

Parameterizing Spatial Models of Infectious Disease Transmission that Incorporate Infection Time Uncertainty Using Sampling-Based Likelihood Approximations

Rajat Malik¹, Rob Deardon^{1,2,3}, Grace P.S. Kwong³

1 Department of Mathematics & Statistics, University of Guelph, Guelph, Ontario, Canada

2 Faculty of Veterinary Medicine, University of Calgary, Calgary, Alberta, Canada

3 Department of Mathematics & Statistics, University of Calgary, Calgary, Alberta, Canada

Supporting Information

S1 Table. Summary statistics for the simulation studies.

Parameter	ρ	m	$E(\cdot x)$	$V(\cdot x)$	Bias [$E(\cdot x)$]	95% CI
α	—	—	1.46	0.05	0.06	[1.05, 1.87]
	0.25	—	0.84	0.16	-0.61	[0.18, 1.64]
	0.50	—	1.09	0.10	-0.36	[0.51, 1.73]
	0.75	—	1.32	0.08	-0.14	[0.78, 1.89]
	0.90	—	1.45	0.08	0.05	[0.94, 2.01]
	0.10	4	1.24	0.18	-0.22	[0.49, 2.15]
	0.50	4	1.29	0.17	-0.17	[0.54, 2.12]
	0.10	9	1.24	0.09	-0.21	[0.75, 1.97]
	0.50	9	1.34	0.08	-0.12	[0.80, 1.89]
	0.10	16	1.39	0.06	-0.07	[0.96, 1.92]
β	—	—	2.32	0.01	0.02	[2.13, 2.51]
	0.25	—	1.56	0.62	-0.75	[0.28, 3.10]
	0.50	—	1.64	0.30	-0.28	[0.67, 2.71]
	0.75	—	1.83	0.22	-0.49	[0.98, 2.76]
	0.90	—	2.24	0.21	-0.08	[1.35, 3.21]
	0.10	4	1.93	0.17	-0.39	[1.49, 2.48]
	0.50	4	2.07	0.06	-0.25	[1.62, 2.54]
	0.10	9	2.11	0.04	-0.21	[1.80, 2.52]
	0.50	9	2.26	0.03	-0.05	[1.95, 2.59]
	0.10	16	2.20	0.04	-0.12	[1.97, 2.64]
λ_z	—	—	0.33	1.09×10^{-3}	0.00	[0.27, 0.39]
	0.25	—	0.19	5.24×10^{-3}	-0.14	[0.06, 0.33]
	0.50	—	0.26	3.56×10^{-3}	-0.07	[0.15, 0.37]
	0.75	—	0.29	2.67×10^{-3}	-0.04	[0.19, 0.39]
	0.90	—	0.33	2.52×10^{-3}	1.43×10^{-3}	[0.23, 0.43]
	0.10	4	0.23	2.57×10^{-3}	-0.10	[0.15, 0.42]
	0.50	4	0.25	2.16×10^{-3}	-0.08	[0.17, 0.35]
	0.10	9	0.24	9.34×10^{-3}	-0.09	[0.18, 0.38]
	0.50	9	0.29	1.10×10^{-3}	-0.04	[0.23, 0.35]
	0.10	16	0.27	6.89×10^{-4}	-0.06	[0.22, 0.32]
	0.50	16	0.32	6.86×10^{-4}	-4.09×10^{-4}	[0.27, 0.37]