Multi-agent Generative AI to Simulate Sponsor-HTA Interactions During Reimbursement Processes: Identifying Evidence Gaps And Informing Mitigation Strategies

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INTRODUCTION

- Renal Cell Carcinoma (RCC) is the most common form of all kidney cancers (~80-85%) and is associated with a substantial clinical and economic burden, particularly in advanced stages of disease where treatment options are complex[1]
- To inform reimbursement decisions, health technology assessment (HTA) agencies (e.g., NICE, CADTH) critically appraise sponsor-submitted clinical and economic evidence
- During appraisal, HTA bodies routinely issue clarification questions to resolve uncertainties related to survival evidence, indirect treatment comparisons, and structural or parameter assumptions in economic models, which may influence decision-making
- The submission process for HTA is currently complex and time-intensive, relying on expert judgment to anticipate payers' concerns, without capturing the complexity and variability of HTA
- This study developed and validated a multi-agent generative artificial inteligence (GenAI) framework that simulates sponsor-NICE interactions by generating clarification questions from sponsor-submitted data, enabling early identification of evidence gaps and supporting more robust reimbursement strategies

METHODS

- A GenAI-enabled analytical framework incorporating a large language model (LLM) was developed to simulate sponsor-HTA interactions **(Figure 1)**
- This framework incorporates multiple independent AI agents reflecting the HTA review roles, including the HTA secretariat (lead), clinical, economic, patient-reported outcomes, and patient/public involvement reviewers
- The HTA secretariat coordinated the process of generating and collecting clarification questions aligning with HTA guidance
- Using sponsor-submitted evidence for RCC, the framework generated clarification questions across domains, which were reviewed by subject matter experts (SME) for relevance, accuracy, traceability, data gaps, and alignment with HTA

RESULTS

- NICE TA858 for first-line advanced RCC was used to replicate sponsor-HTA interactions, with a multi-agent GenAI framework simulated structured clarification questions using sponsor-submitted evidence
- In total, the AI-framework generated 40 questions (12 clinical-effectiveness, 10 cost-effectiveness, 18 textual/additional), compared with 29 questions (12 clinical-effectiveness, 10 cost-effectiveness, 7 textual/additional) raised by NICE **(Figure 2)**
- Most AI-generated questions addressed data gaps, with fewer focused on methodological issues. Some NICE textual questions were not generated by the AI-framework, likely due to data masking, dependance on appendix data, or specific data requests
- The SME validated the output, showing 80-85% agreement with clarification questions raised by NICE **(Figure 3)**
- The additional questions generated by the GenAI demonstrated its capability to identify potential evidence gaps beyond those identified by historical NICE queries and to suggest timely mitigation strategies during the reimbursement process

Figure 1. A Multi-Agent AI Framework for HTA Evidence Review with RAG-based Knowledge Retrieval and SME Evaluation

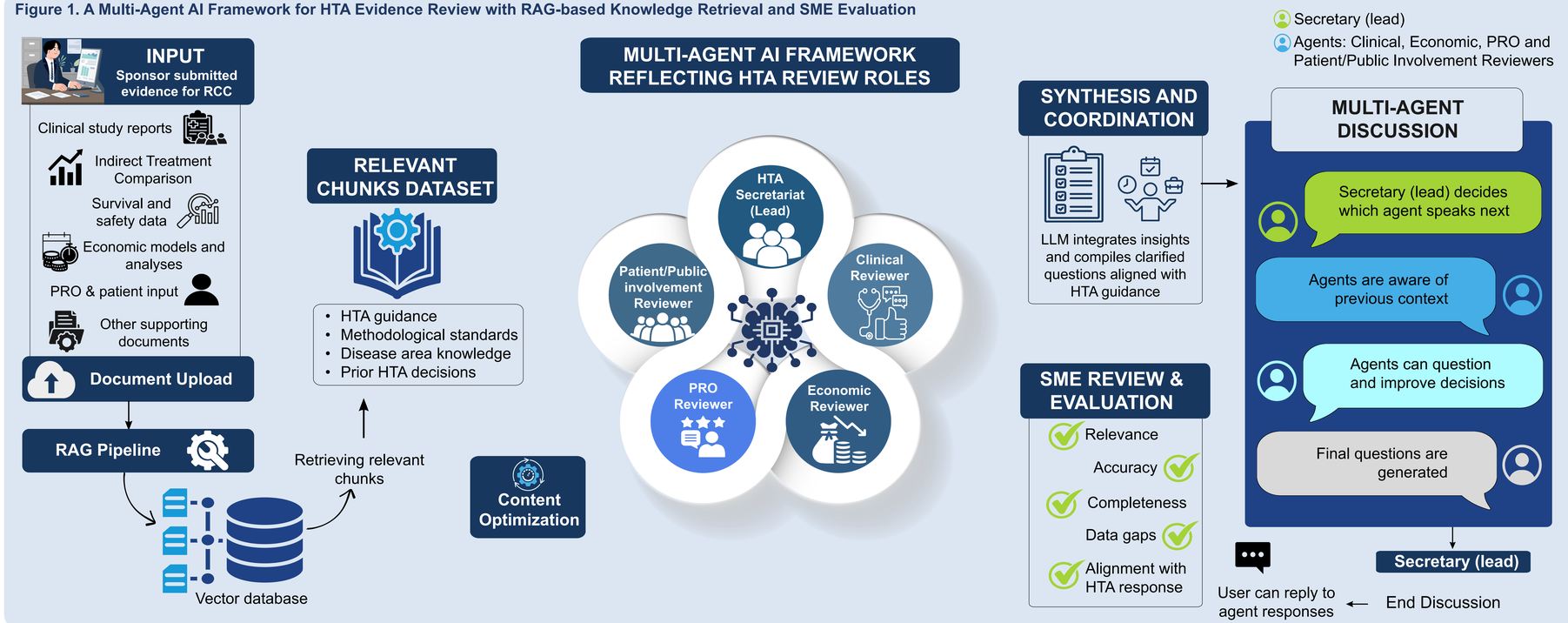


Figure 2. Comparison of AI-Generated and NICE-Raised Questions by Category

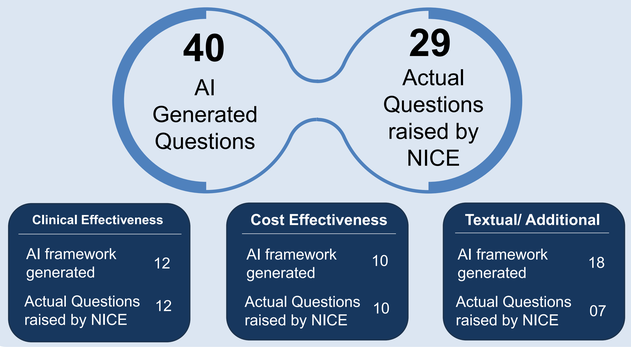


Figure 3. SME Validation of GenAI Simulated Responses

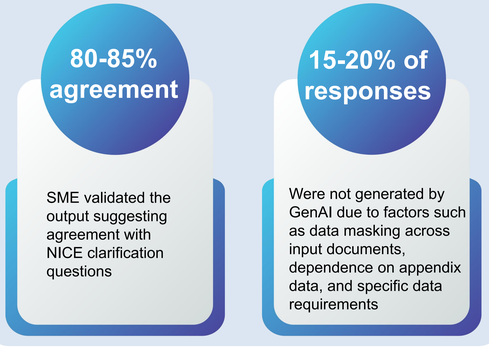
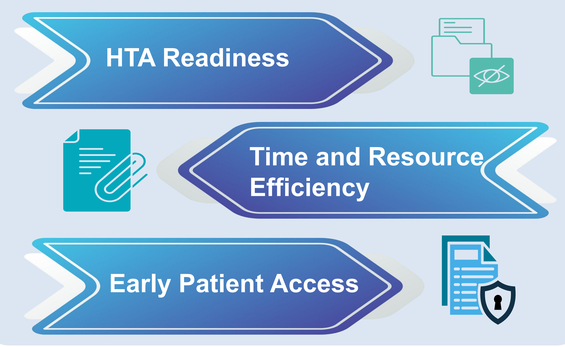


Figure 4. Key Advantages of Using GenAI to Simulate Sponsor-HTA Interactions



CONCLUSIONS

❖The multi-agent GenAI effectively simulated sponsor-HTA interactions, identifying evidence gaps and suggesting mitigation strategies

❖Beyond replicating NICE interactions, it has the potential to streamline assessments across diverse HTA contexts, with future updates to incorporate budget impact and real-world evidence

References
1.Rinaldi L et al., Kidney Cancer: From tumor biology to innovative therapeutics. Biochimica et Biophysica Acta (BBA). 2025; 1880(1)
2.Ball G et al., Appraisals by Health Technology Assessment Agencies of Economic Evaluations Submitted as part of Reimbursement Dossiers for Oncology Treatments: Evidence from Canada, the UK, ad Australia. Current Oncology. 2022; 29(10):7624-7636

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