

Table 1: Comparison between TMLE estimators and one-step EIF estimator under positivity assumption violation with binary, continuous, and multivariate mediators.

	Univariate Binary		Univariate Continuous						Bivariate Continuous			
	$\psi_1(\hat{Q}^*)$	$\psi_1^+(\hat{Q})$	$\psi_1(\hat{Q}^*)$	$\psi_1^+(\hat{Q})$	$\psi_{2a}(\hat{Q}^*)$	$\psi_{2a}^+(\hat{Q})$	$\psi_{2b}(\hat{Q}^*)$	$\psi_{2b}^+(\hat{Q})$	$\psi_{2a}(\hat{Q}^*)$	$\psi_{2a}^+(\hat{Q})$	$\psi_{2b}(\hat{Q}^*)$	$\psi_{2b}^+(\hat{Q})$
n=500												
Bias	-0.001	-0.010	0.006	0.031	0.004	0.045	0.010	0.021	-0.012	0.305	-0.023	-0.074
SD	0.103	0.613	0.161	1.147	0.415	3.644	0.398	1.748	0.500	5.278	0.456	2.021
MSE	0.011	0.376	0.026	1.316	0.172	13.264	0.158	3.054	0.250	27.920	0.208	4.087
CI coverage	87.4%	93.7%	97.6%	95.5%	97.2%	96.6%	97.2%	96.6%	98.9%	96.7%	97.2%	97.2%
CI width	0.391	1.002	1.834	1.808	5.331	6.614	3.142	4.133	11.005	13.085	3.223	4.539
n=1e+03												
Bias	0.004	0.011	0.002	-0.020	-0.002	0.108	-0.002	0.020	0.008	-0.004	0.007	0.030
SD	0.074	0.288	0.116	0.609	0.319	2.026	0.311	0.980	0.363	2.637	0.322	0.962
MSE	0.006	0.083	0.013	0.370	0.102	4.113	0.097	0.959	0.131	6.946	0.104	0.926
CI coverage	88.2%	94.5%	97.8%	95.6%	97.8%	97%	98%	97.1%	99.1%	97%	96.6%	95.3%
CI width	0.299	0.555	1.055	1.042	3.444	3.975	2.072	2.476	5.411	6.096	2.058	2.443
n=2e+03												
Bias	0.002	-0.001	0.002	0.013	0.007	-0.003	0.013	0.022	0.010	0.022	0.013	0.042
SD	0.051	0.170	0.080	0.343	0.240	1.035	0.244	0.640	0.304	1.463	0.282	0.678
MSE	0.003	0.029	0.006	0.118	0.058	1.070	0.060	0.410	0.093	2.138	0.080	0.461
CI coverage	91.2%	96.8%	97.8%	95%	96.9%	96.4%	98%	96.5%	99.8%	97.6%	97.9%	96.2%
CI width	0.213	0.382	0.748	0.739	2.267	2.468	1.611	1.815	3.644	3.961	1.604	1.825