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Editorial

UPGRADING LITERATURE REVIEWS TO META ANALYSES

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Meta analysis employs statistical tools to provide a systematic and unbiased synthesis of results from multiple studies on a specific research interest. Literature reviews are more narrative whereas meta analysis papers present a narrative thread twined around data analysis and are shy of verbatim accounts and superfluity. As a unifying concept, meta analyses are more rigorous, transparent, informative and objective than the conventional literature reviews. Review paper authors enjoy more liberty in pushing forth studies which uphold a particular kind of hypothesis and in downplaying studies that report conflicting results. This inclination is termed as publication bias. Actually, publication bias is being innately brought in by the published academic discourse over the years: positive/ statistically significant findings have been continuously elbowing out negative/statistically non-significant findings. The issue has earlier been flagged by one of our editorials (Sekhon, 2022). Even meta-analysis works have been victim of this publication bias (van Aert *et al*., 2019)

Journals of good academic standing and committed to ethical practices generally prefer invited review papers. Invited review papers become unavoidably biased towards the author(s)' research. Meta analysis works on the other hand are required to embrace geographically and otherwise disparate studies. Despite all this, however, literature review is the first important step in the larger scheme of a meta analysis (Pautasso, 2013). Meta analyses have been of considerable help to policy-makers and researchers alike as they help make a sense of a large volume of data and reasoning.

Quality meta analysis depends upon the employment of appropriate literature selection, analytical and statistical tools (Forero *et al*., 2019; Piggot and Polanin, 2020). Sometimes, authors of the selected papers may need to be contacted for supplementary supporting data. Inclusion criteria need to be established and key variables should be defined. The data measuring units across all the studies may need to be aligned. This may require appropriate data transformations. Another important decision is regarding the choice of model: fixed effects model or random effects model. Complex data may entail test of heterogeneity, metaregression, sensitivity analysis, etc. Some software packages tailored especially for meta analysis are available: Metafor in open source R programme is a typical example. An easy approach to mastering the required domain-specific statistical skills is to refer to various meta analysis publications in the field. These studies address climate impacts on crop yields (Knox *et al*., 2016), nutrient dynamics (Liu *et al*., 2023), crop residue management (Lu, 2020; Zhao *et al*., 2022), crop husbandry (Herrmann *et al*., 2022), genetically modified crops (Klumper *et al*., 2014), genetic diversity (Wouw *et al*., 2010), etc.

It has been evidenced, though anecdotally, that writing Review of Literature is the most mundane task in thesis/dissertation writing. It has become a copy and paste job. Contrarily, it should critique the related work closely to provide a bird's eye view of what ground has been covered and should systematically help in identifying the way forward. It is high time that meta analyses are piloted in master/doctoral research . The exercise may help onboard potential researchers in statistical and critical thinking skills.

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