

---

## AI and the Future of HEOR: Balancing Speed and Accuracy



---

Health Economics and Outcomes Research (HEOR) has long been a methodical discipline, providing decision-makers with critical insights into the impact and value of healthcare interventions. Traditionally, this research required extensive time and resources, with systematic literature reviews (SLRs), cost-effectiveness models and real-world evidence analyses forming the foundation of decision-making. However, the introduction of generative artificial intelligence (Gen AI) is significantly increasing the speed at which HEOR processes are conducted. While this technological advancement offers tremendous potential, ensuring accuracy and reliability remains a pressing challenge. The balance between speed and oversight will define the successful integration of AI in HEOR.

The thought of HEOR as a "fast science" can be unsettling to some professionals in the field. The structured and methodical approach that has governed HEOR for decades ensures the credibility of findings and their applicability to real-world decision-making. However, with the acceleration brought by AI, there is both an opportunity to enhance efficiency and a risk of compromising thoroughness. This duality underscores the need for a cautious but proactive approach to leveraging AI to support HEOR processes.

### AI and Systematic Literature Reviews: A Leap Forward

One of the most immediate applications of AI in HEOR is its ability to streamline SLRs, a traditionally labour-intensive process. Researchers are required to manually sift through thousands of published studies to assess their relevance, quality and potential bias. AI, particularly large language models (LLMs), has demonstrated the ability to significantly reduce the time and effort required for these tasks. By automating initial screening processes, AI can quickly identify relevant studies, apply inclusion and exclusion criteria and summarise findings. This efficiency allows researchers to focus on higher-level analysis and interpretation.

Despite these advantages, AI-driven literature reviews are not without risks. AI models have been known to generate false citations, or "hallucinations," which necessitate human oversight to validate results. Given the lack of formalised best practices for AI-enabled HEOR research, professionals must approach these tools with caution. As AI adoption expands, the development of transparent methodologies and rigorous validation processes will be critical to maintaining research integrity. The ability to quickly synthesise information does not eliminate the necessity for comprehensive analysis, and researchers must remain vigilant in ensuring that AI-generated summaries reflect accurate and unbiased findings.

Moreover, while AI can assist in extracting relevant insights, it does not yet possess the critical judgement required to evaluate study limitations, contextual nuances or the broader implications of research conclusions. Human expertise remains essential in determining how AI-generated insights should be interpreted and applied in HEOR decision-making. As AI tools become more sophisticated, refining best practices will be crucial in maximising their utility while minimising errors.

### The Role of Human Oversight in AI-Driven Research

While AI can accelerate HEOR tasks, human intervention remains indispensable. The ability of AI to process large datasets efficiently is impressive, but it still lacks the nuanced judgement required to assess biases, methodological appropriateness and the broader context of findings. A balanced approach is required where AI acts as an enhancer rather than a replacement for human expertise.

A key concern is the potential for AI to misinterpret data or provide misleading conclusions if left unchecked. Human oversight ensures that AI-generated insights remain accurate and applicable to real-world decision-making. Moreover, as AI continues to evolve, researchers must remain adaptable, refining their methodologies to account for AI's strengths and limitations. Establishing guidelines for AI's role in HEOR will be necessary to standardise its use and mitigate potential risks. Ensuring that human oversight is embedded in the workflow will be critical to

preventing unintended consequences that may arise from over-reliance on AI-driven processes.

Transparency in AI research practices is also essential. Without clear documentation of how AI-generated conclusions are reached, there is a risk of diminishing trust in HEOR findings. Researchers must maintain rigorous documentation of their AI-assisted processes, ensuring that results can be audited, validated and replicated where necessary. The evolution of AI in HEOR will require a collective commitment to refining methodologies, promoting transparency and ensuring that AI serves as a tool for enhancing—rather than replacing—human expertise.

### **Expanding Access to Unstructured Data with AI**

Another transformative impact of AI in HEOR lies in its ability to process unstructured data. The majority of patient-generated data exists in unstructured formats, such as electronic medical records (EMRs) and clinician notes. AI can convert this raw information into structured datasets that can be analysed for real-world evidence. This advancement broadens the scope of available data, allowing for more comprehensive and timely analyses.

However, concerns regarding accuracy persist. The ability of AI to map descriptive text to medical codes remains inconsistent, requiring researchers to refine prompt engineering techniques to improve precision. Additionally, the environmental costs associated with AI model training and inference must be considered as the field advances. While AI offers an opportunity to unlock new data sources, its integration must be guided by careful assessment and continuous improvement in data handling methodologies. Any widespread adoption of AI for this purpose must be accompanied by robust validation techniques to ensure that AI-generated classifications align with traditional research standards.

Furthermore, the increased reliance on AI for structuring unstructured data raises ethical considerations. Ensuring patient privacy and maintaining data security are critical factors in the use of AI for processing healthcare information. As HEOR professionals incorporate AI into their workflows, it will be necessary to establish ethical frameworks that prioritise patient confidentiality while enabling innovation in data utilisation.

The adoption of AI in HEOR presents both opportunities and challenges. On the one hand, AI is accelerating the speed of evidence generation, potentially leading to faster healthcare decision-making and improved patient access to new therapies. On the other, the risks associated with AI-generated inaccuracies highlight the continued necessity of human validation. As AI's role in HEOR evolves, the profession must balance innovation with caution, ensuring that technological advancements do not compromise research quality.

Looking ahead, AI will not only enhance existing HEOR methodologies but also create new challenges that will require AI-driven solutions. Researchers must remain vigilant in refining AI applications, developing best practices and prioritising transparency. While the future of AI in HEOR is promising, its success hinges on a measured approach—one that embraces speed while safeguarding the integrity of research findings. The GenAI era may redefine traditional limits, but responsible implementation will determine its true impact on the field.

**Source:** [Healthcare Transformers](#)

**Image Credit:** [iStock](#)

Published on : Tue, 4 Feb 2025