

**Referee report** for JKSS-D-21-00250

“Infinite Diameter Confidence Sets in Hedges’ Publication Bias Model” by Moss.

When only limited samples are available, meta-analysis is a useful tool to obtain a more reliable estimator by integrating other published studies. However, each study often includes latent bias such as publication bias. To remove the bias, the likelihood is constructed based on published data with some selection function, which explains how likely a study is published. However, empirical results are often unstable and may diverge.

The author tries to provide a theoretical justification why the results fail for a situation where the model is Hedges’ publication bias model. The author introduces a diameter of a confidence set and shows that the probability of the diameter being infinity is positive for Hedges’ model. This result theoretically guarantees that it is hard to conduct a valid statistical inference with Hedges’ model in a frequentist way.

The problem is important, and the manuscript is nicely organized, but I have some comments to improve the quality of the manuscript.

1. Could you clarify the motivation to focus on the step function defined in (2.3)? As for the selection function  $w(\cdot)$  defined in (2.2), there are many options such as one-parameter selection function (Preston et al. 2004) and two-parameters selection function (Copas, 2013). Is it more popular or just for some theoretical reason?
2. How can we decide  $\rho$ ,  $\alpha$ , and  $K$  defined in (2.3)? I feel that determining

the values without data is very subjective.

3. In section 3, I would like the author to add a more detailed explanation of why partition  $\Pi$  is necessary. For example, what is  $\Pi$  in Example 2? What are the benefits of introducing  $\Pi$  in the example?

Here are some additional minor comments:

1. Line 18 on Page 2: remove “xz” at the beginning of the sentence
2. Line 16-17 on Page 3: “non-decreasing” should be “non-increasing”
3. Line 20 and 24 on Page 6: to be consistent the notation,  $\mu_2/\mu_1$  should be  $\mu_1/\mu_2$  or  $E(X)/E(Y)$  should be  $E(Y)/E(X)$
4. Line 31 on Page 8: add “functions” before “ $a_n, b_n, f_n$ ” and “ $a, b, f$ ”

## References

- Copas, J. B. (2013). A likelihood-based sensitivity analysis for publication bias in meta-analysis. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, **62**, 47–66.
- Preston, C., Ashby, D., and Smyth, R. (2004). Adjusting for publication bias: modeling the selection process. *Journal of Evaluation in Clinical Practice*, **10**, 313–322.