Testing tmle3mopttx

Fall, 2018

Simulation 2a (binary treatment)

This simulation tests the coverage of the mean outcome under the true rule, and true data-adaptive rule. The data generating distribution for $O = (W, A, Y)$ setup is as follows:

$$W \sim \mathcal{N}(\mathbf{0}, \mathbf{I_{3\times 3}})$$

$$P(A = 1|W) = \frac{1}{1 + \exp^{(-0.8*W_1)}}$$

$$P(Y = 1|A, W) = 0.5\text{logit}^{-1}[-5I(A = 1)(W_1 - 0.5) + 5I(A = 0)(W_1 - 0.5)] + 0.5\text{logit}^{-1}(W_2W_3)$$

where W reflects $W = (W_1, W_2, W_3)$, A is the binary treatment, and Y is the binary outcome.

Table 1: **Simulation 2a, Binary A**

Info	Param	Coverage	Bias	MSE	n
Blip1, Correct W for Rule	E(Ydn)	0.958	0.001	0.001	1000.000
Blip1, Correct W for Rule	E(Yd0)	0.956	-0.008	0.001	1000.000
Blip1, Correct W for Rule	E(Ydn)	0.950	-0.002	0.002	500.000
Blip1, Correct W for Rule	E(Yd0)	0.912	-0.019	0.002	500.000
Blip2, Correct W for Rule	E(Ydn)	0.960	-0.002	0.001	1000.000
Blip2, Correct W for Rule	E(Yd0)	0.918	-0.011	0.001	1000.000
Blip2, Correct W for Rule	E(Ydn)	0.946	-0.004	0.002	500.000
Blip2, Correct W for Rule	E(Yd0)	0.892	-0.021	0.002	500.000

Simulation 2b (categorical treatment)

This simulation tests the coverage of the mean outcome under the true rule, and true data-adaptive rule. The data generating distribution for $O = (W, A, Y)$ setup is as follows:

$$W \sim \mathcal{N}(\mathbf{0}, \mathbf{I_{4\times 4}})$$

$$P(A = a|W) = \frac{1}{1 + \exp^{(-0.8 * W_a)}}$$

$$P(Y = 1|A, W) = 0.5\text{logit}^{-1}[3I(A = 1)(W_1 - 0.5) - 3I(A = 2)(2W_2 + 0.5) + 3I(A = 3)(3W_3 - 0.5)] + \text{logit}^{-1}(W_2 W_3)$$

where W reflects $W = (W_1, W_2, W_3, W_4)$, A is the binary treatment, and Y is the binary outcome.

Table 2: **Simulation 2b, Categorical A**

Info	Param	Coverage	Bias	MSE	n
Blip3, Correct W for Rule	E(Ydn)	0.944	-0.003	0.001	1000.000
Blip3, Correct W for Rule	E(Yd0)	0.904	-0.015	0.001	1000.000
Blip3, Correct W for Rule	E(Ydn)	0.928	0.000	0.002	500.000
Blip3, Correct W for Rule	E(Yd0)	0.876	-0.023	0.002	500.000
Blip2, Correct W for Rule	E(Ydn)	0.940	-0.001	0.001	1000.000
Blip2, Correct W for Rule	E(Yd0)	0.914	-0.014	0.001	1000.000
Blip2, Correct W for Rule	E(Ydn)	0.936	-0.002	0.001	500.000
Blip2, Correct W for Rule	E(Yd0)	0.898	-0.024	0.002	500.000