Author’s response to reviews

Title: The role of scientific evidence in decisions to adopt complex innovations in cancer care settings: a multiple-case study in Nova Scotia, Canada

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Author’s response to reviews:

Dear Dr. Rogers,

We thank you for your response and the Reviewers for a thorough review of our manuscript. We have incorporated the feedback into a revised version. Changes in the manuscript have been highlighted in yellow so that they are easily identifiable.

If there are additional questions or comments, please feel free to contact me.

Warm regards,

Robin Urquhart, PhD
Comment 1: A revision which includes attention to the comments made by the reviewers (mainly reviewer 2) is requested.

Response: Thank you. We have attended to the comments of both reviewers and hope our responses are satisfactory.

Comment 2: Additionally, the authors need to extend the interpretation and applicability of data as a weakness in terms of the remit of IS and criteria of qualitative research is that it refers to case studies in a limited geographical area (see also reviewer 2). The authors are asked to look closely at and include reference and discussion around typicality as it relates to qualitative research so that interpretation and relevance extends to wider contextual settings out-with the current case studies.

Response: We agree that the issues of typicality and applicability of findings are important to further address. In case study research, a large consideration around these issues relates to case sampling/selection. For this study, we undertook a careful and purposeful case selection process to ensure the cases varied on a number of key features (including contextual aspects) in order to optimize transferability across types of innovations and contexts. While this process was briefly described in the Methods section, it involved extensive consultation with clinical and administrative stakeholders within the cancer system to identify, discuss, and select appropriate cases. First, I met individually with these individuals to develop an inventory of potential cases. Before each meeting, I provided the person with a summary of the proposed study and a rationale for case selection. Specifically, I wished to ensure variation on three criteria: the type of innovation, its evidentiary base, and important contextual factors (e.g., setting, timing, individuals involved). By maximizing diversity across these three criteria, my aim was to ensure the final cases had the potential to provide key insights into the role of scientific evidence in adoption decisions, whether and how this role differed across types of innovations, and the impact of contextual factors when making decisions about adopting and using innovations in the cancer system. By selecting multiple cases, I wished to compare and contrast findings across cases, and develop a deeper understanding of the role of scientific evidence in adoption processes.

After the individual meetings, I held an in-person meeting amongst research team members and key stakeholders to discuss the inventory of potential cases and select the final cases for study. Within this meeting, emphasis was placed on ensuring we met the three criteria cited above and that the most appropriate and information-rich cases were selected for study. In the end, five cases were selected to achieve diversity on key elements (e.g., time periods, individuals involved, decision-making process and level) and to increase the transferability of findings, yet to maintain a reasonable number of cases to ensure we could study the cases in sufficient detail and depth. Following the meeting, we further delineated the boundaries of each case, including the time period included in the study and the types of evidence to be collected. By taking this explicit approach alongside key stakeholders, we anticipated we would optimize the transferability of this study by ensuring that cases were carefully selected and that potentially strategic cases were not overlooked.

Despite our careful sampling, however, I feel it necessary to say we realize the findings of case studies (or any study for that matter) may not translate to different settings. Even in the absence of this, such studies can provide rich information for learning purposes and serve to elaborate on or reformulate existing theory (i.e., analytic generalization). Of course, as with any study, the reader will ultimately have to consider whether and how the findings apply in their setting.
Related to the Editor’s suggestion, we have provided additional details regarding our sampling approach (pg. 6 of revised manuscript) and added literature related to the generalizability of case studies in both the Methods section (pg. 6 of revised manuscript) and limitations paragraph of the Discussion section (pg. 25 of revised manuscript).

Comment 3: Additionally, how evidence is used in adopting complex innovations in cancer care settings needs to be embedded in what is already theorised/known about complex innovation in other health care settings.

Response: We thank the Editor for this comment and agree the findings need to be integrated with what is already known about the adoption of complex innovations in other health care settings. In the manuscript, we did discuss literature around the use of evidence in adoption decisions in health care (including acute care, primary care, health policy-making, and public health), all of which largely corroborate our findings. For example, we reported on the findings of a 2017 review that included 33 primary studies examining the use of evidence in decisions to adopt innovations across many areas of the health care system (infection control, chronic disease management, nutrition, health technology, mental health, peri-operative care, etc). We also discussed literature on policy-makers preferences for and uses of evidence in public health; technology adoption related to infection prevention and control; and the use of research evidence in health policy related to chronic conditions. At the same time, we certainly acknowledge additional literature may be added. Thus, we have added the following statements to the Discussion section (pgs. 21, 22, 23, & 24 of revised manuscript):

Others have also found that the earlier adoption stages focus on assessments of efficacy and safety, with later stages focusing on issues related to implementation (e.g., acceptance, ease of use) [33, 34]. This shift from assessing an innovation’s scientific merit to understanding its “complete value” underscores the need to consider multiple types of evidence as well as important contextual factors [35].

A study on technology adoption and implementation in nine UK acute-care organizations found that managers tend to prioritize implementation and cost evidence from within their own or other hospital organizations over scientific evidence [35]. Similar to our study, managers also noted that evidence generated from research failed to provide direction or prescriptions in terms of taking action.

Critical events and pressures can also have significant impacts on evidence use during the decision-making process, often resulting in a less rigorous approach to evidence use and an adoption of innovations with low or emerging evidence of efficacy [35].

Reviewer 1:

Comment 1: Provision of the interview guide would have been helpful.

Response: We agree with the Reviewer and have included the interview guide as supplementary material. Please note, however, the interview guide was adapted (sometimes extensively) depending on the case and the particular person being interviewed.

Comment 2: I did not find that Figure 1 resonated with the discussion. I think it was probably the qualifiers between the categories under key concepts. The description of the decision maker, in particular, did not seem to fit. I wonder if this table could be reconsidered to make the connections between and within the data more explicit.
Response: Thank you for this comment. We have removed the qualifiers from the figure. We are uncertain how to deal with the description of the decision-maker in particular. Certainly, in the Results text, we have described that this key concept and that, depending on the case, the decision-maker existed at different levels of the system (e.g., department, hospital, government). However, if the Reviewer still finds this figure somewhat troublesome, we could turn it into a table with the same information. If this is preferable, please let us know and we will be happy to do so.

Comment 3: Although not in the scope of this study, it would have been interesting to hear the researchers thoughts on how knowledge of these factors should inform implementation efforts.

Response: Yes, we agree that understanding the practical implications of these findings are important. There are several ways we believe knowledge of these factors could inform implementation efforts. One is the value of data/information on real-world implementation and impacts. A second is the adoption of complex innovations typically involves a number of stakeholders, in varying professional roles. As a consequence, it is critical that the evidence used to support adoption is relevant to and addresses the interests or concerns of all these stakeholders. In reality, this will only be achieved via the use of multiple sources and types of evidence. A third is the influence of reliance on champions to advocate for and push innovations through the various levels of the adoption decision. Although champions often emerge as a key determinant of adoption and implementation, as others (e.g., Greenhalgh et al 2004) have pointed out, there is no simple recipe for how champions should act that is independent of the innovation and the context. We have now added the following paragraph to the Discussion section (pg. 24-25 of revised manuscript):

There are several practical implications of these findings in terms of informing adoption efforts. One relates to the value of information on real-world implementation and impacts. Given that decision-makers must always examine the potential benefits and costs (e.g., potential negative impacts) of an innovation [18], real-world evidence is imperative to understanding both of these issues. A second is that the adoption of complex innovations typically involves a number of stakeholders, in varying professional roles and at different levels of the health system. As a consequence, it is critical that the evidence used to support adoption is relevant to and addresses the interests or concerns of all these stakeholders. In reality, this will only be achieved via the use of multiple sources and types of evidence. A third implication is the influence of reliance on champions to advocate for and push innovations through the various levels of the adoption decision. Although champions often emerge as a key determinant of adoption and implementation, as others [41] have pointed out, there is no simple recipe for how champions should act that is independent of the innovation or the context in which the change is being considered.

Reviewer 2:

Comment 1: A number of methodological issues should be addressed. First, the authors should describe the timelines for each of the cases. Namely, in what year was the adoption decision made and in what year were key informant interviews conducted for each case? This information would be important to understand issues with recall.

Response: Thank you for this information. The time periods of the cases did vary and the thus the length of time that elapsed between the adoption decision and time of interview also varied. We have now added these details to the Table 1 and the revised Results section (pg. 9 of revised manuscript). We have also expanded on the limitations paragraph as it relates to issues of recall (pg. 26 of revised manuscript).
Comment 2: Additionally, the authors should elaborate on who key informants were and their specific roles in each of the case studies.

Response: Given the nature of the cases and the small size of the province, we are cautious about adding much additional (specific) detail around the key informants (or tying these details to individual cases) as this will increase the risk of informants being identifiable in the reporting of this work. However, we have added the following additional statement to the first paragraph of the Results section (pg. 9 of revised manuscript):

They included clinical and administrative champions, departmental managers, department chiefs/heads, executive-level administrators (e.g., hospital VPs), policy-makers from the provincial ministry of health, and community advocates.

Comment 3: Finally, the authors should describe how they integrated and operationalized CFIR in their study.

Response: We thank the Reviewer for this important question. As seen in the interview guide (now appended as supplementary material), the CFIR domains and constructs were incorporated in Question 6 to understand how factors at various levels of the system impacted the adoption decision. Question 4 also directly pertains to the CFIR construct of Evidence Strength & Quality (Domain “Intervention Characteristics”) – in which we were explicitly interested in this study. During analyses, team members also discussed, in an iterative way, how the findings related to CFIR and each of the domains. However, given the nature of our research questions and the resulting dataset (which focused largely on decision-making processes), we felt presenting our results in a way that explicitly reflected CFIR was not appropriate for this study. We have added how we integrated CFIR in our study, specifically in the Methods section (pg. 7 of revised manuscript).

Comment 4: While the authors note limitations of their study, they also should mention the limited generalizability of their cross-case analysis given that all five cases were set in Nova Scotia.

Response: We agree entirely and have now included this as a limitation (see below for inserted text; pg. 25 of revised manuscript) as well as additional information around our case sampling approach to address generalizability concerns (see Editorial comments above).

First, this study was conducted in one jurisdiction only, which may limit the applicability of findings to other settings. However, our sampling strategy ensured the cases varied on a number of key features (including contextual aspects) and thus sought to optimize transferability across types of innovations and contexts. In addition, healthcare systems generally have a number of defining features, including wide-ranging and diverse stakeholders and complex governance arrangements [45]. Both should increase the applicability of these findings outside the province of study. Moreover, this study provides rich information for learning purposes and may serve to elaborate on or reformulate existing theory (i.e., analytic generalization), an important outcome of case study research and qualitative inquiry in general [22, 46].