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BACKGROUND

What are Large Language Models?

A Large Language Model (LLM) is an artificial neural network/ AI model which works by taking input text and predicting the next words. These models, often referred to as 'pre-trained models' are trained on massive datasets of documents, books, websites etc. and may include billions of parameters - which is why they are termed large.

What are some examples of LLMs?

OpenAI's GPT4 and Google's PaLM2 are some of the most popular LLMs around today.

What is so special about LLMs?

LLMs possess the ability to comprehend and generate human-like text, enabling automated analysis of vast volumes of data from diverse sources.

This study examines the potential of LLMs in a Health Technology Assessment process

KEY MESSAGE

GPT models can assist in every step of a Health Technology Assessment process, especially in the Systematic Literature Review and Model Conceptualization steps

USE OF LLMs IN HEALTH TECHNOLOGY ASSESSMENT

LITERATURE SEARCHING

Formulate search queries and suggest relevant databases and sources



META ANALYSIS

Help in selecting appropriate statistical analysis method



HTA REPORT

Help in structuring Health Technology Assessment report and ensure report follows guidelines



STUDY SELECTION AND DATA EXTRACTION

Define & refine selection criteria for studies and extract data

COST EFFECTIVENESS MODELLING

Assist in conceptualization and understanding key parameters

Rapidly review and extract relevant information from a multitude of studies, saving significant time and resources

Aid in identifying and assessing novel treatment comparators, especially in single-arm trials, by analyzing various data sources

Assist in synthesizing and analyzing Real World Evidence (RWE) to evaluate the long-term effectiveness and safety of healthcare interventions

Identify trends, patterns, and safety signals that may not be easily identifiable through traditional methods

Conceptualization of health economic models by enabling testing of various model structures, exploring alternative approaches and refining models to accurately represent complexities of the healthcare system

By iteratively refining with the assistance of LLMs, we can enhance the model's validity, improve predictive capabilities, reduce uncertainty, and strengthen its suitability for Health Technology Assessments

KEY CHALLENGES

Training Bias

LLMs are as good as the data they have been trained on i.e., Garbage In, Garbage Out

Algorithmic Transparency

No transparency in the methods and processes used, so experts are unable to scrutinize the results

Data Privacy

Health Technology Assessment often involves sensitive health information and ethical considerations like data privacy

Reproducibility

Different responses may be produced when using the same prompt more than once

Accountability

There is no single entity which could be held accountable when things go wrong

LIVE EXAMPLE

ChatGPT 4.0 was asked to suggest a modelling approach, with detailed explanation of model structure, health states, comparators and time horizon

SCAN TO SEE THE ACTUAL CHATGPT PROMPT



It responded with details like list of comparators, model diagram, the potential data sources, all steps of the modelling process including sensitivity analyses

References

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