



iRISE-SOLES

A Systematic Online Living Evidence Summary
for interventions to improve reproducibility

Dr Kaitlyn Hair
WCRI, Athens, 2024

Advancing knowledge through openness, integrity and solutions for reproducibility



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Reproducibility is under threat

Failure to Replicate: A Big Nail in the Animal Research Coffin

nature

SPECIAL | 18 OCTOBER 2018

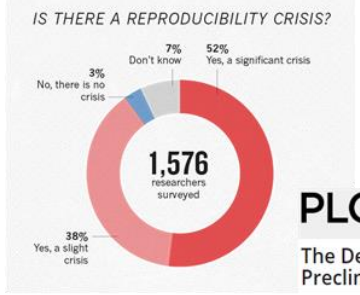
Challenges in irreproducible research

Essay

Why Most Published Research Findings Are False

John P. A. Ioannidis

The HeLa cell line — the most commonly used in cell research — has also been subject to contamination. | Photo: Shutterstock



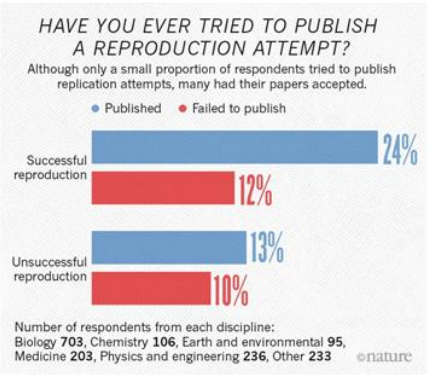
Vox

Too many mice are sacrificed for seriously flawed studies

Updated by Julia Bellis | @bellisforvoxeurope | Published 14 Oct 2018, 10:05am EDT

PLOS ONE

The Devil Is in the Details: Incomplete Reporting in Preclinical Animal Research



nature International weekly journal of science

Irreproducible biology research costs put at \$28 billion per year

Study calculates cost of flawed biomedical research in the United States.

Home / Archive / September 2019 / Careers

Fixing the Flaws in Animal Research

Many preclinical studies carried out in vivo are poorly designed and generate irreproducible data, but efforts to address the problem are on the rise.

Diana Kwon
Sep 1, 2019

ROYAL SOCIETY OPEN SCIENCE
yalsocietypublishing.org

The natural selection of bad science

Paul E. Smaildino¹ and Richard McElreath²

¹Cognitive and Information Sciences, University of California, Merced, CA 95343, USA
²Department of Human Behavior, Ecology, and Culture, Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany



COMPUTER SCIENCE

Artificial intelligence faces reproducibility crisis

Unpublished code and sensitivity to training conditions make many claims hard to verify

Power failure: why small sample size undermines the reliability of neuroscience

Katherine S. Button^{1,2}, John P. A. Ioannidis³, Claire Mokrysz¹, Brian A. Nosek⁴, Jonathan Flint⁵, Emma S. J. Robinson⁶ and Marcus R. Munafò¹

Many potential solutions



How can we bring about evidence-based improvements?

2023 - 2026

iRISE: improving Reproducibility In Science



35 Members



15 Partners

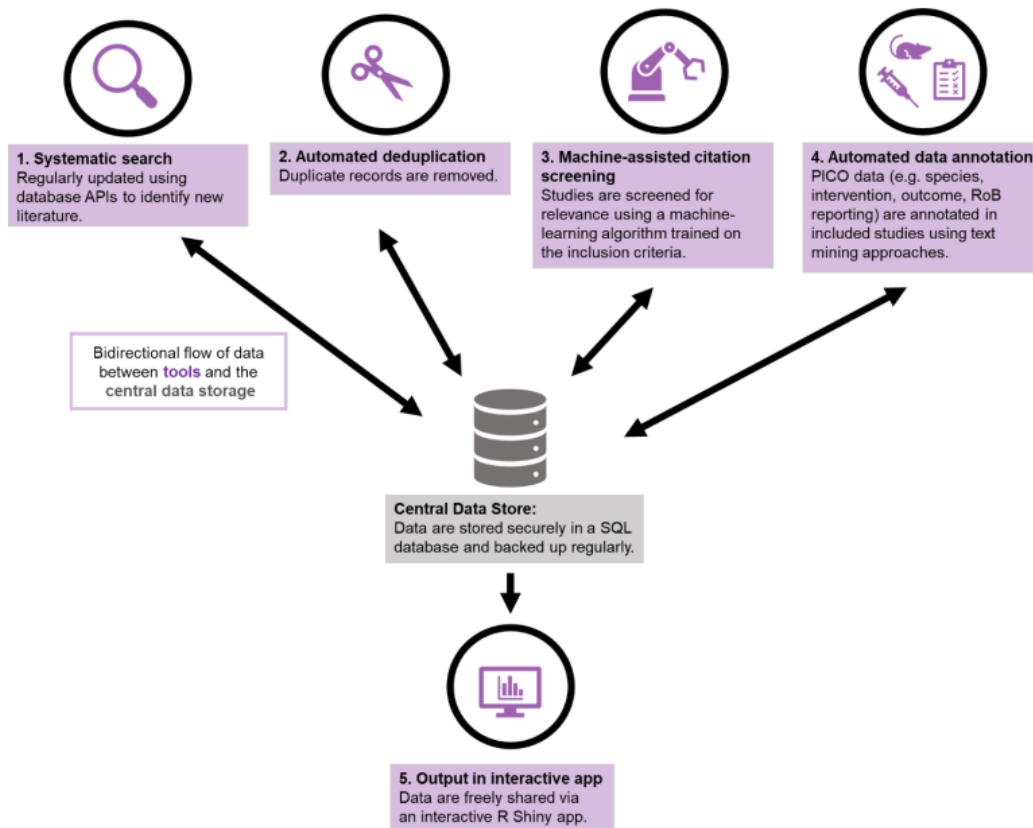


9 Countries

Taking an integrated approach to understanding, investigating and guiding strategies to address irreproducibility.

WP2: systematic identification and evaluation of candidate interventions

What is a SOLES?






Clinical Science (2023) 137 773–784
<https://doi.org/10.1042/CS20220494>



Perspective

Systematic online living evidence summaries: emerging tools to accelerate evidence synthesis

Kaitlyn Hair¹,  Emma Wilson¹, Charis Wong^{2,3}, Anthony Tsang⁴,  Malcolm Macleod¹ and  Alexandra Bannach-Brown⁵

¹Centre for Clinical Brain Sciences, The University of Edinburgh, Edinburgh, U.K.; ²Anne Rowling Regenerative Neurology Clinic, University of Edinburgh, Edinburgh, U.K.; ³Euan Macdonald Centre for Motor Neuron Disease Research, University of Edinburgh, Edinburgh, U.K.; ⁴King's Technology Evaluation Centre, King's College London, U.K.; ⁵Charité Universitätsmedizin Berlin, Berlin Institute of Health – QUEST Center, Berlin, Germany

Correspondence: Alexandra Bannach-Brown (alexandra.bannach-brown@charite.de)



Systematic reviews and meta-analysis are the cornerstones of evidence-based decision making and priority setting. However, traditional systematic reviews are time and labour intensive, limiting their feasibility to comprehensively evaluate the latest evidence in research-intensive areas. Recent developments in automation, machine learning and systematic review technologies have enabled efficiency gains. Building upon these advances, we developed **Systematic Online Living Evidence Summaries (SOLES)** to accelerate evidence synthesis. In this approach, we integrate automated processes to continuously gather, synthesise and summarise all existing evidence from a research domain, and report the resulting current curated content as interrogatable databases via interactive web applications. SOLES can benefit various stakeholders by (i) providing a systematic overview of current evidence to identify knowledge gaps, (ii) providing an accelerated starting point for a more detailed systematic review, and (iii) facilitating collaboration and coordination in evidence synthesis.

What evidence do we want to curate?

All primary research which:

evaluates the
effectiveness of an
intervention






evaluates **modifiers**
of an intervention



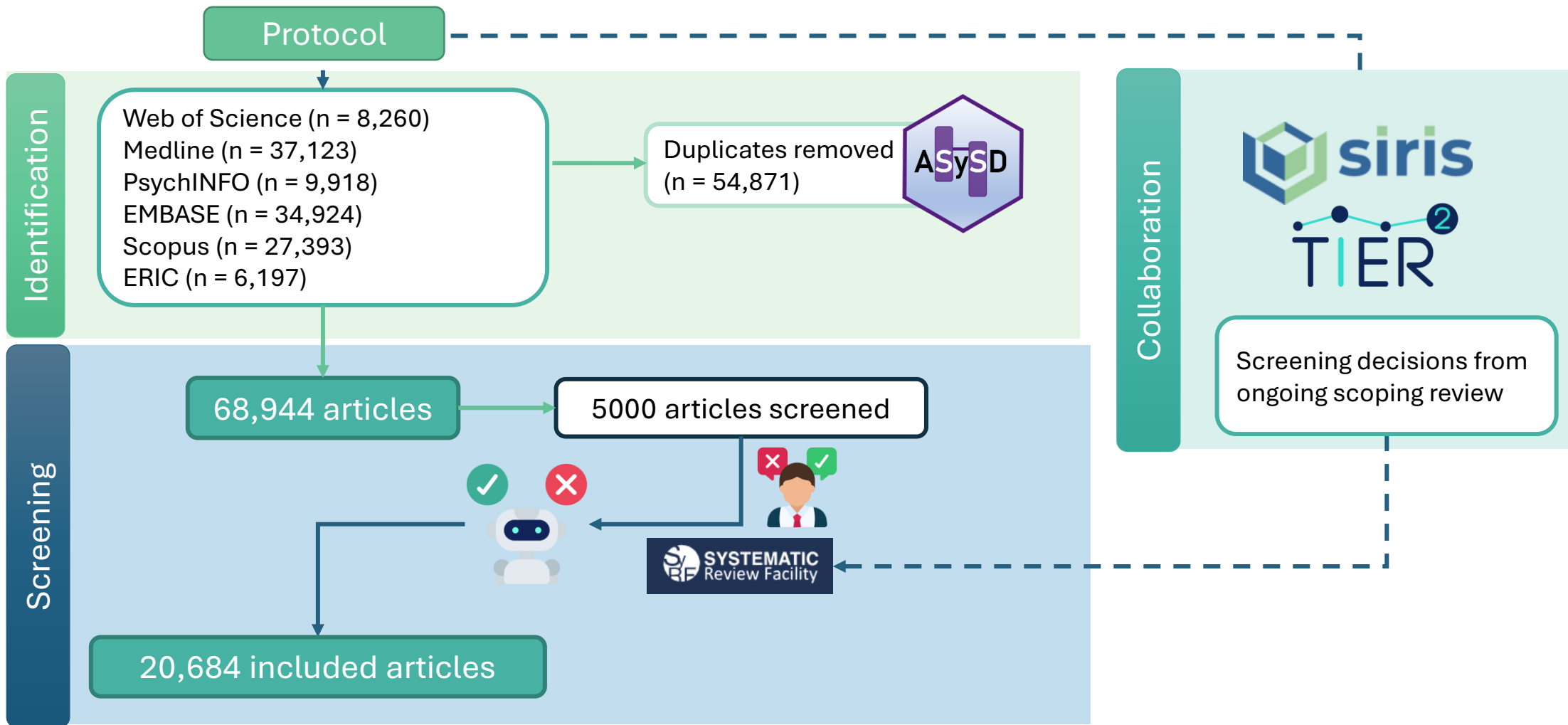
suggests evidence-
based interventions



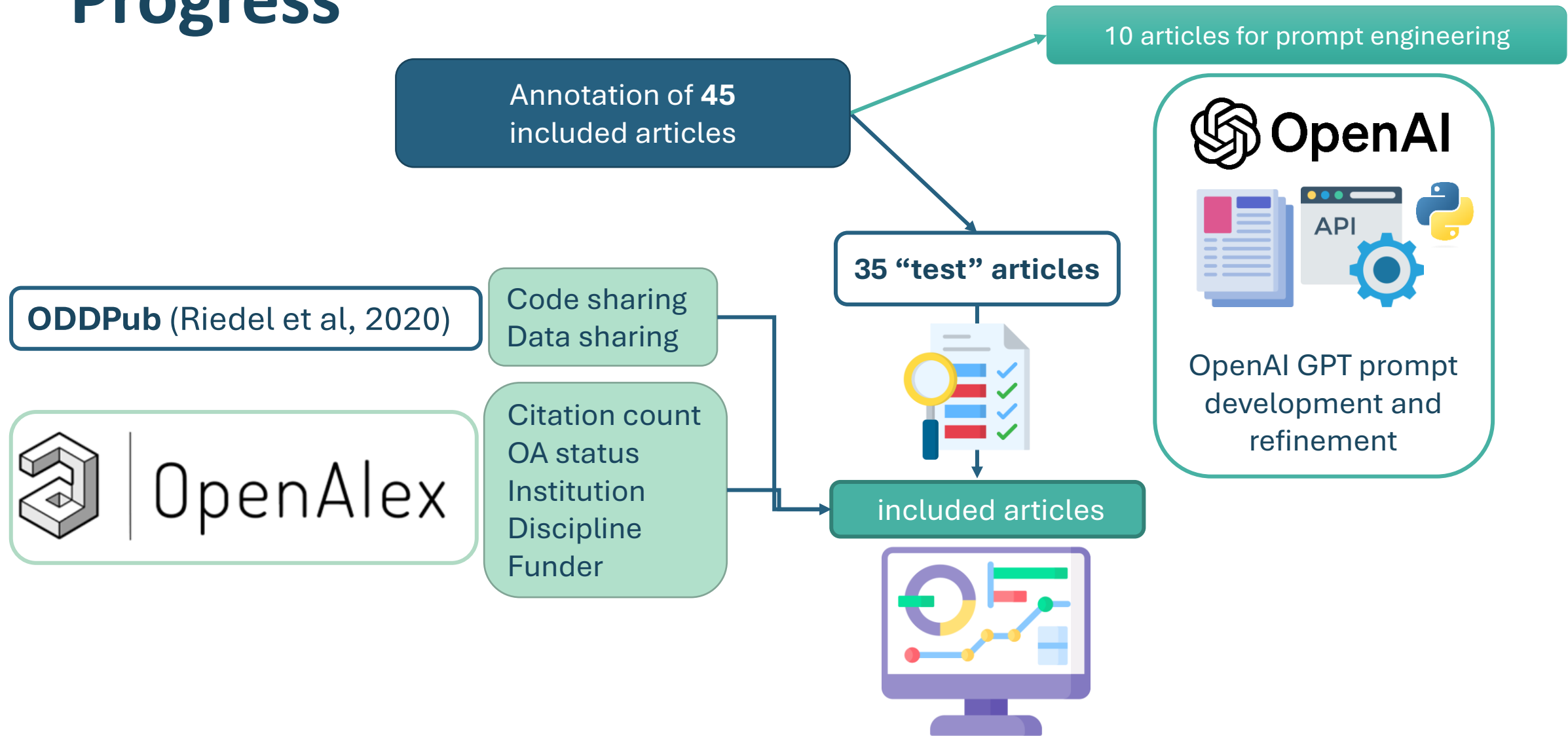
What characteristics are we collecting?

Evidence Type		Research Stage affected	
Intervention Evaluated		Method of delivery	
Intervention Provider		Outcomes	
Target Population		Equity, diversity, and inclusion	
Location		Cost/ benefit analysis	
Discipline		Reproducibility terminology	

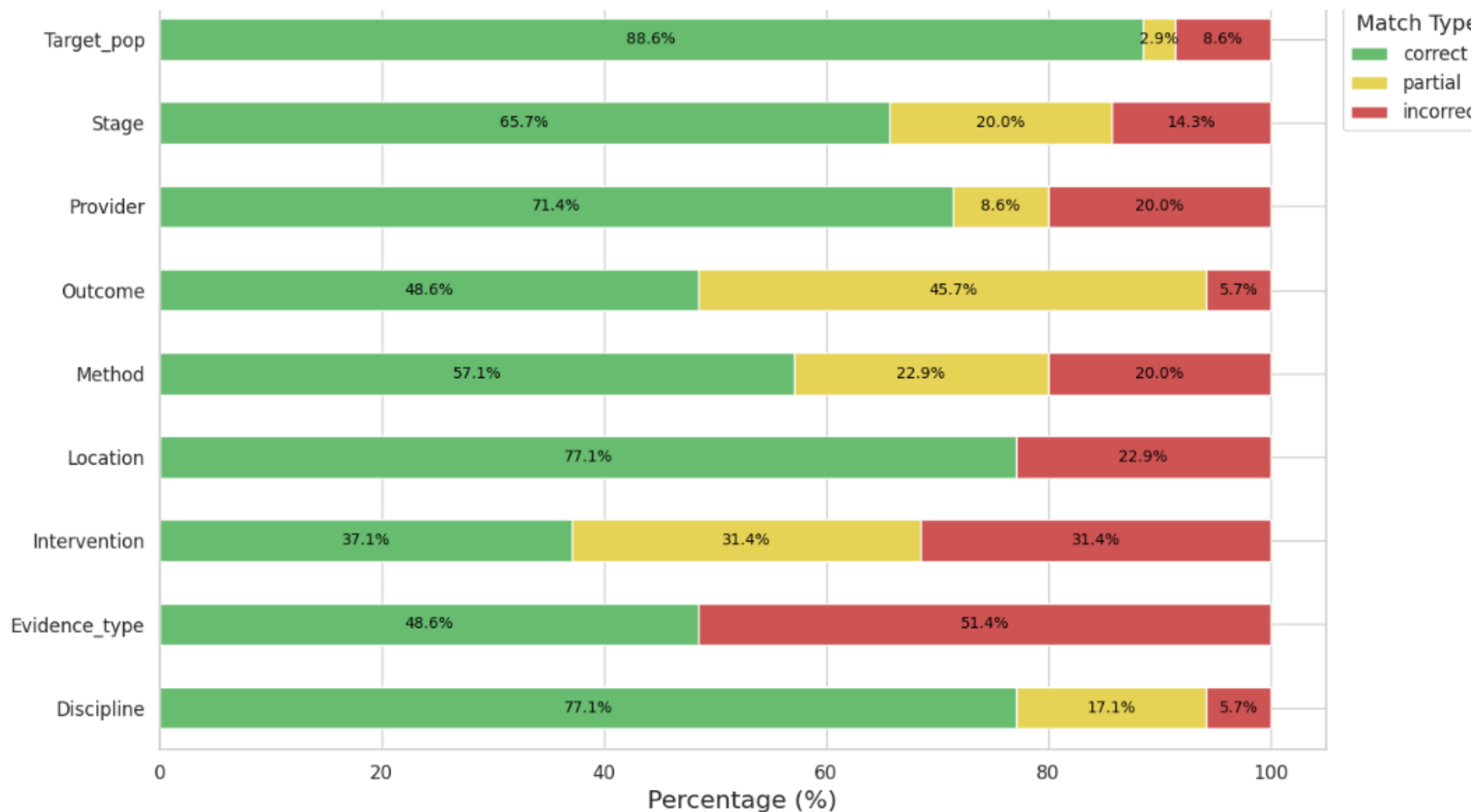
Progress



Progress



Pilot OpenAI GPT4o validation on n=35 articles



Title / Abstract only



Web application

iRISE-SOLES

- Homepage
- Data Collection
- Methodology
- Transparency Metrics
- Evidence Map
- Outcome Overview
- Funder
- Location
- iRISE Database**
- About

iRISE

Basic search | Advanced search

Conduct a search for relevant articles ?

add keywords separated by commas:

Combine keywords with

AND OR

[Search database](#) [Reset search query](#)

Selected studies in database

All 20684 citations loaded. Use the search box above or apply filters to identify relevant studies!

Show entries Search:

year	author	title
2024	Belinda Leighton,	Exploring the lived experience of resilient aging from a biopsychosocial perspective: an interpretive phenomenological study



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IRISE International
Reproducibility
of Science

Evidence map

Use the map below to visualise evidence on interventions to improve different types of reproducibility and related outcomes. Click a bubble to see all of the relevant evidence in the table below.

Select one or more reproducibility measures | **Select a subgroup** | **Filter subgroup options**

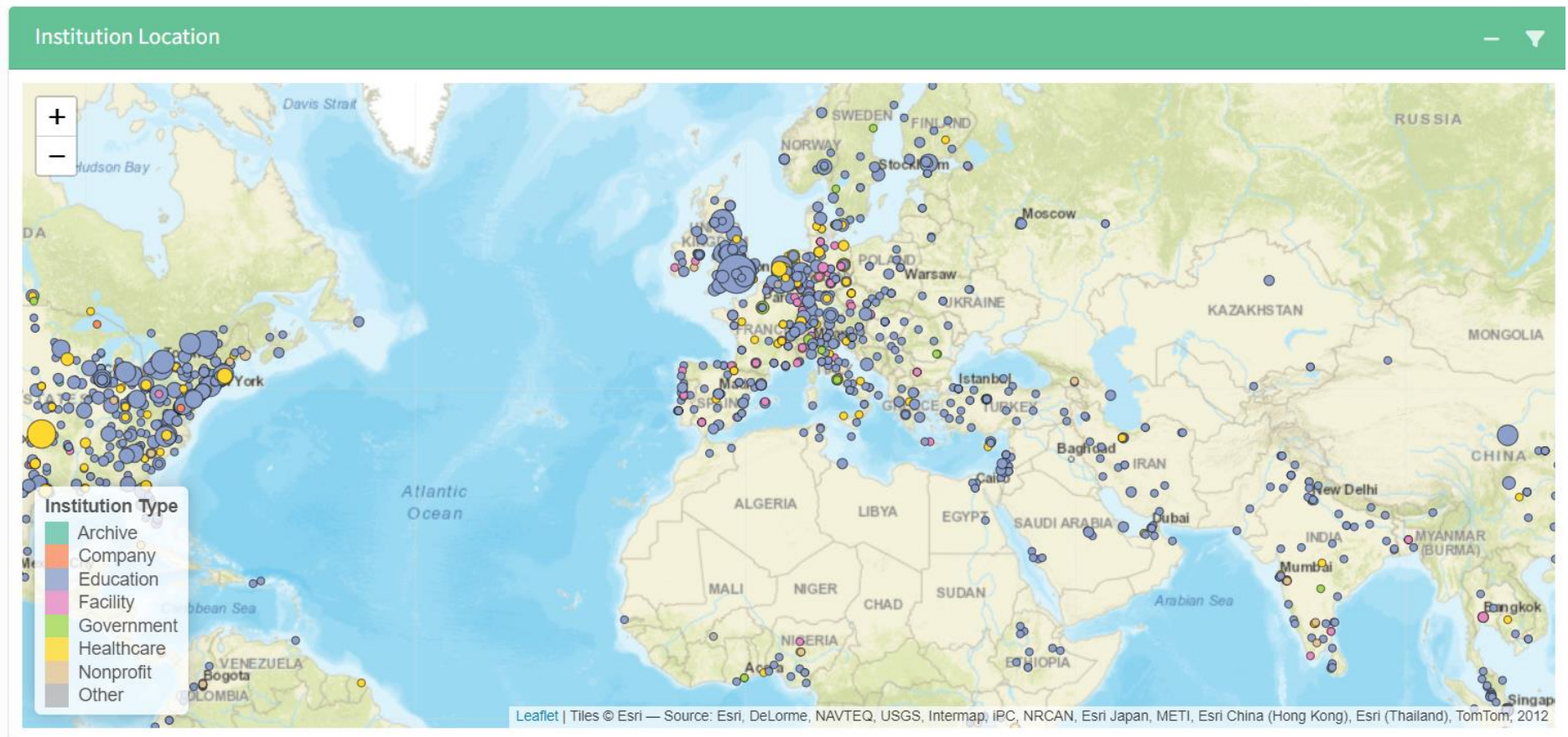
Code / analysis availability and re-use, Data availability and r | Discipline | Biomedical and health sciences, Social sciences

Intervention	Biomedical and health sciences	Social sciences
Trial registration	●	●
Reporting guidelines, checklists, or standards	●	●
Quality checks / feedback	●	●
Protocol registration	●	●
Pre-registration	●	●
other	●	●
Materials sharing policy/guideline	●	●



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Next steps

- Automate searches
- Increase sample of annotated articles
- Further improvements to AI
- Community engagement
- Systematic reviews of specific interventions

Thank **you** for listening!



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**UK Research
and Innovation**

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Contact: Kaitlyn.Hair@ed.ac.uk