Contents

Remember to exceture (C-c C-c) the following line:

1 Packages and setup

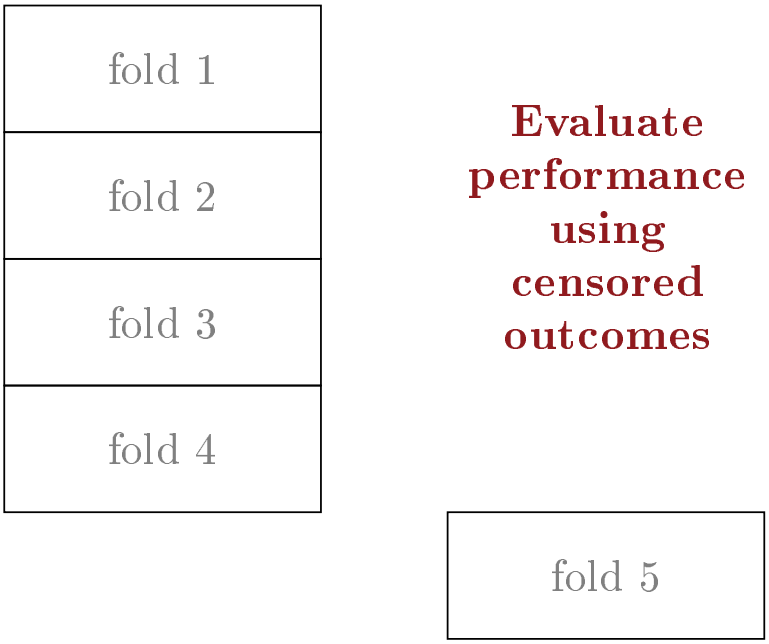
```
riskRegression version 2023.12.21

 randomForestSRC 3.2.3

 Type rfsrc.news() to see new features, changes, and bug fixes.


data.table 1.14.10 using 4 threads (see ?getDTthreads).  Latest news: r-datatable.com
```

2 sandbox

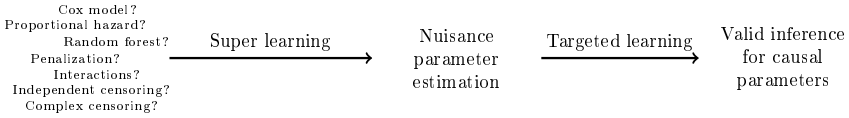
#+RESULTS[(2024-04-03 12:10:39) fee665afcd6283305bb47ea7788468cc4d229ad4]:

3 CV

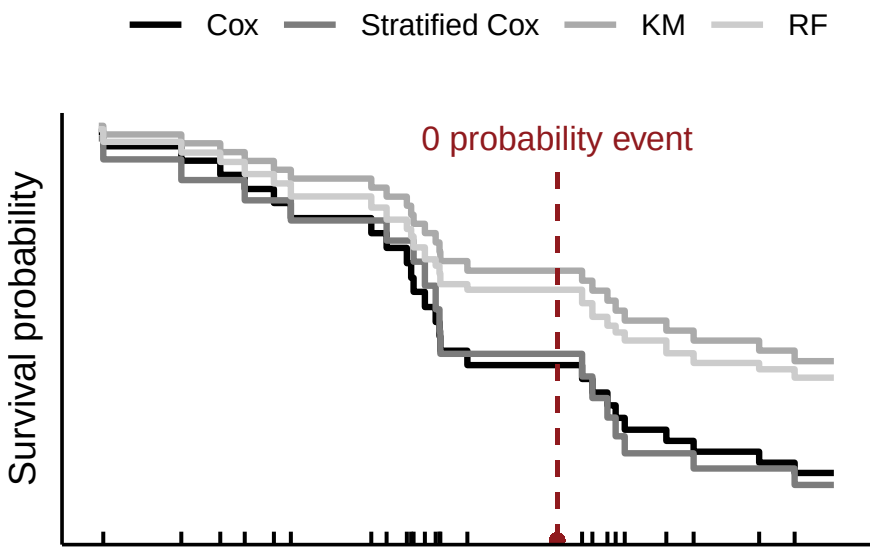
Train learners **Predict in test data**



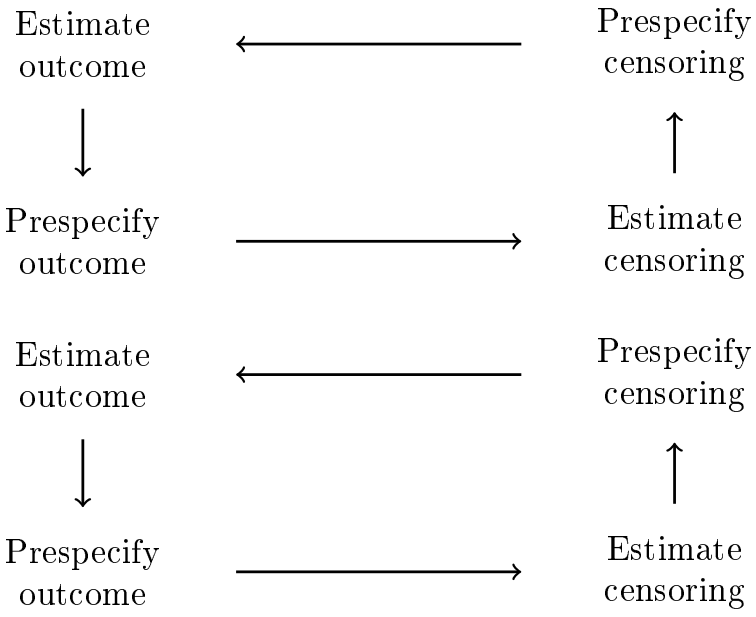
4 Motivation



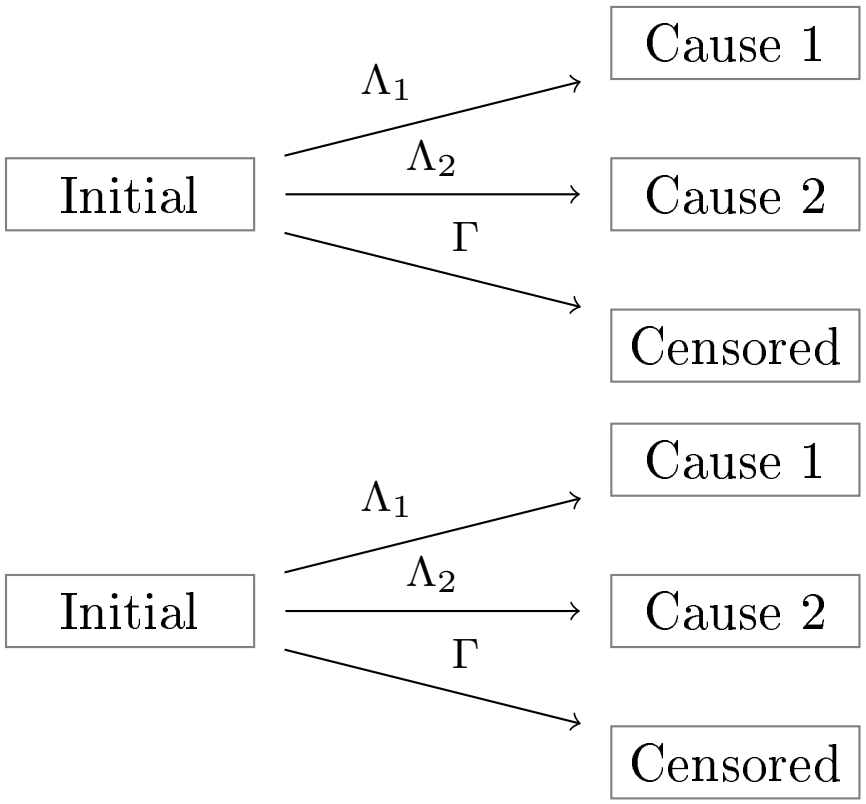
5 Hold-out sample problem

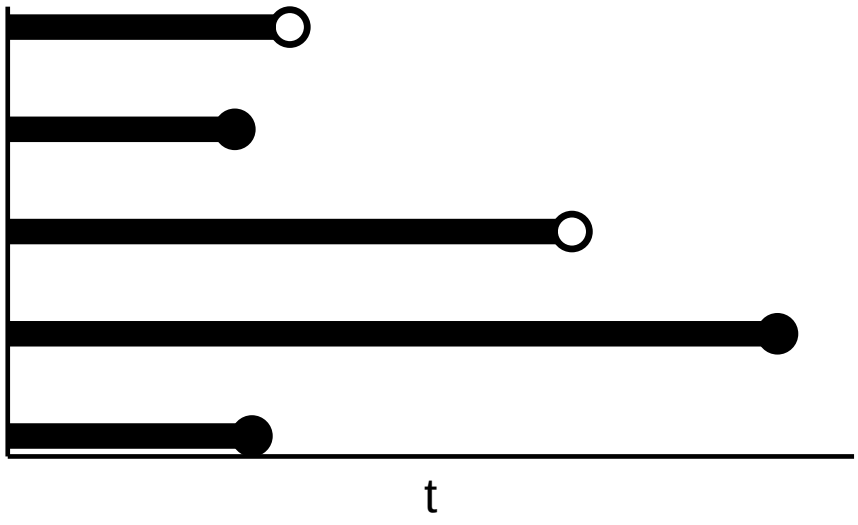


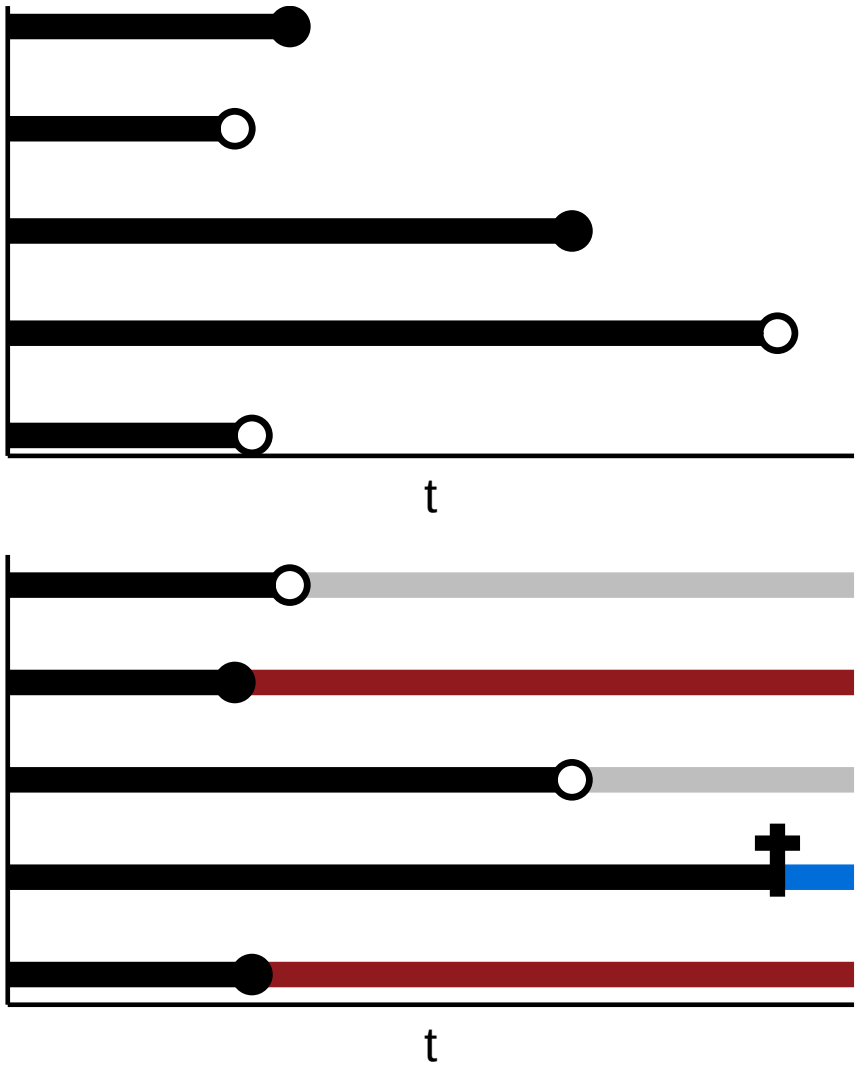
6 IPCW circel



7 Censoring and multi-state system





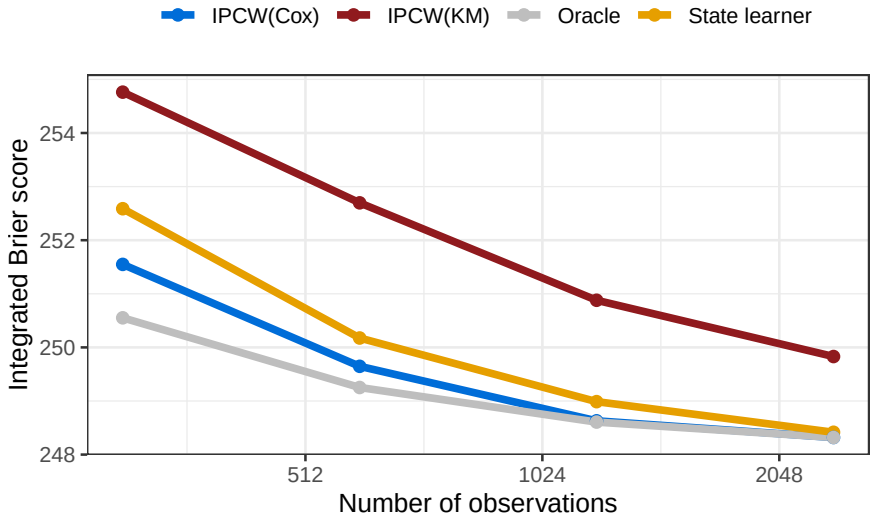


8 Simulation study

```
    n_obs    sim_set  type            SL time type.1       IPA           se
 1:   300   original  cens        survSL    6   cens 0.6978450 0.0008305614
 2:   300   original  cens State learner    6   cens 0.6989384 0.0008192387
 3:   300   original  cens        Oracle    6   cens 0.6992857 0.0008149009
 4:   300   original event        survSL    6  event 0.3488385 0.0019823097
 5:   300   original event State learner    6  event 0.3468667 0.0019972122
---
```

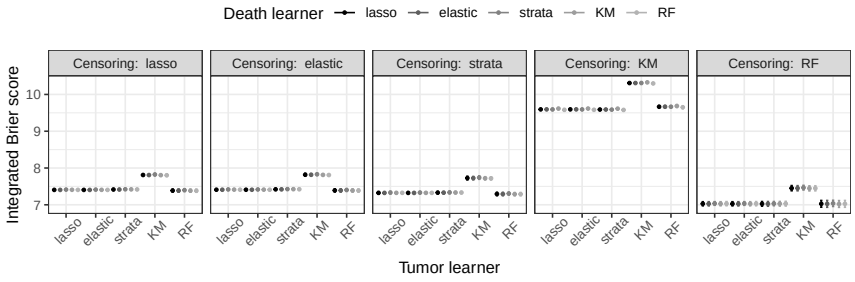
```
380:  2400 indep_cens event        survSL   36  event 0.1922440 0.0003727166
381:  2400 indep_cens event State learner   36  event 0.2005905 0.0002755740
382:  2400 indep_cens event      IPCW(KM)   36  event 0.2005905 0.0002755740
383:  2400 indep_cens event     IPCW(Cox)   36  event 0.2005905 0.0002755740
384:  2400 indep_cens event        Oracle   36  event 0.2005905 0.0002755740
     n_obs               sim_set  type            SL time type.1       IPA           s
  1:   300   Dependent censoring  cens        survSL    6   cens 0.6978450 0.000830561
  2:   300   Dependent censoring  cens State learner    6   cens 0.6989384 0.000819238
  3:   300   Dependent censoring  cens        Oracle    6   cens 0.6992857 0.000814900
  4:   300   Dependent censoring event        survSL    6  event 0.3488385 0.001982309
  5:   300   Dependent censoring event State learner    6  event 0.3468667 0.001997212
 ---
380:  2400 Independent censoring event        survSL   36  event 0.1922440 0.000372716
381:  2400 Independent censoring event State learner   36  event 0.2005905 0.000275574
382:  2400 Independent censoring event      IPCW(KM)   36  event 0.2005905 0.000275574
383:  2400 Independent censoring event     IPCW(Cox)   36  event 0.2005905 0.000275574
384:  2400 Independent censoring event        Oracle   36  event 0.2005905 0.000275574
```

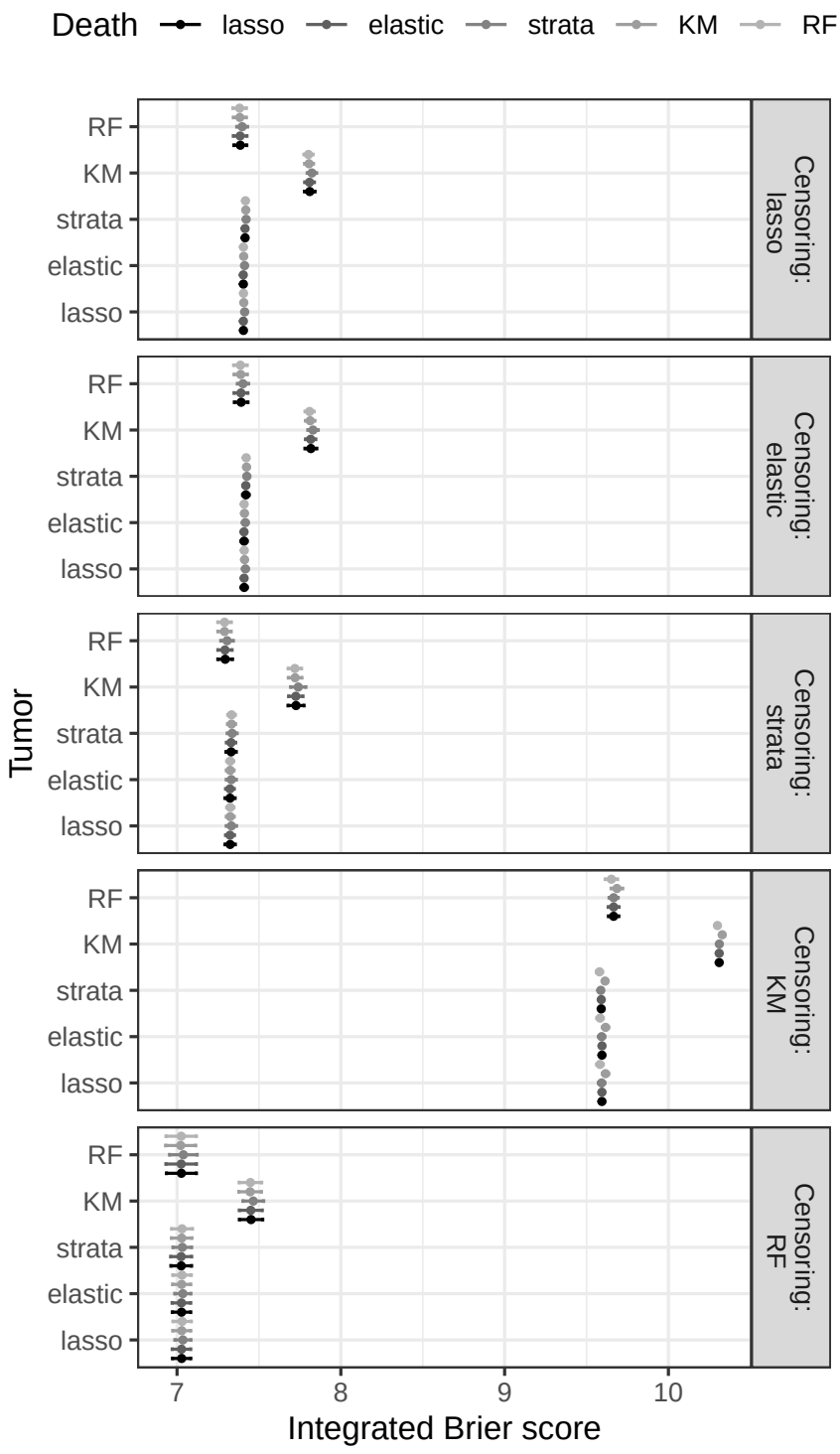
aes(x = n_{obs}, y = IPA, col = SL)) +
aes(ymin = IPA-1.96*se, ymax = IPA+1.96*se), # width = .1, # alpha = .5, # size = 1) +



DRop this

9 Illustration zelefsky data




Death
lasso
elastic
strata
KM
RF
Tumor
RF
KM
strata
elastic
lasso
Censoring: lasso
Censoring: elastic
Censoring: strata
Censoring: KM
Censoring: RF
7
8
9
10
Integrated Brier score

```
     cause1  cause2 censor      loss
  1:     RF      KM     RF  7.022057
  2: strata elastic     RF  7.025097
  3:     RF elastic     RF  7.025267
  4:     RF      RF     RF  7.025504
  5: strata   lasso     RF  7.025648
 ---
121:     KM      RF     KM 10.299304
122:     KM   lasso     KM 10.310004
123:     KM elastic     KM 10.310062
124:     KM  strata     KM 10.310763
125:     KM      KM     KM 10.328653
```

$\text{plot}_{\text{data}}$[,cause:=factor(cause,levels=c("cause1","cause2"),labels=c("Tumor recurrence","Death"))] # ggplot($\text{plot}_{\text{data}}$, aes(x = time, y = est)) + # $\text{geom}_{\text{errorbar}}$(aes(ymin = lower, ymax = upper), width = 1) + # $\text{geom}_{\text{point}}$() + # $\text{geom}_{\text{hline}}$(yintercept = 0, linetype = 2) + # theme_{bw}() + # $\text{facet}_{\text{wrap}}$(~ cause) + # xlab("Months after baseline") + ylab("ATE of hormone therapy") + # $\text{scale}_{\text{x continuous}}$(breaks = seq(6,36,12)) + # $\text{scale}_{\text{y continuous}}$(labels = scales::percent)