Reviewer’s report

**Title:** Individualised prediction of psychosis in individuals with at risk mental states (ARMS): protocol for a systematic review of clinical prediction models

**Version:** 0  **Date:** 16 Jul 2019

**Reviewer:** Ryan Ng

**Reviewer's report:**

**Summary**
The manuscript describes a protocol for a systematic review that summarizes and assesses the quality of prognostic models that predict the transition to psychosis within one year among individuals meeting the At Risk Mental State (ARMS) criteria. The importance of accurately predicting transition to psychosis for high-risk individuals is described as important to prevent unnecessary treatment and reduce costs. While the proposed methods are well-described, their relevance is hard to contextualize without a specific question in which the systematic review is trying to address.

**Major comments**
1. The purpose of the systematic review is generally described, but there is a lack of clarity on what specific question that review is trying to answer. The authors need to frame their question following the PICOTS. This would make it easier to assess the search strategy.
2. Context around the patient population being assessed with the ARMS criteria is needed. It is unclear why it is necessary to examine tools being administered after the ARMS criteria versus other tools that are similar to the ARMs criteria and may be used to assess initial diagnosis. There may be tools comparable to the ARMS criteria that have better predictive accuracy. This comment would be addressed in part by providing a specific question regarding what the systematic review is answering (Major comment #1).
3. Based on the background, it appears as if the ARMS criteria have been validated. This model provides a baseline as regarding the predictive accuracy of transition to psychosis. The authors should consider including this in the systematic review; if not, a justification as to why it is not included is needed and details of its predictive accuracy should also be provided.
4. Why is 12 months considered the primary outcome? The predictive accuracy of the models may change depending on when the prognostic model is administered relative to the initial ARMS criteria assessment.
5. Hand searches of previous psychosis transition systematic reviews and meta-analyses are described. Have any of these reviews summarized prognostic models? If so, this should be acknowledged and the current proposal should describe why this systematic review is necessary or adds value beyond the existing models.
6. Please justify the data extraction strategy of using a primary abstractor. What is the size of the second subset of studies and will disagreements be checked in the second subset?
7. How will updated models of the same prognostic models be considered in the meta-analyses?
8. The discussion describes the importance of the review in identifying prognostic factors that are
important and have consistent prognostic value; however, the methods do not describe how important factors will be identified. Please describe in the methods how a prognostic factor will be judged as being important and/or consistent?

Minor comments
1. Author should consider describing the ARMS criteria in a Box in the Background section.
2. There is a typo in Patient group in the Methods section: "The review will include individuals …"
3. It is unclear whether the prognostic tools of interest are predicting first episode of psychosis or recurring episode.
4. The term prognostic model is used throughout the protocol. This implies examining survival analysis-based prediction models. Will you be including models build using logistic regression, and if so, how will you compare them to the survival models?
5. Which reference management software will be used?
6. How will the extraction form be piloted?
7. Will information on missing data be collected with the extraction tool?

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