The Current Landscape of Artificial Intelligence (AI) Methodology in Health Economics and Outcomes Research (HEOR): A Review of ISPOR Europe 2025 Abstracts

Allie Cichewicz[1], Kush Patel[1], Ellen Thiel[1], Kevin Kallmes[1]
[1]Nested Knowledge, St. Paul, MN

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Introduction

- Research abstracts presented at ISPOR provide a representative snapshot of current methodologies, topics, and research practices across the HEOR field.
- Within this evolving landscape, ISPOR has identified AI as a leading trend for 2026–2027, highlighting its potential to support researchers across evidence generation, analysis, synthesis, and dissemination.[1]
- As AI adoption expands across HEOR domains, a structured landscape analysis is needed to better understand how researchers are incorporating AI into their workflows and how it may influence performance.

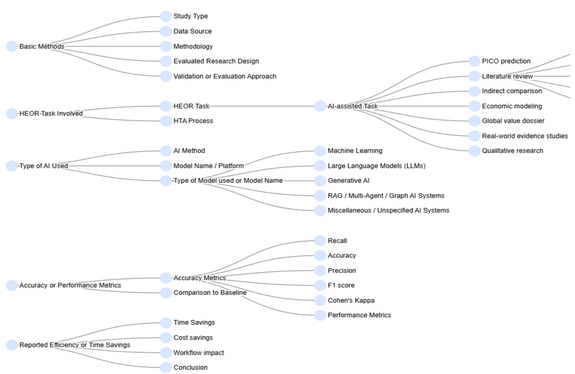
Objective

To characterize the scope, methods, applications, goals, and outcomes of AI and/or large language model (LLM) tools employed in HEOR research and presented at ISPOR Europe in November 2025.

Methods

- A total of **n=145 abstracts** mentioning AI or LLMs were identified from the ISPOR presentations database and uploaded to the **Nested Knowledge platform**.
- Key concepts to be collected from the abstracts were built as a tag hierarchy and extracted using Adaptive Smart Tags (ASTs), an LLM-based extraction tool in Nested Knowledge (*Figure 1, and QR code*).
- ASTs extracted relevant information from all abstracts into a Human-in-the-Loop workflow. Expert curation on objectives, methodology, HEOR task categories, AI platforms reported, data sources, validation approaches, and performance metrics was performed.
- Findings were then synthesized and visualized to define trends across the body of abstracts.

Figure 1. Tag Hierarchy and AI-assisted Data Extraction



Full platform view available via QR code:

Artificial Intelligence Snapshot

Title	AI-assisted Task	Type of Model used or Model Name
Artificial Intelligence in Systematic Reviews: An Investigation Into th...	Screening (Lit Review)	Miscellaneous / Unspecified AI Systems
Artificial Intelligence and Advanced Analytics in HTA	Extraction (Lit Review); Economic mod...	Generative AI; Machine Learning
The Artificial Intelligence Era in Health Economic Modeling	Economic modeling	Miscellaneous / Unspecified AI Systems
Harnessing Generative Artificial Intelligence for Global Value Dossie...	Global value dossier	RAG / Multi-Agent / Graph AI Systems...
Acceptance of Artificial Intelligence in Evidence and Dossier Develo...	Literature review; PICO prediction; Re...	Miscellaneous / Unspecified AI Systems
NICE and CDA Assessment of Artificial Intelligence-Enabled Health ...		Miscellaneous / Unspecified AI Systems
Systematic Literature Review of Artificial Intelligence-Based Models ...	Literature review; Search (Lit Review);...	Machine Learning

Results

Figure 2. Major HEOR Domains for AI Application

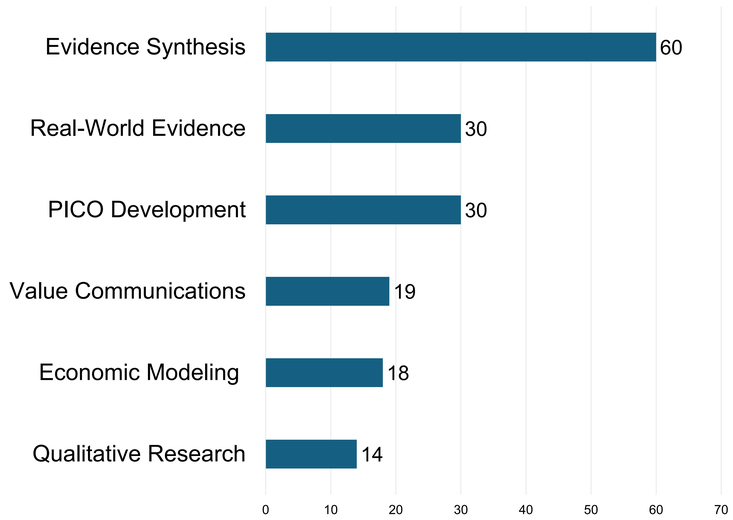
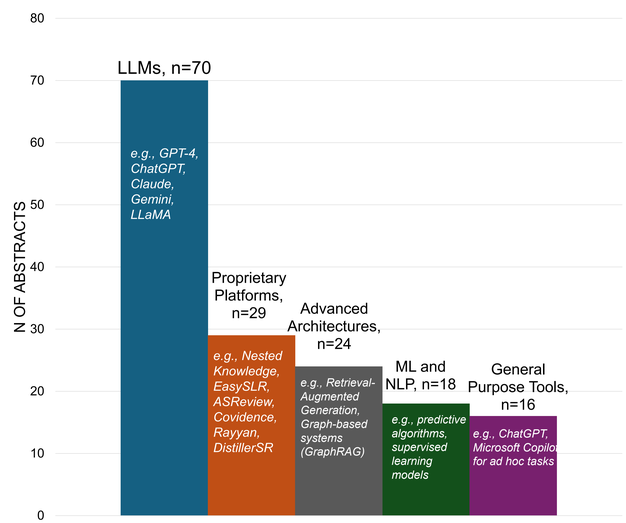


Figure 3. Types of Models Utilized for AI Applications



Scope of AI Presented in ISPOR Abstracts:

- Across HEOR research domains that utilized AI, evidence synthesis dominated (n=60/145 abstracts), followed by real-world evidence applications (n=30) as shown in **Figure 2**.
- Among models mentioned in the identified abstracts, LLMs were most frequently used (n=70) (**Figure 3**).

Performance Metrics Reported:

- Performance metrics demonstrated accuracy of 70-100%, precision of 8-100%, and F1-scores of 11-99%.
- Efficiency gains reported in abstracts included time savings of 48-95% and workload reductions of 46-90%.
- Validation primarily relied on direct human comparison (n=51), with limited external validation (n=30).
- Challenges included interpretability gaps (n=98) and ethical barriers (n=23).
- Hybrid AI-human models consistently outperformed fully-automated or manual-only approaches.

Conclusions

- Studies demonstrated that AI tools reduce time and resource requirements for literature review (screening and data extraction steps) and economic modeling programming.
- Across studies, hybrid AI-human workflows consistently outperformed fully-automated approaches, reinforcing the need for human oversight to maintain analytical validity.
- The range of applications in ISPOR Europe abstracts reflects rapid experimentation and adoption of AI in HEOR. Though most studies were proof-of-concept, use and validation was most mature in literature review.
- AI adoption should prioritize applications with reproducible validation methods while the field develops shared quality frameworks and reporting standards for HEOR-specific uses.

Reference: 1. The Professional Society for Health Economics and Outcomes Research. “ISPOR 2026-2027 Top 10 HEOR Trends”. 2026. https://www.ispor.org/heor-resources/top-10-heor-trends.

Disclosures: Authors are contractors, employees, directors, and/or equity holders of Nested Knowledge and this study was conducted using the Nested Knowledge platform.

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