Supplementary Online Material Part 2

A Bayesian Approach for Summarizing and Modeling Time-Series Exposure Data with Left Censoring

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Table S1: Comparison of Bayesian and frequentist estimates for healthcare workers TVOC dataset

	Posteriors (proposed mod)			OLS		LME/AR(1)		LME/CAR(1)	
	mean	med	sd	Est	SE	Est	SE	Est	SE
Admin	4.72	4.48	0.129	4.79	0.030	4.15	0.146	4.74	0.120
Adminster Med	4.70	4.42	0.144	4.44	0.135	4.19	0.155	4.76	0.131
Area Prep	4.71	4.42	0.147	5.97	0.180	4.23	0.159	4.76	0.136
Bath Patnt	4.65	4.34	0.161	5.46	0.303	4.04	0.192	4.74	0.169
Blast Mat	4.25	3.58	0.327	4.72	0.940	3.73	0.300	4.42	0.300
Blood Draw	5.07	4.65	0.217	4.20	0.366	4.53	0.183	5.01	0.164
Buff Floor	4.78	4.50	0.147	6.70	0.181	4.22	0.161	4.80	0.137
Clean BathRm	4.77	4.51	0.137	4.89	0.154	4.21	0.155	4.79	0.130
Cleaning	4.74	4.48	0.134	4.68	0.066	4.16	0.148	4.73	0.122
Clean Spill	4.52	4.12	0.207	5.56	0.253	4.04	0.175	4.66	0.154
Clean Window	4.72	4.40	0.157	4.57	0.303	4.14	0.187	4.70	0.165
Collect Equip	4.76	4.45	0.156	4.06	0.251	4.18	0.190	4.73	0.169
Cut/Grind Mat	4.79	4.53	0.138	5.40	0.140	4.19	0.165	4.78	0.143
Dental Lab	4.80	4.54	0.139	5.93	0.162	4.23	0.168	4.82	0.145
Dental Lab Wax	4.86	4.58	0.144	5.66	0.189	4.22	0.194	4.81	0.172
Disinfect Machn	5.01	4.53	0.246	4.96	0.448	4.48	0.212	5.00	0.187
Drying	4.37	3.77	0.290	6.41	0.377	3.87	0.196	4.45	0.177
Empty Trash	4.77	4.52	0.136	4.59	0.087	4.24	0.149	4.81	0.124
Floor Strip	4.66	4.16	0.246	5.77	0.371	4.30	0.202	4.84	0.183
Hand Wash	4.76	4.49	0.140	4.38	0.341	4.18	0.172	4.76	0.150
Lab Work	4.69	4.43	0.139	4.16	0.097	4.12	0.157	4.71	0.132
Lunch Break	4.76	4.51	0.132	4.75	0.039	4.18	0.147	4.75	0.121
Mat Handle	4.73	4.34	0.204	4.96	0.310	4.31	0.188	4.74	0.169
Mix Product	4.77	4.43	0.169	5.14	0.366	4.46	0.184	4.71	0.164
Mop Floor	4.72	4.47	0.134	5.12	0.086	4.15	0.149	4.75	0.124
Oper Med Equip	4.62	4.28	0.175	4.18	0.246	4.15	0.174	4.76	0.150
Patient Care	4.75	4.49	0.137	4.78	0.060	4.16	0.149	4.71	0.124
Patnt Care Chart	4.74	4.50	0.130	4.77	0.056	4.19	0.147	4.76	0.122
Pour/Mix Prod	4.79	4.52	0.142	4.29	0.239	4.14	0.165	4.76	0.143
Prep Med Dialysis	4.78	4.47	0.165	4.83	0.219	4.10	0.173	4.69	0.151
Prep Proce Rm	4.61	4.27	0.169	4.60	0.200	4.01	0.168	4.62	0.146
Scope Clean	4.68	4.12	0.283	4.74	0.294	4.28	0.205	4.60	0.188
Sort Stock Delvr	4.70	4.45	0.131	4.52	0.071	4.14	0.148	4.72	0.123
Steril/Disinfe	4.77	4.49	0.150	5.73	0.160	4.21	0.158	4.78	0.134
Sweep/Vacm/Dust	4.70	4.42	0.142	5.04	0.170	4.17	0.158	4.74	0.133
Tear Down Equip	4.55	4.19	0.176	5.22	0.248	4.10	0.173	4.67	0.151
Training	5.43	4.61	0.414	5.79	0.310	4.99	0.316	4.85	0.310
Wash Equipment	4.70	4.42	0.146	5.69	0.142	4.17	0.166	4.68	0.143
Wipe WAlcoh	4.29	3.77	0.265	6.67	0.482	3.93	0.209	4.50	0.191

All coefficients represent statistics for natural-log-transformed concentrations.

Table S2: Comparison of Bayesian and frequentist estimates for healthcare workers TVOC dataset

Pearson	Post Mean	OLS	LME/AR-1	LME/CAR
Post Mean	1.00	-0.14	0.91	0.81
OSL	-0.14	1.00	-0.01	-0.17
LME/AR-1	0.91	-0.01	1.00	0.73
LME/CAR	0.81	-0.17	0.73	1.00

Spearman	Post Mean	OLS	LME/AR-1	LME/CAR
Post Mean	1.00	-0.01	0.66	0.72
OSL	-0.01	1.00	0.13	0.10
LME/AR-1	0.66	0.13	1.00	0.75
LME/CAR	0.72	0.10	0.75	1.00

Table S3: Posterior distribution statistics for healthcare workers TVOC dataset with instrument effects

		Task Means (α)					Task SDs (σ_e)		
	#	mean	sd	med	2.5%	97.5%	med	2.5%	97.5%
Admin	4748	4.63	0.32	4.64	3.99	5.26	0.482	0.469	0.497
Adminster Med	242	4.61	0.33	4.61	3.96	5.24	0.654	0.589	0.731
Area Prep	136	4.62	0.33	4.63	3.95	5.24	0.461	0.378	0.548
Bath Patnt	48	4.55	0.34	4.55	3.90	5.19	0.277	0.205	0.386
Blast Mat	5	4.17	0.43	4.18	3.27	5.06	0.552	0.259	1.256
Blood Draw	33	4.98	0.37	4.98	4.24	5.70	0.726	0.515	1.041
Buff Floor	135	4.69	0.33	4.70	4.04	5.35	0.555	0.476	0.648
Clean BathRm	187	4.68	0.33	4.69	4.04	5.33	0.337	0.283	0.402
Cleaning	1022	4.65	0.32	4.65	4.00	5.28	0.623	0.586	0.661
Clean Spill	69	4.43	0.37	4.42	3.70	5.15	0.985	0.801	1.217
Clean Window	48	4.63	0.33	4.64	3.95	5.28	0.320	0.242	0.435
Collect Equip	70	4.68	0.33	4.68	4.02	5.31	0.117	0.083	0.166
Cut/Grind Mat	226	4.70	0.32	4.71	4.03	5.33	0.156	0.136	0.181
Dental Lab	169	4.72	0.33	4.72	4.05	5.39	0.224	0.197	0.257
Dental Lab Wax	123	4.78	0.33	4.80	4.12	5.38	0.159	0.139	0.187
Disinfect Machn	22	4.92	0.39	4.91	4.21	5.71	0.725	0.502	1.046
Drying	31	4.28	0.42	4.29	3.47	5.12	1.198	0.892	1.677
Empty Trash	582	4.68	0.32	4.69	4.02	5.30	0.644	0.600	0.695
Floor Strip	32	4.58	0.38	4.58	3.86	5.34	0.958	0.719	1.304
Hand Wash	38	4.67	0.33	4.68	4.01	5.32	0.084	0.048	0.193
Lab Work	474	4.60	0.33	4.61	3.92	5.23	0.339	0.309	0.371
Lunch Break	2957	4.67	0.32	4.67	4.01	5.29	0.389	0.374	0.403
Mat Handle	46	4.63	0.36	4.62	3.86	5.29	0.815	0.658	1.040
Mix Product	33	4.68	0.34	4.68	4.04	5.36	0.344	0.208	0.611
Mop Floor	599	4.63	0.32	4.63	3.98	5.26	0.576	0.536	0.620
Oper Med Equip	73	4.53	0.34	4.53	3.85	5.18	0.606	0.454	0.785
Patient Care	1243	4.66	0.32	4.66	4.01	5.28	0.601	0.570	0.635
Patnt Care Chart	1415	4.65	0.32	4.66	4.01	5.28	0.354	0.337	0.374
Pour/Mix Prod	77	4.70	0.32	4.71	4.04	5.30	0.322	0.250	0.420
Prep Med Dialysis	92	4.70	0.34	4.70	4.03	5.36	0.580	0.488	0.707
Prep Proce Rm	110	4.52	0.34	4.52	3.85	5.14	0.661	0.555	0.788
Scope Clean	51	4.58	0.40	4.59	3.76	5.37	0.979	0.743	1.297
Sort Stock Delvr	866	4.61	0.32	4.62	3.98	5.23	0.394	0.366	0.424
Steril/Disinfe	172	4.69	0.33	4.69	4.01	5.32	0.814	0.709	0.932
Sweep/Vacm/Dust	152	4.61	0.33	4.63	3.95	5.26	0.457	0.378	0.548
Tear Down Equip	72	4.46	0.34	4.47	3.77	5.10	0.646	0.529	0.809
Training	46	5.35	0.49	5.35	4.40	6.30	1.101	0.830	1.496
Wash Equipment	220	4.60	0.33	4.61	3.93	5.24	0.285	0.251	0.328
Wipe WAlcoh	19	4.21	0.40	4.21	3.42	4.97	0.877	0.660	1.263

Instrument #101787	2700	0.00	0.00	0.00	0.00	0.00			
Instrument #101806	3314	-0.43	0.42	-0.43	-1.28	0.36			
Instrument #101813	1351	0.68	0.56	0.68	-0.47	1.75			
Instrument #101814	901	-0.07	0.62	-0.07	-1.29	1.14			
Instrument #101876	3385	0.42	0.44	0.41	-0.47	1.30			
Instrument #101882	3710	0.15	0.42	0.14	-0.64	1.00			
Instrument #901547	1323	-0.05	0.58	-0.05	-1.22	1.02			

Spline SD (σ_t)	1.68	1.65	1.73
Random Effect SD (σ_a)	1.82	1.65	2.01

All coefficients represent statistics for natural-log-transformed concentrations.

Table S4: Model Posterior Statistics for NSAM (by Source Enclosure)

		#	mean	sd	2.5%	median	97.5%
Task Means (α)	Prep scooping	9	4.3	0.18	3.9	4.3	4.6
	Receiving powder	135	3.7	0.05	3.6	3.7	3.8
	Scooping LiOH	5	4.2	0.21	3.8	4.2	4.6
	Scooping TiO2	9	4.2	0.18	3.9	4.2	4.6
	Shaking out baghouse	10	4.9	0.17	4.6	4.9	5.2
Covariate (β)	Source enclosure: Yes		0.5	0.15	0.2	0.5	0.8
Task SDs (σ_e)	Prep scooping				0.048	0.069	0.132
	Receiving powder				0.131	0.151	0.174
	Scooping LiOH				0.044	0.068	0.146
	Scooping TiO2				0.042	0.059	0.100
	Shaking out baghouse				0.049	0.073	0.127
Spline SD (σ_ζ)					0.261	0.318	0.398

All coefficients represent statistics for natural-log-transformed concentrations.

Table S5: Posterior distribution statistics for all nanoparticle datasets

Covariate Model:	***Source Enclosure***				
	Posterior Statistics				
CPC	mean	sd	2.5%ile	median	97.5%tile
(Intercept)*	10.41	0.22	10.01	10.41	10.86
Task: Receiving powder	-0.56	0.23	-1.02	-0.56	-0.13
Task: Scooping TiO2	-0.03	0.05	-0.14	-0.03	0.08
Task: Shaking out baghouse	0.52	0.29	-0.05	0.51	1.05
Source enclosure:Complete	0.07	0.14	-0.22	0.07	0.36
Task SD: Prep scooping			0.043	0.059	0.106
Task SD: Receiving powder			0.067	0.079	0.096
Task SD: Scooping TiO2			0.044	0.065	0.123
Task SD: Shaking out baghouse			0.060	0.081	0.121
Spline SD			0.482	0.578	0.713

Covariate Model:	***Enclosure Type***				
	Posterior Statistics				
CPC	mean	sd	2.5%ile	median	97.5%tile
(Intercept)*	10.46	0.22	9.99	10.46	10.85
Task: Receiving powder	-0.60	0.24	-1.03	-0.60	-0.11
Task: Scooping TiO2	-0.03	0.06	-0.13	-0.03	0.09
Task: Shaking out baghouse	0.45	0.30	-0.17	0.45	1.03
Enclosure Type: None	0.02	0.10	-0.17	0.02	0.20
Task SD: Prep scooping			0.042	0.060	0.102
Task SD: Receiving powder			0.067	0.079	0.096
Task SD: Scooping TiO2			0.044	0.064	0.126
Task SD: Shaking out baghouse			0.060	0.081	0.119
Spline SD			0.488	0.583	0.712

Nsam	mean	sd	2.5%ile	median	97.5%tile
(Intercept)*	4.26	0.18	3.92	4.26	4.61
Task: Receiving powder	-0.60	0.18	-0.95	-0.61	-0.28
Task: Scooping LiOH	-0.04	0.13	-0.27	-0.04	0.23
Task: Scooping TiO2	-0.01	0.05	-0.12	-0.01	0.09
Task: Shaking out baghouse	0.64	0.25	0.18	0.63	1.13
Source enclosure:Complete	0.46	0.15	0.16	0.45	0.76
Task SD: Prep scooping			0.048	0.069	0.132
Task SD: Receiving powder			0.131	0.151	0.174
Task SD: Scooping LiOH			0.044	0.068	0.146
Task SD: Scooping TiO2			0.042	0.059	0.100
Task SD: Shaking out baghouse			0.049	0.073	0.127
Spline SD			0.261	0.318	0.398

Nsam	mean	sd	2.5%ile	median	97.5%tile
(Intercept)*	4.71	0.12	4.49	4.71	4.95
Task: Receiving powder	-1.03	0.13	-1.29	-1.02	-0.77
Task: Scooping LiOH	-0.02	0.14	-0.30	-0.02	0.25
Task: Scooping TiO2	-0.01	0.06	-0.13	-0.01	0.10
Task: Shaking out baghouse	0.10	0.30	-0.48	0.10	0.69
Enclosure Type: None	0.09	0.18	-0.25	0.08	0.45
Task SD: Prep scooping			0.048	0.071	0.129
Task SD: Receiving powder			0.130	0.151	0.175
Task SD: Scooping LiOH			0.045	0.067	0.138
Task SD: Scooping TiO2			0.041	0.059	0.102
Task SD: Shaking out baghouse			0.050	0.073	0.125
Spline SD			0.286	0.349	0.421

OPC	mean	sd	2.5%ile	median	97.5%tile
(Intercept)*	4.59	0.20	4.19	4.57	4.95
Task: Receiving powder	1.41	0.20	1.03	1.43	1.81
Task: Scooping LiOH	0.51	0.33	-0.15	0.51	1.18
Task: Scooping TiO2	0.01	0.07	-0.12	0.00	0.16
Task: Shaking out baghouse	0.39	0.23	-0.04	0.39	0.82
Source enclosure:Complete	-0.49	0.13	-0.73	-0.49	-0.22
Task SD: Prep scooping			0.045	0.071	0.153
Task SD: Receiving powder			0.076	0.087	0.101
Task SD: Scooping LiOH			0.246	0.465	0.990
Task SD: Scooping TiO2			0.049	0.080	0.164
Task SD: Shaking out baghouse			0.109	0.143	0.198
Spline SD			0.328	0.393	0.482

OPC	mean	sd	2.5%ile	median	97.5%tile
(Intercept)*	4.11	0.14	3.83	4.11	4.38
Task: Receiving powder	1.84	0.15	1.54	1.84	2.12
Task: Scooping LiOH	0.47	0.34	-0.18	0.47	1.16
Task: Scooping TiO2	0.01	0.08	-0.14	0.00	0.18
Task: Shaking out baghouse	0.73	0.22	0.32	0.73	1.18
Enclosure Type: None	0.13	0.11	-0.08	0.12	0.33
Task SD: Prep scooping			0.045	0.070	0.161
Task SD: Receiving powder			0.075	0.088	0.104
Task SD: Scooping LiOH			0.225	0.450	1.006
Task SD: Scooping TiO2			0.050	0.080	0.172
Task SD: Shaking out baghouse			0.108	0.144	0.200
Spline SD			0.356	0.426	0.514

SMPS	mean	sd	2.5%ile	median	97.5%tile
(Intercept)*	10.09	0.21	9.74	10.06	10.51
Task: Receiving powder	-0.74	0.22	-1.16	-0.71	-0.33
Task: Scooping LiOH	0.04	0.15	-0.26	0.04	0.32
Task: Scooping TiO2	-0.03	0.05	-0.12	-0.03	0.08
Task: Shaking out baghouse	0.42	0.27	-0.13	0.43	0.93
Source enclosure:Complete	0.08	0.11	-0.14	0.08	0.28
Task SD: Prep scooping			0.042	0.061	0.112
Task SD: Receiving powder			0.050	0.058	0.067
Task SD: Scooping LiOH			0.045	0.068	0.144
Task SD: Scooping TiO2			0.042	0.059	0.102
Task SD: Shaking out baghouse			0.165	0.224	0.341
Spline SD			0.470	0.555	0.660

SMPS	mean	sd	2.5%ile	median	97.5%tile
(Intercept)*	10.09	0.15	9.78	10.09	10.38
Task: Receiving powder	-0.72	0.15	-1.01	-0.72	-0.37
Task: Scooping LiOH	0.05	0.15	-0.27	0.06	0.34
Task: Scooping TiO2	-0.03	0.05	-0.13	-0.03	0.08
Task: Shaking out baghouse	0.40	0.23	-0.07	0.40	0.85
Enclosure Type: None	0.00	0.07	-0.13	0.00	0.14
Task SD: Prep scooping			0.043	0.060	0.111
Task SD: Receiving powder			0.050	0.057	0.067
Task SD: Scooping LiOH			0.046	0.071	0.148
Task SD: Scooping TiO2			0.042	0.059	0.102
Task SD: Shaking out baghouse			0.165	0.225	0.331
Spline SD			0.474	0.557	0.671

* Reference Task = Prep scooping. All coefficients represent statistics for natural-log-transformed concentrations.

Table S6: Frequentist estimates for nanoparticle data sets

Covariate Model:	***Source Enclosure***			
CPC	OLS	RI	CAR	ARMA
(Intercept)*	9.96	9.96	10.45	10.11
Task: Receiving powder	-0.17	-0.17	-0.46	0.06
Task: Scooping TiO2	0.04	0.04	-0.02	-0.01
Task: Shaking out baghouse	0.94	0.94	0.38	0.28
Source enclosure:Complete	0.46	0.46	0.02	-0.33
sigma	0.460	0.460	0.586	0.140
ARMA(p,q)				(3,4)
Durbin-Watson p value	<0.0001	<0.0001	<0.0001	0.49

Covariate Model:	***Enclosure Type***			
CPC	OLS	RI	CAR	ARMA
(Intercept)*	10.42	10.42	10.47	9.98
Task: Receiving powder	-0.61	-0.61	-0.47	0.10
Task: Scooping TiO2	0.04	0.04	-0.02	-0.01
Task: Shaking out baghouse	0.11	0.11	0.36	0.52
Enclosure Type: None	0.37	0.37	0.01	-0.03
sigma	0.470	0.470	0.584	0.141
ARMA(p,q)				(5, 4)
Durbin-Watson p value	<0.0001	<0.0001	<0.0001	0.30

Nsam	OLS	RI	CAR	ARMA
(Intercept)*	4.16	4.16	4.61	4.45
Task: Receiving powder	-0.51	-0.51	-0.90	-0.62
Task: Scooping LiOH	-0.21	-0.21	-0.02	0.07
Task: Scooping TiO2	-0.20	-0.20	-0.02	0.00
Task: Shaking out baghouse	0.80	0.80	0.33	0.03
Source enclosure:Complete	0.65	0.65	0.14	0.02
sigma	0.298	0.298	0.353	0.141
ARMA(p,q)				(8,4)
Durbin-Watson p value	<0.0001	<0.0001	<0.0001	0.42

Nsam	OLS	RI	CAR	ARMA
(Intercept)*	4.80	4.80	4.75	4.47
Task: Receiving powder	-1.12	-1.12	-1.03	-0.64
Task: Scooping LiOH	-0.21	-0.21	-0.01	0.07
Task: Scooping TiO2	-0.20	-0.20	-0.02	0.00
Task: Shaking out baghouse	-0.45	-0.45	0.16	0.00
Enclosure Type: None	0.60	0.60	0.03	0.02
sigma	0.329	0.329	0.371	0.141
ARMA(p,q)				(8, 4)
Durbin-Watson p value	<0.0001	<0.0001	<0.0001	0.42

OPC	OLS	RI	CAR	ARMA
(Intercept)*	4.51	4.51	4.81	5.20
Task: Receiving powder	1.51	1.51	0.85	0.79
Task: Scooping LiOH	0.86	0.86	0.14	0.47
Task: Scooping TiO2	0.25	0.25	0.01	0.10
Task: Shaking out baghouse	0.45	0.45	0.16	0.25
Source enclosure:Complete	-0.55	-0.55	-0.28	-1.10
sigma	0.298	0.298	0.775	0.182
ARMA(p,q)				(4,3)
Durbin-Watson p value	<0.0001	<0.0001	<0.0001	0.75

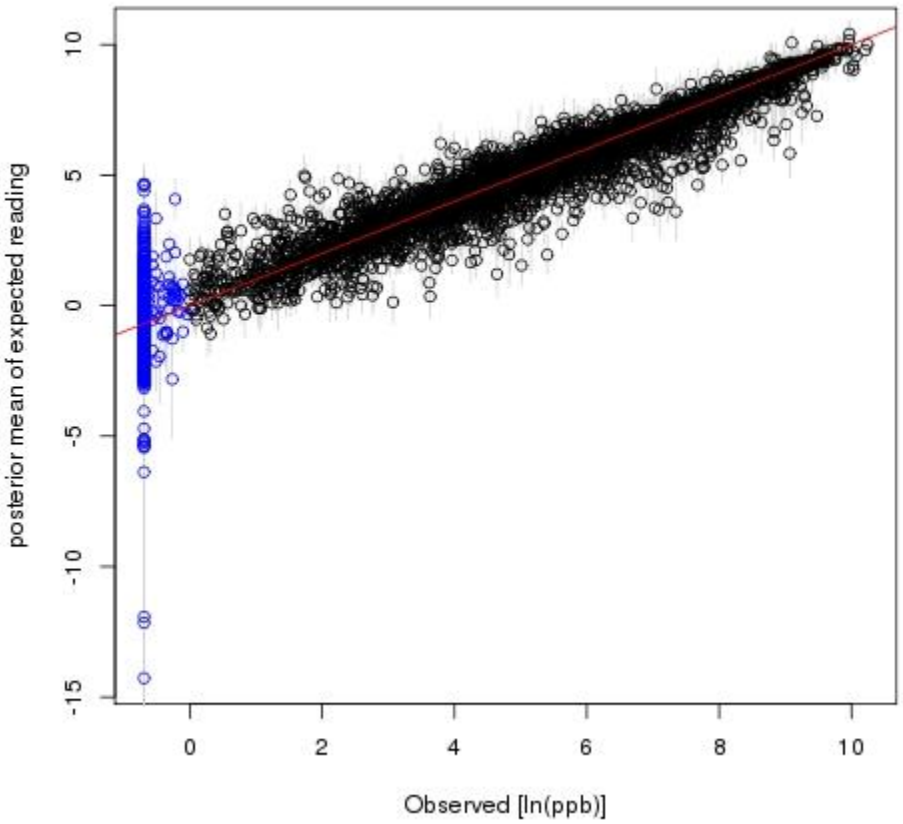
OPC	OLS	RI	CAR	ARMA
(Intercept)*	3.97	3.97	4.58	4.35
Task: Receiving powder	2.02	2.02	0.87	1.44
Task: Scooping LiOH	0.86	0.86	0.13	0.32
Task: Scooping TiO2	0.25	0.25	0.01	0.01
Task: Shaking out baghouse	0.64	0.64	0.24	1.19
Enclosure Type: None	0.36	0.36	0.16	0.20
sigma	0.319	0.319	1.031	0.195
ARMA(p,q)				(3, 3)
Durbin-Watson p value	<0.0001	<0.0001	<0.0001	0.71

SMPS	OLS	RI	CAR	ARMA
(Intercept)*	9.37	9.37	10.06	9.50
Task: Receiving powder	-0.06	-0.06	-0.63	0.11
Task: Scooping LiOH	0.24	0.24	0.05	0.04
Task: Scooping TiO2	0.06	0.06	-0.02	-0.01
Task: Shaking out baghouse	1.12	1.12	0.37	0.83
Source enclosure:Complete	0.64	0.64	0.04	0.08
sigma	0.489	0.489	0.572	0.148
ARMA(p,q)				(7,4)
Durbin-Watson p value	<0.0001	<0.0001	<0.0001	0.57

SMPS	OLS	RI	CAR	ARMA
(Intercept)*	10.01	10.01	10.10	9.59
Task: Receiving powder	-0.66	-0.66	-0.66	-0.01
Task: Scooping LiOH	0.24	0.24	0.05	0.06
Task: Scooping TiO2	0.06	0.06	-0.02	-0.01
Task: Shaking out baghouse	-0.02	-0.02	0.33	0.74
Enclosure Type: None	0.50	0.50	0.00	0.01
sigma	0.507	0.507	0.575	0.156
ARMA(p,q)				(4, 2)
Durbin-Watson p value	<0.0001	<0.0001	<0.0001	0.34

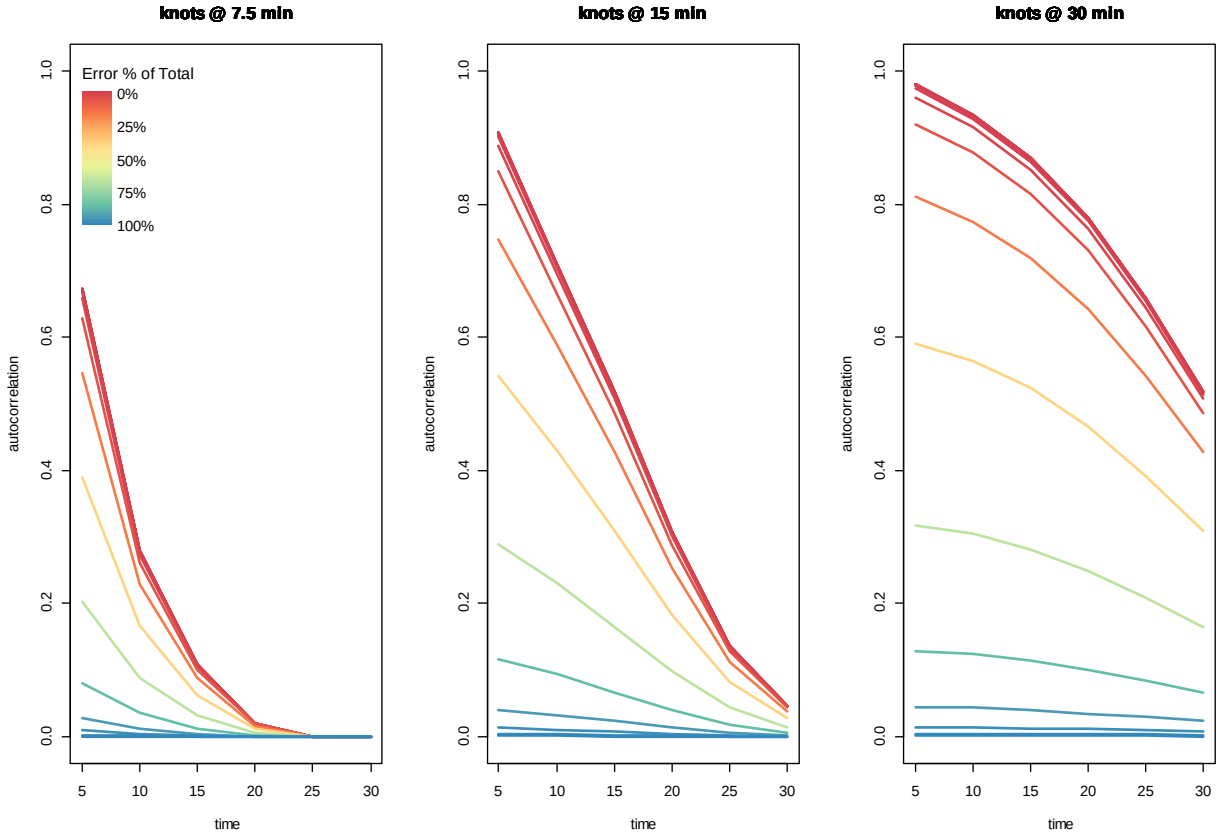
All coefficients represent statistics for natural-log-transformed concentrations.

Figure S1: Observed vs. predicted for healthcare workers TVOC dataset



Note: vertical lines show 95% credible intervals. Red line represents the identity. LOD data shown in blue, with "observed" set at LOD/2.

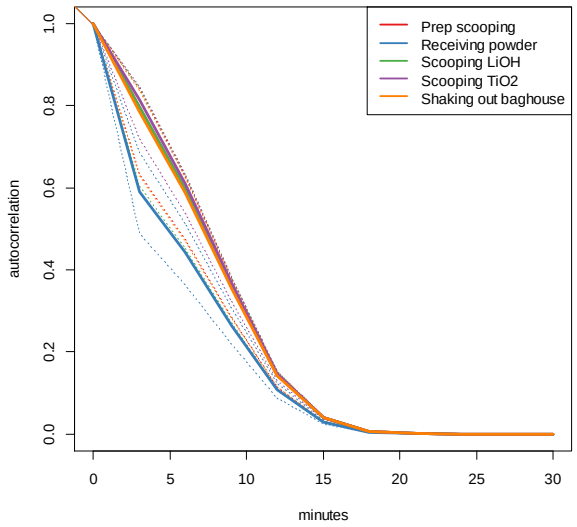
Figure S2: Autocorrelation Profiles for Different Knot Configurations and Different Variance Components



Plots show autocorrelation profiles, $autocorr = \sigma_\zeta^2 \mathbf{b}(0)^{\mathrm{T}} \mathbf{b}(t) / \{\sigma_\zeta^2 \mathbf{b}(0)^{\mathrm{T}} \mathbf{b}(t) + \sigma_e^2\}$, for different knot configurations. Here, time 0 is 12 noon, time t (x-axis) is the number of minutes past noon, and the B-spline basis is constructed for 60 minutes centered at noon and boundaries at midnight (on either side). Thus, the middle panel is based on the same B-spline basis used for our primary data example (healthcare TVOCs). As shown in the left panel legend, line color represents the fraction of total variation contributed by σ_e^2, i.e. $autocorr = \sigma_e^2 / \{\sigma_\zeta^2 \mathbf{b}(0)^{\mathrm{T}} \mathbf{b}(0) + \sigma_e^2\}$. In these knot configurations, $\mathbf{b}(0)^{\mathrm{T}} \mathbf{b}(0)$ ranged from 0.43 to 0.47.

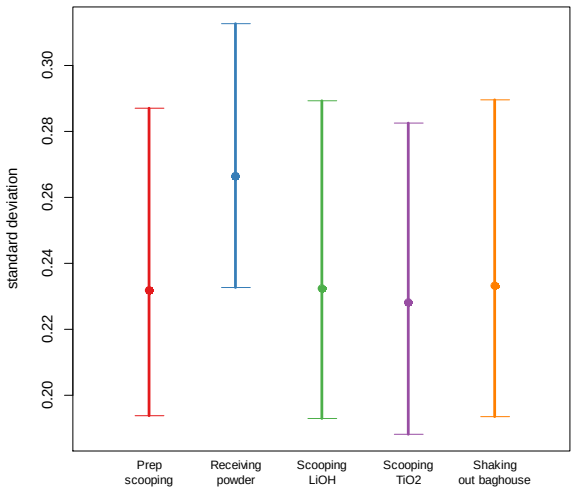
Figure S3: Autocorrelation Profiles for NSAM Data Set

Autocorrelation



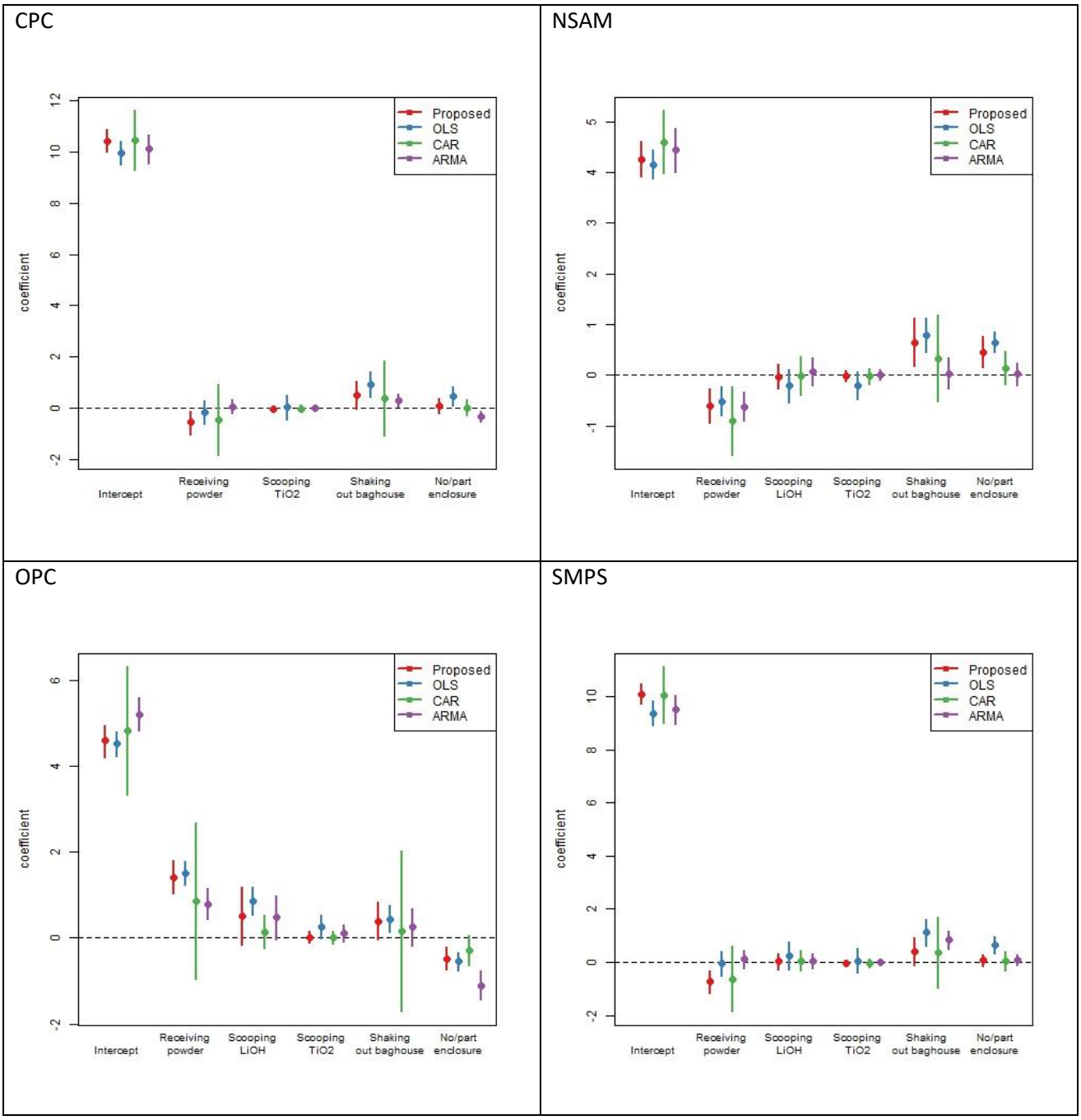
Note: Dashed lines indicate 95% credible intervals.

Standard Deviation



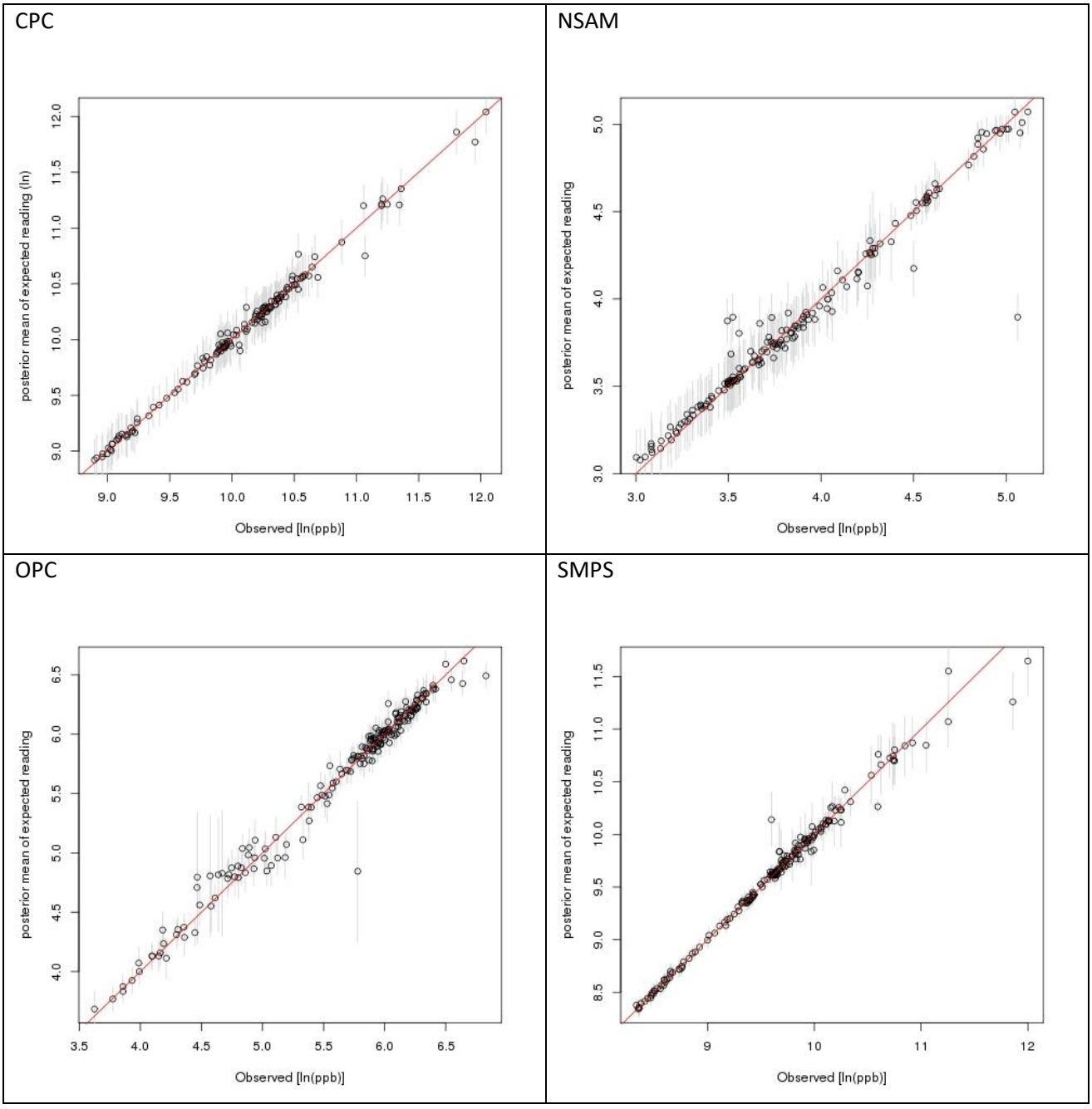
Note: vertical lines show 95% credible intervals; dots show posterior median.

Figure S4: Comparison with Frequentist Methods



Note: vertical lines show 95% credible intervals (proposed method) or 95% confidence intervals (frequentist methods); dots show posterior mean (proposed method) or estimates (frequentist methods).

Figure S5: Observed vs. predicted for nanoparticle models (with *Source Enclosure* covariate)



Note: vertical lines show 95% credible intervals. Red line represents the identity.

Figure S6: Example Time Series - NSAM data set, Baghouse location, March 16, 2006

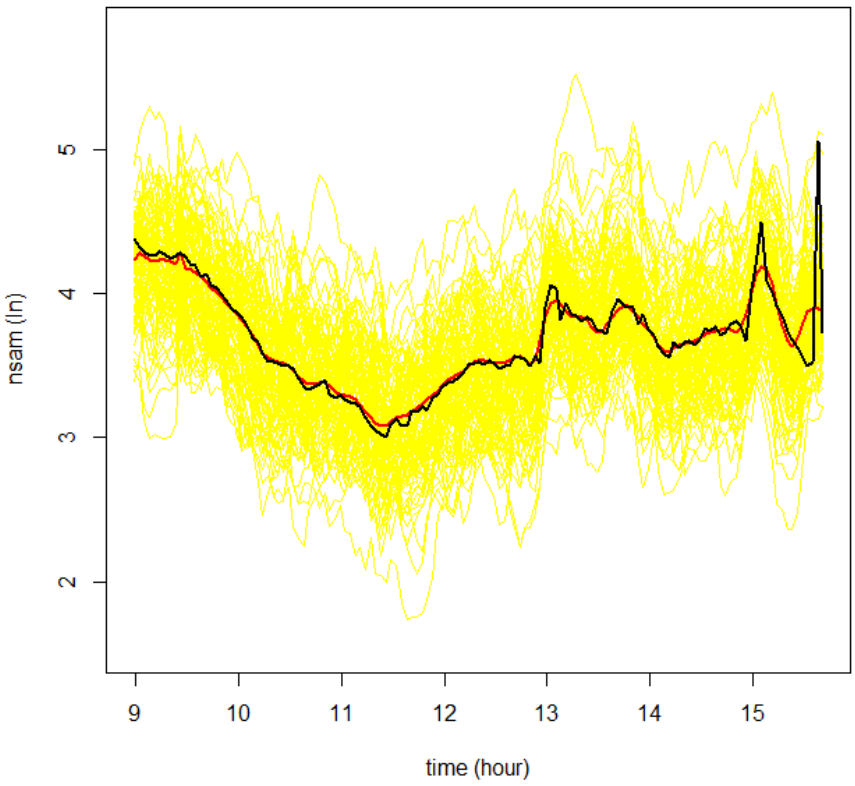


Figure S7: Percent of left-censored values in simulation experiments

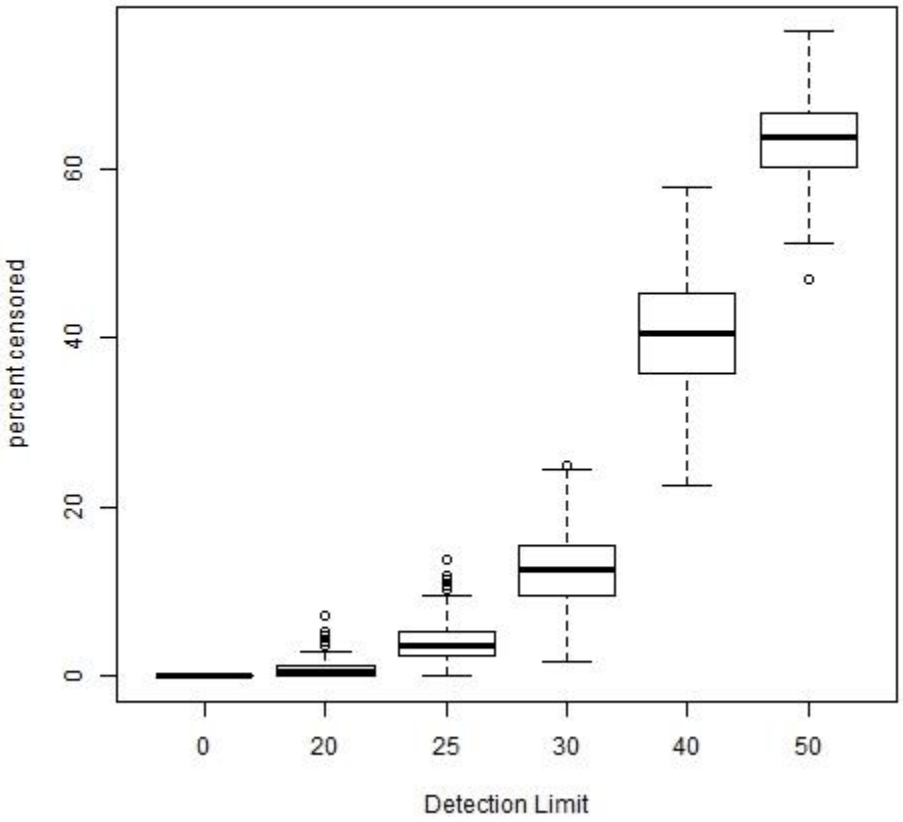
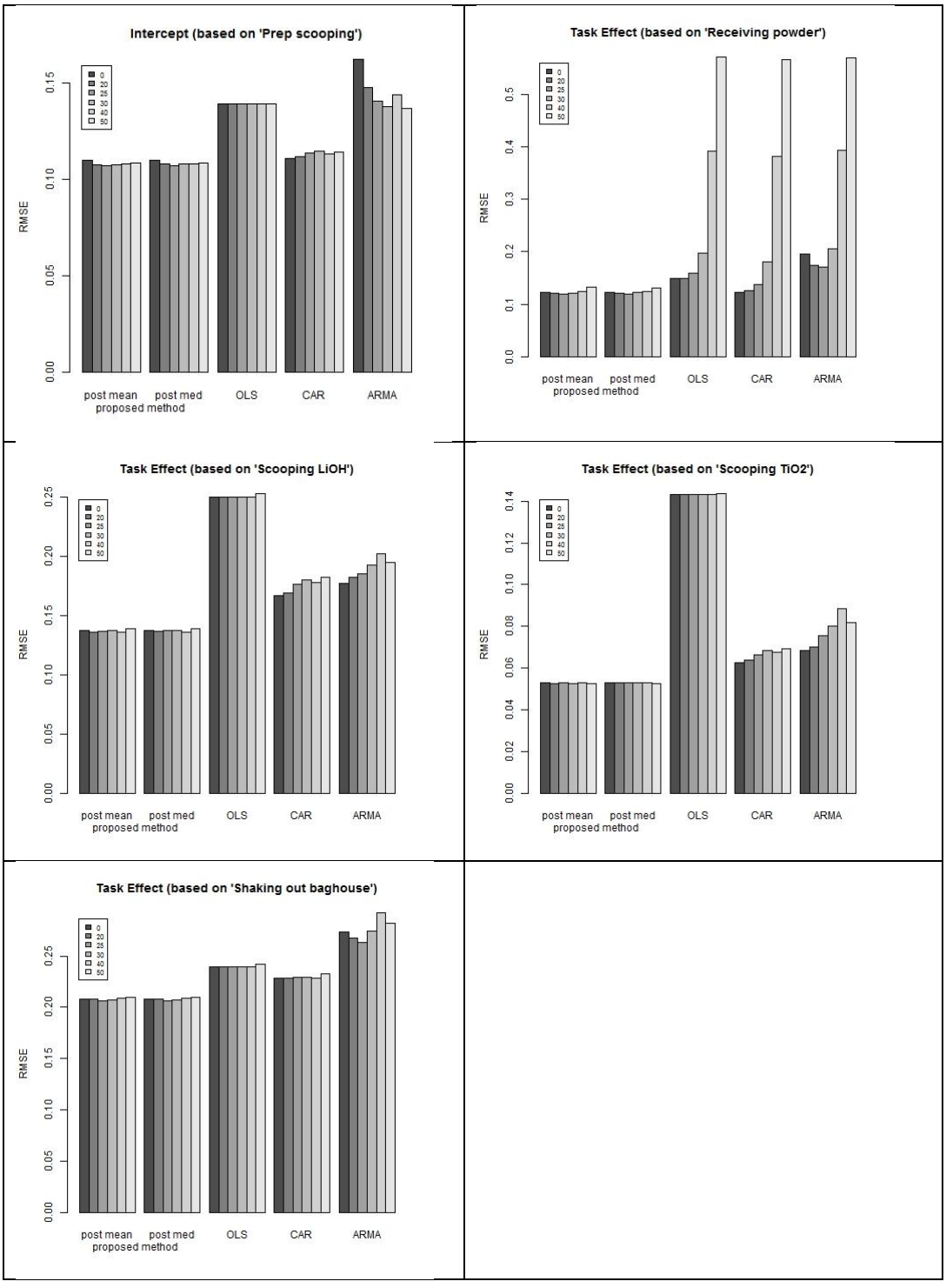


Figure S8: Root-mean-square-error for simulation experiment



Note: shading represents detection limit used in simulation.

Figure S9: Interval coverage for simulation experiment

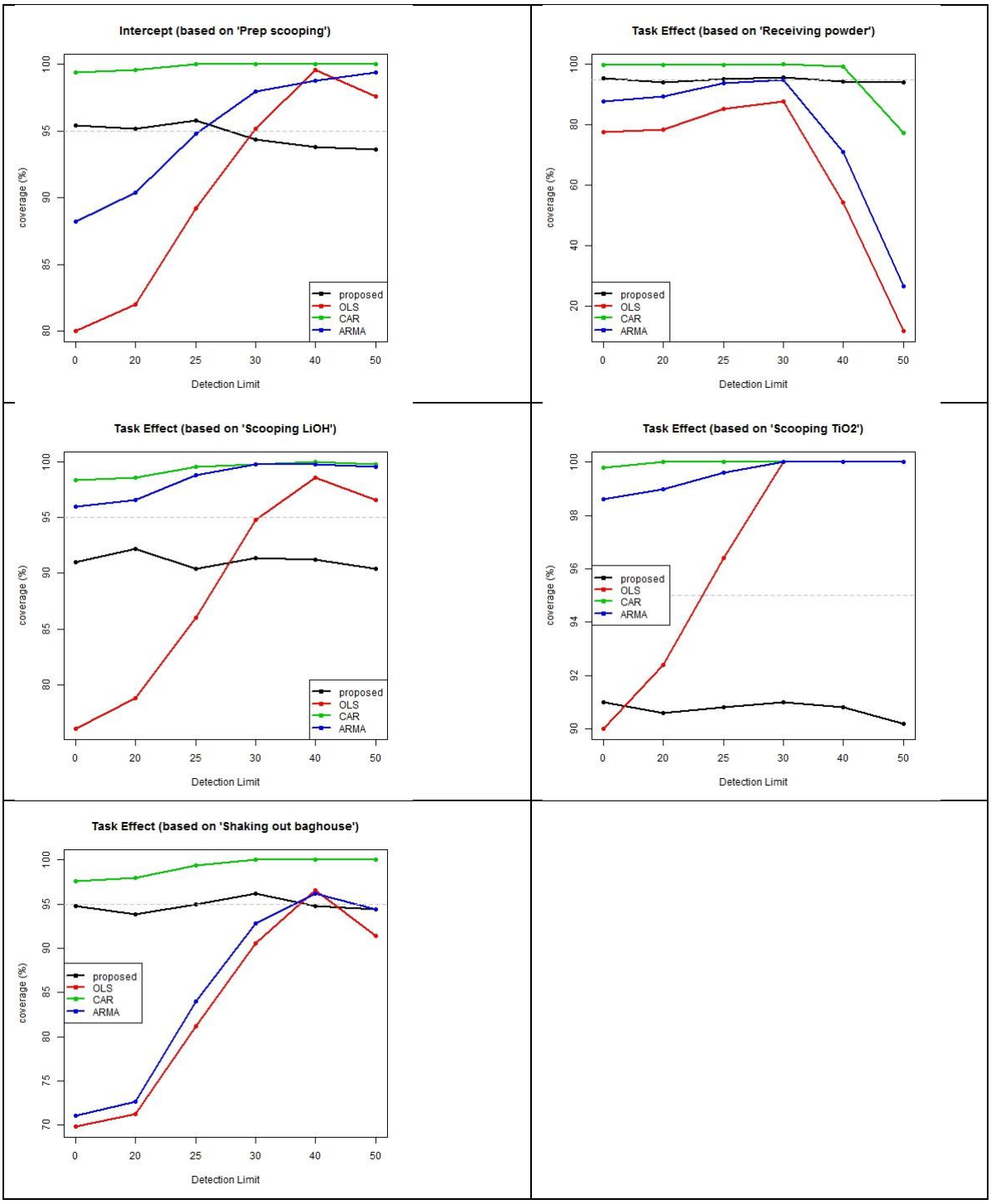


Figure S10: Ratio of standard error or posterior standard deviation to simulation standard deviation

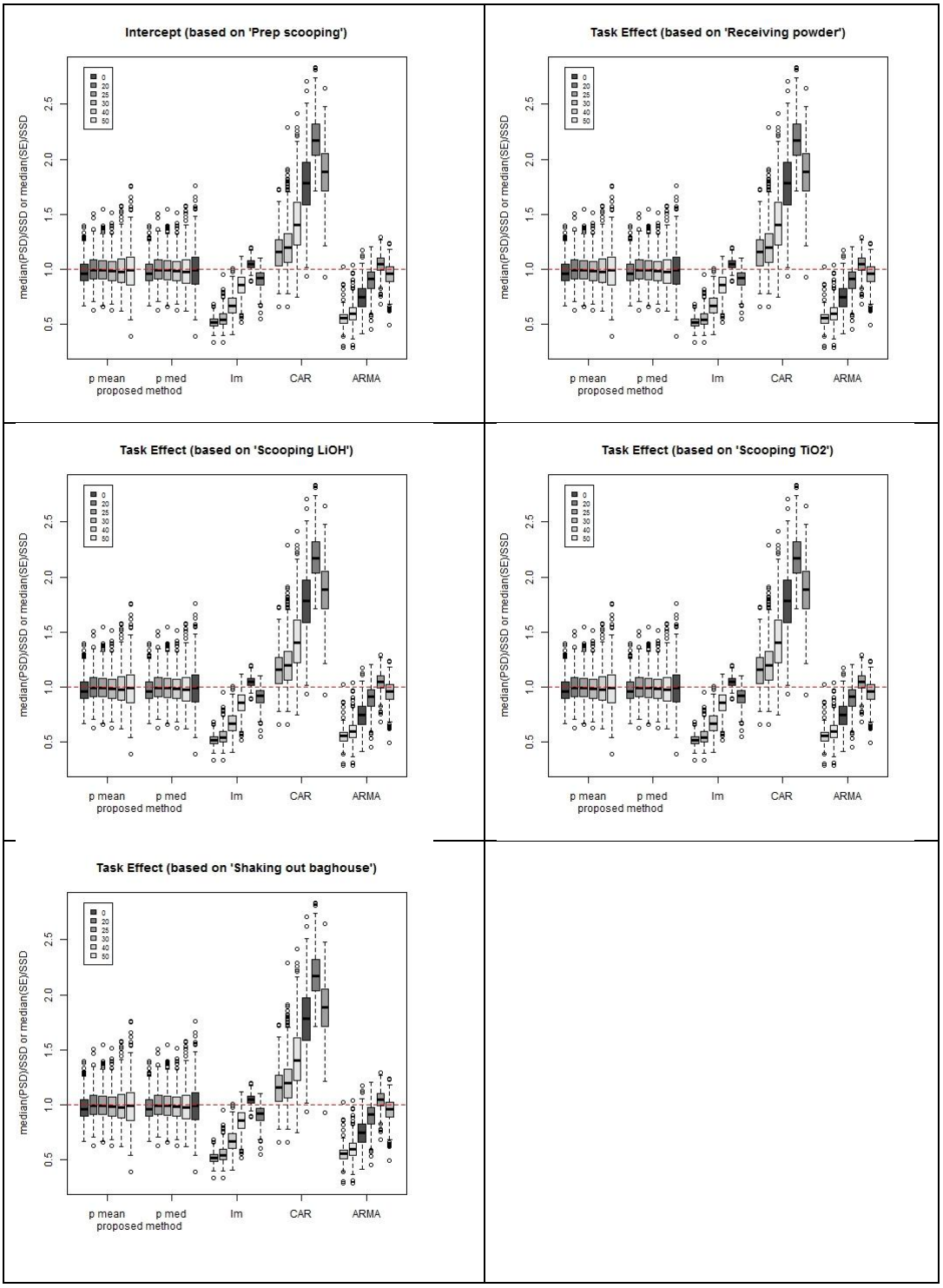


Figure S11: Root-mean-square-error for simulation experiment with AR(1) errors

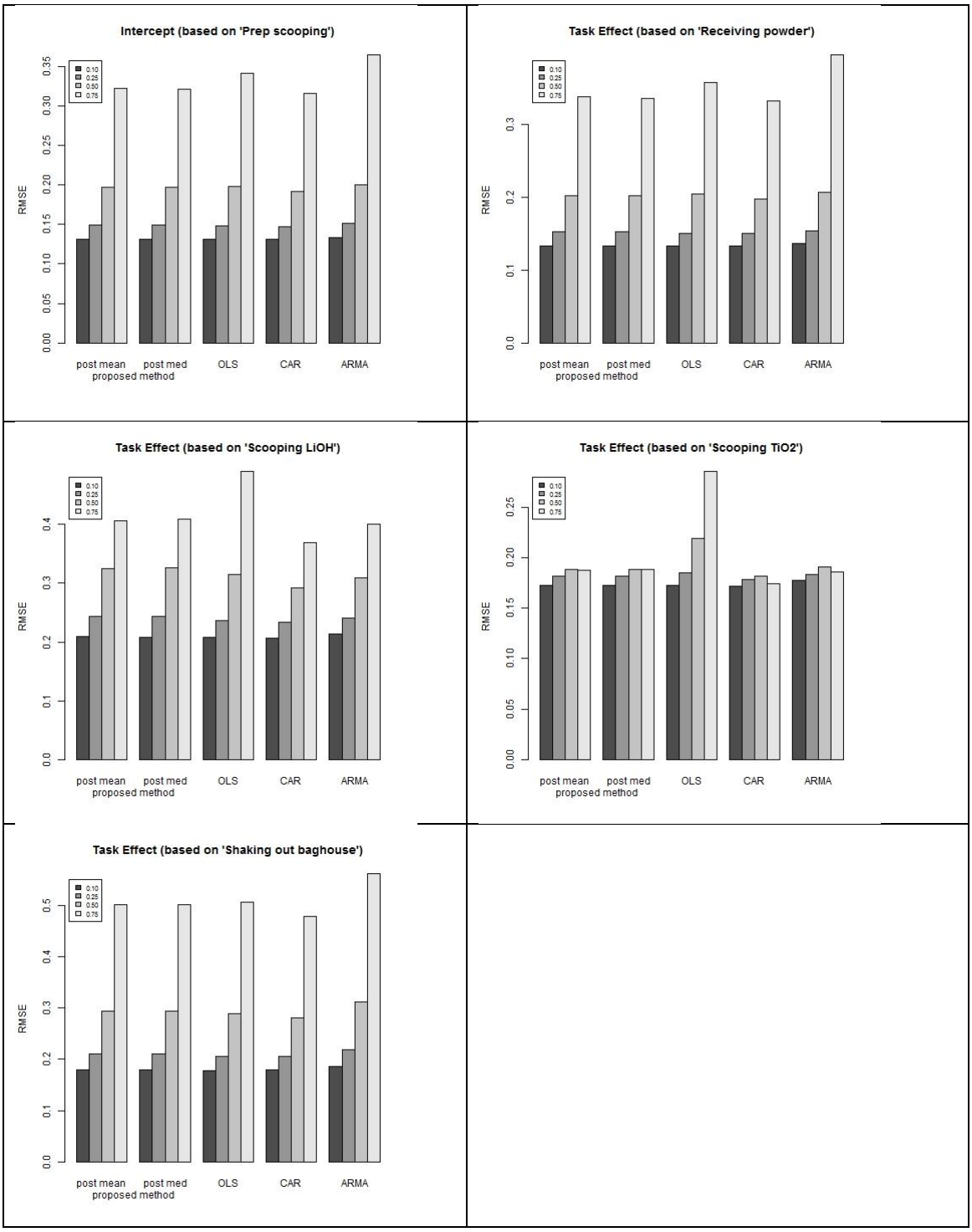


Figure S12: Interval coverage for simulation experiment with AR(1) and AR(2) errors

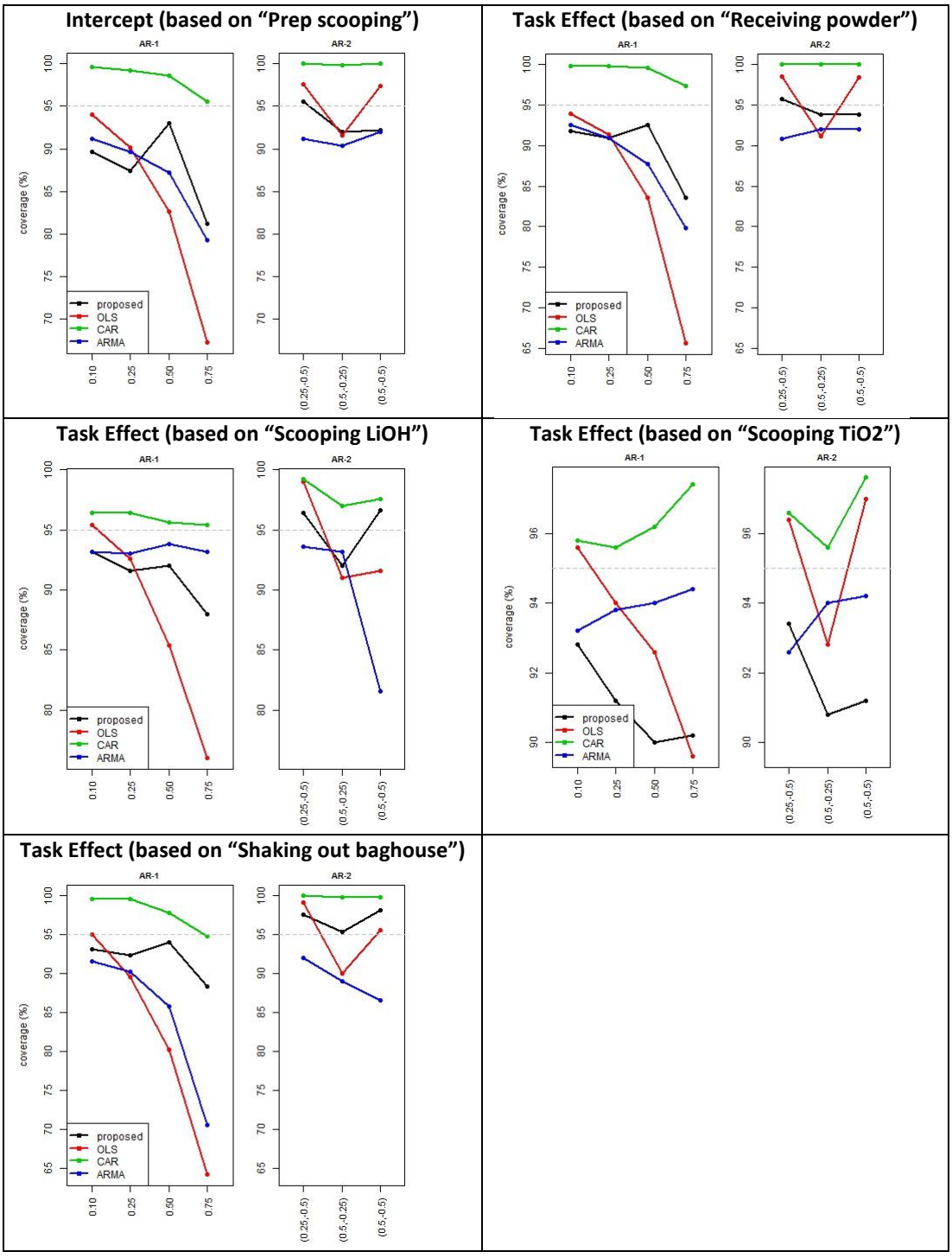


Figure S13: Ratio of standard error or posterior standard deviation to simulation standard deviation for simulation experiment with AR(1) and AR(2) errors