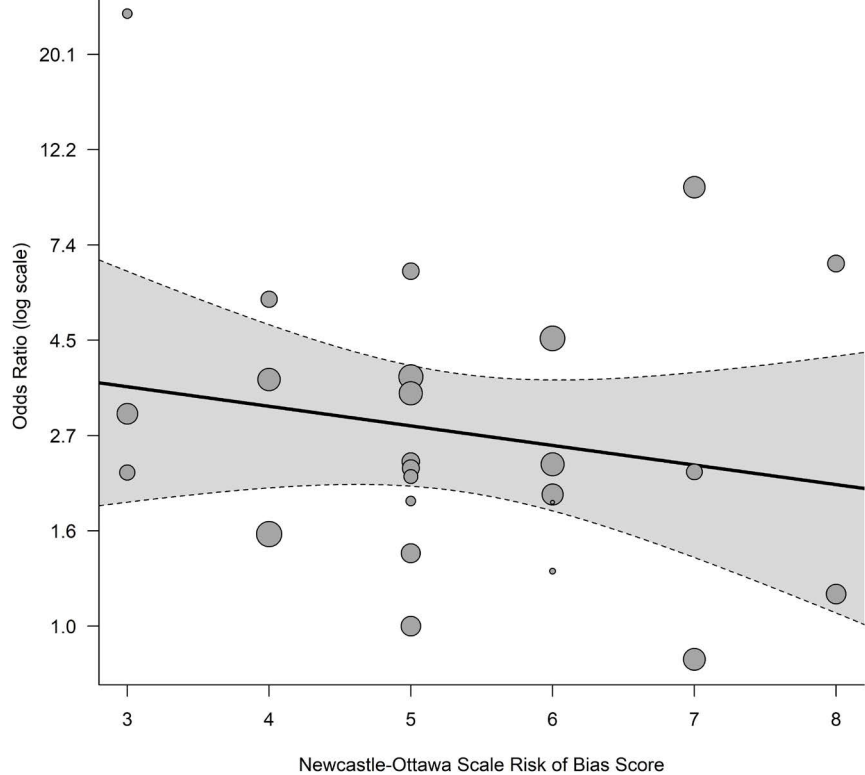


Special Issue on Toxoplasmosis OPEN ACCESS

Catchpole A., Zabriskie B.N., Embley B., Kharazi H., Clarke R., Templeton G., Hunt C., Gale S.D., Hedges D.W. 2025: Association between type-2 diabetes and *Toxoplasma gondii* seropositivity: a systematic review and meta-analysis. Special Issue on Toxoplasmosis. Folia Parasitol. 72: 024.



Supplementary Fig. S1. Bubble plot illustrating results from a meta-regression using Newcastle-Ottawa Scale risk of bias scores as the explanatory variable. Each study is represented as a circle, with circle size proportional to the inverse-variance weight assigned in the analysis. The fitted meta-regression line is shown, along with a shaded 95% confidence interval band for the average log odds ratio. Odds ratios greater than 1 indicate a positive association between *Toxoplasma gondii* seropositivity and type-2 diabetes. The estimated slope was -0.10 (95% CI: -0.33 to 0.12), indicating no clear association between risk of bias score and effect size.

Supplementary Table S1. Summary of meta-regression and sensitivity analysis results.

Moderator	Studies Included	Notes	Coefficient (Reference group)	Odds Ratio (95% CI)	Permutation p-value
Region	All (n = 25)	Model p = 0.10 R ² = 10% only 4 studies in 'Other' group	Intercept	3.14 (2.17, 4.54)	0.06
			North Africa (Middle East)	1.03 (0.50, 2.12)	0.94
			Other (Middle East)	0.43 (0.19, 0.99)	0.04
	Low risk of bias only (n = 19)	Model p = 0.14 R ² = 13% 6 studies removed	Intercept	2.86 (1.93, 4.24)	0.08
			North Africa (Middle East)	1.09 (0.49, 2.47)	0.82
			Other (Middle East)	0.47 (0.22, 1.03)	0.06
	Low risk of bias only and no influential study (n = 18)	Model p = 0.08 R ² = 21% 7 studies removed	Intercept	2.86 (1.94, 4.24)	0.02
			Other (Middle East)	0.38 (0.16, 0.92)	0.03
Risk of Bias Score	All (n = 25)	Model p = 0.35 R ² = 0%	Intercept	4.78 (1.39, 16.41)	0.17
			Risk of Bias Score	0.90 (0.72, 1.13)	0.35

- Notes:
- All odds ratios are derived from random-effects meta-regression models.
 - Permutation p-values are based on 20,000 random permutations.
 - R² indicates the proportion of between-study heterogeneity explained by the moderator.
 - High risk of bias defined as Newcastle-Ottawa Scale Score < 5.

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