Author's response to reviews

Title: A Study of General Practitioners' Perspectives on Electronic Information Management Systems in NHS Scotland. Mixed-Methods Analysis of Barriers and Facilitators

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Author's response to reviews: see over
Dear Editor of BMC Medical Informatics and Decision Making

Please find enclosed below our responses to the reviewers comments on our original manuscript.

We look forward to hearing your views in due course.

Yours sincerely

Dr. Matt-Mouley Bouamrane
Response to Reviewers:

Reviewer 1:

“This study gives rich insight into general practice EMR system use in a mature IT setting, and in the context of a specific relatively-recent change (the move away from a single state-sponsored solution). The authors show good insight and give good supporting references with respect to clinical IT adoption. This is a very useful case study. I have no major compulsory revisions but a number of suggestions for improving the manuscript and/or thoughts on areas where the authors may wish to elaborate.”

We would like to thank this reviewer for these positive and encouraging comments on our manuscript.

“1. I wonder if the abstract could be balanced to give a sentence or two less on Methods and instead a bit more on Results.”

Thank you for this helpful suggestion, we have fully revised Revision submitted for review to BMC Medical Informatics and Decision Making, April 3, 2013 the abstract, reduced the size of the Methods paragraph to the strict minimum and expanded the Results paragraph to emphasise the key findings of the study.

“In 2.1, the 3 sentences starting from “A small number of practices in Scotland are single-handed...” provide no supporting references. Is there any source data about Scottish practice sizes, or is this just an estimate in the authors’ experience?”

Thank you for pointing to the lack of reference to actual figures on practices sizes to support the authors’ statement. We have now provided a footnote link to figures from the NHSScotland Information Service Division (ISD), which provides statistical services relating to the NHS in Scotland. (http://www.isdscotland.org/)

The figures provided are valid as of the 1st of October 2012, which we have now specifically stated in our manuscript.

“Section 3.1, it’s redundant to tell us the total interview time, number of interviewees and the mean time (I’d prefer just number of interviewees and mean). Also, I’d prefer if ‘mean’ were said rather than ‘average’ throughout.” Thank you also for suggesting this modification, we have now included the number of interviews (n=25) and mean time (40 minutes). Please note that two additional interviews were conducted since the date of the initial submission in November 2012. One of these was particularly long (1h.20 mins) and the other one lasted 39 mins. This explains the slightly higher average now provided in our revised manuscript for the mean interview 2 time (40 minutes vs. 38 minutes in original submission )

“Also in section 3.1, the source of the list from which interviewees were recruited is described, but I’d like to know a bit more about the recruitment process / protocol. E.g., how many GPs were contacted to get 23 respondents?”

We used a list of GP practices provided by ISD Scotland to contact GP practices by post-mail invitation. The sample target for primary care providers was 20 to 25. We ceased recruiting new GPs when the upper limit of the primary care sample target was reached in January
2013. We have clarified this in the methods section. We have added the remaining 2 GPs interviewed to the analysis in the revised manuscript: one was from the Ayrshire and Arran NHS board and has been labelled GP11 (as GPs were grouped by health-boards in our analysis). This means that the labels of GPs 1-10 are unchanged and that the labels 11 to 23 in the original study have had 1 added to their respective label, i.e. becoming GP12 to GP24. The second GP was from the Lothian health-board and was therefore added last and labelled GP 25. All the relevant ratios and descriptive statistics provided in the revised manuscript have been revised accordingly following the addition of the 2 GPs to the final study sample.

“Section 3.2 spends a lot of time justifying the methods rather than explaining the specific approach used. While I know that it has a times been an uphill battle to gain acceptance for qualitative methods, I don’t think the reader of the article should be burdened with all of the justification. I believe the work would 3 be perfectly understandable if about 18 lines starting from ”Mixed methods research combines...” were omitted. I think it starts to get relevant to the present study at ”We used the framework approach for qualitative data analysis”

Thank you again for this constructive feed-back. We agree that the original Methods section was overly detailed. The section was been revised and sharpened to provide only aspects of the methods which are useful to understand the results presented in this specific study.

“I’m unsure that Table 1 is necessary, or appropriate. I believe that the words provided in 4.1 accomplish most of what’s needed. Moreover, the amount of data on each subject seems sufficient that readers in Scotland may be tempted to guess the identity of each participant. I’d prefer summaries of the most relevant variables over providing the precise values on each participant. Later graphs indicate some of the values anyway (i.e. we can derive the distributions of years as a GP and years with current system from figure 2).”

Again, we agree that Table 1 was not necessary and have provided the same information in the methods section, describing the GPs per health-boards as well as providing background information in section 3.1. For the same reason, we have removed the scatter grams as the information is available within the results in section 4.

“Outwith” is a chiefly Scottish word choice... ’Beyond’ would be better recognised by most readers.”

Thank you for pointing to our idiosyncratic use of the word “outwith”, which has now been replaced.

“In section 6, with respect to “multiple clicks”, I agree with and am happy to see exposition on the issue that it’s difficult to discern suboptimal usability from lack of training. I would add, however, that the perception of too much effort could also relate to the lack of buy-in on behalf of the GP users with respect to the features (i.e. it can seem like too many clicks because they don’t really want the feature in question, or because they don’t consider themselves part of the solution). This is more just a comment than a criticism (also see next point).”

This was a recurrent complaint among GPs, but because we did not witness the GPs using the systems directly and did not have an opportunity to discuss this feature with the system vendors, it would be difficult to distinguish genuine usability issues from embedded safety features. In any case, our interviews suggest that GPs were oblivious to this potential
distinction, which means that if they were indeed embedded safety features then they were perceived as such by the end-users and also, that the use of multiple click is perhaps a blunt instrument when it comes to avoiding errors: while it might make sense from a system developers to introduce double checks at key decision points, as consultation usually last approximately 10 mins, the frequency of these system interaction is both very high and frustrating for GPs: dozens of times of day, hundreds of times a week, etc.

“9. I find the final point of section 6 about Reflexive Monitoring to be fascinating and important. Maybe more could be said about this. And in relation to it, is there a potential - and I’d say under-developed - responsibility for the GPs to ‘own’ the human-computer interaction result - i.e. is the problem that they haven’t been monitored/asked, or that the GPs haven’t bothered to take proactive measures in communicating concerns and putting themselves forward to improve the interaction? (Of course, the responsibility goes both ways to some extent.)”

Thank you for emphasising this aspect. GPs do have opportunities to provide feedback regarding their EMRs to the system vendors through an online community of users or to their local health-boards (particularly at the time of system transition). However, this seems to be only the case of a minority of proactive users. Many of the respondents we interviewed did not seem to know how or where to turn to provide some constructive feedback on their EMR systems and this certainly seem a area for potential improvement both for the EMR system providers and for primary care doctors.
Reviewer 2:

“This is a report of GP’s opinions and experiences with using information systems in their practice in Scotland. The research is part of a larger study on "information management processes in the patient surgical pathway in NHSScotland". The authors have done 23 semi-structured interviews and analyzed the data with a mixed-methods approach. The results are interpreted within the framework of Normalisation Process Theory.

Comments: 1) The introduction fail to develop a proper research question. I think it should. I also have questions on the “what is known” parts of the introduction. The manuscript can be classified as an summative evaluation. Some references to other evaluation studies should be included (see http://evaldb.umit.at/index.htm).”

It is always a fine balancing act when presenting original research results on how much background literature needs to be provided. Anyhow, we accept that additional information could be provided on studies which identified the factors that promoted adoption of EMRs or indeed the barriers to adoption. We have now added a full subsection on this (2.3 ‘Factors Influencing Adoption of Electronic Medical Records systems in Primary Care’). The research question was to elucidate GPs’ perspectives at a time of national compulsory switch from a long-term yet perhaps technologically obsolete solution to new EMR systems in NHSScotland 2012 and this is clearly stated in the manuscript Abstract and Introduction.

2) Background & Related Work is divided into Primary care computing in NHS Scotland, and Information technology in the patient consultation. The section about Primary care computing in NHS Scotland is a description of the case and the "business model" of GP practices. The description of the case should also include a description of the information system(s) at hand. From reading the rest of the paper, it seems that the developers of the information system has implemented some features that acts as incentives for GPs to use the system. Which are these, (and, in the discussion section: Do they influence on use (and satisfaction)? I also miss a general description of what Scottish GP’s do - i.e., if possible, a general description of their clinical work. Most important: a) Why should these deserve better support from an information system?”

The description of the EMR systems is presented in details in the results section via the feedback that was provided directly by the study respondents. We have now provided additional details on the work performed by primary care doctors in NHSScotland in section 2.1.

3) Methods: Some aspects of NPT is introduced in this section, which leads me to ask whether this section is the proper place for it. Better to put it into a theoretical introduction?

We believe that a brief introduction to NPT in the Methods section is appropriate. We also further elaborate on NPT in the Discussion section. We have also provided a number of references to NPT publications for the interested reader.

4) Results: Quantitative Analysis: The author should say something about the representativeness of the sample. Were the 23 GPs the 23 Scottish GPs most eager to comment on their GP information systems? Were they only GPs, or had they also doubled as participants in a requirements engineering process before the system was commissioned and/or participated as ”superusers” when the system was implemented.

As suggested previously to one of Reviewer’s 1 comments, the sample target for this study was 20 to 25 primary care providers, the upper limit of which was reached in January 2013.
We tried to recruit as broad a sample of GPs so this is why the sample include GPs from 9 health-boards of Scotland. 3 of the 14 healthboards of Scotland have very small population: NHS Orkney, Western Isles and Shetland and naturally less GPs to serve their respective populations. We were not able to recruit any GPs from these 3 health-boards for this study (although we did interview secondary care practitioners in these 3 health-boards). Of the other 10 larger health-board, the only health-board which is not represented in our primary care sample is NHS Borders. Other than that, the sample of respondents did not represent any particular user groups (i.e they were typical EMR users and not experts, technology champions or superusers).

“5) Results: Thematic Analysis: This is OK.
6) Interpretation & Discussion: According to the author, Normalisation Process Theory “is concerned with the social organisation of the work (implementation) of making practices routine elements of everyday life (embedding) and of sustaining embedded practices in their social contexts (integration) and was developed particularly in response to the evidence, which suggested that eHealth implementation, embedding and integration are difficult to achieve in practice”. Some of the concepts used in the manuscript originate from other theoretical frameworks. Usability is a key construct in the research field of Human factors / Human-Computer interaction. Discoverability and learnability are other key concepts. How to discover new features, (and how to learn them) is obviously an issue for the GPs. Maybe this should be mentioned?, i.e. that other theoretical lenses could have been applied? This is not a study of the development of the information systems, neither of it’s designers. But any information system is a human construct, and any human construct is influenced by theory. Human factors researchers have operationalized their theories into guidelines for user-centered design, and into how to test the usability (and learnability) of their systems. What are the implication of the results for those who design and develop such systems? I think the author also should discuss other possible means of gaining access to the same problem space. Do the author plan to observe GPs use of their systems? What about monitoring the use (from logs of the system). The possibility of triangulating is an issue.”

We agree that the NPT framework has elements overlapping with other theoretical or methodological approaches, particularly with regards certain aspects of Human Computer Interaction, Interaction Design, participatory design, etc. However it is really beyond the scope of this study to delve further into a comparative analysis of these various approaches which we have in fact – rather succinctly– discussed in some of our previous work (Understanding the implementation and integration of remote tele-health services; an overview of Normalization Process Theory Pervasive Computing Technologies for Healthcare (PervasiveHealth), 2011 5th International Conference on, 2011, 300-307).

In terms of monitoring system use over time, this could be the subject of future work but again, this was beyond the scope of this study which focused on analysing information management systems and socio-technical factors affecting information integration and sharing in the course of the patient surgical pathway in NHSScotland.