Table 1: Comparison between TMLE estimators and one-step EIF estimator under positivity assumption violation when the outcome is not in the district of the treatment.

| | $\psi^+_{dnorm}(\hat{Q})$ | $\psi_{dnorm}(\hat{Q}^\star)$ | $\psi^+_{densratio}(\hat{Q})$ | $\psi_{densratio}(\hat{Q}^\star)$ | $\psi^+_{bayes}(\hat{Q})$ | $\psi_{bayes}(\hat{Q}^\star)$ |
|---|---|---|---|---|---|---|
| **n=500** | | | | | | |
| Bias | 0.009 | -0.015 | -0.015 | -0.011 | -0.019 | -0.019 |
| SD | 4.583 | 1.124 | 4.247 | 1.117 | 4.566 | 1.125 |
| MSE | 20.984 | 1.262 | 18.021 | 1.246 | 20.830 | 1.265 |
| CI coverage | 97.1% | 96.5% | 97.4% | 97.6% | 97.9% | 98.4% |
| CI width | 8.254 | 4.351 | 8.598 | 4.957 | 9.300 | 5.304 |
| **n=1000** | | | | | | |
| Bias | -0.124 | -0.061 | -0.109 | -0.057 | -0.133 | -0.063 |
| SD | 2.593 | 0.960 | 2.508 | 0.959 | 2.631 | 0.973 |
| MSE | 6.734 | 0.924 | 6.296 | 0.923 | 6.931 | 0.949 |
| CI coverage | 97% | 96.3% | 96.7% | 96.9% | 97.3% | 98.6% |
| CI width | 4.908 | 3.184 | 5.073 | 3.455 | 5.511 | 3.741 |
| **n=2000** | | | | | | |
| Bias | 0.038 | 0.012 | 0.052 | 0.022 | 0.057 | 0.020 |
| SD | 1.361 | 0.728 | 1.333 | 0.724 | 1.408 | 0.735 |
| MSE | 1.851 | 0.530 | 1.776 | 0.525 | 1.985 | 0.540 |
| CI coverage | 97% | 97% | 97.3% | 97.9% | 97.3% | 98.3% |
| CI width | 3.235 | 2.447 | 3.315 | 2.575 | 3.615 | 2.809 |