Author’s response to reviews

Title: Optimisation: defining and exploring a concept to enhance the impact of public health initiatives

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Dear Rosanna Gonzalez-Mcquire,

Editor
Health Research Policy and Systems

Thank you for your email dated 29 August 2019 regarding the in principal acceptance of our manuscript HRPS-D-19-00115 entitled “Optimisation: defining and exploring a concept to enhance the impact of public health initiatives”. We thank the reviewers for their thoughtful comments and believe that the manuscript is strengthened as a result of changes made. Please find below our detailed responses to suggestions. We indicate where changes were made and if changes were not made, why we believed they were not possible or appropriate.

Reviewer #1: I find the study well designed and the manuscript well written. I only have two minor comments:

1. Why were the experts selected based on existing networks of the research team? Is there a risk of biased results because of this?

Participants were purposefully sampled to provide diverse expertise and broad representation of relevant public health professional associations. Such sampling procedures are appropriate for the proposed study. The institutions represented by participants (described in Table 1) demonstrate that that was achieved, and that participants represented organisations with considerable global coverage. We used the ‘networks’ of the research team to identify individuals that were well positioned to provide input into the research for which they may, or may not have existing professional relationships. It is possible that some participant responses may have been influenced by an existing association with a member of the research team. We have edited the methods section and included the following sentences to the discussion to acknowledge this as a potential limitation.

“Participants were purposefully sampled to provide diverse expertise and broad representation of relevant public health professional associations, using existing networks of the research team to identify individuals that were well positioned to provide input into the research. It is possible some participants may not have felt able to express their views freely if they had an existing professional
association with a member of the research team. The extent to which this may have occurred, and any bias it may have introduced, however, is unclear. Nonetheless, participants arrived at a consensus definition of optimisation.”

2. I would like to see more discussion on the applicability of the optimisation concept and the study findings in the real world political policy processes of public health initiatives.

We have included the following as paragraph to the discussion as suggested to comment on the applicability of optimisation in the real world policy process.

“Nonetheless, the findings of this study suggest that the broad application of optimisation processes in public health is likely to represent a considerable challenge. As well as the practical considerations identified by participants, including access to routinely collected data, the public health workforce may require significant capacity building or processes to engage those with expertise in health economics, research trial methods, mechanistic program evaluation, adaptive interventions and research designs. Examples of where optimisation has been applied to improve the impacts of public health initiatives have typically been in the context where such expertise is available and has been applied [26, 44]. Furthermore, public health decision making is influenced by a range of social, political and organisational factors, of which research evidence is one [45]. Optimisation, particularly of public health policy, may be difficult to achieve in the context of these other considerations which may favour policy stability, (rather than change), the introduction of ‘new’ programs (rather than optimisation of existing programs) or investments in public health programs that are short term. While the challenges are considerable, optimisation processes offer enormous potential to efficiently and expediently improve the impact of public health initiatives.”

Reviewer #2: Overall, I enjoyed reading and gained a great deal of relatable knowledge from this thoughtful and well-written manuscript, and would like to thank the authors for their contribution. I've few corrective comments, as I think the vast majority of the paper is clear and succinct, so have focussed on suggestions that might help to improve the practical application of the study's findings. I hope these provide a helpful steer and would be happy to see a further version of the manuscript, if resubmitted.

Background
The study addresses a key issue that public health interventions - especially those evaluated in 'real-world' settings - have variable (and sometimes limited) effects. The authors highlight in particular the challenge of 'adaptation' of existing interventions, in light of meta-analyses that indicate this is an important factor to a programme being effectively transported to 'fit' local contexts. While 'optimisation' is well established as a formal means of adaptation in engineering and IT, and implicit in quality improvement practices in medical health care, the authors point out that such terminology is not well understood in public health interventions. Thus both the research topic and question, and the approach the authors take, seem well justified.

Thank you for the encouraging comments – no response required.

#1: Optimisation inherently feels like something that ought to be done, as part of a wider challenge to improve the quality and value of healthcare interventions. I thus applaud the authors' motivations for exploring this topic in the specific context of public health interventions - and feel that they provide a solid underpinning for the study. I just wonder if it might add weight to the background section, and
make the case for optimisation to practitioners/policymakers for whom this research may be relevant, if they explicitly draw in evidence of the scale of the issue in public health (i.e. framing the need for optimisation)? Perhaps by expanding slightly on some of the references cited in the background section, particularly if any of these speak to issues such as effective spending of public resources / research waste / the 'know-do' gap, or similar?

We have added the following paragraph to text to the second last paragraph of the background section to make help frame the need for optimisation.

“While such examples exist, optimization processes applied across phases of intervention development to large scale delivery appear uncommon. In Canada, for example, government and private foundations have funded thousands of public health pilot projects that are rarely further developed, improved and integrated into public health services – an outcome described by a former health minister as a tragic ‘waste of time, talent and energy’ [27]. Further, while evidence may be used to inform selection of public health interventions, the effectiveness of approaches to their implementation, or their effects on community health outcomes once adopted as a health service are rarely evaluated, precluding the opportunity for ongoing, evidence-based evolution of the program [28].”

Additionally we have provided the following text to expand on the references in the background to better make the case of the need for optimisation.

“Furthermore the effectiveness of interventions is often reduced as interventions are evaluated in more naturalistic contexts. For example, a systematic review of obesity prevention programs found that those interventions tested in more real world (‘pragmatic’ trials) contexts did not significantly reduce child body mass index (−0.09 kg/m2; 95% CI −0.19, 0.01) while those under taken under more controlled research environments (explanatory trials) did (−0.21 kg/m2; 95% CI −0.35, −0.08) [5]. Similarly meta-analysis of childcare-based physical activity intervention reported significant effects for trials evaluated under research conditions (SMD 0.80; 95% CI: 0.12-1.48) but not more real world environments (SMD 0.10; 95% CI:-0.13-0.33) [4].”

#2: I wonder if there would also be illustrative value in summarising examples of the effects/impacts maximised by the interventions the authors refer to (p8 line18) as a result of optimisation in public health? This could act to strengthen further the case for optimisation, as well as link to points made later on the links between optimisation and the need to consider it inclusively of more robust evaluation of programme outcomes/impacts (p15 lines11-33).

We have added the following text to the background to expand on the example so it is more illustrative.

“For example, sequential randomised evaluations of three strategies to implement school nutrition policies improved the incremental cost effectiveness ratios for implementation of the policy in schools (versus usual care) from $4,730 to $2,627 and facilitated its subsequent implementation ‘at scale’ [24, 25].”

Methods
The authors chose a 3-round Delphi process (two email rounds either side of a face-to-face workshop) as a means to build consensus on a definition of public health optimisation, among a group representing both public health research experts, and practitioners.

They sought to elicit participants' understanding what optimisation meant to them in the context of
public health promotion, in advance of the first workshop. In parallel they undertook a literature
search, and publish search terms (additional file 1). These appear comprehensive and grounded in
relevant methods, and provide helpful and systematic search criteria for future reviews on this topic
and/or applications to other areas of healthcare.

#3: could authors make clearer that the purpose of the literature review (and creating the conceptual
maps) was to elicit the different criteria (/categories of criteria) that could/should/ought to be included
in any definition of optimisation? They state 'Johnanna Briggs Institute method to identify frameworks
relevant to the concept of optimisation' (p11 lines11-13) but not being familiar with this method, I feel
the overarching aim is somewhat lost.

We have clarified the need for the literature review on page 11, by adding the following text.

“A scoping review is a form of systematic review conducted when there is uncertainty in the literature,
to examine the key themes, concepts and definitions relating to an area of research [34]. The scoping
review ensured that the study identified prior work in the literature relevant to optimisation for
participants to make use of and consider in the development of a definition.”

#4: the third combined conceptual map (additional file 4) is also useful - but colour scheme seems a bit
random? Is there a way of using colours/shades a little more consistently (e.g. first/second/third order,
or to differentiate between thematic branches)?

We have now included a key within the conceptual map (additional file 4), and a supporting statement
in the manuscript detailing the meaning of the different colours (p11).

“Within the third conceptual map colours represented the source of the theme, that is, yellow
represented the themes derived from the literature review, purple from the participant responses, and
green the key overlapping themes across both the literature and participant responses.”

The authors provide a thorough description of the workshops, which seem well resourced and
facilitated. They describe how they elicited thoughtful considerations of both a working definition of
optimisation, and aspects such as scope and interpretation of such a definition, in a participatory
fashion. It is notable that the team had experience of qualitative research methods (including input of a
researcher with postdoctoral experience in qualitative research) and that their approach ensured
sensitivity to divergent views, and enhanced the rigour of the qualitative analysis.

Thank-you. No response required

Results

Overall I found these clear, well written and consistent with the aims of the study (to define
optimisation in the context of public health, and set out key considerations in optimisation for public
health).

[Subsection: Themes 1, 2, 3 etc. (from p14, line53 onwards)]

#5: Though this is a personal preference, I wonder if the authors might improve the accessibility of key
points of this section of the results, by making all subheadings a sentence? E.g. for Theme 1 ('Pre-
conditions for optimisation') (i) Good quality outcome data and the resources to analyse/evaluate program outcomes are necessary for optimisation, (ii) Optimisation should be undertaken where there is good evidence of unrealised benefits and/or lack of implementation, (iii) Organisational support and leadership for activities such as end-user engagement is fundamental to optimisation (or similar)

We have now revised subheadings to form full sentences in text (pp. 15-21) and in Table 2 (pp. 26-27)

Theme 1

['Pre-conditions for optimisation']

(i) (p15 line13 onwards)
The authors present insightful and important points linking a requirement for good quality impact assessment and/or outcome data as a pre-condition for optimisation.

#6: I felt that this point deserves greater emphasis (e.g. stronger conclusion/recommendation?), perhaps by stating the reverse case - how can we expect to optimise interventions without efforts to obtain, analyse, make accessible etc. data on programme outcomes/impacts? Then places emphasis - and by inference a need for support/resource/capability-building - on actors working in the system (practitioners, researchers, but also research/governance organisations and funders?) to support activities that go beyond local data capture / local impact assessment, and instead look to make best (and methodical) use of what the authors describe as existing and/or inexpensive data sources 'particularly suited' to wider optimisation processes (p15 lines38-47).

Issues regarding the need for robust, easily accessible data for optimisation were certainly identified by participants. We have now added to text of the results to elaborate on this further. For example, with the text:

“For example, existing medical records, linked data sets, or data from public health chronic disease risk surveillance systems could be used for that purpose. Participants noted, however, the limitations of many of these data sources to provide sufficiently valid measures of improvement, and a considerable challenge that goes with identifying easily accessible, suitably robust measures for optimisation in public health”.

The implications of this, and in particular the need for a workforce and capacity to best make use of use of such data, was not specifically identified by participants. We concur that it is important to note, and we have now done so in the discussion (rather then results). Specifically we have added the following to the discussion.

“Nonetheless, the findings of this study suggest that the broad application of optimisation processes in public health is likely to represent a considerable challenge. As well as the practical considerations identified by participants, including access to routinely collected data, the public health workforce may require significant capacity building or processes to engage those with expertise in health economics, research trial methods, mechanistic program evaluation, adaptive interventions and research designs. Examples of where optimisation has been applied to improve the impacts of public health initiatives have typically been in the context where such expertise is available and has been applied [26, 44]. “
On the theme of setting targets for optimisation with due consideration of whether any 'meaningful improvement' can be realised (p16 lines 12-17), this feels eminently sensible. That said, I felt that there was a degree of implicit/tacit knowledge from those involved in the study on what would/could meet this threshold.

#7: Similarly to #2, I wonder if providing some examples would help to illustrate what a 'sufficiently important' public health issue would be, and thus the benefits of optimising?

There were no specific health issues identified during the workshop ‘important enough’ for optimisation. Further, we are reluctant to provide a specific example in the discussion, as the findings of the paper indicate the decisions to engage in optimisation are highly context dependent. Optimisation may be fine for a public health issue that isn’t associated with a great deal of harm, if meaningful improvements can be expected from an optimisation process, particularly if at low costs, and the necessary resources, data sources and expertise etc are available. As such we are reluctant to comment on what a ‘threshold’ for optimisation may look like.

On the theme of support and resources for optimisation, this feels like very important, if not a limiting, factor.

#8: again I wonder if citing/describing some examples of good/emerging practice might help to encourage positive behaviours in this regard?

There were no specific examples of ‘good practice’ elucidated from participants during the study. However, we now have commented in the discussion, on how the resources, expertise and support for optimisation may be facilitated. Specifically we have added the following text to the discussion

“Examples of where optimisation has been applied to improve the impacts of public health initiatives have typically been in the context where such expertise is available and has been applied [26, 44]. As such, strategies to support partnerships between researchers and public health policy makers and practitioners, including embedding of researchers in public health service agencies, may represent one means of enhancing expertise, capacity and infrastructure to facilitate optimisation.”

[i] (p16 line 56 onwards)
The authors' finding that impact 'is more likely to be maximised if optimisation occurs throughout the public health translation continuum' strikes me as having wider relevance than just public health research. It reminds me of wider discussions on impact (my own experience being principally in and around research funding organisations) and, in a resource-constrained system, the tension between supporting activities that increase the likelihood of impact, versus those that seek to evaluate impact - with well-planned methodical evaluations forming a virtuous feedback loop between these two aspects.

#9: Without straying too far beyond the immediate thematic focus of this study, I wonder if the authors might widen applicability of their findings by referencing some of the research (on research) literature that explores factors associated with wider impacts? For instance:
The authors reinforce the importance of including end-user perspectives and priorities in the optimisation process - and provide a good example of a case that sought to optimise care for patients with hip fractures (specifically system-level costs and reductions in infection), but had not considered individuals' quality of life.

#10: I'd like to see more of these 'micro-level outcomes expectancies' if/where they are available, to help illustrate points where macro/abstracted view might risk being a little hard to relate to?

We are unable to provide more examples of these micro-level outcome expectancies as no additional examples were offered by the participants. We have acknowledged the high level nature of research and have recommended in the discussion that future research provides greater depth on a range of important issues identified by the study.

Theme 2
Helpful that the authors reinforce the value of programme logic models as means to underpin evaluation: again, I felt this has broader relevance to the opportunities/challenges of research impact assessment as a whole. Also the value of non-quantitative evaluation 'analogue' methods as appropriate for determining factors influencing impacts.

Theme 3
The authors' final point on identifying considerations relevant to when 'the point of optimisation' is reached is useful, particularly if considering resource constraints.

Conclusions
I generally felt that while the conclusions as stated were entirely appropriate, the authors might be able to strengthen their findings further by a) highlighting the benefits that optimisation, done well, can bring about, and b) reflecting on aspects that relate optimisation to wider opportunities/challenges around research impact and its evaluation (as noted in previous comments)?

We have made a number of amendments to the discussion above that we believe address the issues raised here. Additionally we have included the following to the conclusion paragraph of the discussion

“Previous cases of optimisation in public health, for example, have demonstrated that, through repeated data, driven improvement, the cost of delivering effective public health programs can be achieved at approximately half that of usual practice, effectively doubling its population level impact [26, 45].”

[re. 'Contributions to the literature' (p6 lines 9-27)]

#11: Can the 2nd and 3rd bullets in this section then be updated more around a theme of 'recommendations for optimisation', rather than their current somewhat more abstracted 'we note [but
do not state explicitly here the seminal issues' / 'we recommend further research be undertaken' (which you'll forgive me paraphrasing - somewhat flippantly - for effect!)

Thank-you – we have edited both bullet points to be more specific. We hope you find these modifications and explanations satisfactory. We hope to be considered for publication in Health Research Policy and Systems.

Kind regards,
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