Author’s response to reviews

Title: Identifying potential indicators to measure the outcome of translational cancer research: a mixed method approach

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Author’s response to reviews:

Dear Dr Rosanna Gonzales-Mcquire

We would like to thank you, as well as the three editors for taking the time to review our articles and the constructive criticism. Please find below our response to the reviewer’s comments.

Reviewer 2

1. I couldn't understand how those participated in this study were selected. Were the professionals involved in translational research selected based on their qualification and their domain of work as stated or they were randomly selected.

⇒ We added the following sentence: “Since translational cancer research involves many different disciplines and professionals, we did not select participants according to their qualification but only according to their involvement in translational cancer.”

2. How researchers knew about getting involved in this study?

⇒ We added the following sentence in the ‘methods’ section: “We presented briefly the objective of the study to the participants at the beginning of the interviews.”
3. How long took each interview?
⇒ We added that in the ‘interviews’ section of the Methods part.

4. Was the questions close-ended questions or open questions
⇒ The questions were open. We added that detail in the ‘interviews’ section of the Methods part.

5. EurocanPlatform network: define it and who is included in this network (not all readers are from Europe to know what is Eurocan)
⇒ We added the following sentence to clarify (in the ‘methods-participants’ section): “EurocanPlatform is a consortium of 28 cancer organisations dedicated to translational cancer research on prevention, early detection and treatment”. We also removed the reference to EurocanPlatform in the ‘Results’ section.

Reviewer 3

6. Abstract- Methods: regarding the Delphi study should be more detailed in the abstract. For ex: Participants rated their agreement on the validity and feasibility of (n=?) indicators.
⇒ We added the following sentence: “Participants rated the feasibility and validity of 60 indicators. The physical meeting was held to discuss the methodology of the new indicators.”

7. Results: The 4 indicators relevant to measure translational cancer research need to be cited in the results section with the response rate
⇒ We have added those details in the background section.

8. In the Conclusion section, the sentence “Compared with… undertaken” needs to be removed.
⇒ We have removed that phrase.

9. Backgroung- “Background” is not sufficiently developed. In this paper, it is stated: “in a previous work, we have identified an important number of indicators…” I would like the authors to more explicitly detail these indicators. Please consider adding a brief and clear introduction on your previous work.
We have added an entire paragraph to detail this previous work in the ‘Background’ section.

10. (p.4): The sentence “We have conducted... researchers” needs to be removed to the Methods section.

⇒ We have removed that sentence.

11. Methods- (p.5) In the “Study design” section, authors mentioned “a qualitative study”. Whereas in the Ethics statement section (p.8), authors stated “a qualitative observational study” and in the title “a mixed method” is stated. Please consider consistency all over the paper.

⇒ We have removed the word ‘observational’ that can be confusing but we kept ‘mixed methods’ in the title. For better clarity we have added a definition of mixed methods in the ‘Methods-study design’ part.

12. Regarding the Delphi study is it a Delphi study or modified Delphi study? Please revise. If it is a modified Delphi study, please consider adding a definition of the modified Delphi study.

⇒ It is a modified Delphi. We have changed phrases into ‘modified Delphi’ in the manuscript and added the following definition at the end of the ‘methods-study design’ section: “The Delphi technique is a structured process that uses a series of questionnaires to gather information. Rounds are held until group consensus is reached. A modified Delphi survey is composed of at least two rounds and a physical meeting.”

13. Information on the recruitment method (invitation letter, e---mail, information sheet, etc.) and the total number of participants solicited to participate in the Delphi study needs to be stated explicitly in the “Survey section” (p.6). It would be helpful to provide information on how the questionnaire was administered to participants for both rounds in the “Survey section”.

⇒ We added the following sentences in the ‘Methods-survey’: “Participants were invited to fill in an online questionnaire by email, with a reminder email in case of non-response. On the second round, the questionnaire was personalised for each respondent. Participants received an individualised survey form by email presenting their rating, as well as the average rating and comments for each indicator.” We added the number of participants in the ‘Methods-participants’ section.
14. The methods for determining “consensus” are not clear. Lines 10 –11 (p.7) say, “we included in the final set indicators that were rated in the top tertile by at least 75% of participants. We submitted… participants”. The use of top tertile (7--- 9/9) is actually a consensus on an indicator being valid and feasible, but not on it being not valid and feasible. Please consider explaining more explicitly the methodology.

⇒ We added a paragraph detailing how consensus was defined in the ‘Methods-survey’ part.

15. Results- Figure 1 shows that 35 respondents participated in the first round and a panel of 16 (16 out of 35) experts participated in round 2. It would be helpful to provide information on reasons of dropping out

⇒ We added a paragraph of explanation and discussion on this dropping out in the “Discussion-strengths and limitations” parts.

16. Clearer presentation of emerged themes and/or sub themes from interviews (p.9--p.16 line 7). Although the text mentions themes and/or sub---themes, it is not clear which belongs to theme or sub---theme categories. For example, on p.9 after the presentation of “Characteristics of participants” section, authors stated “Issues to consider when developing…” as a title for an emerged theme /sub--- theme and “Definition of translational research…” as a sub---title for another theme/sub---theme. On (p.12), another sub---title is stated “Multidisciplinarity and collaboration are crucial…” and so on. One---way that this could be fixed by adding (after Participants in the Delphi study paragraph) a brief introduction on the results section for the qualitative part mentioning all emerged themes and their related sub---themes.

⇒ We added a subtitle “Existing evaluation systems reward translational research less favourably” under the title “views of researchers…”. We also added a paragraph detailing the themes and sub-themes after the ’characteristics of participants’ part.

17. Quotes cited in the main text (results section) are all provided by clinician--- researchers. It would be interesting to cite quotes for other interviewed participants such as engineers and/or administrative staff in order to explore their views and opinions about the evaluation of the translational cancer research outcomes.

⇒ We have added verbatim from the interviews of research engineer and research administrator.

18. It would be helpful for readers if authors consider citing in the main text the six included indicators from the first round under “First round survey paragraph, p. 16 and the seven included indicators as well under the Second round survey” paragraph, p.17.
We have added those numbers

19. Conclusion- The sentence “Compared with… undertaken” needs to be removed. The systematic review previously done wasn’t mentioned anywhere in the paper. In the conclusion, I would recommend to mention the final number of indicators selected as valid and feasible indicators to measure the outcomes and outputs of translational cancer research.

We have changed that sentence: “This study has enabled us to receive the input from actors in translational cancer research on the important issues related to the evaluation, select indicators and clarify their methodology. And included that sentence: We have selected a total of 17 indicators including some new ones measuring the impact of research in terms of health service and patient outcome.”

Reviewer 4

20. The definition of translational research applied in this paper is "research that transforms scientific discoveries arising in the lab, clinic, or population into new clinical tools and applications that reduce cancer incidence, morbidity, and mortality”. The implication is that high-impact translational research would lead to many new clinical tools and applications, and resulting reductions in cancer incidence, morbidity and mortality. As an overall initial comment, it is not clear exactly how the indicators can be used to measure this.

We added the following paragraph for clarity: “Many professional bodies have developed indicators for various fields, with the goal of improving quality by detecting suboptimal performance based on the traditional Donabedian model, which assesses structures, processes, and outcomes. According to Pozen et al, indicators can help tracking a translational research organisation’s progress towards goals, highlight achievements and identify areas for improvement.”

21. Missing is a brief introductory discussion of indicators - what constitutes a good or bad indicator, and the distinction between process indicators and knowledge-based indicators and their relative value. At one point the text says "there is an increased demand to measure the outcome of biomedical research in terms of patients' benefits and move beyond classical bibliometric indicators ", which suggests an understanding of the distinction. However, a short, clear introductory discussion of indicators would be helpful in this paper.

In the background section we added a paragraph about the criteria for good indicators and a short paragraph detailing the difference between output, outcome and impact indicators.
22. The authors also note that "the definition of validity of an indicator [is] its capacity to measure what it is intended to measure and the definition of feasibility of an indicator as the possibility and burden of measuring it." It is not clear how or if they applied this criterion to their initial list of indicators.

⇒ We added the following sentence in ‘Methods-survey’ section: “No filter on feasibility or validity was used to pre-select indicators from the initial list.”

23. The absence of a clear discussion of indicators makes it difficult to judge whether the final list of 17 indicators and their very brief descriptions is reasonable and useful. I will come back to this at the end.

⇒ We have added a discussion on the criterion for choosing indicators (see response to your previous comment n°21) and more details on the relevance of the indicators selected to measure the outcomes of translational cancer research (see response to your later comment n°32).

24. The methodology of the study included 1) semi-structured interviews seeking a common definition for translational research (there were disagreements about the exact scope and limits of this research, the importance of multi-disciplinarity and collaboration for the success of translational research, the disadvantages that translational research faces in current evaluation systems, the relative lack of pertinence of existing indicators and propositions to measure translational cancer research in terms of clinical applications and patients outcomes); 2) a 2-round Delphi survey, and 3) a physical meeting. This seems to be a sound methodology.

⇒ We agree.

25. The first line of the Abstract Conclusion is "Indicators need to be accepted by stakeholders who will be evaluated." It is not clear if it is the indicators or the stakeholders who will be evaluated.

⇒ We changed the sentence into “Indicators need to be accepted by the stakeholders under evaluation.”

26. The authors note that "Of the 267 participants invited to complete the survey, 35 participated in the first round." This very low take up should be commented on.

⇒ We added the following sentences in the “Discussion- strengths and limitations” part: “Out of the 267 researchers invited for the Delphi survey, only 35 participated in the first round. This figure can be explained by the length of the questionnaire and by the fact there was no pre-selection of participants based on their willingness to be included in the survey. Although it is a low take-up rate, a panel of 35 participants is sufficient for a Delphi survey.”
27. Nothing is said about the range of other possible media to disseminate translational research - "high-impact journals" are mentioned, but there are numerous others - books, government policy briefs, clinical practice guidelines, etc…

⇒ Those indicators were part of the initial list and 2 of them were included in the final list. We added the following sentence in the “Methods-survey” part: “The initial list submitted to participants included a mix of “traditional” indicators measuring research dissemination and other indicators measuring alternative ways to disseminate research results, such as « citation of research in clinical guidelines », « citation of research in public health guidelines », « reporting of research in the news/media » and « citation in medical education books ».”

28. In discussing journals, there should be an operational definition of impact factor.

⇒ We added the following sentence in the paragraph ‘views of researchers on evaluation…’: “The impact factor is an indicator of journal visibility that is based on the ratio of number citations to the number of citeable items of a journal.”

29. Does publishing in open access journals play a role?

⇒ We added the following sentence: “Participants did not mention whether publishing in open access publishing made any difference.”

30. Most participants argued that translational research should ideally be measured in terms of patients' benefits - output indicator. It is not clear why this is largely ignored in the list of indicators.

⇒ We have added the following paragraph in the ‘Discussion-strengths and limitations’: “Although our study had a focus on developing indicators measuring patients’ benefits, the final list contains only a relatively small number of them. This is because most of the indicators of health service impact and patients’ benefits found in the literature either had little no methodology provided or received a low rating for feasibility or validity. Some of those indicators could be interesting to develop for a case study analysing the impact of the research of a small number of cancer research institutions. However they are not suited for a large-scale bibliometric study.”

31. The whole presentation of the indicator reduction/selection process is obscure - they end up with 17 indicators, but where each one came from remains unclear. In the first round, the researchers presented 60 indicators to a panel of 35 participants. - where did these come from? Where did the metadata come from (definitions, etc.)? Of these 60 indicators, '6 were included in the final set without being submitted to a second round’. Why? What criteria were used to select these 6 indicators? They say 51 indicators
received comments - which means that 9 received no comments. How were these treated? Are any of these among the 6? This section needs revision to clarify these points.

⇒ We have modified the following sentence for more clarity: “Participants were presented an initial list of indicators composed of all indicators retrieved from the systematic review of the literature and suggested by researchers in the qualitative study, with the definition and positive and negative points according to the literature.”

32. The final list of 17 indicators in Table 4 has brief "definitions" attached. These are insufficient - each should be annotated to explain how it meets the purpose of measuring the impact (outcomes and outputs) of translational cancer research. There are also errors - for example, "% of patients included in a clinical trial" is defined as "Number of patients treated at a hospital that participate in a clinical trial" - a percentage of patients is not "a number of patients", "Mean number of citations per article" is defined as "The mean number of citation per articles", which apart from being useless as a definition should not have the "s" in "articles". These indicators, which are the key finding of the paper, should be treated more amply.

⇒ We have corrected the definitions of those indicators, clarified the type of indicator (output, outcome…) and added details about how they can measure the impact of translational research.

We are looking forward to hearing from you.