(A)

Study	Events	Total	Proportion	95%-CI	Weight (common)	Weight (random)
Murakami 2006	74	127	0.583	[0.492; 0.670]	1.1%	2.9%
Enzo Ierardi 2014	35	54	0.648	[0.506; 0.773]	0.6%	2.0%
Zhang 2015	53	63	0.841	[0.727; 0.921]	2.1%	3.9%
Song 2016	198	230	0.861	[0.809; 0.903]	8.8%	5.8%
Song 2016	183	216	0.847	[0.792; 0.892]	7.4%	5.6%
Zhang 2017	143	180	0.794	[0.728; 0.851]	4.3%	5.0%
Zhou 2017	123	150	0.820	[0.749; 0.878]	4.2%	5.0%
Zhang 2018	79	94	0.840	[0.750; 0.908]	3.0%	4.5%
Pu 2018	192	226	0.850	[0.796; 0.894]	7.9%	5.7%
Zhang 2019	193	237	0.814	[0.759; 0.862]	6.4%	5.5%
Li 2019	61	72	0.847	[0.743; 0.921]	2.5%	4.2%
Xu 2019	69	80	0.863	[0.767; 0.929]	3.1%	4.6%
Zhang 2021	126	175	0.720	[0.647; 0.785]	2.8%	4.4%
Huang 2021	95	101	0.941	[0.875; 0.978]	9.9%	5.9%
Zhang 2022	127	150	0.847	[0.779; 0.900]	5.1%	5.2%
Cui 2022	20	28	0.714	[0.513; 0.868]	0.4%	1.5%
Li 2022	35	43	0.814	[0.666; 0.916]	1.2%	3.0%
Hao 2022	63	80	0.787	[0.682; 0.871]	1.8%	3.7%
Suo 2023	181	217	0.834	[0.778; 0.881]	6.7%	5.5%
Zhang 2023	250	300	0.833	[0.786; 0.874]	9.2%	5.8%
Huang 2023	162	184	0.880	[0.825; 0.924]	8.3%	5.7%
Guo 2023	77	90	0.856	[0.766; 0.921]	3.3%	4.6%
Common effect model		3097	0.842	[0.829; 0.855]	100.0%	--
Random effects model			0.823	[0.797; 0.851]	--	100.0%

Heterogeneity: $I^2 = 71\%$, $\tau^2 = 0.0042$, $p < 0.01$

(x-axis: 0.5 0.6 0.7 0.8 0.9)

(B)

Study	Events	Total	Proportion	95%-CI	Weight (common)	Weight (random)
Murakami 2006	15	37	0.405	[0.248; 0.579]	0.1%	0.4%
Enzo Ierardi 2014	35	52	0.673	[0.529; 0.797]	0.4%	1.6%
Zhang 2015	53	60	0.883	[0.774; 0.952]	1.6%	4.3%
Song 2016	194	212	0.915	[0.869; 0.949]	7.8%	7.5%
Song 2016	176	192	0.917	[0.868; 0.952]	7.2%	7.3%
Zhang 2017	143	170	0.841	[0.777; 0.893]	3.1%	5.8%
Zhang 2018	79	90	0.878	[0.792; 0.937]	2.2%	5.1%
Pu 2018	192	201	0.955	[0.917; 0.979]	14.7%	8.2%
Zhang 2019	193	222	0.869	[0.818; 0.911]	5.1%	6.8%
Li 2019	61	65	0.938	[0.850; 0.983]	3.4%	6.0%
Xu 2019	66	70	0.943	[0.860; 0.984]	3.9%	6.3%
Zhang 2021	126	146	0.863	[0.796; 0.914]	3.1%	5.9%
Zhang 2022	127	146	0.870	[0.804; 0.920]	3.3%	6.0%
Cui 2022	20	23	0.870	[0.664; 0.972]	0.5%	2.1%
Li 2022	35	40	0.875	[0.732; 0.958]	1.0%	3.2%
Suo 2023	177	193	0.917	[0.869; 0.952]	7.3%	7.4%
Zhang 2023	242	265	0.913	[0.873; 0.944]	9.5%	7.7%
Huang 2023	149	152	0.980	[0.943; 0.996]	25.8%	8.6%
Common effect model		2336	0.927	[0.917; 0.938]	100.0%	--
Random effects model			0.900	[0.877; 0.924]	--	100.0%

Heterogeneity: $I^2 = 80\%$, $\tau^2 = 0.0019$, $p < 0.01$

(x-axis: 0.3 0.4 0.5 0.6 0.7 0.8 0.9)

Supplementary Figure 1 Summary eradication rate forest plots for intention-to-treat (A) and per-protocol (B) analyses of regimens with and without minocycline.
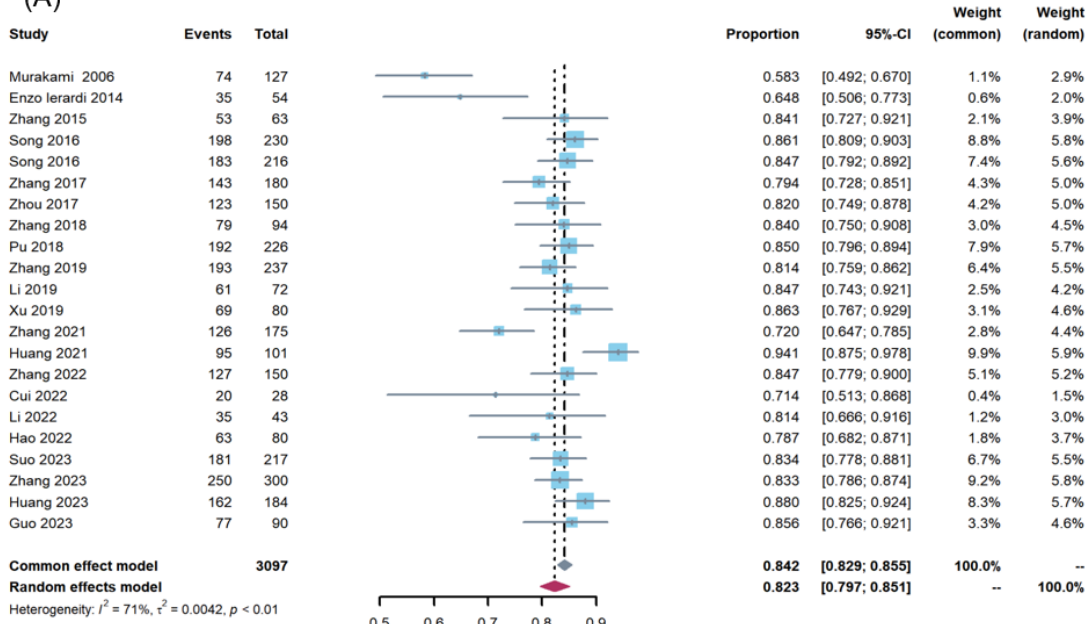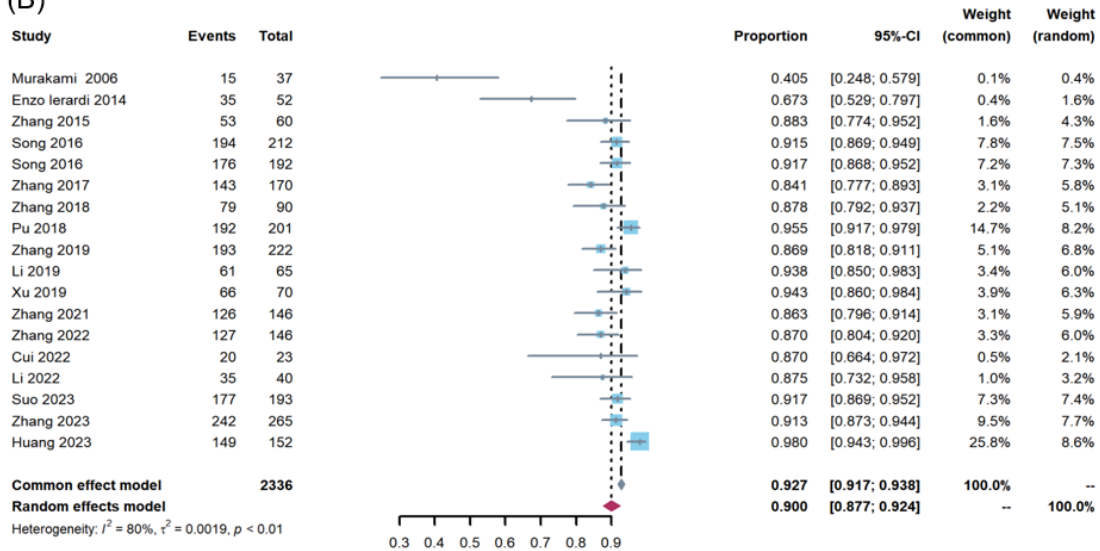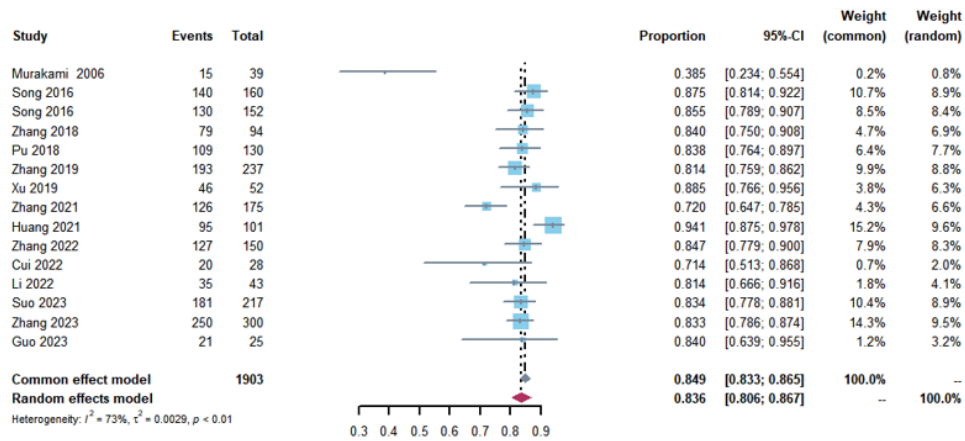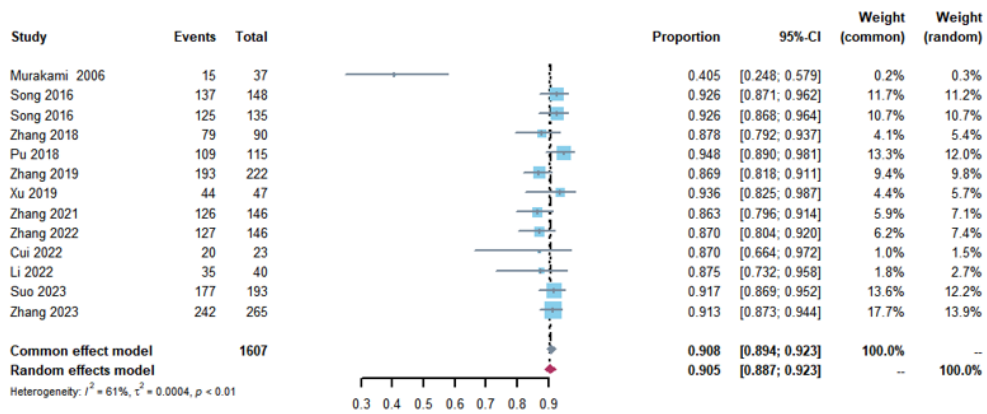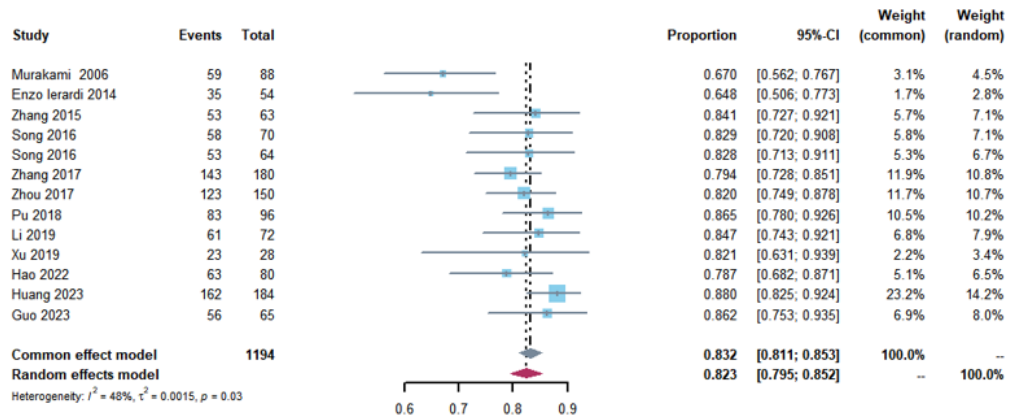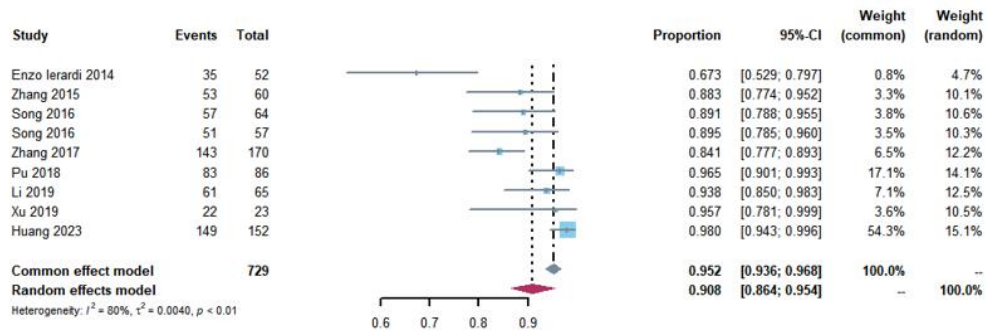
(A)

(B)

Supplementary Figure 2 Summary eradication rate forest plots for intention-to-treat (A) and per-protocol (B) analyses of first-line regimens with and without minocycline.
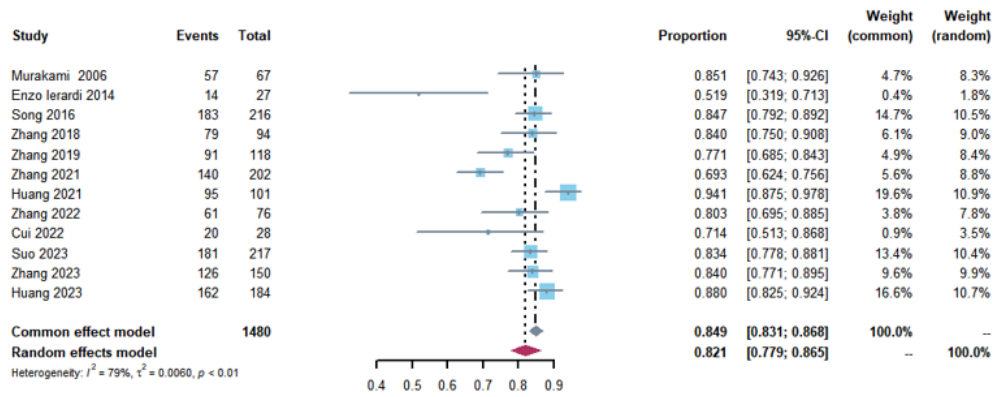
(A)

Study	Events	Total		Proportion	95%-CI	Weight (common)	Weight (random)
Murakami 2006	59	88		0.670	[0.562; 0.767]	3.1%	4.5%
Enzo Ierardi 2014	35	54		0.648	[0.506; 0.773]	1.7%	2.8%
Zhang 2015	53	63		0.841	[0.727; 0.921]	5.7%	7.1%
Song 2016	58	70		0.829	[0.720; 0.908]	5.8%	7.1%
Song 2016	53	64		0.828	[0.713; 0.911]	5.3%	6.7%
Zhang 2017	143	180		0.794	[0.728; 0.851]	11.9%	10.8%
Zhou 2017	123	150		0.820	[0.749; 0.878]	11.7%	10.7%
Pu 2018	83	96		0.865	[0.780; 0.926]	10.5%	10.2%
Li 2019	61	72		0.847	[0.743; 0.921]	6.8%	7.9%
Xu 2019	23	28		0.821	[0.631; 0.939]	2.2%	3.4%
Hao 2022	63	80		0.787	[0.682; 0.871]	5.1%	6.5%
Huang 2023	162	184		0.880	[0.825; 0.924]	23.2%	14.2%
Guo 2023	56	65		0.862	[0.753; 0.935]	6.9%	8.0%
Common effect model		1194		0.832	[0.811; 0.853]	100.0%	--
Random effects model				0.823	[0.795; 0.852]	--	100.0%

Heterogeneity: $I^2 = 48\%$, $\tau^2 = 0.0015$, $p = 0.03$

0.6 0.7 0.8 0.9

(B)

Study	Events	Total		Proportion	95%-CI	Weight (common)	Weight (random)
Enzo Ierardi 2014	35	52		0.673	[0.529; 0.797]	0.8%	4.7%
Zhang 2015	53	60		0.883	[0.774; 0.952]	3.3%	10.1%
Song 2016	57	64		0.891	[0.788; 0.955]	3.8%	10.6%
Song 2016	51	57		0.895	[0.785; 0.960]	3.5%	10.3%
Zhang 2017	143	170		0.841	[0.777; 0.893]	6.5%	12.2%
Pu 2018	83	86		0.965	[0.901; 0.993]	17.1%	14.1%
Li 2019	61	65		0.938	[0.850; 0.983]	7.1%	12.5%
Xu 2019	22	23		0.957	[0.781; 0.999]	3.6%	10.5%
Huang 2023	149	152		0.980	[0.943; 0.996]	54.3%	15.1%
Common effect model		729		0.952	[0.936; 0.968]	100.0%	--
Random effects model				0.908	[0.864; 0.954]	--	100.0%

Heterogeneity: $I^2 = 80\%$, $\tau^2 = 0.0040$, $p < 0.01$
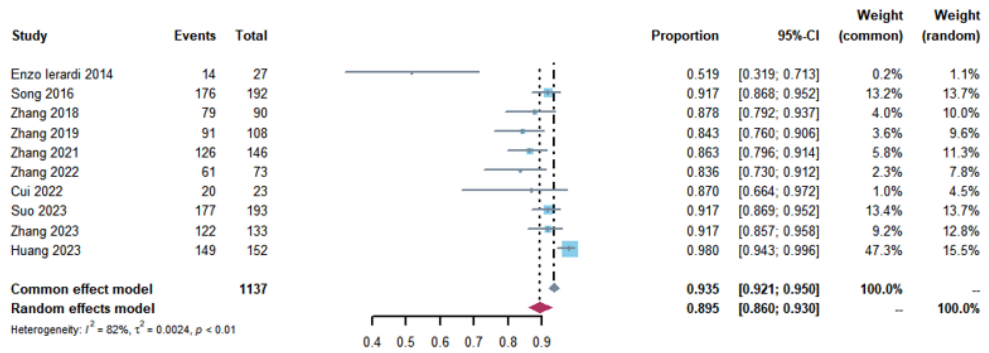
0.6 0.7 0.8 0.9

Supplementary Figure 3 Summary eradication rate forest plots for intention-to-treat (A) and per-protocol (B) analyses of rescue regimens with and without minocycline.
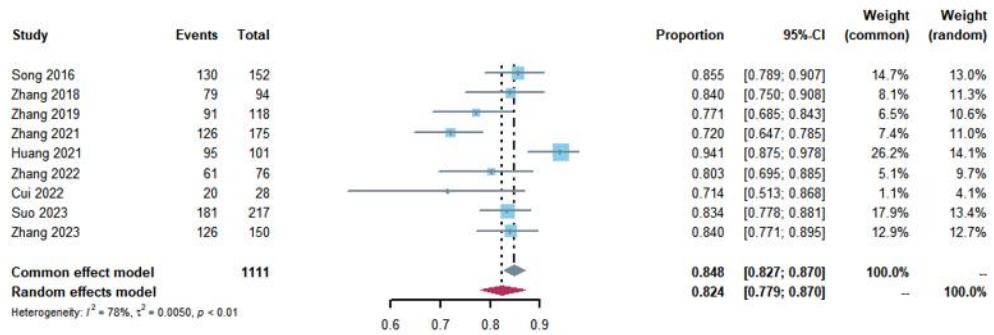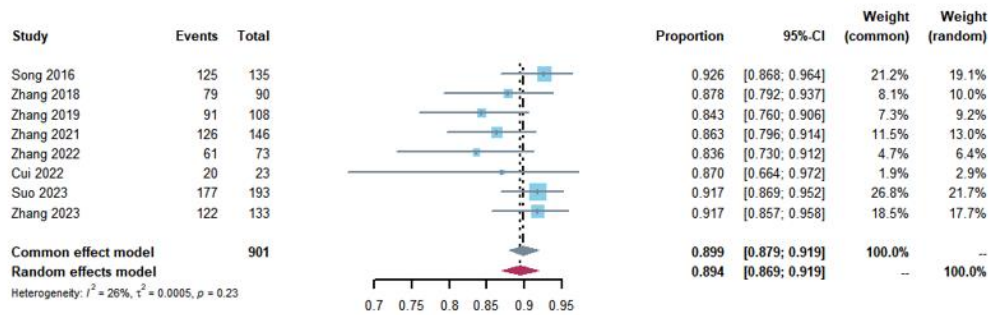
(A)

Study	Events	Total		Proportion	95%-CI	Weight (common)	Weight (random)
Murakami 2006	57	67		0.851	[0.743; 0.926]	4.7%	8.3%
Enzo Ierardi 2014	14	27		0.519	[0.319; 0.713]	0.4%	1.8%
Song 2016	183	216		0.847	[0.792; 0.892]	14.7%	10.5%
Zhang 2018	79	94		0.840	[0.750; 0.908]	6.1%	9.0%
Zhang 2019	91	118		0.771	[0.685; 0.843]	4.9%	8.4%
Zhang 2021	140	202		0.693	[0.624; 0.756]	5.6%	8.8%
Huang 2021	95	101		0.941	[0.875; 0.978]	19.6%	10.9%
Zhang 2022	61	76		0.803	[0.695; 0.885]	3.8%	7.8%
Cui 2022	20	28		0.714	[0.513; 0.868]	0.9%	3.5%
Suo 2023	181	217		0.834	[0.778; 0.881]	13.4%	10.4%
Zhang 2023	126	150		0.840	[0.771; 0.895]	9.6%	9.9%
Huang 2023	162	184		0.880	[0.825; 0.924]	16.6%	10.7%
Common effect model		**1480**		**0.849**	**[0.831; 0.868]**	**100.0%**	**--**
Random effects model				**0.821**	**[0.779; 0.865]**	**--**	**100.0%**

Heterogeneity: $I^2 = 79\%$, $\tau^2 = 0.0060$, $p < 0.01$

0.4 0.5 0.6 0.7 0.8 0.9

(B)

Study	Events	Total		Proportion	95%-CI	Weight (common)	Weight (random)
Enzo Ierardi 2014	14	27		0.519	[0.319; 0.713]	0.2%	1.1%
Song 2016	176	192		0.917	[0.868; 0.952]	13.2%	13.7%
Zhang 2018	79	90		0.878	[0.792; 0.937]	4.0%	10.0%
Zhang 2019	91	108		0.843	[0.760; 0.906]	3.6%	9.6%
Zhang 2021	126	146		0.863	[0.796; 0.914]	5.8%	11.3%
Zhang 2022	61	73		0.836	[0.730; 0.912]	2.3%	7.8%
Cui 2022	20	23		0.870	[0.664; 0.972]	1.0%	4.5%
Suo 2023	177	193		0.917	[0.869; 0.952]	13.4%	13.7%
Zhang 2023	122	133		0.917	[0.857; 0.958]	9.2%	12.8%
Huang 2023	149	152		0.980	[0.943; 0.996]	47.3%	15.5%
Common effect model		**1137**		**0.935**	**[0.921; 0.950]**	**100.0%**	**--**
Random effects model				**0.895**	**[0.860; 0.930]**	**--**	**100.0%**

Heterogeneity: $I^2 = 82\%$, $\tau^2 = 0.0024$, $p < 0.01$

0.4 0.5 0.6 0.7 0.8 0.9

Supplementary Figure 4 Summary forest plots of eradication rates for intention-to-treat (A) and per-protocol (B) analyses of combination regimens with and without minocycline and nitroimidazole antibiotics.
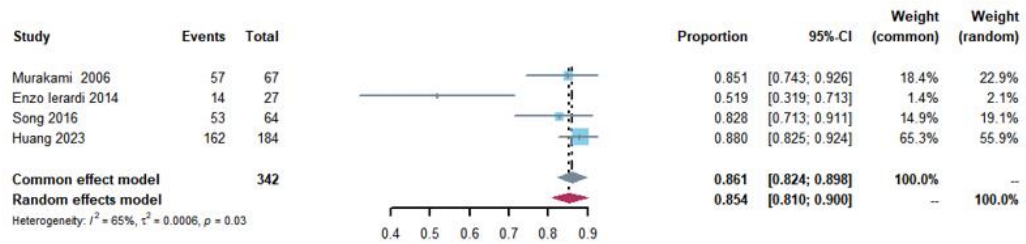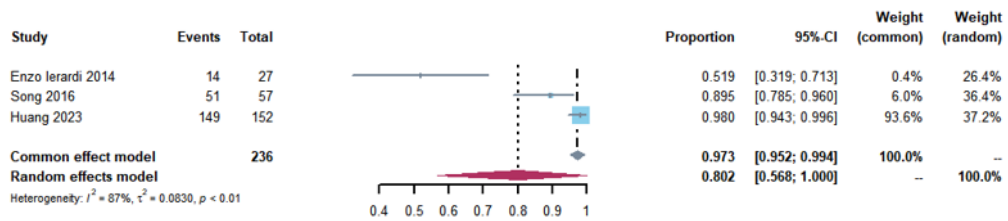
(A)

(B)

Supplementary Figure 5 Summary forest plots of eradication rates for intention-to-treat (A) and per-protocol (B) analyses of first-line regimens with and without combinations of minocycline and nitroimidazole antibiotics.
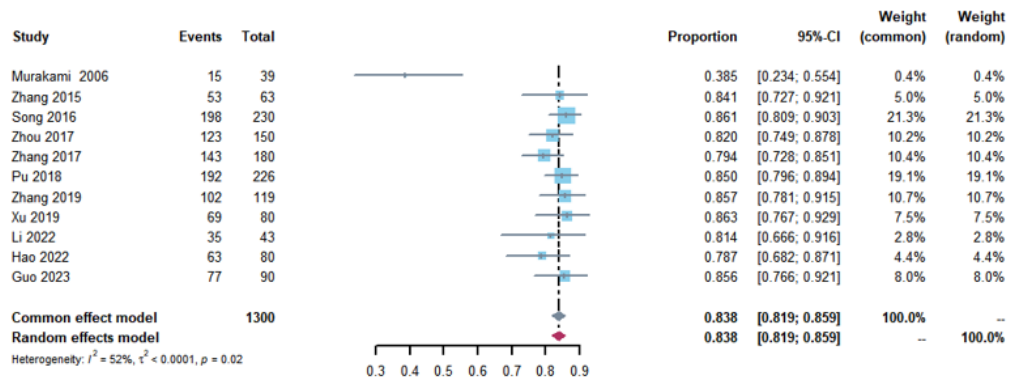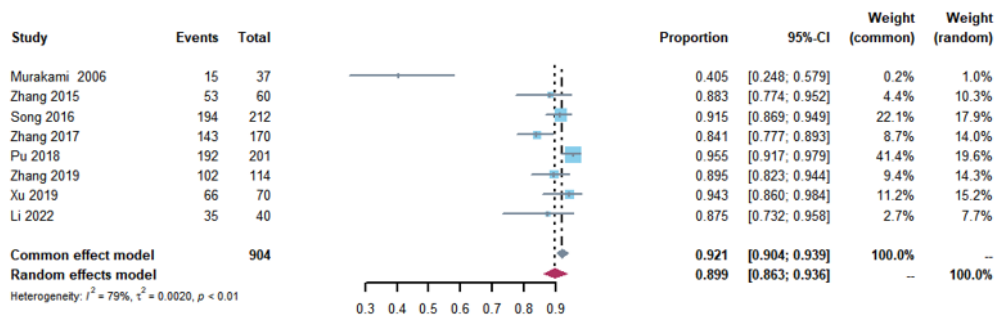
(A)

(B)

Supplementary Figure 6 Summary forest plots of eradication rates for intention-to-treat (A) and per-protocol (B) analyses of rescue regimens with and without combinations of minocycline and nitroimidazole antibiotics.
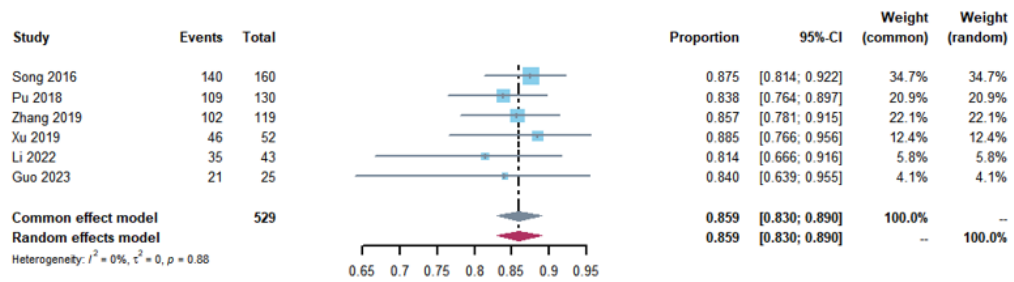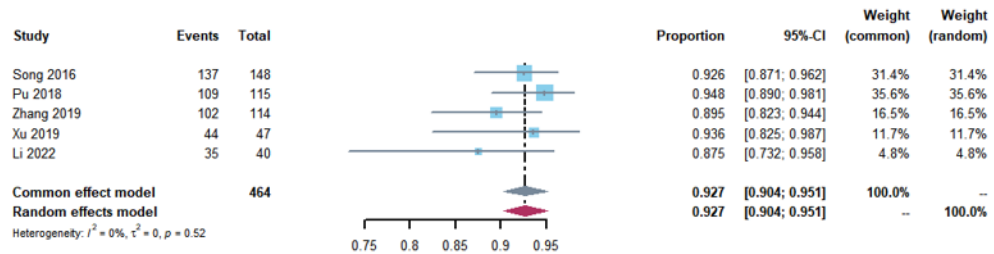
(A)

(B)

Supplementary Figure 7 Summary eradication rate forest plots for intention-to-treat (A) and per-protocol (B) analyses of combination regimens with and without minocycline and amoxicillin.
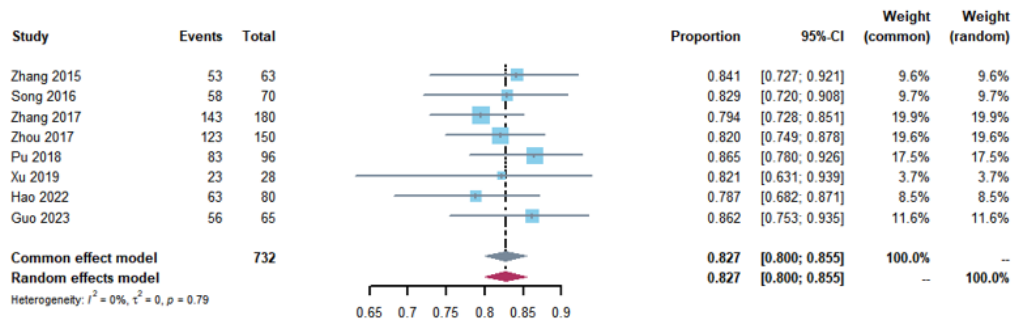
(A)

Study	Events	Total		Proportion	95%-CI	Weight (common)	Weight (random)
Song 2016	140	160		0.875	[0.814; 0.922]	34.7%	34.7%
Pu 2018	109	130		0.838	[0.764; 0.897]	20.9%	20.9%
Zhang 2019	102	119		0.857	[0.781; 0.915]	22.1%	22.1%
Xu 2019	46	52		0.885	[0.766; 0.956]	12.4%	12.4%
Li 2022	35	43		0.814	[0.666; 0.916]	5.8%	5.8%
Guo 2023	21	25		0.840	[0.639; 0.955]	4.1%	4.1%
Common effect model		529		0.859	[0.830; 0.890]	100.0%	--
Random effects model				0.859	[0.830; 0.890]	--	100.0%

Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0$, $p = 0.88$

0.65 0.7 0.75 0.8 0.85 0.9 0.95

(B)

Study	Events	Total		Proportion	95%-CI	Weight (common)	Weight (random)
Song 2016	137	148		0.926	[0.871; 0.962]	31.4%	31.4%
Pu 2018	109	115		0.948	[0.890; 0.981]	35.6%	35.6%
Zhang 2019	102	114		0.895	[0.823; 0.944]	16.5%	16.5%
Xu 2019	44	47		0.936	[0.825; 0.987]	11.7%	11.7%
Li 2022	35	40		0.875	[0.732; 0.958]	4.8%	4.8%
Common effect model		464		0.927	[0.904; 0.951]	100.0%	--
Random effects model				0.927	[0.904; 0.951]	--	100.0%

Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0$, $p = 0.52$
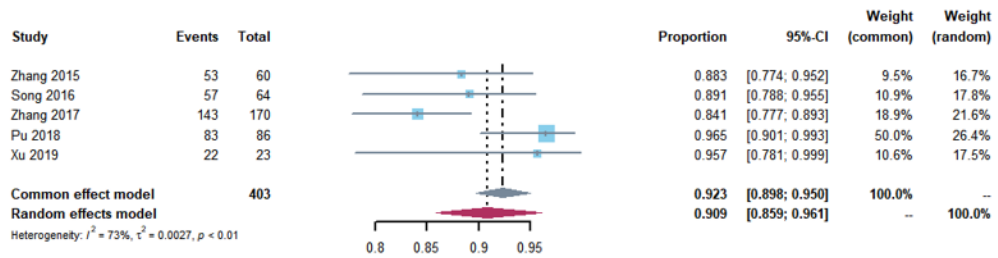
0.75 0.8 0.85 0.9 0.95

Supplementary Figure 8 Summary eradication rate forest plots for intention-to-treat (A) and per-protocol (B) analyses of first-line regimens with and without minocycline and amoxicillin combinations.
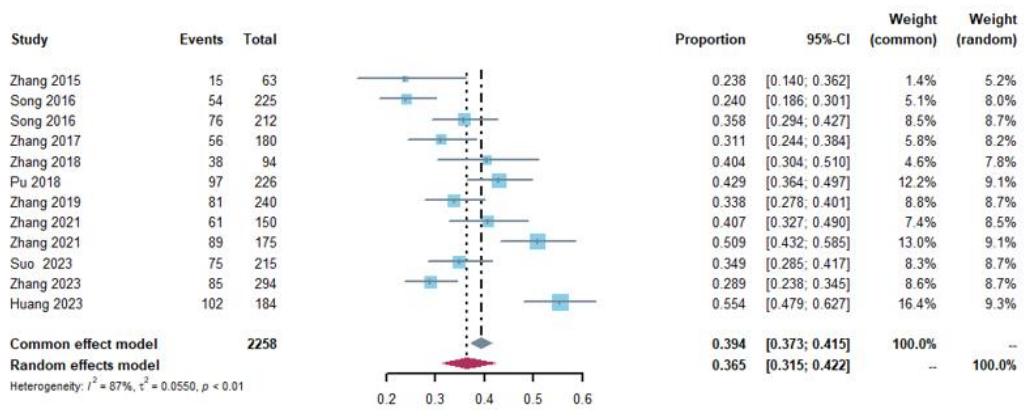
(A)

Study	Events	Total		Proportion	95%-CI	Weight (common)	Weight (random)
Zhang 2015	53	63		0.841	[0.727; 0.921]	9.6%	9.6%
Song 2016	58	70		0.829	[0.720; 0.908]	9.7%	9.7%
Zhang 2017	143	180		0.794	[0.728; 0.851]	19.9%	19.9%
Zhou 2017	123	150		0.820	[0.749; 0.878]	19.6%	19.6%
Pu 2018	83	96		0.865	[0.780; 0.926]	17.5%	17.5%
Xu 2019	23	28		0.821	[0.631; 0.939]	3.7%	3.7%
Hao 2022	63	80		0.787	[0.682; 0.871]	8.5%	8.5%
Guo 2023	56	65		0.862	[0.753; 0.935]	11.6%	11.6%
Common effect model		732		0.827	[0.800; 0.855]	100.0%	--
Random effects model				0.827	[0.800; 0.855]	--	100.0%

Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0$, $p = 0.79$

0.65 0.7 0.75 0.8 0.85 0.9

(B)

Study	Events	Total		Proportion	95%-CI	Weight (common)	Weight (random)
Zhang 2015	53	60		0.883	[0.774; 0.952]	9.5%	16.7%
Song 2016	57	64		0.891	[0.788; 0.955]	10.9%	17.8%
Zhang 2017	143	170		0.841	[0.777; 0.893]	18.9%	21.6%
Pu 2018	83	86		0.965	[0.901; 0.993]	50.0%	26.4%
Xu 2019	22	23		0.957	[0.781; 0.999]	10.6%	17.5%
Common effect model		403		0.923	[0.898; 0.950]	100.0%	--
Random effects model				0.909	[0.859; 0.961]	--	100.0%

Heterogeneity: $I^2 = 73\%$, $\tau^2 = 0.0027$, $p < 0.01$

0.8 0.85 0.9 0.95

Supplementary Figure 9 Summary eradication rate forest plots for intention-to-treat (A) and per-protocol (B) analyses of rescue regimens with and without minocycline and amoxicillin combinations.

Study	Events	Total		Proportion	95%-CI	Weight (common)	Weight (random)
Zhang 2015	15	63		0.238	[0.140; 0.362]	1.4%	5.2%
Song 2016	54	225		0.240	[0.186; 0.301]	5.1%	8.0%
Song 2016	76	212		0.358	[0.294; 0.427]	8.5%	8.7%
Zhang 2017	56	180		0.311	[0.244; 0.384]	5.8%	8.2%
Zhang 2018	38	94		0.404	[0.304; 0.510]	4.6%	7.8%
Pu 2018	97	226		0.429	[0.364; 0.497]	12.2%	9.1%
Zhang 2019	81	240		0.338	[0.278; 0.401]	8.8%	8.7%
Zhang 2021	61	150		0.407	[0.327; 0.490]	7.4%	8.5%
Zhang 2021	89	175		0.509	[0.432; 0.585]	13.0%	9.1%
Suo 2023	75	215		0.349	[0.285; 0.417]	8.3%	8.7%
Zhang 2023	85	294		0.289	[0.238; 0.345]	8.6%	8.7%
Huang 2023	102	184		0.554	[0.479; 0.627]	16.4%	9.3%
Common effect model		2258		0.394	[0.373; 0.415]	100.0%	--
Random effects model				0.365	[0.315; 0.422]	--	100.0%

Heterogeneity: $I^2 = 87\%$, $\tau^2 = 0.0550$, $p < 0.01$

0.2 0.3 0.4 0.5 0.6

Supplementary Figure 10 Forest plots of pooled incidence of adverse effects for regimens with and without minocycline.
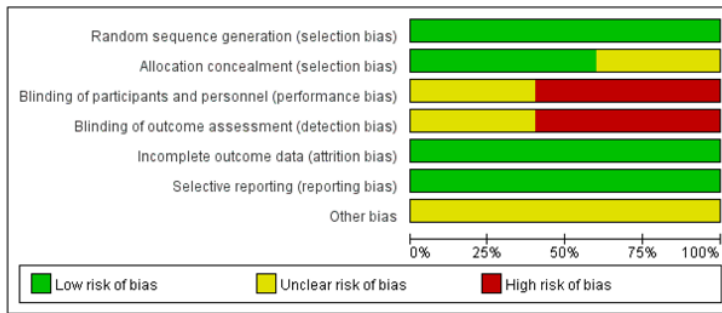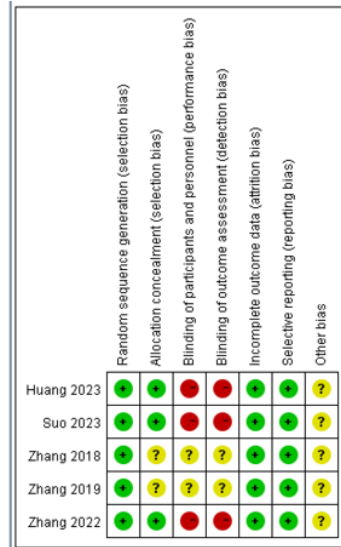
Supplementary Figure 11 Plot of the risk of bias of RCT studies containing minocycline quadruple regimens.