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	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 1.

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Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 2.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 3.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 4.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 5.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 6.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 7.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 8.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 9.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 10.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 11.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 12.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 13.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 14.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 15.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 16.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 17.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 18.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 19.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 20.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 21.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 22.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 23.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 24.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 25.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 26.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 27.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 28.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 29.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 30.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 31.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 32.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 33.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 34.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 35.

Approach	Layout	Response	DRE%	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in simulation scenario 36.

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

Approach	Response	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 1.

Approach	Response	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 2.

Approach	Response	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 3.

Approach	Response	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 4.

Approach	Response	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 5.

Approach	Response	n	MBias	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 (MBias), root-mean-squared error (RMSE), and 95% interval coverage (Coverage) in a data application scenario 6.