

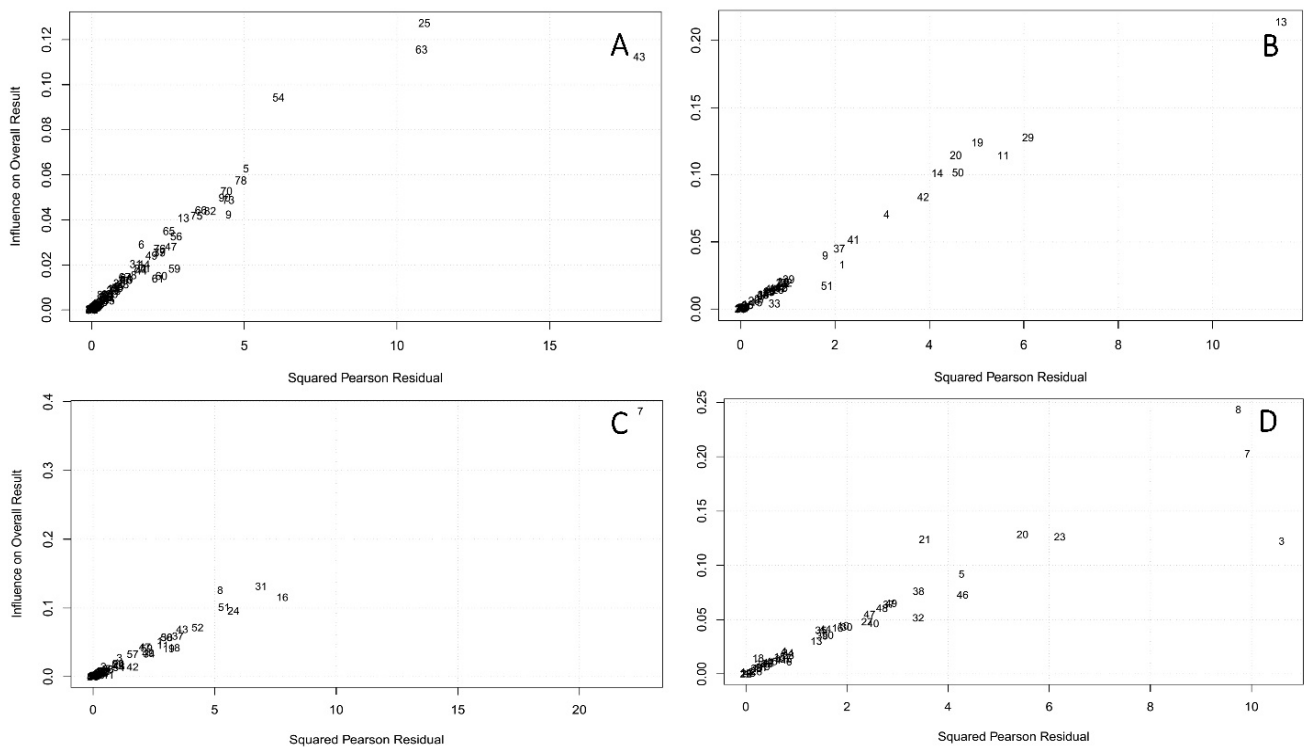


Systematic review and meta-analysis on brucellosis seroprevalence in ruminants (1970 – 2020) of India

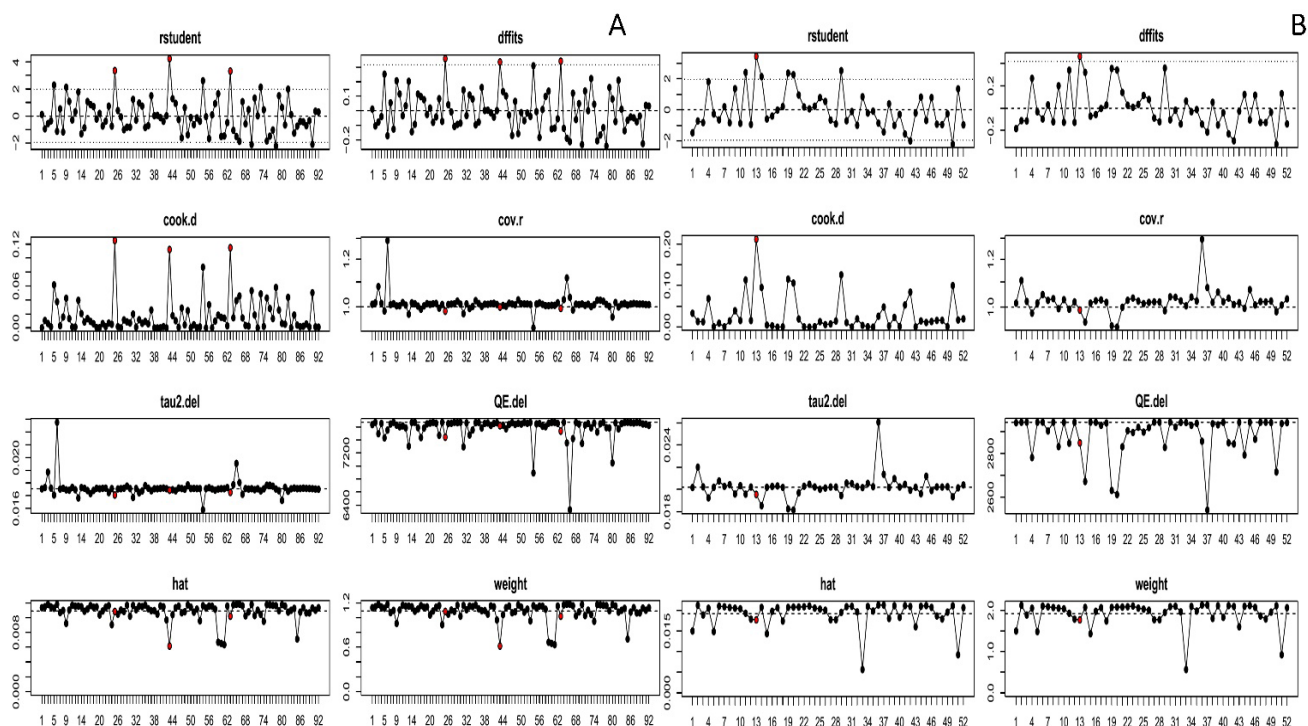
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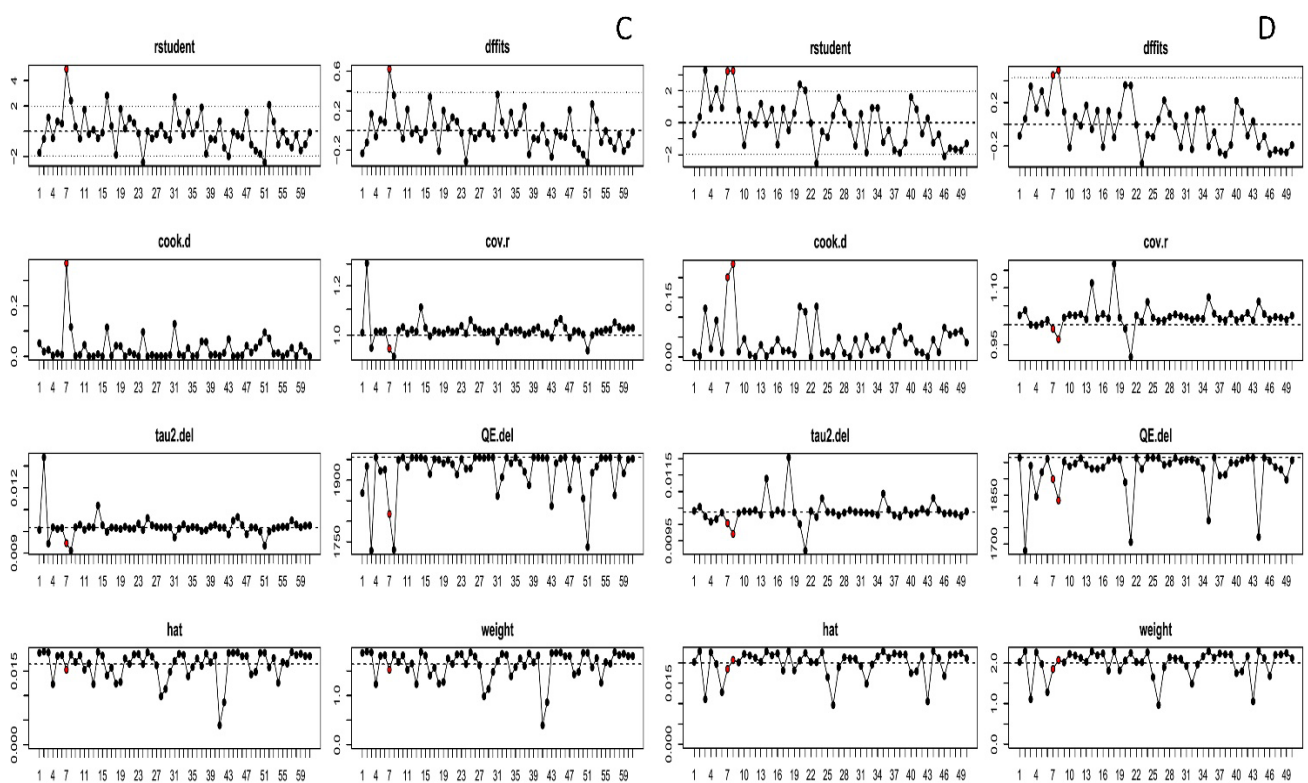
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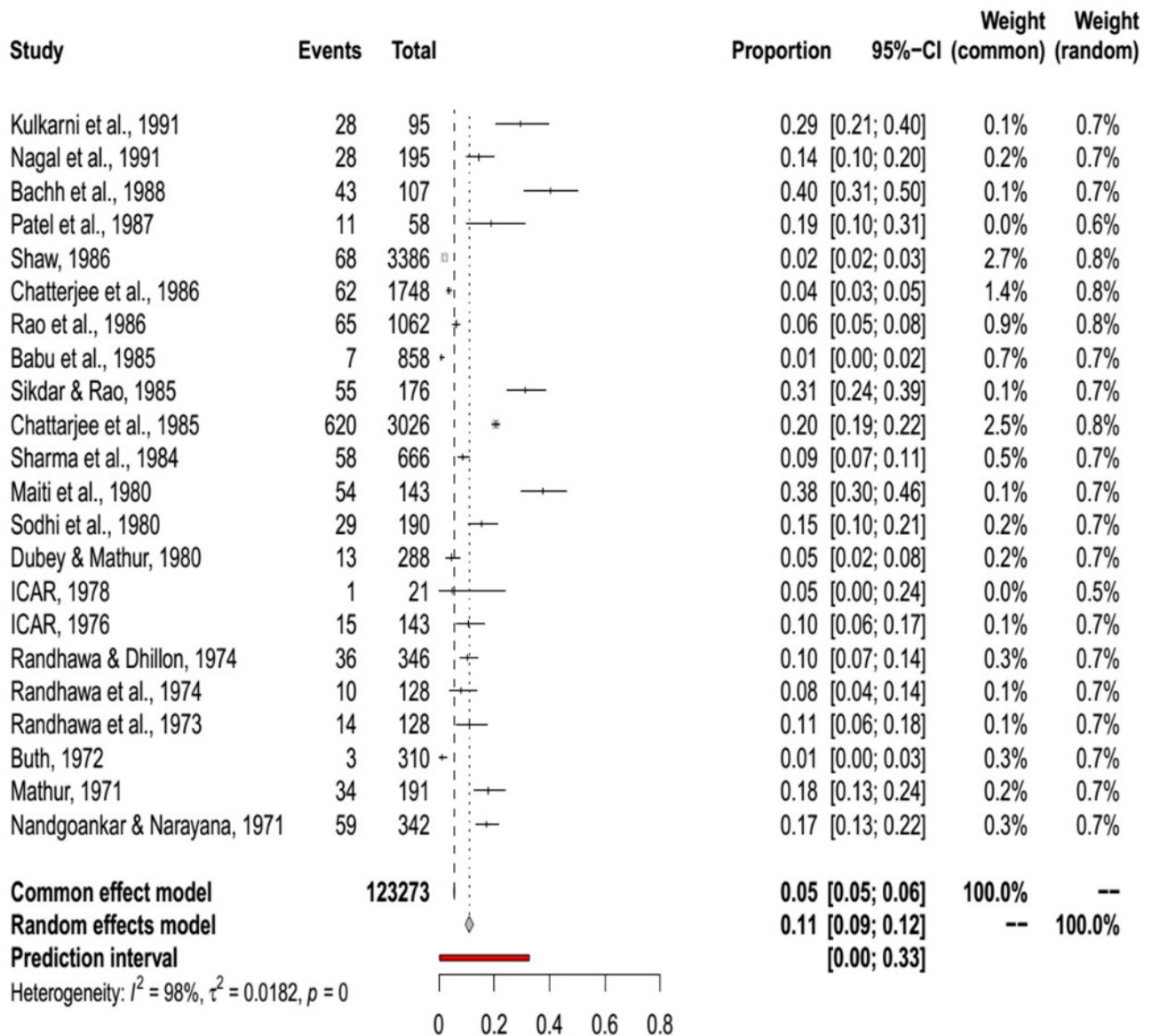
Supplementary Fig. 1. Baujat plot for seroprevalence of brucellosis in cattle (A), buffalo (B), goats (C), sheep (D). The studies in the right upper corner indicates the outlier.



Supplementary Fig. 2. Influence plot for brucellosis seroprevalence in cattle (A) and buffalo (B). The studies marked with red dots are identified as influential studies.



Supplementary Fig. 3. Influence plot for brucellosis seroprevalence in goats (C) and sheep (D). The studies marked with red dots are identified as influential studies.



Supplementary Fig. 4. Forest plot (clipped to depict the effect sizes) showing seroprevalence of brucellosis in cattle, India. Weightage given to each included publication by both RE and FE models has been shown for comparison. 'Total' refers to the number of animals in each publication, 'Events' refers to the number of brucellosis positive animals and 'Proportion' refers to the brucellosis seroprevalence for each publication.

Supplementary Table 1. Details of species, region, diagnostic test, publication year and sample size-wise sub-group meta-analysis on brucellosis seroprevalence in ruminants (1970 – 2020) of India

Variables	Studies included	Strata level studies	Samples tested	Positive samples	Pooled estimate (RE) (95%CI)	Pooled estimate (FE) (95%CI)	P value*	P value	Tau square
Species	92	92	123273	8803	14% (12%-16%)	6% (5%-6%)	<0.01	99%	0.02
Cattle	52	52	40336	2773	8% (6%-9%)	5% (5%-5%)	<0.01	97%	0.02
Buffalo	50	50	51911	3839	8% (7%-10%)	6% (6%-6%)	<0.01	96%	0.01
Sheep	61	61	53837	3678	8% (7%-9%)	6% (5%-6%)	<0.01	96%	0.01
Goat	4	4	760	179	16% (7%-28%)	23% (20%-26%)	<0.01	92%	0.02
Yak	2	2	170	46	26% (12%-42%)	27% (20%-34%)	<0.02	81 %	0.01
Mithun	31	42	23467	2360	13% (10%-17%)	7% (7%-8%)	<0.01	99%	0.03
North India	14	21	7743	1020	14% (8%-21%)	10% (9%-11%)	<0.01	99%	0.05
West India	9	9	5815	474	16% (8%-26%)	6% (5%-7%)	<0.01	99%	0.03
Central India	24	32	37905	1837	8% (6%-10%)	4% (4%-4%)	<0.01	97%	0.01
South India	10	12	41544	2529	7% (4%-10%)	6% (5%-6%)	<0.01	99%	0.01
East India	16	24	6295	485	9% (5%-14%)	5% (4%-5%)	<0.01	97%	0.03
Northeast India	3	3	504	98	14% (3%-31%)	18% (15%-22%)	<0.01	93%	0.03
Andaman & Nicobar Islands									
North India	26	30	11594	85	7% (5%-10%)	5% (5%-6%)	<0.01	96%	0.02
West India	14	20	6434	825	12% (7%-19%)	10% (9%-11%)	<0.01	98%	0.04
Central India	4	4	1154	42	4% (1%-10%)	3% (2%-4%)	<0.01	86%	0.01
South India	11	17	19949	875	4% (2%-7%)	3% (3%-3%)	<0.01	97%	0.01
East India	2	2	936	157	8% (0%-34%)	16% (13%-18%)	<0.01	98%	0.06
Northeast India	4	4	232	21	9% (1%-21%)	6% (3%-10%)	0.02	71%	0.01
Andaman & Nicobar Islands	1	1	37	3	8% (2%-22%)	NA	NA	NA	NA
North India	24	24	21178	1305	7% (5%-10%)	4% (4%-4%)	<0.01	97%	0.01
West India	14	26	8503	800	10% (7%-14%)	8% (7%-8%)	<0.01	95%	0.02
Central India	4	4	1361	171	9% (3%-16%)	12% (10%-13%)	<0.01	88%	0.01
South India	12	18	11494	569	8% (6%-11%)	4% (4%-5%)	<0.01	92%	0.01
East India	3	5	1078	62	5% (0%-14%)	3% (2%-5%)	<0.01	96%	0.03
Northeast India	4	4	347	17	1% (0%-7%)	3% (1%-5%)	<0.01	79%	0.01
All India	1	1	7950	915	12% (11%-12%)	NA	NA	NA	NA
North India	26	28	15671	1008	8% (5%-11%)	5% (4%-5%)	<0.01	98%	0.02
West India	17	28	10187	944	9% (7%-12%)	8% (8%-9%)	<0.01	94%	0.01
Central India	5	5	2290	236	13% (6%-21%)	9% (8%-11%)	<0.01	97%	0.02
South India	10	16	5958	407	7% (5%-10%)	6% (6%-7%)	<0.01	87%	0.01
East India	3	3	986	65	8% (0%-25%)	5% (3%-6%)	<0.01	98%	0.04
Northeast India	9	10	2590	124	5% (2%-10%)	3% (2%-4%)	<0.01	91%	0.02

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Supplementary Table 1. (Continued)

Variables		Studies included	Strata level studies	Samples tested	Positive samples	Pooled estimate (RE) (95%CI)	Pooled estimate (FE) (95%CI)	P value*	F value	Tau square
Diagnostic tests	Cattle	Andaman & Nicobar Islands	2	321	36	5% (0%- 22%)	10% (7%- 14%)	0.03	78%	0.02
		All India	1	15834	858	5% (5%- 6%)	NA	NA	NA	NA
		AB-ELISA	8	2163	277	13% (9%- 19%)	12% (11%- 14%)	<0.01	91%	0.01
		c-ELISA	1	404	44	9% (3%- 17%)	NA	NA	NA	NA
		dot-ELISA	1	110	16	15% (9%- 23%)	NA	NA	NA	NA
		i-ELISA	24	18743	2658	15% (13%- 18%)	13% (12%- 13%)	<0.01	96%	0.02
		m-ELISA	4	692	155	21% (5%- 45%)	20% (17%- 23%)	<0.01	98%	0.07
		MRT	8	5385	263	9% (4%- 16%)	4% (3%- 4%)	<0.01	97%	0.03
		PAT	1	143	54	38% (30%- 46%)	NA	NA	NA	NA
		plate-ELISA	2	1383	289	20% (11%- 31%)	21% (19%- 23%)	<0.01	96%	0.01
	Buffalo	RBPT	15	39205	2664	18% (12%- 25%)	6% (5%- 8%)	<0.01	99%	0.03
		STAT	15	55045	2443	5% (3%- 6%)	3% (3%- 3%)	<0.01	98%	0.01
		AB-ELISA	3	501	169	19% (0%- 55%)	31% (27%- 36%)	<0.01	95%	0.08
		dot-ELISA	1	55	7	13% (5%- 24%)	NA	NA	NA	NA
		i-ELISA	15	8261	909	9% (6%- 12%)	9% (8%- 10%)	<0.01	95%	0.02
		m-ELISA	2	578	74	13% (8%- 19%)	13% (10%- 16%)	0.07	70%	0.00
		MRT	4	1403	10	4% (0%- 16%)	0% (0%- 0%)	<0.01	91%	0.03
		RBPT	8	2630	454	20% (10%- 32%)	15% (14%- 17%)	<0.01	98%	0.04
		STAT	19	26908	1150	4% (2%- 5%)	3% (3%- 4%)	<0.01	96%	0.01
		c-ELISA	2	262	37	14% (10%- 19%)	14% (10%- 19%)	0.78	0%	0.00
	Sheep	dot-ELISA	1	77	17	22% (13%- 33%)	NA	NA	NA	NA
		CIET	1	403	22	5% (3%- 8%)	NA	NA	NA	NA
		i-ELISA	15	18870	2117	8% (6%- 10%)	10% (9%- 10%)	<0.01	93%	0.01
		MAT	1	223	80	36% (30%- 43%)	NA	NA	NA	NA
		m-ELISA	1	390	60	15% (12%- 19%)	NA	NA	NA	NA
		MRT	1	1041	18	2% (1%- 3%)	NA	NA	NA	NA
		RBPT	13	3778	407	12% (7%- 17%)	9% (8%- 10%)	<0.01	94%	0.02
		STAT	16	26867	1081	4% (3%- 5%)	3% (3%- 4%)	<0.01	92%	0.00
		AB-ELISA	3	88	3	2% (0%- 14%)	1% (0%- 5%)	0.07	63%	0.02
		c-ELISA	2	349	46	13% (9%- 18%)	13% (10%- 17%)	0.19	43%	0.00
	Goat	CFT	1	75	2	3% (0%- 9%)	NA	NA	NA	NA
		dot-ELISA	4	2837	424	18% (10%- 28%)	14% (13%- 15%)	<0.01	97%	0.02
		i-ELISA	16	28940	2221	9% (7%- 11%)	7% (6%- 7%)	<0.01	95%	0.01
		MAT	1	1024	15	1% (1%- 2%)	NA	NA	NA	NA
		MRT	2	912	87	10% (5%- 17%)	9% (8%- 11%)	<0.01	90%	0.01
		RBPT	16	6856	388	6% (4%- 9%)	5% (4%- 5%)	<0.01	92%	0.00

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Supplementary Table 1. (Concluded)

Variables		Studies included	Strata level studies	Samples tested	Positive samples	Pooled estimate (RE) (95%CI)	Pooled estimate (FE) (95%CI)	P value*	I ² value	Tau square
Publication period	Cattle	16	18	12756	492	5% (4%- 8%)	3% (3%- 3%)	<0.01	96%	0.01
		18	18	13152	1203	10% (6%- 15%)	7% (7%- 8%)	<0.01	99%	0.03
		17	40	46559	1581	5% (3%- 6%)	2% (2%- 2%)	<0.01	98%	0.01
		58	85	63990	6082	15% (12%- 17%)	8% (8%- 8%)	<0.01	98%	0.02
	Buffalo	12	12	7043	391	5% (2%- 11%)	3% (3%- 4%)	<0.01	98%	0.02
		8	18	20986	755	2% (1%- 4%)	3% (2%- 3%)	<0.01	93%	0.00
	Sheep	33	48	12411	1674	11% (8%- 14%)	11% (11%- 12%)	<0.01	96%	0.02
		5	5	2544	48	2% (1%- 2%)	2% (1%- 2%)	0.54	0%	0.00
	Goat	11	11	18436	627	4% (3%- 5%)	3% (3%- 3%)	<0.01	88%	0.00
		34	66	30931	3164	9% (8%- 11%)	9% (8%- 9%)	<0.01	94%	0.01
Sample size	Cattle	7	7	6297	242	5% (3%- 7%)	4% (3%- 4%)	<0.01	89%	0.00
		14	15	9621	516	6% (3%- 9%)	3% (3%- 4%)	<0.01	97%	0.02
		40	73	38025	2961	9% (7%- 10%)	7% (6%- 7%)	<0.01	95%	0.01
		49	64	7517	1255	15% (12%- 18%)	15% (14%- 16%)	<0.01	92%	0.03
	Buffalo	49	79	116184	7611	8% (7%- 10%)	5% (5%- 5%)	<0.01	99%	0.02
		28	41	3490	368	7% (4%- 11%)	7% (6%- 8%)	<0.01	91%	0.03
	Sheep	27	37	36950	2452	8% (6%- 11%)	5% (5%- 5%)	<0.01	99%	0.02
		25	46	4217	487	9% (6%- 12%)	9% (8%- 10%)	<0.01	89%	0.02
	Goat	28	36	47694	3352	7% (6%- 9%)	6% (6%- 6%)	<0.01	98%	0.01
		33	51	4945	622	9% (7%- 12%)	10% (9%- 11%)	<0.01	90%	0.02
	>200	33	43	48968	3097	7% (5%- 8%)	6% (5%- 6%)	<0.01	97%	0.01

ND: not done; NA: not applicable; RE: Random effect; FE: Fixed effect; CI: Confidence interval; AB-ELISA: Avidin-Biotin Enzyme-linked immunosorbent assay; c-ELISA: competitive Enzyme-linked immunosorbent assay; dot-ELISA: dot-Enzyme-linked immunosorbent assay; i-ELISA: indirect Enzyme-linked immunosorbent assay; MAT: Microscopic agglutination test; MRT: Milk ring test; PAT: Plate agglutination test; RBPT: Rose bengal plate agglutination test; STAT: Standard tube agglutination test; plate-ELISA: plate-Enzyme-linked immunosorbent assay; CFT: Complement fixation test, CIEP: Counter immunoelectrophoresis, m-ELISA: milk ELISA. *, P value <0.01 and <0.05 indicate a significant difference between the fixed effect and random effect models.