Reviewer's report

Title: Integrating vector control across diseases

Version: 2
Date: 11 May 2015

Reviewer: Edward Walker

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Review of Golding et al. Integrating vector control across diseases for BMC Infectious Diseases

Although the question posed by Golding et al. ("Integrating vector control across diseases") is not new, it is newly defined in this succinct and well illustrated, terse manuscript. The main point is that many of the major vector borne diseases overlap so much in geographic distribution that common methods could and should be applied to both. This is an interesting idea but carries important caveats that the authors need to consider carefully and incorporate into their ideas, and this manuscript. Figures are excellent and good maps based on rigorous quantitative analyses (vs hand drawn conjecture) are always useful.

Major compulsory revisions

1. The authors need to consider at least four matters that can rightly be assigned to the category of major compulsory revisions. These might best be thought of as caveats to their central thesis. First, there are already are common methods but these are not based on single applications for multiple purposes but rather multiple applications for multiple purposes. It is rote insecticide application to habitats where adult or transmitting stages of the arthropods of insects dwell, typically in close proximity to where humans live, e.g. houses. By integrating, the authors mean that a single application of a method or approach could have multiple outcomes. That is not quite the same as integrating further upstream at the industry level, where a single insecticide formulation is developed for multiple uses.

2. Improving housing and reducing poverty simultaneously could go a long way towards resolving all of these problems but they are only mentioned in a cursory and non-integrated way here. Poverty appears to be one of the key independent variables that informs the maps and indeed poverty likely explains the overlap of the various disease systems under discussion here, along with the habitat requirements and vector distributions. When we improve housing, we have in effect reduced poverty because an accepted measure of poverty is the quality and standard of housing. Improved housing necessarily includes insect proofing, ventilation, and the like. I am fairly certain that this is recognized as integrated, even beyond vector borne diseases to other matters in which housing is important to human health and well being.

3. The authors show convincingly that there is broad geographic overlap
amongst many vector borne diseases, and thus the integrated control approach seems reasonable. But is it universally true at the microgeographic or local level? That is less likely. For example, dengue is typically an urban problem of congested human living conditions, whereas malaria is typically a rural problem, although admittedly there will be some overlap in some places. Thus, a map at the global scale as shown here might suggest broad overlap but locally it is not true. Further, day active dengue vectors are not going to come into contact with insecticide when humans (the natural attractant of such lethal baited night traps) are not sleeping under them during the day. Thus there are both spatial and temporal issues with the concept of integration, at least for these two disease systems (which appear to be of major concern in the article).

4. Fourth and lastly, attacks against the immature stages cannot be typically viewed as common in context. One could easily imagine, for example, a setting where leishmaniasis, dengue, Bancroftian filariasis borne by Culex, and malaria are all co-endemic yet the larval habitats of the sand flies or mosquitoes associated with these habitats are very different and non-overlapping, and further the insecticides, formulations, and cultural approaches to habitat (source) reduction, would all require separate and independent actions. Even some of the insecticidal formulations would have to be different (example: highly organically polluted Culex larval habitats require different types of insecticides and formulations than do cleaner and perhaps even potable water of Aedes aegypti larval habitats).

I have a fear that an article like this will mis-lead physicians and others in authority inn public health, such as funders and policy makers, that the solutions to the vector borne disease problems are simpler than they really are. Unfortunately they are complex and often because of the local conditions which are not reflected in the broad-scale maps here. One could make the equally strong but less economically appealing argument that customized and highly focused interventions, developed for each case and even each local condition, are what are required instead. It is here that the analogy with the integrated vaccine strategy falls apart. Nevertheless I found this article appealing, enjoyed reading it, and viewing the interesting maps.

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 that I have no competing interests.