



OPEN LETTER

REVISED Responsive feedback: Towards a new paradigm to enhance intervention effectiveness [version 2; peer review: 4 approved]

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Abstract

The current dominant models of intervention design in the development sector do not account for the complexity and unpredictability of implementation challenges. Decision makers and implementers need timely feedback during implementation to respond to field realities and to course-correct. This letter calls for a new approach of “responsive feedback” or “feedback loops” that promotes interactions between project designers, implementers, researchers and decision-makers to enable course corrections needed to achieve intended outcomes. A responsive feedback approach, in theory, should be agile, flexible, adaptive, iterative, and actionable. There can be multiple challenges associated with incorporating this approach into practice including donor requirements, organizational structure and culture, concerns about the additional time required to adopt such an approach, resource and operational constraints, the absence of skill sets needed for such an approach within smaller organizations and inadequate inter-departmental communication. However, these barriers to adaptation can be overcome. For responsive feedback to become a part of the culture of development organizations, commitment is needed from donors, decision-makers, project designers and implementers. We believe that, to generate opportunities for learning and adaptation, donors should provide the stimulus to break down silos between implementers and researchers.

Keywords

Implementation science, responsive feedback, feedback loops, adaptive implementation, theory of change, monitoring and evaluation

Open Peer Review

Approval Status

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- Steven Chapman**, IKEA Foundation, Leiden, The Netherlands
- Robert C. Hornik** , University of Pennsylvania, Philadelphia, USA

Any reports and responses or comments on the article can be found at the end of the article.

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REVISED Amendments from Version 1

We have revised the manuscript in light of reviewers' suggestions.

We agree that that the design of evaluations of social and behavioral intervention have been considerably informed if not influenced by designs of drug trials. The focus on RCTs as a gold standard is a particularly telling illustration of this argument. The RFM approach needs a different philosophy and we highlight this point in the Letter.

The Letter now situates our arguments in the larger context of behavioral, improvement and marketing sciences and show how we connect our arguments to this earlier work. We note how similar argument are also made in other sectors such *Doing Development Differently*.

The Letter now notes the challenge of implementing an RFM approach in a complex environment involving multiple organizations

The Letter also acknowledges the challenges of adapting an RFM approach in light of the availability of resources, skills and priorities of an intervention so as to make it useful.

See referee reports

The current dominant models of intervention design are fraught with challenges that make it difficult for programs to be responsive to the complexity and unpredictability of implementation challenges. Partly, the dominant model is influenced by medical or pharmaceutical trial models which use randomized controlled trials as the gold standard, assume high degree of fidelity and certainty to intervention and seemingly invariant conditions when the stimulus or drug is administered. The reality of social and behavioral interventions, on the other hand, are far too different posing tremendous challenges. For example, current tools and models for understanding deviations from what was originally expected and what is observed during implementation do not allow programs to respond with the flexibility and agility required in rapidly changing field situations. Limited flexibility in programmatic response is often seen when limited or no feedback is provided to decision-makers, including implementers, during the implementation process. This lack of agility may be a function of the types of data, study designs and management skills needed to respond to changing implementation needs. It is equally possible that an organization's culture may not be open to receiving and acting on feedback.

A culture of continuous learning may be needed for a host of reasons, including changing consumer expectations, unexpected implementation constraints or faulty assumptions made at the project design stage. Our conventional approach to assessing the effectiveness of interventions by collecting data at the end of the intervention, provides limited opportunity to be responsive to day-to-day developments in the field. The long interval between the end of the intervention and completion of the evaluation means that the evidence generated is of limited utility in course correction and in providing timely feedback to implementers. Moreover, the lack of a systematic process for linking ongoing implementation learnings to modifications in project design - the feedback loop - often precludes adaptive implementation.

Recent thinking has posed a bold challenge to this orthodoxy aided by developments in theory, methods and practice, calling for an approach that promotes interaction between project designers, implementers, researchers and decision-makers, to encourage adaptation through learning. This newer approach, often using such terms as "responsive feedback" or "feedback loops," calls for timely assessments that provide actionable feedback to implementers to course correct and achieve intended outcomes. Three developments have contributed to the increasing momentum of this approach. One, the advent of information and communication technologies (ICTs) has increased opportunities to collect, analyze and disseminate evidence/data more rapidly. Two, multi-disciplinary and multi-sector thinking has allowed for greater sharing, adoption and adaptation of lessons from different sectors and is increasingly infusing thinking in the development sector. Three, there is a shift among implementing organizations from considering monitoring and evaluation as an accounting or "auditing" function (Colquhoun *et al.*, 2017) to a learning function that drives continuous improvement.

In this letter, we are calling for a wider adoption of this new approach to enhance the effectiveness of interventions, ultimately leading to improvements in the lives of people for whom the interventions are intended. We will briefly touch upon some important issues regarding challenges in adopting a responsive feedback approach, and ways to overcome these challenges. This is not meant to be an exhaustive review of a responsive feedback approach as much as an effort to generate dialogue among donors and practitioners among others. Our approach builds on earlier work in social and behavioral sciences that offered multiple frameworks for implementation and from literature on management that especially integrated implementation sciences with improvement sciences (Balasubramanian *et al.*, 2015; Gaglio *et al.*, 2013; Glanz *et al.*, 2015; Green & Kreuter, 2005). We must also note that the RFM approach builds on and is complementary to similar dialogues in the development sector such as "Doing Development Differently" which also call for "rapid cycles of planning, action, reflection and revision" in implementing social change (Harvard Center for International Development, 2014).

How to label the new approach

To start with, one challenge worth noting is that there is a lack of consensus over terms and definition of what responsive feedback is. While developing a consensus is not the aim of this letter, we contend that it is critical to develop standard terminology and a broadly acceptable definition of what this approach may be called. We argue for the terms "responsive" and "feedback" to characterize the philosophy and goals of this approach. A responsive feedback approach reduces the tension between traditional monitoring and evaluation and traditional implementation and decision-making functions. It proposes that the design of research activities should be driven by the explicit intention of providing actionable insights to implementers. For the learning function to be effective (as judged by whether it leads to improved implementation and design decisions), interaction among researchers, implementers, and other decision-makers is important at defined moments throughout the

project's life cycle. In turn, the learning questions and the timing of these moments should be guided by the project's Theory of Change.

Theories of Change and responsive feedback approach

A Theory of Change (ToC) is critical as, by identifying pathways and markers of course-correction, it can inform factors that influence the effectiveness of an intervention to ensure that short-term to long-term objectives are met. However, few interventions have an explicit ToC and hypotheses that are continuously tested and refined to improve the interventions. We argue that a ToC is an essential complement of a responsive feedback approach.

A ToC approach is about making our forward-thinking narrative explicit – and the assumptions that underlie one's thinking. It clarifies how we see cause-effect relations between activities or actions and their intended changes, ensures that causal links and assumptions behind the links are explicit, and helps hone in on the relationship between activities and the achievement of long-term goals. Instead of becoming fixated on what the program is currently doing, it draws people's minds to the activities that are needed to achieve the goals. This leads to better planning in that activities are linked to a detailed understanding of how change actually unfolds.

ToCs are largely focused on uncovering and critically appraising assumptions, with learning as a key goal of the process. Responsive Feedback Mechanisms (RFM) are a tool to support the practices of learning and adaptive thinking – making ToCs and RFM critical complements to one another. And, by using a collaborative and participatory process, developing a ToC should involve discussion about existing understandings of how change should happen and articulating the underlying assumptions. Through this process one may identify where there are structural inconsistencies or contradictions, particularly around cause-effect relations in the logic of change pathways, or where there is uncertainty, pinpointing where RFM can be most useful.

In summary, these points identify potentially powerful use of ToCs and RFM to drive program improvement – with the ToC setting the learning agenda and uncovering assumptions in need of validation, and RFM providing the tools and methods to do so.

Characteristics of RFM

What are some of the principal characteristics of responsive feedback approach and the interventions informed by RFM? There are five key features:

- 1) *Agility and flexibility*: RFM designs should be agile and flexible enough to capture changes (or lack of changes) due to the intervention.
- 2) *Adaptive*: RFM-driven interventions are not fixed but are adaptive to feedback based on context and situation.
- 3) *Iterative*: The culture of experimentation suggests an openness to test and change the intervention in response

to the latest insights, often building in multiple rounds of feedback loops throughout implementation.

- 4) *Responsive*: The RFM approach should be sensitive to the needs of implementers and decision-makers at each stage of the intervention, driven by methods that take a problem-driven approach to answering key learning questions.
- 5) *Actionable*: The data generated through the RFM approach are relevant and timely to inform key design and implementation questions.

Challenges in implementing a responsive feedback culture

While the idea of responsive feedback is slowly being appreciated, it is by no means without its challenges, particularly in its operationalization. These challenges include the organizational structure and culture, capabilities of both researchers and implementers and resource constraints.

- (a) *Organizational culture*: The culture of an organization has profound implications for whether RFM can be successfully executed by the organization implementing the intervention. One, the leadership of the organization should be open to the philosophy of experimentation and iterative improvement including the presence of champions who can advocate for RFM. Second, any silos between departments such as Monitoring, Learning and Evaluation (MLE) and program design and implementation will have to break down to facilitate communication and coordination. Third, and this is linked to the ToC, there may be a reluctance to question the assumptions built into program design resulting in an unwillingness to acknowledge preconceived notions even in the face of contrary evidence.
- (b) *Program design*: Implementation timelines, resource and operational constraints, or reporting compliance restrictions may not allow for the flexibility needed to allow for iterative design.
- (c) *Organizational structure*: This includes such characteristics as the size and complexity of organizations. Large organizations, in theory, have personnel with specialized functions and separate departments for program design, grant writing, implementation, MLE, front-line workers, information technology (IT) support etc. While large organizations may have the personnel and structure to perform such specialized functions, it may be difficult to change a culture that deters responsiveness of the MLE group to the needs of the designers and implementers with timely feedback. On the other hand, while the division of labor is likely to be simpler in smaller organizations, they may lack the specialization, bandwidth and resources to adopt RFM effectively.

- (d) *Human capital*: It is vital that personnel are trained with appropriate skills in adopting and implementing RFM. This requires specialized skills such research design, programming skills, IT support, critical appraisal and utilization of evidence and execution. One solution is to promote “task shifting” where one can invest in human capital for some of the technical tasks such as evidence-interpretation and program adaptation and shift these tasks from highly technical personnel to decision-makers and implementers within the same organization (Fulton *et al.*, 2011). Digital technologies can be particularly helpful in reaching and training health workers and providing the necessary skills for continuous learning (NAS, 2017).
- (e) Most organizations are *resource-challenged* with multiple demands for their limited resources. Organizations may prefer setting aside a bulk of the money for intervention design and implementation rather than monitoring and evaluation. This is particularly important for organizations that look at MLE and ensuing feedback as a “luxury” available only when programmatic needs have been met. However, “adaptive management,” a culture and structure that allows for experimentation, testing and iterative learning may be able to minimize the adverse impact of limited resources by distributing the responsibility of learning and adaptation across a broader range of actors within the same organization.
- (f) *Funding*: Funding and funders influences the level of flexibility in design and implementation. Implementers could be penalized for “experimentation” or “iterating” with program design. And funder reporting requirements may prioritize basic monitoring activities without encouraging ongoing adaptation and learning throughout implementation, putting RFM at odds with other priorities.
- (g) *Inter-organizational coordination*: Implementation of most social and behavioral interventions takes place under complex societal conditions and that includes multiple organizations and stakeholders with varying degree of expertise, experiences, resources and histories. The “network” effect of complexity when multiple stakeholders are involved call for greater understanding, collaboration and coordination in implementing RFM-informed interventions.

Opportunities

While there are challenges in adopting responsive approaches, there are a number of ongoing developments that make it conducive to accelerate their adoption.

One among them is the alacrity with which the social sector has adopted the tools stemming from the revolution in information and communication technologies. We are witnessing the

emergence of the idea of digital health, “a set of activities and tools that encompass health, information and communication technology (ICT), including mobile health (mHealth), health information technology (IT), health information systems, wearable devices, telehealth, and telemedicine” (National Academy of Sciences, 2017). Development organizations are increasingly taking advantage of these changes particularly as barriers to adaptation are lowering.

But perhaps more foundational is the shift among development practitioners to participatory, actionable, and adaptive MLE approaches. This cultural shift is accompanied by an expansion in the ways traditional monitoring and evaluation tools are being applied to support ongoing learning opportunities – by building in participation of key stakeholders throughout design and implementation or by supporting capacity development for organizational staff on MLE.

Implications

In this letter, we do not make any claims about how easy it is to adopt an RFM approach nor do we discuss in any depth the modes of observation for data collection to facilitate decision-making. Program planners and managers have to prioritize “what” to observe and “when” to observe based on the ToC to help in decision making based on such considerations as costs, order of importance, skills and practicality in decision making (Hornik, 1992).

A culture of responsive feedback begs commitment from all parties involved in project design, implementation and learning. Donors need to provide the impetus for interactions between implementers and researchers that result in opportunities for learning and adaptation. This may require an upfront commitment of time and resources to test areas of uncertainty within the ToC using formative research or small experiments. It may have implications for what functions are needed for project management, for the type of reporting needed and possibly even for what is admissible as learning. Requests for proposals would have to highlight the importance of returning to the ToC periodically and using it as a way of navigating improvements in implementation. At the same time, commitments would be needed of implementers, decision-makers, researchers, and other development practitioners to embrace the RFM approach, actively participate in continuous learning, and act on the evidence generated. Our organizations have each experimented in different ways with using RFM to enhance intervention effectiveness and believe in its power to effect development change on the pathway to impact.

Disclaimer

The views expressed in this article are those of the authors. Publication in Gates Open Research does not imply endorsement by the Bill & Melinda Gates Foundation.

Data and software availability

No data are associated with this article.

Grant information

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The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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in Washington DC on December 5-6, 2018. This CoP is led by M&C Saatchi, Harvard T. Chan School of Public Health and Dimagi and comprises of 20+ implementing and research organizations and 5 donors. We are grateful to all members of the Curve CoP for sharing their experiences with RFM, the challenges they faced, and the successes they experienced by adopting this approach. We thank the reviewers for their thoughtful and insightful suggestions. Finally, we are grateful to Krishna Jafa for her thought-partnership in setting up the grant that made the formation of this CoP possible.

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Open Peer Review

Current Peer Review Status:    

Version 1

Reviewer Report 04 April 2019

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Robert C. Hornik 

Annenberg School for Communication, University of Pennsylvania, Philadelphia, PA, USA

This is a thoughtful, well written letter making the case for building stronger feedback mechanisms into implementation of programs. The authors argue for the benefits of moving beyond the narrow use of research in many current projects, emphasize the essential role of an explicit theory of change, and summarize some of the barriers to building in responsive feedback mechanisms. They charge donors with the responsibility for overcoming such barriers.

I bring a particular perspective to this discussion, a long term engagement with the use of mediated communication within development and particularly health-related interventions. That experience has led me to a perspective that overlaps with the authors' framework, but may also differ from it in some details.

The hardest problem in moving towards a 'responsive feedback' culture is the transformation of organizational culture in practice. There are a very large number of research-able questions that can be asked; determining which ones have priority, framing potential action choices concretely so that evidence can inform those decisions, establishing what quality of evidence will be adequate to underpin decisions, and being ready to respond when the feedback comes in are all part of this transformation. The argument for the responsive feedback culture in the abstract is meritorious; implementing it within a real intervention may be a struggle.

As an example, here is a startup list of questions a mass media-based anti-tobacco program might monitor: whether pretesting has established the promise of the arguments to be emphasized in messages; whether the media channels actually transmitted messages on schedule; whether their primary audiences recall hearing major messages; whether those audiences have been persuaded by the arguments contained in the messages (e.g. that tobacco use is addictive); whether they have intended to change behavior and whether they have actually changed behavior. Monitoring can assess whether responses to these outcomes have been universal or differentiated by characteristics of the audience. Monitoring can ask whether the media messages generated social discussion and diffusion through interpersonal channels, or whether institutional actors were influenced as well and made concrete policy changes (e.g. banning tobacco use in bars).

This already long list of potential monitoring questions, which would be driven by the theory of change articulated as the basis for the program, can be multiplied. But even this restricted list has to be prioritized reflecting the cost to do research, the skills available, the leverage an answer might have for program decisions (Hornik, 1992¹). Then questions have to be formulated in ways that allow obtained answers to drive intervention decisions; will high quality samples and closed-ended face-to-face interviews be required, or will intercept interviews or focus groups or surveilled social media discussions provide adequate information? Will randomized controlled experiments be needed or will naturalistic observational studies be sufficient? Then, what action would be taken if, for example, 40% of the audience recalled exposure to the messages, or 15% reported sharing the messages with others? Is there enough flexibility in the budget and is there the required lead time to make potential needed changes? One can easily imagine program managers being exhausted merely by the process of articulating questions. How to implement a responsive feedback system across the wide range of programs and individuals charged with doing so, is the hard question. The answer may be that some feedback is better than none, and even programs who will be constrained in what they can realize can exploit some such feedback.

A second thought stimulated by the letter leads me to differentiate three quite different forms of responsive feedback that might be incorporated, including monitoring, support for causal claims, and operational testing. All of the example questions above fall under monitoring, the effort to assess whether things are changing consistently with an articulated theory of change. My own guess is that monitoring is where most actionable research will fall. But monitoring may not permit confident causal claims; monitoring may show that the audience increasingly believes that tobacco use is addictive, but that may not allow a claim that the campaign affected that belief if other forces also might be influencing the belief. A more elaborate research approach may be required. Similarly monitoring may establish that ads are inadequately recalled; it will not establish how to make sure they are better recalled—operational testing (comparing proposed A and B strategies for increasing exposure) may be required.

In sum, I very much support the argument in this letter. Turning it from sensible abstract argument to implementable program will be hard. In particular doing such implementation adapted to the realistic context and circumstances of programs that will vary in size, in skills of staff, and of research resources will be demanding. Making sure that the data gathering does not become an end in itself, as is too often the case with program research, but actually serves the evolution of programs will be a constant struggle. It will be worth doing.

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Is the rationale for the Open Letter provided in sufficient detail?

Yes

Does the article adequately reference differing views and opinions?

Partly

Are all factual statements correct, and are statements and arguments made adequately supported by citations?

Yes

Is the Open Letter written in accessible language?

Yes

Where applicable, are recommendations and next steps explained clearly for others to follow?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Public health communication

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 24 Apr 2019

Sohail Agha, Bill & Melinda Gates Foundation, Seattle, USA

In this letter, we do not make any claims about how easy it is to adopt an RFM approach nor do we discuss in any depth the modes of observation for data collection to facilitate decision-making. Program planners and managers have to prioritize “what” to observe and “when” to observe based on the ToC to help in decision making based on such considerations as costs, order of importance, skills and practicality in decision making (Hornik, 1992).

Competing Interests: No competing interests were disclosed.

Reviewer Report 25 March 2019

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Steven Chapman

IKEA Foundation, Leiden, The Netherlands

I am grateful to the authors for publishing these remarks from the 2nd Summit of the Curve Initiative, and for encouraging donors to commit to creating the conditions for Responsive Feedback Mechanisms, particularly ‘an upfront commitment of time and resources to test areas of uncertainty within the ToC using formative research or small experiments.’ I recommend approving this for indexing as is because of the importance of the substance of the letter and the opportunity that open peer review gives to comment. I agree with the overall argument put forth

here in terms of what RFM needs to be, challenges in implementing it, and the opportunities described.

The authors begin by stating that it is critical to develop standard terminology and a broadly acceptable definition of what this approach may be called and then argue for a new term of 'Responsive Feedback Mechanisms.' A new term may indeed be needed, but I wanted to be convinced given the now five years of experience behind 'Doing Development Differently' and nearly ten years behind 'Developmental Evaluation'. Doing Development Differently has a manifesto in which the blending of design and implementation through rapid cycles of planning, action, reflection, and revision to foster learning from both success and failure is one of six principles. Developmental Evaluation supports innovation development to guide adaptation to emergent and dynamic realities in complex environments. These initiatives appear to overlap at least in part with RFM and that merits analysis at some stage.

The authors put Theories of Change as essential to responsive feedback approaches, and describe well their use and promise in intervention planning, monitoring and evaluation. I would welcome comment from the authors about how to think about the proper scope of the ToC, particularly when there is an absence of evidence on a critical success factor. When that is the case, should the intervention be broken up into two parts, one to build evidence about the relationship of the intervention to the critical success factor? Or should it be kept together to learn within the context of a complex intervention?

Lastly, the authors describe many organizational challenges to implementing a RFM, from culture, to structure, human capital, and resource constraints. The authors appear to limit their comments to challenges within a single organization, but many complex interventions are implemented by multiple organizations, increasing these challenges significantly. I would welcome comment from the authors on what learning there now is about how to reduce these challenges.

Is the rationale for the Open Letter provided in sufficient detail?

Yes

Does the article adequately reference differing views and opinions?

Partly

Are all factual statements correct, and are statements and arguments made adequately supported by citations?

Partly

Is the Open Letter written in accessible language?

Yes

Where applicable, are recommendations and next steps explained clearly for others to follow?

Yes

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 24 Apr 2019

Sohail Agha, Bill & Melinda Gates Foundation, Seattle, USA

We thank the reviewer for pointing out similar dialogues in other sectors. We added the relevant citation and referred to the specific movement of Doing Development Differently.

Clearly, this involves a judgement call within the context of the specific intervention and there is not a lot of experience yet on how best to proceed in such an instance. To the extent possible, however, we feel that the project should build evidence about the relationship of the intervention to the critical success factor if such evidence is not available.

We agree with the reviewer that interventions are implemented in a complex environment involving multiple organizations. We added this to our list of challenges.

Competing Interests: No competing interests were disclosed.

Reviewer Report 19 March 2019

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W. Douglas Evans 

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This is an interesting and well-written article on the importance of a new approach to using responsive feedback or feedback loops to program design, implementation, and evaluation. It makes a valuable contribution to the literature and to this reviewer follows in the tradition of related theoretical frameworks, including RE-AIM (Glasgow) and PRECEDE-PROCEED (Green & Kreuter). At the same time it goes beyond these traditional and largely theoretical models.

The new responsive feedback approach offers practical recommendations and an implementation and monitoring and evaluating model for future programs. As such, it goes beyond traditional theories. However, I believe the article could be strengthened in two respects:

1. First, there should be additional citations to related preceding theories, such as those noted above. These should be acknowledged when the topics of feedback loops and their role in customer orientation and satisfaction are discussed. This section should perhaps also acknowledge the business and management sciences literature on related topics on

continuous process improvement and cite some relevant literature (e.g. Drucker, 2014¹).

2. Second, the article would really benefit from at least one specific example of a feedback loop in action in a relevant programmatic context. The discussion is a bit abstract and a concrete example, even if just described in 2-3 sentences with a citation, would be very helpful to readers.

Overall, really nice article. I look forward to seeing this approach applied and studied more broadly in the development sector and related fields.

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Yes

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Are all factual statements correct, and are statements and arguments made adequately supported by citations?

Yes

Is the Open Letter written in accessible language?

Yes

Where applicable, are recommendations and next steps explained clearly for others to follow?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Health communication, digital technology, global health, intervention research

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 24 Apr 2019

Sohail Agha, Bill & Melinda Gates Foundation, Seattle, USA

We referred to earlier work in this area and suggested how our work builds on these earlier writings. We added the relevant citations.

As part of the work under the Curve CoP, we are in the process of developing 4 concrete examples of feedback loops.

Competing Interests: No competing interests were disclosed.

Reviewer Report 11 March 2019

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Richard L. Wright 

Unilever PLC, Port Sunlight, UK

This letter makes an important point concerning the development sector's approach to the implementation of (behavioral) interventions. There is a pressing need for many projects to build in room to course correct; workers must also adapt the appropriate mind-set and we must ensure that the appropriate skills and tools are available.

While I agree with the article, I do think that it could be clearer in describing 'The current dominant models of intervention design'. The authors assume that these are known to all readers and that there is a common understanding of how these models drive intervention design and implementation.

My own belief (without wishing to put words into the mouths of the authors) is that models of intervention design are borrowed from pharmaceutical human trials and applied to behavioral science (rather like RCTs). Within pharmaceutical human trials there is a high degree of certainty around the intervention design - the drug in question having gone through multiple early tests. Behavioral science is different - we start out with humans and high degrees of uncertainty. Therefore, there is a strong need to be adaptive in the early stages and this (as the article points out) needs to be recognised.

The authors may disagree with my analysis, however I still think they need to describe the dominant models in more detail, so the reader is clear on what they are arguing against.

Is the rationale for the Open Letter provided in sufficient detail?

Partly

Does the article adequately reference differing views and opinions?

Partly

Are all factual statements correct, and are statements and arguments made adequately supported by citations?

No

Is the Open Letter written in accessible language?

Yes

Where applicable, are recommendations and next steps explained clearly for others to follow?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Behavioral science; psychological theories of behavior change; behavior measurement; design and implementation of market-based behavioral interventions.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 24 Apr 2019

Sohail Agha, Bill & Melinda Gates Foundation, Seattle, USA

The reviewer raises an important issue and we agree that our social and behavioral intervention designs and evaluation have been considerably informed if not influenced by designs of drug trials. The focus on RCTs as a gold standard is a particularly telling illustration of this argument. We incorporate this point at the very beginning of the essay.

Competing Interests: No competing interests were disclosed.
