

# **Parameter Inference Results**

**Analysis Europe 10d**

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## Deme configuration

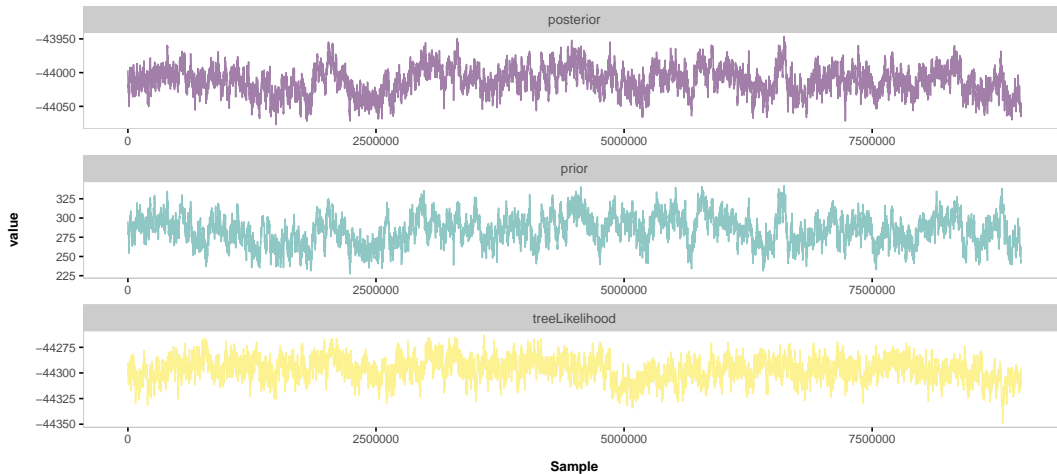
demeID	deme	division	country	region	exclude_country	exclude_division	min_date	max_date	prob
2	China		China	Asia			2019-12-24	2020-01-23	deaths
0	France		France	Europe			2020-01-23	2020-03-08	cases
1	Germany		Germany	Europe			2020-01-28	2020-03-08	cases
3	Italy		Italy	Europe			2020-01-29	2020-03-08	cases
4	OtherEuropean			Europe	France,Germany,Italy,Spain		2020-01-29	2020-03-08	cases_and_location
5	Spain		Spain	Europe			2020-02-24	2020-03-08	cases

## Chains diagnostic

"chain"	"seed"	"burnin"	"length"	"min_ESS"	"included"
"europeC/chains/210129_europe10d.1"	"1"	10	1e+07	50	1
"europeC/chains/210129_europe10d.2"	"2"	10	1e+07	50	0
"europeC/chains/210129_europe10d.3"	"3"	10	1e+07	50	0
"europeC/chains/210129_europe10d.4"	"4"	10	1e+07	50	0
"europeC/chains/210129_europe10d.5"	"5"	10	1e+07	50	0

# Convergence

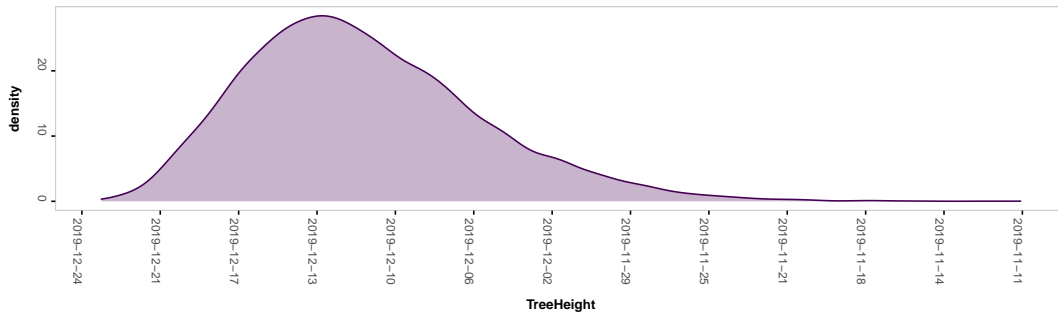
- **Mean ESS value:** 471.0287473
- **Median ESS value:** 163.3769
- **Standard deviation ESS value:** 988.4405029



median    95%HPDlo    95%HPDupp    ESS

# TreeHeight

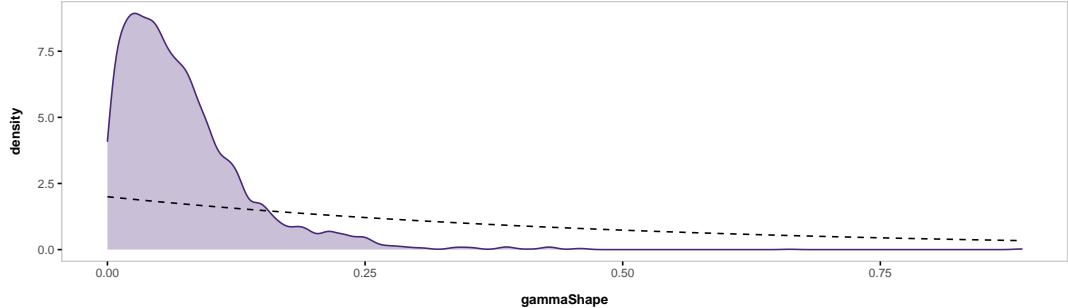
First sample date: 2019-12-23



median	95%HPDlo	95%HPDup	ESS
2019-12-12	2019-12-21	2019-12-01	1073.754

gammaShape

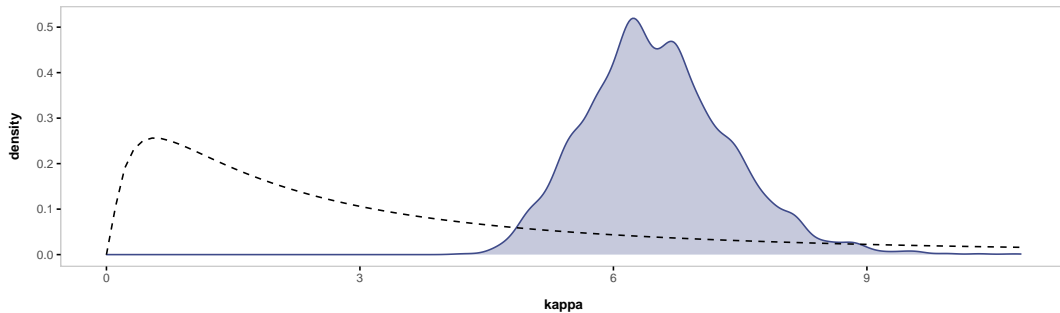
Prior: Exponential, 0.5



median	95%HPDlo	95%HPDupp	ESS
0.059318	0.001017	0.197652	505.7337

**kappa**

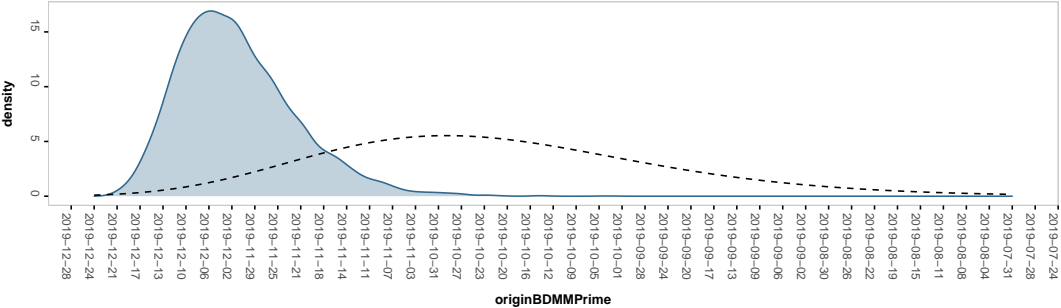
**Prior:** Lognormal, 1.0, 1.25



median	95%HPDlo	95%HPDup	ESS
6.472119	4.964554	8.15563	1490.9

originBDMMPPrime

Prior: Lognormal, -1.0, 0.2

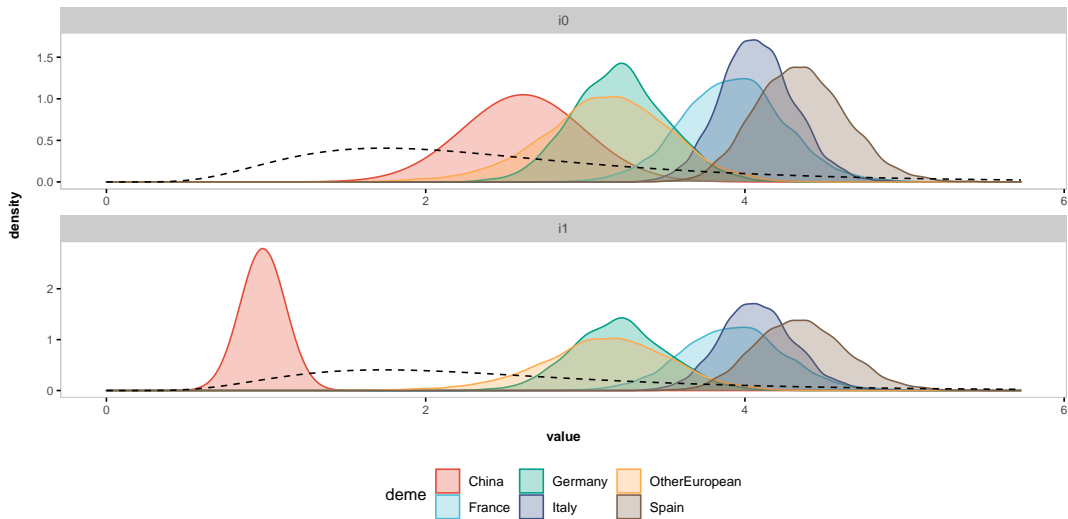


median	95%HPDlo	95%HPDUp	ESS
2019-12-03	2019-12-17	2019-11-13	3452.296



R0

Prior: Lognormal, 0.8, 0.5



item	mean	median	95%HPDlo	95%HPDup	ESS
R0SVi0_China	2.610000	2.610000	2.610000	2.610000	8101.000000
R0SVi0_France	3.922588	3.919791	3.299633	4.571452	124.601800
R0SVi0_Germany	3.217294	3.214058	2.651923	3.806849	475.987400
R0SVi0_Italy	4.076579	4.067077	3.641527	4.577324	64.751610
R0SVi0_OtherEuropean	3.113373	3.128538	2.308365	3.916894	208.458900
R0SVi0_Spain	4.345724	4.334802	3.809023	4.909483	228.434700
R0SVi1_China	0.980000	0.980000	0.980000	0.980000	2.509736
R0SVi1_France	3.922588	3.919791	3.299633	4.571452	124.601800
R0SVi1_Germany	3.217294	3.214058	2.651923	3.806849	475.987400
R0SVi1_Italy	4.076579	4.067077	3.641527	4.577324	64.751610
R0SVi1_OtherEuropean	3.113373	3.128538	2.308365	3.916894	208.458900
R0SVi1_Spain	4.345724	4.334802	3.809023	4.909483	228.434700

**becomeUninfectiousRate**

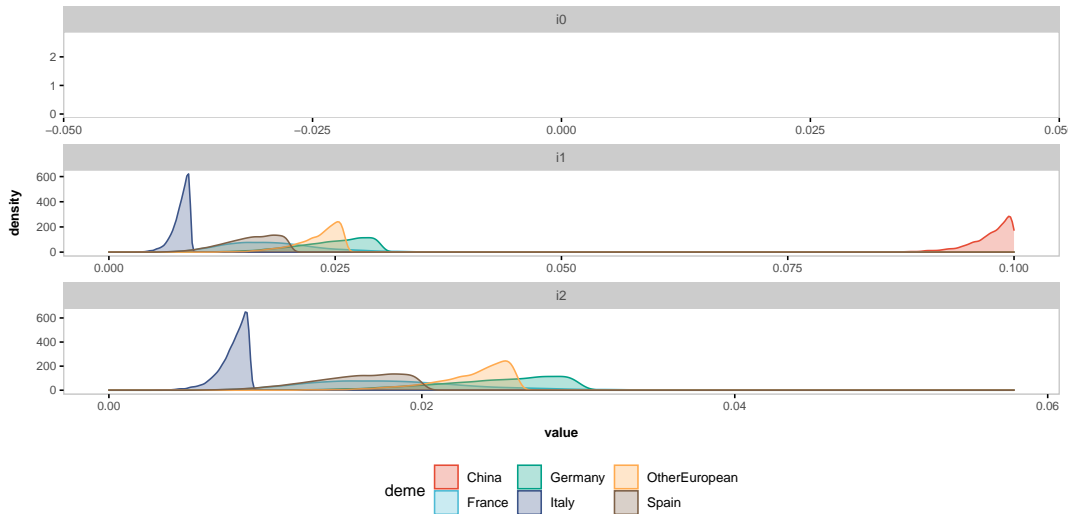
Fixed to  $36.5 \text{ year}^{-1}$  (time exponentially distributed mean 10 days)

## samplingProportion

Prior:

input	deme	210129_europe10d
Lower		0.0
Upper	Hubei	
Upper	China	0.1
Upper	France	0.06
Upper	Germany	0.03
Upper	Italy	0.009
Upper	OtherEuropean	0.026
Upper	Spain	0.02

# samplingProportion



## samplingProportion

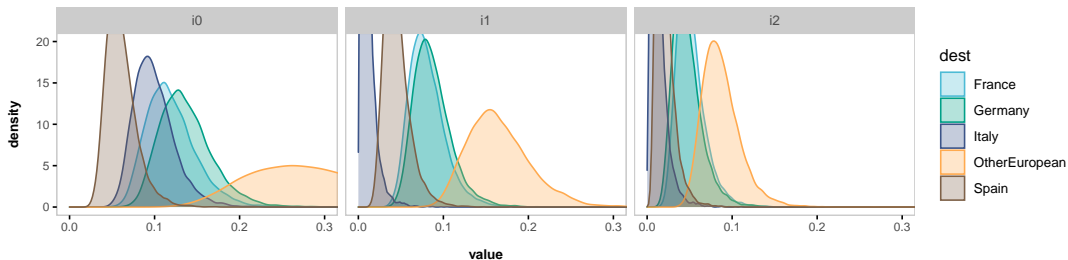
item	mean	median	95%HPDlo	95%HPDup	ESS
samplingProportionSVi0_China	0.000000	0.000000	0.000000	0.000000	
samplingProportionSVi0_France	0.000000	0.000000	0.000000	0.000000	
samplingProportionSVi0_Germany	0.000000	0.000000	0.000000	0.000000	
samplingProportionSVi0_Italy	0.000000	0.000000	0.000000	0.000000	
samplingProportionSVi0_OtherEuropean	0.000000	0.000000	0.000000	0.000000	
samplingProportionSVi0_Spain	0.000000	0.000000	0.000000	0.000000	
samplingProportionSVi1_China	0.097373	0.098090	0.092240	0.100000	861.6094
samplingProportionSVi1_France	0.018104	0.017454	0.008307	0.028812	432.8154
samplingProportionSVi1_Germany	0.024599	0.025340	0.017034	0.029999	827.3395
samplingProportionSVi1_Italy	0.007938	0.008179	0.006085	0.008999	633.8846
samplingProportionSVi1_OtherEuropean	0.023093	0.023883	0.017787	0.025999	1065.3610
samplingProportionSVi1_Spain	0.015691	0.016080	0.010266	0.019996	883.1386
samplingProportionSVi2_China	0.000000	0.000000	0.000000	0.000000	
samplingProportionSVi2_France	0.018104	0.017454	0.008307	0.028812	432.8154
samplingProportionSVi2_Germany	0.024599	0.025340	0.017034	0.029999	827.3395
samplingProportionSVi2_Italy	0.007938	0.008179	0.006085	0.008999	633.8846
samplingProportionSVi2_OtherEuropean	0.023093	0.023883	0.017787	0.025999	1065.3610
samplingProportionSVi2_Spain	0.015691	0.016080	0.010266	0.019996	883.1386

**removalProb**

Fixed to 1.

# migrationRate China

Prior: MigRateGLM, NA, NA, NA

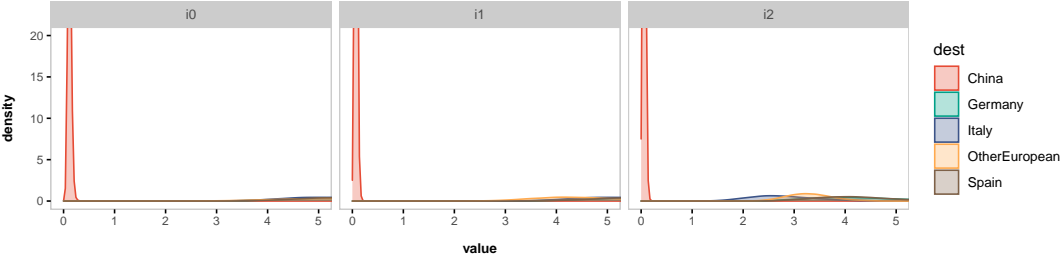


item	mean	median	95%HPDlo	95%HPDup	ESS
migrationRateSMi0_China_to_France	0.119982	0.115857	0.070788	0.181045	148.3713
migrationRateSMi0_China_to_Germany	0.137296	0.133278	0.084014	0.200057	144.2139
migrationRateSMi0_China_to_Italy	0.099741	0.096450	0.056297	0.147406	123.4321
migrationRateSMi0_China_to_OtherEuropean	0.298610	0.285426	0.145289	0.473518	356.1137
migrationRateSMi0_China_to_Spain	0.060595	0.057742	0.030644	0.097080	117.2294
migrationRateSMi1_China_to_France	0.080999	0.077855	0.045178	0.124878	119.3345
migrationRateSMi1_China_to_Germany	0.087189	0.084035	0.048674	0.132285	117.0162
migrationRateSMi1_China_to_Italy	0.010051	0.007729	0.000698	0.025579	209.8695
migrationRateSMi1_China_to_OtherEuropean	0.165965	0.161275	0.102889	0.242697	167.2211
migrationRateSMi1_China_to_Spain	0.044874	0.042282	0.019570	0.075450	106.2972
migrationRateSMi2_China_to_France	0.051182	0.048329	0.022512	0.084395	106.9010
migrationRateSMi2_China_to_Germany	0.047122	0.043976	0.018552	0.081471	111.9775
migrationRateSMi2_China_to_Italy	0.012327	0.009885	0.001162	0.029802	147.9560
migrationRateSMi2_China_to_OtherEuropean	0.087174	0.083908	0.048905	0.132985	116.7604
migrationRateSMi2_China_to_Spain	0.020401	0.017992	0.004568	0.041215	119.2075



# migrationRate France

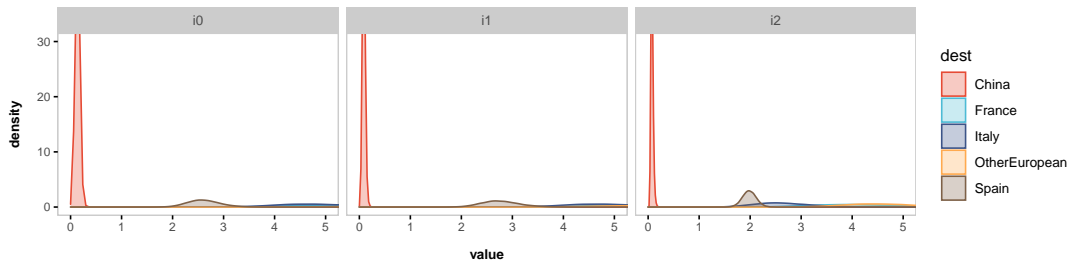
Prior: MigRateGLM, NA, NA, NA



item	mean	median	95%HPDlo	95%HPDup	ESS
migrationRateSMi0_France_to_China	0.118698	0.114702	0.069698	0.178670	147.0030
migrationRateSMi0_France_to_Germany	5.636732	5.542429	3.572463	7.840468	162.1123
migrationRateSMi0_France_to_Italy	5.198097	5.142206	3.472403	6.949588	145.8498
migrationRateSMi0_France_to_OtherEuropean	5.835349	5.620133	3.124481	9.056557	272.0461
migrationRateSMi0_France_to_Spain	5.648265	5.578392	3.729461	7.603050	142.4428
migrationRateSMi1_France_to_China	0.072667	0.069653	0.038370	0.113045	117.1175
migrationRateSMi1_France_to_Germany	5.821919	5.734105	3.784327	8.175317	157.6284
migrationRateSMi1_France_to_Italy	5.226887	5.171276	3.551462	7.047567	145.3104
migrationRateSMi1_France_to_OtherEuropean	4.495384	4.395605	2.748282	6.317388	238.1082
migrationRateSMi1_France_to_Spain	5.854805	5.784717	3.899752	7.961281	140.0512
migrationRateSMi2_France_to_China	0.062022	0.059086	0.029804	0.098303	116.0852
migrationRateSMi2_France_to_Germany	4.197440	4.103218	2.515690	6.061989	225.6794
migrationRateSMi2_France_to_Italy	2.759991	2.693185	1.634658	4.128760	307.2886
migrationRateSMi2_France_to_OtherEuropean	3.313107	3.286744	2.462305	4.276873	159.8660
migrationRateSMi2_France_to_Spain	4.176077	4.110976	2.711836	5.703747	190.0019

# migrationRate Germany

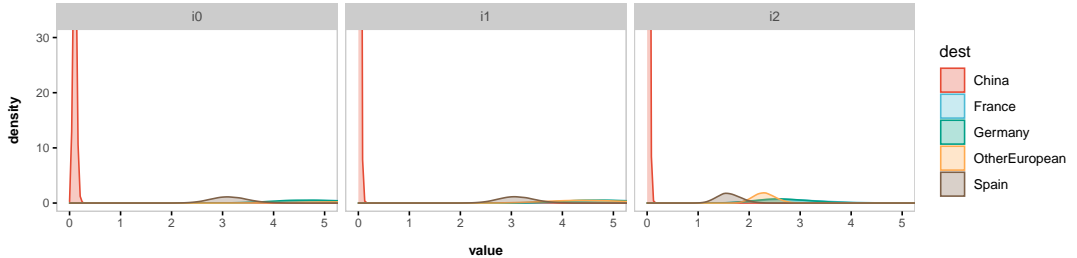
Prior: MigRateGLM, NA, NA, NA



item	mean	median	95%HPDlo	95%HPDupp	ESS
migrationRateSMi0_Germany_to_China	0.136651	0.132575	0.083636	0.199180	143.6180
migrationRateSMi0_Germany_to_France	5.542798	5.451603	3.538790	7.748713	164.6415
migrationRateSMi0_Germany_to_Italy	4.776414	4.732018	3.375250	6.322550	139.6431
migrationRateSMi0_Germany_to_OtherEuropean	9.027388	8.618554	4.324428	14.598610	253.3557
migrationRateSMi0_Germany_to_Spain	2.620230	2.602264	2.021418	3.271670	149.4886
migrationRateSMi1_Germany_to_China	0.088716	0.085535	0.049309	0.133738	117.2067
migrationRateSMi1_Germany_to_France	5.728739	5.639326	3.715294	8.043820	159.8040
migrationRateSMi1_Germany_to_Italy	4.794547	4.751409	3.378587	6.341176	139.3716
migrationRateSMi1_Germany_to_OtherEuropean	6.421953	6.270872	3.691204	9.319394	200.7470
migrationRateSMi1_Germany_to_Spain	2.779625	2.754299	2.072310	3.537342	208.6310
migrationRateSMi2_Germany_to_China	0.077318	0.074179	0.039946	0.118641	116.8434
migrationRateSMi2_Germany_to_France	4.128362	4.033786	2.456131	5.981385	230.3376
migrationRateSMi2_Germany_to_Italy	2.636983	2.586699	1.646974	3.752891	290.9976
migrationRateSMi2_Germany_to_OtherEuropean	4.554080	4.512816	3.161956	5.996895	144.4659
migrationRateSMi2_Germany_to_Spain	1.983962	1.982513	1.721104	2.259876	128.9605

# migrationRate Italy

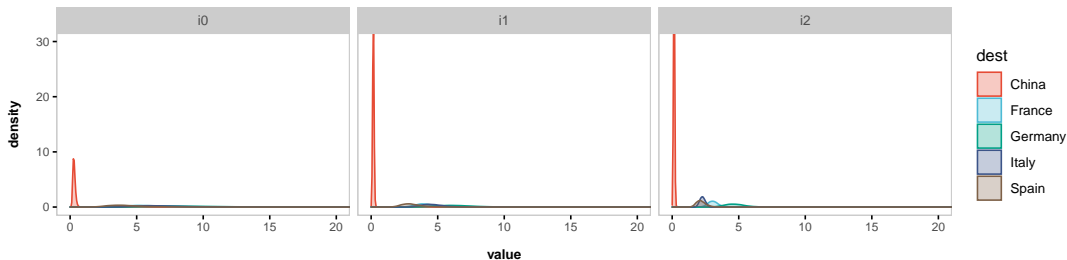
Prior: MigRateGLM, NA, NA, NA



item	mean	median	95%HPDlo	95%HPDUp	ESS
migrationRateSMi0_Italy_to_China	0.103977	0.100595	0.061525	0.155416	125.7672
migrationRateSMi0_Italy_to_France	5.251135	5.195610	3.572026	7.084937	144.8711
migrationRateSMi0_Italy_to_Germany	4.790783	4.747128	3.377228	6.336657	139.4272
migrationRateSMi0_Italy_to_OtherEuropean	6.784437	6.512125	3.587202	10.739010	263.1598
migrationRateSMi0_Italy_to_Spain	3.138094	3.124477	2.456723	3.891802	134.1134
migrationRateSMi1_Italy_to_China	0.023059	0.020253	0.005702	0.048170	127.3888
migrationRateSMi1_Italy_to_France	5.299741	5.242454	3.602912	7.145125	144.0307
migrationRateSMi1_Italy_to_Germany	4.822512	4.778288	3.400879	6.388609	137.5817
migrationRateSMi1_Italy_to_OtherEuropean	4.617782	4.540148	2.946086	6.361199	201.0850
migrationRateSMi1_Italy_to_Spain	3.103604	3.090351	2.446019	3.845406	133.2320
migrationRateSMi2_Italy_to_China	0.023703	0.020877	0.005945	0.049125	126.5897
migrationRateSMi2_Italy_to_France	2.828721	2.762012	1.667086	4.176733	299.0598
migrationRateSMi2_Italy_to_Germany	2.712197	2.664562	1.729896	3.849705	280.4666
migrationRateSMi2_Italy_to_OtherEuropean	2.295813	2.290197	1.885625	2.719343	154.8276
migrationRateSMi2_Italy_to_Spain	1.601923	1.590039	1.183391	2.054592	379.5855

# migrationRate Other European

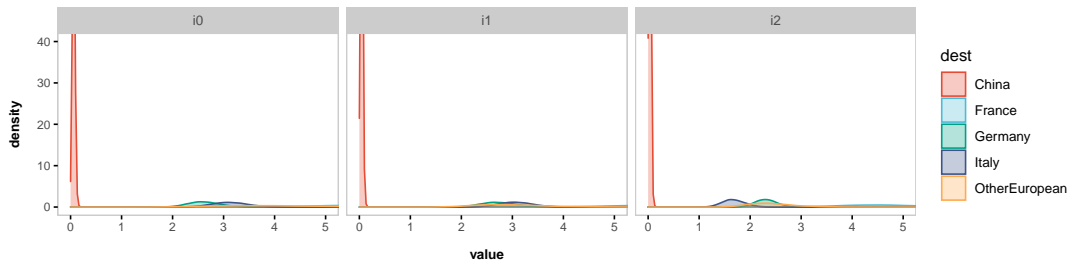
Prior: MigRateGLM, NA, NA, NA



item	mean	median	95%HPDlo	95%HPDUp	ESS
migrationRateSMi0_OtherEuropean_to_China	0.300810	0.287461	0.142015	0.473756	358.6230
migrationRateSMi0_OtherEuropean_to_France	5.834020	5.618996	3.124155	9.053733	272.0189
migrationRateSMi0_OtherEuropean_to_Germany	9.105510	8.691128	4.323180	14.743360	254.3421
migrationRateSMi0_OtherEuropean_to_Italy	6.801013	6.526793	3.581004	10.763750	263.4487
migrationRateSMi0_OtherEuropean_to_Spain	4.286539	4.027579	1.876180	7.192273	392.8538
migrationRateSMi1_OtherEuropean_to_China	0.165424	0.160784	0.102716	0.241938	166.6055
migrationRateSMi1_OtherEuropean_to_France	4.089830	4.021705	2.712041	5.638335	213.4409
migrationRateSMi1_OtherEuropean_to_Germany	6.430349	6.278146	3.694081	9.335496	200.9155
migrationRateSMi1_OtherEuropean_to_Italy	4.596643	4.519601	2.935688	6.321310	200.4032
migrationRateSMi1_OtherEuropean_to_Spain	3.070342	2.961220	1.689016	4.613563	370.2151
migrationRateSMi2_OtherEuropean_to_China	0.142183	0.138104	0.087801	0.205451	142.8864
migrationRateSMi2_OtherEuropean_to_France	3.076128	3.059432	2.323868	3.829289	150.1058
migrationRateSMi2_OtherEuropean_to_Germany	4.708476	4.664576	3.220603	6.256105	147.6963
migrationRateSMi2_OtherEuropean_to_Italy	2.280325	2.273939	1.869309	2.699584	156.8806
migrationRateSMi2_OtherEuropean_to_Spain	2.182251	2.144280	1.528059	2.920221	336.0210

# migrationRate Spain

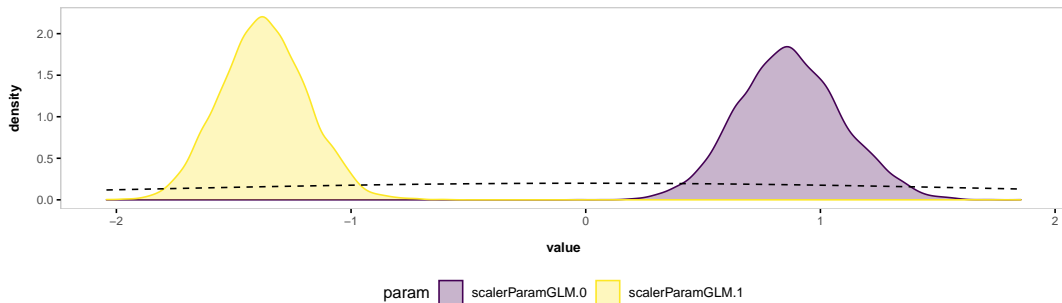
Prior: MigRateGLM, NA, NA, NA



item	mean	median	95%HPDlo	95%HPDup	ESS
migrationRateSMi0_Spain_to_China	0.061748	0.058844	0.031438	0.098537	117.5089
migrationRateSMi0_Spain_to_France	5.810768	5.741485	3.918112	7.938909	140.5037
migrationRateSMi0_Spain_to_Germany	2.631562	2.613132	2.024838	3.289624	149.9956
migrationRateSMi0_Spain_to_Italy	3.129510	3.115770	2.452059	3.878083	133.8894
migrationRateSMi0_Spain_to_OtherEuropean	4.271348	4.014555	1.873738	7.158440	392.6149
migrationRateSMi1_Spain_to_China	0.045756	0.043132	0.019621	0.076216	106.3036
migrationRateSMi1_Spain_to_France	5.969093	5.898848	3.851105	8.005811	139.0108
migrationRateSMi1_Spain_to_Germany	2.746177	2.722861	2.052043	3.471500	154.9104
migrationRateSMi1_Spain_to_Italy	3.072924	3.061378	2.415455	3.781312	132.4928
migrationRateSMi1_Spain_to_OtherEuropean	3.027544	2.922723	1.679243	4.525685	369.2296
migrationRateSMi2_Spain_to_China	0.034387	0.031758	0.012637	0.060871	108.2884
migrationRateSMi2_Spain_to_France	4.603604	4.542710	3.090264	6.282346	168.9624
migrationRateSMi2_Spain_to_Germany	2.315172	2.307043	1.872027	2.745170	151.9365
migrationRateSMi2_Spain_to_Italy	1.674552	1.662889	1.258193	2.115802	351.1081
migrationRateSMi2_Spain_to_OtherEuropean	2.424285	2.370050	1.563999	3.353360	345.8699

## scalerParamGLM

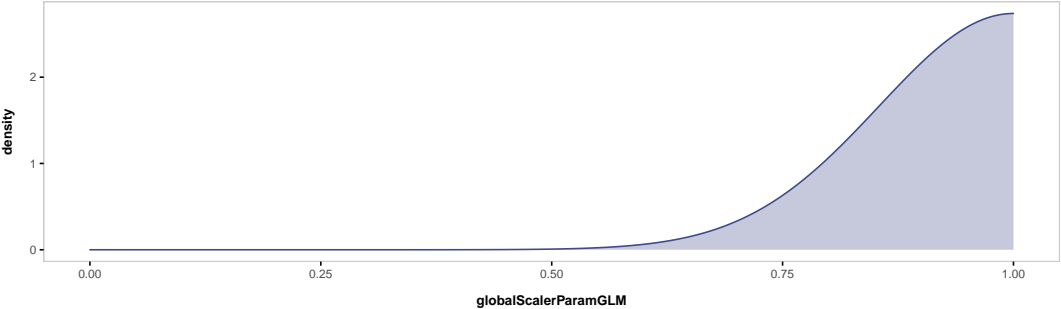
**Prior:** Normal, 0.0, 2.0



item	mean	median	95%HPDlo	95%HPDUp	ESS
scalerParamGLM.0	0.874491	0.868041	0.461943	1.332913	362.2502
scalerParamGLM.1	-1.369470	-1.371610	-1.723420	-1.010330	189.2126

# globalScalerParamGLM

Prior: NA, NA, NA



median	95%HPDlo	95%HPDup	ESS
1	1	1	

## indicatorParamGLM

- Initial value: 0 0
- Inclusion probability: 1, 1