Redo Cate Only Simulations

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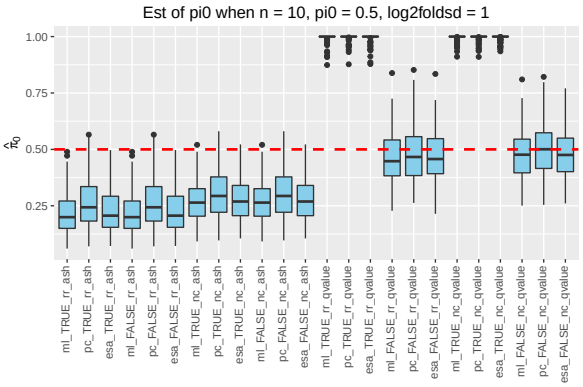
Abstract

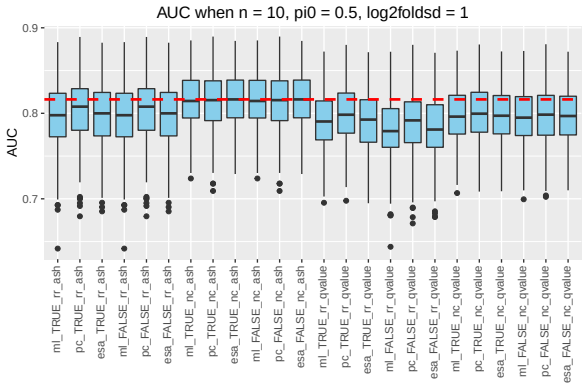
This is a redo of some CATE-only simulations. In previous simulations, I accidently inflated the variance, resulting in surprisingly good performance. Here, I correct this mistake and observe poorer performance.

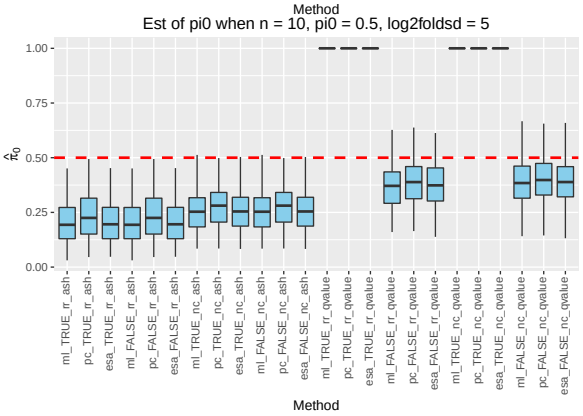
Results

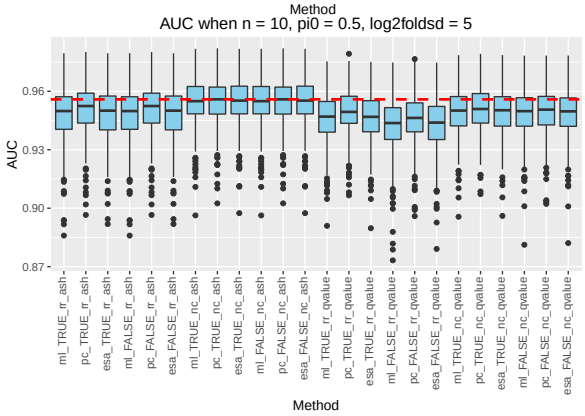
To view a description of these simulations and the results when the variance was inflated, please see http://dcgerard.github.io/succotash_sims/analysis/varyNsampNullpiLog2sd_cateonly.pdf.

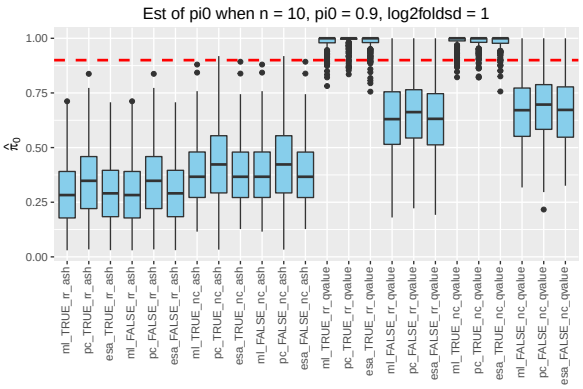
The estimates of π_0 are no longer nearly perfect when $n = 40$.

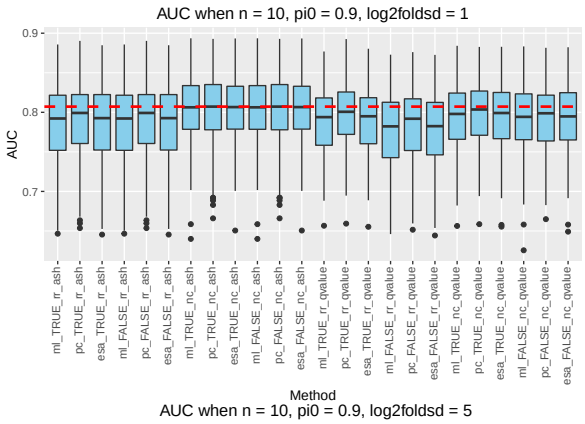


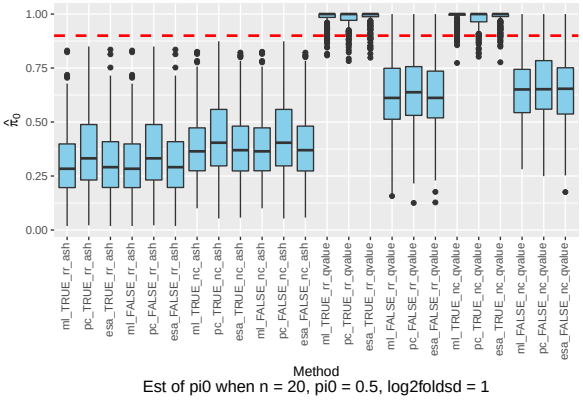


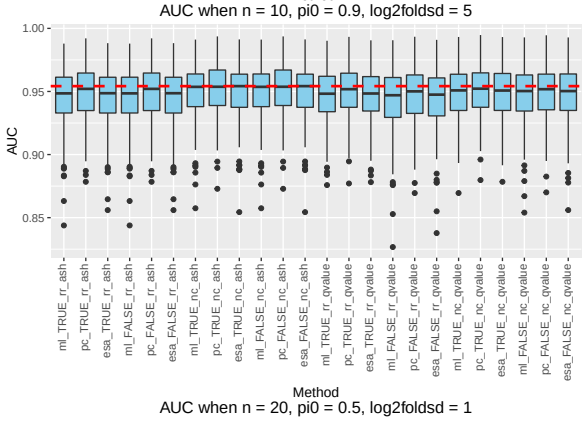


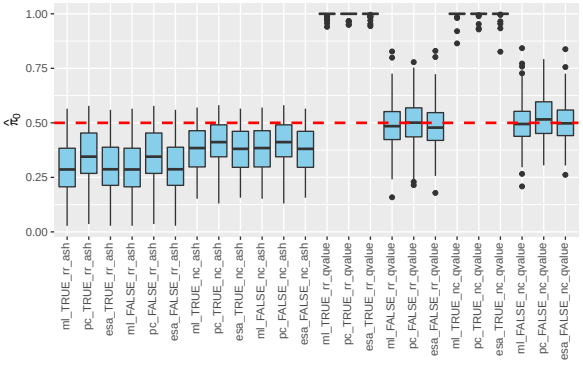


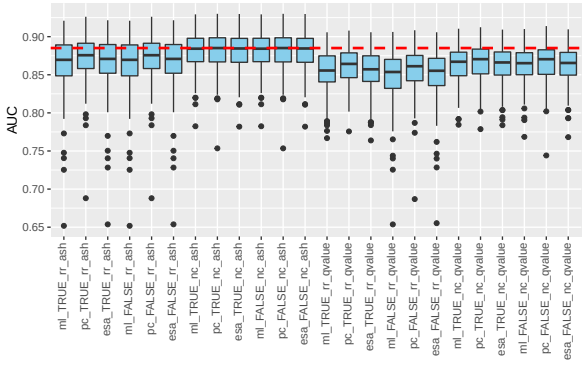

Est of pi0 when n = 10, pi0 = 0.9, log2foldsd = 1
$\hat{\pi}_0$
1.00
0.75
0.50
0.25
0.00
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method

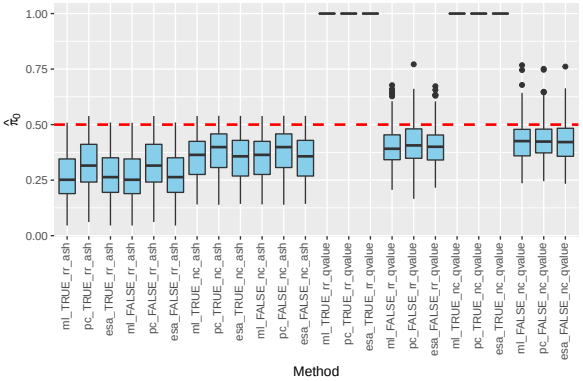

AUC when n = 10, pi0 = 0.9, log2foldsd = 1
AUC
0.9
0.8
0.7
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method

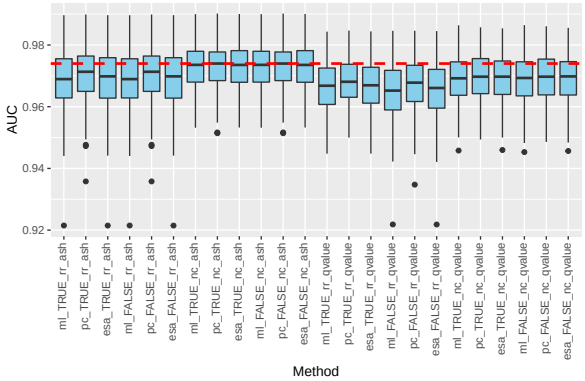

Est of pi0 when n = 10, pi0 = 0.9, log2foldsd = 5
$\hat{\pi}_0$
1.00
0.75
0.50
0.25
0.00
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method

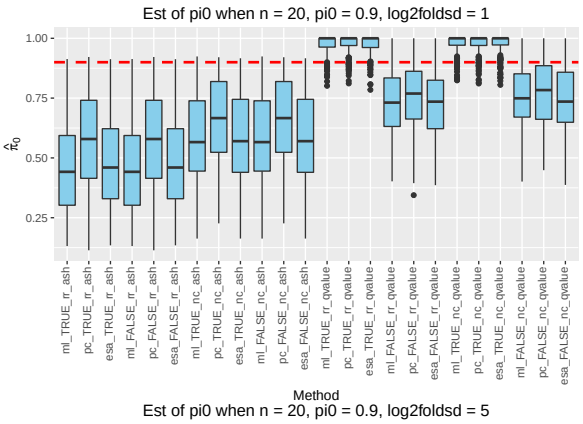

AUC when n = 10, pi0 = 0.9, log2foldsd = 5
AUC
1.00
0.95
0.90
0.85
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method

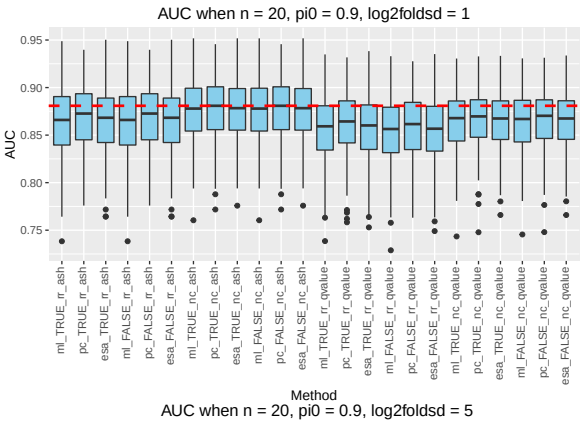

Est of pi0 when n = 20, pi0 = 0.5, log2foldsd = 1
$\hat{\pi}_0$
1.00
0.75
0.50
0.25
0.00
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method

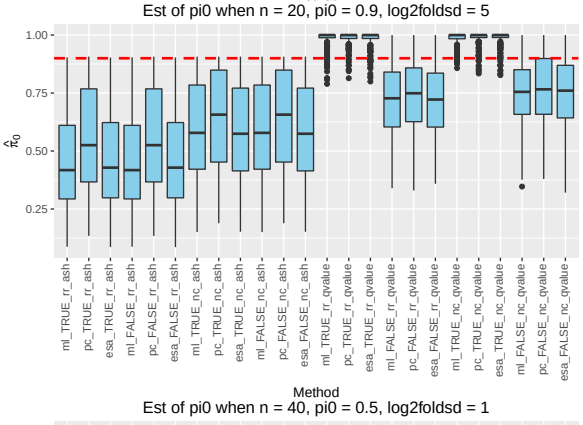

AUC when n = 20, pi0 = 0.5, log2foldsd = 1
AUC
0.90
0.85
0.80
0.75
0.70
0.65
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method

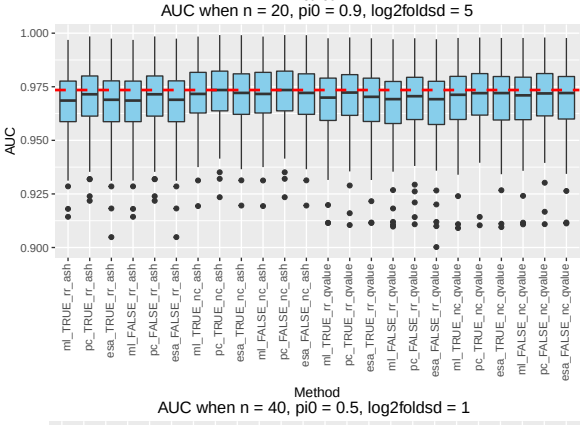

Est of pi0 when n = 20, pi0 = 0.5, log2foldsd = 5
$\hat{\pi}_0$
1.00
0.75
0.50
0.25
0.00
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method

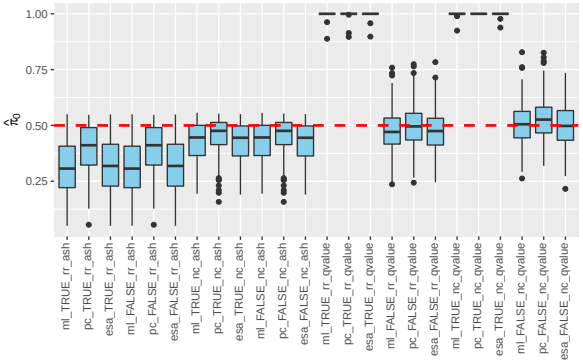

AUC when n = 20, pi0 = 0.5, log2foldsd = 5
AUC
0.98
0.96
0.94
0.92
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method

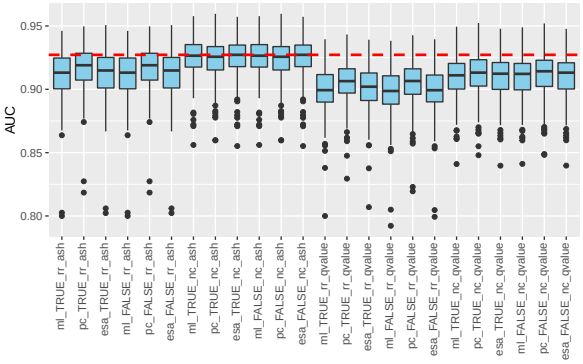

Est of pi0 when n = 20, pi0 = 0.9, log2foldsd = 1
$\hat{\pi}_0$
1.00
0.75
0.50
0.25
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method

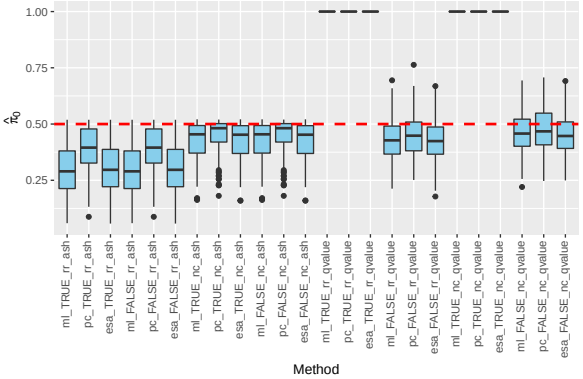

AUC when n = 20, pi0 = 0.9, log2foldsd = 1
AUC
0.95
0.90
0.85
0.80
0.75
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method

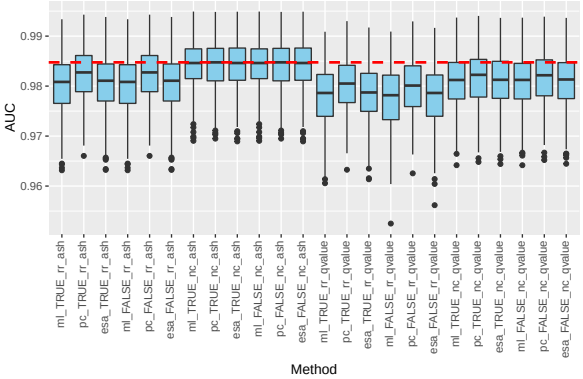

Est of pi0 when n = 20, pi0 = 0.9, log2foldsd = 5
$\hat{\pi}_0$
1.00
0.75
0.50
0.25
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method

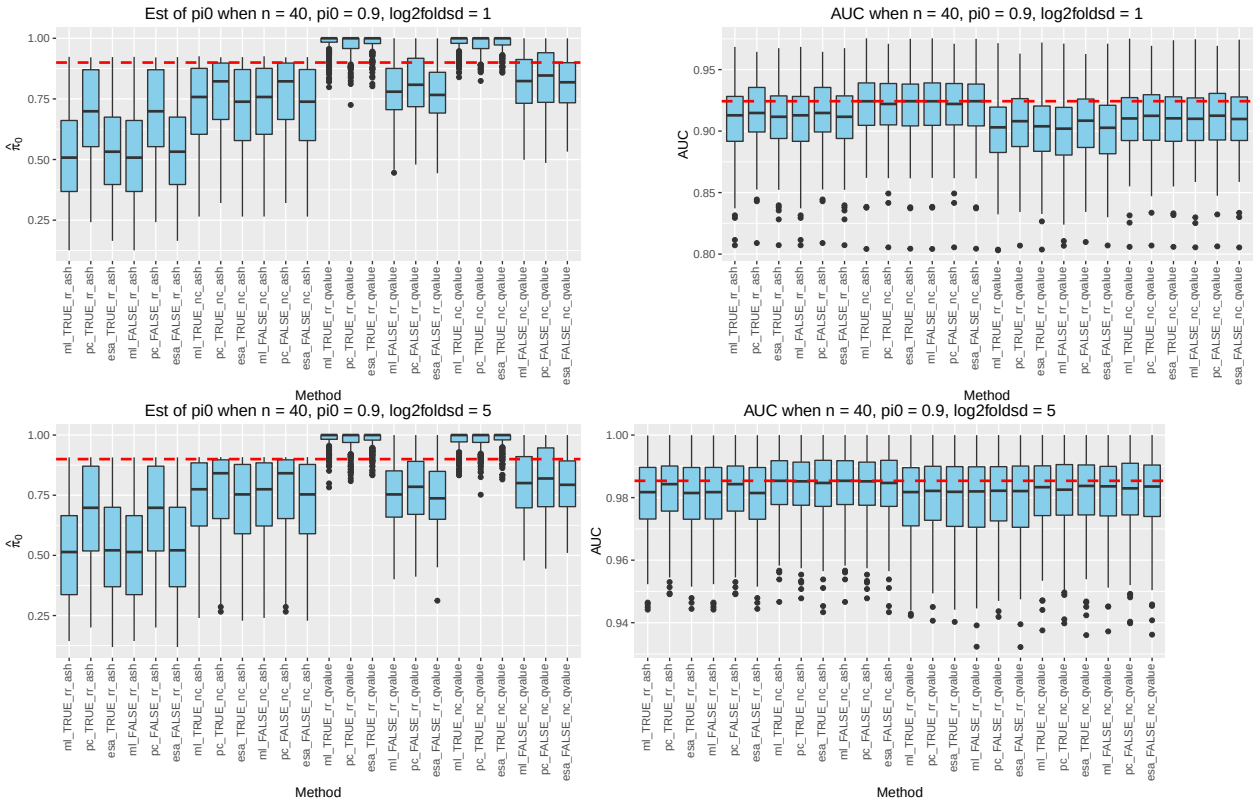

AUC when n = 20, pi0 = 0.9, log2foldsd = 5
AUC
1.000
0.975
0.950
0.925
0.900
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method


Est of pi0 when n = 40, pi0 = 0.5, log2foldsd = 1
$\hat{\pi}_0$
1.00
0.75
0.50
0.25
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method


AUC when n = 40, pi0 = 0.5, log2foldsd = 1
AUC
0.95
0.90
0.85
0.80
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method


Est of pi0 when n = 40, pi0 = 0.5, log2foldsd = 5
$\hat{\pi}_0$
1.00
0.75
0.50
0.25
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method


AUC when n = 40, pi0 = 0.5, log2foldsd = 5
AUC
0.99
0.98
0.97
0.96
ml_TRUE_rr_ash
pc_TRUE_rr_ash
esa_TRUE_rr_ash
ml_FALSE_rr_ash
pc_FALSE_rr_ash
esa_FALSE_rr_ash
ml_TRUE_nc_ash
pc_TRUE_nc_ash
esa_TRUE_nc_ash
ml_FALSE_nc_ash
pc_FALSE_nc_ash
esa_FALSE_nc_ash
ml_TRUE_rr_qvalue
pc_TRUE_rr_qvalue
esa_TRUE_rr_qvalue
ml_FALSE_rr_qvalue
pc_FALSE_rr_qvalue
esa_FALSE_rr_qvalue
ml_TRUE_nc_qvalue
pc_TRUE_nc_qvalue
esa_TRUE_nc_qvalue
ml_FALSE_nc_qvalue
pc_FALSE_nc_qvalue
esa_FALSE_nc_qvalue
Method




```
sessionInfo()
```

```
## R version 3.2.5 (2016-04-14)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Ubuntu 14.04.4 LTS
##
## locale:
##  [1] LC_CTYPE=en_US.UTF-8       LC_NUMERIC=C
##  [3] LC_TIME=en_US.UTF-8        LC_COLLATE=en_US.UTF-8
##  [5] LC_MONETARY=en_US.UTF-8    LC_MESSAGES=en_US.UTF-8
##  [7] LC_PAPER=en_US.UTF-8       LC_NAME=C
##  [9] LC_ADDRESS=C               LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_US.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
## [1] reshape2_1.4.1 xtable_1.8-2   knitr_1.12.24  ggplot2_2.1.0
##
## loaded via a namespace (and not attached):
##  [1] Rcpp_0.12.4       codetools_0.2-14  digest_0.6.9
##  [4] grid_3.2.5        plyr_1.8.3        gtable_0.2.0
##  [7] formatR_1.3       magrittr_1.5      evaluate_0.8.3
## [10] scales_0.4.0      stringi_1.0-1     rmarkdown_0.9.5.9
## [13] labeling_0.3      tools_3.2.5       stringr_1.0.0
## [16] munsell_0.4.3     yaml_2.1.13       compiler_3.2.5
## [19] colorspace_1.2-6  htmltools_0.3.5
```