## PEER REVIEW HISTORY



## ARTICLE DETAILS

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| **TITLE (PROVISIONAL)** | Exploring variation in how ambulance services address non-conveyance: a qualitative interview study |
| **AUTHORS** | Knowles, Emma; Bishop-Edwards, Lindsey; O'Cathain, Alicia |

## VERSION 1 – REVIEW

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| **REVIEWER** | Veronica Lindström<br>Karolinska Institutet, Department of Neurobiology, Care Sciences and Society, section of nursing. Sweden |
| **REVIEW RETURNED** | 10-Jun-2018 |

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| **GENERAL COMMENTS** | Thank you for the possibility to review the manuscript entitled: Exploring variation in how ambulance service addresses non-conveyance: a qualitative study<br>Over all the manuscript is well written and the aim of the study is relevant/interesting/highlight an important topic, non-conveyance out of an organizational perspective.<br>However, I have some questions and suggestions.<br><br>As I read the manuscript I find three similar but different aims; in abstract the aim was to explore how each ambulance service addressed non-conveyance specifically for calls ending in telephone advice and discharge at scene. In p.5 line 7-10 the aim was to; explore how non-conveyance was addressed within each ambulance to identify potential factors affecting variation between ambulance services and finally in p. 6 line 7-8 the aim was to identify potential factors affecting non-conveyance rates. I suggest chose one aim and be consistent in the manuscript.<br><br>In the background you uses percent (%) while describing different rates, and that's ok but I would be easier for me as a reader if you add the numbers otherwise it is difficult for me to interpret the significant of the variation.<br><br>Method, setting, why is not the eleventh ambulance service included in the study? Consider to clarify<br><br>Concerning the participants/conducted interviews, it is not clear in the method section how you ended up with 50 interviews. The first sentence (p.6 line 17-18) indicates that 30 interviews were planned and in line 33-37 (same page) the content indicates that 50 interviews was planned and finally in the section of results you write about 80 individuals. Please clarify.<br><br>You piloted your template, that's good, did you include the pilot interviews in the analysis? Please clarify |

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| | In p.7 line 49-54 concerning the future quantitative study, consider to delete, since that rationale for quantize is not relevant for this study. Or expand the text for clarifying why that is necessary for your analysis/result presentation.<br><br>P. 4 line 4, please clarify how the written informed consent was obtained since you collected data thru telephone interviews.<br><br>Concerning the bullet points; strengths and limitations of this study, consider to delete bullet point four (it's a qualitative study and the amount of participants is not a limitation from my point of view) and replace it with patient and public involvement that's a really good strength of your study.<br><br>Results; consider to add a figure or table showing your themes and sub-themes in the beginning of your result section (in relation to the subheading overview of themes). Please use the same sub-headings when presenting your results as described as broader themes at p 8-9. When you present your results, you sometimes write/refers to A-J (ambulance services) and sometimes not, please be consistent and write out the A-J every time instead of write 'some ambulance services' (i.e p.9 line 14; p.9 line 33; p10 line 39).<br><br>In the beginning of the discussion, consider to make a statement answering your aim; organizational factors affecting non-conveyance was …. Regardless, this was just a suggestion, make the statement out of your selected aim and consider to adjust the title in accordance to the aim/statement.<br><br>Finally, consider to add a patient perspective in your discussion, I mean it's the patients who may suffer when there are differences in the organization, the care in the ambulance service may not be equal. |

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| **REVIEWER** | Adam J. Noble<br>University of Liverpool, UK |
| **REVIEW RETURNED** | 04-Jul-2018 |

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| **GENERAL COMMENTS** | Review of Knowles et al. manuscript titled "Exploring variation in how ambulance services address non-conveyance: a qualitative interview study"<br><br>Thank you for inviting me to review this interesting manuscript by Knowles et al.. It presents valuable evidence from a well conducted study by a respected group and would represent a timely publication. In the UK, for example, the Keogh Urgent and Emergency Care Review envisions that for the NHS to become sustainable, demand on acute services can be reduced by expediting the transformation of the ambulance service – from one where ambulances transport everyone to hospital, to one where they become mobile treatment centres, treating more patients at scene and where greater use is made of alternative care pathways. It has been clear for a while though that variation exists between regional ambulance services in their use of non-conveyance. The reasons for this have not been entirely clear. Thus, a clear understanding of the factors that facilitate and impede non-conveyance is required if the Keogh vision is to stand a chance of being realised. The results of this study contribute to our understanding of the factors that may account for the variation |

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| | between regional services in England. The findings may also have relevance internationally as countries such as the USA, Australia, Canada and New Zealand have similarly organised emergency systems and are also seeking to understand how to reduce conveyance rates.<br><br>Knowles and colleagues present a qualitative study with a relatively large sample of interviewees (n=49) from 10 of the 11 regional ambulance services in England. From each regional service, the team aimed to interview an ambulance service manager, 2 paramedics (one with and one without advanced training) and a lead health care commissioner. Interviews were conducted by telephone and explored participants' views about what factors they believed affected non-conveyance within their region. The findings indicate that a number of factors may be important in influencing whether conveyance happens or not, beyond the clinical need of the patient themselves. Some factors are (to some extent) within the remit of the ambulance service themselves to change. Some factors though were not. Some of the factors identified by the participants – such as perceived organisational support, influence of response-time targets, decision-making confidence and availability of alternatives to ED – have been reported before either for conveyance in general by ambulance services or for specific conditions. Some factors have not though been so clearly articulated and represent novel findings. These include "motivation of senior management", workforce configuration and skill mix of those completing telephone assessments.<br><br>The authors have clearly identified the strengths and weaknesses of their study. I would though suggest the following minor revisions to make it the manuscript even stronger:<br><br>1- The order in which the sentences appear in the 'Recruitment' subsection of 'Results' could be changed to improve the flow. Rather than state how many interviews took place and then data on participant uptake, I would suggest first presenting participant uptake data and then how many of the planned interviews took place and whether the 'recruitment target' was achieved.<br><br>2- In line COREQ requirements, it would helpful to know a little more about the training of the person who did the interviews, including any relationship/ specialist knowledge they had with/ of the ambulance service.<br><br>3- Please include a date range for when the interviews to place. This will allow the findings to be better contextualised.<br><br>4- To make it easier for the reader, I would suggest that the first paragraph on page 10 be split into two. The first would talk about the two services (C & F) in which there appeared to be high levels of motivation. It should then immediately be followed by the supportive quote which is currently on lines 17-23. The second paragraph would then talk Services A, D, E and G in which there was a contrasting position. It should be followed by the illustrative quote currently on lines 26-31.<br><br>5- It is interesting that national drivers for non-conveyance and the potential benefit or otherwise of non-conveyance to services users were not raised by interviewees as influencing factors on |

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| | conveyance within the service. For example, no mention was made about the financial incentives for ambulance services for year on year reductions in conveyance rates (e.g., NHS England. Commissioning for Quality and Innovation (CQUIN) Indicator Specification 2017/18 - 2018/19. https://www.england.nhs.uk/wp-content/uploads/2018/06/cquin-indicator-specification-information-2018.pdf). Given these two factors form part of the case by which change is being looked to be brought about within the NHS it would interesting for the authors to reflect on why these factors were not identified by interviewees and what this may mean.<br><br>6- On page 16, the authors begin to refer to how their findings relate to the findings from other projects. Importantly, they state "Our findings are similar to those identified in a national audit of ambulance non-conveyance in England which included analysis of quantitative data on processes and outcomes, and discussions with managers with each ambulance service." The findings of this 2017 report should be made clearer to allow the reader to better interpret the issue of availability of alternative services that was felt by some interviewees to be important. The report referred to discusses a stocktake by NHS England of the urgent and emergency care system (https://www.nao.org.uk/wp-content/uploads/2017/01/NHS-Ambulance-Services.pdf). It importantly identified that the number of urgent care centres across England varied substantially between areas and that what these centres provided was not consistent.<br><br>7- On page 16 line 10, the authors state that "The study took a national focus and is one of the first studies of organisation perspectives of non-conveyance". They do not though provide references for the other studies. This would be helpful for the interested reader and permit the novelty of the study's findings to be better evaluated. On this point, I think it would appropriate to also acknowledge and cite the additional studies in the literature that have previously picked up on some of the issues reported by the interviewees. I.e.,<br>• Porter et al. 'Should I stay or should I go?' Deciding whether to go to hospital after a 999 call. J Health Serv Res Policy 2007;12(Suppl 1):S1-32–38.<br>• Porter et al. 'Covering our backs': ambulance crews' attitudes towards clinical documentation when emergency (999) patients are not conveyed to hospital. Emerg Med J 2008;25:292–5.<br>• Burrell et al. Decision-making by ambulance clinicians in London when managing patients with epilepsy: a qualitative study. Emerg Med J 2013;30:236–40.<br>• O'Hara R et al. A qualitative study of systemic influences on paramedic decision making: care transitions and patient safety. J Health Serv Res Policy 2015;20(1 Suppl):45–53.<br>• Noble et al. Qualitative study of paramedics' experiences of managing seizures: a national perspective from England. BMJ Open 2016;6:e014022.<br>• Price L. Treating the clock and not the patient: ambulance response times and risk. Qual Saf Health Care 2006;15:127–30.<br><br>8- The views of senior management were identified as having an important influence on conveyance practices within a service. As this is one of the particularly novel findings of the project greater details on this would be valuable. For example, when senior management is talked about, whom exactly are we talking about here in terms of the hierarchy of the ambulance service? It is a |

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| | quite vague at present. Moreover, might the authors like to suggest potential avenues of action here for future studies? Indeed, why is it that some appear to have such differing views?<br><br>9- In outlining the advantages for non-conveyance, it is stated that non-conveyance is also valued by service users. I would suggest adding a caveat here since in reality there is limited evidence out there to support this position. We do not know how care preferences vary across different patient and carer groups. It is possible the picture on preference is much more complex than some have implied.<br><br>10- There are a few typographic errors present (e.g., line 49 page 7; line 39 page 11). |

**VERSION 1 – AUTHOR RESPONSE**

Reviewer(s)' Comments to Author:

Reviewer: 1

Thank you for the possibility to review the manuscript entitled: Exploring variation in how ambulance service addresses non-conveyance: a qualitative study
Over all the manuscript is well written and the aim of the study is relevant/interesting/highlight an important topic, non-conveyance out of an organizational perspective.
However, I have some questions and suggestions.

As I read the manuscript I find three similar but different aims; in abstract the aim was to explore how each ambulance service addressed non-conveyance specifically for calls ending in telephone advice and discharge at scene. In p.5 line 7-10 the aim was to; explore how non-conveyance was addressed within each ambulance to identify potential factors affecting variation between ambulance services and finally in p. 6 line 7-8 the aim was to identify potential factors affecting non-conveyance rates. I suggest chose one aim and be consistent in the manuscript.
Response: We have expanded the text on page 5 and 6 to bring into line with the abstract.

In the background you use percent (%) while describing different rates, and that's ok but I would be easier for me as a reader if you add the numbers otherwise it is difficult for me to interpret the significant of the variation.
Response: We're afraid that the figures reported in the Ambulance Quality Indicators data are presented in %'s rather than as a number so we were unable to present this in the paper. We have added the total number of ambulance incidents to the paper. This helps to provide some idea as to the size of the workload within ambulance services in England in February 2018.

Method, setting, why is not the eleventh ambulance service included in the study? Consider to clarify
Response: The ten larger services deal with 99% of the calls. We excluded the eleventh service due to its relatively small size. Manuscript amended.

Concerning the participants/conducted interviews, it is not clear in the method section how you ended up with 50 interviews. The first sentence (p.6 line 17-18) indicates that 30 interviews were planned

and in line 33-37 (same page) the content indicates that 50 interviews was planned and finally in the section of results you write about 80 individuals. Please clarify.
Response: We can't find the reference to the '30 interviews planned' in the text. Is the reviewer assuming this from the "three groups within each of the 10 ambulance services" i.e. 3x10? If so, we are referring to three groups of staff (i.e. paramedics) rather than three individuals in each service. We planned to interview around 50 participants, and have clarified this in the amended manuscript.

You piloted your template, that's good, did you include the pilot interviews in the analysis? Please clarify
Response: Yes, we did. Manuscript amended.

In p.7 line 49-54 concerning the future quantitative study, consider to delete, since that rationale for quantize is not relevant for this study. Or expand the text for clarifying why that is necessary for your analysis/result presentation.
Response: We agree, and have deleted this text. However, we refer to the wider study in the implications section

P. 4 line 4, please clarify how the written informed consent was obtained since you collected data thru telephone interviews.
Response: This was sent by email or fax prior to the interview. Manuscript amended.

Concerning the bullet points; strengths and limitations of this study, consider to delete bullet point four (it's a qualitative study and the amount of participants is not a limitation from my point of view) and replace it with patient and public involvement that's a really good strength of your study.
Response: Yes, we agree that readers with a qualitative background may understand this. However, we do make some assertions about each of the services and think it's important to highlight the relatively small number of 'voices' within each service. We saw the PPI involvement in the study as a strength and benefit, and have now highlighted this in the discussion.

Results; consider to add a figure or table showing your themes and sub-themes in the beginning of your result section (in relation to the subheading overview of themes). Please use the same sub-headings when presenting your results as described as broader themes at p 8-9.
Response: We felt that the themes (and sub themes) were clearly identified in the headers, without the use of a figure or table. We have, however, amended the text under 'overview of themes' sub header to maintain consistency in the language used to describe themes.

When you present your results, you sometimes write/refers to A-J (ambulance services) and sometimes not, please be consistent and write out the A-J every time instead of write 'some ambulance services' (i.e. p.9 line 14; p.9 line 33; p10 line 39).
Response: Yes, we agree that this was inconsistent. The manuscript has been amended, inserting service IDs, where appropriate. This has led to some minor re-writing within the sub-theme "skill-mix configuration"

In the beginning of the discussion, consider to make a statement answering your aim; organizational factors affecting non-conveyance was …. Regardless, this was just a suggestion, make the statement out of your selected aim and consider to adjust the title in accordance to the aim/statement.
Response: We have reflected on the reviewer's suggestion and feel that we identify, in the first sentence of the discussion, that there was variation in how non-conveyance was addressed in each ambulance service – the aim of the paper. It is difficult to encapsulate the variation in a single statement. Instead we break it down, in the discussion, covering the three themes we identify in the results section: 1) senior management commitment to non-conveyance 2) ambulance workforce 3)

the wider emergency and urgent care system. After considering an amendment to the manuscript title we have retained the original title as it encapsulates what we intended to do.

Finally, consider to add a patient perspective in your discussion, I mean it's the patients who may suffer when there are differences in the organization, the care in the ambulance service may not be equal.
Response: This is a good point and one that was raised by our PPI group. The focus of the funded study was to look at NHS staff views (and routine data). We recognise that the patient voice isn't included, and have always supported this as an important future piece of work. We suggest that future research could now look at how this variation may impact on patient, and carer, experience. We've added the following paragraph to the implications section: "The focus of this paper was to assess NHS workforce views. The variation we found in organisational approaches to non-conveyance may impact on patient and carer experience. Further research into understanding how variation in ambulance non-conveyance impacts on the patient/carer experience is desirable."

Reviewer: 2

Thank you for inviting me to review this interesting manuscript by Knowles et al.. It presents valuable evidence from a well conducted study by a respected group and would represent a timely publication. In the UK, for example, the Keogh Urgent and Emergency Care Review envisions that for the NHS to become sustainable, demand on acute services can be reduced by expediting the transformation of the ambulance service – from one where ambulances transport everyone to hospital, to one where they become mobile treatment centres, treating more patients at scene and where greater use is made of alternative care pathways. It has been clear for a while though that variation exists between regional ambulance services in their use of non-conveyance. The reasons for this have not been entirely clear. Thus, a clear understanding of the factors that facilitate and impede non-conveyance is required if the Keogh vision is to stand a chance of being realised. The results of this study contribute to our understanding of the factors that may account for the variation between regional services in England. The findings may also have relevance internationally as countries such as the USA, Australia, Canada and New Zealand have similarly organised emergency systems and are also seeking to understand how to reduce conveyance rates.

Knowles and colleagues present a qualitative study with a relatively large sample of interviewees (n=49) from 10 of the 11 regional ambulance services in England. From each regional service, the team aimed to interview an ambulance service manager, 2 paramedics (one with and one without advanced training) and a lead health care commissioner. Interviews were conducted by telephone and explored participants' views about what factors they believed affected non-conveyance within their region. The findings indicate that a number of factors may be important in influencing whether conveyance happens or not, beyond the clinical need of the patient themselves. Some factors are (to some extent) within the remit of the ambulance service themselves to change. Some factors though were not. Some of the factors identified by the participants – such as perceived organisational support, influence of response-time targets, decision-making confidence and availability of alternatives to ED – have been reported before either for conveyance in general by ambulance services or for specific conditions. Some factors have not though been so clearly articulated and represent novel findings. These include "motivation of senior management", workforce configuration and skill mix of those completing telephone assessments.

The authors have clearly identified the strengths and weaknesses of their study. I would though suggest the following minor revisions to make it the manuscript even stronger:

1- The order in which the sentences appear in the ‘Recruitment’ subsection of ‘Results’ could be changed to improve the flow. Rather than state how many interviews took place and then data on participant uptake, I would suggest first presenting participant uptake data and then how many of the planned interviews took place and whether the ‘recruitment target’ was achieved.
Response: Thanks. Yes, we agree and have amended the manuscript.

2- In line COREQ requirements, it would helpful to know a little more about the training of the person who did the interviews, including any relationship/ specialist knowledge they had with/ of the ambulance service.
Response: The interviewer has a background in health psychology, but no specialist knowledge or prior relationship with any ambulance service. We include this in the amended manuscript.

3- Please include a date range for when the interviews to place. This will allow the findings to be better contextualised.
Response: Interviews took place throughout 2015, with a minority taking place early in 2016. We include this in the amended manuscript.

4- To make it easier for the reader, I would suggest that the first paragraph on page 10 be split into two. The first would talk about the two services (C & F) in which there appeared to be high levels of motivation. It should then immediately be followed by the supportive quote which is currently on lines 17-23. The second paragraph would then talk Services A, D, E and G in which there was a contrasting position. It should be followed by the illustrative quote currently on lines 26-31.
Response: Thank you. Yes, it reads much better splitting the quotes. Manuscript amended.

5- It is interesting that national drivers for non-conveyance and the potential benefit or otherwise of non-conveyance to services users were not raised by interviewees as influencing factors on conveyance within the service. For example, no mention was made about the financial incentives for ambulance services for year on year reductions in conveyance rates (e.g., NHS England. Commissioning for Quality and Innovation (CQUIN) Indicator Specification 2017/18 - 2018/19. https://www.england.nhs.uk/wp-content/uploads/2018/06/cquin-indicator-specification-information-2018.pdf). Given these two factors form part of the case by which change is being looked to be brought about within the NHS it would interesting for the authors to reflect on why these factors were not identified by interviewees and what this may mean.
Response: Commissioners and managers did identify the need to have alignment around financial incentives for non-conveyance. However, there didn’t appear to be variation of this between ambulance services and therefore it is not presented in this paper of ‘variation’. Given that a large proportion of our sample were paramedics it may well be that the national landscape of financial incentives was less important to them than to managers and commissioners and they were therefore less likely to discuss this. We have added a short paragraph at the beginning to the ‘implications’ section to identify why national policy drivers did not feature in our findings.

6- On page 16, the authors begin to refer to how their findings relate to the findings from other projects. Importantly, they state “Our findings are similar to those identified in a national audit of ambulance non-conveyance in England which included analysis of quantitative data on processes and outcomes, and discussions with managers with each ambulance service.” The findings of this 2017 report should be made clearer to allow the reader to better interpret the issue of availability of alternative services that was felt by some interviewees to be important. The report referred to discusses a stocktake by NHS England of the urgent and emergency care system (https://www.nao.org.uk/wp-content/uploads/2017/01/NHS-Ambulance-Services.pdf). It importantly identified that the number of urgent care centres across England varied substantially between areas and that what these centres provided was not consistent.

Response: The NAO report's emphasis was on non-conveyance for ambulance services in general, unlike our focus on variation between services. We agree, that there are strong parallels, particularly with our 'wider system' findings, and have expanded the discussion of the NAO findings in the discussion.

7- On page 16 line 10, the authors state that "The study took a national focus and is one of the first studies of organisation perspectives of non-conveyance". They do not though provide references for the other studies. This would be helpful for the interested reader and permit the novelty of the study's findings to be better evaluated. On this point, I think it would appropriate to also acknowledge and cite the additional studies in the literature that have previously picked up on some of the issues reported by the interviewees. I.e.,
• Porter et al. 'Should I stay or should I go?' Deciding whether to go to hospital after a 999 call. J Health Serv Res Policy 2007;12(Suppl 1):S1-32–38.
• Porter et al. 'Covering our backs': ambulance crews' attitudes towards clinical documentation when emergency (999) patients are not conveyed to hospital. Emerg Med J 2008;25:292–5.
• Burrell et al. Decision-making by ambulance clinicians in London when managing patients with epilepsy: a qualitative study. Emerg Med J 2013;30:236–40.
• O'Hara R et al. A qualitative study of systemic influences on paramedic decision making: care transitions and patient safety. J Health Serv Res Policy 2015;20(1 Suppl):45–53.
• Noble et al. Qualitative study of paramedics' experiences of managing seizures: a national perspective from England. BMJ Open 2016;6:e014022.
• Price L. Treating the clock and not the patient: ambulance response times and risk. Qual Saf Health Care 2006;15:127–30.
Response: Thank you for highlighting these interesting, and appropriate, papers. We have included reference to a number of them in the discussion section and feel that these strengthen some of our points. We have recently had a paper published from the study, and also felt it should be referenced in the manuscript (see 'Implications').

8- The views of senior management were identified as having an important influence on conveyance practices within a service. As this is one of the particularly novel findings of the project greater details on this would be valuable. For example, when senior management is talked about, whom exactly are we talking about here in terms of the hierarchy of the ambulance service? It is a quite vague at present. Moreover, might the authors like to suggest potential avenues of action here for future studies? Indeed, why is it that some appear to have such differing views?
Response: We attempted to include as much detail regarding our definition of senior management without risk of exposing the identity of our participants. We identify in the sub section: "The qualitative interview study" that we sought the view of managers (both at director level, and at operational management level). Those staff at operational management level were most likely the lead for non-conveyance within that service. Providing this level of information in the paper would, most likely, identify these individuals. In terms of the second point as to why they have differing views we can only speculate….motivation to undertake non-conveyance may be driven by the culture of the organisation (either from the 'bottom' (ambulance workforce) or from the 'top' (director level). Senior managers may be influenced by this. Alternatively, it may be driven by local targets agreed with commissioners, or from the pressure of national targets (i.e. response times). We chose not to pay too much attention to this in the paper simply because it is speculation.

9- In outlining the advantages for non-conveyance, it is stated that non-conveyance is also valued by service users. I would suggest adding a caveat here since in reality there is limited evidence out there to support this position. We do not know how care preferences vary across different patient and carer groups. It is possible the picture on preference is much more complex than some have implied.
Response: We've amended the text to reduce the strength of the assertion that service users value NC.

10- There are a few typographic errors present (e.g., line 49 page 7; line 39 page 11).
Response: Thanks for pointing these out. We hope that we've addressed them.

**Please note that we have updated the reference list without the use of 'track changes**

**VERSION 2 – REVIEW**

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| **REVIEWER** | Veronica Lindström<br>Karolinska Institutet, Department of Neurobiology, Care Sciences and Society, division of nursing, Stockholm Sweden |
| **REVIEW RETURNED** | 08-Oct-2018 |

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| **GENERAL COMMENTS** | Thank you for the revised manuscript, overall the manuscript has improved significantly. I have no further comments / questions. |

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| **REVIEWER** | Adam J. Noble<br>University of Liverpool, UK. |
| **REVIEW RETURNED** | 09-Oct-2018 |

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| **GENERAL COMMENTS** | Thank you for asking me to re-review this manuscript. The authors have taken all points on board from the reviewers and the article is now much stronger. The paper will make an excellent contrbution to the literature and field and is particularly timely given the recent release of Lord Carter's Carter 2018 NHS Improvement report on the 'Operational productivity and performance of NHS Ambulance Trusts'. |