholds

90%	at_max_BACC	at_max_RR	atSPE100
0.643	0.484	0.286	0.151

```
pander::pander(t(rrAnalysisTrain$RR_atP),caption="Risk Ratio")
```

Table 27: Risk Ratio

est	lower	upper
1.71	1.48	1.98

```
pander::pander(rrAnalysisTrain$surdif,caption="Logrank test")
```

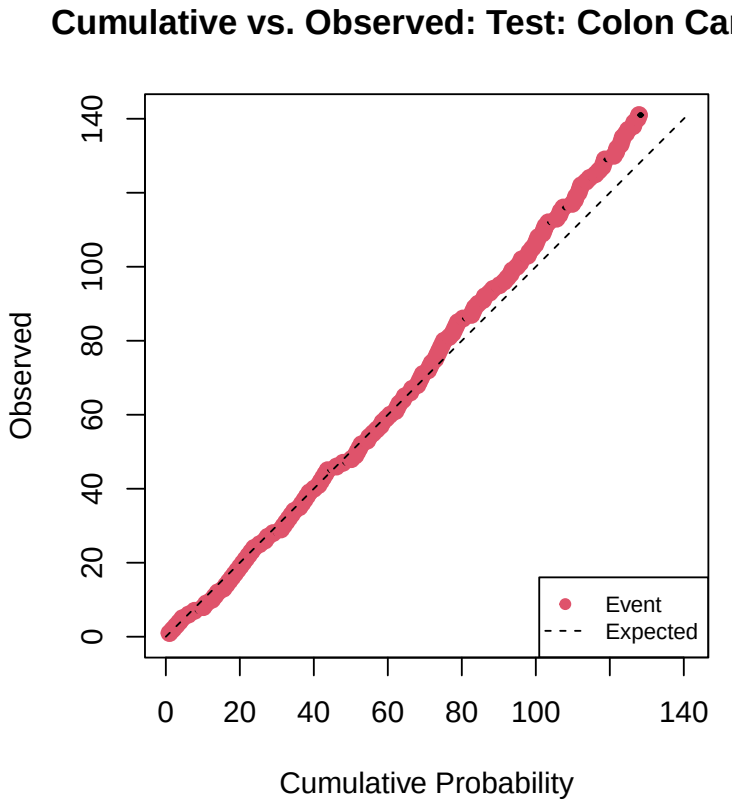
Table 28: Logrank test Chisq = 69.007475 on 1 degrees of freedom, p = 0.000000

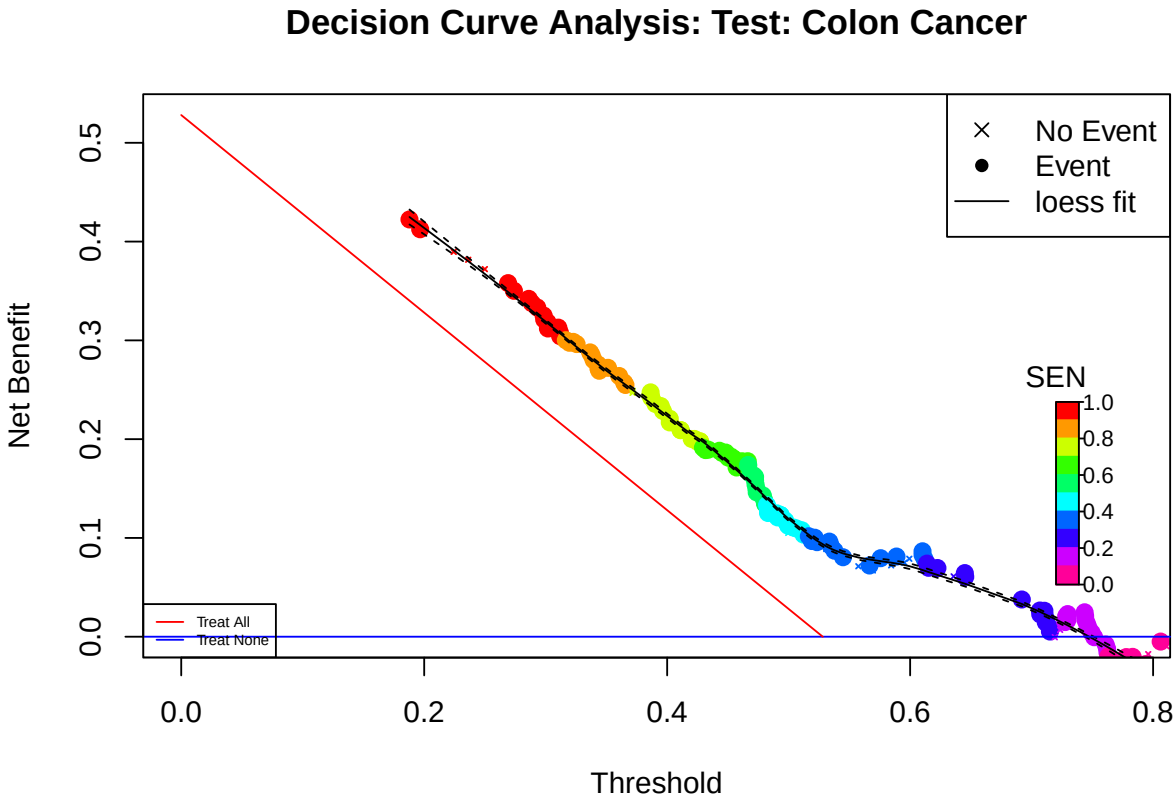
	N	Observed	Expected	(O-E)^2/E	(O-E)^2/V
class=0	500	216	264.8	9.0	69
class=1	121	89	40.2	59.3	69

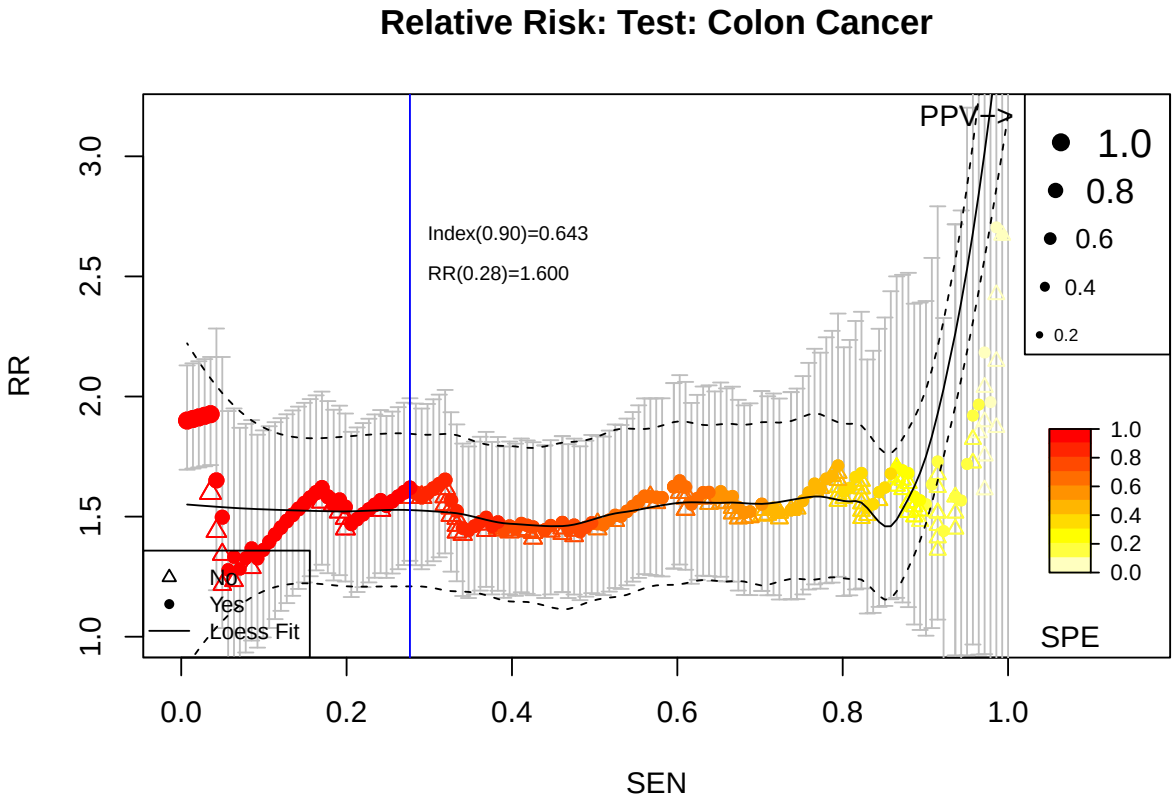
1.3.6 Evaluating on the test set

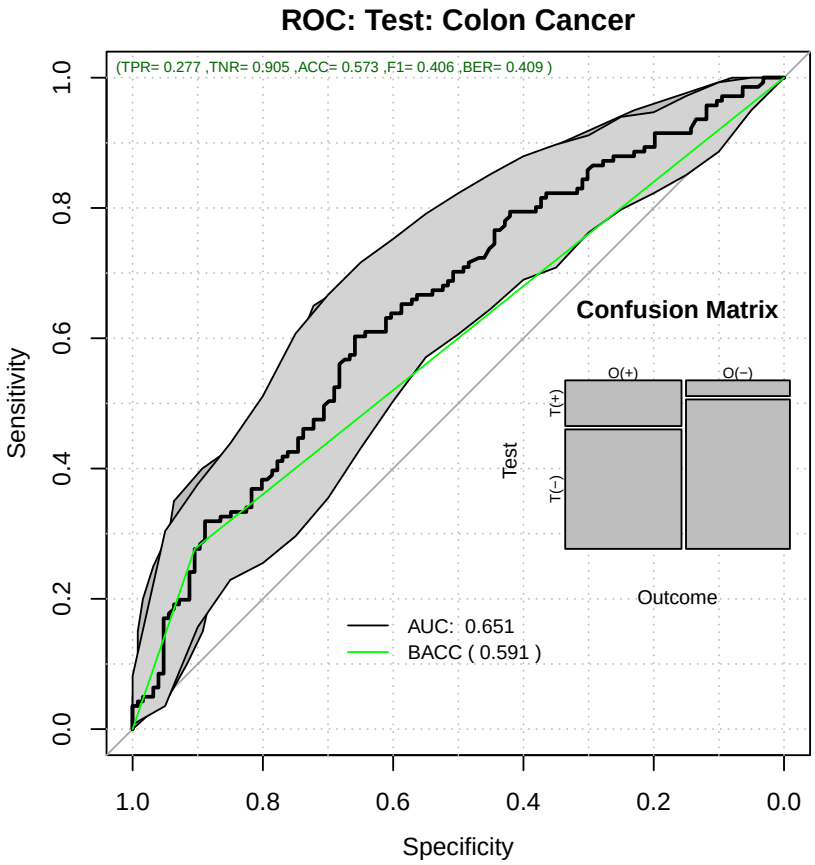
The calibrated h0 and timeinterval were estimated on the training set

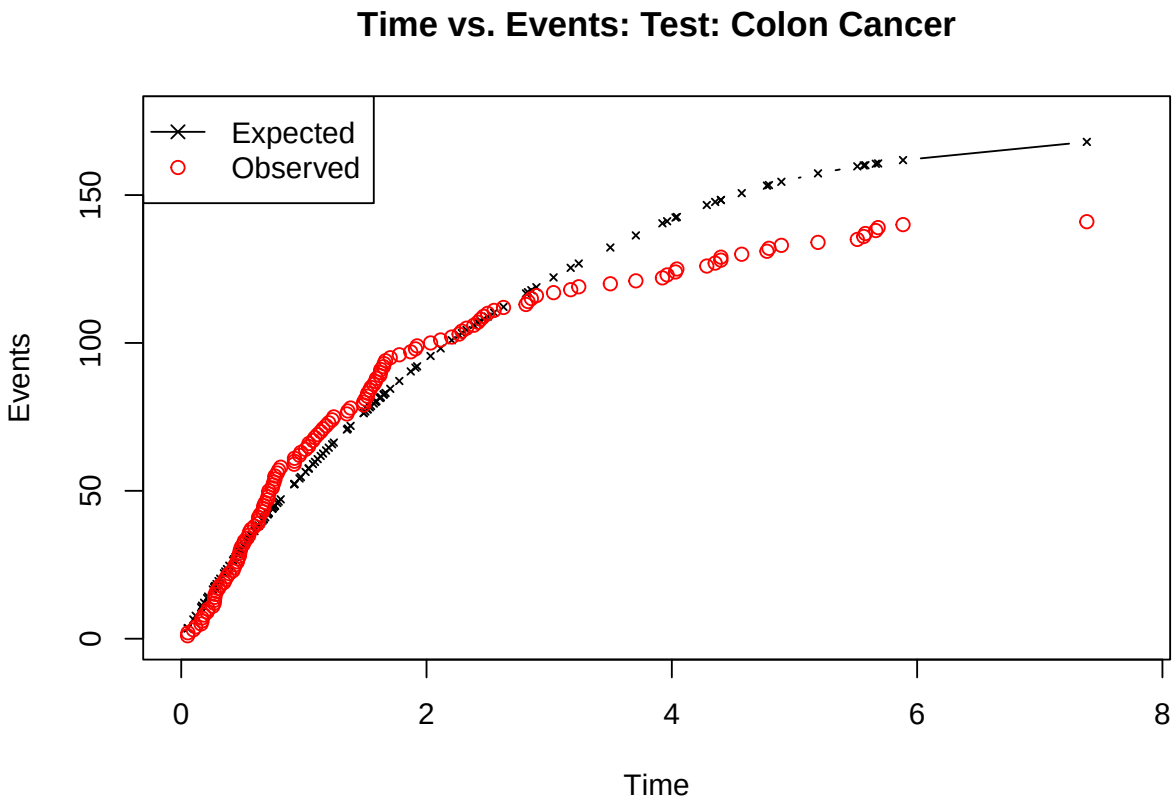
```
index <- predict(ml,dataColonTest)
rdata <- cbind(dataColonTest$status,ppoisGzero(index,h0))

rrAnalysisTest <- RRPlot(rdata,atThr = rrAnalysisTrain$thr_atP,
                     timetoEvent=dataColonTest$time,
                     title="Test: Colon Cancer",
                     ysurvlim=c(0.00,1.0),
                     riskTimeInterval=timeinterval)
```

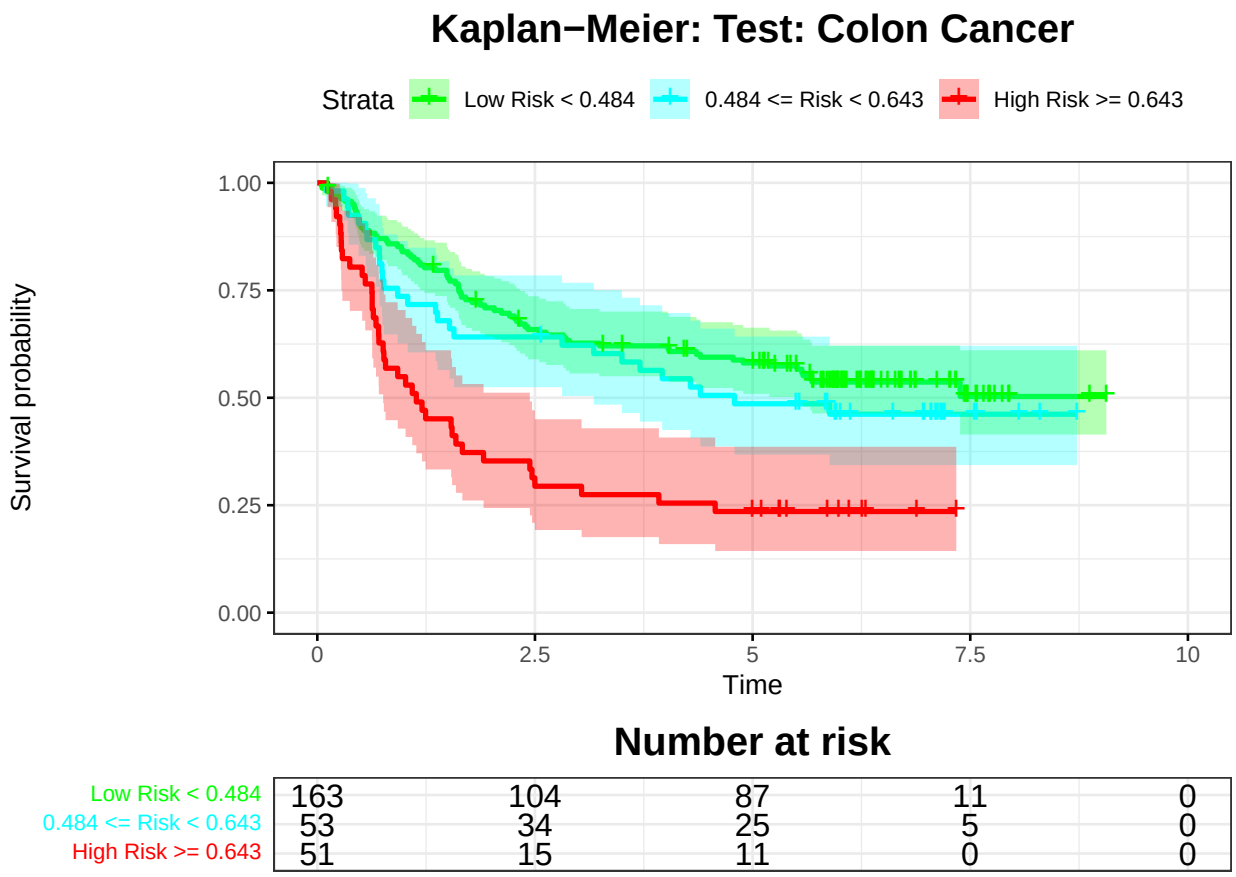

Cumulative vs. Observed: Test: Colon Cancer
Observed
0
20
40
60
80
100
140
Event
Expected
0
20
40
60
80
100
140
Cumulative Probability


Decision Curve Analysis: Test: Colon Cancer
No Event
Event
loess fit
SEN
1.0
0.8
0.6
0.4
0.2
0.0
Treat All
Treat None
Net Benefit
0.0
0.1
0.2
0.3
0.4
0.5
0.0
0.2
0.4
0.6
0.8
Threshold


Relative Risk: Test: Colon Cancer
PPV–>
Index(0.90)=0.643
RR(0.28)=1.600
1.0
0.8
0.6
0.4
0.2
1.0
0.8
0.6
0.4
0.2
0.0
SPE
No
Yes
Loess Fit
RR
SEN
1.0
1.5
2.0
2.5
3.0
0.0
0.2
0.4
0.6
0.8
1.0


ROC: Test: Colon Cancer
(TPR= 0.277 ,TNR= 0.905 ,ACC= 0.573 ,F1= 0.406 ,BER= 0.409)
Sensitivity
Specificity
1.0
0.8
0.6
0.4
0.2
0.0
Confusion Matrix
O(+)
O(−)
T(+)
T(−)
Test
Outcome
AUC: 0.651
BACC (0.591)


Time vs. Events: Test: Colon Cancer
Expected
Observed
Events
0
50
100
150
0
2
4
6
8
Time



1.3.7 Test Performance

```
pander::pander(t(rrAnalysisTest$keyPoints),caption="Threshold values")
```

Table 29: Threshold values (continued below)

	@:0.64303803374701	@:0.483598597950569	@:0.286109857686596
Thr	0.645	0.483	0.2861
RR	1.619	1.437	2.1833
SEN	0.277	0.482	0.9716
SPE	0.905	0.706	0.0952
BACC	0.591	0.594	0.5334

	@:0.15130951853827	@MAX_BACC	@MAX_RR	@SPE100
Thr	0.1879	0.466	0.289	0.1879
RR	21.4449	1.648	1.966	21.4449
SEN	1.0000	0.603	0.965	1.0000
SPE	0.0317	0.659	0.103	0.0317
BACC	0.5159	0.631	0.534	0.5159

```
pander::pander(t(rrAnalysisTest$OERatio),caption="O/E Ratio")
```

Table 31: O/E Ratio

est	lower	upper
0.839	0.707	0.99

```
pander::pander(t(rrAnalysisTest$OE95ci),caption="O/E Ratio")
```

Table 32: O/E Ratio

mean	50%	2.5%	97.5%
1.01	1.01	0.984	1.03

```
pander::pander(t(rrAnalysisTest$OAcum95ci),caption="O/Acum Ratio")
```

Table 33: O/Acum Ratio

mean	50%	2.5%	97.5%
1.03	1.03	1.02	1.04

```
pander::pander(rrAnalysisTest$c.index$cstatCI,caption="C. Index")
```

mean.C Index	median	lower	upper
0.619	0.618	0.573	0.663

```
pander::pander(t(rrAnalysisTest$ROCAnalysis$aucs),caption="ROC AUC")
```

Table 35: ROC AUC

est	lower	upper
0.651	0.585	0.716

```
pander::pander((rrAnalysisTest$ROCAnalysis$sensitivity),caption="Sensitivity")
```

Table 36: Sensitivity

est	lower	upper
0.277	0.205	0.358

```
pander::pander((rrAnalysisTest$ROCAnalysis$specificity),caption="Specificity")
```

Table 37: Specificity

est	lower	upper
0.905	0.84	0.95

```
pander::pander(t(rrAnalysisTest$thr_atP),caption="Probability Thresholds")
```

Table 38: Probability Thresholds

90%	at_max_BACC	at_max_RR	atSPE100	at_max_BACC	at_max_RR	atSPE100
0.643	0.484	0.286	0.151	0.466	0.289	0.188

```
pander::pander(t(rrAnalysisTest$RR_atP),caption="Risk Ratio")
```

Table 39: Risk Ratio

est	lower	upper
1.6	1.3	1.97

```
pander::pander(rrAnalysisTest$surdif,caption="Logrank test")
```

Table 40: Logrank test Chisq = 25.920753 on 2 degrees of freedom, p = 0.000002

	N	Observed	Expected	(O-E)^2/E	(O-E)^2/V
class=0	163	74	93.5	4.0691	12.1407
class=1	53	28	28.6	0.0147	0.0184
class=2	51	39	18.8	21.5536	25.1518

1.4 Cross-Validation

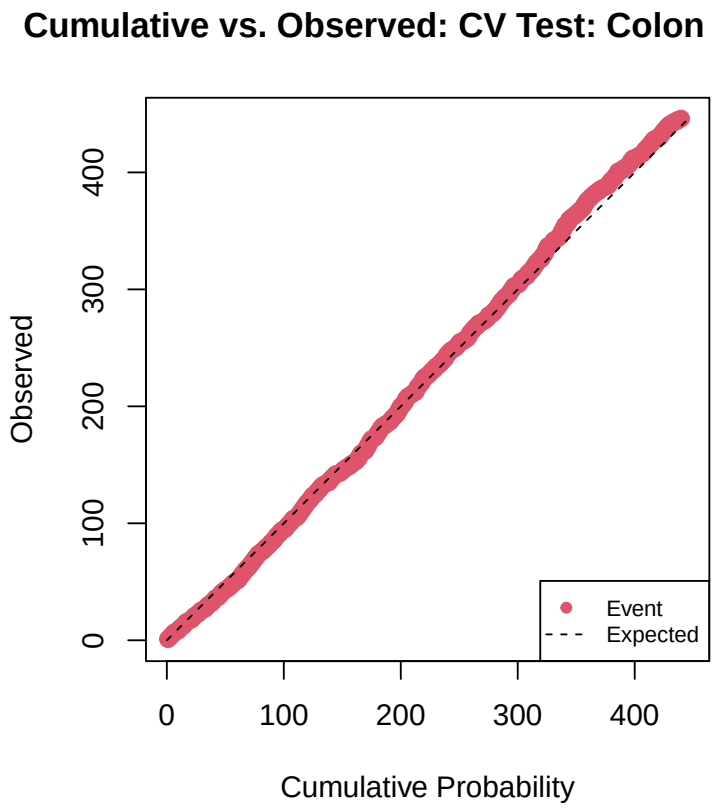
Here we will cross validate the training set and evaluate also on the testing set. The h0 and the timeinterval are the ones estimated on the calibration process

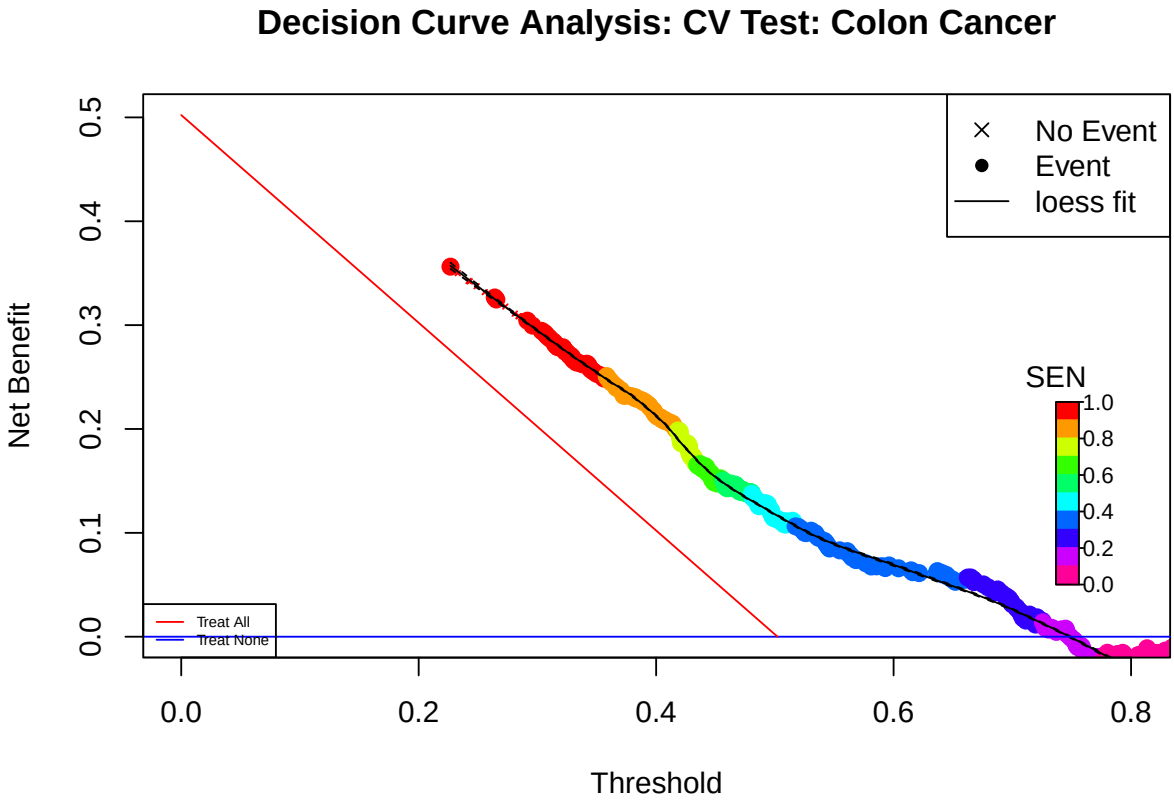
```
rcv <- randomCV(theData=dataColonTrain,
                theOutcome = Surv(time,status)~1,
                fittingFunction=BSWiMS.model,
                trainFraction = 0.75,
                repetitions=50,
                classSamplingType = "Pro",
                testingSet=dataColonTest
        )
```

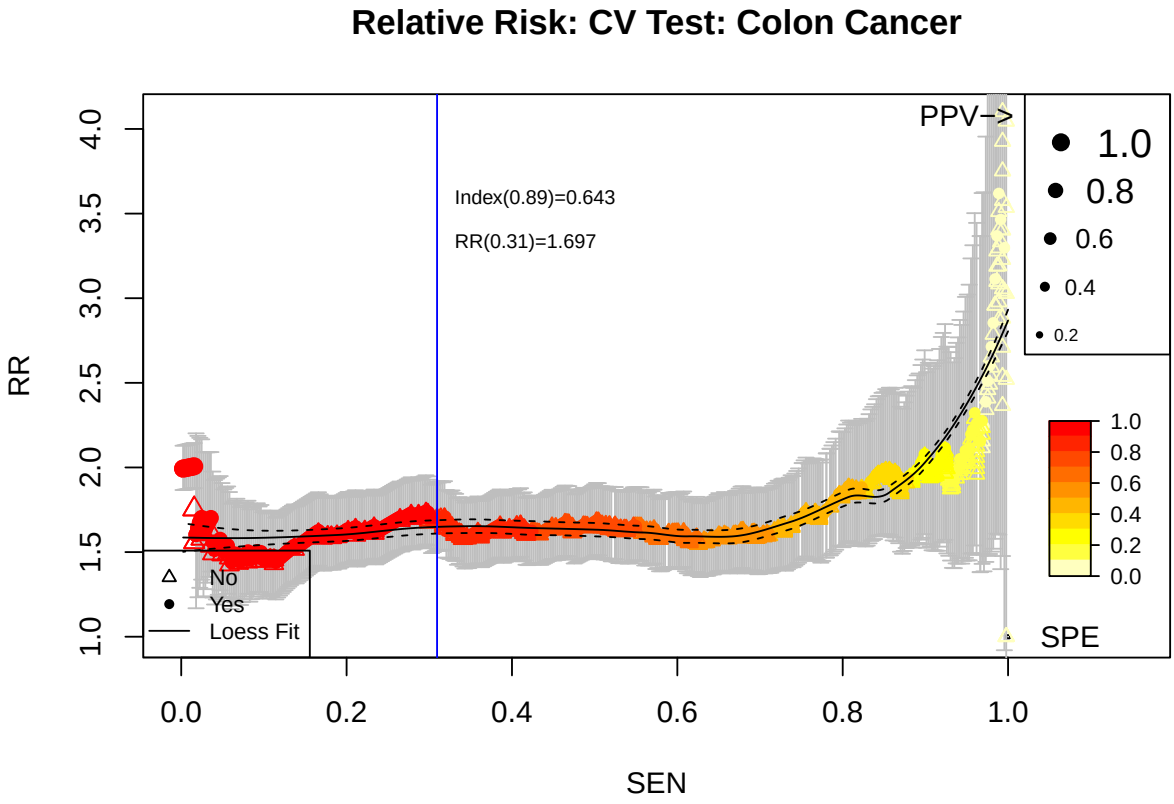
.[+++].[++-].[+++-].[+++-].[++].[++].[++++-].[++-].[+++].[+++]10 Tested: 850 Avg. Selected: 7.9 Min Tests: 1 Max Tests: 10 Mean Tests: 4.976471 . MAD: 0.4681416 .[+++].[++].[+++].[+++].[++].[+++].[+++-].[+++].[++].[++++]20 Tested: 888 Avg. Selected: 8 Min Tests: 1 Max Tests: 20 Mean Tests: 9.527027 . MAD: 0.4671251 .[+++-].[+++++].[++++].[++++].[++].[++-].[+++].[+++].[++++-].[+++]30 Tested: 888 Avg. Selected: 7.966667 Min Tests: 1 Max Tests: 30 Mean Tests: 14.29054 . MAD: 0.4672746 .[+++-].[++-].[+++-].[+++++].[++].[++-].[+++].[++].[++].[++]40 Tested: 888 Avg. Selected: 7.95

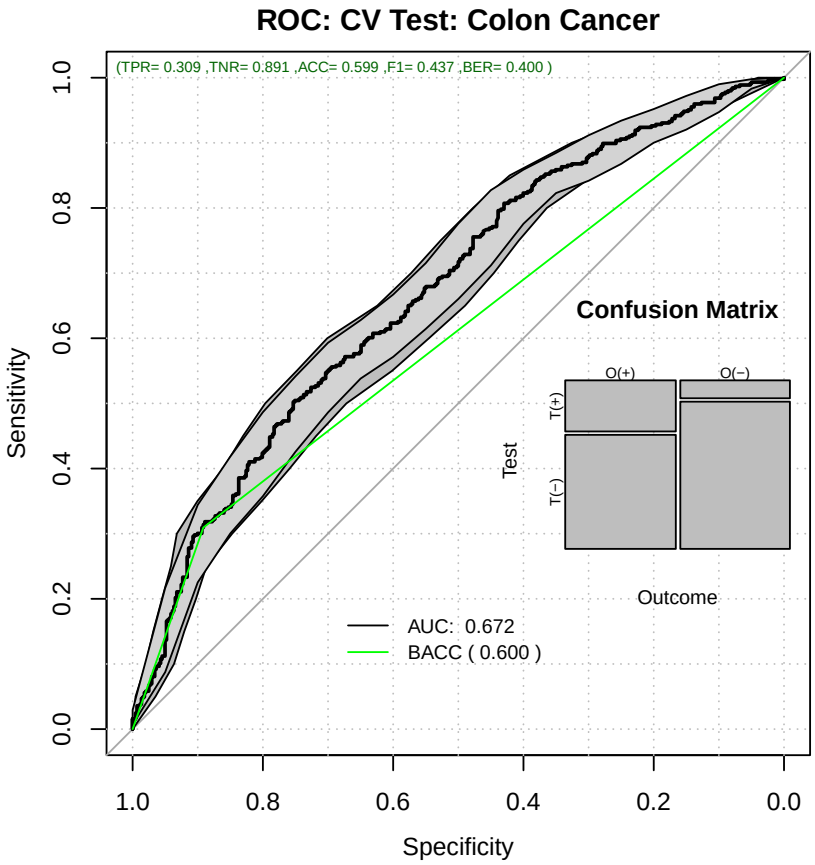
Min Tests: 2 Max Tests: 40 Mean Tests: 19.05405 . MAD: 0.4669155 .[+++].[+++].[+++].[+++].[+++-].[+++].[+++].[+++].[++-].[++++-]50 Tested: 888 Avg. Selected: 7.88 Min Tests: 5 Max Tests: 50 Mean Tests: 23.81757 . MAD: 0.4669755

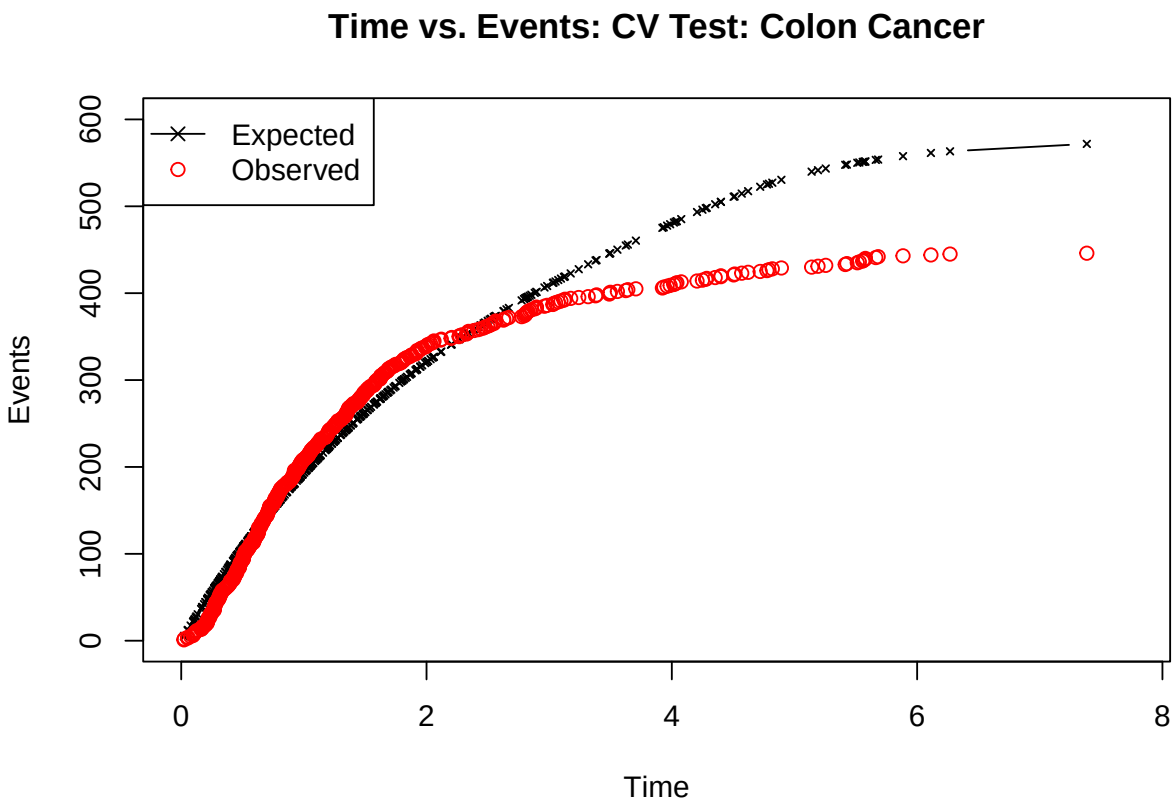
```
stp <- rcv$survTestPredictions
stp <- stp[!is.na(stp[,4]),]

bbx <- boxplot(unlist(stp[,1])~rownames(stp),plot=FALSE)
times <- bbx$stats[3,]
status <- boxplot(unlist(stp[,2])~rownames(stp),plot=FALSE)$stats[3,]
prob <- ppoisGzero(boxplot(unlist(stp[,4])~rownames(stp),plot=FALSE)$stats[3,],h0)

rdatacv <- cbind(status,prob)
rownames(rdatacv) <- bbx$names
names(times) <- bbx$names

rrAnalysisCVTest <- RRPlot(rdatacv,atThr = rrAnalysisTrain$thr_atP,
                     timetoEvent=times,
                     title="CV Test: Colon Cancer",
                     ysurvlim=c(0.00,1.0),
                     riskTimeInterval=timeinterval)
```

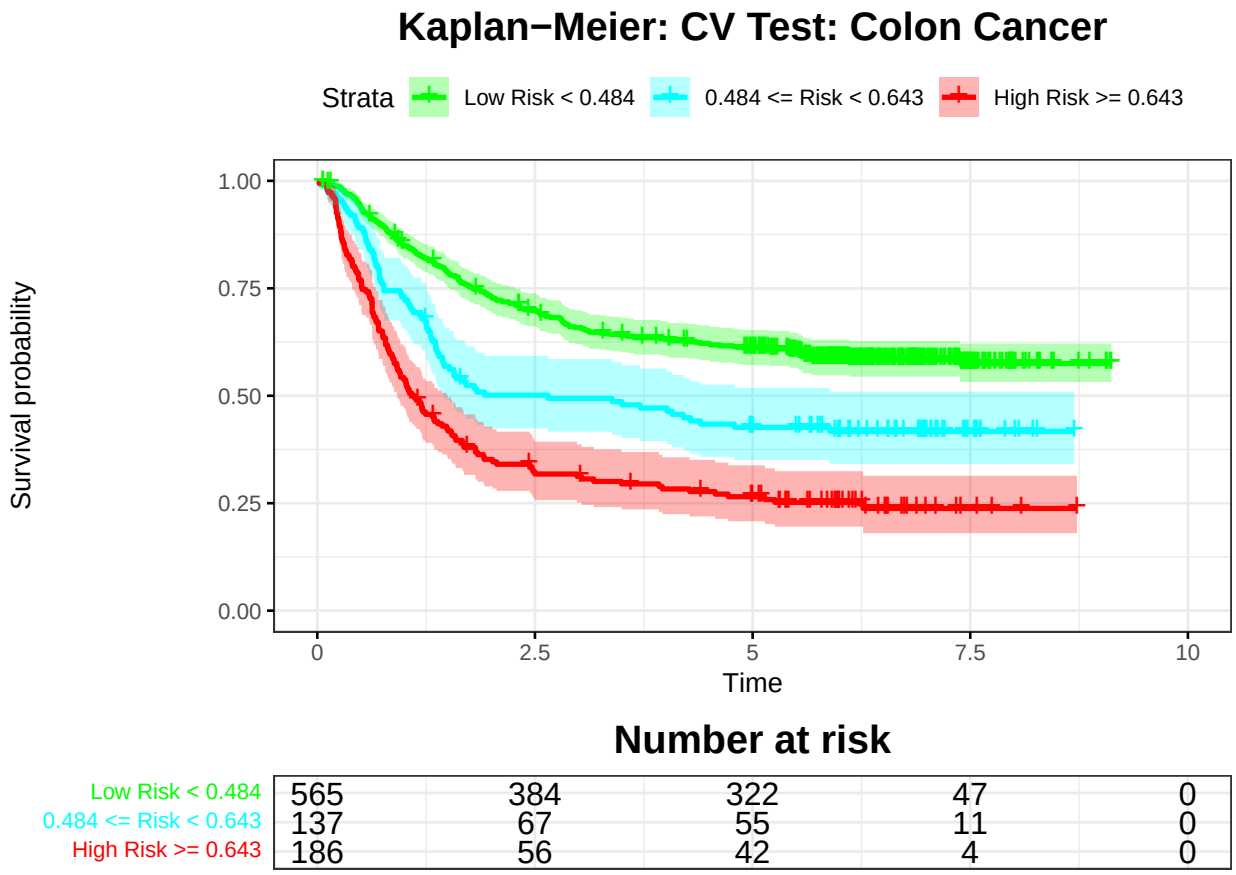



Decision Curve Analysis: CV Test: Colon Cancer
No Event
Event
loess fit
SEN
1.0
0.8
0.6
0.4
0.2
0.0
Treat All
Treat None
Net Benefit
0.0
0.1
0.2
0.3
0.4
0.5
0.0
0.2
0.4
0.6
0.8
Threshold


Relative Risk: CV Test: Colon Cancer
PPV–>
Index(0.89)=0.643
RR(0.31)=1.697
1.0
0.8
0.6
0.4
0.2
1.0
0.8
0.6
0.4
0.2
0.0
SPE
No
Yes
Loess Fit
RR
SEN
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0.0
0.2
0.4
0.6
0.8
1.0


ROC: CV Test: Colon Cancer
(TPR= 0.309 ,TNR= 0.891 ,ACC= 0.599 ,F1= 0.437 ,BER= 0.400)
Sensitivity
Specificity
1.0
0.8
0.6
0.4
0.2
0.0
Confusion Matrix
O(+)
O(−)
T(+)
T(−)
Test
Outcome
AUC: 0.672
BACC (0.600)


Time vs. Events: CV Test: Colon Cancer
Expected
Observed
Events
0
100
200
300
400
500
600
0
2
4
6
8
Time



1.4.1 CV Test Performance

```
pander::pander(t(rrAnalysisCVTest$keyPoints),caption="Threshold values")
```

Table 41: Threshold values (continued below)

	@:0.64303803374701	@:0.483598597950569	@:0.286109857686596
Thr	0.643	0.483	0.2864
RR	1.691	1.650	3.5767
SEN	0.309	0.487	0.9933
SPE	0.891	0.758	0.0407
BACC	0.600	0.622	0.5170

	@:0.15130951853827	@MAX_BACC	@MAX_RR	@SPE100
Thr	0.227	0.481	0.322	0.227
RR	1.000	1.682	2.322	1.000
SEN	1.000	0.502	0.960	1.000
SPE	0.000	0.753	0.138	0.000
BACC	0.500	0.628	0.549	0.500

```
pander::pander(t(rrAnalysisCVTest$OERatio),caption="O/E Ratio")
```

Table 43: O/E Ratio

est	lower	upper
0.78	0.709	0.856

```
pander::pander(t(rrAnalysisCVTest$OE95ci),caption="O/E Ratio")
```

Table 44: O/E Ratio

mean	50%	2.5%	97.5%
0.958	0.958	0.944	0.972

```
pander::pander(t(rrAnalysisCVTest$OAcum95ci),caption="O/Acum Ratio")
```

Table 45: O/Acum Ratio

mean	50%	2.5%	97.5%
0.997	0.997	0.994	1

```
pander::pander(rrAnalysisCVTest$c.index$cstatCI,caption="C. Index")
```

mean.C Index	median	lower	upper
0.645	0.644	0.619	0.67

```
pander::pander(t(rrAnalysisCVTest$ROCAnalysis$aucs),caption="ROC AUC")
```

Table 47: ROC AUC

est	lower	upper
0.672	0.637	0.707

```
pander::pander((rrAnalysisCVTest$ROCAnalysis$sensitivity),caption="Sensitivity")
```

Table 48: Sensitivity

est	lower	upper
0.309	0.267	0.355

```
pander::pander((rrAnalysisCVTest$ROCAnalysis$specificity),caption="Specificity")
```

Table 49: Specificity

est	lower	upper
0.891	0.859	0.919

```
pander::pander(t(rrAnalysisCVTest$thr_atP),caption="Probability Thresholds")
```

Table 50: Probability Thresholds

90%	at_max_BACC	at_max_RR	atSPE100	at_max_BACC	at_max_RR	atSPE100
0.643	0.484	0.286	0.151	0.481	0.322	0.227

```
pander::pander(t(rrAnalysisCVTest$RR_atP),caption="Risk Ratio")
```

Table 51: Risk Ratio

est	lower	upper
1.7	1.51	1.91

```
pander::pander(rrAnalysisCVTest$surdif,caption="Logrank test")
```

Table 52: Logrank test Chisq = 108.473827 on 2 degrees of freedom, p = 0.000000

	N	Observed	Expected	(O-E)^2/E	(O-E)^2/V
class=0	565	229	316.6	24.25	84.33
class=1	137	79	63.6	3.72	4.34
class=2	186	138	65.8	79.35	93.93