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# A systematic map and review of changes to peer review to help build the evidence base for peer review innovations

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# Aims of the systematic map & review

To map and summarise current evidence about peer review innovations

Scope:
Peer review of health applications for funding

Exclusions:

- Outside health care
- Peer review of articles etc.
- No empirical data in report

# Model of peer review process and potential innovations

# Some potential metrics for judging peer review innovations

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Potential review **quality** metrics:

- Consistency in report scores (?)
- Completeness of report
- Perceived report quality: to Board, to applicant
- Accuracy at predicting Board decision, project success, project impact
- Resistance to bias against specific methods, applicants, organisations, innovative proposals

# Some potential metrics for judging peer review innovations

Potential review **efficiency** metrics:

- Funder effort or costs per completed report
- Report return rate
- Median time taken to return report
- Percent of reports contributing useful information to Board decision

# Systematic map of peer review studies

1824 references screened, 83 studies included:

- 50% from USA
- 50% other (mainly Australia, Canada & Europe)

Study types:

- 61% observational
- 31% surveys, interviews or focus groups
- Only 7% were experimental evaluations

# Systematic map of peer review studies

Range of peer review innovations studied:
- Scoring /ranking approaches (12%)
- Alternative reviewer configurations (12%)
- Identifying peer reviewers (7%)
- Involvement of patients/public (6%)
- Simplified or accelerated peer review (6%)
- Incentives for peer reviewers (1%)
- Methods to improve peer reviewer response rates (0%)

Measures and metrics studied:
- Stakeholder opinions (30%)
- Ability of peer review to identify successful research (22%)
- Bias in peer review (20%)
- Consistency in review scoring/judgements between reviewers (18%)
- Other (22%)

# Systematic review of studies

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**Focus on 8 studies on efficiency and effectiveness (Australia, Canada, USA)**

**Results:**

- Shortened proposals / simplified processes (3 studies): reduced overall PR time; variable reliability between approaches; some cost savings
- "Virtual PR" - videoconferencing / teleconferencing (2 studies): similar outcomes to face-to-face meetings & can result in time and cost savings. But some disadvantages
- Delphi-type consensus approach (1 study): promising for selecting innovative proposals in a specialist area
- Training video (1 study) improves reviewers' accuracy in scoring proposals
- Involvement of patients and care-giving stakeholders alongside scientists (1 study): beneficial to overall perspective of PR

**Overall conclusions:** Some promising PR innovations are available, but limited detail on results; poor quality evidence; heterogeneity; variable generalisability to NIHR

# Conclusions and recommendations

- Shorter proposals and virtual peer review meetings offer promise in speeding up peer review and reducing costs; considerable uncertainty remains on how this impacts quality and effectiveness of peer review
- More robust studies of efficiency and effectiveness are needed, comparing a wider range of innovations
- Study methods and settings were poorly reported in all eight studies, hindering assessment of generalisability
- We recommend that peer review innovations should be described more comprehensively and evaluated more rigorously

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# An evaluation of NIHR peer review processes

Ms Helen Payne
Dr Sheila Turner
Also: A Bull, F Chinnery, E Guegan, J Hinks, J Lathlean, N McArdle, B Moran, L Worswick, J Wyatt

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# Process evaluation with NIHR stakeholders

- Stakeholder views: research funding applicants, peer reviewers, funding board members, secretariat staff
- Opinions on:
  - current peer review process at NIHR (external to board meeting)
  - potential changes or innovations which could help to determine what an alternative or improved peer review system might look like
- Thematic template method to analyse and summarise data
- Interviewees were supportive of the need for peer review
- Generally felt current processes were working well

# Suggestions for changes:

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**Reduce the time commitment and volume of paperwork:**
Ask reviewers to comment on - **importance** of study; - **strengths and weaknesses** of application; - and "**fixable flaws**".
And only from within their area of expertise.

- "I do wonder about … asking reviewers to focus on particular areas… if I knew what NIHR were looking to me for, I can … focus on the bit you've asked me to look at. That would be helpful as it would be less daunting in [terms of] the potential workload." (Reviewer)

- "Simple approach, 2-3 key questions to respond to: i."Importance of study", ii."methodological quality/research methods", iii."strengths and weaknesses of proposal." (Board member)

- "Process should allow for separating out major problems from fixable flaws…. particularly important in commissioned stream." (Board member)

# Suggestions for changes:

**Reduce time commitment and volume of paperwork** - Develop a **more proportionate process** with the number of reviewers reflecting the cost and content of an application

- "[Ask] fewer more highly selected reviewers … people with selected experience so they have a good grasp of what is important and what is not."(Applicant)
- "We always have at least 3, usually 5, sometimes more. It's not fair if only a couple. Whilst 3 is a good number, 5 is not particularly useful … An ideal number depends on what they say and how extensive it is; if it's all the same [this is not necessarily] a major advantage for people on the panel. If reviews are brief then 3 is not enough." (Board member)
- It is difficult trying to balance all of this information … and Board members can be swamped with overwhelming amounts of info." (Board member)

# Suggestions for changes:

**Give reviewers more feedback, guidance and training**

- "It feels that it is left down to reviewer as to the extent of what they look at… and what reviewers feel they are there to do." (Board member)
- "[It would] be quite useful to get specific feedback to see if … the review is useful, so I can pitch it [the next review] at the right level." (Reviewer)
- "I never had any training on how to peer review grants. Maybe if you offered a day where people came … and learnt how to be good peer reviewers then they might be more confident to say yes when they're asked … I'd like to hear from a chair on an NIHR panel: what makes a really useful review." (Reviewer)

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# Evaluating the quality of review reports: Comparing reviewer and board scores

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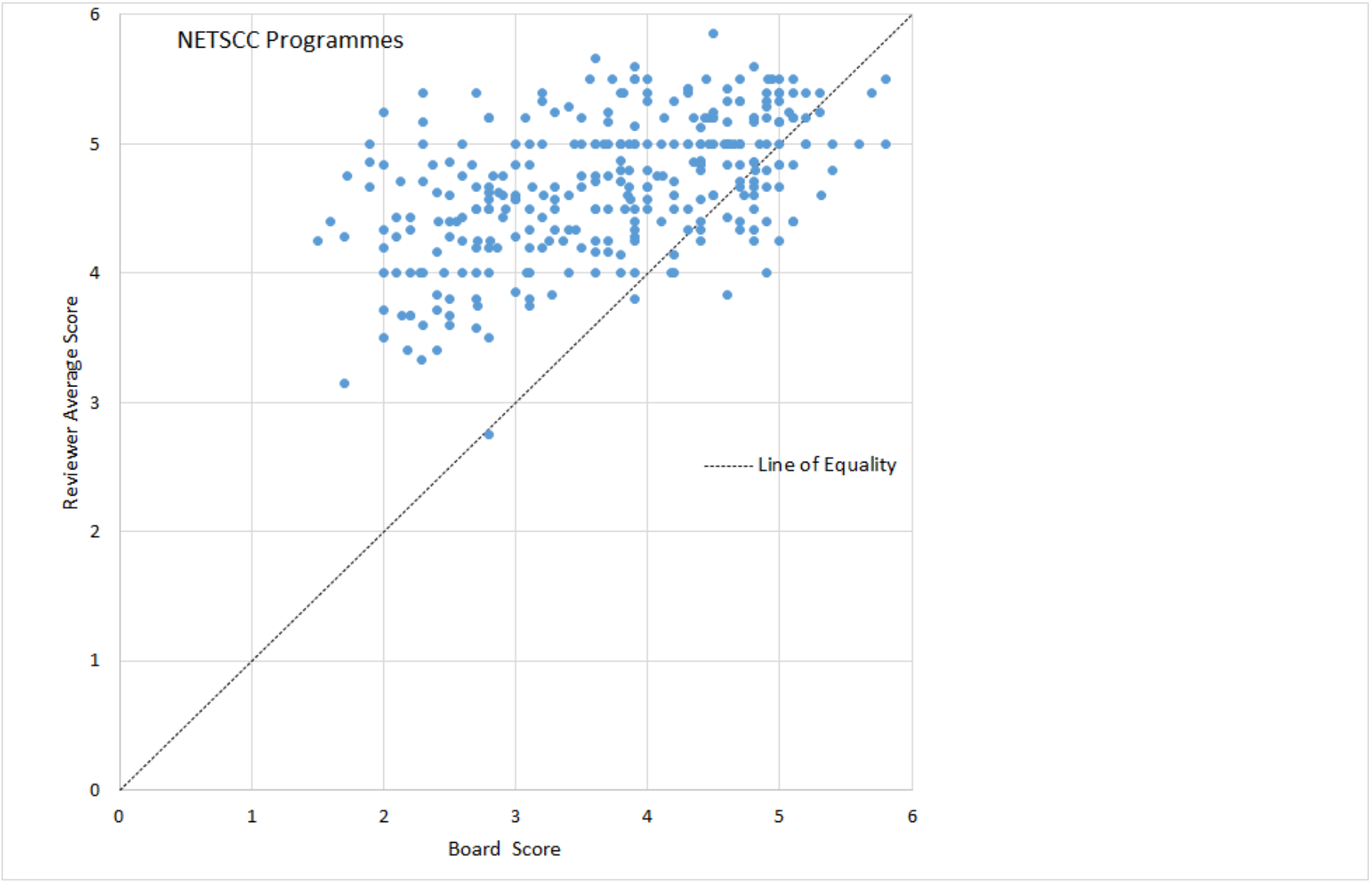
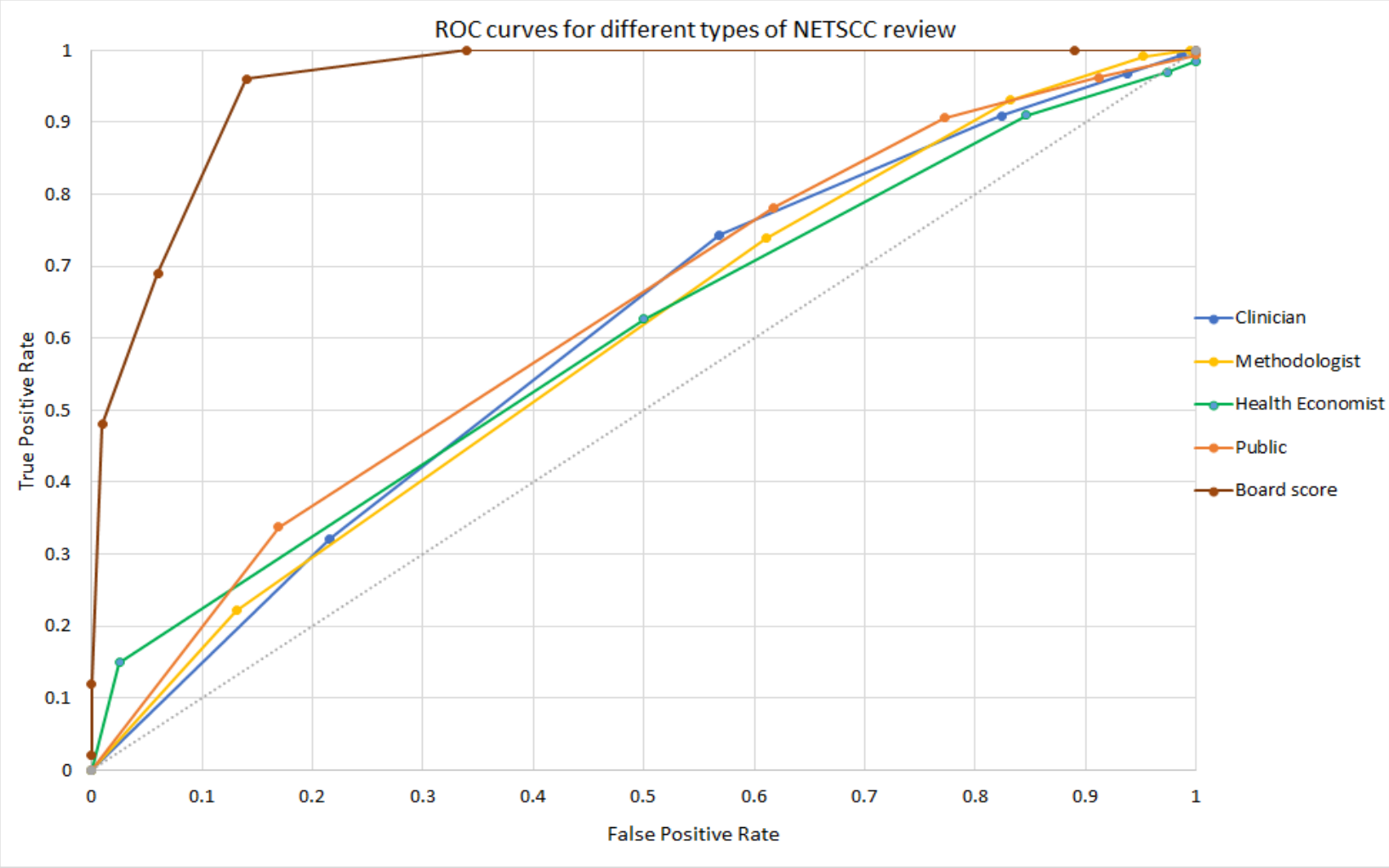
# Plot of mean reviewer vs. Board scores



# Culture differences in peer review



# Reviewer and board scores – conclusions

- Overall, no clear boundary between scores which result in funding and those that are rejected
- Limitations to this analysis: reviewer usually scores one proposal, Board members compare multiple proposals and aim for consistency; Board considers reviewer comments and score
- Board scores are excellent predictor of outcome; average reviewer scores are only a fair predictor
- Influence of reviewer scores is fair and similar from 4 to 7+ reviews - suggesting sometimes 4 reviews may suffice