Reviewer’s report

Title: Elucidating the impact of the pneumococcal conjugate vaccine programme on pneumonia, sepsis and otitis media hospital admissions in England using a composite control

Version: 0 Date: 28 Jul 2017

Reviewer: Joshua Warren

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Statistical Review: Elucidating the impact of the pneumococcal conjugate vaccine programme on pneumonia, sepsis and otitis media hospital admissions in England using a composite control

The statistical methods/tools being used in the manuscript are appropriate for answering the questions of interest in the study (i.e., are these diseases impacted PCV introduction?).

[1] The use of 5 control variables is a major strength of the work. However, it would further strengthen the findings if the authors could show/discuss how the control variables were related to the main diseases of interest in the pre-vaccine years through plotting or modeling. Ideally, the 5 controls would have similar pre-vaccine behavior to the main diseases (in addition to being unaffected by the vaccine) but then differ post-vaccine if there was an actual PCV effect. If the controls never showed much association with the main diseases then it may suggest that they are less informative about the potential PCV impact, and additional controls should be obtained.

[2] Can the authors give some information in the text regarding the non-specific sepsis results? Even after adjusting for the control variables the IRRs are much larger than one for many age groups. Does this indicate that the controls are not adequate to account for global changes in this disease over time or is there some other explanation? How can we tell that something similar isn't occurring for some of the diseases where we see an IRR less than one (i.e., control variables not adequately accounting for global trends)? Adding control variables to the analysis could improve this.

[3] The authors investigate a number of diseases and age groups while reporting 95% confidence intervals for the "unadjusted" IRRs. A Bonferroni correction for these confidence intervals may be needed to decrease the chances of making a type I error when interpreting the findings.
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.
Yes

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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