Reviewer's report

Title: Cost-effectiveness of programs to eliminate disparities in elderly vaccination rates in the United States

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Reviewer: Alessia Melegaro

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Major points

1. Given a societal point of view of the analysis, the authors claim to consider both direct medical and non-medical costs. However, in my opinion, all the costs listed in Table 1 of the manuscript are direct medical costs. Typical non-medical costs should include, for instance, costs of transportation to hospital or GP or costs related to the presence of a relative/nurse providing assistance to the elder who is constrained in bed at home or is hospitalized following one of the infections that the vaccinations under consideration should avert. Moreover, considered the targeted people, it might be that indirect costs such as productivity loss at work do not matter in this context, but this should be nonetheless mentioned in the manuscript.

2. While sensitivity analyses are performed on almost all the considered parameters, the discount rate is always kept fixed at 3% and there is no account of its uncertainty. However, considering that the vaccination programs are assumed to run for ten years and consequences for the elders were considered over a lifetime horizon (the target is a 65-aged cohort, thus life expectancy should be of around 15-20 years), it might be that the impact of the discount rate is not negligible. The authors should provide/discuss results under at least one alternative discounting scenario (i.e., differential discount rates for health effects and costs. For example: 3.5% for costs and 1.5% for health effects as in the latest British NICE recommendations).

3. The conclusions drawn from the cost-utility analysis here presented are solely based on the ICER of the different vaccination programs, as if perfect information on all the parameters were available. Unfortunately, this is not usually the case. Some of the parameters might refer to contexts that are different from the one under consideration. An example of this lack of perfect information is the estimate of the IPD incidence for the Hispanic elderly population, which is based on the IPD incidence for the Afro-American and Hispanic child population (pag. 8 of the manuscript). The consequence of the lack of perfect information is that the final decision about the optimal program has a certain chance to be the ‘wrong’ one. In the recent literature, two new measures have been introduced to account for this lack of perfect information: the ‘expected value of perfect information’ (EVPI) and the ‘expected value of partial perfect information’ (EVPPI). I believe the take-home message of the paper would become stronger if the authors
included EVPI approach in their analysis to evaluate the impact of the chosen values for those parameters for which stronger assumptions have been used (see Briggs et al., Decision Modelling for Health Economic Evaluation, OUP 2006 for details on EVPI).

4. The authors should provide additional details in the method section on the PSA they performed. In particular, for the CEAC shown in Figure 3 the authors should clarify whether the plotted values refer to what in the literature is called “net monetary benefit” (NMB, Briggs et al. 2006), which is given by the formula WTP*Delta_E - Delta_C (where Delta_E is the difference in effectiveness and Delta_C is the difference in costs). Only in terms of NMB framework, it is possible to have CEACs non-monotonic. In the more traditional ICER framework, CEACs can be only monotonic increasing as they represent the cumulative probability of being cost-effective for increasing values of the ICER threshold.

Minor points

1. Background section: ‘Both vaccines are effective…’ please reference

2. The use of the IPD meningitis rates as a proxy for disability rates should either be explored with sensitivity analysis or EVPPI (see above) or removed by using existing estimates of IPD-related sequelae from other developed countries.

3. Vaccine effectiveness: please provide reference to show that PPV is not effective against non invasive pneumococcal disease.

4. Analysis: Rephrase the sentence to avoid repetition (‘We then performed….program. We then performed…’)

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:

I declare that I have no competing interests