Author's response to reviews

Title: Invasive meningococcal disease epidemiology and control measures: a framework for evaluation

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Version: 3 Date: 18 April 2007

Author's response to reviews: see over
April 18, 2007

Annabel Phillips, PhD
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Dear Dr. Phillips:

Please find enclosed the revised version of the manuscript “Invasive meningococcal disease epidemiology and control measures: a framework for evaluation” (MS: 5513254931104146) based on the second set of comments from Dr. Sally Blower.

We are grateful to her for her useful comments and remarks, and to Dr. Finn who recommended the manuscript’s acceptance. We are also grateful to you for giving us the opportunity to improve our manuscript and to try to answer the various comments satisfactorily.

The main issue raised by Dr. Blower was that our manuscript needed to be focused more on results than on methodology and that our model should be accompanied by more detailed sensitivity analyses. Our manuscript now places greater emphasis on the specific analyses conducted to evaluate the impact of routine vaccination of 12 years olds in the US, and to identify key drivers of these estimates. As suggested by Dr. Blower, details of the model are now given in two appendices and the Methods and Results sections have been subdivided to stress the model validation as much as our research question.

In particular, sensitivity analyses have been expanded to include potentially important model inputs and assess the robustness of our findings. These analyses allow the reader to identify those assumptions or data that may be of influence in our results.

We hope that we have provided satisfactory answers to the various issues raised by the referees and that the manuscript is now suitable for publication in BMC Public Health.

Finally, you had asked whether ethics approval were obtained for use of the data in our study. As all of the data used were based on publicly available data, we did not seek ethics approval for use of these data.
Reviewer: Sally Blower

General

*My main concern is still that the authors state that the emphasis of their paper is to describe a model and not to present results. This is an unusual way to write a modeling paper. Firstly, if the main objective is to describe a model then it is essential that the authors present (as I said previously) a detailed sensitivity analysis of their model in order that readers may assess the appropriate validity of their model structure and assumptions. A detailed sensitivity analysis is especially important when a very complex model (such as the model in this paper) is presented. Furthermore, I remain unconvinced that it is appropriate to write a modeling paper that only describes the structure of a model and presents very few results. I would urge the authors to present substantially more results. Details of the model structure and assumptions could then be presented in an Appendix or Supplementary Information as is common when writing a modeling paper based upon a complex model.*

**Response:** We have made substantial revisions throughout the manuscript to address these concerns. The manuscript now places greater emphasis on the specific analyses conducted to evaluate the impact of routine vaccination of 12 years olds in the US and to identify key drivers of these estimates. Results from sensitivity analyses are presented for potentially important model inputs in order to test the robustness of findings and to indicate those assumptions or data that are especially influential. While we did not have access to data at the level required for to performing external validation analyses of the simulation, we do report that the model does accurately reproduce the recent epidemiology of meningococcal disease in the US. The results in Table 1 and Figure 4 can be used by the reader to compare baseline predictions with observed outcomes in the US. In addition, as suggested, we have moved large sections of the methods to two appendices: one detailing the sources of data used to populate the model, and the other describing the various calibration methodologies used in developing the model. Modifications have also been made to the background and discussion sections, in order to better describe the purpose of the simulation and the relevance of our findings to decision makers.

Thank you for your consideration of this manuscript. We look forward to hearing from you soon.

Sincerely,

J. Jaime Caro, MDCM, FRCPC, FACP