Supplementary File S1

Table S1. Retrieval formulas in six databases in present study.

Database	Search Details
PubMed 160	(Lyme disease OR Borrelia burgdorferi) AND (human OR people OR person OR man OR men OR women OR woman OR patient OR Ixodes tick) AND (infection rate OR prevalence OR seroprevalence OR serological survey OR sero-prevalence OR seroepidemiology OR sero-epidemiology OR prevalence OR epidemiology) AND (China OR chinese)
Web of Science 178	#1 TS=(Lyme disease OR *Borrelia burgdorferi*) #2 TS= (human OR people OR person OR man OR men OR women OR woman OR patient OR Ixodes tick) #3 TS=(infection rate OR prevalence OR seroprevalence OR serological survey OR sero-prevalence OR seroepidemiology OR sero-epidemiology OR prevalence OR epidemiology) #4 TS=(China OR chinese) Final query = #1 AND #2 AND #3 AND #4
ScienceDirect 1068	(Lyme disease OR Borrelia burgdorferi) AND (human OR people OR person OR Ixodes tick) AND (China OR chinese)
CNKI 260	(Lyme disease OR *Borrelia burgdorferi*) and (humans OR Ixodes ticks) (In chinese)
Wanfang 679	(Lyme disease OR *Borrelia burgdorferi*) and (humans OR Ixodes ticks) (In chinese)
Vip 220	(Lyme disease OR *Borrelia burgdorferi*) and (humans OR Ixodes ticks) (In chinese)

Supplementary File S2. References for the human and tick studies included in the systematic review and meta-analysis.

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MDPI

Supplementary File S3

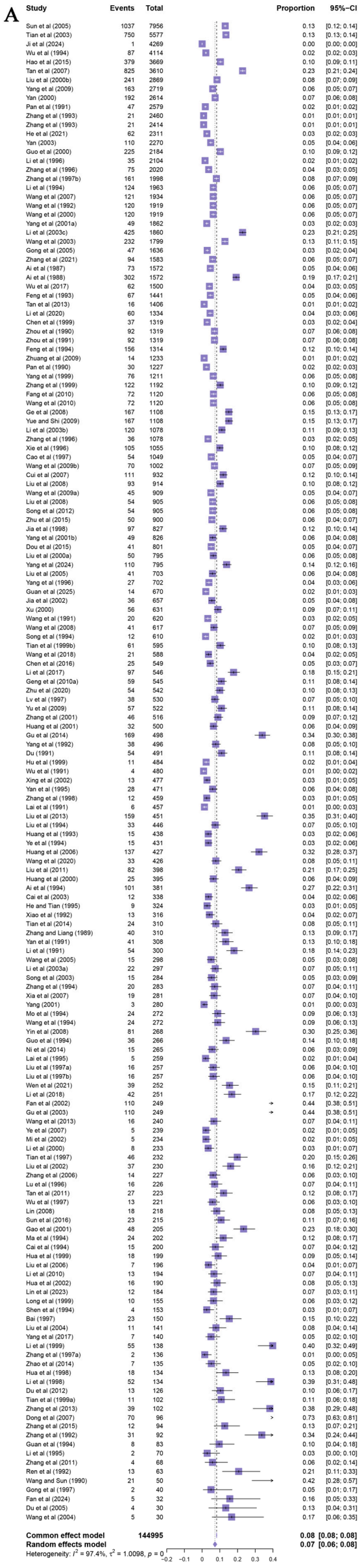


Figure S1. Forest plots of *Borrelia burgdorferi* sensu lato prevalence in humans and questing or unfed *Ixodes* ticks in China. (A) Random-effects meta-analysis of human seroprevalence, including 167 studies comprising 144,995 examined individuals and 11,867 seropositive individuals. The pooled seroprevalence was 7% (95% CI: 6%–8%), with substantial between-study heterogeneity (I^2 = 97.4%). (B) Random-effects meta-analysis of PCR-confirmed infection prevalence in questing or unfed *Ixodes* ticks, including 22 studies comprising 12,862 examined ticks and 2,040 PCR-positive ticks. The pooled infection prevalence was 20% (95% CI: 10%–32%), with substantial between-study heterogeneity (I^2 = 99.5%). Individual study estimates and the corresponding pooled estimates are presented with 95% confidence intervals.

Supplementary File S4

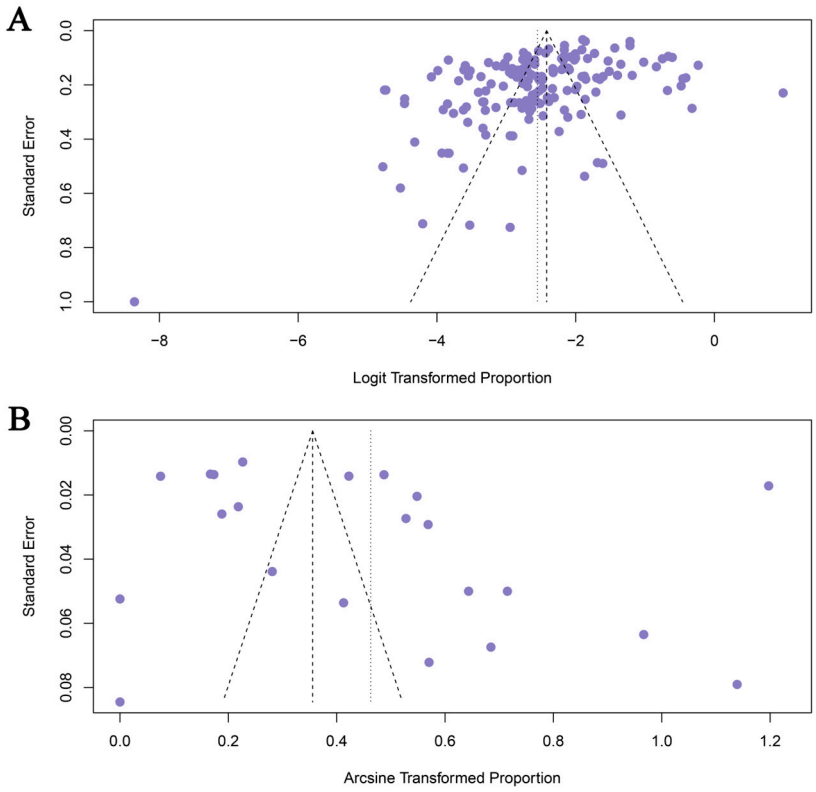


Figure S2. Funnel plots of *Borrelia burgdorferi* sensu lato seroprevalence in humans and infection prevalence in questing Ixodes ticks in China. Panels A and B show the original funnel plots for human seroprevalence and infection prevalence in questing Ixodes ticks, respectively. Filled circles represent the observed studies. Standard errors are plotted against logit-transformed proportions for human studies (A) and arcsine-transformed proportions for tick studies (B). The vertical reference lines indicate the pooled effect estimates, and the diagonal dashed lines represent the pseudo 95% confidence limits.

Supplementary File S5

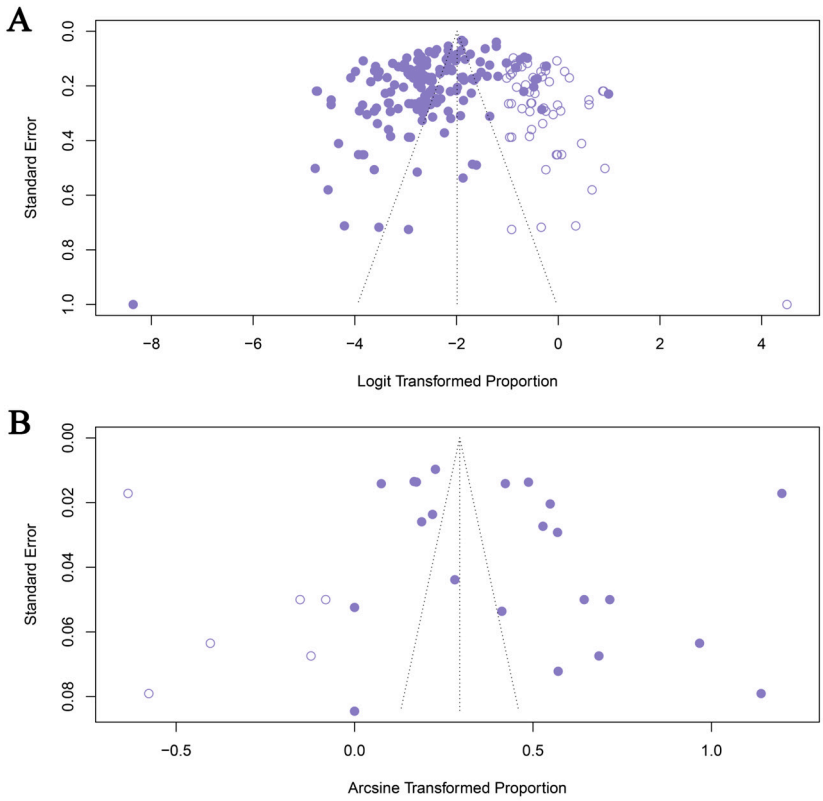


Figure S3. Trim-and-fill-adjusted funnel plots of *Borrelia burgdorferi* sensu lato seroprevalence in humans and infection prevalence in questing Ixodes ticks in China. Panels A and B show the adjusted funnel plots for human seroprevalence and infection prevalence in questing Ixodes ticks, respectively. Filled circles represent the observed studies, whereas open circles represent potentially missing studies imputed using the trim-and-fill method. Standard errors are plotted against logit-transformed proportions for human studies (A) and arcsine-transformed proportions for tick studies (B). The vertical reference lines indicate the pooled effect estimates after trim-and-fill adjustment, and the diagonal dotted lines represent the pseudo 95% confidence limits.

Supplementary File S6

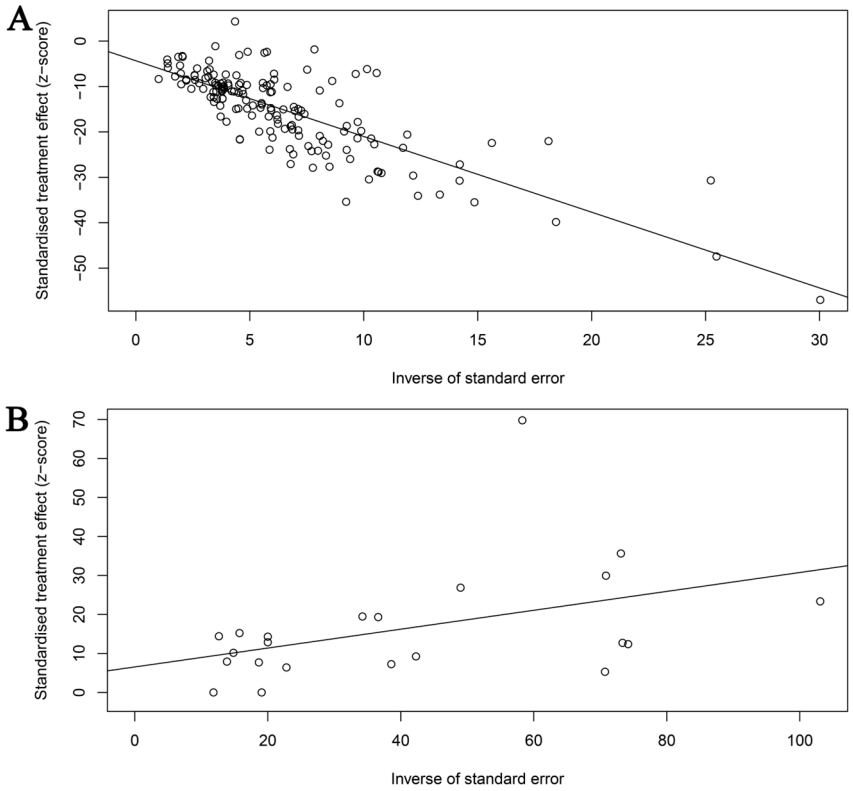


Figure S4. Egger's regression plots assessing small-study effects in studies of Borrelia burgdorferi sensu lato prevalence in China. Panel A shows human seroprevalence studies, and panel B shows infection-prevalence studies of questing Ixodes ticks. Each open circle represents an individual study, with the standardized effect estimate (z score) plotted against the inverse of its standard error; the solid line represents the fitted Egger regression line. Significant funnel-plot asymmetry was detected for human studies (t = −5.40, df = 165, P < 0.0001; bias estimate = −4.3313, SE = 0.8026), indicating evidence of small-study effects. In contrast, no significant funnel-plot asymmetry was detected for tick studies (t = 1.20, df = 20, P = 0.2431; bias estimate = 6.5355, SE = 5.4338).

Supplementary File S7

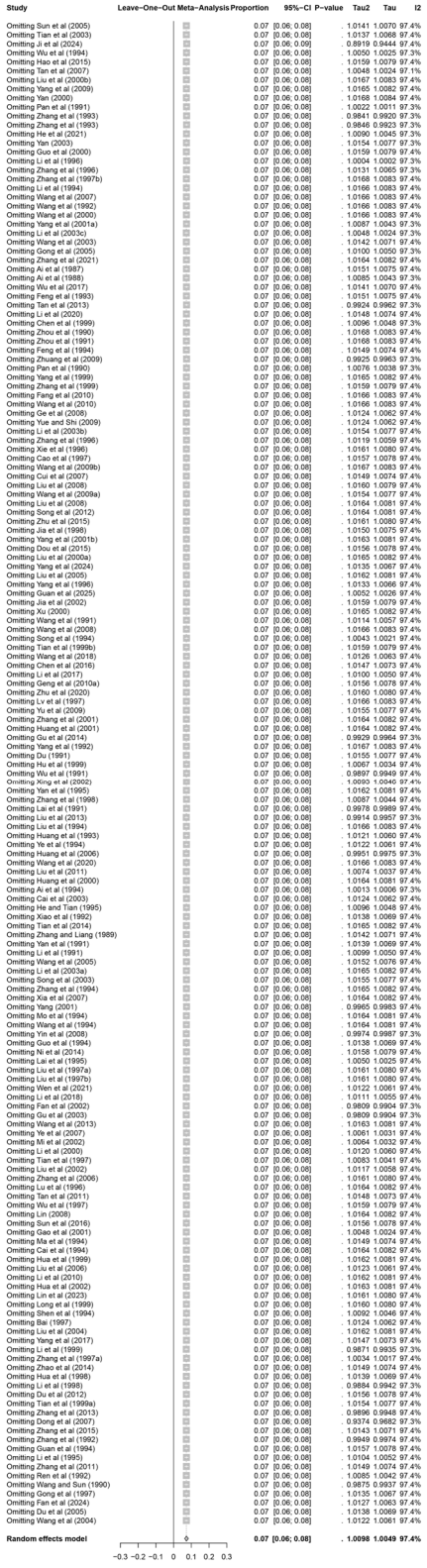


Figure S5. Leave-one-out sensitivity analysis of the seroprevalence of Borrelia burgdorferi sensu lato in humans in China. Each row presents the pooled seroprevalence and corresponding 95% confidence interval obtained from the random-effects model after sequential omission of one study. The pooled estimates remained approximately 7% (95% CI: 6%–8%) across all iterations, indicating that no individual study materially influenced the overall estimate. The diamond at the bottom represents the pooled estimate based on all included human studies. Substantial residual heterogeneity remained (I^2 = 97.4%).

Supplementary File S8

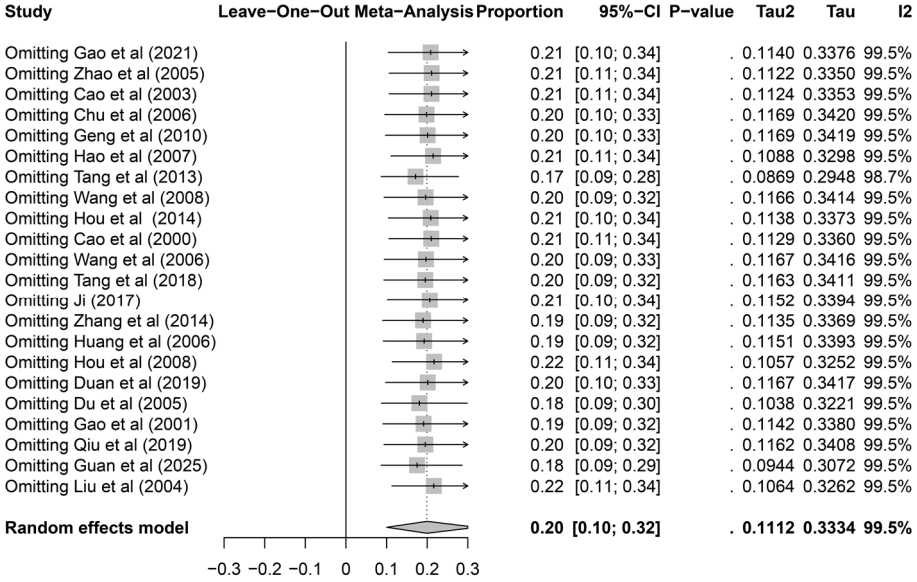


Figure S6. Leave-one-out sensitivity analysis of the infection prevalence of Borrelia burgdorferi sensu lato in questing Ixodes ticks in China. Each row presents the pooled infection prevalence and corresponding 95% confidence interval obtained from the random-effects model after sequential omission of one study. The pooled estimates remained close to 20% (95% CI: 10%–32%) across all iterations, indicating that the overall result was not disproportionately influenced by any single study. The diamond at the bottom represents the pooled estimate based on all included tick studies. Substantial residual heterogeneity remained (I^2 = 99.4%).

Supplementary File S9

Table S2. Summary of pooled human seroprevalence of *Borrelia burgdorferi* sensu lato exposure and PCR-confirmed infection prevalence in questing *Ixodes* ticks in China.

	No. studies	No. examined	No. positive	% (95% Cl)	Heterogeneity			Univariate meta-regression	
					$\chi 2$	*p*-value	I^2 (%)	*p*-value	Coefficient (95% CI)
Humans									
Geographical region									
Central China	19	18366	1921	0.0925 [0.0773-0.1088]	213.23	$p < 0.0001$	91.6	0.1855	-0.0521 (-0.1293 to 0.0250)
Eastern China	29	29851	1452	0.0510 [0.0355-0.0691]	549.15	$p < 0.0001$	94.9	<.0001	-0.1347 (-0.2024 to -0.0669)
Northeastern China	35	27548	2230	0.1310 [0.0838-0.1870]	2901.52	$p = 0$	98.8	-	-
Northern China	27	19392	1422	0.0798 [0.0554-0.1082]	1271.42	$p < 0.0001$	98.0	0.0298	-0.0771 (-0.1466 to -0.0076)
Northwestern China	31	26959	3115	0.0900 [0.0725-0.1092]	1107.64	$p < 0.0001$	97.3	0.0766	-0.0603 (-0.1271 to 0.0064)
Southwestern China	15	11395	788	0.0540 [0.0318-0.0815]	414.14	$p < 0.0001$	96.6	0.0029	-0.1284 (-0.2130 to -0.0439)
Western China	7	7173	401	0.0784 [0.0445-0.1208]	128.34	$p < 0.0001$	95.3	0.1637	-0.0787 (-0.1895 to 0.0321)
Sampling year									
1986-1995	49	46246	2696	0.0637 [0.0494-0.0797]	1723.65	$p = 0$	97.2	0.0263	-0.0629 (-0.1184 to -0.0074)
1996-2005	37	23327	2669	0.0983 [0.0724-0.1277]	1877.85	$p = 0$	98.1	-	-
2006-2015	23	14273	866	0.0863 [0.0547-0.1241]	425.56	$p < 0.0001$	94.8	0.4969	-0.0237 (-0.0919 to 0.0446)
2016-2025	8	8236	278	0.0556 [0.0222-0.1030]	591.77	$p < 0.0001$	98.8	0.1094	-0.0807 (-0.1795 to 0.0181)
Age (years)									
＜20	27	6338	435	0.0673 [0.0506-0.0862]	176.11	$p < 0.0001$	85.2	0.0368	-0.0621 (-0.1204 to -0.0038)
＞50	34	6878	666	0.0892 [0.0686-0.1122]	243.56	$p < 0.0001$	86.5	0.4408	-0.0216 (-0.0765 to 0.0333)
20-30	31	8984	799	0.0826 [0.0639-0.1034]	283.19	$p < 0.0001$	89.4	0.2506	-0.0327 (-0.0884 to 0.0231)
30-40	32	13033	1564	0.1019 [0.0772-0.1296]	568.22	$p < 0.0001$	94.5	-	-

40-50	**34**	**10317**	**1074**	**0.0936 [0.0706-0.1195]**	**427.92**	***p* < 0.0001**	**92.3**	**0.6087**	**-0.0143 (-0.0690 to 0.0404)**
Sex									
Man	63	27353	2137	0.0858 [0.0697-0.1033]	1165.31	*p* < 0.0001	94.7	-	-
Women	60	21598	1618	0.0797 [0.0632-0.0979]	1014.86	*p* < 0.0001	94.2	0.6168	-0.0112 (-0.0551 to 0.0327)
Season									
Spring	9	4019	234	0.0551 [0.0407-0.0714]	35.17	*p* < 0.0001	77.3	0.0735	-0.1869 (-0.3916 to 0.0177)
Winter	2	1550	83	0.1892 [0.0000-0.6524]	48.45	*p* < 0.0001	97.9	-	-
Autumn	7	5300	371	0.0633 [0.0184-0.1325]	255.52	*p* < 0.0001	97.7	0.1163	-0.1677 (-0.3769 to 0.0416)
Summer	18	11869	737	0.0714 [0.0450-0.1034]	850.40	*p* < 0.0001	98.0	0.1302	-0.1514 (-0.3474 to 0.0447)
Tick bites									
Not suffering	**12**	**10159**	**406**	**0.0506 [0.0229-0.0885]**	**416.93**	***p* < 0.0001**	**97.4**	**-**	**-**
Suffering	**99**	**94255**	**8564**	**0.1025 [0.0837-0.1230]**	**5170.94**	***p* =0**	**98.1**	**0.0465**	**0.0987 (0.0015 to 0.1959)**
Risk									
Low	**19**	**9857**	**1058**	**0.0883 [0.0498-0.1365]**	**1028.30**	***p* < 0.0001**	**98.2**	**0.6350**	**-0.0177 (-0.0908 to 0.0554)**
High	**87**	**84790**	**7406**	**0.0984 [0.0808-0.1177]**	**3553.32**	***p* = 0**	**97.6**	**-**	**-**
Moderate	**13**	**9384**	**266**	**0.0489 [0.0299-0.0724]**	**235.72**	***p* < 0.0001**	**94.9**	**0.0466**	**-0.0882 (-0.1751 to -0.0013)**
Residence									
Urban	16	8129	860	0.0706 [0.0404-0.1085]	672.79	*p* < 0.0001	97.8	0.3758	-0.0372 (-0.1195 to 0.0451)
Rural	103	92714	7485	0.0908 [0.0739-0.1093]	4776.31	*p* = 0	97.9	-	-
Antibodies									
IgG	100	69926	5610	0.0883 [0.0724-0.1056]	3203.57	*p* = 0	96.9	-	-
IgG + IgM	18	24604	2575	0.0860 [0.0570-0.1203]	884.55	*p* < 0.0001	98.1	0.9205	-0.0037 (-0.0759 to 0.0685)
IgM	5	7471	708	0.0661 [0.0219-0.1320]	467.85	*p* < 0.0001	99.1	0.5289	-0.0413 (-0.1701 to 0.0874)
Pathogen species									
B.afzelii	3	1215	86	0.0754 [0.0512-0.1039]	5.36	*p* = 0.0687	62.7	0.7657	-0.0444 (-0.3364 to 0.2476)
B.garinii	2	1087	113	0.1039 [0.0865-0.1227]	0.22	*p* = 0.6412	0.0	-	-
B.garinii + B.afzelii	3	2835	223	0.1019 [0.0016-0.3286]	326.69	*p* < 0.0001	99.4	0.9782	-0.0041 (0.9782 to 0.2870)
Detection Method									
ELISA	22	11705	1049	0.0828 [0.0569-0.1189]	936.28	*p* < 0.0001	97.8	0.8700	-0.1219 (-1.2518 to 1.3380)
ELISA+WB	1	310	24	0.0774 [0.0524-0.1129]	0.00	-	-	0.8646	-0.2103 (-2.6268 to 2.2063)

IFA	121	103621	8314	0.0750 [0.0632-0.0889]	4258.99	$p = 0$	97.2	0.7537	-0.2256 (-1.6349 to 1.1836)
IFA+ELISA	2	8111	1047	0.1291 [0.1220-0.1366]	5.58	$p = 0.0182$	82.1	-	-
IFA+WB	2	765	81	0.1059 [0.0860-0.1297]	0.77	$p = 0.3817$	0.0	0.8567	0.1812 (-1.7585 to 2.1481)
WB	6	3996	255	0.0614 [0.0253-0.1414]	171.13	$p < 0.0001$	97.1	0.5952	-0.4373 (-2.0501 to 1.1756)
Ticks									
Geographical region									
NORTHEASTERN CHINA	**12**	**3999**	**1203**	**0.2941 [0.1497-0.4637]**	**2800.15**	**p = 0**	**0.92**	**-**	**-**
NORTHERN CHINA	**2**	**1013**	**1**	**0.0009[0.0000-0.0037]**	**0.36**	**p = 0.5488**	**0.0**	**0.0101**	**-0.5563 (-0.9800 to -0.1327)**
EASTERN CHINA	**2**	**452**	**21**	**0.0460[0.028-0.0672]**	**0.94**	**p = 0.3312**	**0.0**	**0.0635**	**-0.4378 (-0.9003to 0.0246）**
CENTRAL CHINA	**2**	**147**	**19**	**0.1293[0.0801-0.1881]**	**0.00**	**p < 0.0001**	**--**	**0.4862**	**-0.2053 (-0.7832 to 0.3726)**
NORTHWESTERN CHINA	**12**	**6878**	**723**	**0.1554 [0.0574; 0.2899]**	**615.03**	**p = 0.3376**	**98.2**	**0.1475**	**-0.1679(-0.3951 to 0.0593)**
SOUTHWESTERN CHINA	**2**	**373**	**73**	**0.1953 [0.1567; 0.2371]**	**0.92**	**p = 0**	**0.0**	**0.5465**	**-0.1306 (-0.5551 to 0.2939)**
SAMPLING YEAR									
2016-2025	3	2783	181	0.3083 [0.0021-0.8192]	141.34	p < 0.0001	98.6	-	-
2006-2015	9	3425	1197	0.2990 [0.1346-0.4960]	1694.59	p = 0	98.6	0.9816	-0.0051 (-0.4394 to 0.4292)
1996-2005	10	6266	576	0.1445 [0.0381-0.3034]	871.28	p < 0.0001	99.0	0.3723	-0.1941 (-0.6206 to 0.2324)
GENOSPECIES									
B.garinii + B.afzelii	10	6378	1435	0.3264 [0.1401-0.5471]	3151.25	p = 0	99.7	-	-
B.garinii	7	5541	390	0.1441 [0.0319-0.3180]	332.12	p < 0.0001	98.2	0.1854	-0.2173 (-0.5389 to 0.1043)
B.afzelii	1	293	20	0.0683 [0.0423; 0.0999]	0.00	p = 0	-	0.3245	-0.3433 (-1.0261 to 0.3396)
TICK SPECIES									
IXODES HYATTI	1	1	0	0.0000 [0.0000-0.6897]	0.00	-	-	0.3343	-0.6323 (-1.9160 to 0.6514)
IXODES OVATUS	1	35	0	0.0000 [0.0000; 0.0272]	0.00	-	-	0.1427	-0.6323 (-1.4778 to 0.2132)
IXODES PERSULCA-TUS	22	11151	1791	0.2030 [0.1089; 0.3174]	3960.97	P = 0	99.5	0.5386	-0.1643 (-0.6881 to 0.3594)

IXODES ACUTITARSUS	2	47	33	0.3026 [0.0000-1.0000]	30.93	p < 0.0001	96.8	-	-
IXODES VESPERTILIONIS	1	4	0	0.0000 [0.0000-0.2215]	0.00	P = 0	-	0.1982	-0.6323 (-1.5954 to 0.3308)

NOTE: CI - CONFIDENCE INTERVAL, X2 - CHI-SQUARED. THE SAMPLE-SIZE THRESHOLD OF ⩾30 WAS APPLIED AT THE ORIGINAL STUDY OR INDEPENDENT DATASET LEVEL. SOME SUBGROUP STRATA WERE DERIVED FROM ELIGIBLE STUDIES AND MAY HAVE SMALLER DENOMINATORS; THESE SPARSE STRATA ARE PRESENTED FOR DESCRIPTIVE TRANSPARENCY ONLY AND SHOULD NOT BE INTERPRETED AS INDEPENDENT ESTIMATES OF VECTOR IMPORTANCE OR SPECIES-SPECIFIC RISK.