Barriers delaying the implementation of artificial intelligence-based literature reviews (AILRs) by health technology assessment (HTA) bodies

HTA187

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Background

Proven competence

Artificial vs HUMAN Intelligence

Low confidence in AI assistance

› Evidence synthesis through systematic literature reviews is crucial for health technology assessments (HTAs). However, due to the explosion of scientific publications in recent years, it is challenging to critically assess, extract information, and keep these reviews current. The emergence of artificial intelligence (AI) tools offers promising solutions to automate many labor-intensive tasks associated with evidence synthesis. This indicates that AI-driven approaches could substantially streamline secondary information processing, reducing the time and human effort required for these tasks. Although AI holds great promise, significant barriers exist for HTA practitioners, researchers, and reimbursement decision-makers.

› NICE recently published a position statement on AI use in literature reviews, recommending that AI should augment, not replace, human involvement. However, significant work remains to establish broader consensus and guidelines across the HTAs and the industry.

› Multiple research papers have been published, primarily focusing on the performance of different AI tools in the market and their ethical issues. While these studies provide valuable insights, they fall short of comprehensively addressing the broader, system-level, or policy-level issues that arise when considering the practical implementation of AI. So far, limited research has taken a comprehensive and interconnected approach to examining these multifaceted issues. Drawing from our firsthand experience as HTA users and incorporating insights from recent publications, speaker sessions, conferences, etc., this viewpoint presentation explores the barriers associated with AI implementation.
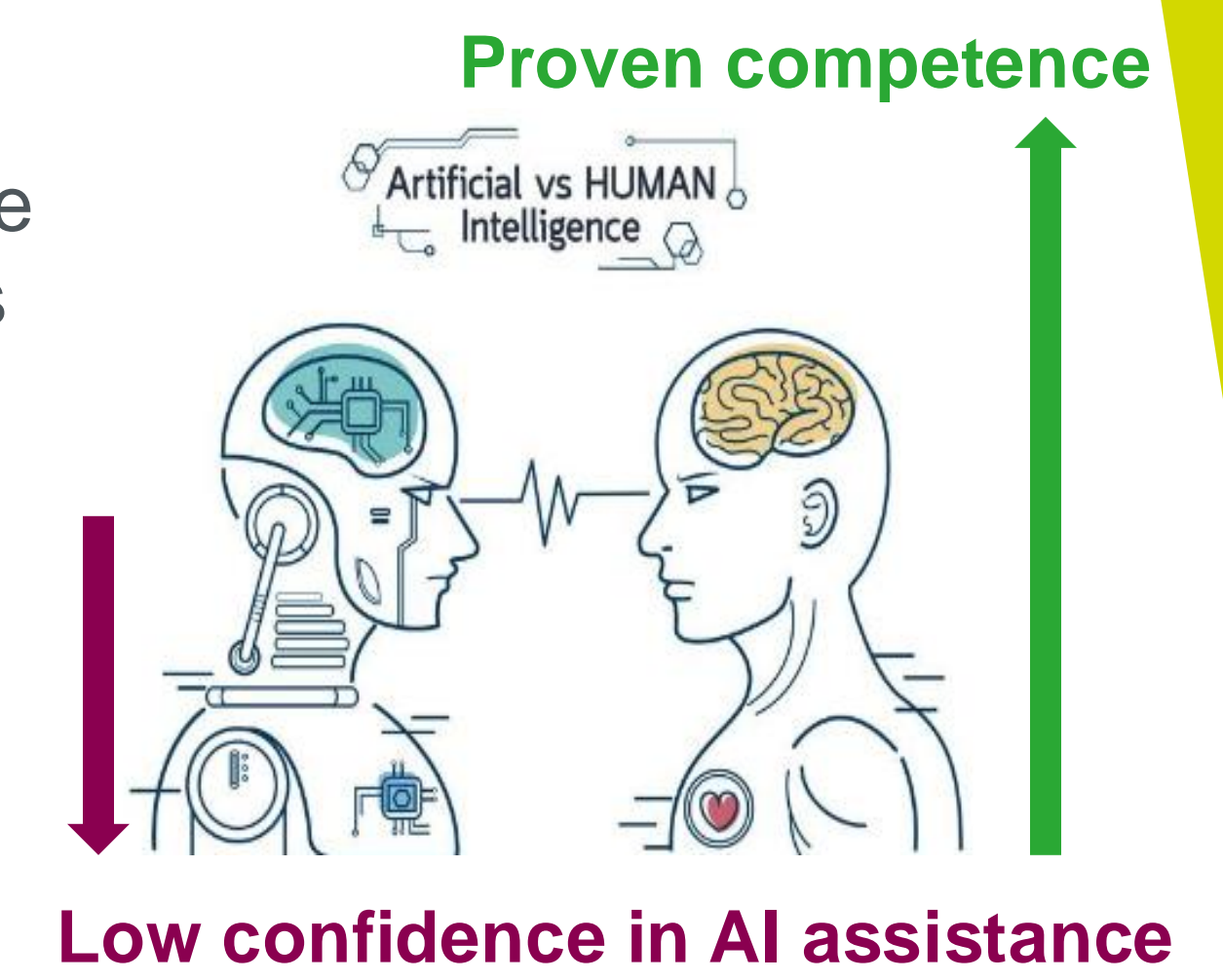
Methods

› A rapid literature review, encompassing both scientific publications and gray literature, was performed to identify and compile a list of challenges associated with implementing AI in HTA and decisions related to reimbursement. The Embase database was accessed, and relevant articles were identified through a combination of focused keywords, i.e., ('artificial intelligence' OR 'machine learning') AND (HTA OR 'health technology assessment') AND (obstacle OR barrier OR hurdle OR problem OR complication OR issue OR difficulty OR implementation OR 'decision making'). One experienced reviewer reviewed the articles identified. The review was limited to publications in English. Additionally, a reference-tracking approach was employed to discover other pertinent research papers. In parallel, we reviewed panel presentations, discussions, speaker podiums, etc., of different HTA experts at conferences and noted their opinions. Identifying barriers from the literature and those presented by HTA experts were reviewed and synthesized.

Results

› The potential barriers were classified into technological, administrative, and methodological. While some of the identified barriers were interconnected, we also observed differences in their specific characteristics and nuances.

Technology Barriers

• **Lack of fit-for-purpose AI tools for HTA bodies** – Most tools suit the daily operational requirements of consulting, pharma researchers, or tool developers, not HTA bodies, leading to isolated efforts by HTA bodies to develop their own tools (e.g., internal RCT classifiers developed by NICE).

• **Requirement of tools with specialized functionalities** – Tools required by HTA bodies to be tailored for their unique workflows, complex decision-making processes, stakeholder engagement, and transparent, explainable methodologies.

Pressing need for collaborative efforts between AI developers, HTA experts, and policymakers to create purpose-built AI tools for HTA agencies

Administrative Barriers

• **Financial barriers** – Tight budgets & uncertainty about the return on investment for AI in HTA.

• **Political barriers** – Political priorities are focused on other areas of healthcare, leaving AI in HTA underfunded and unsupported.

• **Legal implications** – Liability concerns if AI-driven decisions lead to adverse outcomes in patient care (who would be legally responsible?), breaches in sensitive health data, intellectual property issues, etc.

Developing a clear regulatory framework, creating funding mechanisms, providing education and training to policymakers and HTA professionals about the benefit of AI use

Methodological Barriers

• **Black-box phenomenon**
  • Lack of clarity (such as the reason of the exclusion of studies) poses substantial challenges in the context of HTA, where transparency is crucial
  • Absence of explanation can also lead to several other issues, e.g., reduced trust, potential bias, regulatory and ethical concerns

• **Training**
  • Previous AI models require rigorous indication-specific training
  • Generative AI models offer broader applicability, though they lack the specificity required for certain HTA tasks. Further, the use of poor input or non-controlled data from the real world may potentially skew assessments of treatment efficacy and safety, misallocation of healthcare resources based on inaccurate cost-effectiveness analyses

• Development of explainable AI (XAI) tools designed explicitly for HTA processes that provides clear, qualitative explanations for their decisions along with data-driven insights
• Need for rigorous studies comparing performance of indication-specific and generative AI models in HTA contexts

Conclusion

› HTA bodies face an unprecedented burden when adopting AI technologies in their assessment processes. This challenge requires a coordinated approach across the healthcare ecosystem. Strong collaboration between all relevant stakeholders is crucial. HTA bodies should assume a central, mediating role in this collaborative framework rather than acting independently. By facilitating dialogue and coordinating efforts among these diverse stakeholders, HTA bodies can ensure a more comprehensive and balanced integration of AI into their methodologies, ultimately leading to more effective and patient-centric health technology assessments.

› Further, more sophisticated AI systems need to be developed for HTA bodies that can better interpret qualitative data and incorporate emotional intelligence and build hybrid approaches (combining AI-driven insights with human expertise).

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