Reviewer’s report

Title: Modelling the risk of transfusion transmission from travelling donors

Version: 1  Date: 7 July 2015

Reviewer: Brian Custer

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Major Compulsory Revisions

1. The major question that needs further development is the predictive ability of the enhanced traveler model. The examples of Chikungunya and Q-Fever do validate the model using retrospective data, but in the situation of an emerging agent model parameter estimates may not be available or may be highly uncertain. How do the traveler-related enhancements to EUFRAT overcome these challenges?

2. With respect to the Q-Fever example, is this really an appropriate traveler related example? What is the burden of travel to the part of The Netherlands which experienced the Q-Fever outbreak? This would seem to be small for any given jurisdiction which would have returning travelers, except for perhaps immediately adjacent geographies.

3. Linked to point 2, the nature of each epidemic drives the potential consequences and implications in the model. The key contribution of this work is the ability the new model provides to segment risk estimates into potentially actionable (will occur) versus past (already occurred) sections. This is a highly valuable achievement for blood safety decision makers. More information would be helpful to explain exactly how to parameterize the model to accomplish this assessment. Even so, with respect to splitting infections into fractions of already occurred and yet to occur, what information is used to do this? Again this seems like something that can be examined retrospectively but not prospectively. Please comment.

4. Does the model include a transmission probability (transmissibility) or infectivity parameter? The methods section (page 8, line 17) suggests the model does include such a parameter. However, the discussion section indicates 100% transmissibility. The model has lower utility than it could have if this was included as part of the overall model structure. Please explain.

5. It is unclear why asymptomatic infections in donors are not included in the analysis of the Chikungunya data from Italy. These are the infections of greatest concern and would reflect the strongest justification for deferring people who traveled to an outbreak area.

6. Table 1. Some of the model parameters don’t have numerical values listed. Was this intentional? If so, why are these parameters listed? Are they not necessary for the model? Please see page 16.

7. The manuscript is technically and mathematically complex, readers may
The authors could place even more of the equations into the already supplied accompanying appendix. This might provide more space to further describes ways in which the enhance model can be used.

Minor Essential Revisions
8. There are minor issues such as not having proper table and figure numbers throughout – At least one Table and one Figure are simply called Table and Figure.
9. There are minor word choice and use issues in the paper, please review carefully.

Discretionary Revisions
10. It is suggested that including confidence intervals (CIs) would be straightforward, but to this reviewer such CIs are not trivial unless implemented as credible intervals using Monte Carlo simulation. The inclusion of uncertainty seems critical given the intended use of the tool which is looking forward at new risks rather than looking back as was done for validation reasons. Please comment.

Level of interest: An article of importance in its field

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

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.