

DIAGNOSTIC ERROR

A patient safety challenge

NAM workshop, April 23, 2021

Laura Zwaan, PhD

@laurazwaan81 

Erasmus MC
University Medical Center Rotterdam



The burden of diagnostic errors

- 10-15% of the diagnoses are not entirely correct ¹
- Highly preventable ²
- High mortality rates ^{2,3}
- Prevalent in malpractice claims ³



1. Berner & Graber, Am J Med, 2008
2. Zwaan et al. Arch Intern Med, 2010
3. Bishop et al. JAMA, 2011

Patient Safety Priority

National Academy of Medicine
Report



Diagnostic Errors on
WHO high priority list



ECRI: Diagnostic Errors Tops
List of Patient Safety Concerns



Complexity of the diagnostic process

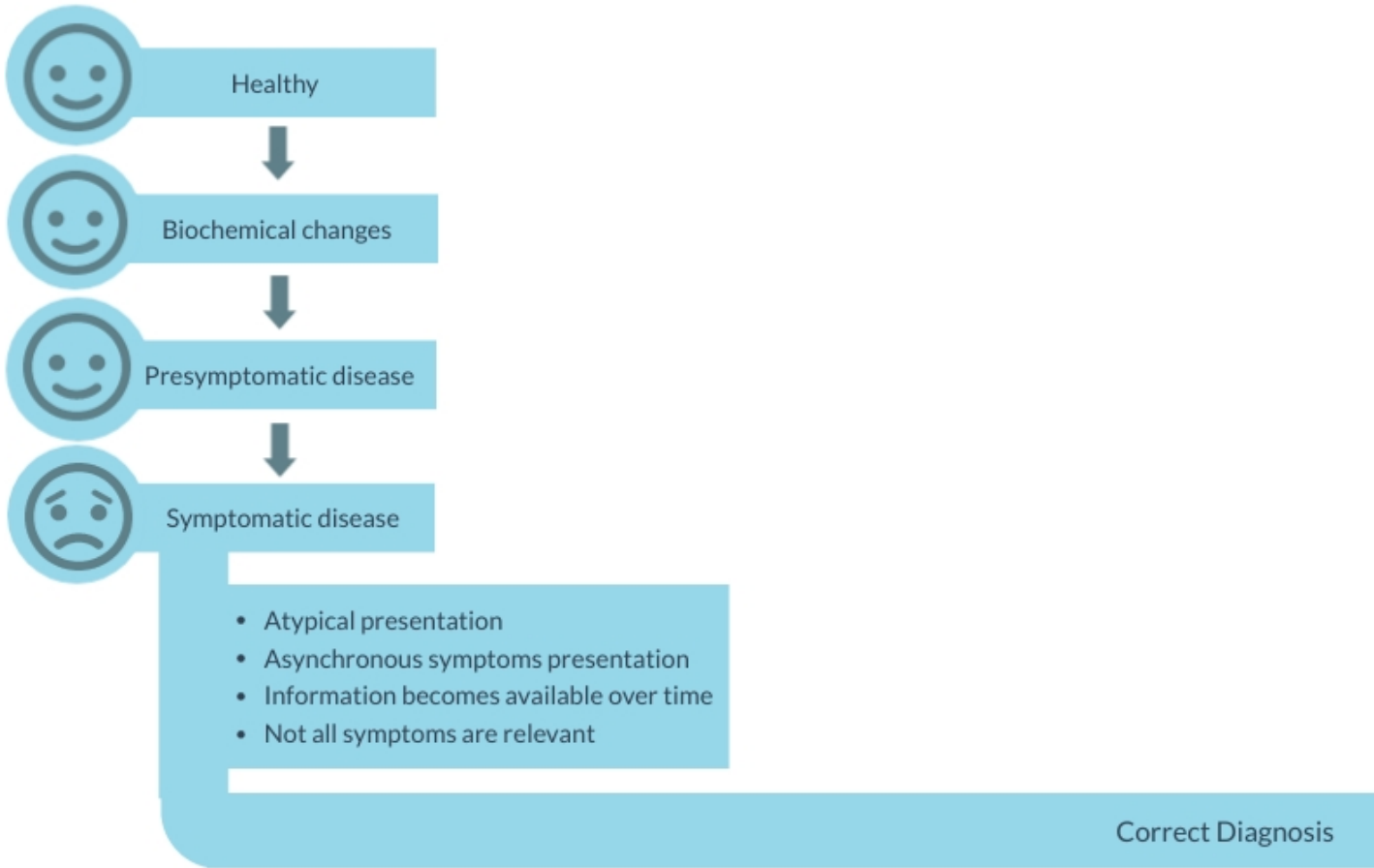
1. A disease evolves over time
2. Balance of overdiagnosis and underdiagnosis
3. Dealing with uncertainty



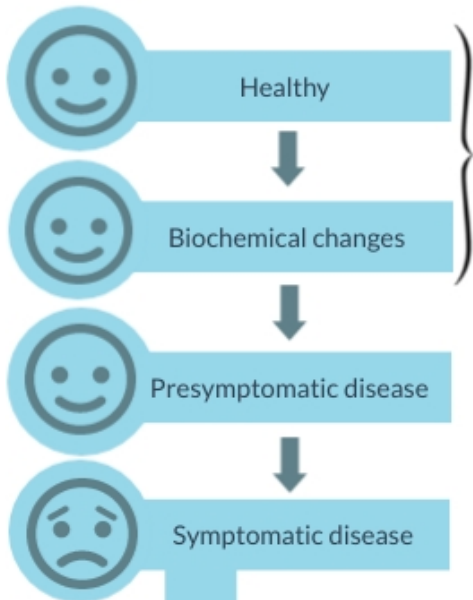
Challenge 1: Evolving disease



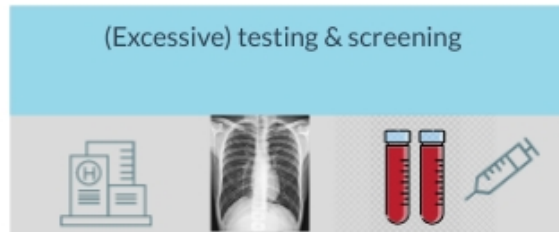
Disease evolution



Disease evolution



Diagnostic risks



Outcomes

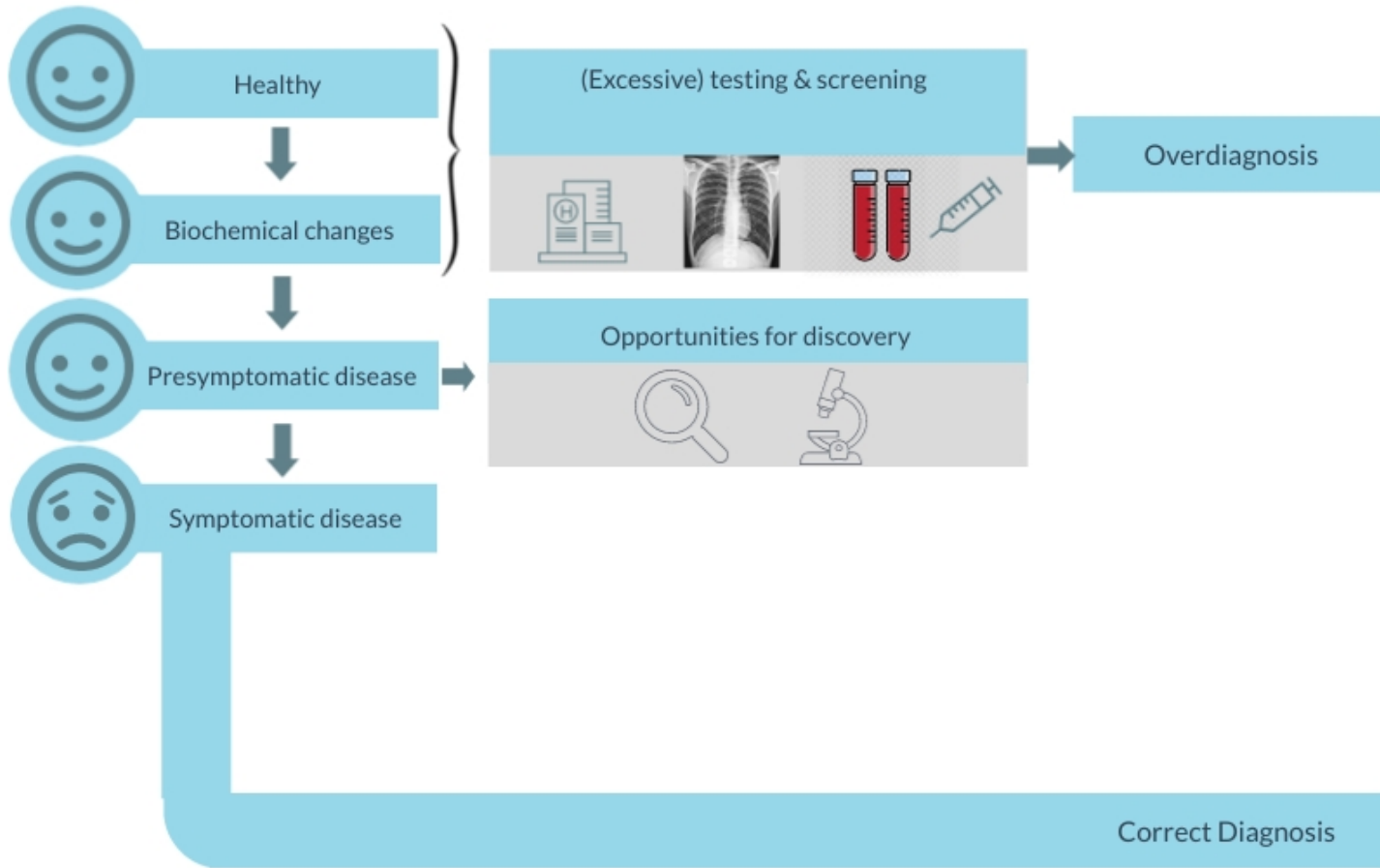
Overdiagnosis

Correct Diagnosis

Disease evolution

Diagnostic risks

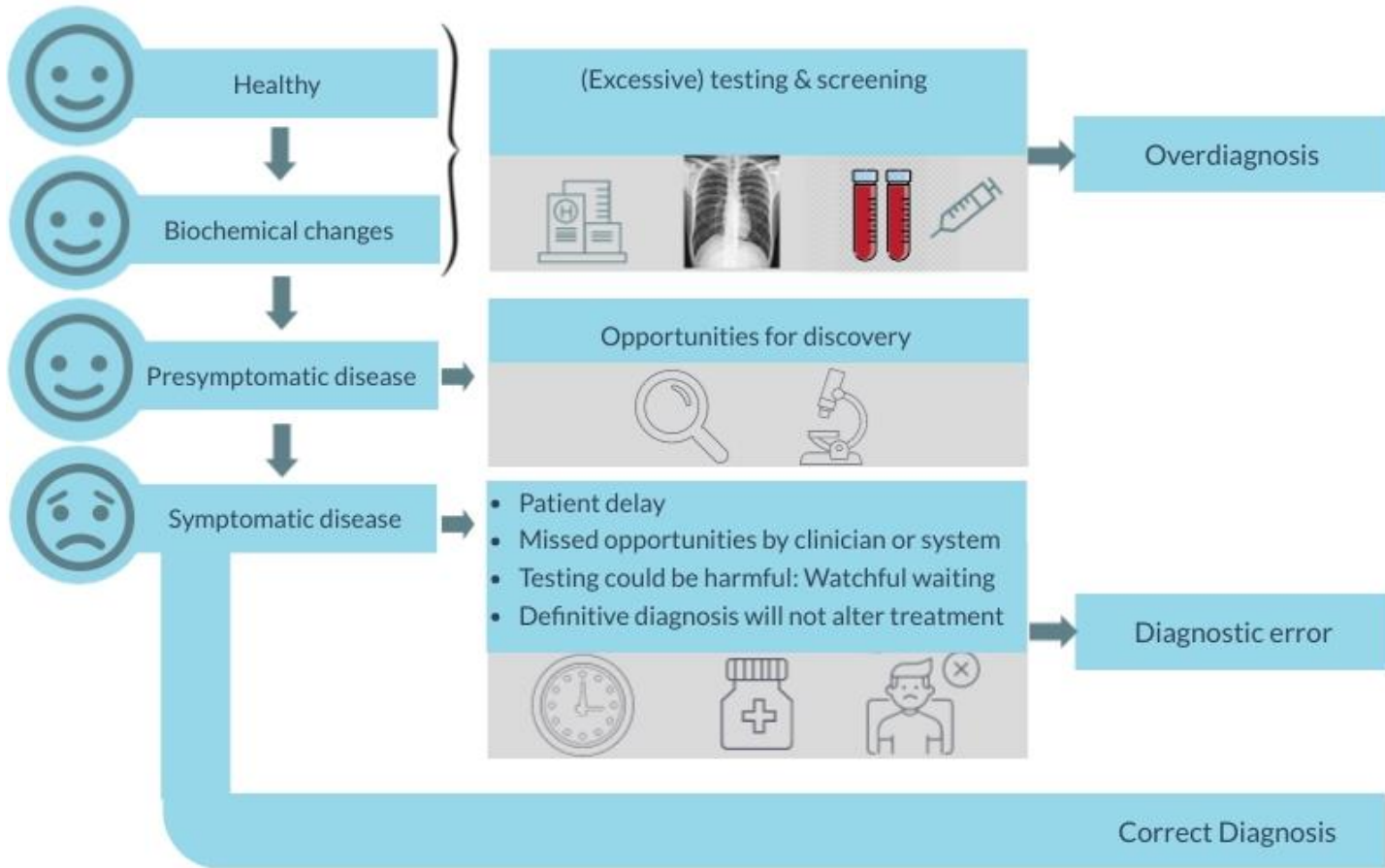
Outcomes



Disease evolution

Diagnostic risks

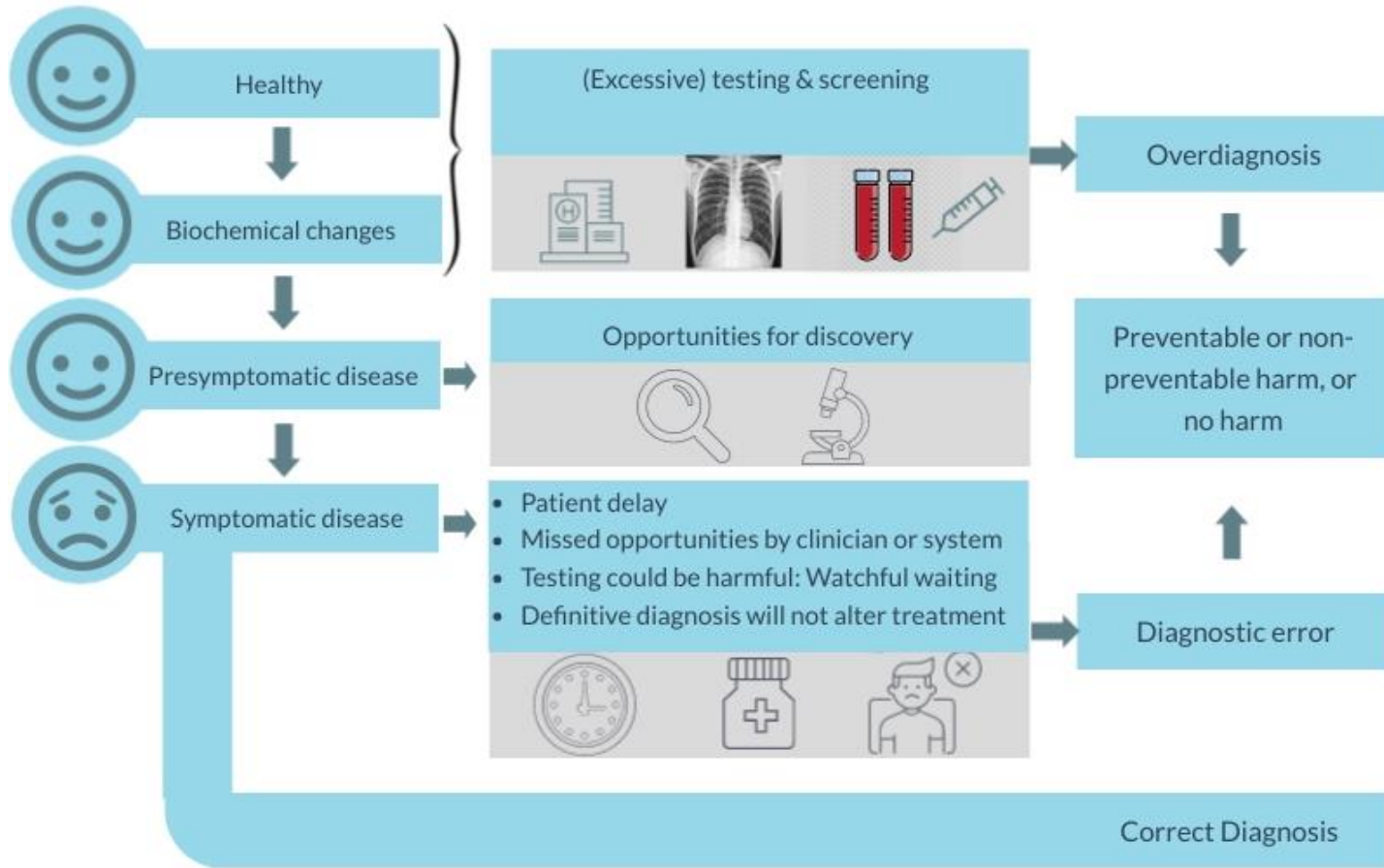
Outcomes



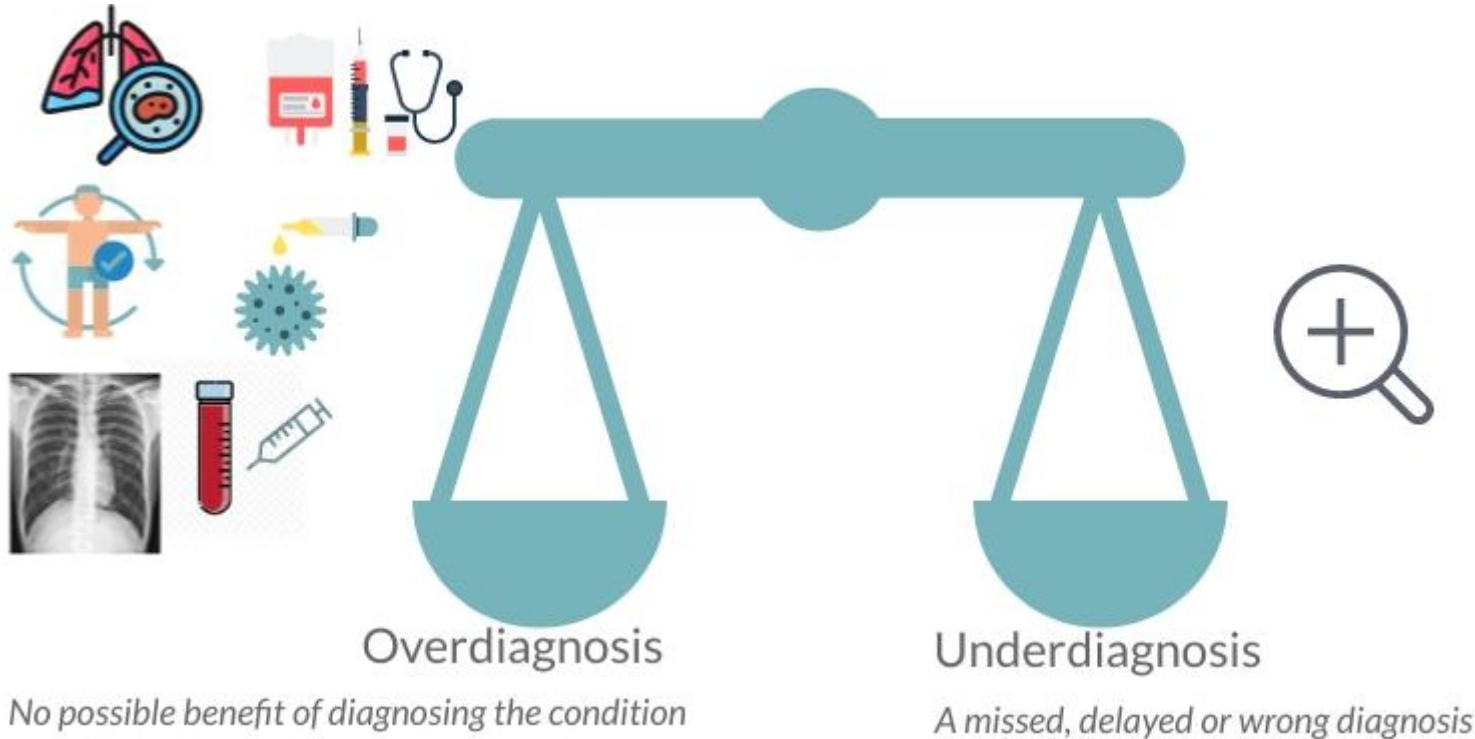
Disease evolution

Diagnostic risks

Outcomes



Challenge 2: Balance of overdiagnosis vs underdiagnosis



Challenge 3: Dealing with Uncertainty

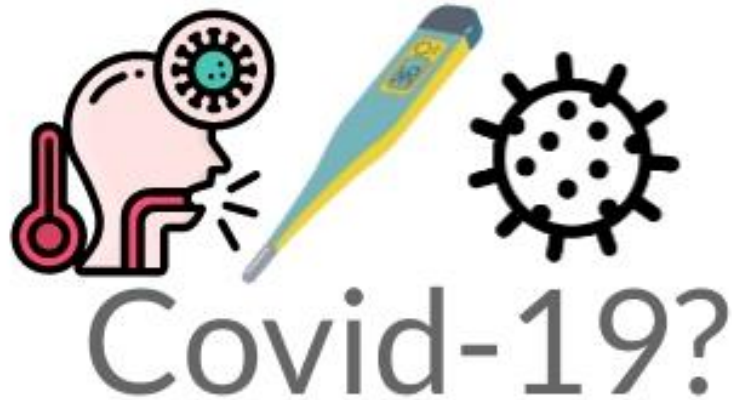


- Decision making under uncertainty
 - Unknown probabilities
 - Unknown diagnostic possibilities
- Poor confidence- accuracy calibration

Coping with the challenges

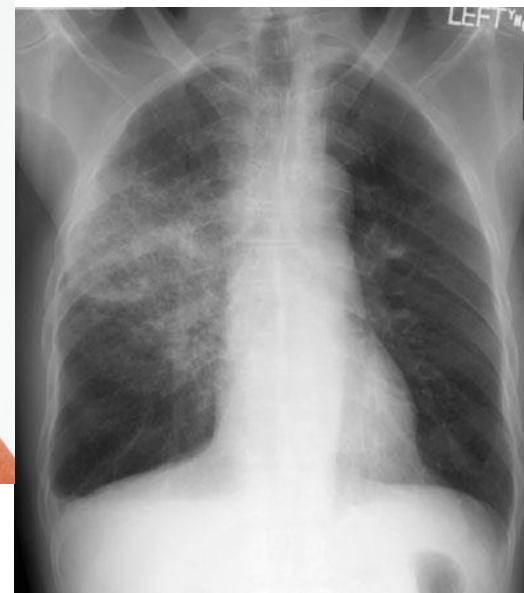
Heuristics: Shortcuts in the reasoning process

- Representativeness heuristic
- Availability heuristic





Diagnosing in a split second



Cognitive biases

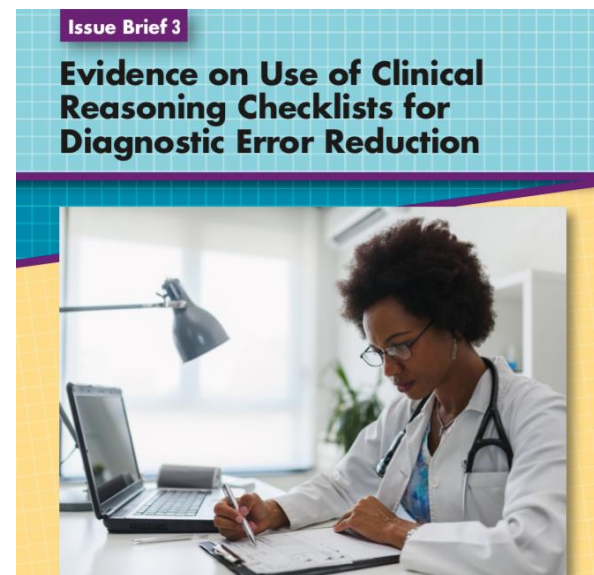
Failed heuristic can result in a cognitive bias

- Representativeness bias
- Availability bias



Knowledge-focused interventions

- Correct and extensive knowledge representations are key
- Little/no effect:
 - General debiasing
 - General checklists
- More effective:
 - Content specific feedback
 - Practice with distinguishing features
 - Collaboration with artificial intelligence



Zwaan & Staal, AHRQ brief, 2020

Conclusions

- The diagnostic process is complex
 - A disease evolves over time
 - Balance of overdiagnosis and underdiagnosis
 - Dealing with uncertainty
- Heuristics are used in the diagnostic process
 - These may result in biases
- Content specific interventions are needed to improve the diagnostic reasoning process



DIAGNOSTIC ERROR

A patient safety challenge

NAM workshop, April 23, 2021

Laura Zwaan, PhD

@laurazwaan81 

Erasmus MC
University Medical Center Rotterdam



