PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Optimising antimicrobial stewardship interventions in English primary care: a behavioural analysis of qualitative and intervention studies
AUTHORS	Borek , Aleksandra; Wanat, Marta; Atkins, Lou; Sallis, Anna; Ashiru-Oredope, Diane; Beech, Elizabeth; Butler, Christopher C.; Chadborn, Tim; Hopkins, Susan; Jones, Leah; McNulty, Cliodna; Roberts, Nia; Shaw, Karen; Taborn, Esther; Tonkin-Crine, Sarah

VERSION 1 – REVIEW

REVIEWER	Timothy Rawson Imperial College London, London, UK
REVIEW RETURNED	10-May-2020

GENERAL COMMENTS	Many thanks for the opportunity to review this manuscript. This is a well written manuscript. The authors have a strong track record in the field and present a detailed and interesting analysis. The study aimed to build on a recent study exploring the behavioural content of national AMS interventions in primary care in England. The authors wanted to identify self-reported influences on antibiotic prescribing, evidence of the effectiveness of interventions, and then compare these to current nationally implemented AMS interventions. Whilst I agree with the findings of the study and feel that it would add to the current literature surrounding AMS in primary care, I have a few major/minor comments that I would like to share with the authors. General: The document is very detailed and technical. Depending on the intended audience, it may require a little signposting within the text to support those that are not as familiar with the TDF and behaviour change taxonomies etc. The study investigated AMS in primary care. In parts, the text describes looking at AMS interventions in England. It should be clearer that your focus was on “AMS interventions in primary care in England”. Abstract: No major comments Introduction: 1. Page 5 lines 12-14: “with interventions achieving about a quarter or less reduction in antibiotic prescribing”…. Is this 25% reduction in inappropriate prescribing or total prescribing?

	a. I think it is important to be careful not to classify all antibiotic prescribing as unnecessary b. Is a modest effect from single interventions surprising? It is likely that several interventions will be required to reduce and sustain low levels of prescribing. There is evidence that multimodal / bundled interventions may have a greater impact? Methods: 2. The literature searches were performed in November 2018. Undertaking a brief search of the literature in 2019 and 2020, there seem to be several developments within this field (including publications by members of the authorship) that that may meet the inclusion criteria to ensure that the authors recommendations are up to date. Updating the literature search to a more recent date may be useful to ensure that the results, discussion, and importantly - recommendations made are based on the most recent evidence. 3. I have been unable to find reference [6] which provides the previously identified national AMS content (presumably for primary care). I note that it has previously been referenced by the authors as unpublished work in 2019 (Borek et al. Antibiotics 2019). When was this published and is it up to date in terms of national interventions within this time-period? Is there an up to date link to be able to access it? It would be good to be able to review this given it is an important reference within the manuscript. 4. Please further justify why you excluded delayed prescribing or include it within the analysis. Although there is an element of patient choice, it is also a different prescribing behaviour (and potential target for interventions for prescribers also). Furthermore, it is eluded to as a future area to focus on in the discussion section, suggesting that analysis of this area may be important if there is data to support it currently? 5. The authors explore self-reported barriers and facilitators. What biases could this have included? Was there no way of triangulating these self-reported views with studies using other qualitative techniques? a. Similarly to the point about regarding AMS in primary care. The authors should ensure that the the is consistency throughout in describing "self-reported" views and influences on antibiotics prescribing. Results / discussion: 6. Although the authors explored interventions looking at four different settings (GP, pharmacies, OOH, and urgent care) their results and suggestions have been reported together? Would all types of AMS intervention have the same impact in these areas? Was there any heterogeneity in findings? I note that the conclusion discusses this briefly. If there is a paucity of data in the other areas at present, this should be made clear in the text. 7. What about interventions that failed? Can we learn why they failed based on this type of analysis? 8. For suggested interventions not yet implemented at a national level: Several of these may be implemented locally or through regional arrangements within certain CCG's. The authors should

	reflect on the benefits of a nationally versus locally implemented interventions. Many thanks once again,

REVIEWER	Cathal Cadogan Royal College of Surgeons in Ireland
REVIEW RETURNED	23-May-2020

GENERAL COMMENTS	This is an interesting piece of work which reports on a behavioural analysis of qualitative and intervention studies focusing on antibiotic prescribing. The overall aim and objectives need to be clarified. The authors alternate in parts between England and UK which makes it hard to know if some of the included studies in each of the reviews were in fact specific to England or the wider UK region. This has important implications in terms of study inclusion in the rapid reviews and the subsequent coding exercises. Abstract The objective/aim is somewhat vague “Four domains were addressed by 50-67%, ‘skills’ by 24%,” I’m not clear what this means or how it was determined Article summary According to the abstract above, the setting of included was limited England so slightly misleading to refer to “UK primary care” Introduction Overall, very well written Opening paragraph; it would be nice to include some examples of inappropriate antibiotic prescribing Suggest that you work in an overarching aim and phrase the questions as objectives It would be good to have specified exactly what you mean by appropriate antibiotic prescribing as a behaviour. In terms of question 2: Should the interventions have focussed on reducing inappropriate antibiotic prescribing as opposed to total antibiotic prescribing? Methods Suggest including a very brief/concise paragraph after this section heading just by way of a signpost to the two reviews that you describe and perhaps a line on how the two reviews will link together. I also wonder if rather than splitting this section into rapid review 1 and 2, could you could break it down into a series of stages to help the reader full understand the exact role of each of tools/frameworks that were used (e.g. Stage 1: Identification of determinants of antibiotic prescribing behaviour….) and how they all fit together Why were rapid reviews chosen in place of systematic reviews? It would be good to elaborate on what you mean by rapid review in the context of this work. “The search was adjusted to identify systematic reviews, then primary studies” what does that mean? “The identified research interventions were compared with the nationally implemented AMS interventions in England (identified

	previously [6]) to see which national interventions had evidence of effectiveness" I don't follow this – why didnt you just determine effectiveness from the studies themselves? In terms of intervention coding, it is well documented that the quality of intervention reporting in published manuscripts is often poor. Did you email study authors for additional information regarding the interventions? Results Were any primary qualitative studies identified as part of the searches? You only refer to the systematic reviews I don't follow the section labelled "Comparison of national and research interventions" and what part of the study questions or methods this links with It would be useful to clarify in the relevant tables if the qualitative and intervention studies were conducted in England or other parts of the UK; it's not reported consistently Did any of the identified qualitative studies follow through to develop any of the identified interventions? Did any of the studies in either rapid review apply the TDF, BCW or BCT taxonomy? Discussion The opening sentence is the first specific mention of an aim and I am not clear as to how this has been achieved. I think that there has to be greater acknowledgment from the outset that the various frameworks/taxonomies have been applied retrospectively and the implications that that has in terms of the findings. As noted above, it would be useful to know whether any of the included studies (qualitative and/or intervention) had used any of the frameworks/taxonomies and to discuss the implications of this in terms of future research. I am not used to seeing bullet points in a discussion and I don't think they work "We found that five effective research interventions, have not been implemented": I am not clear how this was determined based on the three questions outlined at the end of the introduction "As up-to-date evidence from systematic reviews is available, we used rapid review methods (e.g., studies' quality was not assessed)." I don't follow this point and I would question the statement regarding how up to date the searches are if the rapid review searches were conducted in November 2018 "We aimed to develop suggestions for AMS 12 interventions in England so we only included UK-based studies": this was not specified at the outset I think the limitations of relying on published study reports needs to be further emphasised for both components "These were also supplemented by feedback from stakeholders and experts" where is this reported in the methods Conclusion A more succinct concluding paragraph is needed

VERSION 1 – AUTHOR RESPONSE

Addressed Reviewers' Comments
Reviewer: 1
Reviewer Name: Timothy Rawson

1. Many thanks for the opportunity to review this manuscript. This is a well written manuscript. The authors have a strong track record in the field and present a detailed and interesting analysis. The study aimed to build on a recent study exploring the behavioural content of national AMS interventions in primary care in England. The authors wanted to identify self-reported influences on antibiotic prescribing, evidence of the effectiveness of interventions, and then compare these to current nationally implemented AMS interventions.

Whilst I agree with the findings of the study and feel that it would add to the current literature surrounding AMS in primary care, I have a few major/minor comments that I would like to share with the authors.

Thank you for the positive comment. We explain how we have addressed the Reviewer's helpful comments and suggestions below.

General:

2. The document is very detailed and technical. Depending on the intended audience, it may require a little signposting within the text to support those that are not as familiar with the TDF and behaviour change taxonomies etc.

We agree with the Reviewer that some readers may be less or un-familiar with the behavioural analysis methods and tools used. We included a paragraph explaining it in the Background and signposted to other studies that used similar methods (p.6). While we agree that a more detailed explanation might be helpful to those less familiar with the behavioural analysis tools, such explanation would require adding another paragraph and/or additional boxes/figures and therefore extending the length of the manuscript.

If the Editor agrees that this is an important addition that justifies further extending the manuscript length, we can add more explanation of the behavioural frameworks used.

3. The study investigated AMS in primary care. In parts, the text describes looking at AMS interventions in England. It should be clearer that your focus was on "AMS interventions in primary care in England".

Our focus was to assess, and develop recommendations for, AMS interventions in primary care in England. Where relevant, we have clarified this throughout the paper.

However, in both rapid reviews we included studies conducted in the UK, rather than in England alone. This was because in quite a few qualitative and intervention studies it was either unclear which countries within the UK the participants were recruited from, or participants were recruited across the UK and the findings were reported for all participants (regardless of the nation). We have added the nations in the tables with study characteristics (in the 'setting' columns) in Supplementary Documents 4 and 6. We have also clarified this in the Methods on p. 8.

Introduction:

4. Page 5 lines 12-14: “with interventions achieving about a quarter or less reduction in antibiotic prescribing”…. Is this 25% reduction in inappropriate prescribing or total prescribing?

We have clarified that this referred to total antibiotic prescribing.

5. I think it is important to be careful not to classify all antibiotic prescribing as unnecessary.

We have clarified this at the end of the first paragraph on p. 5.

6. Is a modest effect from single interventions surprising? It is likely that several interventions will be required to reduce and sustain low levels of prescribing. There is evidence that multimodal / bundled interventions may have a greater impact?

We agree that it may be that multifaceted interventions (i.e. those combining multiple interventions/components within one approach) are more effective than single-component interventions. To our knowledge evidence specifically on multifaceted (versus single-component) interventions is limited. We have noted this as a recommendation for future research in thDiscussion on p. 21.

Most of the current AMS interventions in England already contain multiple behavioural components, which is illustrated by our findings (i.e. when reporting the behaviour change techniques in interventions in Supplementary Document 7). We have clarified this by adding a statement in the Discussion on p. 18.

Methods:

7. The literature searches were performed in November 2018. Undertaking a brief search of the literature in 2019 and 2020, there seem to be several developments within this field (including publications by members of the authorship) that that may meet the inclusion criteria to ensure that the authors recommendations are up to date. Updating the literature search to a more recent date may be useful to ensure that the results, discussion, and importantly - recommendations made are based on the most recent evidence.

We have performed update searches for both rapid reviews. In the review of qualitative studies we have identified one additional study that met the inclusion criteria – we have referenced it in the Results (p. 13) but we are unable to re-do the analyses to incorporate this new study. In the review of interventions, we have not identified any study that met the inclusion criteria, but we have identified some relevant studies that we refer to in the Discussion (pp. 19, 22-23). We have reported the update searches in the Methods, Results, and in the flow charts in Supplementary Documents 3 and 5.

8. I have been unable to find reference [6] which provides the previously identified national AMS content (presumably for primary care). I note that it has previously been referenced by the authors as unpublished work in 2019 (Borek et al. Antibiotics 2019). When was this published and is it up to date in terms of national interventions within this time-period? Is there an up to date link to be able to access it? It would be good to be able to review this given it is an important reference within the manuscript.

Reference number 6 refers to the article which is currently under review in another journal. We expect the decision about that manuscript soon and we will update our reference accordingly with the journal name and estimated volume number at the proofs stage.

9. Please further justify why you excluded delayed prescribing or include it within the analysis. Although there is an element of patient choice, it is also a different prescribing behaviour (and potential target for interventions for prescribers also). Furthermore, it is eluded to as a future area to focus on in the discussion section, suggesting that analysis of this area may be important if there is data to support it currently?

The identified studies of delayed prescribing aimed to evaluate the impact of delayed antibiotic prescriptions on patients' consumption of antibiotics and clinical outcomes and not on the clinicians' prescribing behaviour. In these studies prescribers were given envelopes that randomly assign patients to receive a delayed prescription or not (or different formats of delayed prescriptions); they did not involve behaviour change strategies to influence prescriber's choice of the prescribing behaviour. In the studies that we identified, delayed prescription strategies were not a clinician-targeted behavioural intervention. We have further explained this in the Methods section on p. 11.

We agree that delayed prescriptions may be an important strategy to reduce antibiotic use, and consequently mitigate antibiotic resistance. However, to change prescribers' behaviour beyond the context of the trials, such behavioural interventions would need to be targeted at prescribers and aim to influence their choice to use a delayed prescription by using behaviour change techniques such as, for example, providing prescribers' with feedback on their use of delayed prescriptions, information about consequences of using delayed prescriptions etc. We have added another reference to delayed prescriptions as a promising AMS strategy in the Discussion on pp. 22-23.

10. The authors explore self-reported barriers and facilitators. What biases could this have included? Was there no way of triangulating these self-reported views with studies using other qualitative techniques?

Relying on self-reports to identify barriers and facilitators to appropriate antibiotic prescribing meant that some other barriers and facilitators may have been missed (e.g. subconscious influences on prescribing) and/or some may have been overly highlighted (e.g. those most salient to (i.e. easily or readily thought of by) study participants).

Other types of studies may identify additional or different influences on prescribing; for example, studies involving analyses of observations or recordings of consultations and prescribing, quantitative analyses of predictors of prescribing, or those incorporating patients' perspectives. More such studies may need to be conducted in the context of UK general practice. As we were conducting a rapid review within very limited time, we prioritised narrow study selection criteria focused on a homogenous type of qualitative studies involving self-reports. We have added a further clarification of this in the Limitations section on p. 24.

11. Similarly to the point about regarding AMS in primary care. The authors should ensure that the there is consistency throughout in describing "self-reported" views and influences on antibiotics prescribing.

We have added the clarification that there were self-reported influences on antibiotic prescribing where relevant throughout the paper (pp. 13, 15, 17, 18).

Results / discussion:

12. Although the authors explored interventions looking at four different settings (GP, pharmacies, OOH, and urgent care) their results and suggestions have been reported together? Would all types of AMS intervention have the same impact in these areas? Was there any heterogeneity in findings? I note that the conclusion discusses this briefly. If there is a paucity of data in the other areas at present, this should be made clear in the text.

In this study we focused on primary care services which included the four settings, rather than specifically on each setting separately. We have clarified this in the Abstract. In the Methods we previously specified which primary care settings we included in the reviews.

In the Results (pp. 13-14) we reported that the majority of identified studies were conducted in general practice: out of 13 qualitative studies, one was in an out-of-hours surgery and one in a walk-in centre; and out of 17 intervention studies, one was in an urgent care centre and one in a community pharmacy. Considering the small number of studies conducted in settings other than general practice it would not be meaningful to conduct the behavioural analysis separately for each setting.

However, we agree with the Reviewer that setting is an important factor to consider. For example, influences on antibiotic prescribing may be of different importance across settings, and different AMS interventions may be needed and/or their impact may vary across settings. Unfortunately, our analysis did not allow us to explore this further. We have added this as a recommendation for future research on p. 23.

13. What about interventions that failed? Can we learn why they failed based on this type of analysis?

We have not analysed the behavioural content of interventions that were not effective (based on the statistically significant effect of the intervention on reducing antibiotic prescribing), but we agree with the Reviewer that it is important to identify what we can learn from such interventions. The interventions that we identified but not included in the behavioural analysis mostly showed promising results. We have discussed them on pp. 22-23.

14. For suggested interventions not yet implemented at a national level: Several of these may be implemented locally or through regional arrangements within certain CCG's. The authors should reflect on the benefits of a nationally versus locally implemented interventions.

We have added this in the Discussion on p. 20.

Reviewer: 2
Reviewer Name: Cathal Cadogan

1. This is an interesting piece of work which reports on a behavioural analysis of qualitative and intervention studies focusing on antibiotic prescribing.

Thank you.

2. The overall aim and objectives need to be clarified.

As we stated in the Abstract (and now clarified), the overall aim of the study was to 'identify ways to optimise antimicrobial stewardship (AMS) interventions' in primary care in England by using behavioural analysis to develop recommendations for potential improvements. We listed our specific research questions (corresponding with study objectives) on p. 6. We have now further clarified these on pp. 6-7.

3. The authors alternate in parts between England and UK which makes it hard to know if some of the included studies in each of the reviews were in fact specific to England or the wider UK

region. This has important implications in terms of study inclusion in the rapid reviews and the subsequent coding exercises.

We have clarified this in the paper and responded to the similar comment (number 3) made by Reviewer 1.

Abstract

4. The objective/aim is somewhat vague

We have clarified the study aim in the Abstract, but due to the word limit we cannot provide more details of specific objectives.

5. "Four domains were addressed by 50-67%, 'skills' by 24%," I'm not clear what this means or how it was determined

This refers to the results of behavioural analysis and specifically to the proportion of identified interventions that addressed the top three TDF domains of influences on prescribing behaviour. We have made some small changes in the sentence to help clarify this. However, the abstract length does not allow for providing the specific details of behavioural analysis, which are reported in the Methods section of the paper.

Article summary

6. According to the abstract above, the setting of included was limited England so slightly misleading to refer to "UK primary care"

We have clarified this.

Introduction

7. Overall, very well written

Thank you.

8. Opening paragraph; it would be nice to include some examples of inappropriate antibiotic prescribing. It would be good to have specified exactly what you mean by appropriate antibiotic prescribing as a behaviour.

We have specified what we mean by inappropriate antibiotic prescribing on p. 5. We have also added a related clarification in response to Reviewer's 1 comment 5.

9. Suggest that you work in an overarching aim and phrase the questions as objectives

We have clarified the overall aim and rephrased the research questions as objectives on pp. 6-7.

10. In terms of question 2: Should the interventions have focussed on reducing inappropriate antibiotic prescribing as opposed to total antibiotic prescribing?

The outcomes of studies evaluating AMS interventions include changes in overall antibiotic prescribing as an outcome. They do not specify that the changes are only by reducing inappropriate antibiotic prescribing. It would be very difficult to assess it without seeing the patients but we can assume that no adverse consequences of reducing antibiotics suggests that the decrease was in unnecessary antibiotic use.

Methods

11. Suggest including a very brief/concise paragraph after this section heading just by way of a signpost to the two reviews that you describe and perhaps a line on how the two reviews will link together.

We have added a paragraph at the start of the Methods (pp. 7-8) to outline the three stages and how they fit together. We have also amended the sub-headings in the Methods to clarify each stage.

12. I also wonder if rather than splitting this section into rapid review 1 and 2, could you could break it down into a series of stages to help the reader full understand the exact role of each of tools/frameworks that were used (e.g. Stage 1: Identification of determinants of antibiotic prescribing behaviour….) and how they all fit together

The paragraph outlining the three stages at the start of the Methods, clarifying the sub-headings in the Methods, and the overall aim and the three objectives should hopefully sufficiently clarify the aims of each stage and how they fit together.

13. Why were rapid reviews chosen in place of systematic reviews? It would be good to elaborate on what you mean by rapid review in the context of this work.

We used rapid review methods (i.e. without full double-screening and assessing study quality) because relevant systematic reviews already exist, so we aimed to use these reviews to identify individual studies and then search for any studies published after the searches conducted in the most up-to-date reviews. We have now elaborated on this at the end of the added first paragraph in the Methods (p. 8).

14. “The search was adjusted to identify systematic reviews, then primary studies” what does that mean?

We meant that the search terms were adjusted: in one search we included search terms for systematic reviews, and in the second search we included search terms for primary studies. We have now clarified this (p. 8 and p. 10).

15. “The identified research interventions were compared with the nationally implemented AMS interventions in England (identified previously [6]) to see which national interventions had evidence of effectiveness” I don’t follow this – why didnt you just determine effectiveness from the studies themselves?

Not all national AMS interventions have been evaluated in research studies, and not all research studies have been nationally implemented. This is why we compared (mapped) the national and research AMS interventions. Table 3 in the Results shows which interventions have been nationally implemented but without research evidence of effectiveness, which have research evidence of effectiveness but have not been nationally implemented, and which have been shown effective in research studies and nationally implemented. We have clarified this in the Methods (p. 11) and in the sub-headings in Table 3.

16. In terms of intervention coding, it is well documented that the quality of intervention reporting in published manuscripts is often poor. Did you email study authors for additional information regarding the interventions?

We agree that the quality of reporting is at times sub-optimal and may influence which and how well intervention components can be identified. While we did not email study authors for additional information, we coded the information reported in any published papers describing the interventions

(including protocols and study development papers), as reported on p. 11. We had only five interventions that we coded based on the published descriptions (the nationally implemented interventions had been previously coded in another study [reference 6] using the interventions directly to identify their components). Since these five research interventions were conducted in England by members of the study team or their colleagues, we feel relatively confident that we were able to identify and code the main components of these interventions well. We acknowledged the issue with the quality of reporting in study limitations on p. 24.

Results

17. Were any primary qualitative studies identified as part of the searches? You only refer to the systematic reviews

The flow charts in Supplementary Document 3 and 5 included the details of how many studies were identified from systematic reviews and directly from the database search for individual studies, and were included for screening. We have clarified this in the Results (p. 13).

18. I don't follow the section labelled "Comparison of national and research interventions" and what part of the study questions or methods this links with

This should be now clearer after we have included the paragraph at the start of the Methods (pp. 7-8) and explaining it in response to the comment #15.

19. It would be useful to clarify in the relevant tables if the qualitative and intervention studies were conducted in England or other parts of the UK; it's not reported consistently

We have added this information in the tables with study characteristics (in the column with 'setting') reported in the Supplementary Documents 4 and 6.

20. Did any of the identified qualitative studies follow through to develop any of the identified interventions?

To our knowledge none of the qualitative studies identified in our rapid review 1 were used to develop the interventions identified in the second rapid review of interventions.

21. Did any of the studies in either rapid review apply the TDF, BCW or BCT taxonomy?

The qualitative studies did not report (or refer to) the TDF, BCW or BCT taxonomy. From the effective interventions studies, only Hallsworth et al. (2016) [reference 54] reported using the BCT taxonomy version 1 to classify intervention components. (This was taken into account when coding the intervention content.) It is worth noting though that quite of few of the identified studies had been published before the behavioural tools were developed and published (TDF – 2012, BCW – 2011, BCTTv1 – 2013).

Discussion

22. The opening sentence is the first specific mention of an aim and I am not clear as to how this has been achieved.

We removed the first sentence in the Discussion. The overall aim of identifying possible improvements of AMS interventions in England is addressed in the Implications section of the Discussion.

23. I think that there has to be greater acknowledgment from the outset that the various frameworks/taxonomies have been applied retrospectively and the implications that that has in terms of the findings.

We used the behavioural tools retrospectively to assess studies (most of which had not been developed by using these tools prospectively, as explained in response to the comment #21). We have also acknowledged that the coding was done retrospectively in the Methods (p. 11).

Using these frameworks/taxonomies retrospectively is a common approach in behavioural analysis and systematic reviews. It allows us to compare different types of components and mechanisms of change between different types of interventions. However, we also acknowledge that this approach has some limitations – we have now added this in the Limitations on pp. 24-5.

24. As noted above, it would be useful to know whether any of the included studies (qualitative and/or intervention) had used any of the frameworks/taxonomies and to discuss the implications of this in terms of future research.

As explained in response to the comment #21, only one study reported intervention content using the taxonomy of behaviour change techniques, but the frameworks had not been available for many included studies to be used. We have added a comment on this linking to our acknowledgement of limitations of using these tools retrospectively (p. 24).

25. I am not used to seeing bullet points in a discussion and I don't think they work

We have used bullet points to make it easier for readers to identify separate recommendations. We could remove bullet points and keep the same text continuous but we feel that it would decrease readability.

26. "We found that five effective research interventions, have not been implemented": I am not clear how this was determined based on the three questions outlined at the end of the introduction

This was determined by comparing the national AMS interventions (identified in the previous study [6]) and the effective research AMS interventions (identified in the stage 2 rapid review in this study). This is reported (and now clarified) at the end of the Methods for stage 2 rapid review. The interventions are listed and compared in Table 3 and we have added some clarifications in Table 3.

27. "As up-to-date evidence from systematic reviews is available, we used rapid review methods (e.g., studies' quality was not assessed)." I don't follow this point and I would question the statement regarding how up to date the searches are if the rapid review searches were conducted in November 2018

We have explained the reasons for conducting rapid reviews in response to the comment #13, and by adding a clarification in the Methods (p. 8). As we reported in the Methods, the most up-to-date systematic review of qualitative studies included studies up to June 2016, and the most up-to-date systematic review of interventions included studies up to January 2018.
Our searches were conducted in November 2018 and we searched for additional studies published after the most up-to-date reviews' search dates (for qualitative studies this was since 2016, and for intervention studies since 2018). We have now run update searches, and after screening we have identified one qualitative study matching our inclusion criteria and no intervention studies matching the inclusion criteria. We have reported this in the Methods, Results and Supplementary Documents (see our response to Reviewer's 1 comment #7).

28. “We aimed to develop suggestions for AMS 12 interventions in England so we only included UK-based studies”: this was not specified at the outset

We have clarified throughout the paper that our focus was on AMS interventions in England. In the reviews we included studies conducted in the UK, rather than in England alone, because studies either did not report which nation within the UK the study was conducted in, or did not report the results separately for England. We have clarified this in the Methods. (See also our response to Reviewer’s 1 comment #3).

29. I think the limitations of relying on published study reports needs to be further emphasised for both components

We acknowledged the issue with the quality of reporting in study limitations on p. 24, and have also addressed this in response to comment #16.

30. “These were also supplemented by feedback from stakeholders and experts” where is this reported in the methods

We have reported the findings of the stakeholder consultations in a separate paper (now reference number 14). We have clarified this in the Methods (p. 8) and in the sentence on p. 24.

Conclusion

31. A more succinct concluding paragraph is needed

We have included examples of how AMS interventions may be improved in the conclusions which makes it a bit longer but we think these examples are valuable to highlight. We have made some minor edits to remove unnecessary words from the conclusions to make it more concise.

VERSION 2 – REVIEW

REVIEWER	T Rawson Imperial College London, UK
REVIEW RETURNED	29-Jul-2020

GENERAL COMMENTS	Many thanks for the invitation to review this manuscript. The authors have addressed my previous comments within the limits of the study that they have conducted and manuscript guidelines for the journal to a satisfactory level. I will leave the question to the editor raised in point 2 to the editors discretion with regards to the level of detail required in the text. Thanks again and best wishes.

REVIEWER	Cathal Cadogan Royal College of Surgeons in Ireland
REVIEW RETURNED	19-Oct-2020

GENERAL COMMENTS	Thank you for the detailed responses to my previous comments. I have no further comments

VERSION 2 – AUTHOR RESPONSE

Reviewer 1:

The authors have addressed my previous comments within the limits of the study that they have conducted and manuscript guidelines for the journal to a satisfactory level. I will leave the question to the editor raised in point 2 to the editors discretion with regards to the level of detail required in the text.

Comment 2:

The document is very detailed and technical. Depending on the intended audience, it may require a little signposting within the text to support those that are not as familiar with the TDF and behaviour change taxonomies etc.

Our response:

We have now added more details in the manuscript to explain the behavioural sciences frameworks used in our study on pp. 5-7 and in Box 1.

Editorial Office comments:

Kindly remove reference <6> with under review citation. We only include published works in the reference list, although under review can be cited in the main body of the article with the name of the author who wrote the study, and its title.

Not all 15 authors cited in contributorship statement. Please provide a more detailed contributorship statement. It needs to mention all the names/initials of authors along with their specific contribution/participation for the article. This should be stating how each author contributed to the article. It should discuss on the planning, conduct and reporting of the work in your paper. You may also consider the conception and design, acquisition of data or analysis and interpretation of data, etc. The statement in the ScholarOne system and main document should matched.

Our response:

We have amended reference <6> to a published paper. We have also amended the statement of Author Contributions.

VERSION 3 – REVIEW

REVIEWER	Timothy Miles Rawson Imperial College London, London, UK
REVIEW RETURNED	15-Nov-2020

GENERAL COMMENTS	Changes addressed.