Reviewer's report

Title: Economic Evaluation of Pneumococcal Conjugate Vaccination in The Gambia

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Reviewer: Mark Rozenbaum

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General comments:
I think that this is a very well done cost-effectiveness analysis for PCVs in The Gambia. Nevertheless, I have some point which might improve the quality of the paper.

- Major Compulsory Revisions

Page 2. In the method section the authors state that “While PCV7 is currently being used in The Gambia [25], motivated by the availability of local clinical trial data [8,9], we chose to assume a PCV9 intervention for the base-case analysis and adjusted the results to a PCV7 intervention”. Although I understand that due to the availability reasons of clinical data it is attractive to calculate the potential cost-effectiveness of PCV9, however calculating the cost-effectiveness for one of the available vaccines (PCV7/10/13) in the base-case would be much more interesting and useful. As the cost-effectiveness of PCV10 is supposed to be exactly similar to PCV9, addressing the cost-effectiveness of PCV9 seems redundant.

Page 3 line 113-118. The authors assume that efficacy is maintained for a time period of 5 years. For this assumption they refer to Madhi et al (ref 11), however in this study only two cases of VT IPD occurred during the extended surveillance period in HIV uninfected children, 1 in the placebo and 1 in the PCV group. This does not show a prolonged duration of protection upto 5 years as almost all cases occurred during the first 2,3 years of follow-up. However, based on the serological data it is reasonable to assume that the duration of protection against IPD will last for 5 years. The duration of protection against non-invasive pneumonia, however, might be shorter1;2. What is the effect of a shorter duration of protection on the ICUR. Please consider whether or not it would be more appropriate to reduce the duration of protection for pneumonia.

Page 4 line 100 please insert a reference for the type of neurological sequelae. Sleeping disorders seem to be of minor importance compared to mental retardation, epilepsy and hearing problems which all do occur after meningitis in young children. Are all sequelae assumed to result in the same disability (0.555)?

Page 6. Line 166 The authors use serotype coverage based on a published paper, are these age specific or assumed to be constant in children aged less than 5 years of age?
Page 7 line 209-213. The authors included caregiver's time costs. How were these costs calculated?

- Was the wage corrected for the employed part of the population,
- does the caregiver (I assume mostly women) normally work in Gambia,
- which method was used to calculate caregiver’s costs: the friction cost method, or the human capital approach?

Page 8 scenario analysis. How did the authors correct for the much lower serotype coverage (which seem to have a large impact on the level of herd immunity) when they applied the decreases in IPD (as observed by Whitney et al) in unvaccinated individual in the herd immunity scenarios?

Page 10. The authors calculate the cost per DALY, would it also be possible to perform a scenario analysis in which the cost per QALY are presented (eg extract them from Melegaro et al 2004 vaccine)

General The authors decided not to include serotype replacement in the base case analysis, this might be a too conservative approach considering the low serotype coverage of the vaccine. A low serotype coverage might result in a faster and a larger increase in non-vaccine serotype disease. In some European countries the increase of invasive disease cases due to non-vaccine serotypes in has substantially reduced the vaccine program’s net-overall benefits(see e.g. http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1207821646480). Nevertheless, it is not certain whether this increase is a real increase or this is due to installation or enhancement of existing surveillance systems or other potential confounding bias. The authors should at least stress this more in the discussion.

Page 13. Line 380. To my knowledge reductions in (non-invasive) pneumococcal disease in unvaccinated elderly groups have not yet been shown. Please insert invasive before pneumococcal disease in line 380.

Page 24./25 Although the authors do give age specific incidence for age groups of 5 years and older, the disability weights associated with disease is not stated, are these similar among all age groups? Upto which age were caregiver time costs included?

- Minor Essential Revisions

General. A tornado diagram would be usefull as a way of displaying the result of the univariate sensitivity analysis

Page 15. Although the authors note that they perform the analysis from the societal perspective I was a little confused about who is paying for the vaccine. Does the industry provide cheaper vaccines for the poorest countries, the authors also mention UNICEF on page 11. Maybe the authors could address the
role of the industry (if any), UNICEF and GAVI briefly in the introduction or discussion.

Page 24. Please insert % after the age specific case fatality rates for meningitis.
Page 28 Please insert a space between 9 and &.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

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