Reviewer’s report

Title: Estimation of cumulative number of post-treatment Lyme disease cases in the US, 2016 and 2020

Version: 0 Date: 04 Oct 2018

Reviewer: Claudia Coipan

Reviewer's report:

I have read and reviewed the manuscript entitled "Mathematical determination of cumulative number of post-treatment Lyme disease cases in the US, 2016 and 2020" by DeLong et al., submitted for publication in BMC Public Health. The aim of the manuscript was to assess the cumulative number of post-treatment Lyme disease for 2016 and to infer possible trends of this number in the future (2020).

The framing, the objective and the results of the manuscript are clear. Furthermore, the results may be a useful metric in calculating the disease burden associated with sequelae of Lyme infection.

It is only in terms of methodology that I raise a couple of points.

1. Throughout the manuscript, the subjective and variable nature of late Lyme disease is underlined by the authors, which I think is completely justified. Also, the authors name the unreliability of the diagnostic tests in late phases of the disease. Yet, the tendency is to deem the tests as lacking sensitivity and therefore to trust more the clinical diagnosis - as described in Nelson et al. (2015). My point is, couldn't the laboratory tests also be lacking specificity, and couldn't the clinicians diagnostic be subjective. Given the fact that ticks carry more potentially pathogenic microorganisms, and not only Borrelia burgdorferi, couldn't it be that the high numbers of PTLD are actually an overestimation?

Thus, I consider it objective to include in the analysis also a scenario using the official estimates based on the direct surveillance (30.000).

2. How was the number of runs for the simulations chosen? What was the uncertainty you were willing to accept so that the chosen number of runs was 500 and not higher? Should one be expected to trust the results of the simulations, these details are essential.

3. For reproducibility of the analyses you should indicate what program/software you used for performing the analyses

4. Inaccuracy (paragraph2, page 11) is a very broad term and also inaccurate when it comes to tests - there you have sensitivity and specificity. Could you make it more clear for the reader what do you mean by that?
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
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I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

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