PROBAST

Prediction model risk of bias assessment tool

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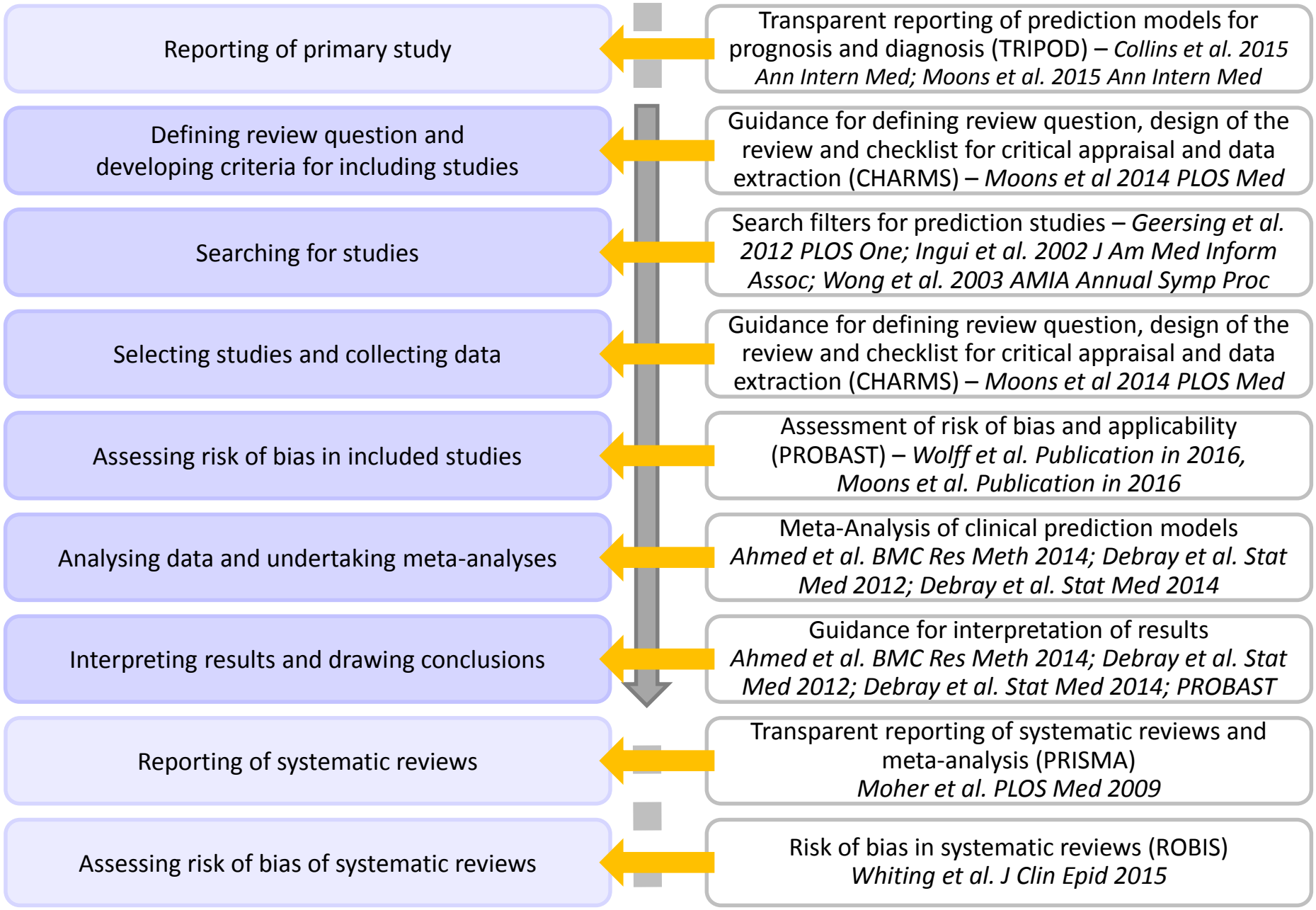
I have no actual or potential conflict of interest in relation to this presentation.

Conducting systematic reviews of prediction modelling studies



Which prediction studies?

Predictive factor studies - which predictors contribute to prediction of particular prognostic/diagnostic outcome – often using multivariable modelling – aim not to develop prediction model for individualised predictions

QUIPS 2 – assessing bias in studies of prognostic factors (Hayden et al. 2013 Ann Intern Med)

Model development studies – to develop prediction model(s) from data at hand: identify important predictors; estimate multivariable predictor weights; construct model for individualised predictions; quantify predictive performance in development set; internal validation.

PROBAST

(Diagnostic and prognostic models)

Model validation studies – test (validate) predictive performance of previously developed model in participant data other than development set – sometimes combined in development study – sometimes followed by updating/revision model

Model impact studies – quantify effect/impact actually using model on participant/physician behaviour and management, on health outcomes or cost-effectiveness of care – relative to not using the model → comparative studies.

Comparative, intervention studies – different risk assessment → Cochrane Risk of Bias tool

Bouwmeester et al. PLoS Med 2012

Development and structure of PROBAST

Development:

- Delphi procedure with 42 panel members
- Seven rounds
- Seven steering group members from six institutions
- Feedback from piloting

Structure:

- Assessment of risk of bias and applicability
- Follows QUADAS-2, ROBIS, ACROBAT-NRS and new Cochrane ROB
- Five domains

PROBAST: Five domains

Domain 1: Participant selection

Domain 2: Predictors

Domain 3: Outcome

Domain 4: Sample size and participant flow

Domain 5: Analysis

DOMAIN 1: Participant selection			
A. Risk of Bias			
Describe the sources of data and criteria for participant selection:			
		Dev	Val
1. Were appropriate data sources used, e.g. cohort, RCT or nested case-control study data?			
2. Were all inclusions and exclusions of participants appropriate?			
3. Were participants enrolled at a similar state of health, *or* were predictors considered to account for differences?			
Risk of bias introduced by selection of participants	**RISK:** *(low/ high/ unclear)*		
Justification of bias rating:			
B. Applicability			
Describe included participants, setting and dates:			
Concern that the included participants and setting do not match the review question	**CONCERN:** *(low/ high/ unclear)*		
Justification of applicability rating:			

PROBAST group

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Patrick Bossuyt, University of Amsterdam
Gary Collins, University of Oxford
Nancy Cook, Harvard University
Gennaro D´Amico, Ospedale V Cervello
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Jon Deeks, University of Birmingham
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Frank Harrell, Vanderbilt University
Jill Hayden, Dalhousie University
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* denotes steering group members

More on prognostic research

1.	Workshop 15	**CHARMS checklist**	Sunday, 16.00-17.30
2.	Workshop 39	**QUIPS tool**	Monday, 14.00-15.30
3.	Workshop 57	**PROBAST tool**	Monday, 16.00-17.30
4.	Workshop 73	**Meta-analysis**	Tuesday, 11.00-12.30
5.	Oral session 12	**Prediction models**	Wednesday, 11.00-12.30
6.	Workshop 91	**Prognostic GRADE**	Wednesday, 14.00-15.30