Reviewer’s report

Title: Establishing the extent of malaria transmission and challenges facing pre-elimination in the Republic of Djibouti

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Reviewer: Charles Delacollette

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To be published with Minor Essential Revisions

Comments to paper “Establishing the extent of malaria transmission and challenges facing pre-elimination in the Republic of Djibouti”

The paper describes the first national malaria survey in Africa incorporating - in addition to routine MIS data information - parasitological and serological markers expected to provide relevant “biological information” on the extent of malaria transmission in the Republic of Djibouti in order to ultimately explore the potential for malaria (pre-) elimination.

General comments:

This is a very well designed large-scale survey building on existing agreed upon methods (MIS) incorporating important up-to-date biological parameters to look at more carefully when progressing towards pre-elimination conditions and status. The sampling method has been carefully designed in a situation where events are becoming rare and increasingly patchy with a quite detailed description of laboratory, equipments and reagents used.

Authors rightly conclude that additional survey parameters used to assess transmission across the Republic provide information on the biological feasibility to (pre) eliminate malaria without too much insisting on the operational feasibility to achieve such ambitious target. I would suggest that the title reflects the study purpose (biological feasibility) which per se is a critical “decision-making” element to be considered among others by malaria national programmes. I am not a statistician so I cannot comment on statistical procedures used but authors seem to have considered all conditions / variables and parameters which might influence results and their final interpretation.

Elimination targets all malaria species. This is only on page 14 that authors mention P. vivax infections. This is a big randomly sample survey using sophisticated laboratory tools like PCR expected to give information on all malaria species. Authors should explain why they are not referring to / searching for other species infections than P. falciparum when looking at parameters to support malaria elimination.

Into the conclusion section, authors should provide information on the cost
(effectiveness) of the survey and recommendations on this proposed MIS+ tools for other (small?) countries facing similar challenges. Is it a survey tool to be recommended to programmes (or further adjusted?) in an increasingly patchy transmission environment with rare or no events? Is it a national survey to be repeated at regular interval when progressing toward elimination? Do malaria programmes and Governments have to rely on such (expensive?) data to inform / decide on next steps and assess progress?

Specific comments:

The “MIS+ survey method” is well described sometimes with too many details on laboratory procedures making the narrative quite complex too read. Such useful details indeed could appear as foot notes or in a special annex to inform scientists.

The survey design has incorporated blood smears to be taken in a subsample of the investigated population in addition to RDTs and filter papers. Blood smears unfortunately were of poor quality and unable to be read. Quality assured microscopy diagnosis is so far one of the cornerstone elements of any malaria (pre-) elimination programmes. From authors’ statement, it seems that there is no national procedure towards a culture of quality microscopy diagnosis in Djibouti. Can authors comment a bit further on this?

Authors refer to biological “pre-elimination” conditions towards elimination without referring to any “decision” threshold per suggested parameter over space and time (RDTs, microscopy, sero-epidemiology or PCR). Any suggestions to be considered?

Migrant and mobile populations are critical but complex “parameters” to be factored in any pre-elimination equation as rightly mentioned by authors. Multi country approach is needed. Have authors any ideas how statistics and sampling methods targeting such special population (including from military force) could further help from an elimination perspective?

Authors conclude that there is no / poor statistical correlation between fever and history of fever and biological parameters used. Any comments on this important observation pertaining to the routine use of clinical parameters towards pre - elimination ?

In Fig3, investigated locations are classified into 3 categories: high, low and insignificant prevalence. What does “insignificant” mean? Any timeframe (how many years per location with such ranking status ?)

Conclusions:

This is a very interesting and original paper to be published with minor essential revisions to clarify the survey purpose and clarify / further comment on some statements, conclusions and recommendations.
Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare having no competing interests pertaining to all of the above questions.