Can Gen-AI Assist in Interpreting the Health Economic Model Results As per Target Audience?

MSR228

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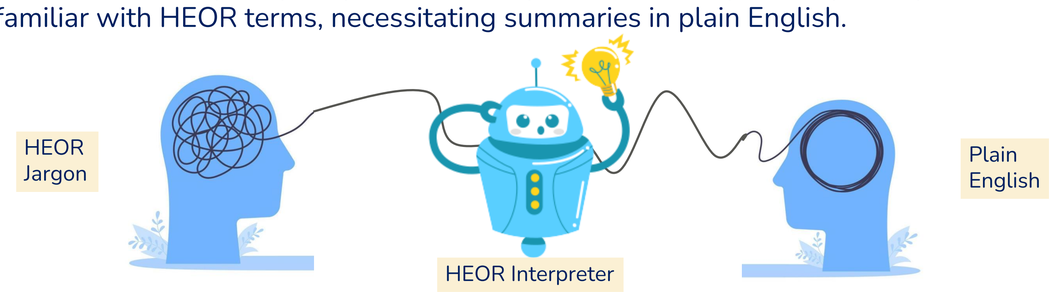
BACKGROUND AND OBJECTIVE

Context: In HEOR studies, effective collaboration among a multidisciplinary team is essential. Stakeholders from diverse fields including modeling, epidemiology, statistics, clinical practice, pharmacology, and commercial strategy require that HEOR study results be communicated in a manner tailored to their expertise.
Complex metrics such as cost per quality-adjusted life years (QALY) or incremental cost-effectiveness ratio (ICER) may not be easily understood by all, especially clinicians are unfamiliar with HEOR terms, necessitating summaries in plain English.



Aims: This study explores the use of Generative-Artificial Intelligence (Gen-AI) to adapt the dissemination of health economic model results to the understanding levels of different target audiences.

CHALLENGES

How to make complex HEOR jargon comprehensible to:

- A layman
- A clinician
- A health policy maker
- A market access professional?

METHODS

A proof-of-concept exercise was conducted using ChatGPT 4.0, a language-based Gen-AI, with the tool functionality implemented in Python. Designed to understand and generate human language, this model was ideal for the task. Multiple virtual stakeholders were defined, each with specific subject knowledge attributes. The Gen-AI was tasked with interpreting results and framing responses suitable for the expertise of various stakeholders (such as modelers, clinicians, providers or payers, layman language, etc.) A human-in-the-loop approach ensured accuracy and relevance of the context.

PROOF OF CONCEPT EXERCISE

Interpret this statement for me:

WORD LIMIT: 100

GPT MODEL: GPT-4o

"A model-based analysis indicated that Drug X represents a cost-effective treatment strategy compared to the standard of care in the UK, based on a willingness-to-pay threshold of £30,000 per QALY."

SUBMIT and convey to...

A layman

Drug X is a good option for treating heart disease in the UK. It gives the same or even better health benefits as the usual treatment, and it fits within the money the healthcare system is willing to spend. So, Drug X is worth choosing because it's effective and affordable for the healthcare budget.

A Clinician

The benefits of using Drug X (in terms of improving patient health or extending life) justify its cost compared to other treatments available. It's somewhat like deciding whether a new surgical technique that offers faster recovery times is worth the extra cost of the equipment needed.

A policy maker

The additional cost of using Drug X over the standard of care is justified by the health gains it provides, measured in terms of cost per additional unit of health benefit. Staying below WTP threshold suggests that Drug X provides good value for money according to standards commonly applied in the UK healthcare system.

A market access person

Drug X being labeled as "cost-effective" means that the benefits to patients of chronic heart disease, relative to the costs are favorable. This is especially important when considering the investment from healthcare systems or insurers' perspectives. Staying below the UK WTP threshold generally favors the adoption and reimbursement of new treatments.

Interpret this statement for me:

WORD LIMIT: 100

GPT MODEL: GPT-4o

"The model predicted higher QALYs for patients in the treatment arm versus the comparator in stable states, but lower QALYs in severe states."

SUBMIT and convey to...

A layman

The model shows that this treatment helps Alzheimer's patients live more comfortably when their symptoms aren't too severe. But as the disease gets worse, the treatment isn't as helpful. So, the treatment is like a car that drives smoothly in good weather but struggles when conditions get tough.

A Clinician

For patients with Alzheimer's who are not experiencing significant deterioration in their cognitive or functional abilities, the treatment provided better health outcomes compared to another treatment. This could mean that the treatment helps in maintaining cognitive functions, managing symptoms better than the comparator during these stable phases but, in severe stages the same treatment does not perform as well compared to other usual treatments.

A policy maker

The treatment provides patients in stable conditions with better quality and possibly longer life than the standard care. Conversely, the same treatment offers less benefit in terms of quality and length of life for patients in severe conditions. A treatment is only effective in early or stable stages of Alzheimer's, policies might prioritize early diagnosis and early intervention strategies.

A market access person

The treatment appears to be more beneficial for patients in the earlier, stable stages of Alzheimer's disease. This information is crucial for tailoring the positioning of the treatment. The drug might be more appealing to payers and clinicians if it is marketed primarily for patients in the earlier stages of Alzheimer's where it is most effective. For severe disease states, additional support or combination therapies might be needed, which could be an area for further research and development.

RESULTS

The Gen-AI effectively interpreted and contextualized results, making them more accessible depending on the stakeholder. It adeptly translated complex HE metrics such as cost per QALY, ICER, and net monetary benefit (NMB) into straightforward terms linked to relevant disease contexts, enhancing understanding for clinicians and non-technical stakeholders. Additionally, the AI's ability to adjust language and focus based on the level of technical knowledge was particularly useful in ensuring that more nuanced economic concepts were simplified for non-experts, without losing critical information for specialists. Furthermore, the integration of a human-in-the-loop process helped ensure that contextual accuracy was maintained, improving both the clarity and precision of the interpretations.

This study underscores the potential of Gen-AI in interpreting and communicating the results of HE models tailored to diverse stakeholders. Gen-AI shows promise in bridging communication gaps within HEOR. However, further research is necessary to refine these approaches and fully harness AI's capabilities, ensuring effective and precise information dissemination across varied audiences.

Disclaimer

The developed application a proprietary tool of ConnectHEOR.

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