Author's response to reviews

Title: Building a house on shifting sand: methodological considerations when evaluating the implementation and adoption of national electronic health record systems

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Author's response to reviews: see over
Dear Dr. Gerard Clunn

BioMed Central Editorial

Re: MS: 7205615226433718

“Building a house on shifting sand: methodological considerations when evaluating the implementation and adoption of national electronic health record systems”

Thank you for your decision letter dated February 2, 2012 and the accompanying constructive feedback from peer reviewers. We are delighted that you and your reviewers found our paper of interest and we are pleased to submit for your consideration our revised manuscript. In revising the paper we have taken careful note of the reviewers’ helpful suggestions and the editorial steer. Our revisions (prefixed R) are for your convenience summarised below in the order in which issues have been raised.

Reviewer 1

Sections B2, B3, and B4 of Reviewer 1’s comments were in relation to correcting referencing on the basis of the Journal’s house style, wording and grammatical problems, all of which have now been attended to. Please note that references 63 (now 64) and 70 (now 71) are not the same. Reference 63 is our summative final report, and reference 70 is our detailed case studies from 12 NHS hospitals investigated in our evaluation. The responses to the rest of Reviewer 1’s comments are below.

B5:

1. Should it be EHR singular (eg EHR – The initial design para6 line 11) or plural (eg EHRs). I think you mean “EHRs”.

March 2nd, 2012

Dr. Dr Gerard Clunn

BioMed Central Editorial
R: We have now used EHR singular for the concept of EHR, and EHR systems (or at times for greater clarity EHR software systems) (plural) when referring to the software and applications studied in our evaluation. All plural occurrences of EHR describing the latter have now been replaced with EHR (software) systems throughout the manuscript.

2. Is it “trusts” (eg Translating the NHS CRS para2 line4) or “Trusts” (e.g. Geographical and institutional distribution para1 line4).
R: In the terminology of the English NHS, Trust (upper case) is used for singular NHS settings (e.g. a proper noun) and trusts (lower case) for plural use. However, in an attempt to minimise confusion, we now use Trust(s) throughout the manuscript for both singular and plural contexts.

3. The correct word is probably “interpretive”, but you’ve used “interpretative” in para ...
R: Both spellings are found in the literature, but we have now standardised on “interpretive”.

B6:
- Please introduce a consistent nomenclature for NPfIT at first use, and stay with it.
R: We have now used NPfIT throughout.

B7:
The authors should reconsider the phraseology used. The paper includes a number of specialised, non-standard and informal terms (including word inversions). Relevant examples:

*The initial design of the NHS CRS evaluation study
- para3 line3: ‘epidemiological discourse’ – not sure what meaning you intend in this context.
R: We have rephrased this.
- para6 line2: ‘meaningful use’ is a loaded phrase with ‘special meanings’, particularly in a US context. What precisely do you mean by it here?
R: We agree that reference to ‘meaningful use’ is potentially confusing so we’ve rephrased the text.

- para6 line2: ‘...sites identified detailed study...’ should be ‘...sites identified FOR detailed study...’
R: Done.

- para6 line6: ‘explored directly’ – ‘directly explored’ would be better.
R: Done.

* Translating the NHS CRS

- para 1 line 6: include “or” in the list – ie “non-adoption or even dis-adoption”
R: Done.

- para1 line16: ‘a touch of 20:20 hindsight’ – clichéd buzzwords; could be better expressed.
R: We have revised and simplified this sentence.

- para2 line9: ‘had already’ – ‘already had’ would be better.
R: Done.

- Methodological reflexivity para 1 line 3: ‘protean nature’ – not a common term; in what sense was the NHS CRS ‘protean’?
R: We have retained the word protean as we feel this expresses best an important idea, but we have added some explanation for those who may be unfamiliar with this term.

* Ontological lessons

- para1 line12: ‘performative view’ – is this term too specialised for a general HSR audience?
R: We wish to retain the word/concept of a performative view of technology and have explained it further.

- para1 line14 ‘sociotechnically framed and performative...ontology’. You might wish to rephrase, or to elucidate.
R: We have revised and simplified the text here.

* Methodological lessons

- para1 line2 ‘co-constitutive’ – is this term too specialised for a general HSR audience? (I’m not sure what you mean by the term in this context).
R: We have rewritten this whole paragraph removing as many technical terms as possible
- para1 line6 ‘dwelling into’ – is this term too esoteric for a general HSR audience? (I’m not sure what you mean by the term in this context).
R: Now rephrased.

* Building the house
- para3 line7 ‘the researchers embodied the criteria’ – not sure of your intended meaning here.
R: This has been rephrased. The idea is a standard one in interpretive work, that researchers’ brains are the instrument that process data based on based on their prior knowledge (‘prejudice’ in the language of hermeneutics).

- para3 line2: ‘salience’ is a curious word – would ‘relevance’ be better?
R: Done.
- para6 last sentence: please check the structure of the list in this sentence.
R: Done.

- Conclusions
- para3 line3: sedimented and stratified dynamics is this too esoteric for a general HSR audience? (I’m not sure what you mean in this context).
R: Now rephrased.

B8. You state that “Most EHR evaluations draw upon a broadly positivist ontology...” (Introduction, para2). While I don’t necessarily disagree, you provide no evidence for this assertion.
R: References added

C. Discretionary Revisions
C9. The flow and readability could be improved with a judicious re-writing, making a much stronger paper.
R: We have made a number of revisions and deletions throughout and we believe that the paper is as a result stronger and clearer.
C10. While the paper does touch on the theoretical considerations, which underpin this divide, I would have welcomed a more thorough exploration of those theoretical issues.

R: Whilst we understand the reviewer’s comment about the necessity of theoretical discussions of the issues of evaluation of EHR systems, we think that expanding the discussions here would divert from the main focus of this paper, which is concerned with describing our experiences of undertaking a real-time evaluation of the implementation and adoption of nationwide EHR systems. We do however hope to reflect on the relevant theoretical considerations in more detail in a possible follow-on paper.

C12. The authors suggest that the sheer size of this undertaking has a causal effect in making positive approaches inappropriate, but without offering clear evidence or exploring the relationship further. It may be that the tension is also present in smaller implementations.

R: We have clarified on several occasions that the complexity of large-scale EHR implementations is in our view qualitatively distinct from smaller scale projects in a single context (e.g. one hospital). We do however acknowledge that smaller scale experiences might face similar issues, see for instance (Greenhalgh T, Russell J, Ashcroft R. E, & Parsons, W. (2011). Why National eHealth Programs Need Dead Philosophers: Wittgensteinian Reflections on Policymakers’ Reluctance to Learn from History. *The Milbank Quarterly*, 89(4), 533-563.). Thus we would expect some more or less similar problems in smaller scale implementations, as mentioned in the revised paper. The above reference has now been used instead of another reference to highlight such acknowledgement.

C13. Was the problem situation described here just the result of a mismatch between the timeframe of the implementation and the period allocated (inflexibly) for the evaluation? Would have a conventional approach to evaluation have been appropriate over a longer interval, one that covered a true “pre – during – post” timeframe?

R: We have directly addressed this comment in the section on *Building the house: implications* 2nd para… Our argument is that whilst this certainly contributed, this was more than just a temporal mismatch. Rather, we suggest that a focus on the system-in-the-making, as we came to study it, is fundamental to building robust evidence on EHR and thus to inform future policy makers, implementers and users.
C14. Was there also a political dimension to the evaluation process (Political dimension para3)? It may have been the case that an evaluation using the original model would have produced results, which were politically unpalatable.

R: Our response to this question is ‘No’. This work was commissioned by an independent University of Birmingham led research programme. From the outset, we were granted the freedom to publish our findings with no restriction. Indeed, our interim and summative findings were published in the BMJ at the height of controversy in relation to the NPfIT. To be quite clear, we did not revise our methodology in the light of any governmental or indeed other pressure – rather, this decision was a scientific one taken by the research team (scientific reflexivity described in the paper).

C15. The intended audience was not immediately clear. Is the paper intended for the small community of sociologists, informaticians and evaluators who already have some familiarity with the background, issues and theoretical underpinnings of this discourse, or for the wider health services research community who struggle to understand why large projects often fail to deliver.

R: Our audience, we envisioned, are those who evaluate large-scale EHR initiatives and are interested in exploring and narrating the socio-political complexity of such contexts. This may include both sociologists interested in these aspects but also health services researchers across various different fields of expertise. This is why; we have chosen BMC HSR to disseminate our message to just such a broad audience. We hope that our revised manuscript has made the arguments we develop more accessible to the latter group.

Reviewer 2

1- General comment: Parts of the paper could be modified to make the message stronger. Reduce redundancies, make the messages stand out a bit more, organize the paper as lessons learned and minimize complex language. For e.g. “performative approach” might mean different things to different people. The paper has numerous jargon terms such as
“positivist ontology” and “sociotechnical performativity” etc. that need to be clarified for this.

R: As described above we have revised the language in a number of places, removed jargon and in the few instances in which we think it is particularly important to retain technical terms or specialist language these have now been explained more fully. We trust this will render our message interpretable by the Journal’s broad readership. Furthermore, we have tried to better tease out the lessons learned (e.g. see section on Learning methodological reflexivity: adaptation to the shifting sand). However, we have not radically reorganised the paper and remain committed to offer readers insights into these lessons and a deeper and more reflective exploration of undertaking an evaluation of this nature.

2- At times, it appears that the authors were conducting both types of evaluation: implementation/adoptions versus effectiveness/outcomes. Readers would wonder why a short-term time period of 30 months would also include an outcome evaluation of a national scale when the EHRs had not even been fully implemented. Nevertheless, as long as the authors clarify their focus, whatever that may be, that should work; they can then readjust other parts of the paper according to this focus.

R: We have, in line with the suggestion, tried to more clearly explain the focus of the evaluation that we were commissioned to undertake and also explain the time constraints which we were operating within.

3- Page 4 para 3. I think this para should specify the basis of the authors’ argument, i.e. lessons learned.

R: Please see response above.

4- Page 5 para 2: the authors might want to highlight that the sociotechnical model/approaches was taken up recently by the US Institute of Medicine’s report.

R: We found the approach recently published by the Institute of Medicine (IOM) in line with our adapted sociotechnical framework for our evaluation. We have now replaced Reference 21 with this source, which is very suitable as support for our argument. We very much thank the referee for this suggestion.

5- On page 8, it appears that this was an implementation focused evaluation, which makes the later discussion on outcomes a bit out of context.
R: As mentioned in response to point 2 above, we were commissioned to conduct a mixed-methods evaluation to look at the process of implementation/adoption, as well as some early outcome measures. We discuss in the paper how, in part because of delays in implementation but also our developed understanding of the reality we faced, we were unable to do much of the latter, while we were able to pursue the former objective. The paper’s argument could be seen as saying that ambitious evaluation plans may well need to be adjusted as events unfold, and some flexibility as between implementation/adoption and outcome should be built in at the outset. The reasons for this are the basis for the main discussion in the paper.

6- I was not sure how the political context directly affected the researchers. Could the authors please clarify that? Also, the first half of the section could be shortened.

R: This is an interesting comment similar to that made by the first reviewer. We have now clarified our understanding of the influence of the political climate on the implementation of EHR systems, and our research. This section is now rewritten and refocused.

7 page 22, question 1, the discussion of desired ends; not sure if the authors actually set out to do just that. If they did, this needs to be clarified up front (see earlier point on this). Page 22-23 material could also be shortened. I think point # 2 is touching upon an implementation “continuum” and if so this could be clarified.

R: We have deleted some of this material and reorganised the rest. We found that in the light of the reviews suggestion of clearer messages in the paper, that some of this detail could be removed.

8. The paper should try to highlight succinctly specific methodologies and specific generalizable lessons for others, and also try to strengthen the conclusions with this material. Currently, much of this material is buried in the text. Could they reorganize some of the sections (such as through new subtitles etc.) in order to make this information stand out? Also, try to minimize abbreviations.

R: We think that the revised and slimmed down paper has addressed these comments. This has been achieved by removing some peripheral arguments and restatements, using less jargon and adding a little more explanation of specific terminologies, as well as through the restructuring of the paper as explained in
point 1. We have also added a “insights box” in page 16, under learning methodological reflexivity section.

Discretionary revisions

9. **Introduction:** Page 4 para 1 sentence “Evaluation studies often aim....”
Not clear what there is referring to and outputs of what?
R: Now rephrased and elaborated on.

10. Most of the information on page 7 and timelines can be summarized/integrated with the tables/figures and a few lines could sufficiently summarize this complexity.
R: We appreciate the reviewer’s suggestion. However, we believe that this information is key to following the later discussion and descriptions. Each main observation here is returned to and used later in the paper as the analysis develops.

11. The paper makes several references to “our study”. Could switch to something like “our project” or “our evaluation”.
R: This has now been replaced with our evaluation throughout the manuscript.

12. **Page 9**—not clear on what the four and the six work packages were.
R: We appreciate the reviewer’s comment and think describing the work packages of our evaluation might bring confusion, without necessarily adding to the core discussion of paper. We have now reworded the paragraph accordingly.

13. Page 17, the way references 59,60 are used, it gives the impression that the authors are citing their studies.
R: We hope that the redraft makes it clear that references 59 & 60 (now 60 & 61) are none of authors’ papers. Our main final reports are references 39 & 40.

14) **Page 18**, sentence needs to be clarified “Thus the meaning of the NHS CRS (i.e. what was understood as ‘inside’ it) could not be captured without understanding it as conveying (translating or embodying) multiple institutional contexts (i.e. what is ‘outside it’)”.
R: We have rephrased and added some explanation of these ideas. We believe that this is a relevant set of concepts - e.g. EHR may be defined by its internal (and essentially technical) characteristics, or be defined by the relationships to other institutions and interests it interacts with?

15) **Page 19 Para 2** could be significantly shortened.
R: This has been revised and rephrased in a shorter paragraph.
Once again, we would like to thank you for giving us the opportunity to improve our paper. We hope that these revisions are to your satisfaction and that we are now in a position to proceed with publication. Please do not however hesitate to contact us if you require any further information or revisions.

With kind regards,

Amir Takian, Dimitra Petrakaki, Tony Cornford, Aziz Sheikh, Nicholas Barber