1 Description of DGP

$$W_1, W_2, W_3, W_4 \sim Normal(\mu = 0, \sigma^2 = 1)$$
$$A \sim Bernoulli(p = 0.5)$$
$$Y \sim Bernoulli(p) \ .$$

$p = 0.5 * logit^{-1}(1 - W_1^2 + 3W_2 + 5W_3^2 A - 4.45A) + 0.5 logit^{-1}(-0.5 - W_3 + 2W_1 W_2 + 3|W2|A - 1.5A)$,

True blip function is:

$$B_0(W) = 0.5[logit^{-1}(1 - W_1^2 + 3W_2 + 5W_3^2 - 4.45) + logit^{-1}(-0.5 - W_3 + 2W_1 W_2 + 3|W2| - 1.5) - logit^{-1}(1 - W_1^2 + 3W_2) + logit^{-1}(-0.5 - W_3 + 2W_1 W_2)] \ .$$

2 Library legend

- Simple - GLMs
  - QAW.SL.library = linear model with W_j and A as main terms and W_j*A interaction for each j
  - blip.SL.library = linear model with main terms W_j for each j
- Medium - ML + GLMs not aggressive
  - QAW.SL.library = GLMs library AND SL.glm, SL.mean, SL.glm.interaction, SL.earth, SL.nnet, SL.svm, SL.rpart
  - blip.SL.library = GLMs library AND SL.glm, SL.mean, SL.glm.interaction, SL.earth, SL.nnet, SL.svm, SL.rpart
- Aggressive - ML + GLMs not aggressive
  - QAW.SL.library = ML + GLMs aggressive library AND SL.randomForest
  - blip.SL.library = ML + GLMs aggressive library AND SL.randomForest

2.1 Table Simple Library

```
## $table_EnYdn_for_E0Yd0
##                Bias Variance    MSE Coverage
## Psi_gcomp   -0.0765    3e-04 0.0062        -
## Psi_IPTW    -0.0569    8e-04 0.0041    45.7%
## Psi_IPTW_DR -0.0565    7e-04 0.0038    29.8%
## Psi_TMLE    -0.0563    7e-04 0.0038    29.4%
## Psi_CV.TMLE -0.0752    9e-04 0.0066      14%
##
## $table_EnYd0_for_E0Yd0
##                Bias Variance   MSE Coverage
## Psi_gcomp   -0.0935    2e-04 9e-03        -
## Psi_IPTW    -0.0004    8e-04 8e-04    95.8%
## Psi_IPTW_DR  0.0002    4e-04 4e-04    95.8%
## Psi_TMLE     0.0004    4e-04 4e-04    95.8%
```

```
## Psi_CV.TMLE  0.0007    5e-04 5e-04    95.3%
##
## $table_EnYdn_for_E0Ydn
##                Bias Variance    MSE Coverage
## Psi_gcomp   -0.0035    3e-04 0.0004        -
## Psi_IPTW     0.0162    8e-04 0.0011    94.9%
## Psi_IPTW_DR  0.0166    7e-04 0.0009    90.6%
## Psi_TMLE     0.0167    7e-04 0.0009    90.5%
## Psi_CV.TMLE  0.0002    9e-04 0.0009    93.9%
```

2.2 Table Medium Library

```
## $table_EnYdn_for_E0Yd0
##                Bias Variance    MSE Coverage
## Psi_gcomp   -0.1325    7e-04 0.0182        -
## Psi_IPTW     0.0300    1e-03 0.0019    79.5%
## Psi_IPTW_DR  0.0295    8e-04 0.0016    69.9%
## Psi_TMLE     0.0268    7e-04 0.0014    72.2%
## Psi_CV.TMLE -0.0310    7e-04 0.0017    70.3%
##
## $table_EnYd0_for_E0Yd0
##                Bias Variance    MSE Coverage
## Psi_gcomp   -0.1313    6e-04 0.0179        -
## Psi_IPTW    -0.0009    7e-04 0.0007    96.3%
## Psi_IPTW_DR -0.0009    5e-04 0.0005      95%
## Psi_TMLE    -0.0008    5e-04 0.0005    94.8%
## Psi_CV.TMLE -0.0004    5e-04 0.0005    94.9%
##
## $table_EnYdn_for_E0Ydn
##                Bias Variance    MSE Coverage
## Psi_gcomp   -0.1048    7e-04 0.0117        -
## Psi_IPTW     0.0577    1e-03 0.0043      48%
## Psi_IPTW_DR  0.0572    8e-04 0.0041      33%
## Psi_TMLE     0.0545    7e-04 0.0037    33.9%
## Psi_CV.TMLE -0.0008    7e-04 0.0007    93.9%
```

2.3 Table Aggressive Library

```
## $table_EnYdn_for_E0Yd0
##                Bias Variance    MSE Coverage
## Psi_gcomp   -0.1152   0.0007 0.0140        -
## Psi_IPTW     0.1131   0.0114 0.0242    38.3%
## Psi_IPTW_DR  0.0925   0.0096 0.0181    38.9%
## Psi_TMLE     0.0963   0.0118 0.0211    38.5%
## Psi_CV.TMLE -0.0281   0.0007 0.0015    71.9%
##
## $table_EnYd0_for_E0Yd0
```

```
##                Bias Variance    MSE Coverage
## Psi_gcomp   -0.1165    6e-04 0.0142        -
## Psi_IPTW     0.0007    8e-04 0.0008    95.2%
## Psi_IPTW_DR -0.0074    5e-04 0.0006    90.5%
## Psi_TMLE    -0.0067    5e-04 0.0006      91%
## Psi_CV.TMLE  0.0007    5e-04 0.0005    94.7%
##
## $table_EnYdn_for_E0Ydn
##                Bias Variance    MSE Coverage
## Psi_gcomp   -0.0842   0.0007 0.0078        -
## Psi_IPTW     0.1442   0.0114 0.0322      25%
## Psi_IPTW_DR  0.1236   0.0096 0.0248    22.6%
## Psi_TMLE     0.1274   0.0118 0.0280    22.5%
## Psi_CV.TMLE  0.0013   0.0007 0.0007    93.9%
```

3 Results

```
## pdf
##   2
```