AI/ML in HTA Evidence Synthesis: Where Do We Stand Today?

MSR140

Raju Gautam, PhD[1], Saeed Anwar, MSPharm[2], Ratna Pandey, MSc[2], Khushbu Baranwal, MSc[2], Tushar Srivastava, MSc[1]
[1]ConnectHEOR, London, UK; [2]ConnectHEOR, Delhi, India.
Email: raju.gautam@connectheor.com

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KEY MESSAGE

Among 1,391 HTA documents screened across NICE, CDA, and IQWiG, only 3 submissions (all from NICE) reported AI/ML use in SLRs, highlighting a significant gap between growing regulatory guidance on AI adoption and actual implementation in HTA evidence synthesis.

BACKGROUND

- ✓ Systematic Literature reviews (SLRs) are a cornerstone of health technology assessment (HTA), enabling transparent and evidence-based decision-making.[1]
- ✓ SLRs provide a transparent, reproducible, and comprehensive synthesis of available evidence, forming a critical foundation for HTA submissions and appraisal processes. However, the growing volume and complexity of biomedical literature have made SLRs increasingly resource-intensive and time-consuming.[1]
- ✓ Artificial intelligence and machine learning (AI/ML) technologies offer potential to improve efficiency, accuracy and scalability in evidence synthesis. While HTA agencies have issued guidance on AI use, their real use in HTA submissions remains unclear.[2]

Challenges of traditional SLRs

- Time-Consuming
- Resource-Intensive
- Human Limitations

OBJECTIVES

1. To review the methodological and guidance documents from major HTA international agencies to identify recommendations on AI/ML use in HTA-compliant SLRs.
2. For agencies referencing AI/ML, conduct a comprehensive review of HTA submissions over 3 years to assess the reporting, type, purpose, and extent of AI/ML use.

METHODS

8
HTA Agencies Reviewed

- National Institute for Health and Care Excellence (NICE, UK)
- Haute Autorite de Sante (HAS, France)
- Institute for Quality and Efficiency in Health Care (IQWiG, Germany)
- National Centre for Pharmacoeconomics (NCPE, Ireland)
- Scottish Medicines Consortium (SMC, Scotland)
- Tandvards- och lakemedelsformansverket (TLV, Sweden)
- Canada's Drug Agency (CDA/CADTH, Canada)
- Pharmaceutical Benefits Advisory Committee (PBAC, Australia)

- ✓ HTA methodological/guidance documents and submission dossiers were sourced from eight major international HTA agencies.
- ✓ Publicly available HTA methodological documents, guidance manuals, and published HTA submissions were systematically reviewed from official agency websites.
- ✓ The dataset included a diverse range of document types such as technology appraisals, clinical guidelines, reimbursement review reports, pharmacoeconomic evaluations and stakeholder submissions depending on agency-specific processes.

METHODS

A two-step structured approach was employed.

STEP 1

- As part of the first step, agencies were reviewed to identify explicitly the recommendations and guidelines on the use of AI/ML in evidence synthesis.
- However, only a few of agencies (NICE, CDA and IQWiG) were found to provide relevant AI/ML-related methodological or policy direction.
- Thus, in the second step, detailed appraisal-level analysis was restricted to these agencies, focusing on HTA submissions and evidence dossiers where AI/ML use could plausibly be reported.

STEP 2

- Among three agencies selected, NICE and CDA datasets formed the primary basis for in-depth screening of individual submissions, given the availability of structured, publicly accessible technology appraisal reports and comprehensive evidence documentation suitable for assessing real-world AI/ML implementation.
- For agencies with AI/ML guidelines, the review of HTA submissions (2023-25) was conducted to identify existing recommendations, gaps, and areas of caution for their application in SLRs.

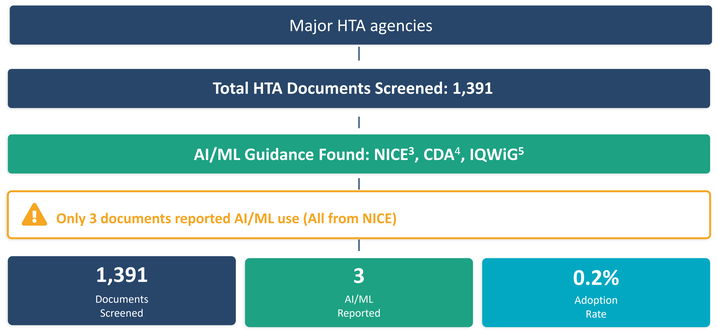
Data extracted on:

- Type of AI/ML
- Purpose of use
- Extent of integration
- SLR stages supported

RESULTS

Figure 1: HTA document selection diagram

- Despite the substantial volume of evidence reviewed, AI/ML use was identified in only 3 documents (0.2%), all originating from NICE submissions.
- No explicit reporting of AI/ML use was observed in CDA or IQWiG dossiers, indicating extremely limited real-world adoption across HTA processes.



The identified applications of AI/ML in NICE submissions were limited to the specific stage of SLR process, including:

- AI-assisted study screening, aimed at improving efficiency in identifying relevant studies.
- AI-assisted ad hoc literature searches, used to explore potential treatment effect modifiers.
- Natural Language Processing (NLP)-based approaches, applied to refine search strategies and support SLR updates.

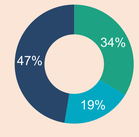
RESULTS (CONTINUED)

Table 1: AI/ML Applications Identified in NICE Submissions

Appraisal	AI/ML Application	Purpose
TA11540 (Feb 2025)	AI-assisted study screening	Improve efficiency in identifying relevant studies
TA1071 (Dec 2024)	AI-assisted ad hoc literature searches	Identify potential treatment effect modifiers
TA962 (Sept 2023)	NLP approach	Update SLR and refine search strategy via keyword identification

- Across all agencies, SLRs were consistently present as a core component of HTA submissions; however, AI/ML integration within these workflows was minimal and highly localized, suggesting that traditional manual processes continue to dominate evidence synthesis practices.
- Overall, these findings demonstrate a pronounced gap between increasing regulatory recognition of AI/ML potential and its limited implementation in real-world HTA submissions, with adoption restricted to isolated use cases rather than systematic integration

Figure 2: Distribution of HTA Documents Screened



DISCUSSION and CONCLUSIONS

Despite growing recognition of AI's potential, actual implementation remains limited and sporadic.

Key Barriers to AI/ML Adoption in HTA

- Methodological Uncertainty
- Lack of Standardization
- Limited Reporting

- ✓ Despite growing regulatory interest, real-world AI/ML use in HTA evidence synthesis remains extremely limited, with adoption restricted to isolated and exploratory applications rather than systematic integration into SLR workflows.
- ✓ This gap highlights the need for greater methodological standardization, transparent reporting frameworks, and validation of AI-driver approaches to support their broader acceptance in HTA processes.
- ✓ Addressing these challenges will be critical to unlocking the potential of AI/ML to improve efficiency and scalability of evidence synthesis.

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Poster presented at ISPOR in Pennsylvania, Philadelphia, USA, May 17–20, 2026

Financial Disclosure: Authors are employees of ConnectHEOR Limited. No external funding received. No conflict of interest to declare.