Reviewer’s report

Title: A systematic review of the effects of care provided with and without diagnostic clinical prediction rules

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Reviewer: Matthew Thompson

Reviewer's report:

THis is an excellent systematic review from a highly experienced team. The focus of this article is a review of current evidence of the effects of clinical prediction rules on patient centered outcomes and clinical outcomes. This is a timely and useful article, and contributes to our understanding of the general lack of impact or evidence for impact for most clinical prediction rules, and suggests an urgent need to re evaluate our methods and approach in this field of diagnostic research.

Introduction - this is fine, and the authors make the case appropriately. One recent paper to consider citing that might add to their argument is: IEEE J Transl Eng Health Med. 2016 Jun 13;4:2800208. doi: 10.1109/JTEHM.2016.2570222. eCollection 2016. More Than Just Accuracy: A Novel Method to Incorporate Multiple Test Attributes in Evaluating Diagnostic Tests Including Point of Care Tests.

Methods - these are good. My only comment is whether the inclusion only of RCTs is too restrictive? THey found in the end only 27 trials which is a surprisingly small number. It would be interesting to see whether expanding study design to controlled clinical studies and other designs, albeit less rigorous than RCTs, would produce a much larger body of literature. The small number of trials suggests that RCTs of CPRs are perhaps difficult to perform/fund/undertake in clinical practice, which I would concur with, particularly for conditions with potentially serious outcomes such as serious infection in children, or acute appendicitis. Therefore I wonder if their restriction to RCTs is justifiable? However, the methods they used to find, appraise and synthesize the trials were excellent, so this is perhaps a commentary point.

Discussion - I have little to add to the detailed discussion. The authors discuss at length the implications of their findings appropriately, and call into question our current methods and approach to evaluation of CPRs in clinical research. In particular they note the lack of evidence for impact of CPRs across the wide range of conditions they identified, and the lack of data on patient centered outcomes. It would be interesting to speculate on whether the current approach researchers have used (as the authors note, deriving more and more CPRs and limited validation and limited impact assessment) should be radically changed - what exactly has been the benefit to clinicians, and policy makers of the considerable investment on research on CPRs with so few
implemented worldwide? On the other hand, one might argue that for other diagnostic tests, eg new biomarkers or other lab tests, the typical standard is to demonstrate comparative accuracy to existing tests (and perhaps some other advantage eg cheaper/more acceptable etc), and that is considered sufficient for implementation. Is it reasonable to expect CPRs to not only show comparative accuracy to some other diagnostic test/process, but then also show impact on clinical or patient centered outcomes? Based on the findings of this review, clearly this does not happen, suggesting these different standards have impacted adoptions of CPRs

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