

Supplementary table 3: Risk of bias assessment tool

	<b>Criterion</b>	<b>Considerations</b>	<b>Score considerations (0, none, 1, poor, 2, good)</b>	
	<b>(A) Screening questions</b>			Definition, Max 4 points
1	Does the paper clearly address aims and objectives?	Is the paper relevant to the objectives of the systematic review of Bayesian modelling?	0 not stated 1 stated but vague 2 stated and focussed	
2	Is the setting and population clearly defined?	Does the paper clearly state the setting (e.g. number of geographical location, number of malaria cases)?	0 not stated 1 stated but vague 2 stated and focussed	
	<b>(B) Assessed the validity of model</b>			Model methods, Max 4 points
3	Is the model structure clearly described and appropriate for the research question?	Is there a description of model structure (prior for space, time or space-time)? Does the model structure include covariates?	0 not appropriate model structure, or no description of model 1 incomplete description 2 complete description	
4	Are the modelling methods appropriate for the research question?	Were the modelling methods clearly described, and suited to the research question?	0 not appropriate modelling method, or no description of method 1 incomplete description 2 complete description	
5	Are the parameters, ranges and data source specified?	Are all parameters and their ranges reported? Are the data sources for parameters reported?	0 poorly reported 1 some information missing 2 complete reporting of parameters, ranges and data sources	Model inputs, Max 4 points
6	Is the quality of data considered?	Are data limitations discussed?	0 no sources of uncertainty 1 partially addressed, and/or data inappropriate 2 fully addressed	
	<b>(C) Assessed the overall results and study conclusion</b>			Results, Max 4 points
7	Have the results been clearly and completely presented?	Do the results match the aims and objectives?	0 not reported, very unclear 1 stated, but not directly aligned with research question 2 valuable and aligned with research question	
8	Are the results appropriately interpreted and discussed in context?	Are the results of the study discussed in context and generalisability considered?	0 no discussion 1 some discussion but key points and/or limitations missed 2 full discussion of key points, limitations discussed	

ID	References	Year	Aims & Objectives	Setting & Population	Model structure	Modelling methods	Data Sources	Data Quality	Results	Discussion	Final Score	Rating
1	Abellana et al.	2008	1	2	1	1	1	1	1	1	9	Medium
2	Alegana et al	2016	2	2	2	1	2	1	2	2	14	Very high
3	Alegana et al	2013	2	1	2	2	2	2	2	1	14	Very high
4	Alemu et al	2013	1	2	1	1	1	2	1	2	11	High
5	Amek et al.	2012	2	1	2	2	1	1	2	1	12	High
6	Amratia et al.	2019	2	1	1	2	2	2	1	1	12	High
7	Appiah et al.	2011	1	2	0	1	1	1	1	1	8	Medium
8	Awine et al.	2018	2	1	2	1	2	1	1	2	12	High
9	Bejon et al.	2010	1	2	1	1	2	2	1	1	11	High
10	Bejon et al.	2014	2	2	0	1	2	2	1	1	11	High
11	Belay et al.	2017	1	1	1	1	1	1	1	1	8	Medium
12	Bennett et al.	2013	1	2	2	1	2	2	2	2	14	Very high
13	Bennett et al.	2016	1	2	2	2	2	2	2	2	15	Very high
14	Bennett et al.	2014	1	2	1	1	2	2	1	2	12	High
15	Bhatt et al	2015	1	1	1	1	2	2	1	1	10	Medium
16	Bisanzio et al	2015	2	2	1	1	2	2	2	2	14	Very high
17	BM & OE	2007	1	1	1	2	1	2	1	1	10	Medium
18	Bousema et al.	2010	2	2	0	1	1	1	0	2	9	Medium
19	Ceccato et al	2007	1	2	1	1	2	1	1	2	11	High
20	Chipeta et al.	2019	1	2	0	1	2	1	1	2	10	Medium
21	Chironbo et al.	2020	2	1	2	2	2	1	2	2	14	Very high
22	Cissoko et al.	2020	2	1	2	1	2	1	1	2	12	High
23	Colborn et al.	2018	1	2	2	1	2	2	1	2	13	High
24	Coulibaly et al.	2013	2	2	1	1	1	1	2	2	12	High
25	DePina et al.	2019	2	1	1	1	1	2	1	1	10	Medium
26	Diboulo et al.	2016	1	2	1	2	2	1	2	1	12	High
27	Ferrão et al.	2017a	1	2	1	1	2	1	2	1	11	High

28	Ferrão et al.	2017b	1	2	1	1	2	1	2	1	11	High
29	Ferrari et al.	2016	1	2	0	1	1	1	2	2	10	Medium
30	Gaudart et al.	2006	2	2	2	1	2	1	1	2	13	High
31	Gemperli et al.	2006	1	1	2	1	2	1	2	2	12	High
32	Gething et al.	2016	1	1	1	1	2	1	2	2	11	High
33	Giardina et al.	2015	2	2	2	2	2	1	2	2	15	Very high
34	Giardina et al.	2012	2	2	2	2	2	1	2	2	15	Very high
35	Giardina et al.	2014	2	2	2	2	2	1	2	1	14	Very high
36	Giorgi et al.	2018	2	2	2	2	2	1	2	2	15	Very high
37	Gómez-Barroso et al.	2017	1	2	2	1	2	1	2	2	13	High
38	Gosoni et al.	2012	2	2	2	2	2	1	1	2	14	Very high
39	Gosoni et al.	2010	1	2	2	2	2	2	2	1	14	Very high
40	Gosoni et al.	2006	2	2	2	2	2	1	2	2	15	Very high
41	Houngbedji et al.	2016	2	2	1	2	2	1	2	1	13	High
42	Ihantamalala et al.	2018	1	2	1	1	2	1	1	2	11	High
43	Ikeda et al.	2017	2	2	1	1	2	1	1	2	12	High
44	Ishengoma et al.	2018	1	2	1	1	2	1	1	1	10	Medium
45	Kabaghe et al.	2017	1	2	0	1	1	1	1	1	8	Medium
46	Kabaria et al.	2016	2	2	1	1	2	2	1	2	13	High
47	Kamuliwo et al.	2015	1	2	2	1	2	1	2	1	12	Medium
48	Kang et al.	2018	2	2	2	2	2	2	2	1	15	Very high
49	Kangoye et al.	2016	1	1	0	1	2	1	1	1	8	Medium
50	Kanyangara et al.	2016	1	2	1	1	2	1	1	2	11	High
51	Kazembe et al.	2006	2	2	2	2	2	1	2	2	15	Very high
52	Kifle et al.	2019	1	1	1	1	2	1	1	1	9	Medium
53	Kigozi et al.	2016	2	2	1	1	2	1	2	2	13	High
54	Kleinschmidt et al.	2000	2	2	1	1	2	1	1	1	11	High
55	Kleinschmidt et al.	2001a	2	2	1	2	2	1	2	2	14	Very high
56	Kleinschmidt et al.	2001b	2	2	1	2	2	1	2	2	14	Very high

57	Kleinschmidt et al.	2002	2	2	0	2	2	1	1	1	11	High
58	Mabaso et al.	2005	2	2	2	2	2	1	2	2	15	Very high
59	Mabaso et al.	2006	2	2	2	2	2	1	2	2	15	Very high
60	Macharia et al.	2018	2	2	2	2	2	2	2	2	16	Very high
61	Mfueni et al.	2018	0	2	0	1	2	1	1	1	8	High
62	Midekisa et al.	2012	1	2	1	2	2	1	1	1	11	High
63	Millar et al.	2018	2	2	1	2	2	1	2	2	14	Very high
64	Mirghani et al.	2010	2	2	1	1	1	1	1	2	11	High
65	Mlacha et al.	2017	2	1	0	1	1	1	1	2	9	Medium
66	Mukonka et al.	2014	1	2	0	0	1	1	1	1	7	Low
67	Mukonka et al.	2015	1	2	1	1	2	1	1	0	9	Medium
68	Mwakalinga et al.	2016	2	2	1	2	2	1	1	1	12	High
69	Ndiath et al.	2015	2	2	1	2	1	1	2	1	12	High
70	Ndiath et al.	2014	1	1	1	1	2	1	0	2	9	High
71	Nguyen et al.	2020	2	1	2	1	1	2	2	2	13	Very high
72	Noor et al.	2013a	1	2	2	2	2	2	2	1	14	Very high
73	Noor et al.	2008	2	2	2	2	2	2	2	2	16	Very high
74	Noor et al.	2012b	2	2	2	2	2	2	2	2	16	Very high
75	Noor et al.	2009	2	2	2	2	2	2	2	1	15	Very high
76	Noor et al.	2014	1	2	2	2	2	2	2	2	15	Very high
77	Noor et al.	2013b	2	2	2	2	2	2	2	2	16	Very high
78	Noor et al.	2012a	2	2	2	2	2	2	2	2	16	Very high
79	Nyadanu et al	2019	1	2	1	1	2	2	1	1	11	High
80	Okunola et al.	2019	2	1	2	0	2	2	2	1	12	High
81	Onyiri	2015	1	1	1	1	0	1	1	1	7	Low
82	Ouedraogo et al.	2018	1	1	1	2	1	1	1	0	8	Medium
83	Ouédraogo et al.	2020	2	1	2	2	1	1	2	1	12	High
84	Peterson et al.	2009	1	1	1	0	2	1	1	1	8	Medium
85	Pinchoff et al.	2015	2	1	2	1	2	1	1	1	11	High

86	Raso et al.	2012	2	2	2	2	2	1	2	1	14	Very high
87	Rouamba et al.	2020	2	2	2	2	2	1	2	2	15	Very high
88	Rumisha et al.	2014	1	2	1	1	2	1	1	2	11	High
89	Selemani et al.	2015	2	2	2	1	2	1	1	1	12	High
90	Selemani et al.	2016	1	2	2	1	2	1	1	2	12	High
91	Sewe et al.	2016	2	1	1	1	0	1	1	2	9	Medium
92	Seyoum et al.	2017	2	2	1	1	1	1	1	2	11	High
93	Shaffer et al.	2020	2	1	1	1	1	1	2	1	10	Medium
94	Simon et al.	2013	1	2	1	1	2	1	1	1	10	Medium
95	Siraj et al.	2015	1	1	1	1	1	1	2	1	9	Medium
96	Snow et al.	2017	2	2	1	2	2	2	2	2	15	Very high
97	Snow et al.	1998	2	2	1	1	1	1	2	2	12	High
98	Solomon et al.	2019	1	2	1	0	2	1	2	1	10	High
99	Ssempiira et al	2018a	2	2	2	2	2	2	2	2	16	Very high
100	Ssempiira et al	2018b	2	2	2	2	2	2	2	2	16	Very high
101	Ssempiira et al	2017b	2	2	2	2	2	1	2	2	15	Very high
102	Ssempiira et al	2017a	2	2	2	2	1	1	2	2	14	Very high
103	Sturrock et al.	2014	2	2	2	2	2	2	2	2	16	Very high
104	Yankson et al.	2019	2	2	2	2	2	2	2	2	16	Very high
105	Yeshiwondim et al.	2009	1	2	1	1	2	2	2	2	13	Very high
106	Zacarias & Andersson	2011	2	2	2	2	2	2	1	1	14	Very high
107	Zacarias & Majlender	2011	2	2	2	2	2	2	2	2	16	Very high
<b>Median score</b>			2	2	1	1	2	1	2	2	12	High
<b>Mean score</b>			1.57	1.76	1.35	1.40	1.75	1.33	1.52	1.54	12.21	High