Review of: "Measuring the efficacy of a vaccine during an epidemic"

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Potential competing interests: No potential competing interests to declare.

The authors investigate a relevant issue in epidemiology using a simple analysis: obtaining a reasonable estimate of vaccine efficacy from a clinical trial conducted during an ongoing epidemic.

They model an infectious disease outbreak (of COVID-19) using the classical SIR-model and include vaccination by a simple factor, $\delta = 1 - \epsilon$, that scales the transmission rate, β. Here, ϵ denotes the *vaccine efficacy*. This parameter, ϵ, can be estimated from a clinical trial using the *vaccine effectiveness*, η, by comparing the number of diseased individuals (in the SIR-model one does not differentiate between infected-healthy *versus* infected-diseased individuals) in a vaccinated *versus* placebo cohort. Based on classical results, and by employing a series expansion in βc, where c is the attack rate, the authors show that the estimate η underestimates the parameter ϵ. The error is approximately proportional to δ (*i.e.*, the deviation decreases for a more efficient vaccine) and grows with βc, *i.e.*, the estimate is worst if the clinical trial is performed at the epidemic peak. Furthermore, the bias grows with R_0.

In summary, the key results are straightforward to grasp and clearly formulated. However, the manuscript contains many writing errors that necessitate a revision and it is not very detailed. I have not assessed the suitability of the cited sources nor the formatting. Furthermore, the conducted formal analysis is not involved. All in all, the added awareness over the delineated bias in the estimate for ϵ forms a relevant contribution to the field. In particular, this work motivates the tracking of population-level epidemic statistics during an ongoing clinical trial (for a vaccine against the spreading infectious agent).