

TABLE S1 Results of ATE Estimates from the Single Covariate Simulation Study Setting 1: $\{\gamma_0, \gamma_1, \gamma_2, \gamma_3\} = \{0.5, 0, 0, \sqrt{0.75}\}$.

Method	Sample Size	RMSE	MAE	Bias	Rc	SE_{avg}	SE_{emp}
GPMatch	100	0.26	0.16	-0.038	0.93	0.241	0.258
	200	0.161	0.116	0.033	0.97	0.166	0.159
	400	0.122	0.085	-0.005	0.96	0.118	0.123
QNT_PS	100	0.376	0.244	0.052	0.95	0.392	0.216
	200	0.309	0.220	0.127	0.94	0.275	0.283
	400	0.238	0.159	0.096	0.92	0.201	0.219
LM	100	0.409	0.216	-0.179	0.93	0.347	0.37
	200	0.291	0.183	-0.119	0.89	0.25	0.266
	400	0.28	0.169	-0.171	0.84	0.185	0.223
AIPTW1	100	0.82	0.341	-0.176	0.96	0.554	0.805
	200	0.765	0.294	-0.209	0.98	0.504	0.74
	400	0.753	0.251	-0.231	0.96	0.426	0.721
AIPTW2	100	0.411	0.236	-0.045	0.91	0.349	0.41
	200	0.288	0.203	0.029	0.93	0.268	0.288
	400	0.225	0.146	0.002	0.93	0.197	0.226
LM_PS1	100	0.367	0.239	-0.109	0.91	0.332	0.352
	200	0.272	0.161	-0.051	0.91	0.246	0.268
	400	0.198	0.13	-0.064	0.95	0.181	0.189
LM_PS2	100	0.366	0.201	-0.054	0.93	0.349	0.364
	200	0.256	0.181	0.031	0.99	0.253	0.255
	400	0.185	0.136	-0.004	0.95	0.186	0.186
LM_sp(PS1)	100	0.264	0.186	-0.054	0.91	0.241	0.26
	200	0.156	0.102	0.023	0.97	0.167	0.155
	400	0.127	0.086	-0.008	0.94	0.118	0.128
LM_sp(PS2)	100	0.267	0.175	-0.057	0.90	0.24	0.262
	200	0.155	0.11	0.02	0.98	0.167	0.154
	400	0.126	0.089	-0.01	0.94	0.118	0.126
BART	100	0.27	0.156	-0.026	0.95	0.257	0.27
	200	0.185	0.145	0.048	0.95	0.178	0.18
	400	0.133	0.084	0.016	0.97	0.125	0.133

RMSE = root mean square error; MAE = median absolute error; Bias = Estimate-True; Rc = Rate of coverage by the 95% interval estimate; SE_{avg} = average of standard error estimate from all replicate; SE_{emp} = standard error of ATE estimates from all replicate; GPMatch: Bayesian structural model with Gaussian process prior, only treatment effect is included in the mean function; covariance function includes X .

QNT_PS: Propensity score sub-classification by quintiles.

AIPTW1 & AIPTW2: augmented inversed probability of treatment weighting.

LM_PS1 & LM_PS2: linear regression modeling with propensity score adjustment;

LM_sp(PS1) & LM_sp(PS2): linear regression modeling with spline fit propensity score adjustment;

BART: Bayesian additive regression tree.

Propensity scores are estimated using different logistic models, with AIPTW1, LM_PS1 & LM_sp(PS1) use PS estimated using logistic model $\text{logit}A \sim X$; and AIPTW2, LM_PS2 & LM_sp(PS2) use PS estimated using logistic model $\text{logit}A \sim X^{1/3}$. QNT_PS using either PS estimates produces identical results.