Living literature reviews: Maintaining quality in real-time evidence synthesis

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Introduction

- Systematic literature reviews are the gold standard for synthesising research but inevitably become outdated as new developments emerge.
- "Living" literature reviews (LLRs) continuously update, offering significant value to rapidly evolving fields, but challenge traditional quality assurance models.
- The robustness and mechanisms of quality assurance for LLRs have not been fully established. This research aimed to explore methods and quality assurance mechanisms in recently published LLRs.

Methods

- Ad-hoc scoping searches were conducted using Google Scholar to identify active, open-access LLRs published in the last 10 years.
- Recently published, peer-reviewed publications were included which covered a range of disease areas.
- Methods and discussion sections of LLRs were reviewed to determine the common practices in LLR design, typical limitations, and quality assurance mechanisms.

Results

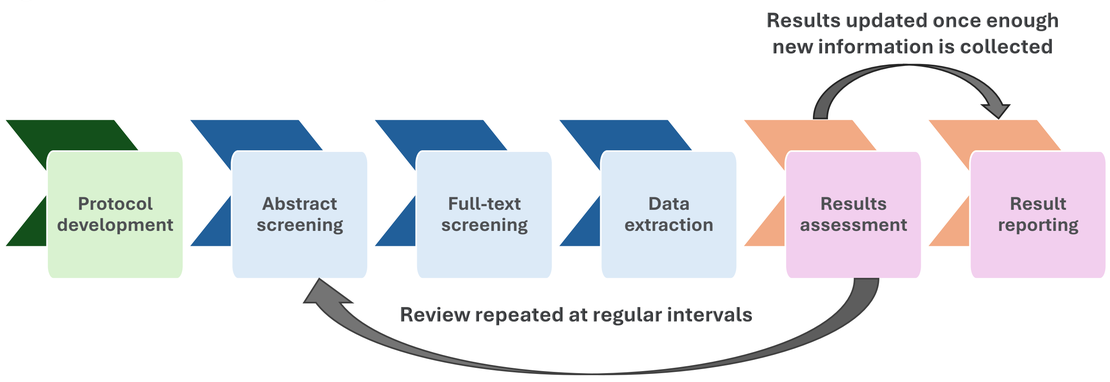
- Seven LLRs were identified across various disease areas (COVID-19, Zika virus, traumatic brain injury, prostate cancer, myopia, and osteoporosis; Table 1).

Table 1. Overview of LLRs Identified for Inclusion

Author	Year	Disease area	Frequency of updates	Automation processes used
[1]Counotte	2018	Zika Virus	Quarterly	• Automated database searches • Automated deduplication • Partial automating of screening • Automated updating/ production of tables/figures
[2]Michelen	2021	COVID-19	6-monthly	• No automation reported – all human updates
[3]Brazinova	2021	Brain injury	NR	• Automated deduplication
[4]Juul	2021	COVID-19	Weekly updates	• No detail provided
[5]Ayers	2023	Osteoporosis	NR	• No detail provided
[6]Riaz	2023	Prostate cancer	Weekly updates	• Automated database searches • Automated deduplication
[7]Lawrenson	2025	Myopia	Every 6 months	• No detail provided

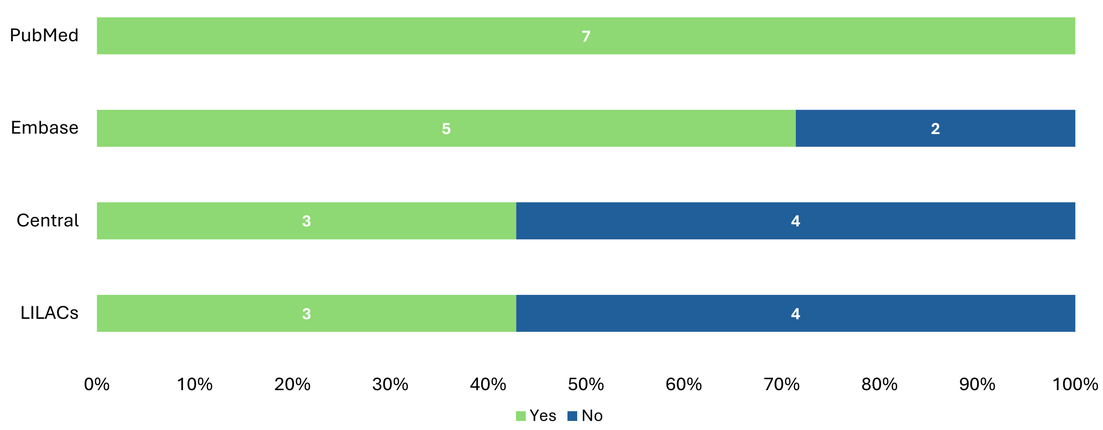
- Overall, two LLRs automatically reran searches on a regular basis and three had automated de-duplication of studies, with reviewers assessing new evidence weekly or monthly (Figure 1).[1,6]

Figure 1. Overview of a Living Literature Review Process



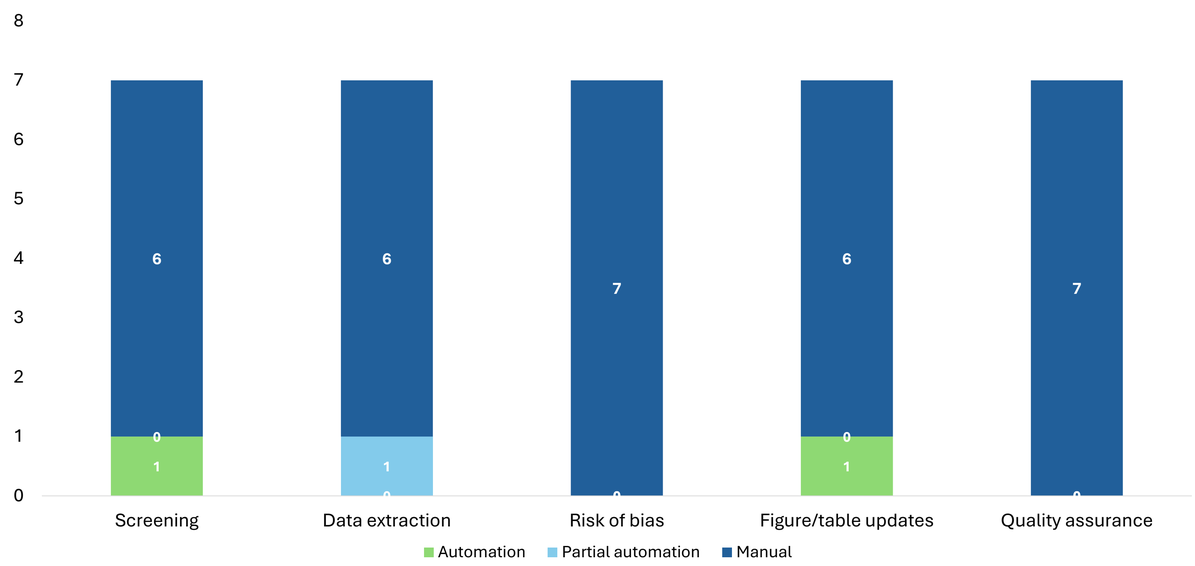
- Where reported, publication updates ranged from weekly to biannually.[1-2,4,6-7]
- The necessity of updates depended on new evidence availability, quality, and the impact of new findings on study outcomes and decision-making.[1-7]
- The most utilised literature search platforms were PubMed, OVID, and LILACS, all of which have auto-alert functions (Figure 2).[1-7]

Figure 2. Databases Used in Living Literature Reviews



- Only 1/7 LLRs reported substantial use of automation, having automated database searches and de-duplication, partial automation of screening, and automated updates of tables/figures.[1] Most LLRs (6/7) relied on manual screening, manual extraction, and manual risk-of-bias assessment, despite having automated search capabilities (Figure 3).[2-7]

Figure 3. Use of Automation in Identified Living Literature Reviews

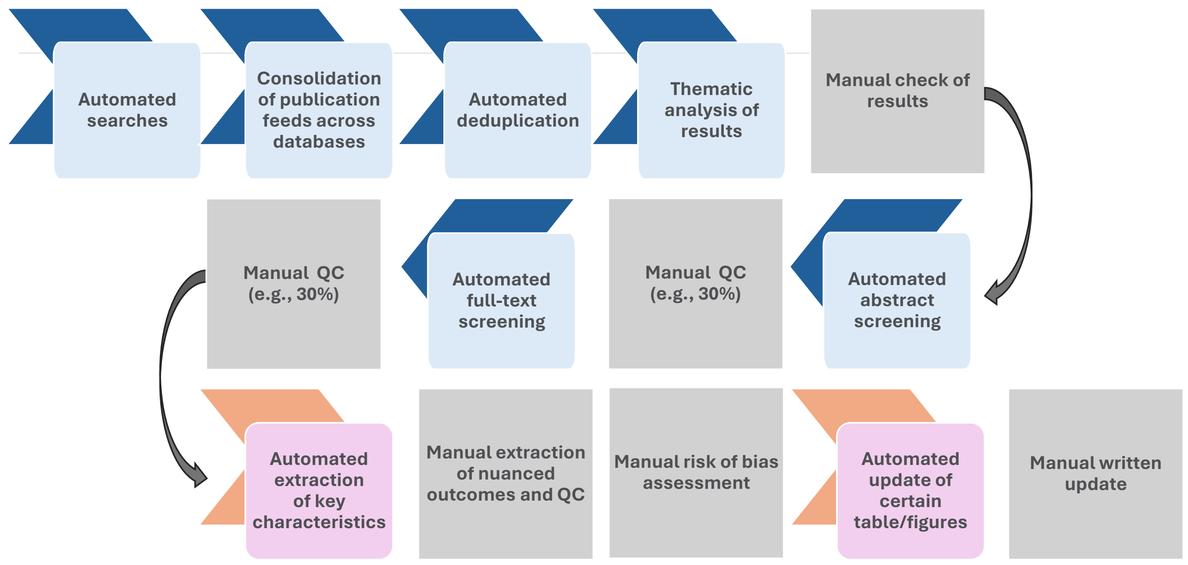


- LLR-specific limitations and quality assurance mechanisms were rarely reported. Risk of bias was always assessed manually, often using GRADE, and most studies manually extracted and incorporated newly published evidence.[1-7]

Future considerations

- The increased automation of LLRs would improve the efficiency of LLR updates, given the rate at which the literature evolves (Figure 4).
- AI-powered search alert aggregators could support the consolidation of publication feeds from PubMed, Embase, preprint servers, clinical trial registries, and gray literature sources into single dashboard
  - Natural Language Processing could be used to map new citations against predefined search strategies and classify relevance in real-time (with semantic search to identify thematically similar studies despite varied terminology)
- Automated screening could be utilised to leverage machine learning classifiers (trained on existing inclusion/exclusion decisions) to automate title/abstract screening with a high confidence threshold.
- Automated extraction using large language models (LLMs) trained on domain-specific extraction templates could identify and extract key study characteristics, including population, intervention, comparator, outcomes, and results, thereby supporting the data extraction phase of LLRs.

Figure 4. Suggested Future Implementation of Automation in Living Literature Review Development



Conclusion

- LLRs provide up-to-date information in rapidly evolving fields, supporting timely decision-making as new data emerge.
- To date, most LLRs have relied heavily on manual processes and methodologies utilised in traditional reviews; however, advances in AI tool availability and versatility are expected to drive increasing automation across literature searching, study identification, screening, and potentially data extraction.
- As AI-enabled workflows become more widely adopted, robust quality assurance frameworks will be essential to maintain the transparency, quality, and scientific integrity of LLRs.

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