Reviewer’s report

Title: Online Cost-Effectiveness ANalysis (OCEAN): A user-friendly interface to conduct cost-effectiveness analyses for cervical cancer

Version: 2 Date: 25 Nov 2019

Reviewer: Research Square Reviewer 1

Reviewer's report:

PEER REVIEWER ASSESSMENTS:

OBJECTIVE - Full research articles: is there a clear objective that addresses a testable research question(s) (brief or other article types: is there a clear objective)?
Yes - there is a clear objective

DESIGN - Is the current approach (including controls and analysis protocols) appropriate for the objective?
Yes - the approach is appropriate

EXECUTION - Are the experiments and analyses performed with technical rigor to allow confidence in the results?
N/A - no experiments or analyses

STATISTICS - Is the use of statistics in the manuscript appropriate?
N/A - there are no statistics in this study

INTERPRETATION - Is the current interpretation/discussion of the results reasonable and not overstated?
No - there are major issues

OVERALL MANUSCRIPT POTENTIAL - Is the current version of this work technically sound?
If not, can revisions be made to make the work technically sound?
Maybe - with major revisions

PEER REVIEWER COMMENTS:

GENERAL COMMENTS:
Overview

This manuscript describes an online implementation of a Markov model that can be used to evaluate the cost-effectiveness of HPV vaccination programs. The underlying model has been programmed in R, and a beautiful interface has been programmed in shiny. Users are able to use the fixed model structure but customize the parameterization and calibrate the population. I applaud the authors for making their model available and for the truly impressive online interface
they have made that would allow others to use and customize their model. The manuscript itself has several issues. The language is awkward in places, and difficult to read. In addition, the flexibility and usefulness of the model and online tool are exaggerated in places. And finally, I worry about the motivation for the online tool. It is suggested that this model will allow users without a background in modeling or cost-effectiveness to perform cost-effectiveness analyses of HPV vaccination programs. In reality, users without a background in modeling or cost-effectiveness are not likely to either appreciate what the model can do nor understand how to customize transition probabilities, costs, or utilities in the model. I think there value to having this model available but would urge the authors to re-think who could successfully use it, and how. I have the following suggestions to improve the manuscript.

Major issues

1. The title does not reflect the content of the manuscript. The title implies that the tool is useful for *any* cost-effectiveness analysis. But the tool is only useful for studying cost-effectiveness of HPV vaccination programs in females. Please consider narrowing the focus of the title to a more appropriate scope.

I'm uncomfortable with the motivation that this tool will allow people unfamiliar with decision analysis, Markov models, or cost-effectiveness analysis, to perform this kind of analysis. Without some background in these methods, how will they be able to properly specify transition probabilities, costs, and utilities so that results are meaningful? How will they be able to interpret the results? Is it plausible to think that someone who does not understand cost-effectiveness will be able to produce and interpret an incremental cost-effectiveness ratio or net monetary benefit correctly? It seems to me that the tool is going to be best used by analysts who ARE familiar with these methods.

Minor issues

[Page 3, line 1] "Professionals that should face these analyses" is unclear. What kind of professionals? And does "face" mean read? Or desire to perform?

[Page 3, line 18] "Quick tool" is misleading. The tool itself is neither quick nor slow. The tool can certainly facilitate CEA, but it is hard to imagine a scenario where doing so will be quick unless only the default parameters are used. And in that case, why is it worth doing since those results are already available?

[Page 3, line 33] Consider changing "are consistent to" to "are consistent with".

[Page 3, line 35] I disagree that having a tool "will certainly" be an asset. It could be as asset, for some, but this is in no way certain.

[Page 4, line 3] Consider changing "its efficient" to "their efficient".

[Page 4, line 12] Consider changing "optimum" to "optimal".
Consider changing "find any pre-cancerous lesions" to "find pre-cancerous lesions".

I do not understand what you mean by "concrete setting".

Consider changing "challenges to be faced" to "challenges faced".

I would recommend qualifying "most cost-effectiveness analysis" to indicate cost-effectiveness analysis of HPV vaccination and cervical cancer prevention.

It is not true that users of the model can perform cost-effectiveness analysis "without dealing with complex mathematical modelling". The do still deal with complex modeling. The fact that the model has been pre-specified does not mean it does not have to be dealt with.

I would avoid making this bulleted list a specific instruction manual. This should list the inputs without instructions such as ticking boxes.

The language "used in the cost-effectiveness part" is awkward and unclear.

Is there a reason undiscounted results are presented by default, when most guidelines for good practice in CEA (e.g. ISPOR guidelines) suggest using a 3% discount rate by default? Even your example later uses a 3% discount rate.

Consider changing "one…matrices" to "one…matrix".

How is "best-fitting" defined?

I completely disagree with your characterization of this tool as a "very adaptive and flexible environment". The model is completely fixed. The population is fixed. Only the parameterization has some flexibility.

Again, I would contest the idea that the tool "will certainly" be an asset. It might be, for some. It has the potential to be an asset to folks that DO have a background in modeling.

I'd recommend removing "great". It might be useful, and that is good enough. There is no need to exaggerate.

I suspect you meant "warts" not "wards".

Consider changing "in the upcoming" to "in upcoming".

REQUESTED REVISIONS:
No additional revisions beyond those identified above.
ADDITIONAL REQUESTS/SUGGESTIONS:
No additional revisions beyond those identified above.

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.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

Not relevant to this manuscript

Quality of written English
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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Please complete a declaration of competing interests, considering the following questions:

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