Reviewer's report

Title: Re-inventing the wheel: a new method for characterising and designing behaviour change interventions

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Reviewer: Paul Glasziou

Reviewer's report:

I found this review both thorough and insightful. The paper is really two parts: (i) a "systematic review" to indentify existing frameworks, and (ii) a synthesis and extension to create the behaviour change wheel (BCW) framework. The latter is intuitively very appealing, and the systematic review suggests it is more comprehensive and coherent than other frameworks. The authors tested this new framework on two areas - obesity and tobacco control - but give us little of the details of this testing. The combined parts make for a rather heavy and abstract but worthwhile paper. I found it a little lopsided, as the BCW is really the central product but I'd have like to see more details and application. However, that might require a second paper or splitting this one. A couple of more specific comments.

Minor Essential Revisions
1. Table 3a, 3b and 4 - the notation here is ambiguous. Maybe better to use a tick or even a tick and cross.
2. Figure 2 - the elements in the outer wheel (Policy categories) seem out of alignment with the intervention functions, e.g, shouldn't regulation be near restriction? Fiscal near incentivisation? Etc
3. The analysis of the obesity and tobacco control frameworks is not presented. That would have been useful to make this less abstract.

Level of interest: An article of outstanding merit and interest 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:

non-financial competing interests in relation to this paper:
I have worked with Susan Michie on monitoring in chronic disease, but not on the topic of this review.