Subset calibration report: marginal risk difference

Sentinel Subset Calibration Workgroup

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The tables in this section contain performance for estimating the marginal risk difference (mRD) using plasmode simulation.

Results

5-year self-harm or hospitalization

Table 1: **Plasmode data simulation: 5-year self-harm or hospitalization, regression functions are glms, oracle marginal risk difference (mRD)**. Relative performance of estimators with sample size n = 50,337 and 1000 simulation replications. Note: Bias, ESE, ASE, MAD, and RMSE scaled by a factor of 10 to facilitate comparisons across estimands. The value of the estimand is -0.017. ESE = empirical standard error, ASE = asymptotic standard error, MAD = mean absolute deviation, RMSE = root mean squared error, rRMSE = robust RMSE (using median bias and MAD), Oracle coverage = coverage of a confidence interval based on the ESE, Nominal coverage = coverage of a confidence interval based on the ASE.

Estimator	Mean bias	Median bias	ESE	ASE	MAD	RMSE	rRMSE	Nominal coverage	Oracle coverage	Power	Prop. completed
Benchmark model	-0.001	-0.001	0.028	0.028	0.027	0.028	0.027	0.941	0.946	1.000	100.0
Complete-case	0.012	0.012	0.041	0.040	0.043	0.042	0.045	0.943	0.950	0.981	100.0
Confounded model	-0.063	-0.062	0.027	0.027	0.025	0.069	0.067	0.342	0.360	1.000	100.0
IPW	0.006	0.007	0.043	0.042	0.042	0.043	0.043	0.944	0.954	0.978	100.0
Raking (vanilla)	0.006	0.006	0.030	0.029	0.027	0.03	0.028	0.938	0.941	0.999	99.2
MICE	0.004	0.004	0.030	0.028	0.027	0.029	0.027	0.926	0.946	0.999	100.0
MI-XGB	0.207	0.205	0.082	0.042	0.082	0.212	0.221	0.056	0.290	0.357	100.0
MI-RF	-0.026	-0.026	0.028	0.028	0.025	0.039	0.036	0.851	0.845	1.000	100.0
IPCW-TMLE-M	0.006	0.007	0.043	0.043	0.043	0.043	0.043	0.955	0.958	0.983	100.0
IPCW-TMLE-MTO	0.003	0.003	0.043	0.043	0.043	0.043	0.043	0.958	0.957	0.986	100.0

Table 2: **Plasmode data simulation: 5-year self-harm or hospitalization, regression functions are glms, census marginal risk difference (mRD)**. Relative performance of estimators with sample size n = 50,337 and 1000 simulation replications. Note: Bias, ESE, ASE, MAD, and RMSE scaled by a factor of 10 to facilitate comparisons across estimands. The value of the estimand is -0.016. ESE = empirical standard error, ASE = asymptotic standard error, MAD = mean absolute deviation, RMSE = root mean squared error, rRMSE = robust RMSE (using median bias and MAD), Oracle coverage = coverage of a confidence interval based on the ESE, Nominal coverage = coverage of a confidence interval based on the ASE.

Estimator	Mean bias	Median bias	ESE	ASE	MAD	RMSE	rRMSE	Oracle coverage	Nominal coverage	Power	Prop. completed
Benchmark model	-0.006	-0.005	0.028	0.028	0.026	0.028	0.027	0.940	0.934	1.000	100.0
Complete-case	0.001	0.002	0.041	0.040	0.043	0.04	0.043	0.953	0.946	0.981	100.0
Confounded model	-0.074	-0.073	0.027	0.027	0.025	0.079	0.077	0.192	0.179	1.000	100.0
IPW	-0.004	-0.004	0.043	0.042	0.042	0.042	0.042	0.948	0.942	0.978	100.0
Raking (vanilla)	-0.005	-0.005	0.030	0.029	0.027	0.03	0.028	0.939	0.935	0.999	99.2
MICE	-0.006	-0.007	0.030	0.028	0.027	0.029	0.028	0.938	0.930	0.999	100.0
MI-XGB	0.197	0.194	0.082	0.042	0.082	0.201	0.211	0.337	0.074	0.357	100.0
MI-RF	-0.037	-0.036	0.028	0.028	0.025	0.047	0.044	0.757	0.760	1.000	100.0
IPCW-TMLE-M	-0.005	-0.004	0.043	0.043	0.043	0.043	0.043	0.953	0.951	0.983	100.0
IPCW-TMLE-MTO	-0.008	-0.008	0.043	0.043	0.043	0.044	0.044	0.943	0.942	0.986	100.0

Table 3: **Plasmode data simulation: 5-year self-harm or hospitalization, regression functions are trees, oracle marginal risk difference (mRD)**. Relative performance of estimators with sample size n = 50,337 and 1000 simulation replications. Note: Bias, ESE, ASE, MAD, and RMSE scaled by a factor of 10 to facilitate comparisons across estimands. The value of the estimand is -0.008. ESE = empirical standard error, ASE = asymptotic standard error, MAD = mean absolute deviation, RMSE = root mean squared error, rRMSE = robust RMSE (using median bias and MAD), Oracle coverage = coverage of a confidence interval based on the ESE, Nominal coverage = coverage of a confidence interval based on the ASE. Estimators that are mismatched with the estimand (i.e., are estimating a different parameter) are emphasized using a star.

Estimator	Mean bias	Median bias	ESE	ASE	MAD	RMSE	rRMSE	Nominal coverage	Oracle coverage	Power	Prop. completed
Complete-case*	0.024	0.022	0.041	0.041	0.042	0.048	0.047	0.905	0.904	0.243	100.0
Confounded model*	-0.02	-0.02	0.027	0.027	0.026	0.034	0.033	0.888	0.879	0.947	100.0
IPW*	0.021	0.02	0.042	0.043	0.043	0.048	0.047	0.924	0.923	0.248	100.0
Raking (vanilla)*	0.016	0.016	0.030	0.030	0.029	0.034	0.033	0.920	0.917	0.531	99.3
MICE*	0.017	0.017	0.030	0.029	0.029	0.034	0.033	0.908	0.919	0.531	100.0
MI-XGB*	0.061	0.062	0.086	0.042	0.085	0.073	0.105	0.558	0.886	0.355	100.0
MI-RF*	0.001	0	0.028	0.029	0.027	0.029	0.027	0.956	0.949	0.758	100.0
IPCW-TMLE-M	0.014	0.013	0.037	0.043	0.036	0.046	0.039	0.964	0.924	0.267	100.0
IPCW-TMLE-MTO	-0.006	-0.006	0.037	0.042	0.037	0.042	0.037	0.972	0.953	0.516	100.0

Table 4: **Plasmode data simulation: 5-year self-harm or hospitalization, regression functions are trees, census marginal risk difference (mRD)**. Relative performance of estimators with sample size n = 50,337 and 1000 simulation replications. Note: Bias, ESE, ASE, MAD, and RMSE scaled by a factor of 10 to facilitate comparisons across estimands. The value of the estimand is -0.006. ESE = empirical standard error, ASE = asymptotic standard error, MAD = mean absolute deviation, RMSE = root mean squared error, rRMSE = robust RMSE (using median bias and MAD), Oracle coverage = coverage of a confidence interval based on the ESE, Nominal coverage = coverage of a confidence interval based on the ASE. Estimators that are mismatched with the estimand (i.e., are estimating a different parameter) are emphasized using a star.

Estimator	Mean bias	Median bias	ESE	ASE	MAD	RMSE	rRMSE	Oracle coverage	Nominal coverage	Power	Prop. completed
Benchmark model	0.001	0.000	0.028	0.029	0.027	0.029	0.027	0.949	0.952	0.569	100.0
Complete-case	0.009	0.008	0.041	0.041	0.042	0.042	0.042	0.951	0.951	0.243	100.0
Confounded model	-0.035	-0.035	0.027	0.027	0.026	0.044	0.043	0.746	0.755	0.947	100.0
IPW	0.007	0.005	0.042	0.043	0.043	0.043	0.043	0.949	0.948	0.248	100.0
Raking (vanilla)	0.001	0.001	0.030	0.030	0.029	0.03	0.029	0.947	0.950	0.531	99.3
MICE	0.002	0.003	0.030	0.029	0.029	0.029	0.029	0.945	0.941	0.531	100.0
MI-XGB	0.046	0.047	0.086	0.042	0.085	0.062	0.097	0.907	0.594	0.355	100.0
MI-RF	-0.014	-0.014	0.028	0.029	0.027	0.032	0.03	0.922	0.938	0.758	100.0
IPCW-TMLE-M*	0	-0.001	0.037	0.043	0.036	0.043	0.036	0.944	0.973	0.267	100.0
IPCW-TMLE-MTO*	-0.02	-0.021	0.037	0.042	0.037	0.046	0.042	0.923	0.955	0.516	100.0

1-year self-harm

Table 5: **Plasmode data simulation: 1-year self-harm or hospitalization, regression functions are glms, oracle marginal risk difference (mRD)**. Relative performance of estimators with sample size n = 50,337 and 1000 simulation replications. Note: Bias, ESE, ASE, MAD, and RMSE scaled by a factor of 10 to facilitate comparisons across estimands. The value of the estimand is 0.001. ESE = empirical standard error, ASE = asymptotic standard error, MAD = mean absolute deviation, RMSE = root mean squared error, rRMSE = robust RMSE (using median bias and MAD), Oracle coverage = coverage of a confidence interval based on the ESE, Nominal coverage = coverage of a confidence interval based on the ASE. Estimators that are mismatched with the estimand (i.e., are estimating a different parameter) are emphasized using a star.

Estimator	Mean bias	Median bias	ESE	ASE	MAD	RMSE	rRMSE	Nominal coverage	Oracle coverage	Power	Prop. completed
Benchmark model	0	0	0.008	0.008	0.008	0.008	0.008	0.937	0.947	0.173	98.6
Complete-case*	0	0	0.012	0.012	0.013	0.012	0.013	0.947	0.957	0.113	98.6
Confounded model*	-0.004	-0.004	0.008	0.008	0.008	0.008	0.009	0.920	0.925	0.087	98.6
IPW*	0	0	0.012	0.011	0.013	0.011	0.013	0.951	0.956	0.101	98.6
Raking (vanilla)*	0	0	0.008	0.008	0.009	0.008	0.009	0.950	0.952	0.148	99.2
MICE*	-0.001	-0.001	0.008	0.008	0.008	0.008	0.008	0.937	0.941	0.147	98.6
MI-RF*	0	0	0.008	0.008	0.008	0.008	0.008	0.947	0.942	0.150	98.6
IPCW-TMLE-M	0	0	0.012	0.011	0.012	0.011	0.012	0.952	0.954	0.106	100.0
IPCW-TMLE-MTO	0	0	0.011	0.011	0.012	0.011	0.012	0.950	0.953	0.102	100.0
r-IPCW-TMLE-MTO	0	0	0.011	0.011	0.012	0.011	0.012	0.947	0.950	0.105	100.0

Table 6: **Plasmode data simulation: 1-year self-harm or hospitalization, regression functions are glms, census marginal risk difference (mRD)**. Relative performance of estimators with sample size n = 50,337 and 1000 simulation replications. Note: Bias, ESE, ASE, MAD, and RMSE scaled by a factor of 10 to facilitate comparisons across estimands. The value of the estimand is 0.001. ESE = empirical standard error, ASE = asymptotic standard error, MAD = mean absolute deviation, RMSE = root mean squared error, rRMSE = robust RMSE (using median bias and MAD), Oracle coverage = coverage of a confidence interval based on the ESE, Nominal coverage = coverage of a confidence interval based on the ASE. Estimators that are mismatched with the estimand (i.e., are estimating a different parameter) are emphasized using a star.

Estimator	Mean bias	Median bias	ESE	ASE	MAD	RMSE	rRMSE	Oracle coverage	Nominal coverage	Power	Prop. completed
Benchmark model	0	0.000	0.008	0.008	0.008	0.008	0.008	0.944	0.937	0.178	98.6
Complete-case	0	0.000	0.012	0.012	0.013	0.012	0.013	0.956	0.948	0.113	98.6
Confounded model	-0.004	-0.004	0.008	0.008	0.008	0.008	0.009	0.922	0.918	0.087	98.6
IPW	0	-0.001	0.012	0.011	0.013	0.011	0.013	0.956	0.950	0.101	98.6
Raking (vanilla)	0	0.000	0.008	0.008	0.009	0.008	0.009	0.950	0.950	0.148	99.2
MICE	-0.001	-0.001	0.008	0.008	0.008	0.008	0.008	0.941	0.937	0.147	98.6
MI-RF	0	0.000	0.008	0.008	0.008	0.008	0.008	0.941	0.946	0.150	98.6
IPCW-TMLE-M*	0	0.000	0.012	0.011	0.012	0.011	0.012	0.954	0.953	0.106	100.0
IPCW-TMLE-MTO*	0	0.000	0.011	0.011	0.012	0.011	0.012	0.953	0.949	0.102	100.0
r-IPCW-TMLE-MTO*	0	-0.001	0.011	0.011	0.012	0.011	0.012	0.951	0.947	0.105	100.0

Table 7: **Plasmode data simulation: 1-year self-harm or hospitalization, regression functions are trees, oracle marginal risk difference (mRD)**. Relative performance of estimators with sample size n = 50,337 and 1000 simulation replications. Note: Bias, ESE, ASE, MAD, and RMSE scaled by a factor of 10 to facilitate comparisons across estimands. The value of the estimand is 0. ESE = empirical standard error, ASE = asymptotic standard error, MAD = mean absolute deviation, RMSE = root mean squared error, rRMSE = robust RMSE (using median bias and MAD), Oracle coverage = coverage of a confidence interval based on the ESE, Nominal coverage = coverage of a confidence interval based on the ASE. Estimators that are mismatched with the estimand (i.e., are estimating a different parameter) are emphasized using a star.

Estimator	Mean bias	Median bias	ESE	ASE	MAD	RMSE	rRMSE	Nominal coverage	Oracle coverage	Power	Prop. completed
Complete-case*	0.008	0.009	0.012	0.012	0.012	0.014	0.015	0.895	0.901	0.085	98.1
Confounded model*	0	0	0.008	0.008	0.007	0.008	0.007	0.950	0.943	0.062	98.1
IPW*	0.008	0.008	0.011	0.011	0.011	0.014	0.014	0.894	0.896	0.084	98.1
Raking (vanilla)*	0.008	0.008	0.008	0.009	0.008	0.011	0.011	0.866	0.846	0.084	98.1
MICE*	0.007	0.007	0.008	0.008	0.008	0.01	0.01	0.860	0.869	0.094	98.1
MI-RF*	0.006	0.006	0.008	0.008	0.007	0.01	0.01	0.887	0.867	0.073	98.1
IPCW-TMLE-M	0.006	0.006	0.011	0.012	0.011	0.013	0.012	0.940	0.916	0.035	100.0
IPCW-TMLE-MTO	0	0	0.010	0.011	0.010	0.011	0.01	0.967	0.946	0.047	100.0
r-IPCW-TMLE-MTO	0	0	0.011	0.011	0.011	0.011	0.011	0.958	0.944	0.045	100.0

Table 8: **Plasmode data simulation: 1-year self-harm or hospitalization, regression functions are trees, census marginal risk difference (mRD)**. Relative performance of estimators with sample size n = 50,337 and 1000 simulation replications. Note: Bias, ESE, ASE, MAD, and RMSE scaled by a factor of 10 to facilitate comparisons across estimands. The value of the estimand is 0. ESE = empirical standard error, ASE = asymptotic standard error, MAD = mean absolute deviation, RMSE = root mean squared error, rRMSE = robust RMSE (using median bias and MAD), Oracle coverage = coverage of a confidence interval based on the ESE, Nominal coverage = coverage of a confidence interval based on the ASE. Estimators that are mismatched with the estimand (i.e., are estimating a different parameter) are emphasized using a star.

Estimator	Mean bias	Median bias	ESE	ASE	MAD	RMSE	rRMSE	Oracle coverage	Nominal coverage	Power	Prop. completed
Benchmark model	0	0.000	0.008	0.008	0.008	0.008	0.008	0.954	0.954	0.052	98.1
Complete-case	0.005	0.005	0.012	0.012	0.012	0.013	0.013	0.928	0.925	0.085	98.1
Confounded model	-0.004	-0.004	0.008	0.008	0.007	0.009	0.008	0.922	0.924	0.062	98.1
IPW	0.004	0.005	0.011	0.011	0.011	0.012	0.012	0.933	0.929	0.084	98.1
Raking (vanilla)	0.004	0.004	0.008	0.009	0.008	0.009	0.009	0.920	0.938	0.084	98.1
MICE	0.003	0.003	0.008	0.008	0.008	0.009	0.008	0.931	0.923	0.094	98.1
MI-RF	0.003	0.003	0.008	0.008	0.007	0.008	0.008	0.939	0.943	0.073	98.1
IPCW-TMLE-M*	0.002	0.002	0.011	0.012	0.011	0.012	0.011	0.943	0.969	0.035	100.0
IPCW-TMLE-MTO*	-0.004	-0.003	0.010	0.011	0.010	0.012	0.011	0.932	0.951	0.047	100.0
r-IPCW-TMLE-MTO*	-0.004	-0.004	0.011	0.011	0.011	0.012	0.011	0.928	0.946	0.045	100.0