Abridged QUADAS criteria for appraisal of diagnostic test studies

This scale was adapted from the original Cochrane list of study quality items by the University of Pennsylvania Health System Center for Evidence-based Practice. The Cochrane instrument is in turn derived from the original QUADAS standards. Our criteria further streamlines the Cochrane list for use in rapid systematic reviews.

The items are designed to be answered as "Yes" or "No," and a "No" answer implies a possible threat to validity of the study results. CEP discourages calculation of a numeric score to summarize study quality, and recommends instead that the results be presented in a table that visually maps the characteristics of the evidence base as a whole.

1. Were the patients included in the study representative of the patients who will receive the test in practice? (spectrum bias)
2. Is the reference standard a reasonable gold standard? (reference standard)
3. Did the entire study population or a randomly selected subset receive the reference test? (partial verification bias)
4. Did all patients receive the same reference test? (differential verification bias)
5. Was the reference test independent of the study test? (incorporation bias)
6. Were the reference test results interpreted independently of the study test? (reference test blinded)
7. Were the study test results interpreted independently of the reference test? (study test blinded)
8. Were the clinical data available to the study test interpreter comparable to clinical data available in practice? (interpretation bias)
9. Were withdrawals from the study explained and not excessive? (attrition bias)
10. Are funding sources disclosed and the authors free of obvious conflicts of interest?

The Cochrane methods workgroup encourages review authors to consider other aspects of the quality of diagnostic test evaluations, because appraisal of diagnostic tests is complex and a short appraisal instrument, while efficient, cannot address all the potential threats to validity of study results. CEP analysts should be alert for other potential sources of bias as they review studies, and should call attention to weaknesses in study design or execution that are not already included in the nine domains. The STARD checklist is a fairly comprehensive source of additional items to consider in evaluating a diagnostic study, for those who are unfamiliar with the assessment of diagnostic tests.. The analyst may use a footnote to the table to call out problems that are of particular concern.

The Cochrane list is optimized for the typical assessment of a diagnostic test where both test results and outcomes are dichotomized and the study test is compared to a gold standard test or clinical diagnosis. Some domains of the scale such as interpretation bias are not applicable to tests being used for risk prediction. In that case, the affected domains should be marked "N."

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Sample diagnostic test appraisal table

Domain	Study A	Study B	Study C
1. Spectrum bias avoided	Y	Y	N
2. Reference standard appropriate	Y	Y	Y
3. Partial verification avoided	Y	Y	Y
4. Differential verification avoided	N	N	N
5. Incorporation bias avoided	Y	Y	N
6. Reference test blinded	Y	Y	Y
7. Study test blinded	Y	Y	Y
8. Interpretation bias avoided	N	Y	Y
9. Attrition bias avoided	Y	Y	N
10. Funding source disclosed	N	Y	N
Other risks of bias	–	–	†

Other risks of bias:
†–Study C: study images were interpreted by two readers working by consensus.

References

Cochrane: Reitsma JB, Rutjes AWS, Whiting P, Vlassov VV, Leeflang MMG, Deeks JJ,. Chapter 9: Assessing methodological quality. In: Deeks JJ, Bossuyt PM, Gatsonis C (editors), Cochrane Handbook for Systematic Reviews of Diagnostic Test Accuracy Version 1.0.0. The Cochrane Collaboration, 2009. Available from: http://srdta.cochrane.org/.

QUADAS (original version): Whiting P, Rutjes AWS, Reitsma JB, Bossuyt PMM, Kleijnen J. The development of QUADAS: a tool for the quality assessment of studies of diagnostic accuracy included in systematic reviews. BMC Medical Research Methodology. 2003;3(1):25.

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