

SHORT META-ANALYSIS · Peer-reviewed · Published · Live dashboard figures

Severe Asthma Biologics Ultra-Precision — Living Meta-Analysis (RapidMeta)

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Short Meta-Analysis · Volume 9

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Abstract

Do trials of severe-asthma biologics yield a clinically meaningful reduction in exacerbations? The RapidMeta clinical-medicine living review uses a browser-based, auditable workflow to combine six placebo-controlled phase-3 randomised trials - EXTRA (omalizumab), MENSA (mepolizumab), SIROCCO (benralizumab), Study 3082 (reslizumab), QUEST (dupilumab), and NAVIGATOR (tezepelumab). Each trial's published annualised exacerbation rate ratio was pooled by generic inverse-variance random-effects (REML) on the log scale, with a Hartung-Knapp-Sidik-Jonkman-adjusted interval and a t-based prediction interval.

The pooled rate ratio was 0.52 (95% CI 0.44 to 0.62), an approximately 48% reduction in exacerbations. Between-study heterogeneity was moderate-to-substantial ($I^2 = 69%$, Cochran's $Q(5) = 16.2$, $p = 0.007$, $\tau^2 = 0.03$), reflecting differing mechanisms and eosinophil-defined populations, yet the entire 95% prediction interval (0.32 to 0.85) remained below one. Results are registered into a reproducibility capsule containing a machine-readable config, an interactive reader, and a Vancouver reference pack.

Trials are pooled at heterogeneous primary endpoints, doses, and biomarker thresholds, so the pooled estimate is a class-level summary rather than a head-to-head comparison, and cannot substitute for adjudicated trial-level review of risk of bias, switched endpoints, or missing subgroup data.

References

1. Hanania NA, Alpan O, Hamilos DL, et al. Omalizumab in severe allergic asthma inadequately controlled with standard therapy: a randomized trial. *Ann Intern Med.* 2011;154(9):573-582. PMID 21536936. doi:10.7326/0003-4819-154-9-201105030-00002.
2. Ortega HG, Liu MC, Pavord ID, et al. Mepolizumab treatment in patients with severe eosinophilic asthma. *N Engl J Med.* 2014;371(13):1198-1207. PMID 25199059. doi:10.1056/NEJMoa1403290.
3. Bleecker ER, FitzGerald JM, Chanez P, et al. Efficacy and safety of benralizumab for patients with severe asthma uncontrolled with high-dosage inhaled corticosteroids and long-acting beta2-agonists (SIROCCO): a randomised, multicentre, placebo-controlled phase 3 trial. *Lancet.* 2016;388(10056):2115-2127. PMID 27609408. doi:10.1016/S0140-6736(16)31324-1.
4. Castro M, Zangrilli J, Wechsler ME, et al. Reslizumab for inadequately controlled asthma with elevated blood eosinophil counts: results from two multicentre, parallel, double-blind, randomised, placebo-controlled, phase 3 trials. *Lancet Respir Med.* 2015;3(5):355-366. PMID 25736990. doi:10.1016/S2213-2600(15)00042-9.

5. Castro M, Corren J, Pavord ID, et al. Dupilumab Efficacy and Safety in Moderate-to-Severe Uncontrolled Asthma. *N Engl J Med*. 2018;378(26):2486-2496. PMID 29782217. doi:10.1056/NEJMoa1804092.
6. Menzies-Gow A, Corren J, Bourdin A, et al. Tezepelumab in Adults and Adolescents with Severe, Uncontrolled Asthma. *N Engl J Med*. 2021;384(19):1800-1809. PMID 33979488. doi:10.1056/NEJMoa2034975.
7. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021;372:n71. doi:10.1136/bmj.n71. PMID 33782057.
8. Higgins JPT, Thomas J, Chandler J, et al, editors. *Cochrane Handbook for Systematic Reviews of Interventions*, version 6.4. Cochrane; 2023. www.training.cochrane.org/handbook.
9. IntHout J, Ioannidis JPA, Borm GF. The Hartung-Knapp-Sidik-Jonkman method for random effects meta-analysis is straightforward and considerably outperforms the standard DerSimonian-Laird method. *BMC Med Res Methodol*. 2014;14:25. doi:10.1186/1471-2288-14-25. PMID 24548571.

Interactive dashboard figures

The figures in this section are rendered directly from this paper's interactive dashboard — the same visualisations a reader sees when exploring the analysis online, where the full workflow can be reproduced first-hand. **Interactive dashboard:** <https://mahmood726-cyber.github.io/rapidmeta-asthma-biologics/>

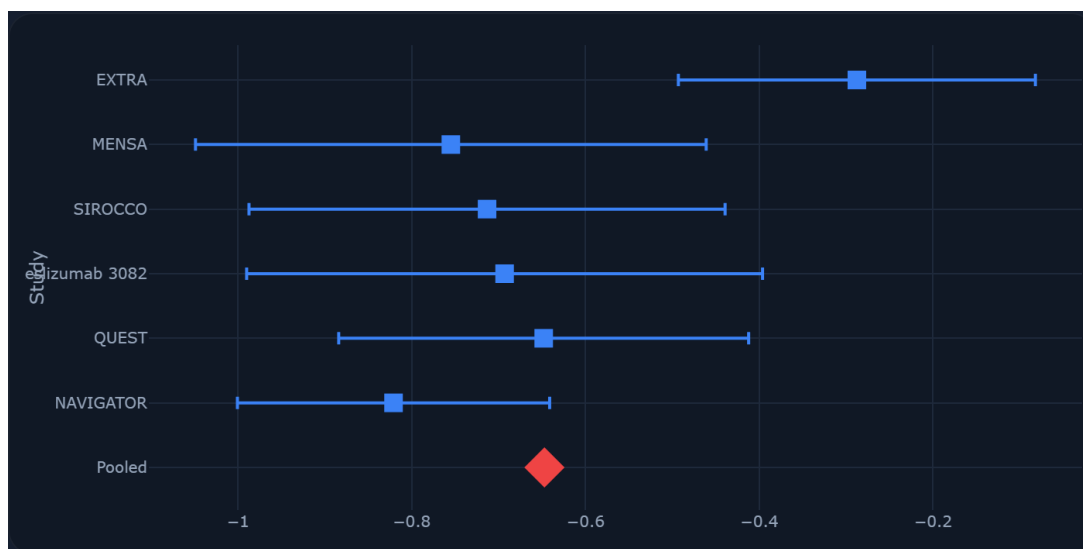


Figure 1. 1. FOREST PLOT (FIXED/RANDOM EFFECTS) Rendered directly from the article's live interactive dashboard.

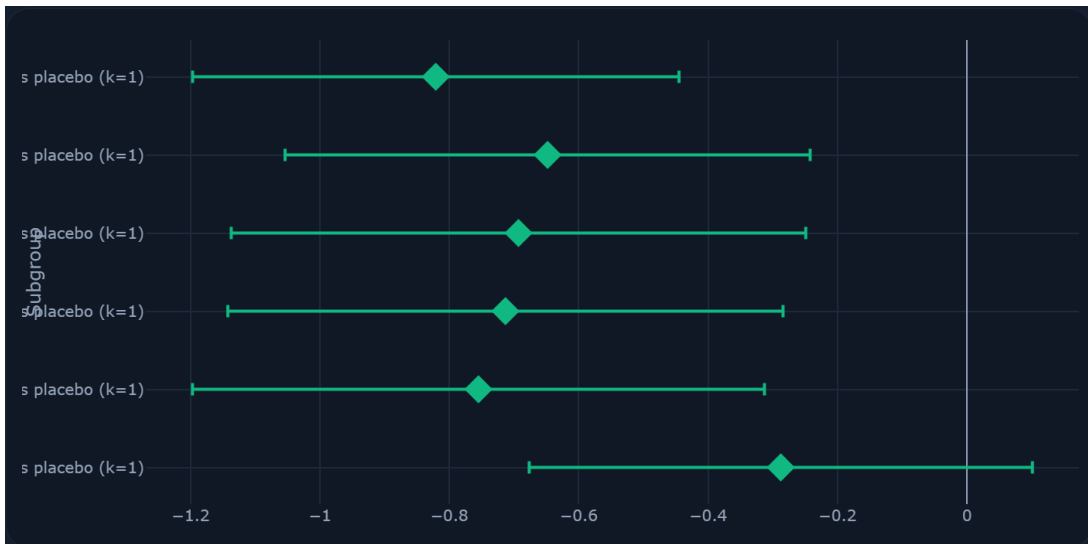


Figure 2. 2. SUBGROUP SYNTHESIS (HF VS CKD) Rendered directly from the article's live interactive dashboard.

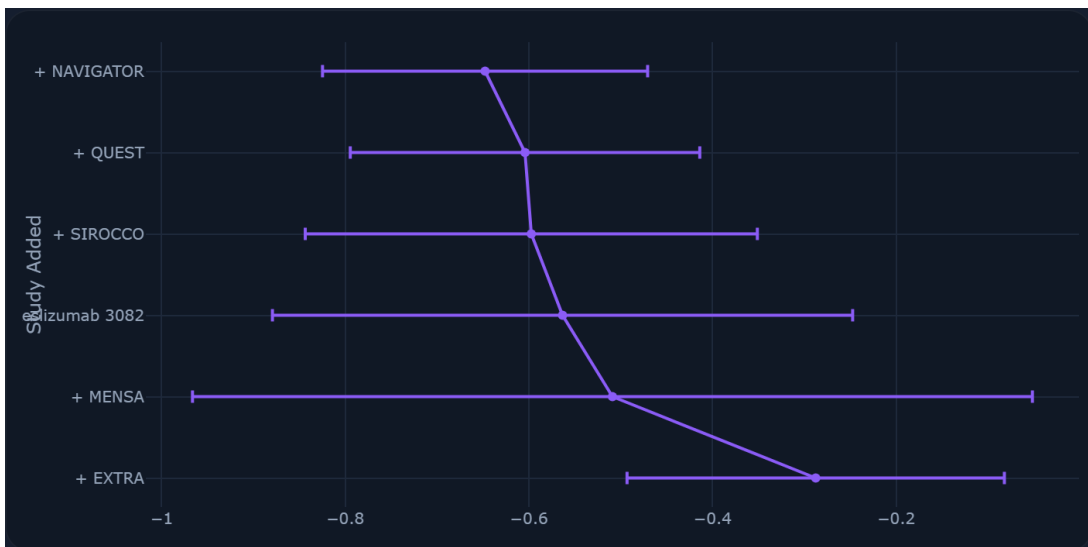


Figure 3. 3. CUMULATIVE META-ANALYSIS Rendered directly from the article's live interactive dashboard.

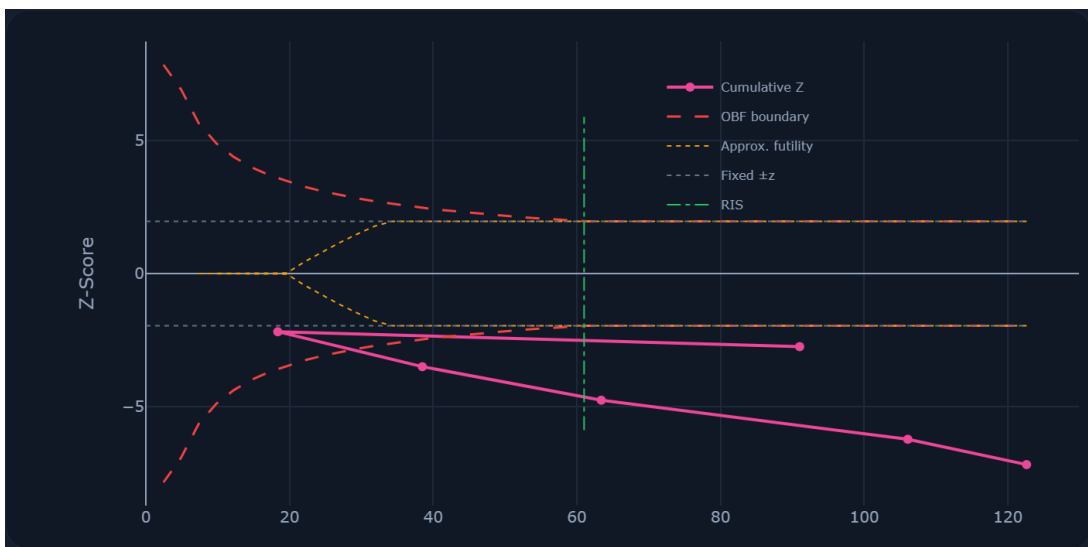


Figure 4. 4. CUMULATIVE Z-CURVE ANALYSIS Rendered directly from the article's live interactive dashboard.

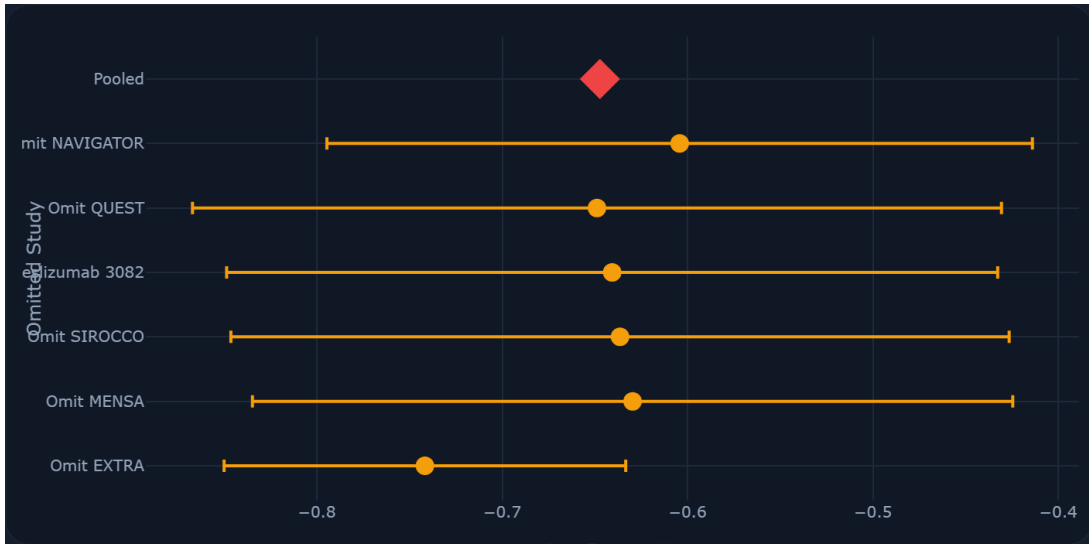


Figure 5.5. LEAVE-ONE-OUT SENSITIVITY Rendered directly from the article's live interactive dashboard.

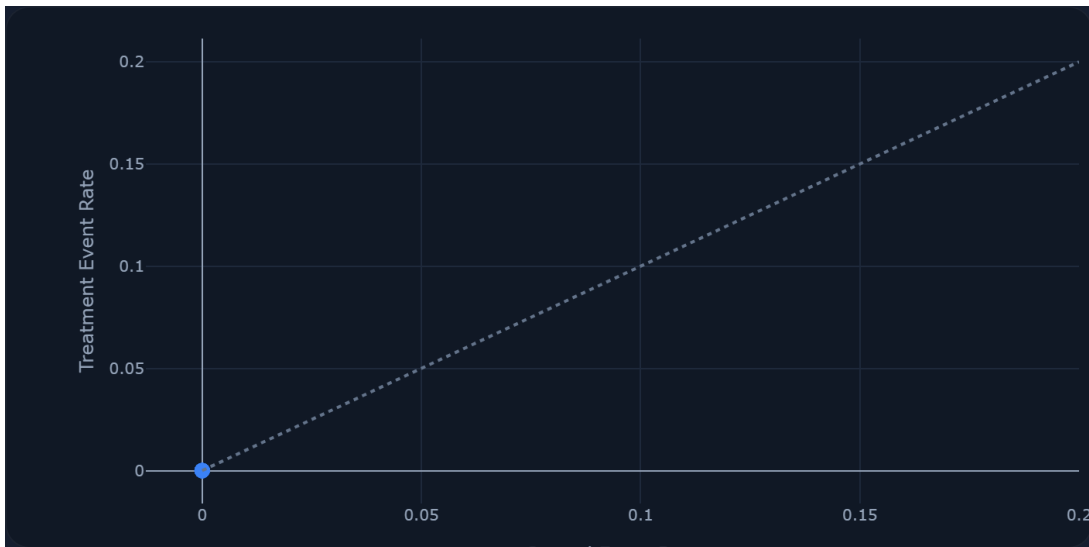


Figure 6.6. L'ABBE PLOT (EVENT INCIDENCE) Rendered directly from the article's live interactive dashboard.

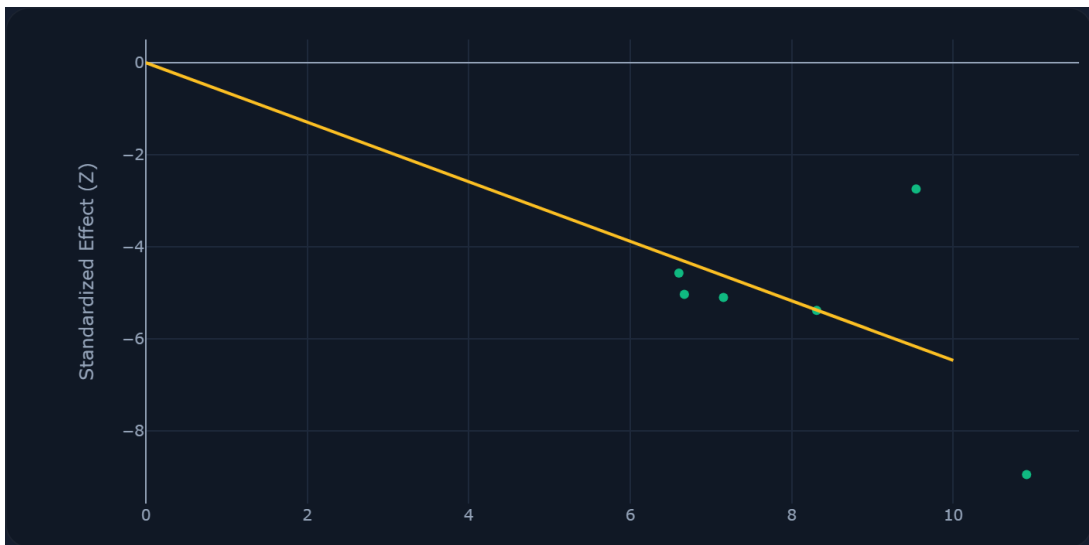


Figure 7.7. GALBRAITH PLOT (HETEROGENEITY CHECK) Rendered directly from the article's live interactive dashboard.

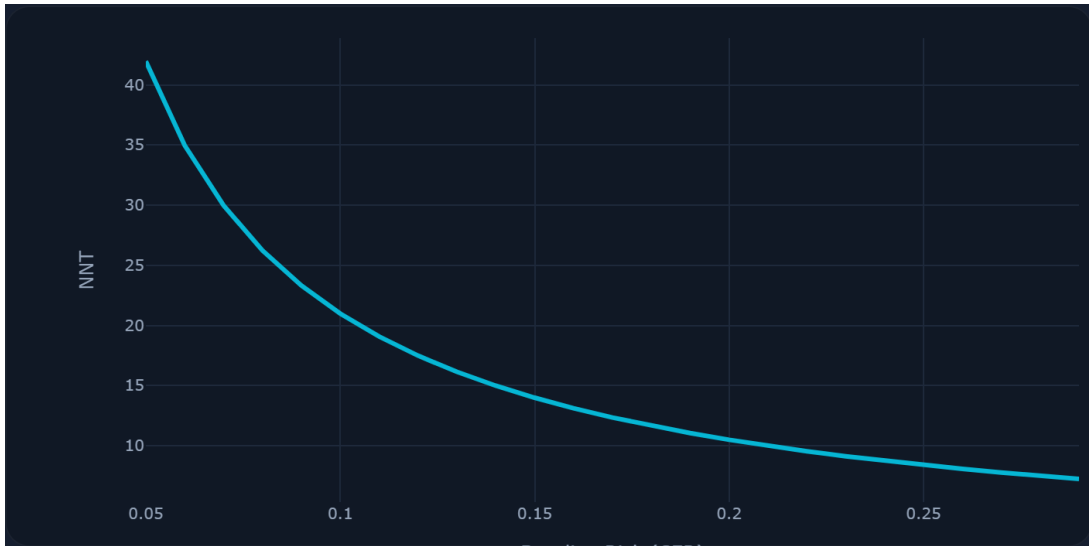


Figure 8. 8. CLINICAL UTILITY (NNT CURVE) Rendered directly from the article's live interactive dashboard.

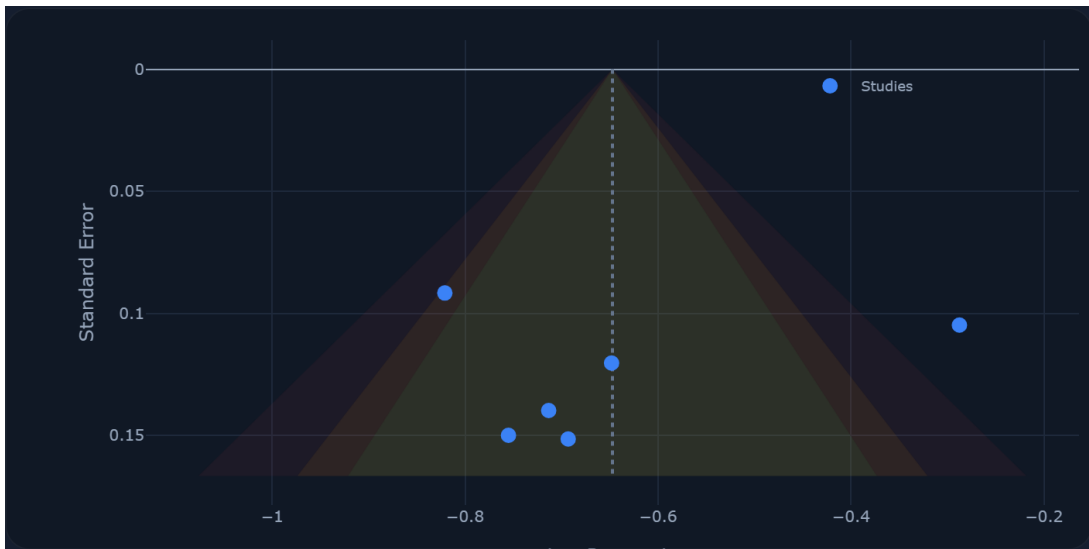


Figure 9. 9. FUNNEL PLOT (PUBLICATION BIAS) Rendered directly from the article's live interactive dashboard.

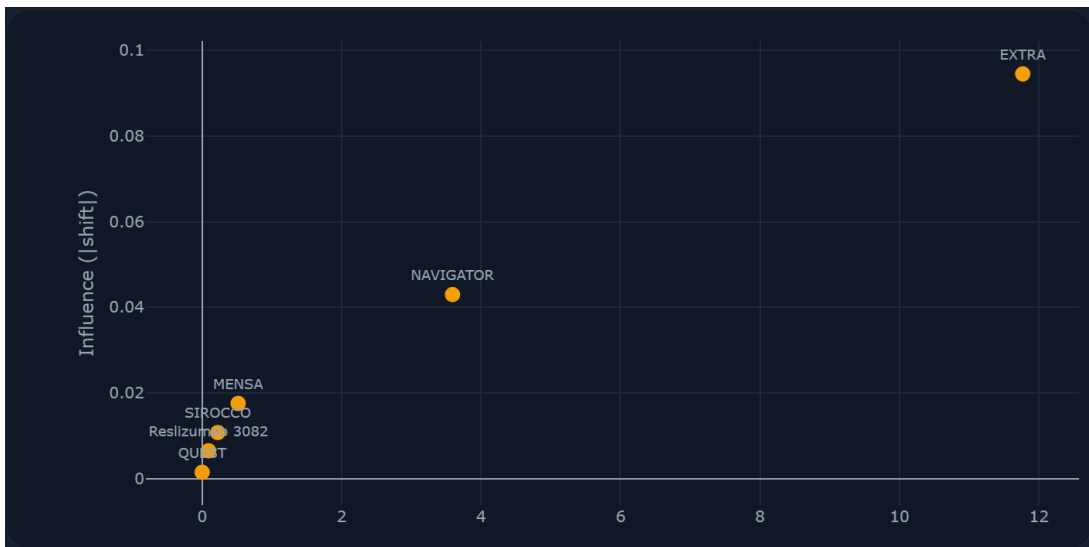


Figure 10. 10. BAUJAT PLOT (INFLUENCE X HETEROGENEITY) Rendered directly from the article's live interactive dashboard.

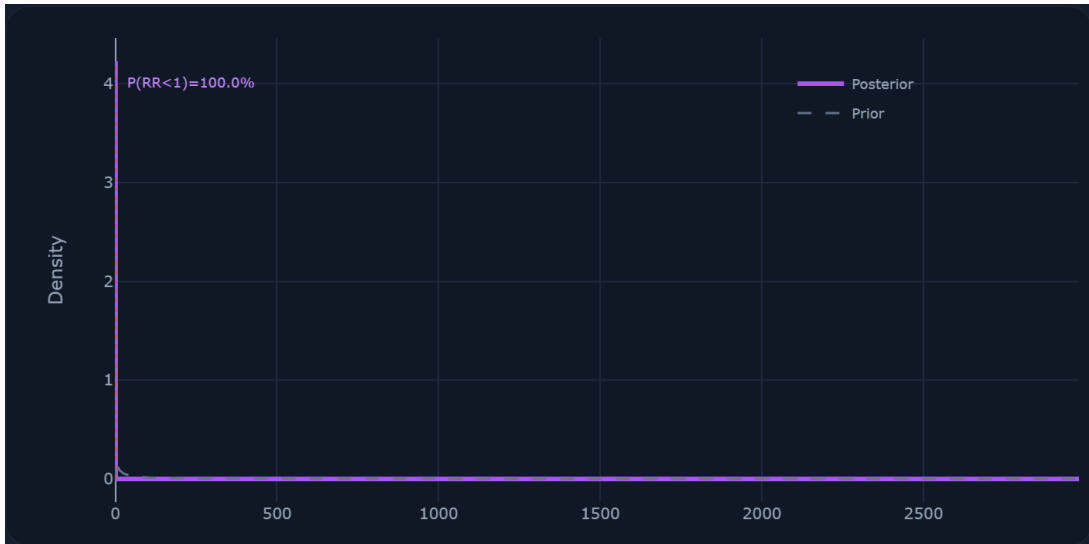


Figure 11. 11. BAYESIAN POSTERIOR DENSITY Rendered directly from the article's live interactive dashboard.

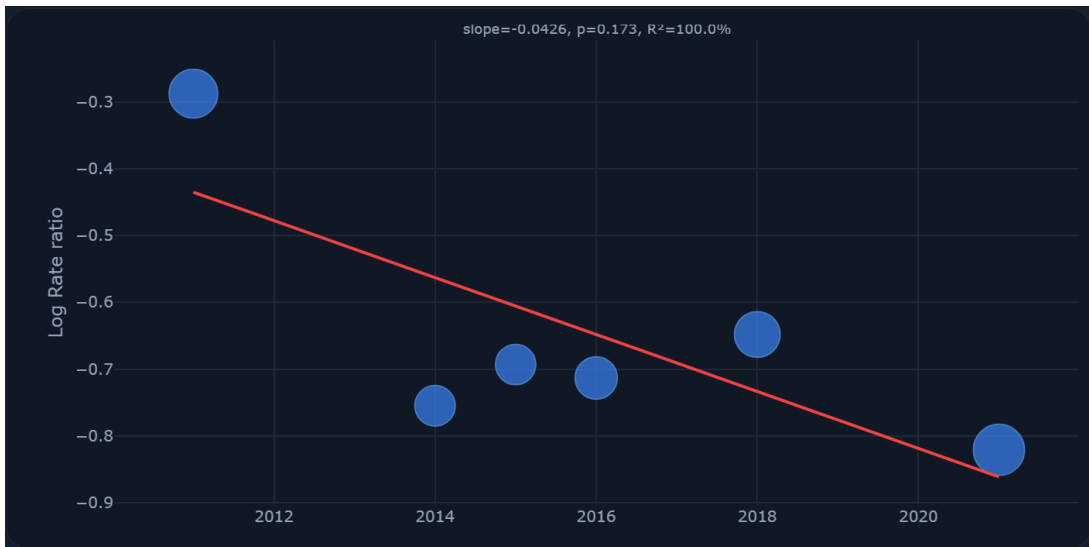


Figure 12. 12. META-REGRESSION Rendered directly from the article's live interactive dashboard.

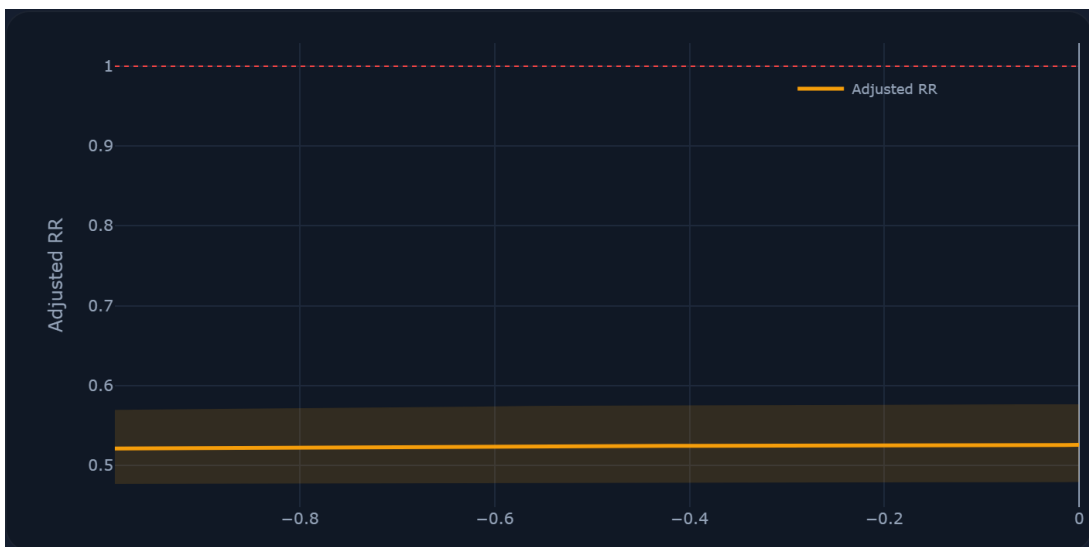


Figure 13. 13. COPAS SENSITIVITY CURVE Rendered directly from the article's live interactive dashboard.

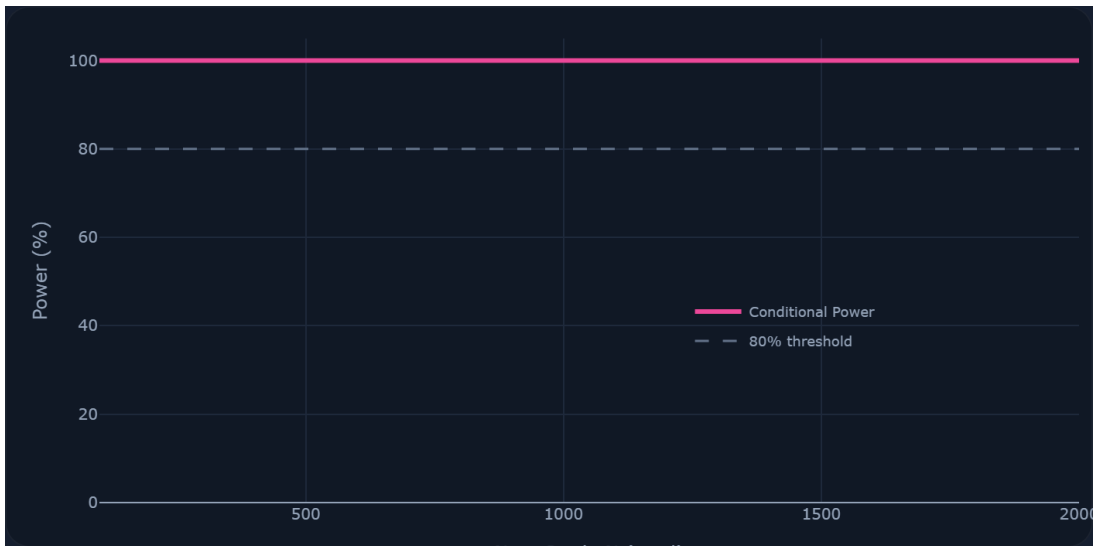


Figure 14. 14. CONDITIONAL POWER CURVE Rendered directly from the article's live interactive dashboard.

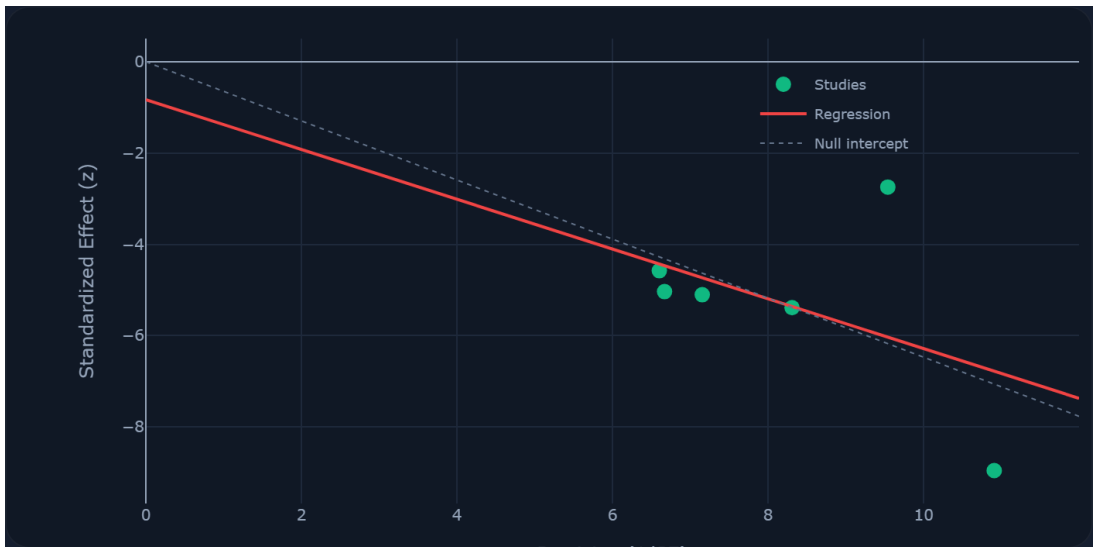


Figure 15. 15. EGGER'S REGRESSION PLOT Rendered directly from the article's live interactive dashboard.

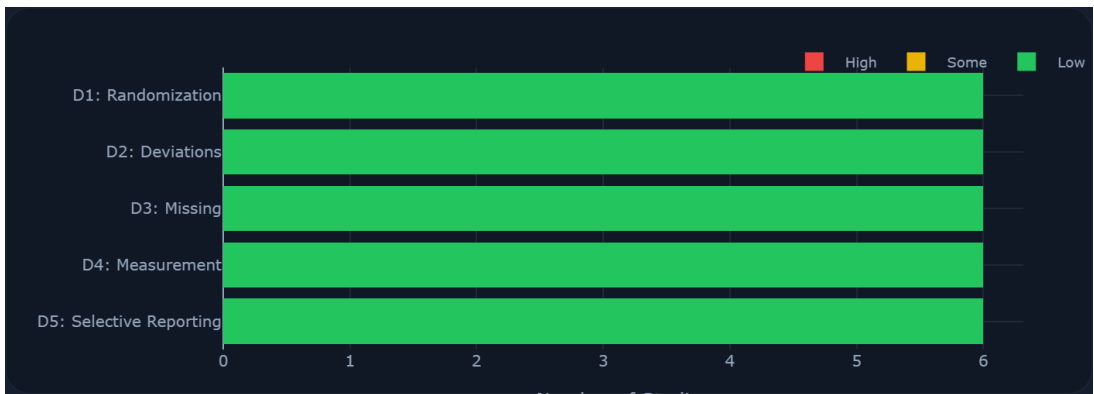


Figure 16. 16. RISK OF BIAS SUMMARY Rendered directly from the article's live interactive dashboard.

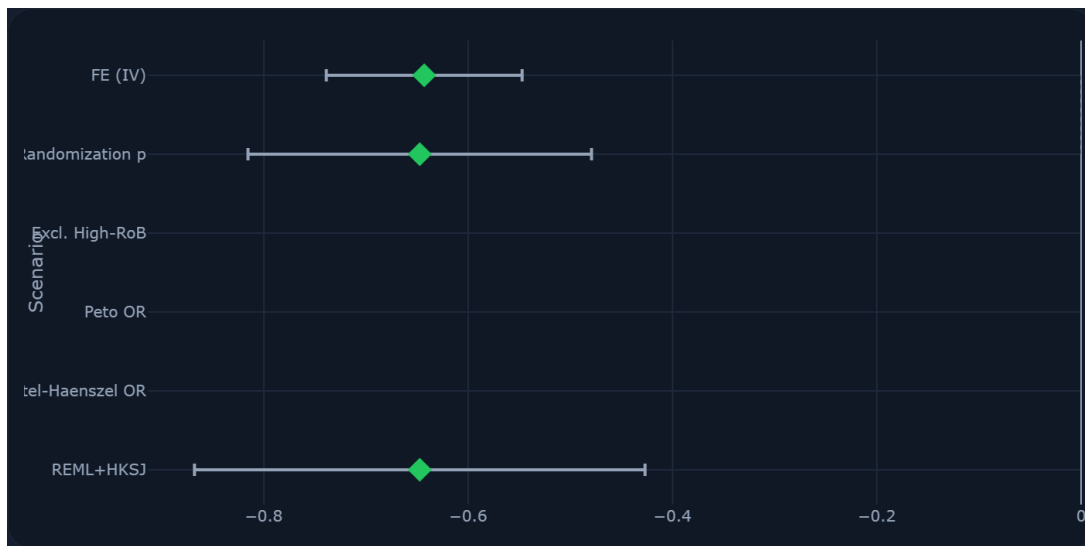


Figure 17. 17. SENSITIVITY ANALYSIS PANEL Rendered directly from the article's live interactive dashboard.



Figure 18. 18. INFLUENCE & OUTLIER DIAGNOSTICS Rendered directly from the article's live interactive dashboard.

HOW TO CITE

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