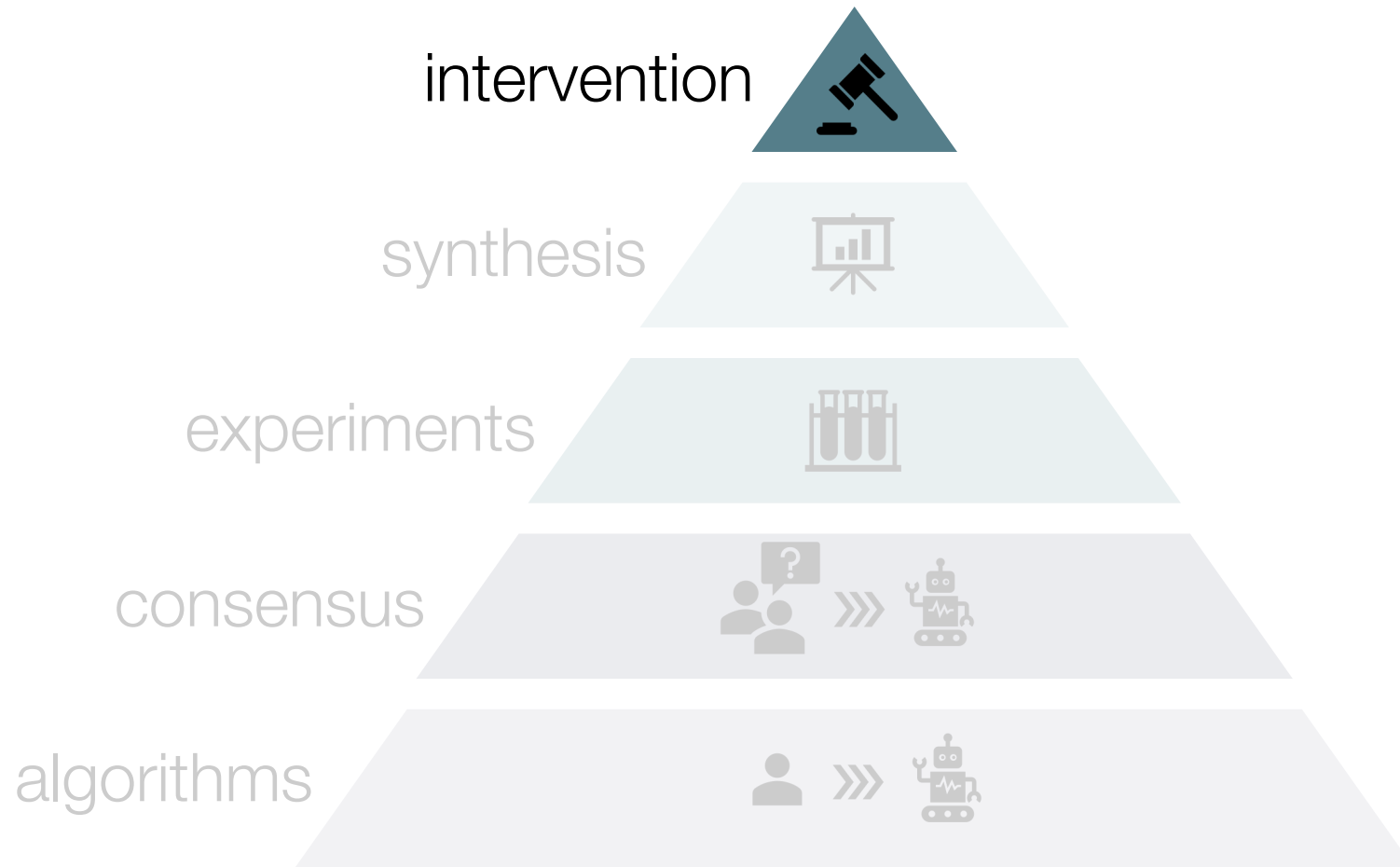


# Evidence-based Decision Making Interventions: Implementation

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Rui Mata, FS 2024

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# Goals for today

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- Gain an overview of implementation science
- Discuss limits of the evidence-based approach
- Discuss course evaluation
- Answer any outstanding questions from the Q&A forum

# Implementation science

Implementation science can be defined as “the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services”

By focusing on strategies to enhance the adoption and sustainable use of evidence-based practices, implementation science aims to close the **research-practice gap**, ensuring that investments in healthcare research translate into real-world benefits.

# Implementation science

**Table 1** Characteristics of Efficacy vs. Effectiveness Trial Designs (after [8])

	Efficacy Trial	Effectiveness Trial
Validity Priority	Internal > External	External $\geq$ Internal
Population and Sample	<ul style="list-style-type: none"> <li>• Highly selected for condition of interest, narrowly defined</li> <li>• Few comorbidities</li> <li>• Willing and motivated participants</li> </ul>	<ul style="list-style-type: none"> <li>• Selected for condition of interest, reflecting presentation in source population</li> <li>• Comorbidities resemble those in population to which results will be applied; only those who cannot practically or ethically participate are excluded</li> </ul>
Intervention	<ul style="list-style-type: none"> <li>• Intervention staff are highly qualified</li> <li>• Training may be intensive</li> <li>• Fidelity monitoring may be similarly intensive</li> </ul>	<ul style="list-style-type: none"> <li>• Staff selection, training, and fidelity monitoring resemble those likely to be feasible in target sites outside of the protocol proper</li> </ul>
Outcome Measures and Data Collection	<ul style="list-style-type: none"> <li>• Outcome measurements can be extensive, casting a wide net for potential secondary effects, moderators and mediators, or adverse effects</li> <li>• Since subjects are motivated, respondent burden less of a concern</li> </ul>	<ul style="list-style-type: none"> <li>• Outcome batteries minimize respondent burden (in terms of both frequency and length of assessments) since subjects are heterogeneous in their willingness and capability to participate</li> <li>• Accordingly, outcome measures chosen carefully to target fewer outcomes, and must be simple to complete</li> </ul>
Data Analysis	<ul style="list-style-type: none"> <li>• Standard statistical approaches suffice, and data-intensive analyses may be feasible</li> </ul>	<ul style="list-style-type: none"> <li>• Analyses to account for greater sample heterogeneity</li> <li>• Analyses account for more missing data and data not missing at random</li> </ul>

Bauer, M. S., Damschroder, L., Hagedorn, H., Smith, J., & Kilbourne, A. M. (2015). An introduction to implementation science for the non-specialist. *BMC Psychology*, 3(1), 65–12. <http://doi.org/10.1186/S40359-015-0089-9>

# Implementation science

**Table 2** Types of Studies to Address Blockages in the Implementation Process

Implementation Process Gap	Types of Studies
Limited external validity of efficacy/effectiveness studies	<ul style="list-style-type: none"> <li>• Design clinical interventions ready for implementation earlier in the research pipeline, emphasizing tools, products, and strategies that mitigate variations in uptake across consumer, provider, and or organizational contexts</li> </ul>
Quality gaps across systems due to variations in organizational capacity (e.g., resources, leadership)	<ul style="list-style-type: none"> <li>• Assess variations and customize implementation strategies based on organizational context</li> <li>• Data infrastructure development to routinely capture or assess implementation fidelity, patient-level processes/outcomes of care, and value/return-on-investment measures</li> <li>• Further refinement of implementation strategies involving organizational and/or provider behavior change</li> <li>• Development of provider/practice networks to conduct implementation studies or evaluation of national programs</li> </ul>
Frontline provider competing demands (e.g., multiple clinical reminders)	<ul style="list-style-type: none"> <li>• Refinement of implementation strategies using cross-disciplinary methods that address provider behavior/organizational change (e.g., business, economics, policy, operations research. etc.)</li> <li>• Positive deviation or adaptation studies especially to improve implementation at lower-resourced, later-adopter sites</li> </ul>
Misalignment with national or regional priorities	<ul style="list-style-type: none"> <li>• National policy/practice roll-outs</li> <li>• Randomized evaluations of national programs or policies</li> </ul>

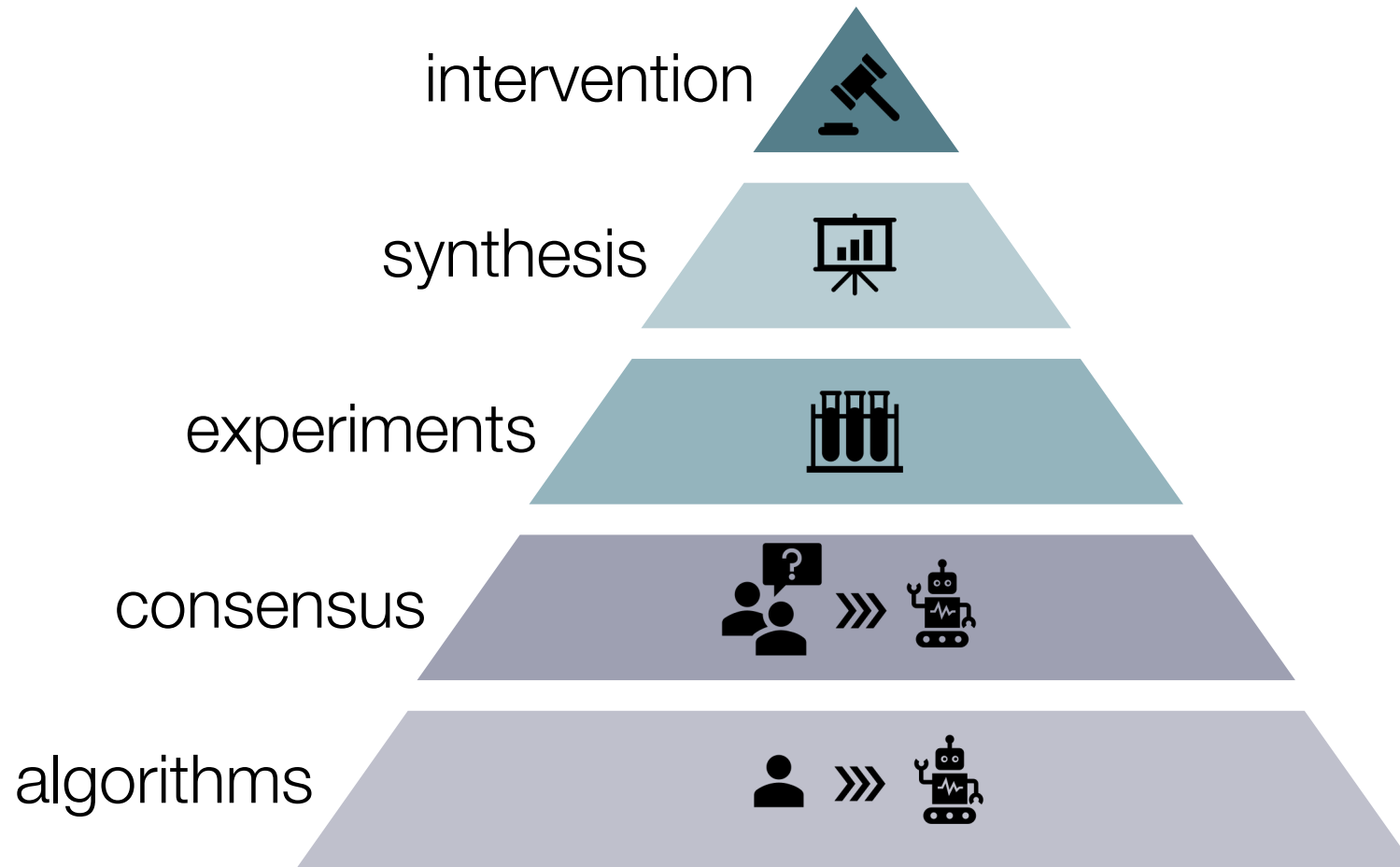
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# Implementation science

Relevance	To what extent are the programme objectives justified in relation to needs?
Efficiency	Have the objectives been achieved at the lowest cost?
Effectiveness	To what extent has the outcome been achieved?
Sustainability	Are the results and impacts, including institutional changes, durable over time?
Impact	Are the results still evident after the intervention is completed?

World Health Organization (2013). *WHO evaluation practice handbook*.

# Evidence-based decision making – **FTW!!!**





# Cautionary tales: Type III errors

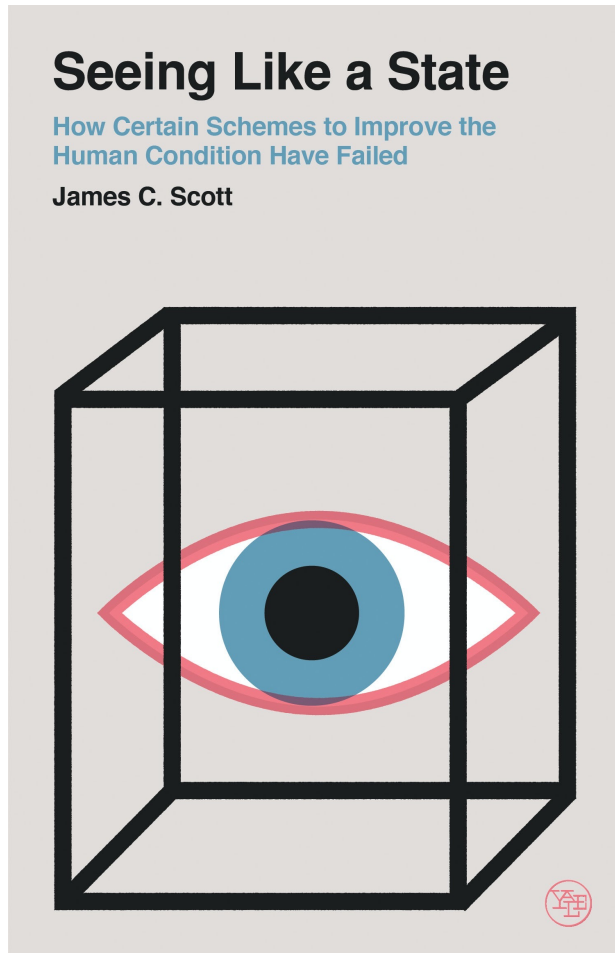
Type	Definition
Type I	False positive: detecting an effect that is not present
Type II	False negative: failing to detect an effect that is present

Type III	not a standard term in statistics, used informally to describe errors in the interpretation of statistical tests...
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finding the right answer to the wrong question!

# Cautionary tales: Seeing like a state



Legibility

Legibility (making this visible) often leads to simplifications that strip away local knowledge and context, leading to flawed decision-making

Metis

Importance of metis (practical local knowledge) in decision-making processes

High-modernism

High-modernist ideology combined with authoritarian state power can lead to disastrous social engineering projects (colonization; Soviet collectivization of agriculture; design of Brasília)



Evidence-based approaches should integrate both quantitative data and qualitative insights from local contexts

# Cautionary tales: The big con



Over-reliance  
on outside  
expertise

Standardization

Lack of long-  
term focus

Public sectors have become overly dependent on consulting, leading to a lack of in-house expertise and reliance on advice that not aligned with the best interests of the public (tax law consultancy, healthcare.gov rollout)

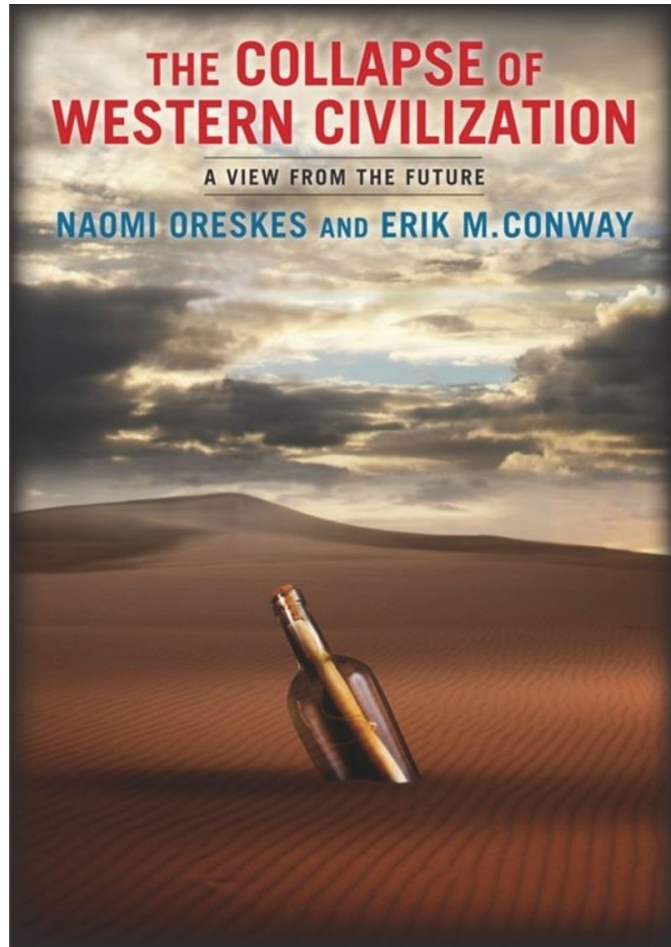
The advice offered by consulting firms often lead to a standardization of strategies and policies across different sectors and regions resulting in homogenized approaches not suitable for local contexts

Consulting firms promote efficiency and cost-cutting, often at the expense of long-term sustainability, equity, and investment in public goods



Evidence-based approaches need to integrate the values and needs of local contexts

# Cautionary tales: The collapse of western civilization



work of fiction - a speculative history of the 21<sup>st</sup> century from the perspective of a future historian

Scientific denial

Climate change was both predictable and predicted, technological solutions were available but not accepted by all

Political failure

Short political cycles, influence of vested interests, and beliefs in market fundamentalism led to ignoring evidence and lack of coordinated action



Evidence is not enough!

# Summary

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- **Implementation science:** Efficacy of interventions (nudges or otherwise) isn't the only criterion on how to decide about their use/implementation. Considerations of effectiveness, but also cost—benefit, etc. are key!
- **Limits of evidence-based approach:** evidence-based approaches favor legible evidence but legible evidence may not be the best evidence or may not bear on the “right” question to ask; one must remain humble and ensure that evidence is put into practice...

# Course evaluation

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# Q&A

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