CURRENT GUIDELINES ON THE USE OF ARTIFICIAL INTELLIGENCE IN HTAs

ASSESSING THE APPLICATION OF AI ASSISTED SLR METHODOLOGIES IN HTA

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Introduction

Artificial intelligence (AI) has been rapidly assimilated into accessible and powerful tools which are transforming a variety of fields; among those is health economics and outcomes research (HEOR).

AI solutions extend human capabilities, allowing for faster and more accurate evidence synthesis and analysis. In HEOR, systematic literature reviews (SLRs) comprise an optimal example use case, as AI assisted techniques are ideal to analyse, compile and sort large amounts of data based on pre-defined criteria.

With a properly set up preface for SLR search, analysis, and compilation (e.g., inclusion and exclusion criteria), AI assisted methods can alleviate resource intensive tasks and seamlessly provide human reviewers with the information they need to make correct decisions.

How acceptable are AI assisted SLR methodologies to HTA? Three crucial pillars help us evaluate the operational rigor and impact on decision-making of AI activities informing health technology assessments (HTAs):

- Validated technical implementation
- Consistently high-quality outcomes
- Sensitivity to HTA authorities' acceptance of AI methodologies

While the pillars are of equal importance, the first two can be satisfied through internal technical excellence and comprehensive quality control, following standard submission practices.

The third pillar hinges on HTA agencies' knowledge and willingness to adopt evidence generated via AI. Lacking this, AI is a solution without a willing customer.

Objective

The aim of this research was to understand and describe the current state of HTA guidance regarding AI to assess go/no go for AI assisted SLR methods.

Method

A comprehensive review of official guidelines on the use of AI for HTAs was conducted in June 2024 and updated in October 2024.

The following HTA agencies were included, based on influence, geographic spread, and diversity of HTA archetype:

Archetypes	Countries
Cost-effectiveness: UK, Sweden, Canada	
Budget-impact: Italy, Spain	
Clinical differentiation: France, Germany	

Results

Out of the seven assessed HTA bodies guidelines, only the National Institute for Health and Care Excellence (NICE) in the UK had developed guidelines on the use of AI in HTAs[1].
There are four key positions in NICE's Position Statement:

- **Augmentation, Not Replacement**: NICE highlights that the use of AI should be "*based on the principle of augmentation, not replacement, of human involvement.*"
  In FIECON's AI assisted SLR workflow (**Figure 1**), human oversight is included in each step, and recommendation-based approach is utilised, thus ensuring AI is augmenting human expertise, not replacing it.
- **Use of machine learning (ML) and large language models (LLMs)**: NICE highlights the potential for the use of ML and LLMs to "*support evidence identification,…, the primary and full-text screening of records to identify eligible studies, and the visualisation of search results.*"
  The AI assisted workflow (**Figure 1**) utilises ML and LLMs to generate search strategies, to aid in the primary screening of records (with human oversight and cross-validation), and to classify and visualise studies.
- **Data Extraction Automation:** NICE highlights the potential for the use of LLMs to "*automate data extraction*."
  Our workflow (**Figure 1**) uses LLMs that can recognise and extract key data points from publications in a semi-automated approach to ensure human oversight.
- **AI Methods Disclosure:** NICE highlights the need for organisations and authors to "*clearly declare its (AI) use, explain the choice of method and report how it was used.*"
  Our workflow (**Figure 1**) provides full and comprehensive disclosures that detail how the AI technology is being used, ensuring full transparency and allowing for the proper evaluation of the methodology used.

Figure 1: The FIECON AI assisted SLR workflow

Protocol	Run and download searches		Screening		Extraction	
Review questions & search terms	Run searches	Set up extraction sheet	De-duplication	1st pass	2nd pass	Extract data	Report data
Human: Develop review questions capturing overarching strategy		**Human**: Tailor templates	**Human:** Manual QC	**Human**: Screening by two independent human reviewers		**Human:** Manual QC	**Human**: HTA compliant templates
AI: Enhance searches and retain information to inform rapid updates		**AI:** Automatic updates	**AI:** Automated de-duplication	**AI:** Provide reviewers information to make faster and more accurate decision		**AI:** Automated extraction	**AI:** Automated data refresh

Conclusions

- The NICE AI Position Statement allows for innovation and progress in the integration of AI into HTAs.
- Other HTA bodies are formulating guidelines at present; if they reference NICE then it is plausible they will adopt similar open positions that allow organisations to benefit from technological advancements while maintaining a high degree of responsibility and awareness.
- AI assisted SLRs, as a discrete use case in HTA, is optimal and appropriate given current guidance.
- AI assisted SLR use cases are a "go" in HTA.

Abbreviations: AI – Articifial intelligence; **HTA** – Health technology assessment; **QC** – Quality control; **SLR** – Systematic literature review

Want to know more?

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References:

1. Use of AI in evidence generation: NICE position statement. https://www.nice.org.uk/about/what-we-do/our-research-work/use-of-ai-in-evidence-generation--nice-position-statement Accessed 28th October 2024