AI in CEE Health System Decision Making: Can Payers, Patients, and Policy Align for Smarter Access?

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Disclosures

- **Kevin Kallmes is an equityholder and employed by Nested Knowledge, Inc.**

- He is an equityholder and board member of Superior Medical Experts and Piraeus Medical.

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AI Philosophy *In Action*

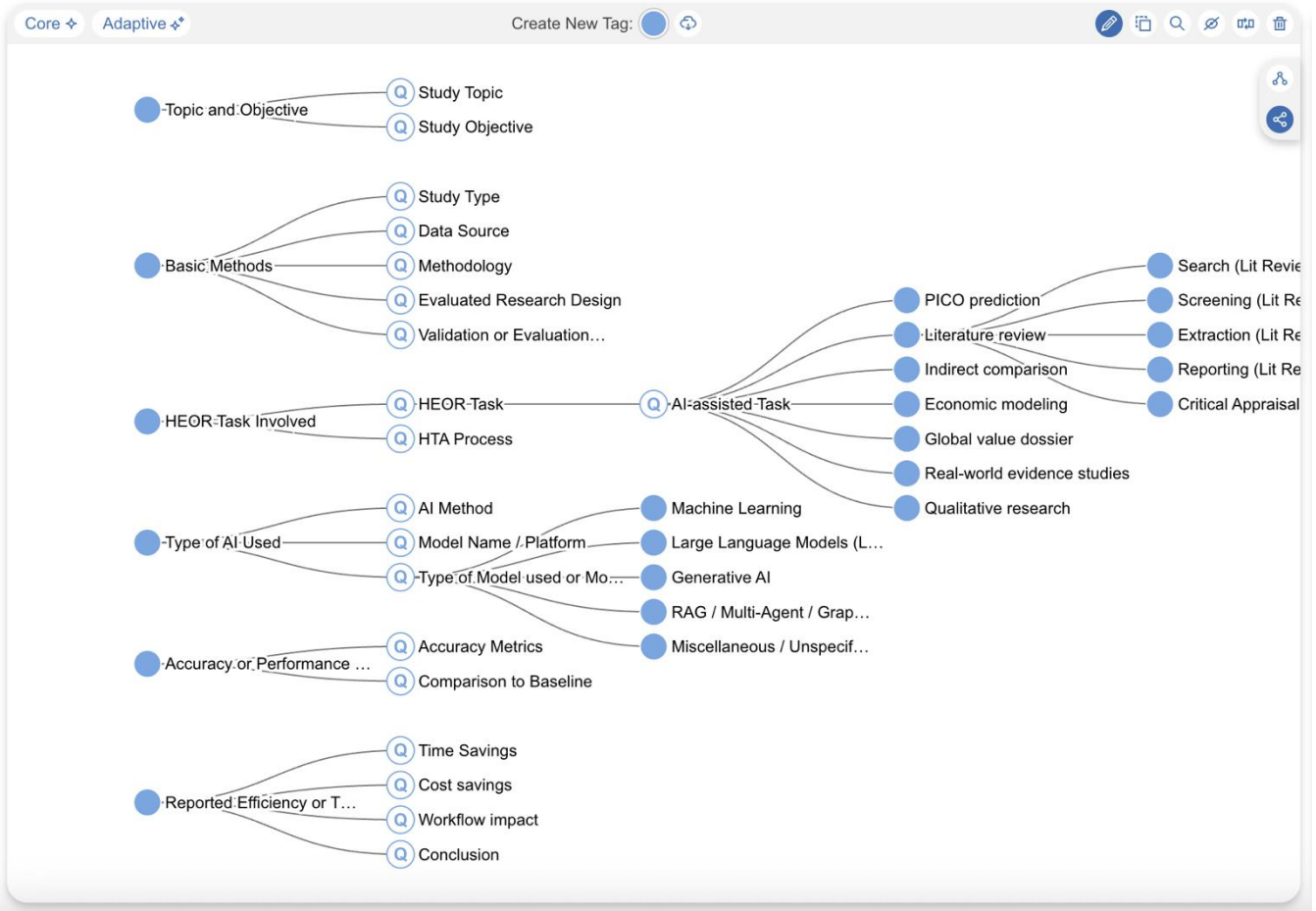
Our Team's Guiding Principles:

- **Data Provenance:** Always link AI-identified findings to their original source and exact supporting text or data, ensuring traceability and verifiability within systematic reviews.
- **Methodological Transparency:** Disclose how AI models are trained and validated, including data sources, algorithms used, performance metrics, and known limitations, enabling informed use and continued refinement.
- **Human Oversight:** AI outputs are reviewed by human experts wherever automation replaces manual effort, preserving accuracy and interpretability.

Intended Impact: *Producers* of reviews retain full control and traceability of sources, methods, and oversight checkpoints. For *Consumers:* AI accelerates evidence synthesis outputs without compromising rigor or decision confidence.

AI at ISPOR Europe 2025

- We performed an AI Rapid Review (Configuration & curation: 2 hours) on all Glasgow AI-related Posters and Presentations (**145 total!**), in Nested Knowledge:



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AI at ISPOR Europe 2025

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- **Results:** HEOR / Market Access AI Applications:
  - Evidence synthesis dominated (60/145 studies), followed by:
  - Economic modeling (18/145),
  - Real-world evidence (30 mentions),
  - Qualitative research (14 mentions),
  - Value communication / dossiers / narratives (19 mentions),
  - PICO development (30 mentions).
- **AI Summary:** Key Findings:
  - Time savings: 48%–95%,
  - LLMs (71 studies) or GenAI (38 studies) dominated; ML reported in 27.
  - *Enhanced:* Accessibility (104 studies), Scalability (88), Quality enhancement (101).
  - Every step in NICE-supported review had validation presented *(see below).*

Check out “Acceptance of Artificial Intelligence in Evidence and Dossier Development by Global HTA Agencies” by *Skowron et al.* for an overview of HTA Acceptance!

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AI at ISPOR Europe 2025

Dashboard

Artificial Intelligence Snapshot

Title	AI-assisted Task	Type of Model used or Model Name
Artificial Intelligence in Systematic Revi…	Literature Review: Screening	Miscellaneous / Unspecified AI Systems
Artificial Intelligence and Advanced Ana…	Economic modeling; Literature Review:…	Machine Learning ; Generative AI
The Artificial Intelligence Era in Health …	Economic modeling	Miscellaneous / Unspecified AI Systems
Harnessing Generative Artificial Intellig…	Global value dossier	Generative AI; RAG / Multi-Agent / Gra…
Acceptance of Artificial Intelligence in E…	Economic modeling; Real-world eviden…	Miscellaneous / Unspecified AI Systems
NICE and CDA Assessment of Artificial …		Miscellaneous / Unspecified AI Systems
Systematic Literature Review of Artifici…	Literature review	Machine Learning
Trusting a Machine? Opportunities and …	Qualitative research	
Zoom Out: Simplifying Complex Health…	Economic modeling	RAG / Multi-Agent / Graph AI Systems
Artificial Intelligence in Health Economi…		Machine Learning
Artificial Intelligence in Health Economi…	Economic modeling; Critical Appraisal; …	Machine Learning ; Large Language M…
Health Technologies Using Artificial Inte…		Miscellaneous / Unspecified AI Systems
The Cost-Effectiveness of an Artificial I…	Economic modeling	Large Language Models (LLMs)
Assessing the Use of Artificial Intelligen…	Literature review; Qualitative research	Miscellaneous / Unspecified AI Systems

Leveraging AI for HEOR Processes

Key Study: Validation and Time Savings of AI Reviews in NK

AI in Evidence Synthesis: Have We Reached the Promised Land or Are We Still Wandering the Desert?

OBJECTIVES: Artificial Intelligence (AI) has transformed long-standing paradigms in the conduct of literature reviews (LR). This study evaluates the capabilities of a commercially available AI-enhanced LR tool to automate key elements of the review process. METHODS: Following a direct comparative evaluation of four AI-assisted LR tools published in May 2025, the top-performing platform was adopted as our organization's primary LR solution. In this study, we assessed its

Guidance on AI in HTA, an Overview and Review

Acceptance of Artificial Intelligence in Evidence and Dossier Development by Global HTA Agencies

OBJECTIVES: This study investigates the extent to which Health Technology Assessment (HTA) agencies have issued guidance related to the use of Artificial Intelligence (AI) in HTA submissions. The aim is to assess the current landscape and identify opportunities and challenges for broader adoption of AI-supported methodologies in evidence generation. METHODS: A targeted search was conducted for publicly available documents—such as policy papers, position statements, or

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AI at ISPOR Europe 2025

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Literature Review is a Flexible Foundation

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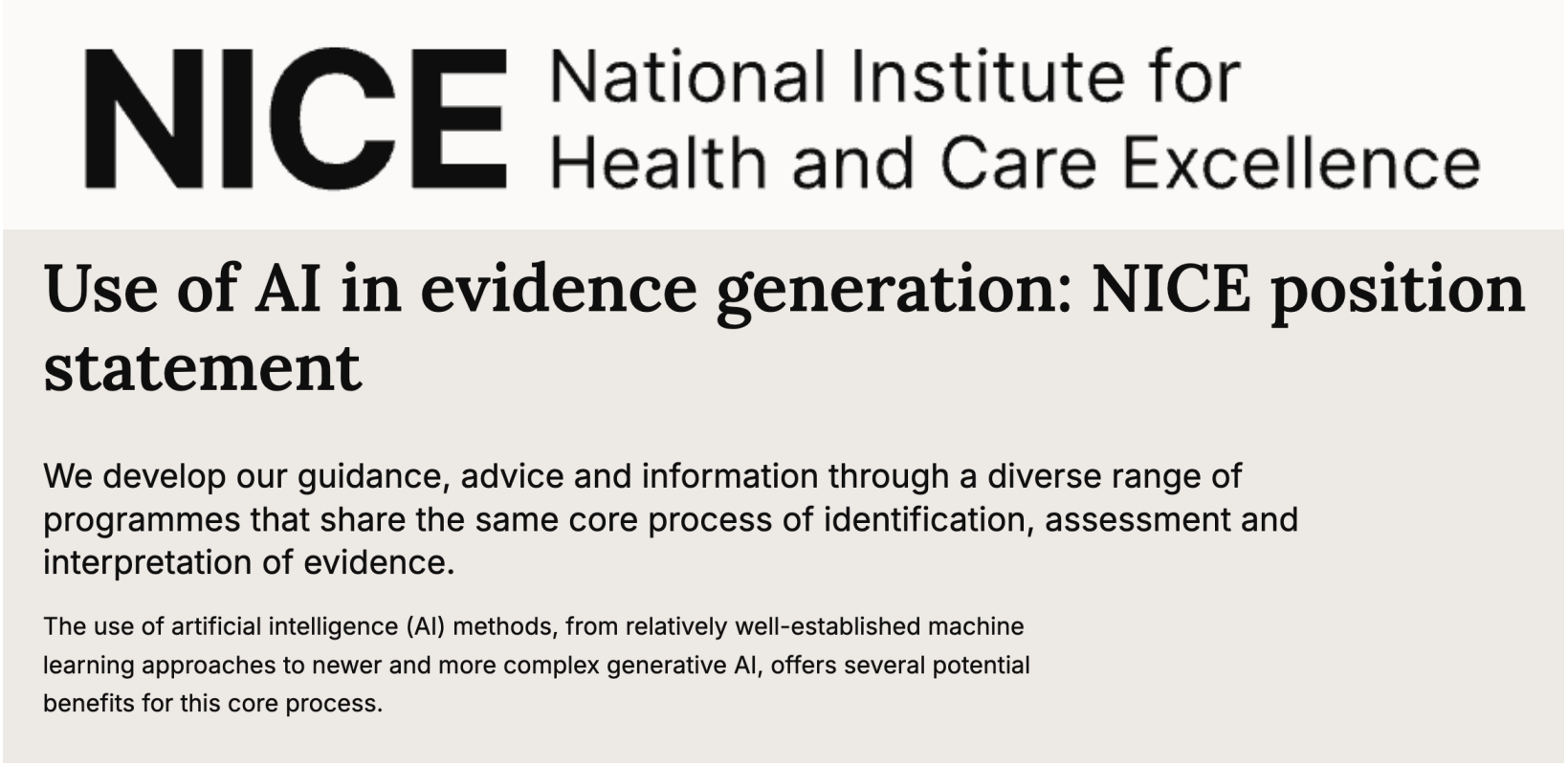
Emerging Guidance: NICE 2024



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Emerging Guidance: CDA 2025

Canada's Drug Agency
L'Agence des médicaments du Canada
Drugs. Health Technologies and Systems. Médicaments, technologies de la santé et systèmes.

News

New Position Statement Aims to Guide the Use of AI Methods in Health Technology Assessment

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High-level Approach: NICE Statement

- **Augmentation, Not Replacement**: NICE states:
  - “Any use of AI methods should be based on the principle of augmentation, not replacement, of human involvement.”

- **Framework & Focus on Systematic Review: “**Review processes are largely undertaken manually [and] require substantial time and resources. **AI methods have the potential to automate various steps in these processes.”**

High-level Approach: NICE Guidance

AI allowed for Systematic review and evidence synthesis specifically:

- 18. **Search and Screening: "**Machine learning methods and large language model prompts may be able to support evidence identification by
    - Generating **search strategies**,
    - Automating the **classification of studies** (for example, by study design),
    - The **primary and full-text screening** of records to identify eligible studies, and
    - The **visualisation of search results**."

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High-level Approach: NICE Guidance

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  - The **visualisation of search results**."
- 19. **Data Extraction: "**Large language models could be used to **automate data extraction** from published quantitative and qualitative studies." *Less proven.*
- 20. **Meta-analysis: "**Large language models could be provided with prompts to generate the code required to **synthesise extracted data in the form of a (network) meta-analysis**." *Less proven.*
- 21. *Publicized:* Cochrane and Guidelines International Network are drafting emerging further guidance, explicitly incorporated here.

NOT LISTED: Interpretation and writing of results!

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{Nested} Knowledge Compliance & Methods:

Publication in Cochrane: Evidence Synthesis & Methods

COCHRANE EVIDENCE SYNTHESIS AND METHODS

METHODS ARTICLE | Open Access

Human-in-the-Loop Artificial Intelligence System for Systematic Literature Review: Methods and Validations for the AutoLit Review Software

Kevin M. Kallmes, Jade Thurnham, Marius Sauca, Ranita Tarchand, Keith R. Kallmes, Karl J. Holub

First published: 25 October 2025 | https://doi.org/10.1002/cesm.70059

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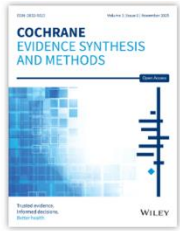
ABSTRACT

Introduction

While artificial intelligence (AI) tools have been utilized for individual stages within the systematic literature review (SLR) process, no tool has previously been shown to support each critical SLR step. In addition, the need for expert oversight has been recognized to ensure the quality of SLR findings. Here, we describe a complete methodology for utilizing our AI SLR tool with human-in-the-loop curation workflows, as well as AI validations, time savings, and approaches to ensure compliance with best review practices.

Methods

SLRs require completing Search, Screening, and Extraction from relevant studies, with meta-analysis and critical appraisal as relevant. We present a full methodological



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This article also appears in:
AI in Evidence Synthesis

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Figures References Related Information

Figure 1

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{Nested} Knowledge Compliance & Methods:

Mapping against NICE Guidance

Stage	NICE Statement Summary	Nested Knowledge AI Tool *All Human-in-the-Loop!*
Search	**Allows:** Generate Search Strategies & Visuals	**Smart Search,** Research Question -> Boolean Query
Screening	**Allows:** Abstract & Full Text Screening	**Criteria-based Screening,** LLM traceable decisions
Data Extraction	**Allows:** Extracting data (less proven)	**Adaptive Smart Tags,** Qualitative & Quantitative extraction;
NMA	**Allows:** Generation of analysis	**Smart Meta-analytical Extraction,** generates Network Meta-analysis!
Critical Appraisal	**Allows:** *Silent, no guidance to date*	**Adaptive Smart Tags** (on Critical Appraisal systems)

{Nested} Knowledge Compliance & Methods:

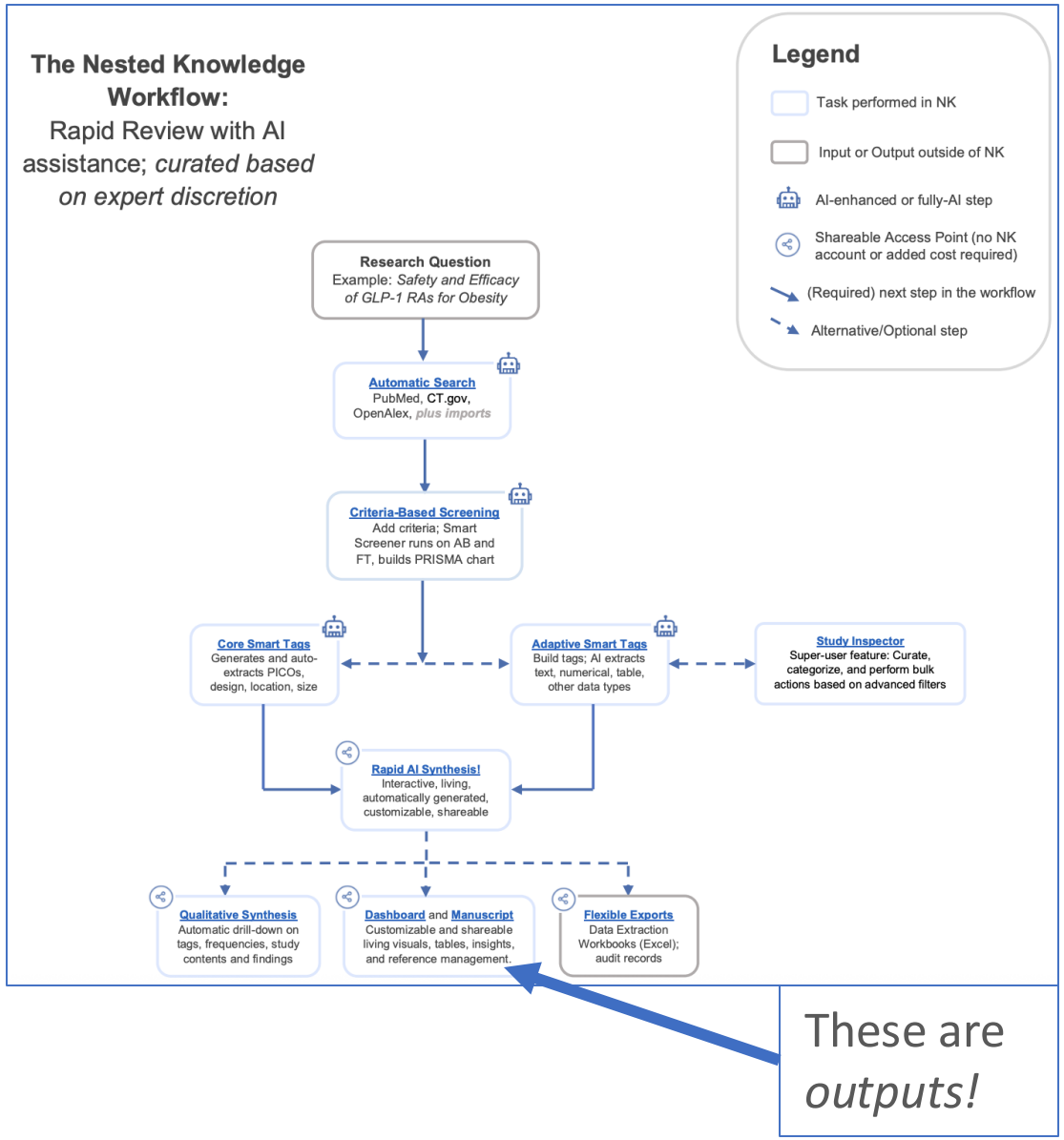
All Validation Studies:

Stage	NICE Statement Summary	Nested Knowledge AI Tool *All Human-in-the-Loop!*	Validation Overview	Accuracy	Time saved
Search	**Allows:** Generate Search Strategies & Visuals	**Smart Search,** Research Question -> Boolean Query	Recall tested against Cochrane Reviews	*76%-80% Recall*	95%
Screening	**Allows:** Abstract & Full Text Screening	**Criteria-based Screening,** LLM traceable decisions	Accuracy against expert gold standard	94%	87%
Data Extraction	**Allows:** Extracting data (less proven)	**Adaptive Smart Tags,** Qualitative & Quantitative extraction;	Accuracy against expert gold standard	90%	85%
NMA	**Allows:** Generation of analysis	**Smart Meta-analytical Extraction,** generates Network Meta-analysis!	Accuracy against expert gold standard	*98%+ Precision*	95%
Critical Appraisal	**Allows:** *Silent, no guidance to date*	**Adaptive Smart Tags** (on Critical Appraisal systems)	*Exploratory:* Accuracy vs. expert gold standard	99%	85%

Rapid Review Guide

- **Search, Screen, Tag (Extract), Synthesize** in a day (for TLR),
- **Fully Human-in-the-Loop,**
- Demonstrated in a case study to support 12+ Rapid Reviews on Oncological Indications to support single-day reviews,
- Published in multiple ISPOR Glasgow posters/presentations!

Focus: AI Philosophy *In Action!*



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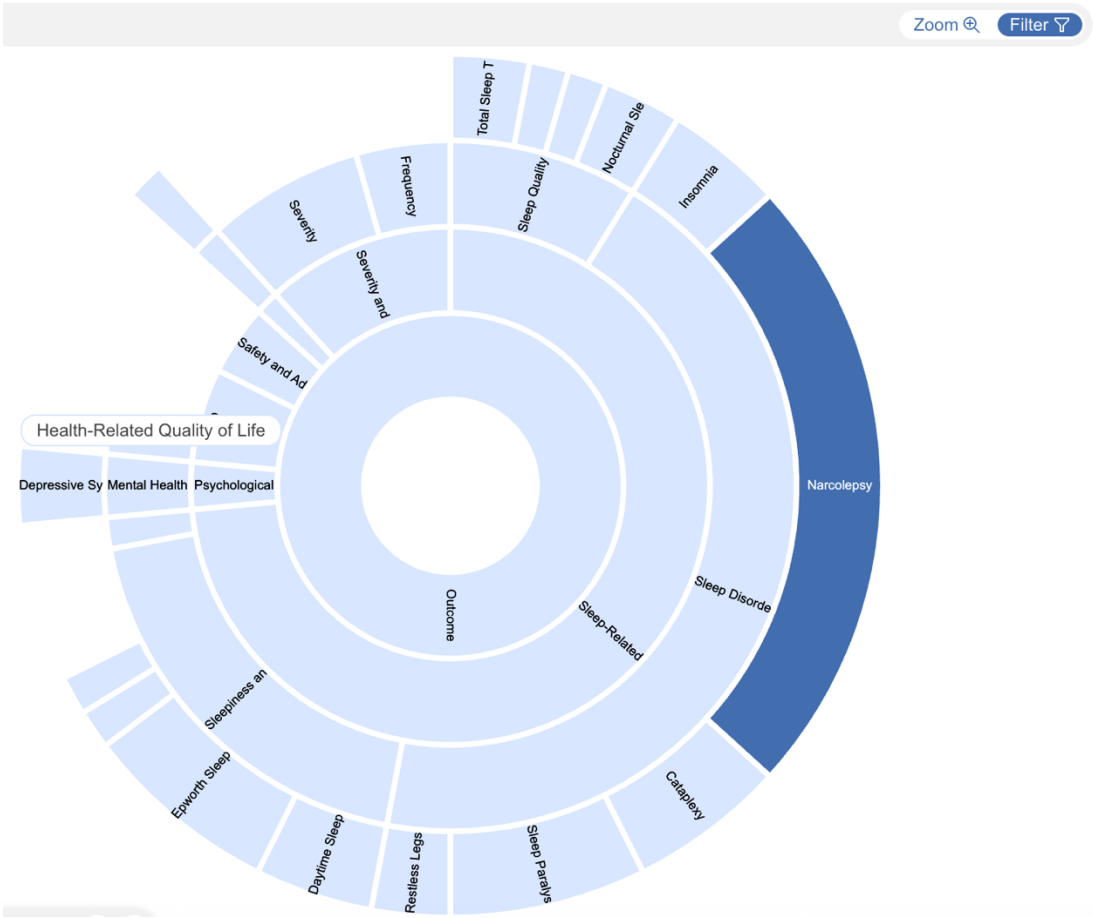
Case Study: PROs / Symptom Mapping

- ***Conceptual Disease Model construction:***
  - Find and extract signs, symptoms, *wide range of impacts,*
  - *Literature Review provides:* Symptom & impact map & frequency. “Building blocks” of Model.



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Case Study: AI in RWE Phenotypes

- ***Computable Phenotypes:***
  - Consistently and reproducibly identify patient cohorts from sources (e.g. electronic health records) for RWE research and clinical trials.
  - Literature-based construction enables: Reproducibility, Efficiency, Selection Bias, Fit-for-Purpose

- *Urgent Revascularization (truncated sample):*
  - `Identify adults (≥18 y) with inpatient/ED encounter for acute ischemia (ICD-10: I21., I63., I74., I70.2-I70.6*).`
  - `Revascularization (CPT 92920-92944, 33510-33536, 37220-37235, 61630-61645; ICD-10-PCS 027, 03C/H*, 04C/H* etc.*) occurs ≤48 h after admission or with admission_type = emergent/urgent.`
  - `Exclude elective admissions or procedures >48 h post-admit.`
  - `Output: urgent_revascularization = 1 if inclusion met and no exclusions.`
  - `Optional: record vascular bed (coronary / neurovascular / peripheral) and time_to_revascularization (hours).`

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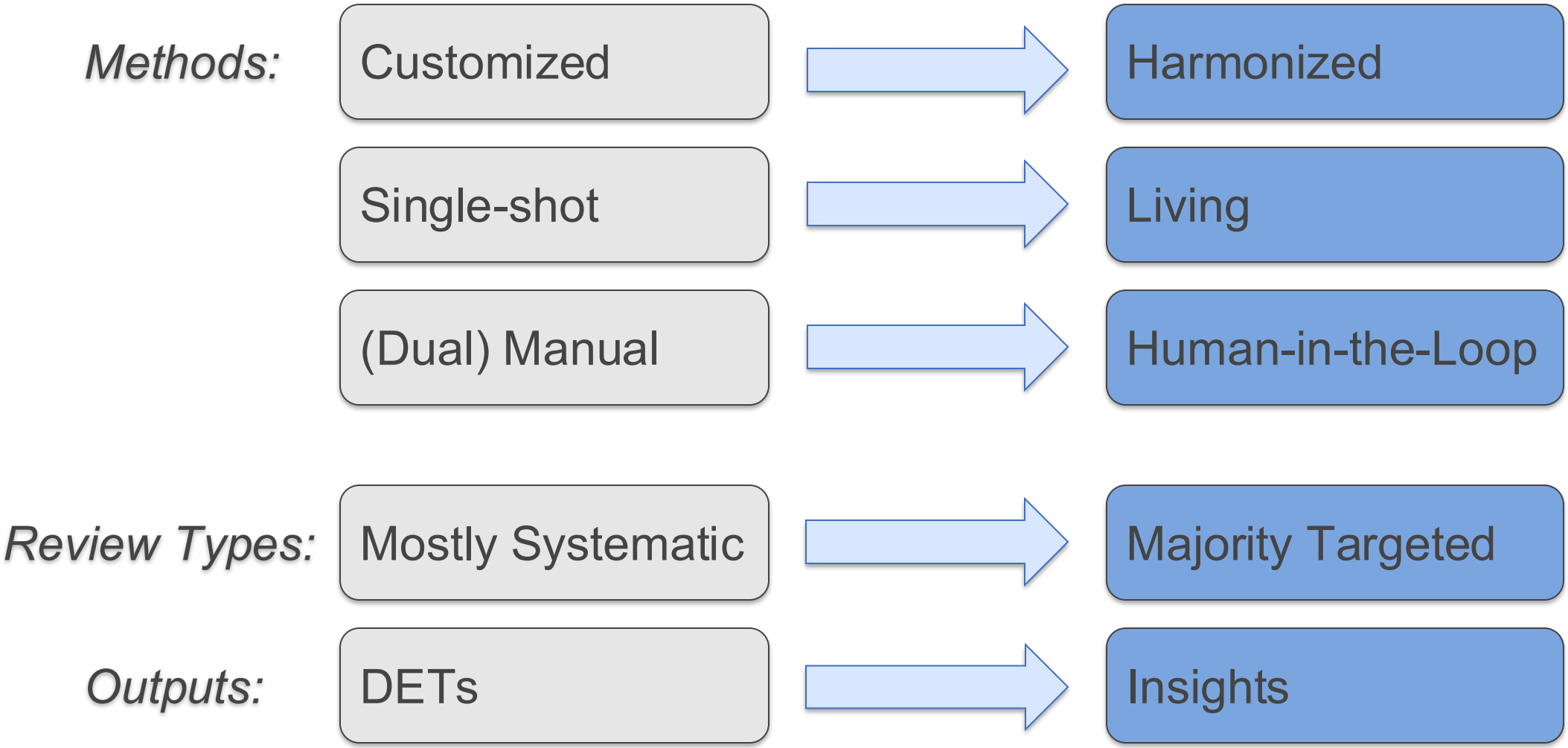
The Past and Future of Literature Review



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Concluding thoughts

- AI philosophy boils down to trust;
  - Principles for *producers* and *consumers*
- Guidance landscape is solidifying & harmonizing
  - NICE & CDA alignment; Cochrane coming
  - For HTA, compliance is key
- AI Rapid Reviews:
  - 90+% accuracy, 85% time savings for critical steps,
  - For pressing questions, rapid (AI) answers are a revolution
- Recommendations:
  - Redesign ‘custom’ for the harmonized future & AI future
  - Trust, but verify
  - Feedback loops!