Reviewer's report

**Title:** Mass campaigns with antimalarial drugs: A modeling comparison of artemether-lumefantrine and DHA-piperaquine with and without primaquine as tools for malaria control and elimination

**Version:** 2  
**Date:** 19 December 2014

**Reviewer:** Thomas Eisele

**Reviewer's report:**

**Overall summary**

This paper uses an agent based mathematical model to simulate and test various mass drug administration scenarios, comparing AL to DP with and without single low dose primaquine (as well as other various scenarios). The paper could use a substantial reorganization to improve its readability and comprehensibility, as outlined below. I have not commented on the validity of the modeling approach used as it is outside my area of expertise.

**Major Compulsory Revisions**

1. I recommend the manuscript have separate results and discussion sections.
2. In the results, please use subheading to allow the reader to understand what is being compared (what factors are being varied) and what factors are being held constant. For the given set of major variables – drug, EIR, coverage (pop coverage and compliance), 2 vs 3 rounds, MDA vs MSAT and time since last round (1 vs 4 months), please be consistent and specify what is varying in the model, and what is remaining constant. I suppose this could be done through consistently denoting this at the beginning of each comparison, but sub-heading would be better.
3. There is a substantial amount of the methods repeated in the results which results in a good amount of redundancy throughout much of the paper. Please streamline the results accordingly.
4. To the best of my knowledge, elimination programs do not, and are not, expected to target areas of high transmission (e.g. EIR of 50) for elimination using drugs alone. The finding that prevalence quickly returns to pre-campaign levels is completely expected. I recommend discussions around such findings be discussed/interpreted accordingly.
5. Why was population movement of individuals with infections into the simulation cohort population not included? This is a significant weakness of this study. If such population movement would not be expected to significantly change the modelling results given the relatively short follow-up period post last round in these simulations, then that needs to be clearly stated.
6. I assume EIR values across simulations could be a proxy for effective vector control coverage, but I would argue not entirely. There is likely an interaction
between host acquired immunity, potential/historical EIR and vector control coverage level (including length of time since introduced) that may very well impact the parameters assessed in this modelling exercise. If the inclusion of vector control cannot be reasonably accommodated, or if you feel EIR serves as a valid proxy, please include this rationale/discussion in the paper.

7. Same as point 6 above- why was coverage of diagnosis and treatment not included in the model? Please either include it or provide a solid rationale for its exclusion.

8. Coverage of MDA was assumed independent in each campaign round and across all individuals; this is a problematic assumption as this is clearly not true in the real world. Would missing dependent chunks of the same individuals (subgroups) across rounds not have an effect on transmission and the effect of the MDA strategies? I suspect it would. And I would make the same argument that independence across individual level adherence is equally problematic. This either needs to be addressed in the modeling, or a solid rationale as to why it is not needs to be given.

9. A linear regression is used to assess differences of model outcomes for rounds with and without PQ across a range of EIRs- is this relationship expected to be linear?

Minor Essential Revisions

10. The language around relative vs. absolute reductions is confusing- i.g. that on p 11 lines 430-437. I suggest using ‘relative’ reduction to reference percent reduction (i.e. 50% reduction from 30 to 15%) and ‘absolute’ reduction be used to explain going from XX% to XX%.

11. Last sentence of conclusions- this hypothesis is not ‘based on your (our) findings’ as no vector control or case management was included in this modelling study.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
'I declare that I have no competing interests.