

A modelling framework for the prediction of the herd-level probability of infection from longitudinal data

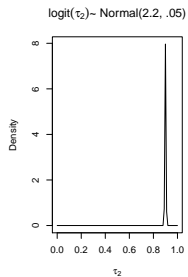
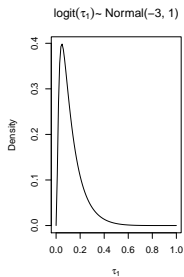
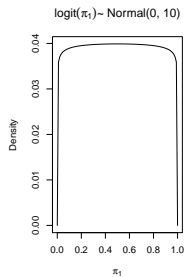
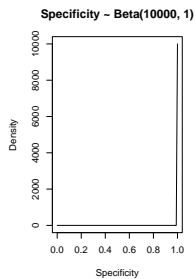
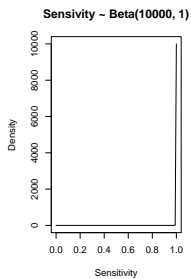
Supplementary material 2

Madouasse et al.

2021

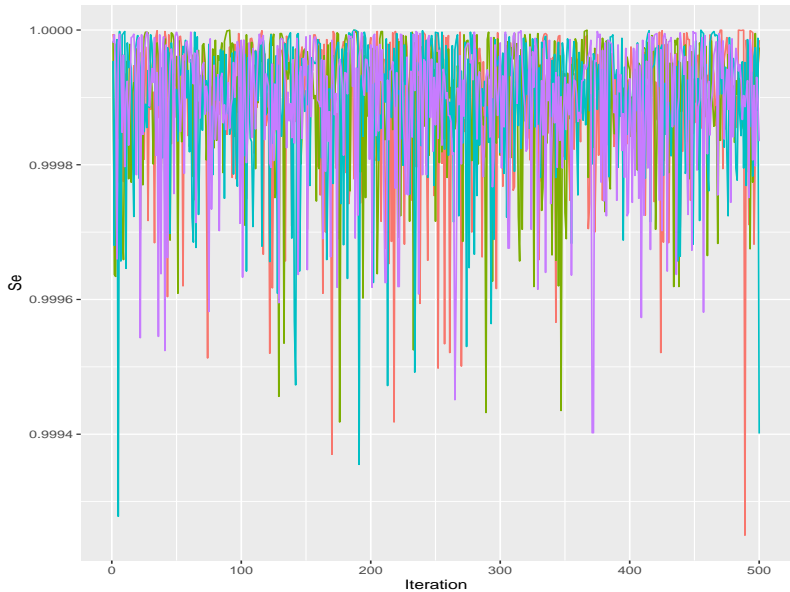
Model 1

Prior distributions



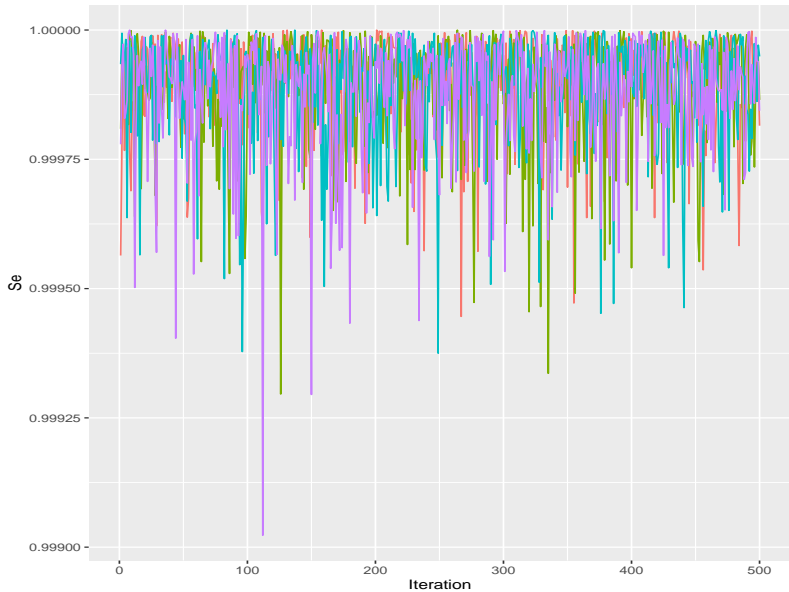
Model 1

Traceplot Se - Stan



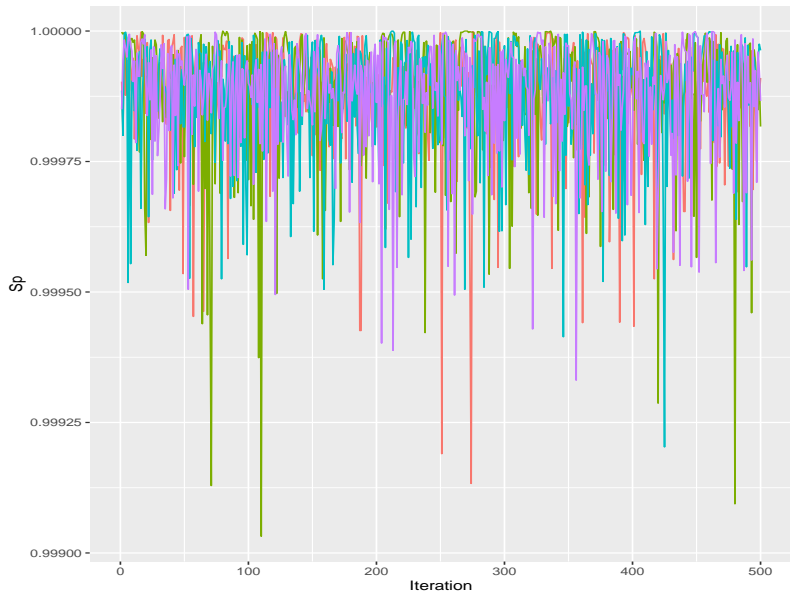
Model 1

Traceplot Se - JAGS



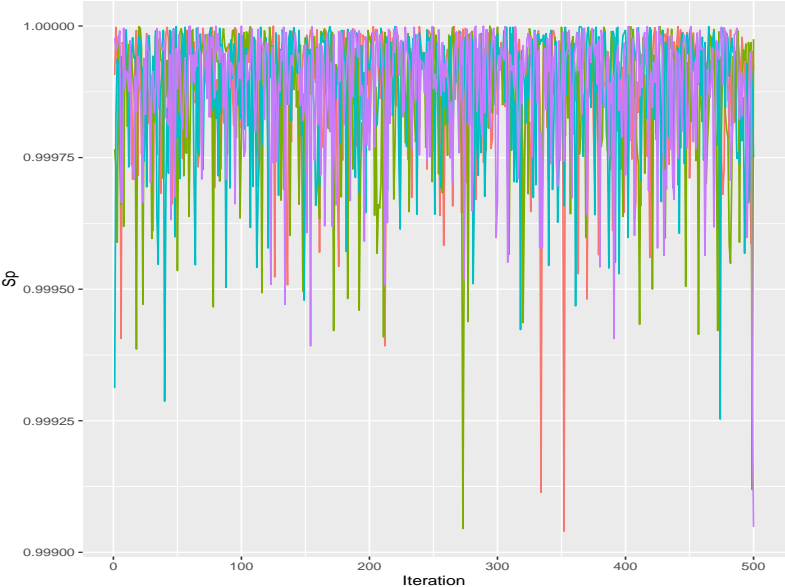
Model 1

Traceplot Sp - Stan



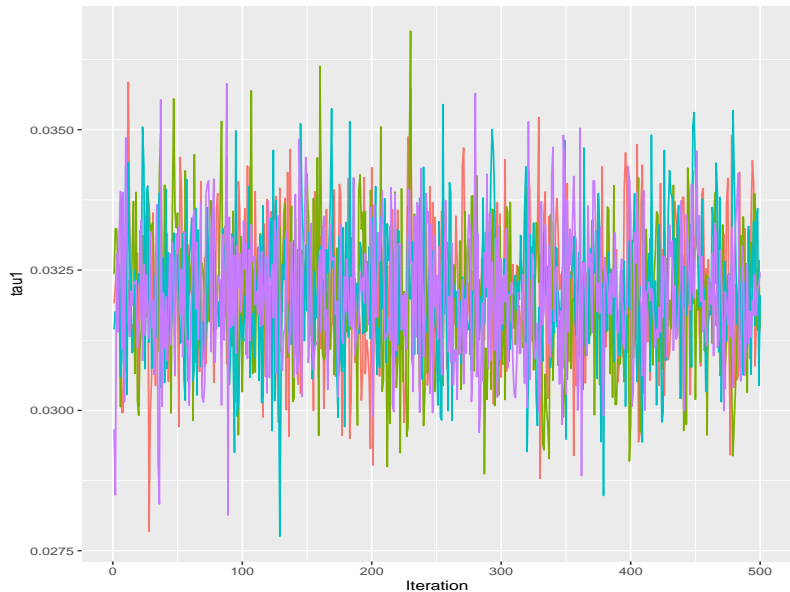
Model 1

Traceplot Sp - JAGS



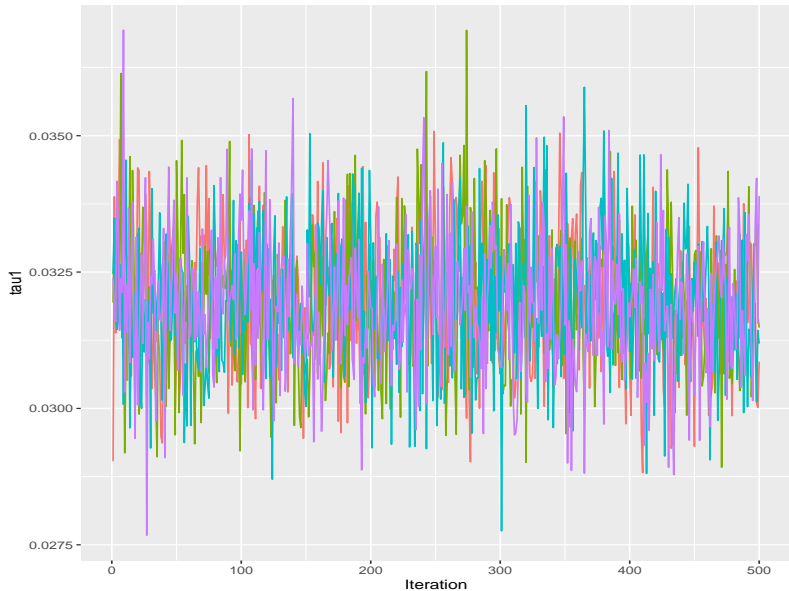
Model 1

Traceplot τ_1 - Stan



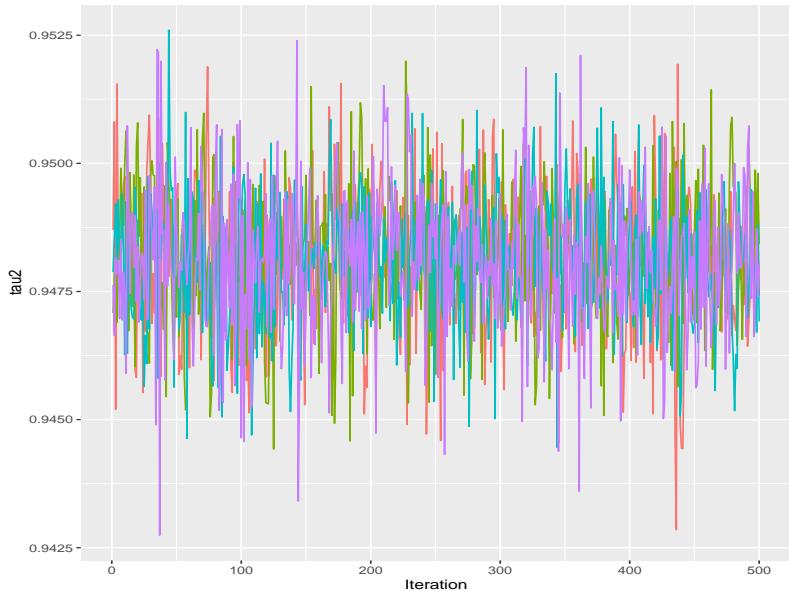
Model 1

Traceplot τ_1 - JAGS



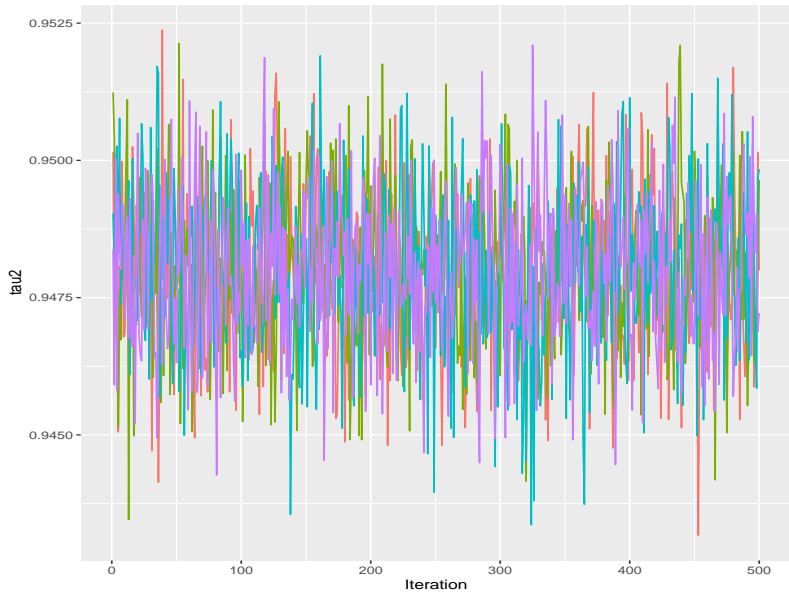
Model 1

Traceplot τ_2 - Stan



Model 1

Traceplot τ_2 - JAGS



Model 1

Results

Stan

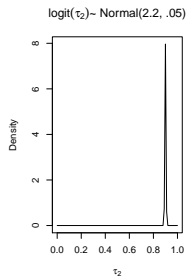
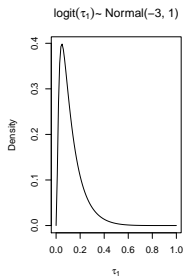
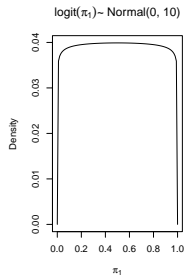
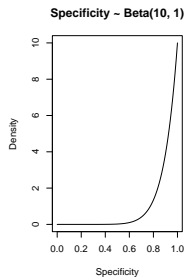
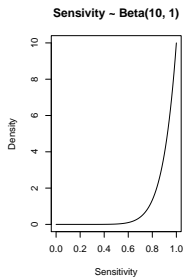
##		mean	sd	median	2.5%	97.5%	ess
##	Se	0.99989376	0.0001053692	0.9999270	0.99961900	0.99999700	2601.547
##	Sp	0.99988042	0.0001198700	0.9999150	0.99954897	0.99999800	2723.426
##	pi1	0.42245757	0.0119822438	0.4225950	0.39994568	0.44616445	2316.042
##	tau1	0.03207462	0.0012292664	0.0320741	0.02975105	0.03441909	2307.151
##	tau2	0.94812699	0.0013613351	0.9481435	0.94532152	0.95074420	2197.862

JAGS

##		mean	sd	median	2.5%	97.5%	ess
##	Se	0.99988866	0.0001091851	0.9999230	0.99959282	0.99999700	1852.002
##	Sp	0.99987858	0.0001248576	0.9999170	0.99954698	0.99999800	1812.019
##	tau1	0.03193929	0.0012354725	0.0318992	0.02956246	0.03442477	1883.035
##	tau2	0.94797153	0.0014219378	0.9479885	0.94518408	0.95078215	2000.000

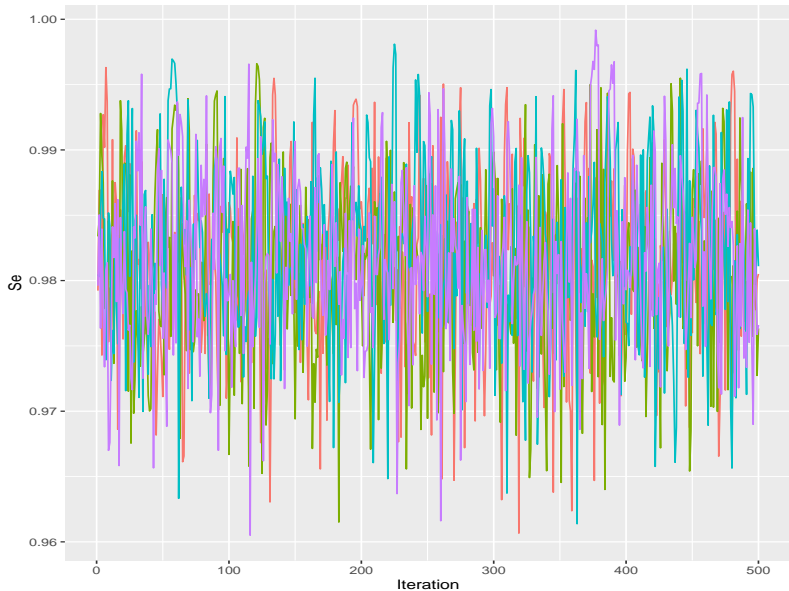
Model 2

Prior distributions



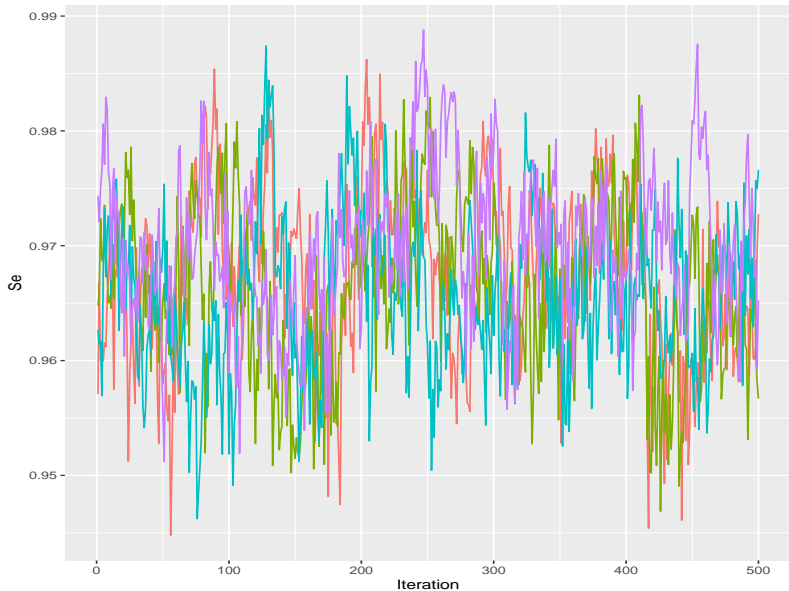
Model 2

Traceplot Se - Stan



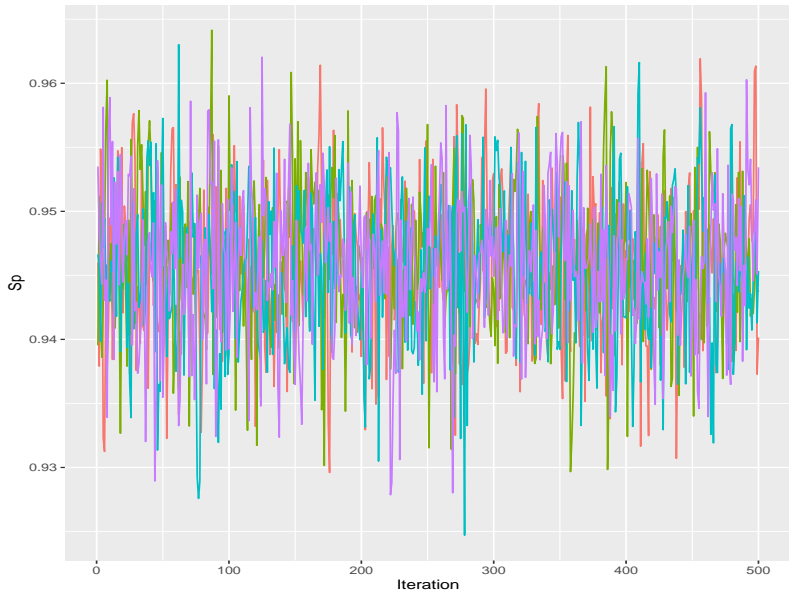
Model 2

Traceplot Se - JAGS



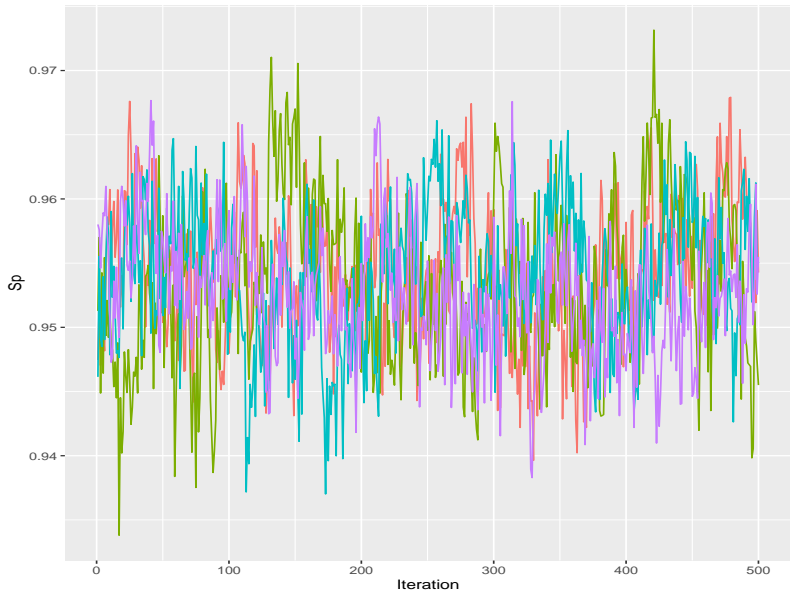
Model 2

Traceplot Sp - Stan



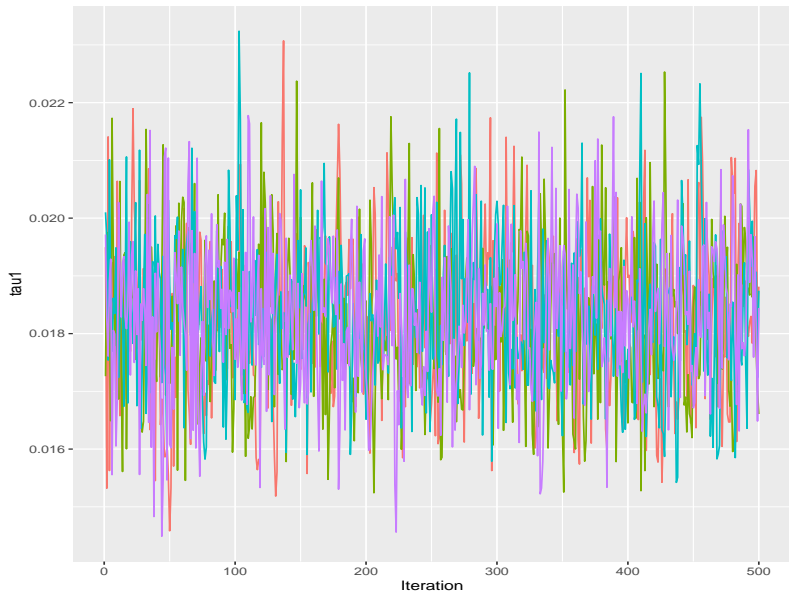
Model 2

Traceplot Sp - JAGS



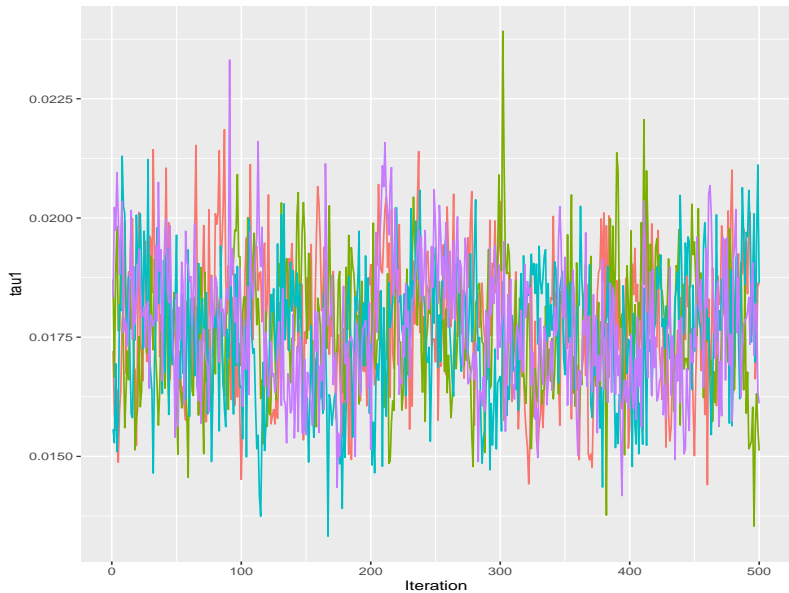
Model 2

Traceplot τ_1 - Stan



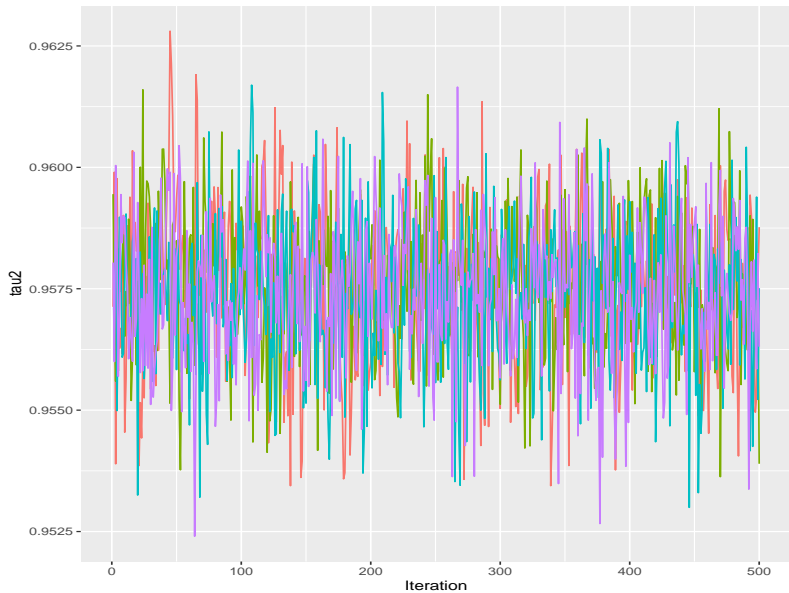
Model 2

Traceplot τ_1 - JAGS



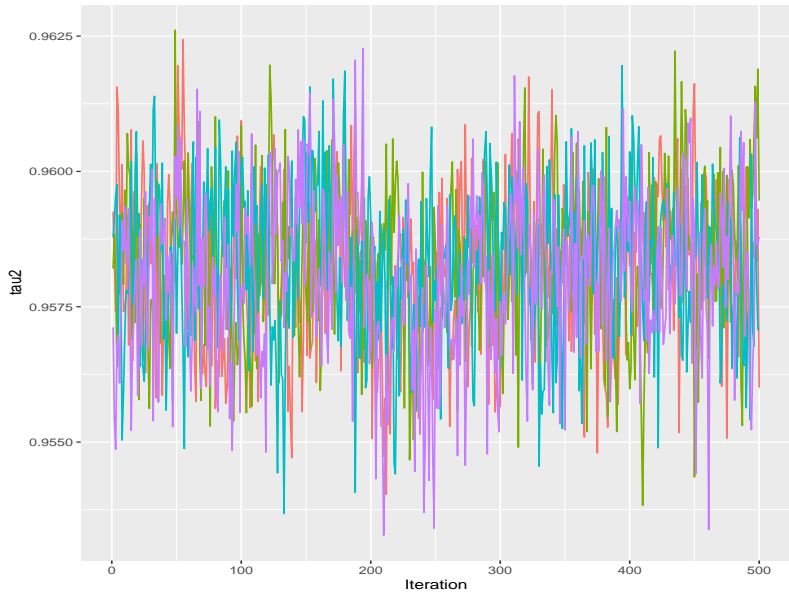
Model 2

Traceplot τ_2 - Stan



Model 2

Traceplot τ_2 - JAGS



Model 2

Results

Stan

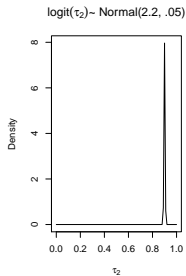
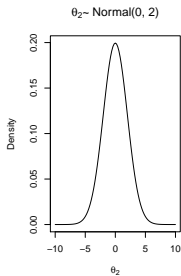
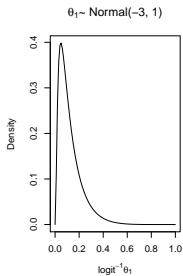
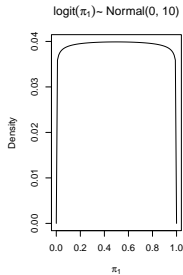
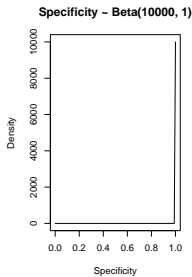
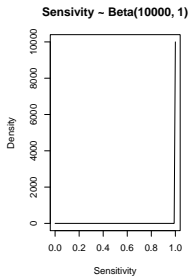
##		mean	sd	median	2.5%	97.5%	ess
##	Se	0.98153148	0.006772653	0.9815960	0.96764590	0.99441652	1293.904
##	Sp	0.94578074	0.005760651	0.9459730	0.93387790	0.95655520	1609.149
##	pi1	0.40960053	0.014337346	0.4095955	0.38182278	0.43783165	1858.271
##	tau1	0.01828308	0.001325285	0.0182527	0.01582774	0.02104124	1422.944
##	tau2	0.95748992	0.001502596	0.9575120	0.95447680	0.96034437	1816.834

JAGS

##		mean	sd	median	2.5%	97.5%	ess
##	Se	0.96735005	0.007174289	0.96738050	0.95292408	0.98157328	142.2322
##	Sp	0.95364573	0.005575297	0.95354450	0.94312475	0.96480888	243.2250
##	tau1	0.01770141	0.001369073	0.01768865	0.01509428	0.02032662	365.3527
##	tau2	0.95820726	0.001466730	0.95828350	0.95528177	0.96086675	545.3703

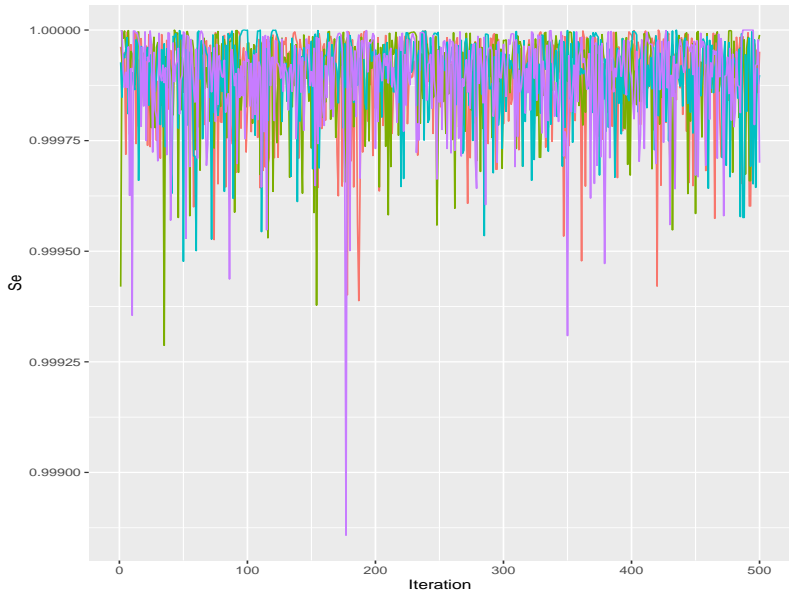
Model 3

Prior distributions



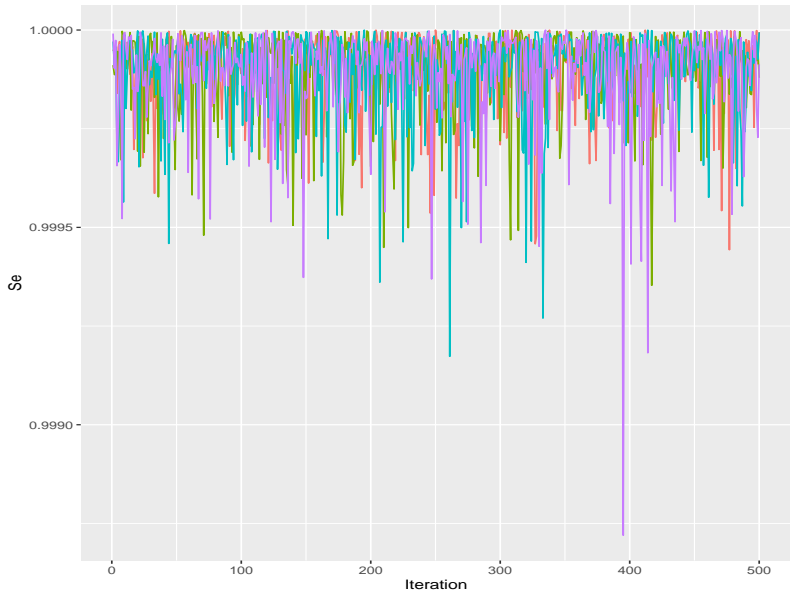
Model 3

Traceplot Se - Stan



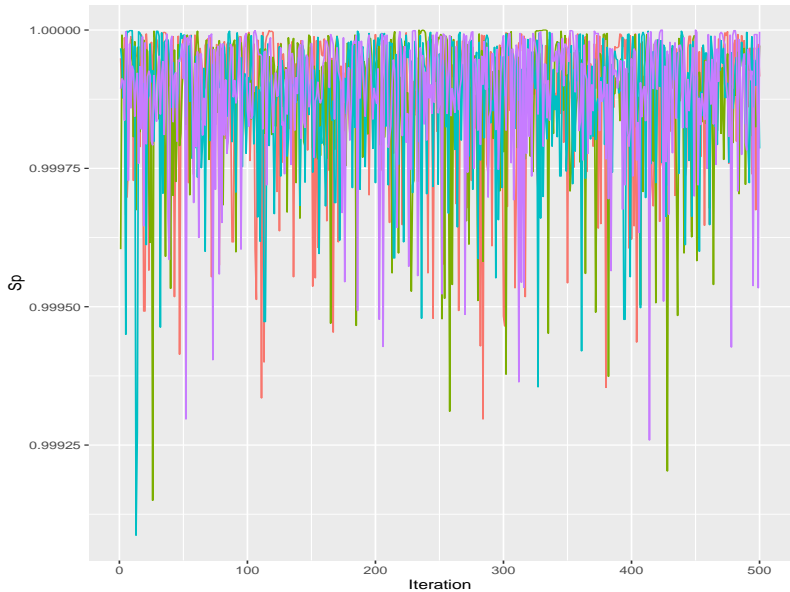
Model 3

Traceplot Se - JAGS



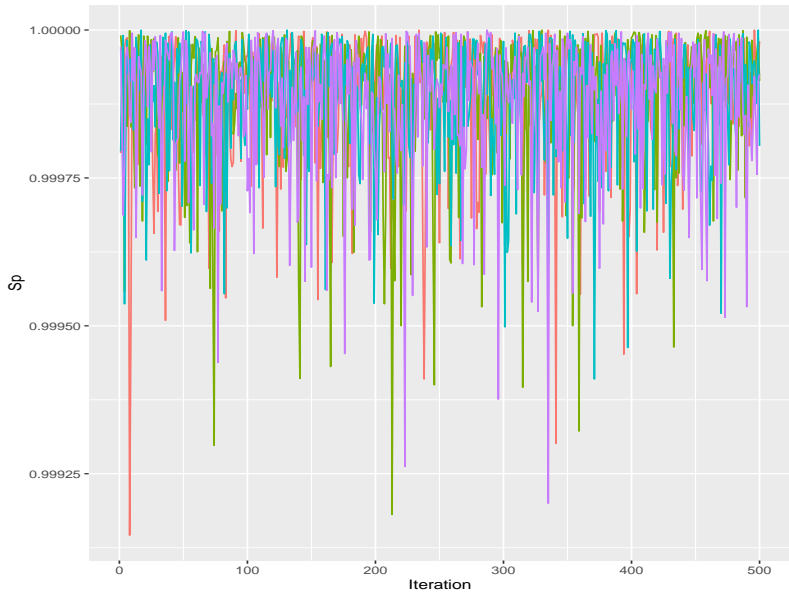
Model 3

Traceplot Sp - Stan



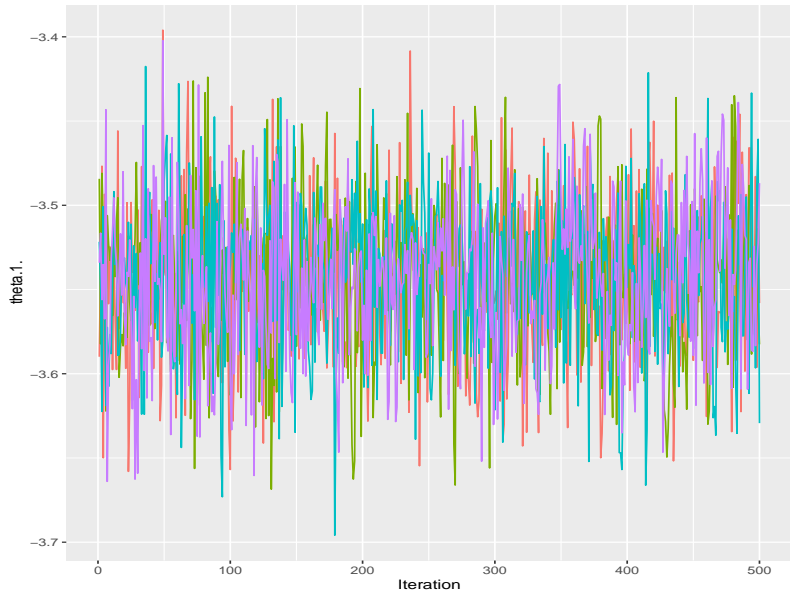
Model 3

Traceplot Sp - JAGS



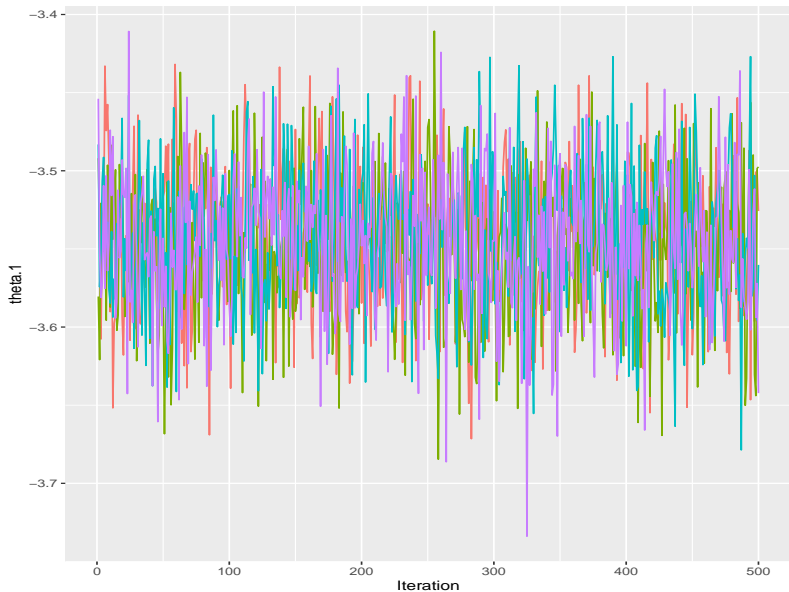
Model 3

Traceplot θ_1 - Stan



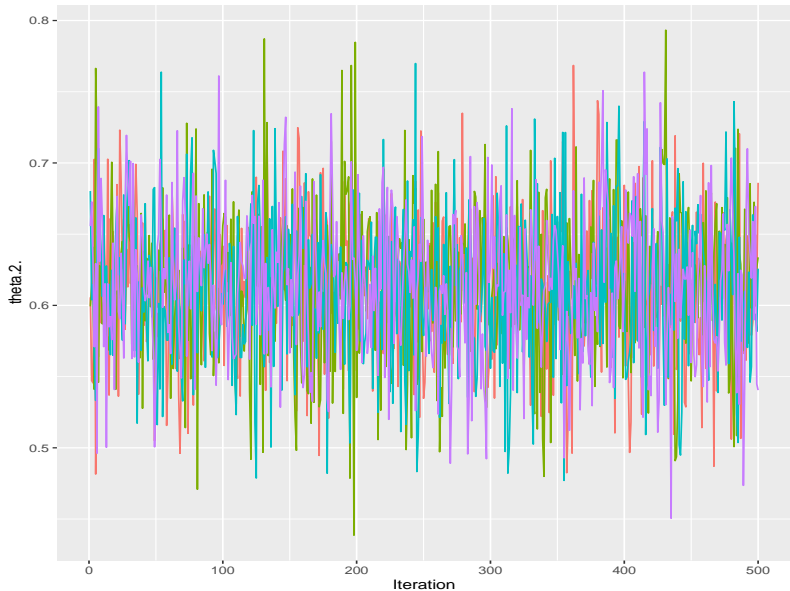
Model 3

Traceplot θ_1 - JAGS



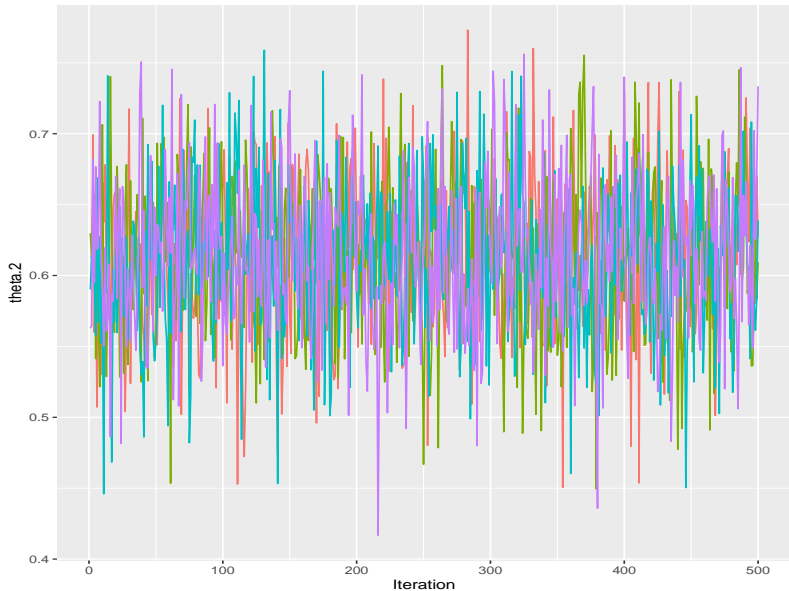
Model 3

Traceplot θ_2 - Stan



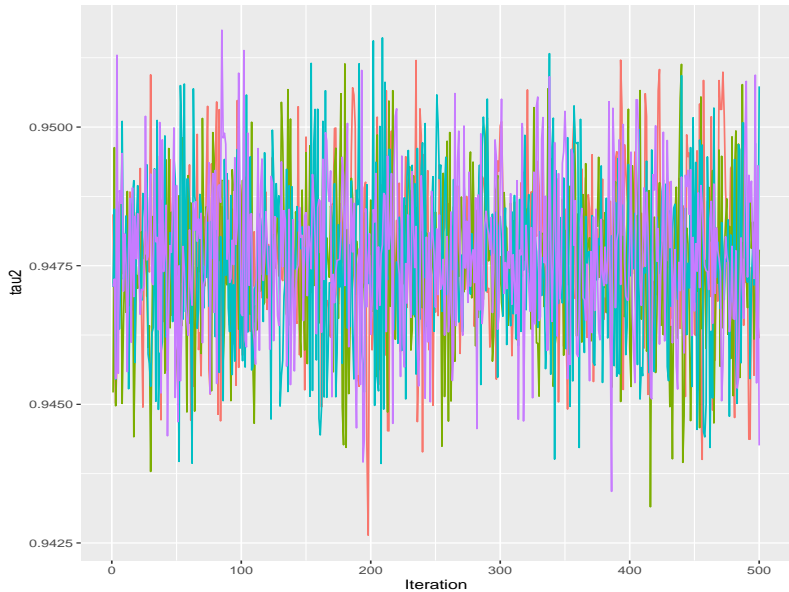
Model 3

Traceplot θ_2 - JAGS



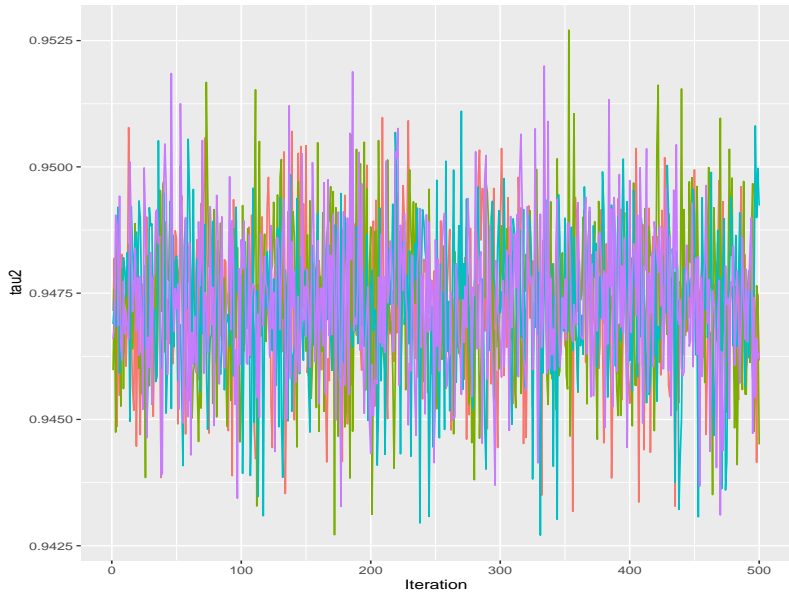
Model 3

Traceplot τ_2 - Stan



Model 3

Traceplot τ_2 - JAGS



Model 3

Results

Stan

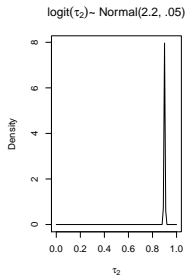
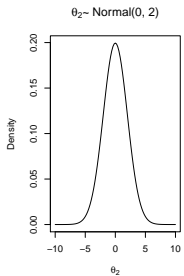
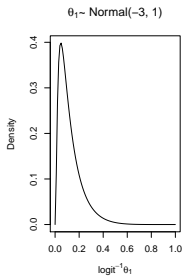
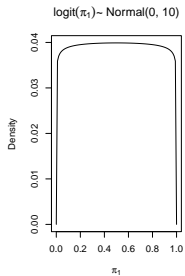
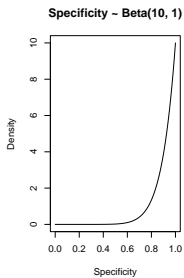
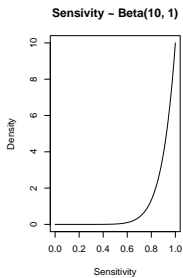
##		mean	sd	median	2.5%	97.5%	ess
##	Se	0.9998923	0.0001068553	0.9999260	0.9996299	0.9999980	2541.058
##	Sp	0.9998794	0.0001257076	0.9999190	0.9995129	0.9999970	2386.008
##	pi1	0.4229835	0.0122642609	0.4232040	0.3980133	0.4476861	2436.371
##	tau2	0.9476429	0.0014357052	0.9476455	0.9447869	0.9504940	2387.804
##	theta.1.	-3.5435235	0.0458758567	-3.5415950	-3.6335347	-3.4540673	1989.401
##	theta.2.	0.6135751	0.0515536865	0.6153020	0.5084849	0.7162110	2566.518

JAGS

##		mean	sd	median	2.5%	97.5%	ess
##	Se	0.9998933	0.0001127128	0.9999290	0.9995820	0.9999970	2000.000
##	Sp	0.9998831	0.0001138203	0.9999170	0.9995760	0.9999960	1978.305
##	theta.1	-3.5452866	0.0452831075	-3.5447350	-3.6363005	-3.4575155	2026.991
##	theta.2	0.6129062	0.0539827551	0.6127870	0.5079346	0.7207263	1735.106
##	tau2	0.9472999	0.0014943146	0.9473445	0.9442210	0.9502642	2114.463

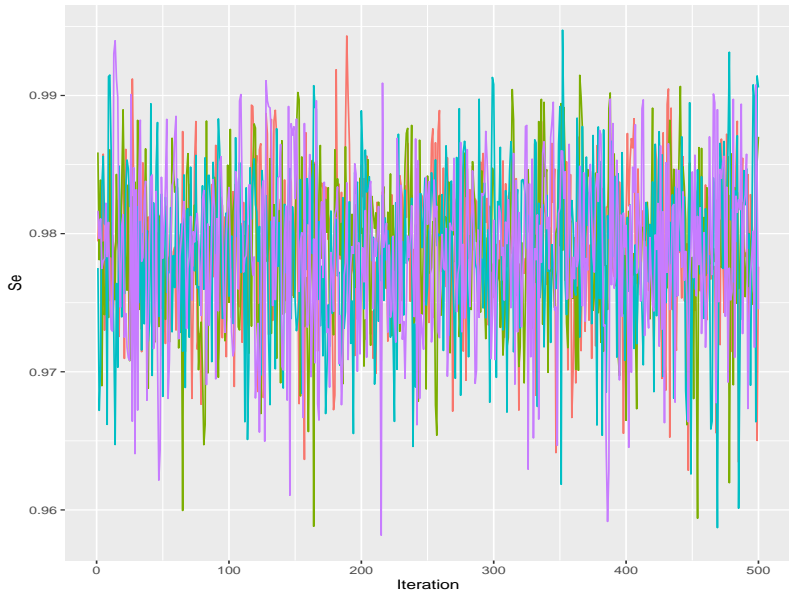
Model 4

Prior distributions



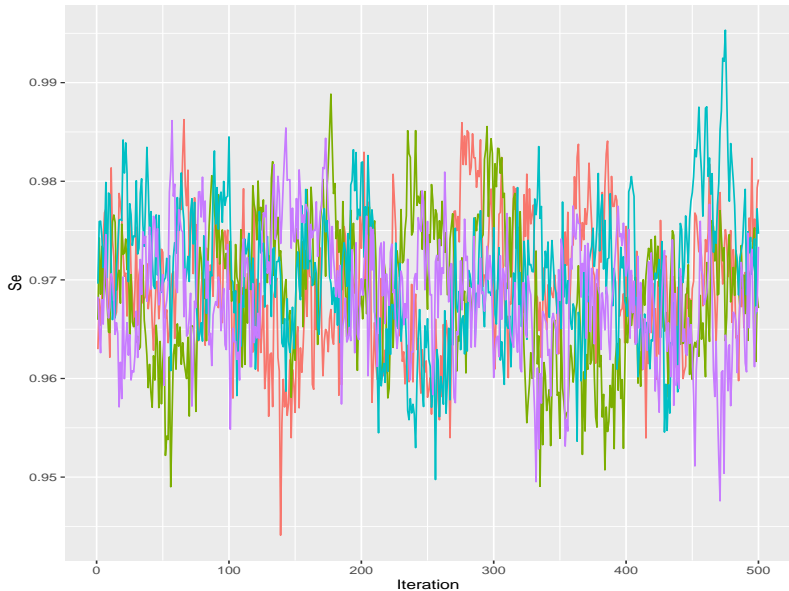
Model 4

Traceplot Se - Stan



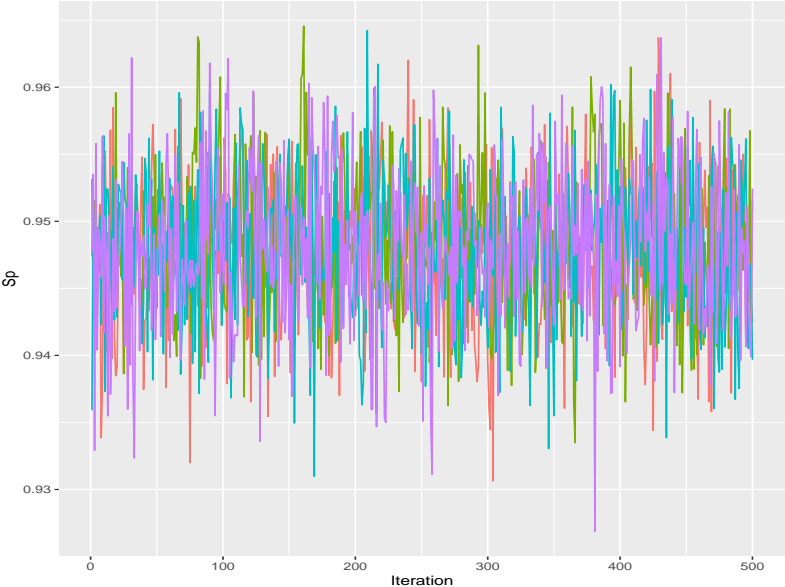
Model 4

Traceplot Se - JAGS



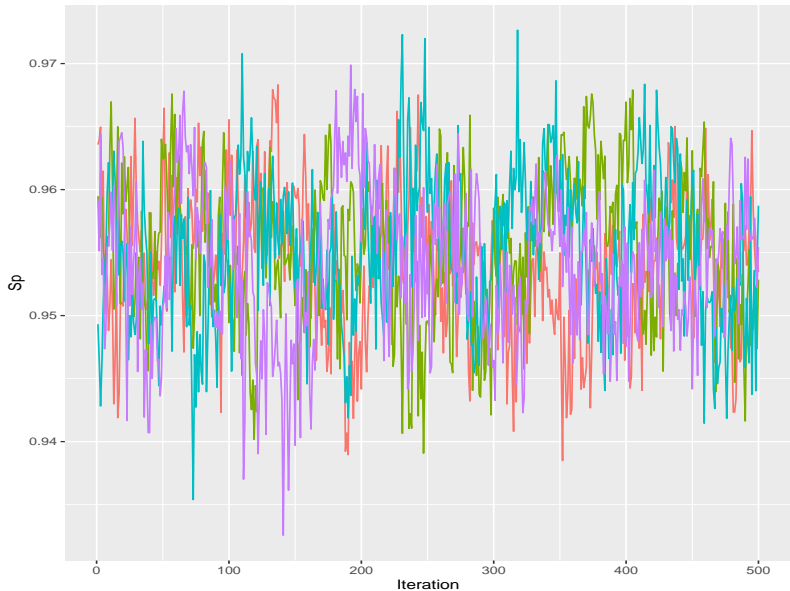
Model 4

Traceplot Sp - Stan



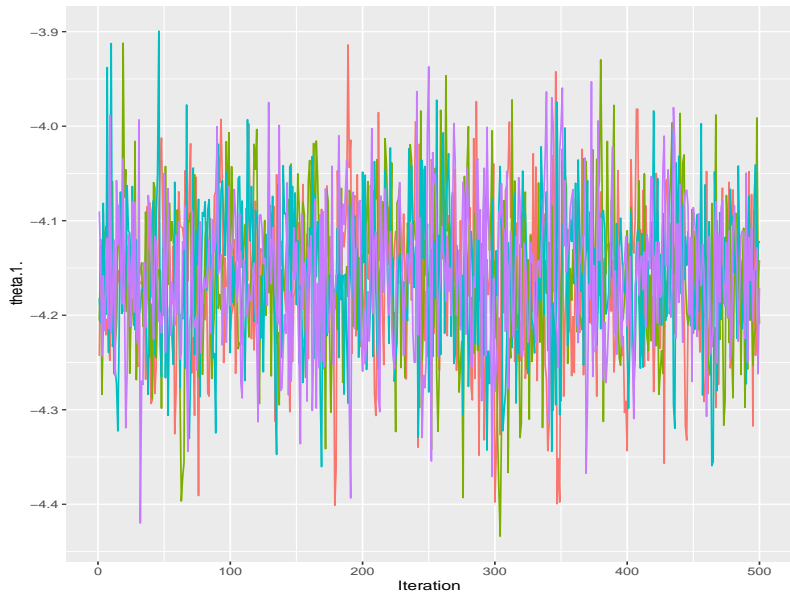
Model 4

Traceplot Sp - JAGS



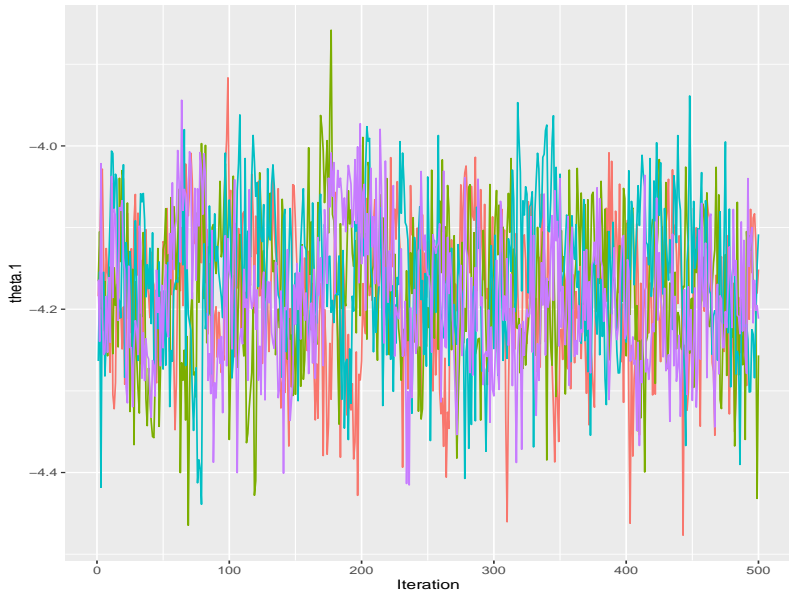
Model 4

Traceplot θ_1 - Stan



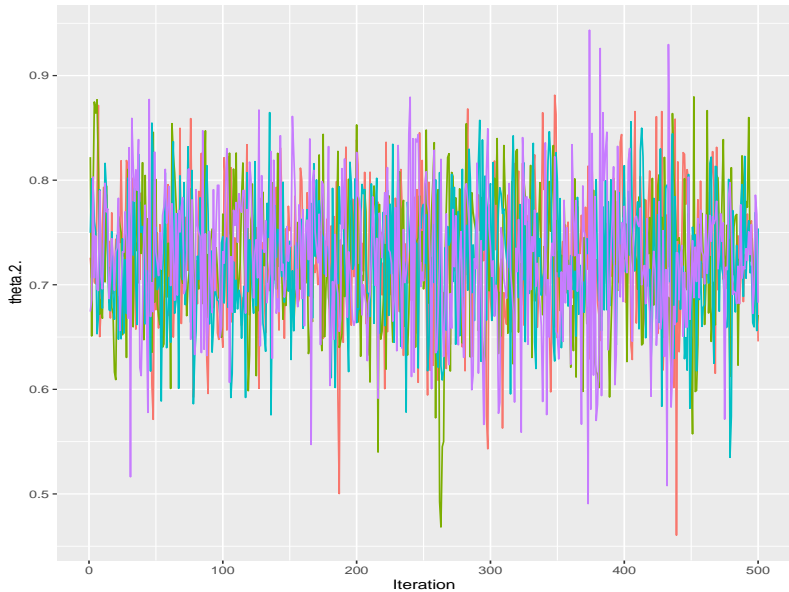
Model 4

Traceplot θ_1 - JAGS



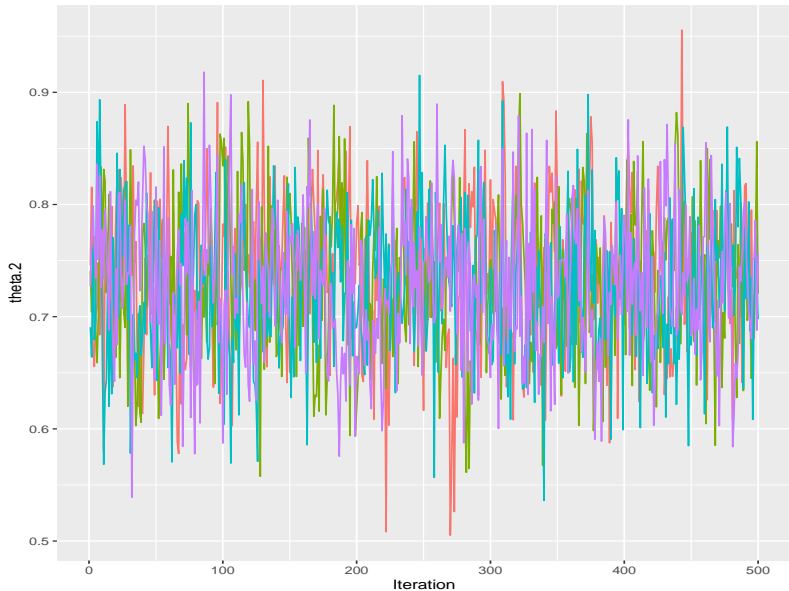
Model 4

Traceplot θ_2 - Stan



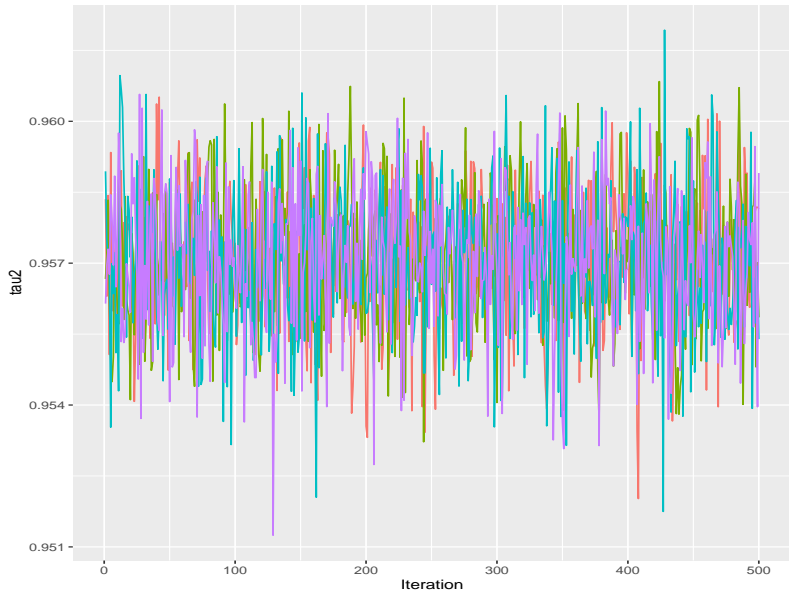
Model 4

Traceplot θ_2 - JAGS



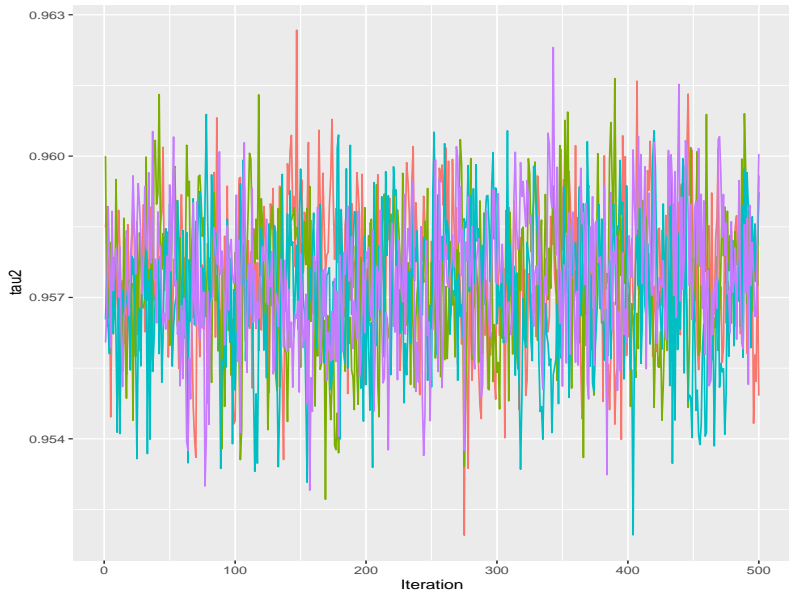
Model 4

Traceplot τ_2 - Stan



Model 4

Traceplot τ_2 - JAGS



Model 4

Results

Stan

##	mean	sd	median	2.5%	97.5%	ess
## Se	0.9787592	0.005700809	0.9790445	0.9664178	0.9892195	2087.078
## Sp	0.9480368	0.005590873	0.9479030	0.9371573	0.9590133	2007.011
## pi1	0.4107576	0.013008345	0.4108420	0.3843662	0.4364940	2173.017
## tau2	0.9570797	0.001471666	0.9571275	0.9540979	0.9598452	3039.028
## theta.1.	-4.1586092	0.078906029	-4.1559800	-4.3198643	-4.0032375	1432.438
## theta.2.	0.7244467	0.062941083	0.7246880	0.5958777	0.8424609	1802.306

JAGS

##	mean	sd	median	2.5%	97.5%	ess
## Se	0.9693652	0.006778411	0.9693805	0.9563966	0.9824612	145.0035
## Sp	0.9546281	0.005765281	0.9547860	0.9430777	0.9651936	174.6555
## theta.1	-4.1771472	0.088496446	-4.1773050	-4.3575447	-4.0141232	404.9377
## theta.2	0.7309639	0.064165430	0.7313855	0.6064481	0.8555339	1057.3814
## tau2	0.9573082	0.001506189	0.9573440	0.9541348	0.9601620	566.9616

Predicted probabilities of status positive

