Reviewer’s report

Title: Annual public health and economic benefits of seasonal trivalent inactivated influenza (TIV) vaccination in 27 countries of the European Union

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Reviewer: Bruno Christian C Ciancio

Reviewer’s report:

The model used for estimating the impact of influenza vaccination is not described in sufficient detail and does not allow the reviewer to make a proper assessment of its soundness. This should be included in the methods. Similarly some of the assumptions and extrapolations are not provided with sufficient detail and there is limited description of their limitations and weaknesses.

Influenza related hospitalisations and morality data are very scant in Europe. Estimating the burden of disease as the excess of all-cause hospitalisations and deaths leads to a severe overestimation of the burden, whereas using Eurostat case-specific events leads to an underestimation as very few influenza deaths are recorded as such. The way these two data sources are reconciled to make the calculations in this paper are not very clear.

Vaccination coverage in target groups other than older individuals are available only from few countries in Europe. These cannot be extrapolated to all other countries as are there are huge differences between them. Thus the calculation of the vaccination gap is imprecise for most countries. VENICE and other data sources for vaccine coverage are mentioned, but there is no description of these and it is difficult to judge their appropriateness.

Vaccine effectiveness estimates are season specific and outcome specific. Using average values does not take into account years when VE is close to zero and there are few or no cases are averted.

It is not clear why point estimates of vaccine effectiveness were taken from US studies whereas upper and lower limits were taken from European studies. Given the European scope of the analysis it would make more sense to use European data if available.

It is not clear what it the study period under investigation and to which years the various assumptions apply. This is relevant as vaccination coverage is a changing parameter as well as disease severity and age specific attack rates which depends on the dominant strains.

The decision to use an approach that is not season specific is problematic. One would have expected a number of consecutive seasons with their own specific parameters to be analysed and average estimates with ranges reported.

The paper seems too long and some repetitions between introduction, discussion
and conclusions should be removed. The introduction includes a description of the methods under “What our study addresses” which would be better placed in the methods section. The methods should provide a clear description of all the analyses performed with corresponding formulae.

**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