A comparison of design-based and model-based approaches for finite population spatial data – Supporting information.

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Recall the four sampling-analysis combinations from the simulated and real data: simple random sampling with design-based inference (SRS-DB), simple random sapling with model-based inference (SRS-MB), GRTS sampling with design-based inference (GRTS-DB), and GRTS sampling with model-based inference (GRTS-MB).

1. Simulated Data

For the simulated data, we considered 36 parameter configurations – the crossing of three sample sizes ($n = 50$, $n = 100$, $n = 200$), two location layouts (random and gridded), three proportions of dependent random error (DRE) (0%, 50%, 90%), and two response types (normal and skewed).

Next we present tables summarizing mean bias, RMSE, and interval coverage for all 36 simulation scenarios.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Normal	0%	50	-0.0112	0.1905	0.9490
SRS-MB	Gridded	Normal	0%	50	-0.0112	0.1930	0.9420
GRTS-DB	Gridded	Normal	0%	50	0.0005	0.1914	0.9170
GRTS-MB	Gridded	Normal	0%	50	0.0004	0.1922	0.9345

Table 1: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 1.

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Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Skewed	0%	50	-0.0048	0.1988	0.9110
SRS-MB	Gridded	Skewed	0%	50	-0.0110	0.2055	0.9045
GRTS-DB	Gridded	Skewed	0%	50	0.0025	0.1947	0.8710
GRTS-MB	Gridded	Skewed	0%	50	0.0004	0.1965	0.8955

Table 2: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 2.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Normal	0%	50	0.0031	0.1940	0.9425
SRS-MB	Random	Normal	0%	50	0.0045	0.1953	0.9395
GRTS-DB	Random	Normal	0%	50	-0.0004	0.1951	0.9065
GRTS-MB	Random	Normal	0%	50	-0.0002	0.1964	0.9295

Table 3: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 3.

2. National Lakes Assessment (Real) Data

Next we present tables summarizing mean bias, RMSE, and interval coverage for ZMMI and Hg ppb data.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Skewed	0%	50	0.0000	0.1861	0.9225
SRS-MB	Random	Skewed	0%	50	-0.0059	0.1932	0.9130
GRTS-DB	Random	Skewed	0%	50	0.0041	0.1910	0.8740
GRTS-MB	Random	Skewed	0%	50	0.0016	0.1941	0.8985

Table 4: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 4.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Normal	50%	50	-0.0013	0.1775	0.9460
SRS-MB	Gridded	Normal	50%	50	-0.0007	0.1617	0.9355
GRTS-DB	Gridded	Normal	50%	50	-0.0030	0.1501	0.9205
GRTS-MB	Gridded	Normal	50%	50	-0.0031	0.1472	0.9400

Table 5: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 5.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Skewed	50%	50	-0.0047	0.1891	0.9100
SRS-MB	Gridded	Skewed	50%	50	-0.0083	0.1787	0.8990
GRTS-DB	Gridded	Skewed	50%	50	-0.0041	0.1610	0.8995
GRTS-MB	Gridded	Skewed	50%	50	-0.0060	0.1605	0.9085

Table 6: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 6.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Normal	50%	50	0.0061	0.1744	0.9445
SRS-MB	Random	Normal	50%	50	0.0042	0.1615	0.9350
GRTS-DB	Random	Normal	50%	50	-0.0092	0.1513	0.9165
GRTS-MB	Random	Normal	50%	50	-0.0097	0.1507	0.9315

Table 7: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 7.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Skewed	50%	50	0.0014	0.1804	0.9195
SRS-MB	Random	Skewed	50%	50	-0.0051	0.1808	0.9065
GRTS-DB	Random	Skewed	50%	50	0.0021	0.1618	0.8880
GRTS-MB	Random	Skewed	50%	50	-0.0021	0.1624	0.9000

Table 8: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 8.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Normal	90%	50	0.0055	0.1621	0.9355
SRS-MB	Gridded	Normal	90%	50	0.0044	0.1137	0.9435
GRTS-DB	Gridded	Normal	90%	50	-0.0021	0.1072	0.9280
GRTS-MB	Gridded	Normal	90%	50	-0.0037	0.0960	0.9400

Table 9: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 9.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Skewed	90%	50	0.0007	0.1546	0.9345
SRS-MB	Gridded	Skewed	90%	50	-0.0011	0.1217	0.9130
GRTS-DB	Gridded	Skewed	90%	50	-0.0017	0.1129	0.9180
GRTS-MB	Gridded	Skewed	90%	50	-0.0039	0.1039	0.9205

Table 10: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 10.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Normal	90%	50	0.0058	0.1575	0.9470
SRS-MB	Random	Normal	90%	50	0.0045	0.1093	0.9445
GRTS-DB	Random	Normal	90%	50	-0.0017	0.1054	0.9295
GRTS-MB	Random	Normal	90%	50	-0.0011	0.0940	0.9410

Table 11: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 11.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Skewed	90%	50	-0.0022	0.1772	0.9305
SRS-MB	Random	Skewed	90%	50	-0.0046	0.1301	0.9180
GRTS-DB	Random	Skewed	90%	50	-0.0026	0.1250	0.9175
GRTS-MB	Random	Skewed	90%	50	-0.0026	0.1127	0.9225

Table 12: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 12.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Normal	0%	100	-0.0028	0.1352	0.9475
SRS-MB	Gridded	Normal	0%	100	-0.0026	0.1362	0.9405
GRTS-DB	Gridded	Normal	0%	100	-0.0011	0.1345	0.9210
GRTS-MB	Gridded	Normal	0%	100	-0.0010	0.1352	0.9445

Table 13: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 13.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Skewed	0%	100	-0.0001	0.1384	0.9210
SRS-MB	Gridded	Skewed	0%	100	-0.0024	0.1412	0.9150
GRTS-DB	Gridded	Skewed	0%	100	0.0082	0.1304	0.8945
GRTS-MB	Gridded	Skewed	0%	100	0.0077	0.1307	0.9155

Table 14: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 14.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Normal	0%	100	-0.0004	0.1339	0.9450
SRS-MB	Random	Normal	0%	100	-0.0007	0.1344	0.9435
GRTS-DB	Random	Normal	0%	100	0.0021	0.1315	0.9280
GRTS-MB	Random	Normal	0%	100	0.0019	0.1318	0.9460

Table 15: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 15.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Skewed	0%	100	0.0021	0.1322	0.9280
SRS-MB	Random	Skewed	0%	100	0.0005	0.1342	0.9280
GRTS-DB	Random	Skewed	0%	100	0.0043	0.1311	0.8990
GRTS-MB	Random	Skewed	0%	100	0.0039	0.1315	0.9230

Table 16: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 16.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Normal	50%	100	-0.0025	0.1207	0.9420
SRS-MB	Gridded	Normal	50%	100	-0.0007	0.1058	0.9425
GRTS-DB	Gridded	Normal	50%	100	0.0000	0.1003	0.9300
GRTS-MB	Gridded	Normal	50%	100	-0.0003	0.0993	0.9435

Table 17: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 17.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Skewed	50%	100	0.0023	0.1221	0.9315
SRS-MB	Gridded	Skewed	50%	100	0.0002	0.1135	0.9160
GRTS-DB	Gridded	Skewed	50%	100	0.0000	0.1113	0.9025
GRTS-MB	Gridded	Skewed	50%	100	-0.0019	0.1127	0.9175

Table 18: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 18.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Normal	50%	100	-0.0016	0.1214	0.9440
SRS-MB	Random	Normal	50%	100	-0.0001	0.1079	0.9440
GRTS-DB	Random	Normal	50%	100	-0.0012	0.1012	0.9235
GRTS-MB	Random	Normal	50%	100	-0.0010	0.0997	0.9380

Table 19: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 19.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Skewed	50%	100	0.0020	0.1188	0.9395
SRS-MB	Random	Skewed	50%	100	-0.0020	0.1097	0.9290
GRTS-DB	Random	Skewed	50%	100	0.0013	0.1104	0.9090
GRTS-MB	Random	Skewed	50%	100	-0.0002	0.1105	0.9235

Table 20: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 20.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Normal	90%	100	-0.0027	0.1083	0.9460
SRS-MB	Gridded	Normal	90%	100	-0.0003	0.0701	0.9440
GRTS-DB	Gridded	Normal	90%	100	-0.0013	0.0670	0.9325
GRTS-MB	Gridded	Normal	90%	100	-0.0013	0.0602	0.9425

Table 21: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 21.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Skewed	90%	100	-0.0015	0.1108	0.9345
SRS-MB	Gridded	Skewed	90%	100	-0.0038	0.0767	0.9265
GRTS-DB	Gridded	Skewed	90%	100	0.0018	0.0746	0.9270
GRTS-MB	Gridded	Skewed	90%	100	0.0004	0.0695	0.9280

Table 22: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 22.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Normal	90%	100	0.0002	0.1071	0.9490
SRS-MB	Random	Normal	90%	100	0.0011	0.0675	0.9475
GRTS-DB	Random	Normal	90%	100	0.0009	0.0651	0.9430
GRTS-MB	Random	Normal	90%	100	-0.0007	0.0570	0.9480

Table 23: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 23.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Skewed	90%	100	-0.0019	0.1165	0.9325
SRS-MB	Random	Skewed	90%	100	-0.0031	0.0757	0.9315
GRTS-DB	Random	Skewed	90%	100	0.0026	0.0751	0.9225
GRTS-MB	Random	Skewed	90%	100	0.0023	0.0671	0.9230

Table 24: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 24.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Normal	0%	200	0.0005	0.0891	0.9465
SRS-MB	Gridded	Normal	0%	200	0.0003	0.0894	0.9440
GRTS-DB	Gridded	Normal	0%	200	0.0032	0.0842	0.9520
GRTS-MB	Gridded	Normal	0%	200	0.0032	0.0843	0.9610

Table 25: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 25.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Skewed	0%	200	-0.0018	0.0894	0.9440
SRS-MB	Gridded	Skewed	0%	200	-0.0023	0.0895	0.9445
GRTS-DB	Gridded	Skewed	0%	200	0.0006	0.0891	0.9360
GRTS-MB	Gridded	Skewed	0%	200	0.0005	0.0892	0.9405

Table 26: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 26.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Normal	0%	200	0.0019	0.0905	0.9385
SRS-MB	Random	Normal	0%	200	0.0017	0.0907	0.9375
GRTS-DB	Random	Normal	0%	200	0.0008	0.0881	0.9400
GRTS-MB	Random	Normal	0%	200	0.0009	0.0882	0.9480

Table 27: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 27.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Skewed	0%	200	0.0007	0.0867	0.9400
SRS-MB	Random	Skewed	0%	200	0.0005	0.0869	0.9390
GRTS-DB	Random	Skewed	0%	200	-0.0011	0.0873	0.9345
GRTS-MB	Random	Skewed	0%	200	-0.0011	0.0873	0.9395

Table 28: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 28.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Normal	50%	200	-0.0016	0.0777	0.9520
SRS-MB	Gridded	Normal	50%	200	-0.0004	0.0678	0.9510
GRTS-DB	Gridded	Normal	50%	200	0.0036	0.0688	0.9330
GRTS-MB	Gridded	Normal	50%	200	0.0039	0.0679	0.9375

Table 29: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 29.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Skewed	50%	200	0.0013	0.0816	0.9400
SRS-MB	Gridded	Skewed	50%	200	0.0016	0.0747	0.9400
GRTS-DB	Gridded	Skewed	50%	200	0.0019	0.0698	0.9325
GRTS-MB	Gridded	Skewed	50%	200	0.0018	0.0691	0.9360

Table 30: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 30.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Normal	50%	200	0.0008	0.0816	0.9389
SRS-MB	Random	Normal	50%	200	0.0005	0.0713	0.9444
GRTS-DB	Random	Normal	50%	200	0.0005	0.0655	0.9474
GRTS-MB	Random	Normal	50%	200	0.0009	0.0643	0.9510

Table 31: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 31.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Skewed	50%	200	-0.0041	0.0789	0.9510
SRS-MB	Random	Skewed	50%	200	-0.0048	0.0729	0.9350
GRTS-DB	Random	Skewed	50%	200	-0.0001	0.0680	0.9400
GRTS-MB	Random	Skewed	50%	200	-0.0007	0.0679	0.9385

Table 32: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 32.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Normal	90%	200	-0.0011	0.0730	0.9450
SRS-MB	Gridded	Normal	90%	200	-0.0008	0.0418	0.9445
GRTS-DB	Gridded	Normal	90%	200	-0.0010	0.0418	0.9455
GRTS-MB	Gridded	Normal	90%	200	-0.0008	0.0376	0.9475

Table 33: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 33.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Gridded	Skewed	90%	200	0.0038	0.0768	0.9430
SRS-MB	Gridded	Skewed	90%	200	-0.0007	0.0475	0.9365
GRTS-DB	Gridded	Skewed	90%	200	0.0018	0.0482	0.9370
GRTS-MB	Gridded	Skewed	90%	200	0.0010	0.0423	0.9375

Table 34: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 34.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Normal	90%	200	0.0026	0.0713	0.9495
SRS-MB	Random	Normal	90%	200	0.0011	0.0408	0.9480
GRTS-DB	Random	Normal	90%	200	0.0016	0.0418	0.9450
GRTS-MB	Random	Normal	90%	200	0.0014	0.0368	0.9475

Table 35: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 35.

Approach	Layout	Response	DRE%	n	MB	RMSE	Coverage
SRS-DB	Random	Skewed	90%	200	0.0028	0.0708	0.9504
SRS-MB	Random	Skewed	90%	200	0.0011	0.0437	0.9414
GRTS-DB	Random	Skewed	90%	200	-0.0008	0.0431	0.9504
GRTS-MB	Random	Skewed	90%	200	-0.0001	0.0396	0.9419

Table 36: Sampling-inference combination (Approach), population layout (Layout), response type (Response), proportion of dependent random error (DRE%), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 36.

Approach	Response	n	MB	RMSE	Coverage
SRS-DB	Hg ppb	50	0.2539	12.9467	0.9215
SRS-MB	Hg ppb	50	0.0573	11.3760	0.9020
GRTS-DB	Hg ppb	50	-0.1880	10.5558	0.8970
GRTS-MB	Hg ppb	50	-0.5604	10.4434	0.9070

Table 37: Sampling-inference combination (Approach), response type (Response), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 1.

Approach	Response	n	MB	RMSE	Coverage
SRS-DB	ZMMI	50	0.0461	2.4502	0.9440
SRS-MB	ZMMI	50	0.0000	2.1477	0.9395
GRTS-DB	ZMMI	50	-0.0047	1.9953	0.9210
GRTS-MB	ZMMI	50	-0.1191	1.9608	0.9355

Table 38: Sampling-inference combination (Approach), response type (Response), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 2.

Approach	Response	n	MB	RMSE	Coverage
SRS-DB	Hg ppb	100	-0.1390	8.9667	0.9290
SRS-MB	Hg ppb	100	-0.4213	7.4820	0.9190
GRTS-DB	Hg ppb	100	0.0075	7.1415	0.9045
GRTS-MB	Hg ppb	100	-0.4156	7.0344	0.9230

Table 39: Sampling-inference combination (Approach), response type (Response), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 3.

Approach	Response	n	MB	RMSE	Coverage
SRS-DB	ZMMI	100	-0.0541	1.6901	0.9460
SRS-MB	ZMMI	100	-0.0942	1.3920	0.9445
GRTS-DB	ZMMI	100	-0.0066	1.3219	0.9205
GRTS-MB	ZMMI	100	-0.0968	1.2958	0.9450

Table 40: Sampling-inference combination (Approach), response type (Response), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 4.

Approach	Response	n	MB	RMSE	Coverage
SRS-DB	Hg ppb	200	-0.0876	5.9176	0.9450
SRS-MB	Hg ppb	200	-0.1775	4.6970	0.9400
GRTS-DB	Hg ppb	200	-0.0538	4.5051	0.9325
GRTS-MB	Hg ppb	200	-0.2762	4.3998	0.9410

Table 41: Sampling-inference combination (Approach), response type (Response), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 5.

Approach	Response	n	MB	RMSE	Coverage
SRS-DB	ZMMI	200	-0.0093	1.1311	0.9455
SRS-MB	ZMMI	200	-0.0736	0.9090	0.9450
GRTS-DB	ZMMI	200	0.0193	0.8524	0.9460
GRTS-MB	ZMMI	200	-0.0311	0.8280	0.9450

Table 42: Sampling-inference combination (Approach), response type (Response), sample size (n), mean bias (MB), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 6.