Test performance on simulations

Benoit Lepage

2023-05-15

Simulations

Simulation setting

2) Results for the binary outcome

2.1) Estimation by g-computation

Note that the standard error was not estimated in 150 simulations out of 1000, resulting in a missing average standard error and coverage for the log RERI indicator.

2.2) Estimation by IPTW

2.3) Estimation by TMLE

3) Results for the continuous outcome

3.1) Estimation by g-computation

3.2) Estimation by IPTW

3.3) Estimation by TMLE

Table 1: Results from g-computation estimation with a binary outcome

	Bias (%)	Variance	Std.bias (%)	MSE	Av.SE (%)	Coverage (%)
p00	-0.005	0.00007	-0.53	0.00007	0.88	93.5
p10	0.012	0.00007	1.41	0.00007	0.88	95.3
p01	-0.015	0.00024	-0.98	0.00024	1.51	93.2
p11	-0.114	0.00030	-6.53	0.00030	1.74	94.5
RD__A1__A2is0	0.017	0.00015	1.34	0.00015	1.24	94.9
RD__A1__A2is1	-0.098	0.00051	-4.34	0.00051	2.29	94.9
RD__A2__A1is0	-0.011	0.00032	-0.60	0.00032	1.74	94.7
RD__A2__A1is1	-0.126	0.00038	-6.47	0.00038	1.95	95.1
logRR__A1__A2is0	2.619	0.09284	8.59	0.09353	33.43	96.8
logRR__A1__A2is1	1.853	0.05795	7.70	0.05829	24.22	96.6
logRR__A2__A1is0	0.708	0.12603	1.99	0.12608	37.51	97.6
logRR__A2__A1is1	-0.058	0.02792	-0.35	0.02792	17.34	95.8
a.INT	-0.115	0.00069	-4.39	0.00069	2.59	93.4
log.m.INT	-0.765	0.15916	-1.92	0.15922	41.12	96.0
logRERI	-0.433	0.09062	-1.44	0.09064	NA	NA

Table 2: Results from IPTW estimation with a binary outcome

	Bias (%)	Variance	Std.bias (%)	MSE	Av.SE (%)	Coverage (%)
p00	-0.013	0.00009	-1.43	0.00009	0.96	92.6
p10	0.010	0.00007	1.13	0.00007	0.90	94.8
p01	-0.021	0.00025	-1.32	0.00025	1.55	92.8
p11	-0.131	0.00032	-7.29	0.00033	1.83	95.1
RD__A1__A2is0	0.023	0.00017	1.77	0.00017	1.31	94.2
RD__A1__A2is1	-0.110	0.00055	-4.68	0.00055	2.39	95.0
RD__A2__A1is0	-0.008	0.00035	-0.42	0.00035	1.82	94.9
RD__A2__A1is1	-0.141	0.00040	-7.02	0.00040	2.03	95.8
logRR__A1__A2is0	3.405	0.10721	10.40	0.10837	32.31	94.3
logRR__A1__A2is1	1.931	0.06141	7.79	0.06178	23.86	94.2
logRR__A2__A1is0	1.368	0.14098	3.64	0.14116	36.19	95.7
logRR__A2__A1is1	-0.105	0.02912	-0.62	0.02912	17.43	96.2
a.INT	-0.133	0.00075	-4.87	0.00075	2.73	94.1
log.m.INT	-1.474	0.17770	-3.50	0.17792	40.16	94.2
logRERI	-0.027	0.09917	-0.09	0.09917	32.43	97.2

Table 3: Results from TMLE estimation with a binary outcome

	Bias (%)	Variance	Std.bias (%)	MSE	Av.SE (%)	Coverage (%)
p00	-0.013	0.00009	-1.39	0.00009	0.95	93.0
p10	0.009	0.00007	1.02	0.00007	0.89	94.8
p01	-0.028	0.00025	-1.77	0.00025	1.53	92.9
p11	-0.124	0.00032	-6.94	0.00032	1.79	94.5
RD_A1_A2is0	0.022	0.00017	1.67	0.00017	1.30	94.4
RD_A1_A2is1	-0.096	0.00054	-4.12	0.00054	2.35	94.1
RD_A2_A1is0	-0.015	0.00034	-0.82	0.00034	1.80	94.6
RD_A2_A1is1	-0.133	0.00040	-6.66	0.00040	1.99	95.4
logRR_A1_A2is0	3.362	0.10684	10.29	0.10797	32.09	94.4
logRR_A1_A2is1	2.037	0.06052	8.28	0.06093	23.61	94.4
logRR_A2_A1is0	1.272	0.13962	3.40	0.13978	35.93	95.7
logRR_A2_A1is1	-0.053	0.02887	-0.31	0.02887	17.21	95.6
a.INT	-0.118	0.00074	-4.34	0.00074	2.69	93.6
log.m.INT	-1.325	0.17600	-3.16	0.17618	39.84	94.3
logRERI	0.130	0.09802	0.41	0.09803	32.01	96.6

Table 4: Results from g-computation estimation with a continuous outcome

	Bias (%)	Variance	Std.bias (%)	MSE	Av.SE (%)	Coverage (%)
p00	-0.110	1.45	-9.11	1.46	36.5	99.9
p10	0.083	0.81	9.19	0.82	36.2	100.0
p01	-0.006	1.67	-0.50	1.67	36.3	99.9
p11	0.375	1.01	37.35	1.15	36.4	99.9
RD_A1_A2is0	0.193	1.70	14.76	1.74	1.5	97.6
RD_A1_A2is1	0.381	2.07	26.48	2.22	2.2	98.9
RD_A2_A1is0	0.103	2.60	6.41	2.61	2.1	99.1
RD_A2_A1is1	0.292	1.26	26.00	1.35	2.6	99.4
a.INT	0.189	3.68	9.83	3.72	2.3	97.8

Table 5: Results from IPTW estimation with a continuous outcome

	Bias (%)	Variance	Std.bias (%)	MSE	Av.SE (%)	Coverage (%)
p00	0.027	2.62	1.68	2.62	34.1	97.0
p10	-0.043	1.10	-4.06	1.10	33.6	97.5
p01	0.008	3.02	0.47	3.02	34.3	96.1
p11	-0.019	1.54	-1.54	1.54	33.8	97.7
RD_A1_A2is0	-0.070	3.90	-3.53	3.91	2.2	96.5
RD_A1_A2is1	-0.027	5.00	-1.22	5.00	2.4	96.6
RD_A2_A1is0	-0.019	5.52	-0.81	5.52	2.6	96.6
RD_A2_A1is1	0.023	2.41	1.51	2.41	1.8	98.4
a.INT	0.043	9.96	1.35	9.96	3.2	94.8

Table 6: Results from TMLE estimation with a continuous outcome

	Bias (%)	Variance	Std.bias (%)	MSE	Av.SE (%)	Coverage (%)
p00	0.035	1.55	2.81	1.56	33.6	94.9
p10	-0.048	0.82	-5.33	0.82	33.3	95.0
p01	0.051	1.73	3.88	1.73	33.7	94.8
p11	-0.047	1.00	-4.69	1.00	33.4	96.1
RD_A1_A2is0	-0.083	1.82	-6.17	1.83	1.4	95.4
RD_A1_A2is1	-0.098	2.16	-6.66	2.17	1.5	95.6
RD_A2_A1is0	0.016	2.75	0.96	2.75	1.7	95.9
RD_A2_A1is1	0.001	1.28	0.11	1.28	1.1	95.1
a.INT	-0.015	3.94	-0.73	3.94	2.0	96.1