

**COFFEE**



**LECTURE**

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# Unveiling bias: going beyond study types



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Research support services  
Medical Library

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13:00, Zoom

# Context

## Evidence synthesis

All systematic reviews require risk of bias assessment be formally done of the included studies so that users of such research are cognizant of how much the results can be trusted.

**Risk of bias assessment** concerns about the implications of the methodological safeguards in the study results

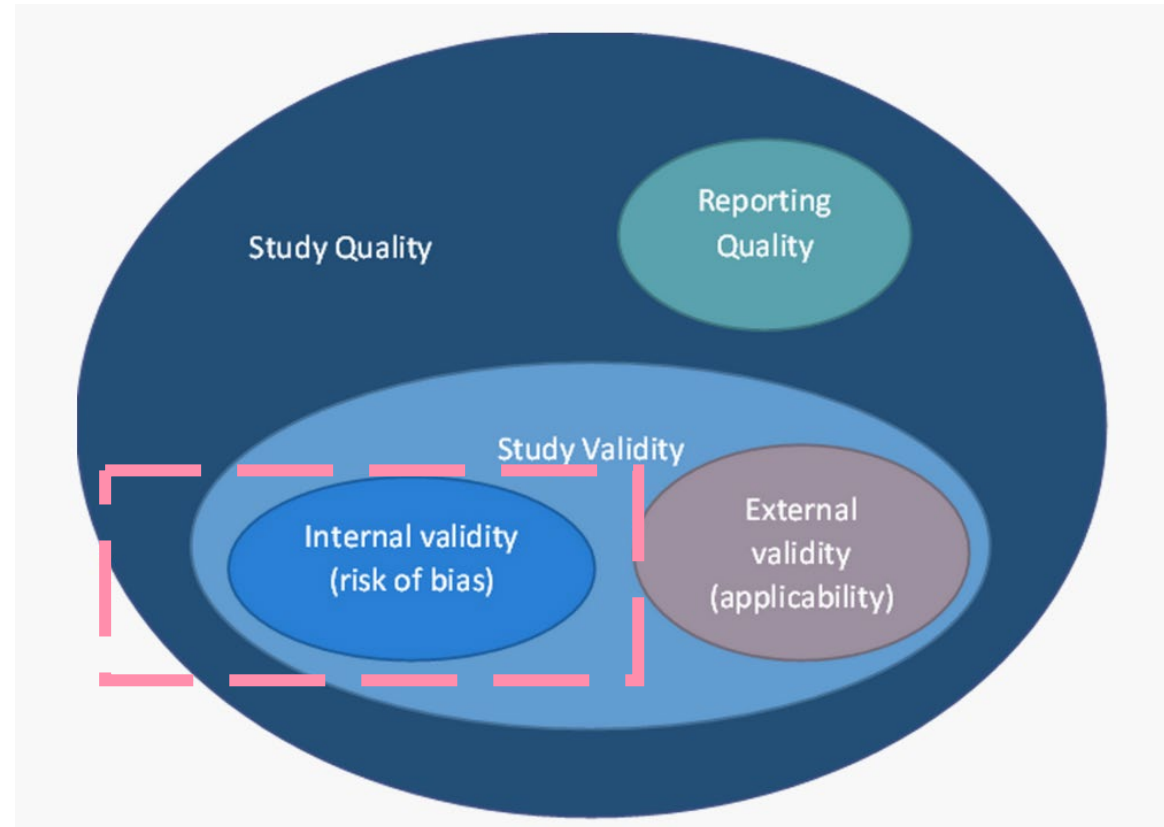
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## Key tools



### 1. Focuses on risk of bias



# Key tools



1. Focuses on risk of bias
2. Offers a method to reach either a domain specific or overall assessment of risk of bias
3. Used in at least one review that none of the tool authors were co-authors
4. Tool development involving a range of stakeholders from different disciplines (e.g. methodologists, statisticians, clinicians)
5. Avoids recommending use of summary numerical quality scores

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## Validity assessment tools for evidence synthesis: your one-stop-shop

Search for tools

Search

Filter by Study Design



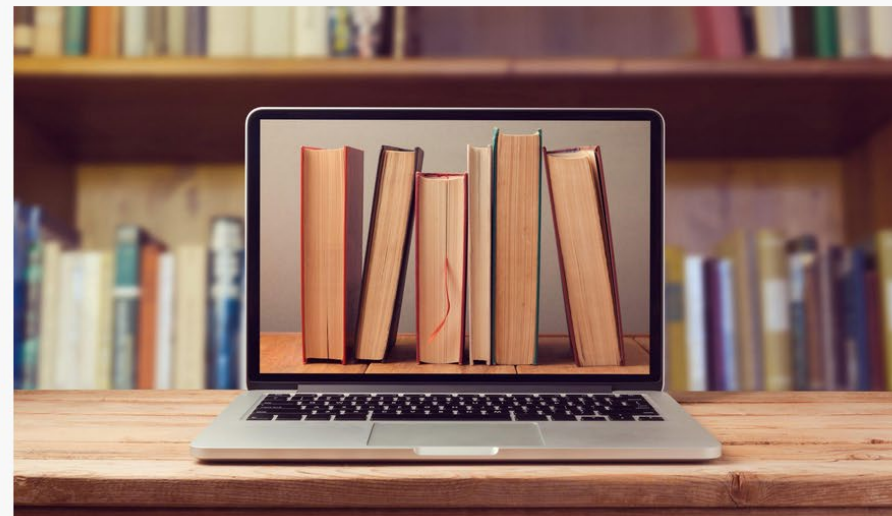
Library



Training resources



Suggest or register a tool



### LATITUDES key tools

Systematic Reviews	<a href="#">ROBIS</a>
RCTs	<a href="#">RoB 2</a>
Cohort studies (interventions)	<a href="#">ROBINS-I</a>
Cohort studies (exposures)	<a href="#">ROBINS-E</a>
Diagnostic accuracy studies	<a href="#">QUADAS-2</a> <a href="#">QUADAS-C</a>
Prognostic accuracy studies	<a href="#">QUAPAS</a>
Prediction models	<a href="#">PROBAST</a>
Reliability studies	<a href="#">COSMIN</a>

<https://www.latitudes-network.org/>

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## Validity assessment tools for evidence synthesis: your one-stop-shop

Search for tools Search Filter by Study Design ▾

### Welcome to the LATITUDES Library of validity assessment tools

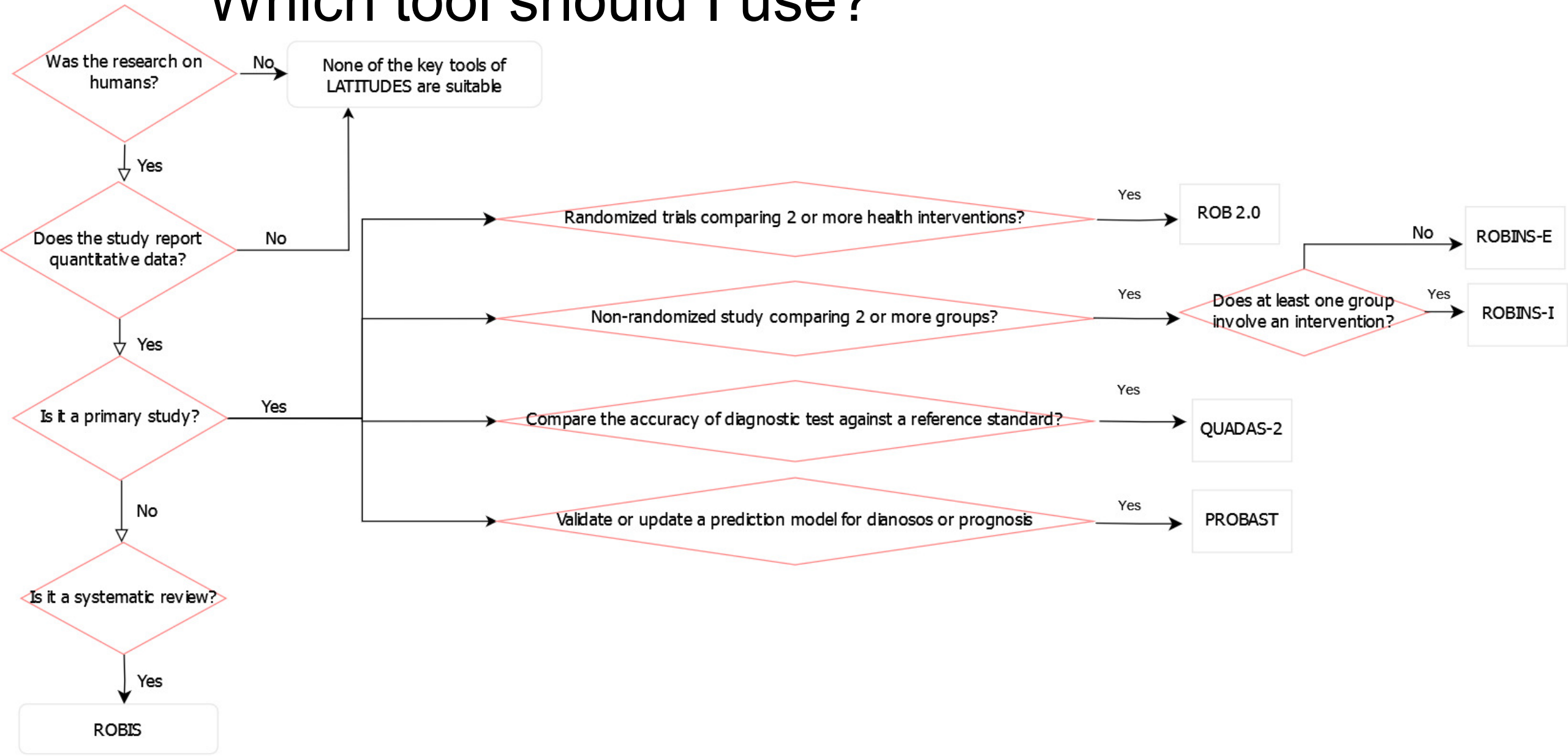
Find validity assessment tools Cohort studies ▾ [Reset](#)

Tool name	Study types
 <a href="#">ROBINS-E</a>	Cohort studies
 <a href="#">ROBINS-I</a>	Cohort studies
<a href="#">Newcastle-Ottawa Cohort</a>	Cohort studies

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# Which tool should I use?



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# ROBIS

## Assessing the **Risk Of Bias** in *Systematic reviews*

- Interventions
- Diagnosis
- Prognosis
- Etiology

### Phase 1

Assess Relevance  
(Research question  
- review)

	Phase 2				Phase 3
	1. Study eligibility criteria	2. Identification and selection of studies	3. Data collection and study appraisal	4. Synthesis and findings	Risk of bias in the review
Signaling questions	1.1 Did the review adhere to predefined objectives and eligibility criteria?	2.1 Did the search include an appropriate range of databases/ electronic sources for published and unpublished reports?	3.1. Were efforts made to minimize error in data collection?	4.1. Did the synthesis include all studies that it should?	4. Did the interpretation of findings address all of the concerns identified in domains 1 to 4?
Judgment	Concerns regarding specification of study eligibility criteria	Concerns regarding methods used to identify and/or select studies	Concerns regarding methods used to collect data and appraise studies	Concerns regarding the synthesis	Risk of bias in the review



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## ROB 2.0

### Risk of Bias in randomized trials

The tool is structured into **five domains** (signalling questions) through which bias might be introduced into the result:

1. Randomization process
2. Deviations from intended interventions
3. Missing outcome data
4. Measurement of the outcome
5. Selection of the reported result

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# ROBINS-I

## Risk Of Bias In Non-randomized Studies - of Interventions

Comprises **seven domains** for assessing bias in Non-Randomized Studies of Interventions (NRSI)

Pre-Intervention	At intervention	Post-intervention
1. Confounding 2. Selection of participants	3. <i>Classification of interventions</i>	4. Deviations from intended interventions 5. Missing data 6. Measurement of outcomes 7. Reported results

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## ROBINS-E

# Risk Of Bias In Non-randomized Studies - of Exposures

Seven domains of bias:

1. Confounding
2. *Measurement of the exposure*
3. Selection of participants into the study (or into the analysis)
4. Post-exposure interventions
5. Missing data
6. Measurement of the outcome
7. Selection of the reported result

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## QUADAS-2

### Risk of bias and Applicability Of Primary Diagnostic Accuracy Studies

QUADAS-2, consists of **four domains** (signalling questions)

1. Patient selection
2. Index test
3. Reference standard
4. Flow and timing

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# PROBAST

## Prediction Model Risk Of Bias Assessment Tool

Four domains with signalling questions:

1. Participants
2. Predictors
3. Outcome
4. Analysis

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## Other sources

Analytical Cross Sectional Studies	+
Case Control Studies	+
Case Reports	+
Case Series	+
Cohort Studies	+
Diagnostic Test Accuracy Studies	+
Economic Evaluations	+
Prevalence Studies	+
Qualitative Research	+
Quasi-Experimental Studies	+
Randomized Controlled Trials	+
Systematic Reviews	+
Textual Evidence: Expert Opinion	+
Textual Evidence: Narrative	+
Textual Evidence: Policy	+

<a href="#">SYRCLE RoB tool</a>	Animal studies
<a href="#">SANRA</a>	General reviews
<a href="#">RTI item bank – bias and precision</a>	Observational studies (mixed designs)
<a href="#">Prompts for appraising qualitative research</a>	Qualitative studies
<a href="#">Newcastle-Ottawa Cohort</a>	Cohort studies
<a href="#">Evidence Project risk of bias tool</a>	Non-randomised studies of interventions   Randomized controlled trials (RCT)
<a href="#">Drummond Checklist</a>	Economic evaluations
<a href="#">Downs &amp; Black Tool</a>	Observational studies (mixed designs)   Randomized controlled trials (RCT)
<a href="#">CHEC List</a>	Economic evaluations
<a href="#">AXIS tool</a>	Cross-sectional studies
<a href="#">Arrive</a>	Diagnostic test accuracy (DTA) studies
<a href="#">EPHPP tool for quantitative studies</a>	Observational studies (mixed designs)
<a href="#">RCT-PQRSS</a>	Randomized controlled trials (RCT)
<a href="#">Boutron</a>	Randomized controlled trials (RCT)

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## Conclusions

The right tool choice is crucial, and awareness of its limitations is essential. Especially if it's not explicitly designed for risk of bias assessment.

Latitudes Network provides helpful resources for risk of bias assessment tools.

All tools will guide you over three main topics

Selection bias

Information bias

Confounding

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# Literature

Latitudes Network. <https://www.latitudes-network.org/> [Consulted October 2023]

Ma LL, Wang YY, Yang ZH, Huang D, Weng H, Zeng XT. Methodological quality (risk of bias) assessment tools for primary and secondary medical studies: what are they and which is better?. *Military Medical Research*. 2020 Dec;7:1-1.

Furuya-Kanamori L, Xu C, Hasan SS, Doi SA. Quality versus risk-of-bias assessment in clinical research. *Journal of clinical epidemiology*. 2021 Jan 1;129:172-5.



# Thanks



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# Next Coffee Lectures, slides and screencasts:



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## Questions & Discussion

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