Reviewer’s report

Title: Public Health Impact of Strain Specific Immunity to Borrelia burgdorferi

Version: 1 Date: 27 March 2015

Reviewer: Ellen Tijsse-Klasen

Reviewer’s report:

Major Compulsory Revisions

1) My main concerns regard the choice of data used to estimate the frequencies of the different OspC types: sequence data of cultured patient isolates were used. The bottleneck of culturing could affect different strains to various degrees, which might lead to skewing. A further source of potential skewing is that it cannot be excluded that some of the patients whose data was used here might have suffered a second or third infection with B. burgdorferi. Due to the strain specific immunity mentioned by the authors, this would lead to an underrepresentation of common OspC types in the study population. This is especially important as the data are used to estimate the number of averted cases due to strain specific immunity. It would therefore be desirable to include a discussion of such shortcomings of the data set. Though not all B. burgdorferi strains found in ticks are pathogenic, a comparison with OspC frequencies in tick population might help to support the assumptions of the authors. However, while I would like to see a more elaborate discussion of potential shortcomings of the study design in the final manuscript, I believe that the main message of the manuscript remains valid based on the study’s findings.

Minor Essential Revisions

2) Line 158-161: Could differences in culturability of various strains lead to such high frequencies of some strains in human isolates?

3) Line 163-167: The authors state: “the frequency of a positive blood culture in patients with a recurrence of erythema migrans would be reduced by approximately 25.3%” and refer to supplementary table 1. This table does not support the statement made by the authors.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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.