

# Artificial Intelligence and the Literature Search

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May 1, 2026



# Disclosures

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- I have no financial or other conflicts of interest
- I used AI in creating this presentation, though active-learning screening in SRDR+ (now VADRR), and help with r code for the figures
- This presentation is based on a living rapid review conducted under contract to the Agency for Healthcare Research and Quality (AHRQ), Rockville, MD\*
- Full report and all updates available at:  
<https://effectivehealthcare.ahrq.gov/products/machine-learning-tools/white-paper>

\*The findings and conclusions presented are those of the authors, who are responsible for its contents; the findings and conclusions do not necessarily represent the views of AHRQ. Therefore, no statement in this report should be construed as an official position of AHRQ, or the U.S. Department of Health and Human Services.

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What diagnostic tools exist to diagnose developmental dyslexia in children?

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(developmental dyslexia OR dyslexia) AND (diagnostic tools OR diagnosis OR assessment) AND (children OR child OR pediatric OR paediatric)

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# Search tools

☰ Google Scholar | Labs

Current session

what diagnostic tools have been developed to diagnose...

🔄 Evaluated 30 top results

+ New session

what diagnostic tools have been developed to diagnose developmental dyslexia in children

[\[HTML\] Using eye-tracking to assess dyslexia: A systematic review of emerging evidence](#)

[E I Toki](#) - Education Sciences, 2024 - mdpi.com

Systematically reviews the use of eye-tracking technology as a diagnostic tool for assessing developmental dyslexia in children.

- **Specific Eye-Tracking Metrics:** Identifies that eye-tracking technology is a practical, objective, and non-invasive tool that measures fixation duration, saccadic movements, and gaze patterns during reading tasks to identify anomalies associated with dyslexia.
- **Machine Learning Integration:** Shows that integrating machine learning algorithms, such as Logistic Regression, K-Nearest Neighbors, and Support Vector Machines, with eye-tracking data can enhance the accuracy of dyslexia classification.

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[\[HTML\] mdpi.com](#)

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[\[HTML\] Diagnosing dyslexia in early school-aged children using the LSTM network and eye tracking technology](#)

[Z Gomolka](#), [E Zeslawska](#), [B Czuba](#), [Y Kondratenko](#) - Applied Sciences, 2024 - mdpi.com

Explains that traditional assessment methods, primarily focusing on written and oral tests, are being supplemented by modern technologies like eye tracking and artificial intelligence for objective and precise diagnostics.

- **Brain Imaging Techniques:** Identifies diagnostic methods based on brain imaging, such as functional magnetic resonance imaging (fMRI) or diffusion tensor imaging (DTI), along with electroencephalographic (EEG) studies, as tools that provide information about the neurobiological basis of dyslexia.
- **Integrated Eye Tracking/AI Test:** Proposes an innovative hybrid technology for diagnosing dyslexia that integrates the Benton Visual Retention Test (BVRT) with eye-tracking technology and deep neural networks (DNN), specifically a long short-term memory (LSTM) network, for analyzing visual attention trajectories.

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[\[HTML\] The use of cognitive tests in the assessment of dyslexia](#)

[N Mather](#), [D Schneider](#) - Journal of Intelligence, 2023 - mdpi.com

Discusses the use of standardized cognitive tests, including intelligence tests, as diagnostic tools for assessing and diagnosing dyslexia in children.

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Ask a follow-up



# Key Question and Inclusion Criteria

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**Key Question:** What tools that use artificial intelligence (AI) or machine learning (ML) to semi- or fully automate any aspect of evidence synthesis product (ESP) production have had their performance evaluated, and how well do these tools perform?

**Domain:** Any task in ESP production

**Tools:** Publicly available systems, methods, instruments, models, applications, software, and packages that use AI or ML to semi- or fully automate ESP production

**Comparators:** Reference standard as defined by the study

**Outcomes:** Quantitative performance

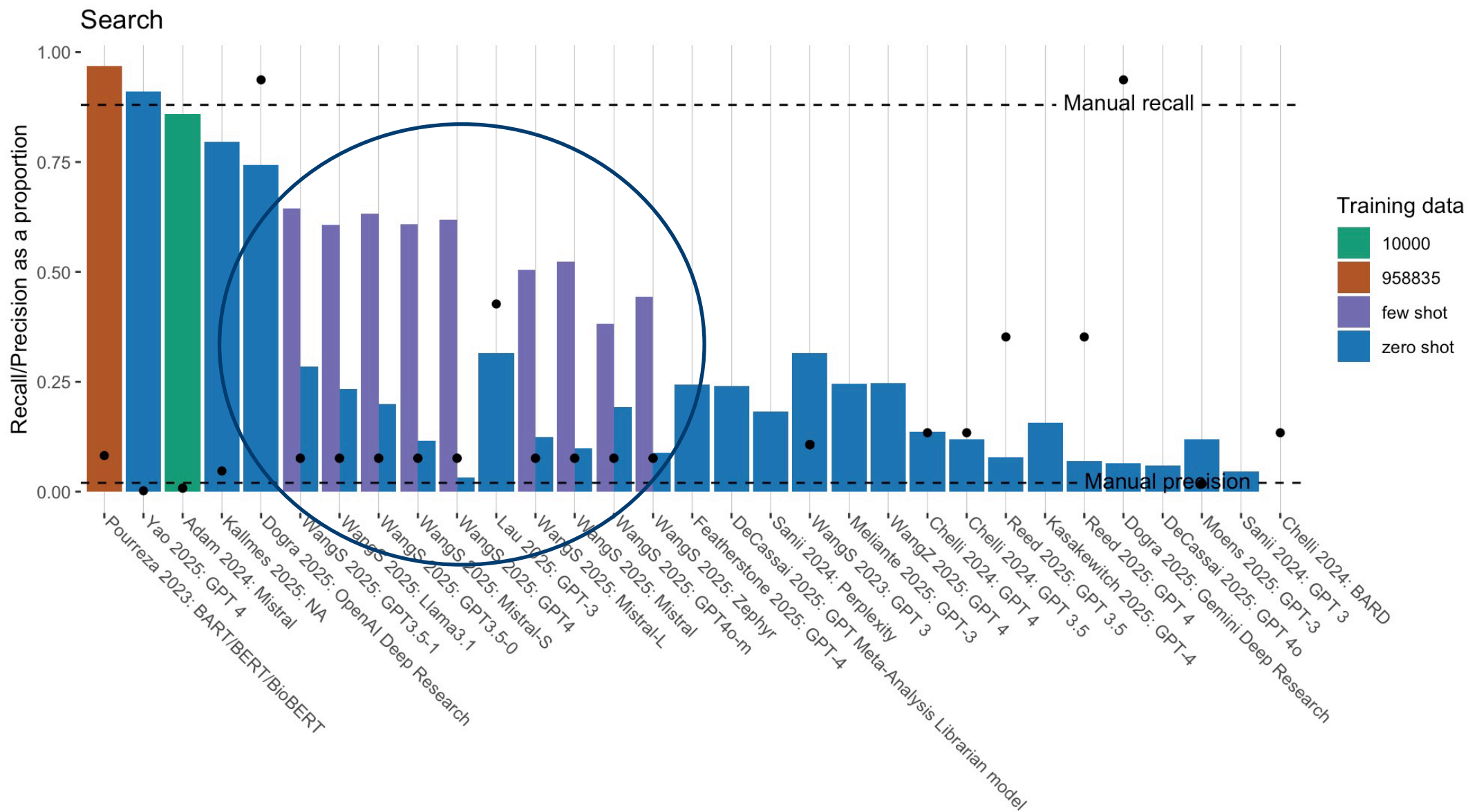
**Standard AHRQ methodology** for systematic reviews, as well as EPC guidance for rapid reviews and living reviews. Latest search October 2025.

# Literature Identification (25 Studies)

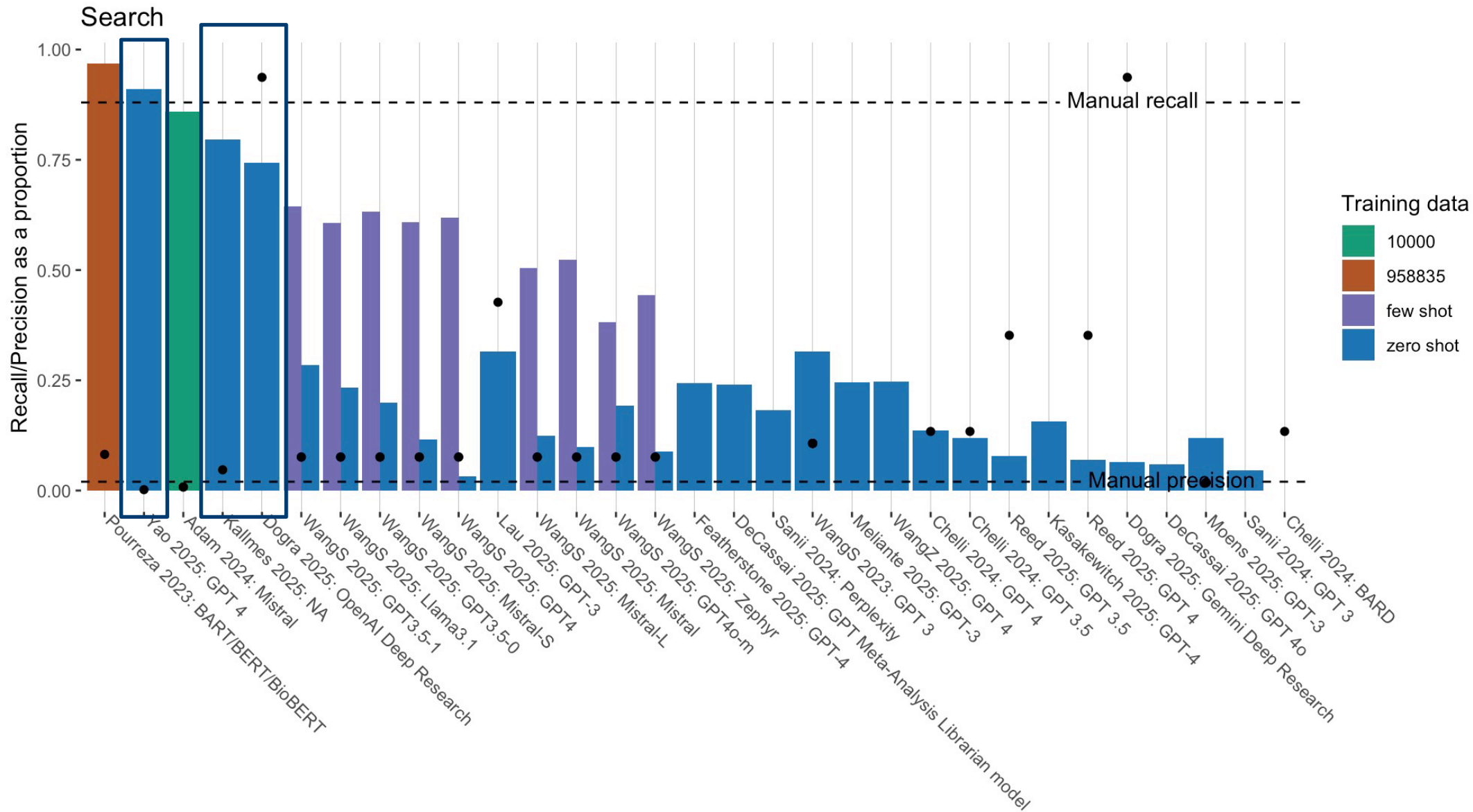
| Evidence Synthesis Task            | Number of studies (tools) | Comparator  | Accuracy measure, median (range) | Burden measure, median (range) |
|------------------------------------|---------------------------|---|----------------------------------|--------------------------------|
| <b>Search</b>                      | 18 (22)                   | Human-developed search strategies                       | Recall: 17% (0% to 97%)          | Precision: 7% (0% to 94%)      |
| <b>Study design classification</b> | 7 (7)                     | Human identification or PubMed's "publication type" tag | Recall: 98% (96% to 100%)        | Precision: 92% (4% to 100%)    |



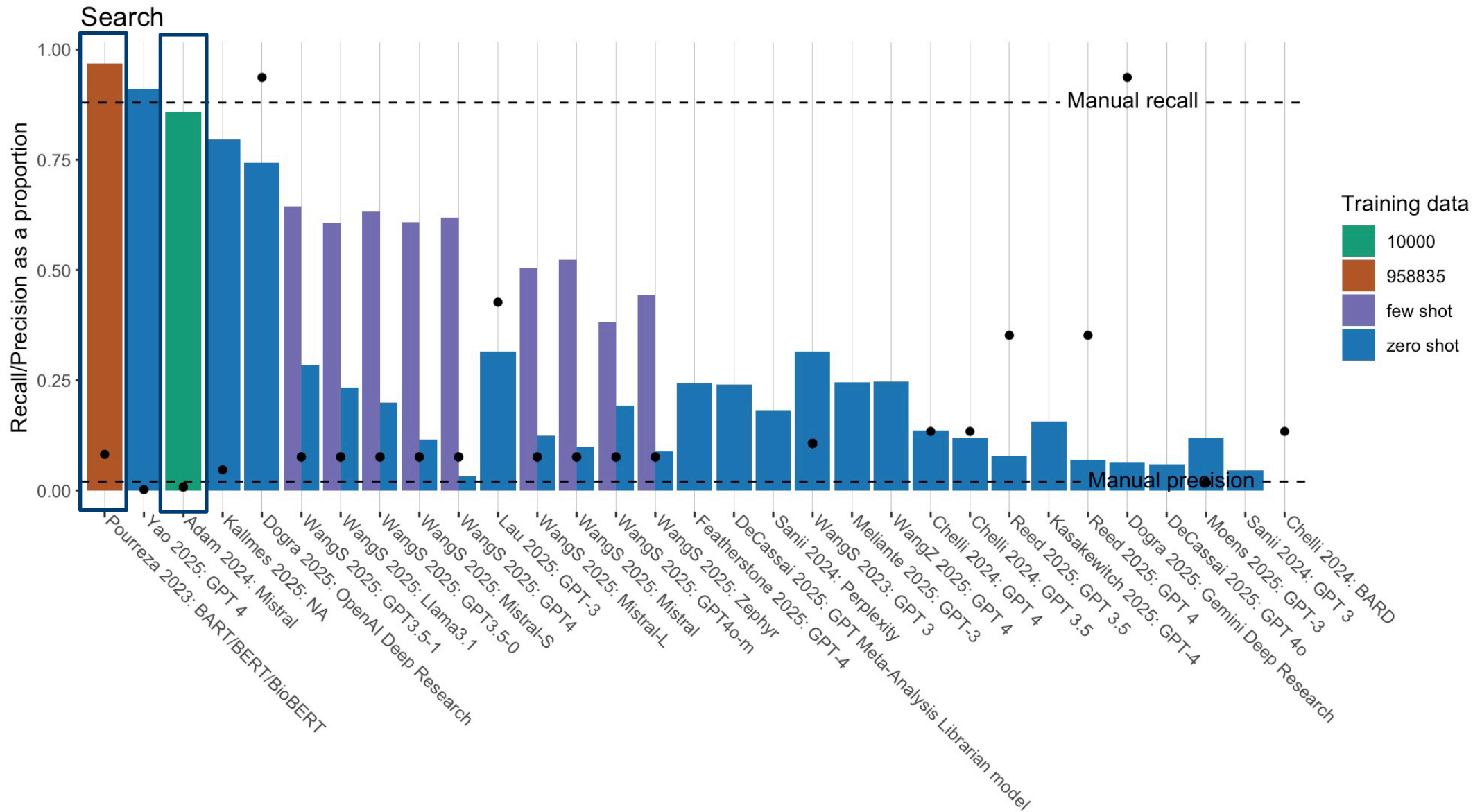
# Database search



# Database search



# Database search



# Implementation issues

- Platforms are beginning to adopt these tools, making them more accessible.
- But with limitations
- First, we need to get the technology right

# Transparency, Replication, Evaluation

- Tools should adhere to the evidence retrieval standards for evidence synthesis
  - Literature searches should be “human evaluable” and “reproducible”
  - Literature searches should be comprehensive (or at least not biased)
- Search-automation methods can be evaluated, but only retrospectively (based on known included studies)
- Where to from here?