

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	-0.004	-0.010	-0.022	-0.004	-0.002	0.000	-0.002	-0.012	-0.012	0.153	-0.031	-0.065
SD	0.078	0.418	0.135	0.799	0.432	2.524	0.405	1.191	0.610	5.096	0.495	1.447
MSE	0.006	0.174	0.019	0.638	0.187	6.363	0.164	1.418	0.372	25.965	0.245	2.097
CI coverage	91.2%	95.4%	96.6%	95.2%	98.4%	97.1%	98.3%	97.3%	99.4%	98.2%	98.5%	97.7%
CI width	0.317	0.854	1.533	1.531	4.764	5.705	2.720	3.447	10.115	12.100	2.854	3.834
n=1000												
Bias	0.000	-0.002	-0.012	-0.018	-0.004	0.041	-0.003	0.020	-0.015	-0.078	-0.003	-0.001
SD	0.056	0.207	0.101	0.470	0.342	1.394	0.338	0.787	0.389	1.841	0.333	0.716
MSE	0.003	0.043	0.010	0.221	0.117	1.942	0.114	0.619	0.152	3.391	0.111	0.513
CI coverage	92.1%	95.4%	96%	94.3%	98.5%	96.3%	98%	97.1%	99.4%	97.1%	99%	96.4%
CI width	0.240	0.492	0.931	0.930	3.071	3.460	1.861	2.178	4.809	5.365	1.852	2.136
n=2000												
Bias	0.000	-0.002	-0.005	0.010	0.009	0.010	0.009	0.014	0.003	-0.006	0.008	0.022
SD	0.039	0.114	0.068	0.239	0.238	0.699	0.243	0.481	0.319	0.980	0.276	0.489
MSE	0.001	0.013	0.005	0.057	0.057	0.488	0.059	0.231	0.102	0.959	0.076	0.240
CI coverage	94.1%	96.2%	97.4%	96%	99.2%	96.9%	98.7%	96%	99.2%	96.9%	98.6%	97.4%
CI width	0.175	0.318	0.602	0.602	1.960	2.092	1.321	1.454	2.989	3.209	1.351	1.504