Author’s response to reviews

Title: Fitness to Practice sanctions in UK doctors are predicted by poor performance at MRCGP and MRCP(UK) assessments: data linkage study

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Author’s response to reviews:

There seems to be no way of uploading this as a Word file, so please ignore comments below about italics, etc.

Comments and response are in italics.

Dear Editor,

Thank you for the good news that this paper is now near to being accepted. We have made the few revisions requested (see below), and hope that the paper is now in its final state.

With thanks to the journal for its interest in and commitment to this research,

Chris McManus (on behalf of the co-authors)

Dear Prof. McManus,

Your manuscript "Fitness to Practice sanctions in UK doctors are predicted by poor performance at MRCGP and MRCP(UK) assessments: data linkage study" (BMED-D-18-00910R1) has been
assessed by our reviewers. Based on these reports, and my own assessment as Editor, I am pleased to inform you that it is potentially acceptable for publication in BMC Medicine, once you have carried out some essential revisions suggested by our reviewers.

Their reports, together with any other comments, are below. Please also take a moment to check our website at
https://bmed.editorialmanager.com/l.asp?i=183782&l=6PFQPTSH for any additional comments that were saved as attachments. Please note that as BMC Medicine has a policy of open peer review, you will be able to see the names of the reviewers.

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We request that a point-by-point response letter accompanies your revised manuscript. This letter must provide a detailed response to each reviewer/editorial point raised, describing what amendments have been made to the manuscript text and where these can be found (e.g. Methods section, line 12, page 5). If you disagree with any comments raised, please provide a detailed rebuttal to help explain and justify your decision.

Please also ensure that your revised manuscript conforms to the journal style, which can be found in the Instructions for Authors on the journal homepage.

A decision will be made once we have received your revised manuscript, which we expect by 02 Nov 2018.

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By resubmitting your manuscript you confirm that all author details on the revised version are correct, that all authors have agreed to authorship and order of authorship for this manuscript and that all authors have the appropriate permissions and rights to the reported data.

We look forward to receiving your revised manuscript and please do not hesitate to contact us if you have any questions.

Best wishes,

Anna Lopez Munoz, PhD

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Reviewer reports:

Reviewer #1: I thank the authors for their careful consideration of the initial round of comments, their detailed responses to this in their reply, and their subsequent detailed amending of the manuscript. I am very happy to recommend acceptance and have only a couple of very minor additional comments:
1. Bottom of page 6 - just because knowledge tests ('written') are auto-marked doesn't mean there is no potential for bias (what else, then, is evidence of DIF etc?). This little section could be made slightly more nuanced in this regard.

Response: We presume that this is referring to the sentence saying,

“Variation in FtP sanctions by sex, ethnicity and place of qualification is not immediately relevant to assessing the extent to which examination results predict FtP issues, since written examinations are marked independently of knowledge of sex, ethnicity or place of qualification (although all three show a relationship to examination performance [21]).”

We take the point that written examinations can of course be biased, if poorly constructed, and have added in a statement that in fact we have found minimal DIF in the MRCP Part 1 exam in relation to sex and ethnicity in UK graduates. However there is quite extensive DIF when UKMGs and IMGs are compared (see figure 3 of the 2014 BMC Med Ed paper [23]) but this need not represent bias, and is more likely to reflect differences in clinical experience (and hence IMGs no less about the immunology of typhoid but more about the clinical presentation of typhoid, both manifesting as DIF). We have added in a paragraph saying some of this:

“Variation in FtP sanctions by sex, ethnicity and place of qualification is not immediately relevant to assessing the extent to which examination results predict FtP issues, since written examinations are marked independently of knowledge of sex, ethnicity or place of qualification (although all three show a relationship to examination performance [21]). However our analyses of the relationship of FtP sanctions and performance on written and clinical examinations separately within groups based on sex, ethnicity and place of qualification, will show that confounding cannot explain the association that we find. Machine-marked knowledge assessments can show Differential Item Functioning (DIF), whereby item performance relates to sex or ethnicity, and analyses of MRCP(UK) Part 1 suggests that differential item performance in UK graduates in relation to sex or ethnicity is extremely rare [27]. In contrast, DIF does occur when UK and non-UK graduates are compared [23], but probably relates to differential training and clinical experience.”

We hope that is sufficiently nuanced.
2. The detail on page 7 regarding odds ratios - is this really needed - maybe hive off to an online appendix? It is unreasonable for the authors to have to 'teach' the methodology in such detail.

Response: We included this section at the previous revision because of some of the comments of one of the other reviewers. We agree that some of it is relatively elementary (at least for sophisticated medical educationalists), but it is relevant to the issue of what is and what is not linear in a logistic regression. The bounding of probabilities by 0 and 1 almost forces many relationships to be curvilinear, albeit not in an interesting way. Likewise we are dealing with a ‘raw disease’ situation here, which is less commonly met in education, and it did seem worth unpacking quite what is going on, with curvilinearity once more being inevitable on a probability scale. So we would see this paragraph not as ‘teaching’ but as ‘explicating’ in a context which is not entirely typical of logistic regression. We hope the reviewer agrees.

3. Top of page 9 - just for the benefit of those who struggle with the detailed statistical evidence, could it be spelled out that the AUC in a particular direction means one that the CSA is a better predictor than the AKT etc?

Response: That was mentioned in passing at the top of page 7 in statistical methods, but we have added a clause into page 9 where the AUCs are discussed, which says, “showing that the CSA better predicts ESCUW than does AKT” and later a sentence saying that, “PACES is therefore a better predictor of ESCUW than either Part 1 or Part 2.” We hope that clarifies things.

4. The Discussion is quite long now - I think the deeper theorisation of the 'linearity' issue is very welcome, but I wonder if a few (2 or 3) sub-headings might help the reader through it a bit?

Response. This is a good suggestion and we have now added sub-headings within the discussion which we hope clarifies things a little.

(ref 32) Reviewer #3: The authors seem to have addressed my initial comments. I noted one typo: "IMGGs" in the first paragraph of discussion. Presume this is meant to be 'IMGs'.

Response: Sorry about that; yes, corrected to IMGs.
Also, I prefer the use of confidence intervals around ORs rather than SEs- the SEs are probably unnecessary now in the Tables if the 95% CIs are shown.

Response: We wondered about this as in tables 2 and 3 the SE is for the log(odds ratio) whereas the 95% CIs are for the odds ratios, and therefore are slightly different. However we agree that one can be calculated from the other, and therefore have removed the SEs as suggested.

Other minor changes:

1. We have corrected the funding information the recipient being not Richard Wakeford but Chris McManus

2. We have added in a reference to the very recent book by Major and Machin (ref 32), in the context of the good-enough model and the use of random lotteries above a certain threshold.

3. The font in the tables is now entirely monochrome as we realised that BMC does not like the use of coloured text in tables.

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