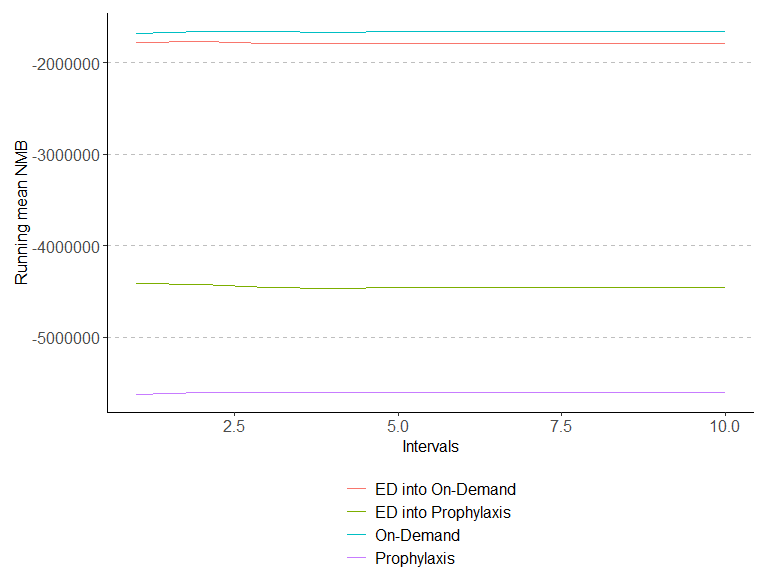
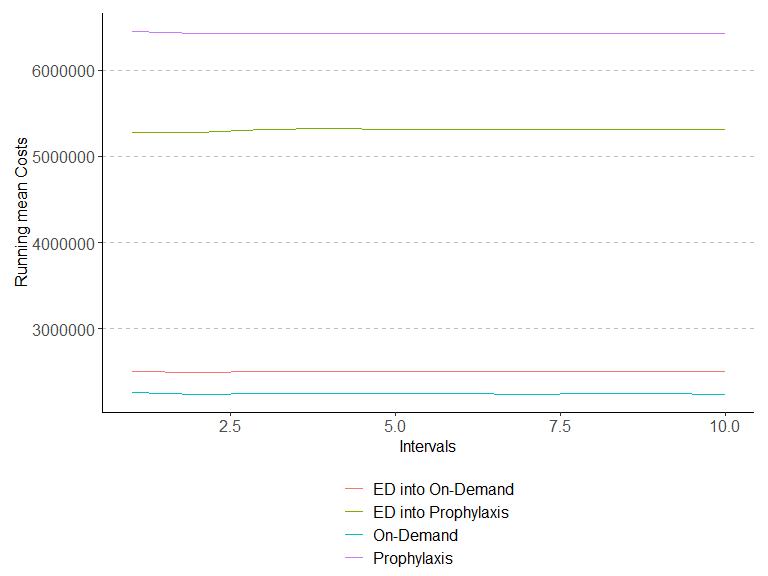
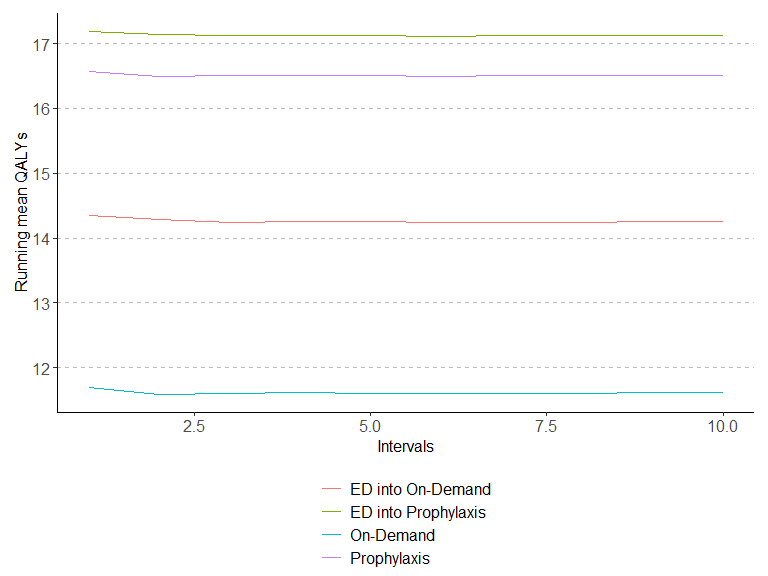
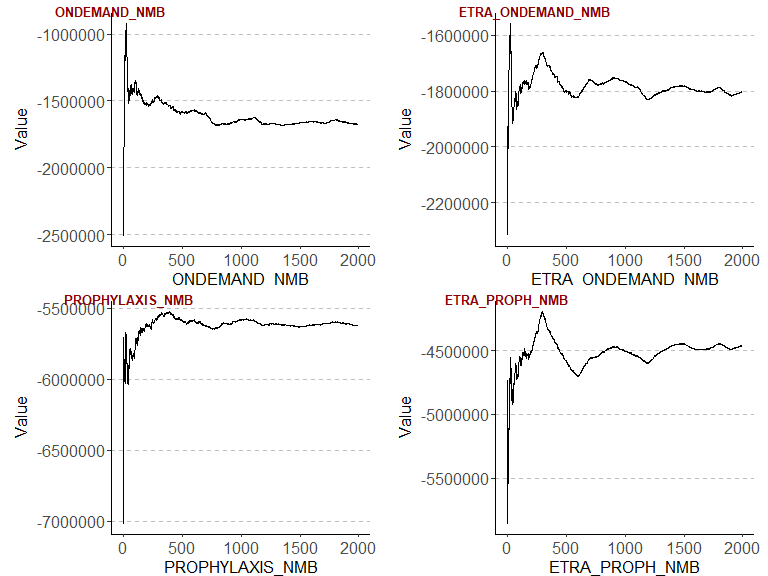
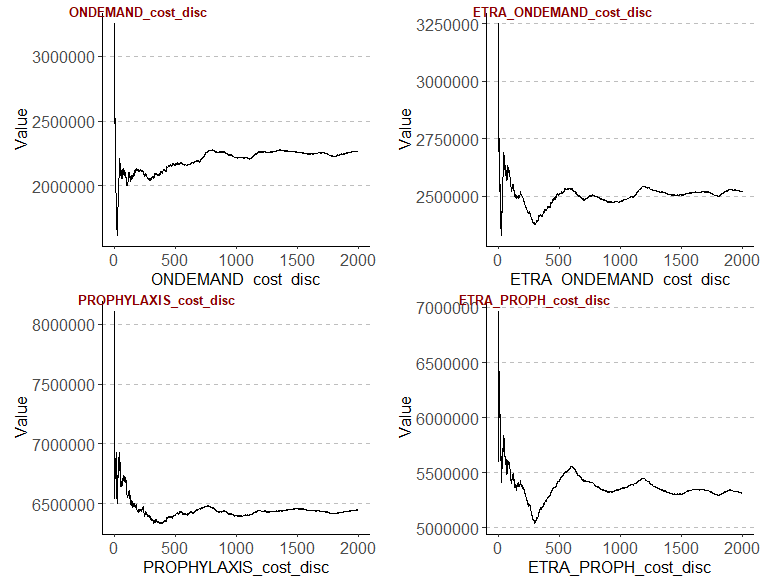
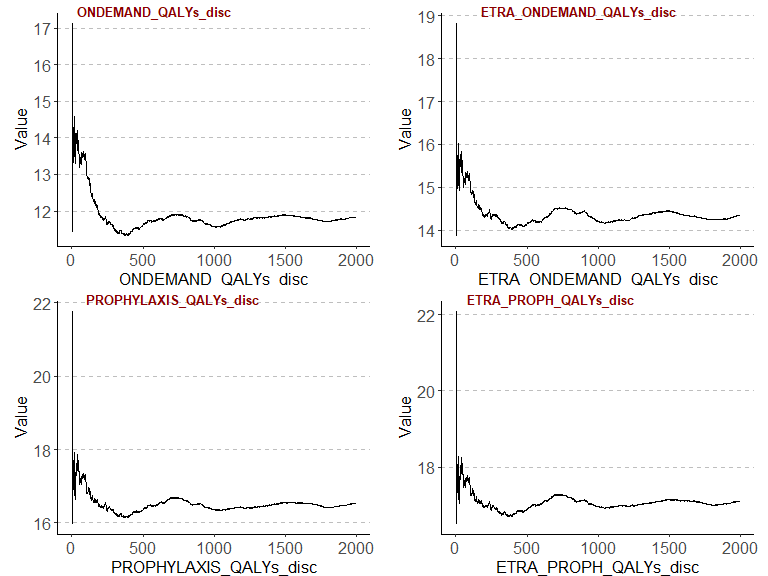
Analysis of HB CE decision rules

Niklaus Meier

Februar 17, 2025



Convergence QALYs

| ONDEMAND\_QALYs\_disc | ETRA\_ONDEMAND\_QALYs\_disc | PROPHYLAXIS\_QALYs\_disc | ETRA\_PROPH\_QALYs\_disc |
| --- | --- | --- | --- |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |

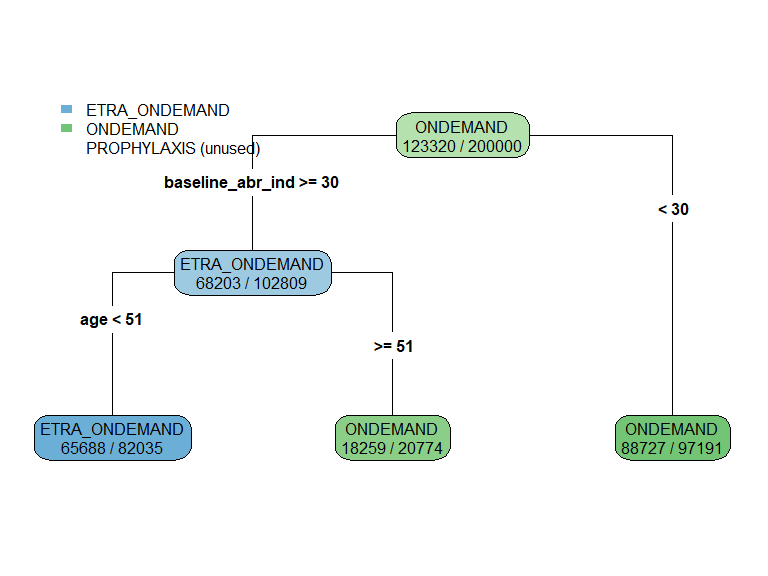
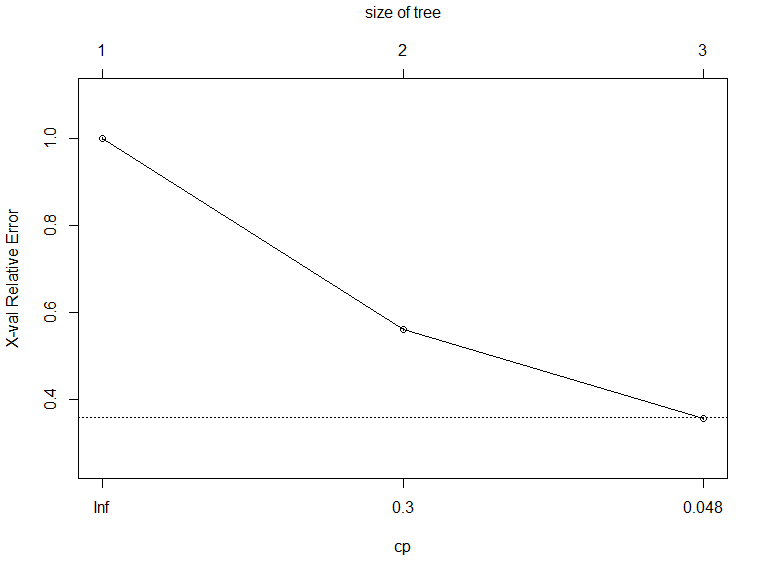
Convergence Costs

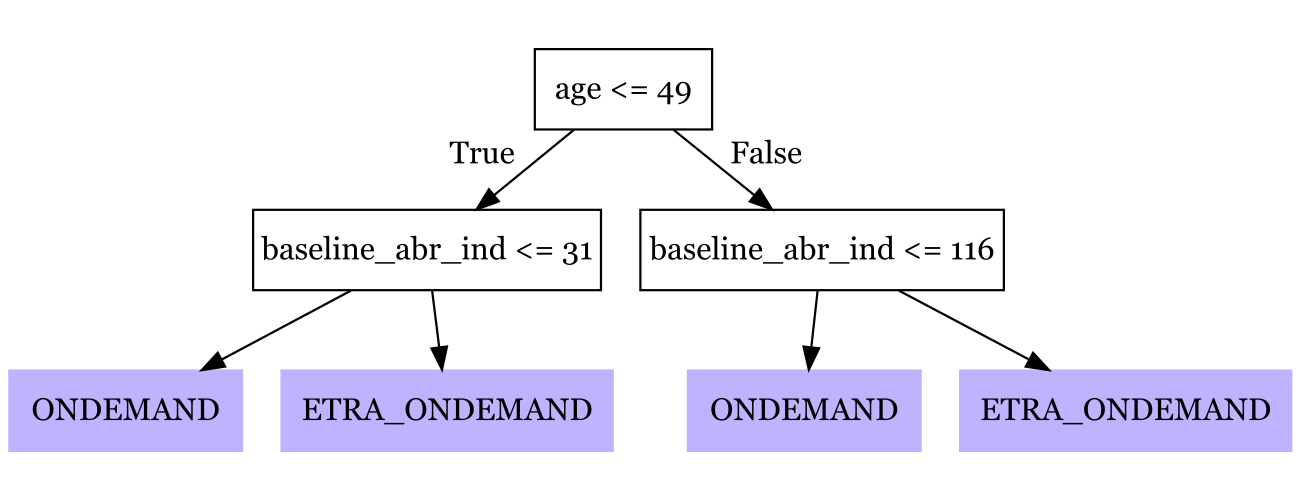
| ONDEMAND\_cost\_disc | ETRA\_ONDEMAND\_cost\_disc | PROPHYLAXIS\_cost\_disc | ETRA\_PROPH\_cost\_disc |
| --- | --- | --- | --- |
| 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |

Convergence NMB

| ONDEMAND\_NMB | ETRA\_ONDEMAND\_NMB | PROPHYLAXIS\_NMB | ETRA\_PROPH\_NMB |
| --- | --- | --- | --- |
| 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |

## CP nsplit rel error xerror xstd  
## 1 0.43831508 0 1.0000000 1.0000000 0.002835703  
## 2 0.20532081 1 0.5616849 0.5616849 0.002397416  
## 3 0.01145018 2 0.3563641 0.3565858 0.002003633





| **term** | **estimate** | **std.error** | **statistic** | **p.value** |
| --- | --- | --- | --- | --- |
| (Intercept) | 2,553,620.99 | 57,256.20 | 44.60 | 0.00 |
| baseline\_abr\_ind | -151,564.09 | 1,591.08 | -95.26 | 0.00 |
| age | -131,139.06 | 4,914.54 | -26.68 | 0.00 |
| sex | -848,877.16 | 12,395.70 | -68.48 | 0.00 |
| ETRA\_ONDEMAND | -1,867,488.93 | 167,177.71 | -11.17 | 0.00 |
| PROPHYLAXIS | -7,471,854.03 | 167,177.71 | -44.69 | 0.00 |
| ETRA\_PROPH | -4,180,060.63 | 79,447.36 | -52.61 | 0.00 |
| baseline\_abr\_ind\_INT\_age | 847.42 | 2.78 | 304.75 | 0.00 |
| baseline\_abr\_ind\_INT\_sex | 1,404.91 | 168.74 | 8.33 | 0.00 |
| age\_INT\_sex | 16,937.99 | 234.86 | 72.12 | 0.00 |
| ETRA\_ONDEMAND\_INT\_baseline\_abr\_ind | 62,190.71 | 2,234.34 | 27.83 | 0.00 |
| ETRA\_ONDEMAND\_INT\_age | 34,436.72 | 19,425.65 | 1.77 | 0.08 |
| ETRA\_ONDEMAND\_INT\_sex | 118,121.97 | 8,408.64 | 14.05 | 0.00 |
| PROPHYLAXIS\_INT\_baseline\_abr\_ind | 130,971.36 | 2,234.34 | 58.62 | 0.00 |
| PROPHYLAXIS\_INT\_age | 92,046.29 | 19,425.65 | 4.74 | 0.00 |
| PROPHYLAXIS\_INT\_sex | -683,117.16 | 8,408.64 | -81.24 | 0.00 |
| ETRA\_PROPH\_INT\_baseline\_abr\_ind | -111,407.76 | 2,234.34 | -49.86 | 0.00 |
| ETRA\_PROPH\_INT\_age | 37,407.80 | 6,941.11 | 5.39 | 0.00 |
| ETRA\_PROPH\_INT\_sex | -225,074.31 | 8,408.64 | -26.77 | 0.00 |
| baseline\_abr\_ind\_power2 | 1,596.78 | 72.39 | 22.06 | 0.00 |
| ETRA\_ONDEMAND\_INT\_baseline\_abr\_ind\_power2 | -845.40 | 102.37 | -8.26 | 0.00 |
| PROPHYLAXIS\_INT\_baseline\_abr\_ind\_power2 | -1,856.61 | 102.37 | -18.14 | 0.00 |
| ETRA\_PROPH\_INT\_baseline\_abr\_ind\_power2 | 7,064.26 | 102.37 | 69.01 | 0.00 |
| baseline\_abr\_ind\_power3 | -19.16 | 1.42 | -13.46 | 0.00 |
| ETRA\_ONDEMAND\_INT\_baseline\_abr\_ind\_power3 | 11.63 | 2.01 | 5.78 | 0.00 |
| PROPHYLAXIS\_INT\_baseline\_abr\_ind\_power3 | 21.14 | 2.01 | 10.50 | 0.00 |
| ETRA\_PROPH\_INT\_baseline\_abr\_ind\_power3 | -126.56 | 2.01 | -62.86 | 0.00 |
| baseline\_abr\_ind\_power4 | 0.13 | 0.01 | 10.35 | 0.00 |
| ETRA\_ONDEMAND\_INT\_baseline\_abr\_ind\_power4 | -0.09 | 0.02 | -5.20 | 0.00 |
| PROPHYLAXIS\_INT\_baseline\_abr\_ind\_power4 | -0.13 | 0.02 | -7.73 | 0.00 |
| ETRA\_PROPH\_INT\_baseline\_abr\_ind\_power4 | 0.93 | 0.02 | 53.47 | 0.00 |
| baseline\_abr\_ind\_power5 | 0.00 | 0.00 | -8.75 | 0.00 |
| ETRA\_ONDEMAND\_INT\_baseline\_abr\_ind\_power5 | 0.00 | 0.00 | 4.97 | 0.00 |
| PROPHYLAXIS\_INT\_baseline\_abr\_ind\_power5 | 0.00 | 0.00 | 6.36 | 0.00 |
| ETRA\_PROPH\_INT\_baseline\_abr\_ind\_power5 | 0.00 | 0.00 | -44.94 | 0.00 |
| age\_power2 | 3,547.98 | 147.13 | 24.11 | 0.00 |
| ETRA\_ONDEMAND\_INT\_age\_power2 | 16.38 | 862.81 | 0.02 | 0.98 |
| PROPHYLAXIS\_INT\_age\_power2 | -4,508.85 | 862.81 | -5.23 | 0.00 |
| ETRA\_PROPH\_INT\_age\_power2 | -619.77 | 208.07 | -2.98 | 0.00 |
| age\_power3 | -31.56 | 1.56 | -20.22 | 0.00 |
| ETRA\_ONDEMAND\_INT\_age\_power3 | -33.32 | 18.29 | -1.82 | 0.07 |
| PROPHYLAXIS\_INT\_age\_power3 | 108.64 | 18.29 | 5.94 | 0.00 |
| ETRA\_PROPH\_INT\_age\_power3 | 11.45 | 2.21 | 5.19 | 0.00 |
| ETRA\_ONDEMAND\_INT\_age\_power4 | 0.48 | 0.19 | 2.59 | 0.01 |
| PROPHYLAXIS\_INT\_age\_power4 | -0.96 | 0.19 | -5.15 | 0.00 |
| age\_power5 | 0.00 | 0.00 | 10.81 | 0.00 |
| ETRA\_ONDEMAND\_INT\_age\_power5 | 0.00 | 0.00 | -2.68 | 0.01 |
| PROPHYLAXIS\_INT\_age\_power5 | 0.00 | 0.00 | 3.91 | 0.00 |
| ETRA\_PROPH\_INT\_age\_power5 | 0.00 | 0.00 | -8.00 | 0.00 |

Comparison of treatment assignments and decision rules

|  | QALYs | Costs | NMB | Goodness |
| --- | --- | --- | --- | --- |
| ONDEMAND | 11.62 | 2,238,940.48 | -1,657,944.49 | 265,235.39 |
| ETRA\_ONDEMAND | 14.26 | 2,499,796.58 | -1,786,915.54 | 394,206.44 |
| PROPHYLAXIS | 16.51 | 6,427,659.72 | -5,601,952.15 | 4,209,243.05 |
| ETRA\_PROPH | 17.13 | 5,308,144.04 | -4,451,697.16 | 3,058,988.06 |
| OPTIMAL | 12.84 | 2,034,709.87 | -1,392,709.10 | 0.00 |
| LASSO | 12.83 | 2,092,625.56 | -1,450,973.32 | 58,264.22 |
| POLICY\_TREE | 12.70 | 2,082,204.32 | -1,447,263.85 | 54,554.75 |
| RECURSIVE\_PARTITIONING | 12.83 | 2,090,196.74 | -1,448,847.51 | 56,138.41 |

## baseline\_abr\_ind age   
## 18 36

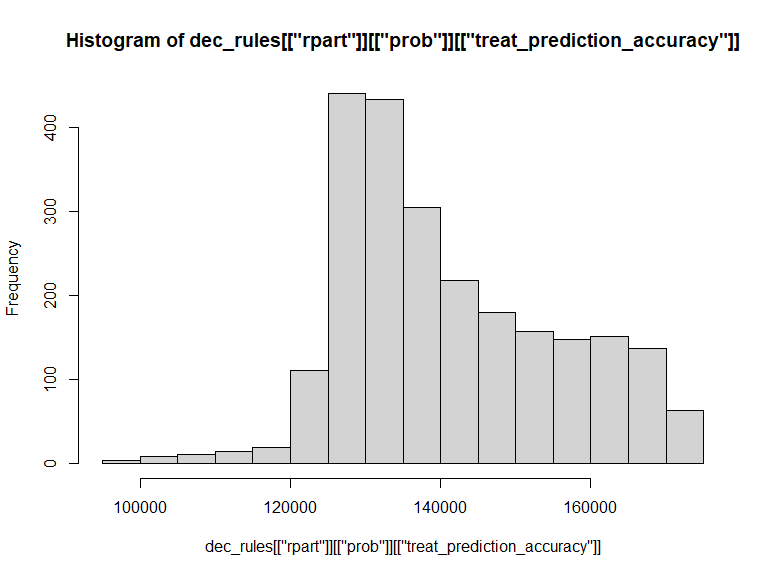
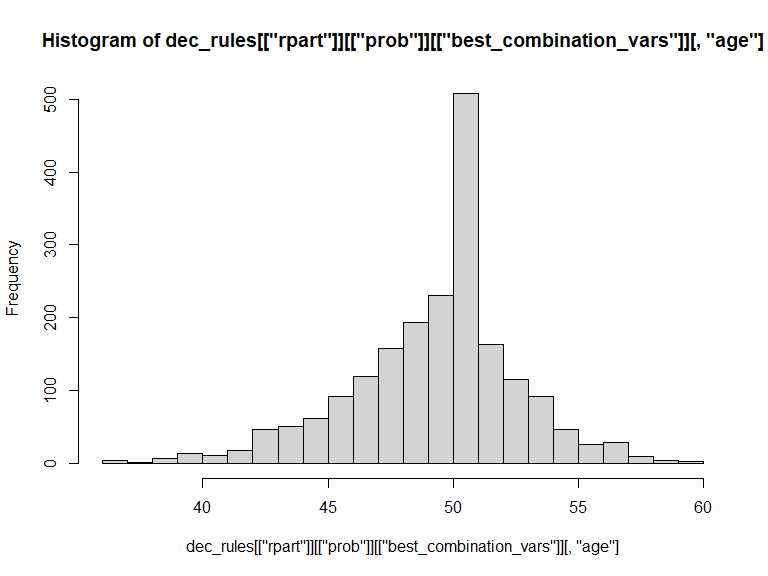
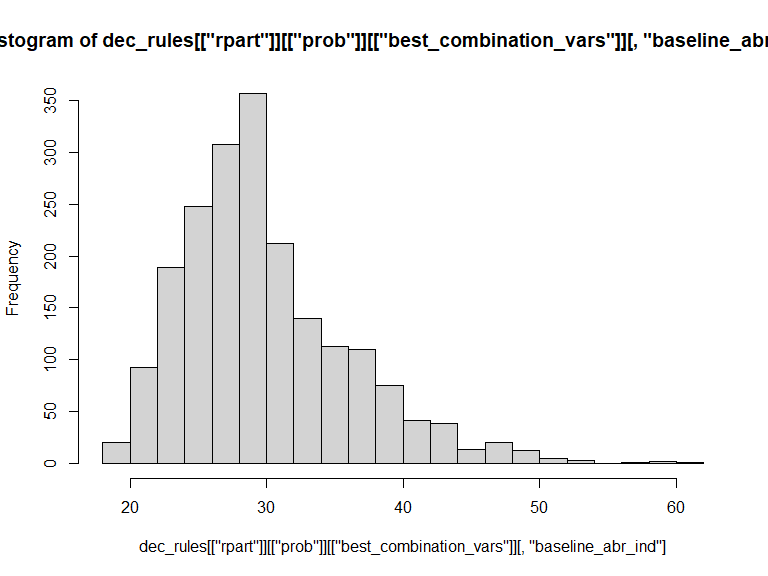
## baseline\_abr\_ind age   
## 61 60

## 2.5%   
## 21

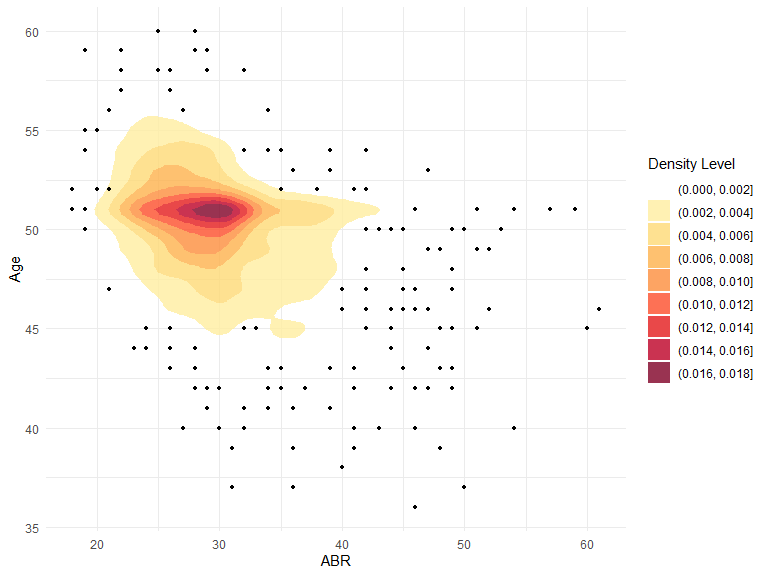
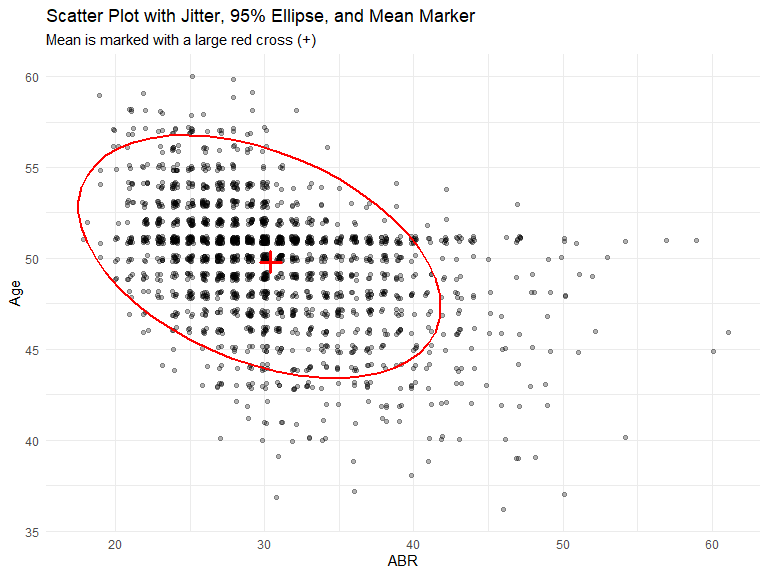
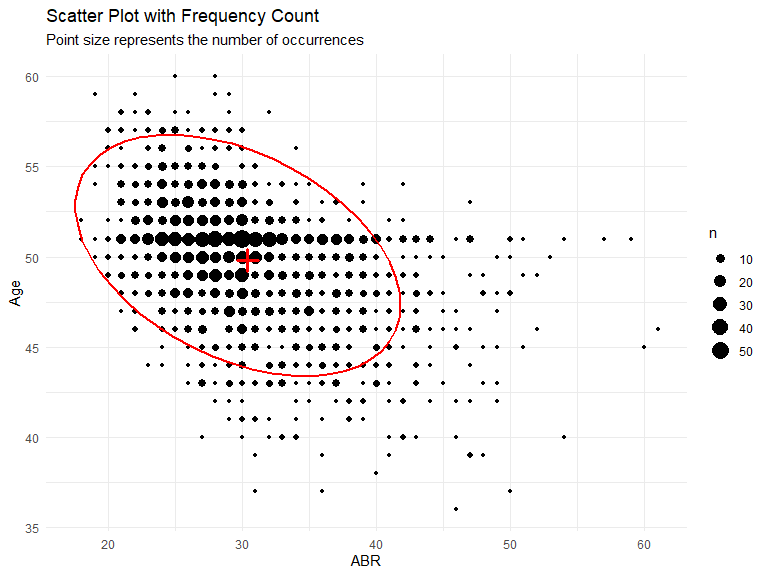
## 97.5%   
## 46

## 2.5%   
## 42

## 97.5%   
## 56



## Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.  
## ℹ Please use `linewidth` instead.  
## This warning is displayed once every 8 hours.  
## Call `lifecycle::last\_lifecycle\_warnings()` to see where this warning was generated.



# System information

Sys.info()

sysname release version nodename machine login user   
 "Windows" "10 x64" "build 19045" "M04486" "x86-64" "min1" "min1"

effective\_user “min1”

sessionInfo(package = NULL)

R version 4.3.1 (2023-06-16 ucrt) Platform: x86\_64-w64-mingw32/x64 (64-bit) Running under: Windows 10 x64 (build 19045)

Matrix products: default

locale: [1] LC\_COLLATE=German\_Switzerland.utf8 LC\_CTYPE=German\_Switzerland.utf8 LC\_MONETARY=German\_Switzerland.utf8 [4] LC\_NUMERIC=C LC\_TIME=German\_Switzerland.utf8

time zone: Europe/Zurich tzcode source: internal

attached base packages: [1] stats graphics grDevices utils datasets methods base

other attached packages: [1] MASS\_7.3-60 dplyr\_1.1.2 scales\_1.3.0 flextable\_0.9.3 broom\_1.0.5 DiagrammeRsvg\_0.1 [7] fastDummies\_1.7.3 glmnet\_4.1-8 Matrix\_1.6-0 rattle\_5.5.1 bitops\_1.0-7 tibble\_3.2.1  
[13] rpart.plot\_3.1.2 rpart\_4.1.19 policytree\_1.2.2 grf\_2.3.2 mgcv\_1.8-42 nlme\_3.1-162  
[19] kableExtra\_1.3.4 rmarkdown\_2.23 ggrepel\_0.9.3 plyr\_1.8.8 ggpubr\_0.6.0 truncnorm\_1.0-9  
[25] lookup\_1.0 data.table\_1.14.8 pander\_0.6.5 RColorBrewer\_1.1-3 ggplot2\_3.5.1

loaded via a namespace (and not attached): [1] rlang\_1.1.1 magrittr\_2.0.3 compiler\_4.3.1 png\_0.1-8  
[5] systemfonts\_1.0.4 vctrs\_0.6.3 rvest\_1.0.3 stringr\_1.5.1  
[9] httpcode\_0.3.0 pkgconfig\_2.0.3 shape\_1.4.6.1 crayon\_1.5.2  
[13] fastmap\_1.1.1 backports\_1.4.1 ellipsis\_0.3.2 labeling\_0.4.3  
[17] utf8\_1.2.3 promises\_1.2.0.1 ragg\_1.2.5 purrr\_1.0.1  
[21] xfun\_0.39 jsonlite\_1.8.7 highr\_0.10 later\_1.3.1  
[25] uuid\_1.1-0 R6\_2.5.1 stringi\_1.8.3 car\_3.1-2  
[29] Rcpp\_1.0.11 iterators\_1.0.14 knitr\_1.43 httpuv\_1.6.11  
[33] splines\_4.3.1 tidyselect\_1.2.1 rstudioapi\_0.15.0 abind\_1.4-5  
[37] yaml\_2.3.7 codetools\_0.2-19 curl\_5.0.1 lattice\_0.21-8  
[41] shiny\_1.7.4.1 withr\_3.0.0 askpass\_1.1 evaluate\_0.21  
[45] survival\_3.5-5 isoband\_0.2.7 zip\_2.3.0 xml2\_1.3.5  
[49] pillar\_1.9.0 carData\_3.0-5 foreach\_1.5.2 generics\_0.1.3  
[53] munsell\_0.5.1 xtable\_1.8-4 glue\_1.6.2 gdtools\_0.3.3  
[57] tools\_4.3.1 gfonts\_0.2.0 webshot\_0.5.5 ggsignif\_0.6.4  
[61] cowplot\_1.1.3 grid\_4.3.1 tidyr\_1.3.0 colorspace\_2.1-0  
[65] cli\_3.6.1 textshaping\_0.3.6 officer\_0.6.2 rsvg\_2.6.1  
[69] fontBitstreamVera\_0.1.1 fansi\_1.0.4 viridisLite\_0.4.2 svglite\_2.1.2  
[73] V8\_6.0.0 gtable\_0.3.5 rstatix\_0.7.2 digest\_0.6.33  
[77] fontquiver\_0.2.1 crul\_1.4.0 farver\_2.1.1 htmltools\_0.5.5  
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