AI-Agentic Approach to Health Economic Modeling Using Claude and other Large Language Models: *A Practical Guide*

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The Claude Microsoft Excel® add-in released in January 2026, enables Excel-based health economic models to be quickly generated. But there are substantial limitations,[1] which can be overcome to improve quality and significantly reduce development times by integrating Claude with other Large Language Models (LLMs) and human experts within a structured process.

Background

Traditional methods of developing health economic models are undergoing radical changes due to the availability (and ability) of Large Language Models (LLM) based add-ins and agents to generate Excel workbooks and spreadsheets (see Figure 1).

These add-ins/agents generate Excel workbooks, based on user prompts, by interpreting natural-language requests, producing structured data or formulas, and converting them into complex linked spreadsheets and charts.

For example, the Claude add-in for Excel operates as a sidebar within Microsoft Excel enabling users to analyze, construct, and modify complex workbooks in real time.

Formula dependencies and cell-level changes are tracked and documented transparently throughout the workflow, supporting the development of complex structures, such as health economic models, within a single integrated environment.

Figure 1: Leading AI add-ins for Excel and their capabilities

	LLM	Excel Integration	Capabilities
	Microsoft Copilot Native Excel AI	• Fully embedded in Excel • OneDrive / SharePoint • Outlook and Teams context	• Creates pivot tables, charts and formulas from plain English • Can write and explain VBA macros • Draws context from across M365 (emails, chats, documents) • Works best with files in OneDrive or SharePoint • Optimized for guided assistance rather than deep model reasoning
	Claude in Excel Anthropic (beta)	• Side-panel add-in • Local & cloud files • Model Context Protocol • Cross-app context with PowerPoint	• Creates and reasons across complex, multi-sheet models based on instructions • Generates audit log • Can create custom VBA code • Recommends changes for user review before applying
	ChatGPT for Excel OpenAI	• Side-panel add-in • Local files supported	• Fast, conversational interface with broad general knowledge • Strong for everyday formula generation and explanation • Suited to single-sheet tasks and ad-hoc data questions
	Gemini (add-in) Google / third-party	• Third-party add-in • API key configuration • Google Workspace	• Multilingual formula generation across language contexts • Parallel processing suited to high-volume row operations • Well-fitted in the Google ecosystem • Requires API key setup • No official first-party Excel add-in

Incorporating LLMs into the Model Development Process

The traditional and AI-assisted approaches for model development are shown in Figure 2. Typically, model concepts and specifications are created first, followed by input collection (making assumptions whenever required), and Excel model development in parallel. Next, models and inputs undergo quality check (QC), followed by analysis and reporting based on a QC'd model.

Figure 2 also shows a revised agentic AI process where AI assistance is used across the development cycle, managed by the human health economist.

Model conceptualization stage assists in identifying relevant model structures, health states, evidence gaps based on human inputs, relevant context, and materials. It can also rapidly create alternative model structures and document them in an automated manner.

AI agents can help identify input sources and assess suitability for modeling. Add-ins such as Claude also have powerful QC capabilities. Lastly, AI-assisted processes can create reports, dashboards, and other value communications.

Figure 2: Traditional and AI-assisted development process



AI-Agentic Tools: Concept and Specifications

The process to develop the health economic model concept and specifications is shown below in Figure 3. This incorporates data sources and user inputs to develop specifications and parameter lists. AI identifies data gaps and provides suggestions. All outputs are QC'd by the modeler. Screenshots of the PharmaQuant tool are shown in Figure 4.

Figure 3: Outline of AI-agentic tool for concept and specifications

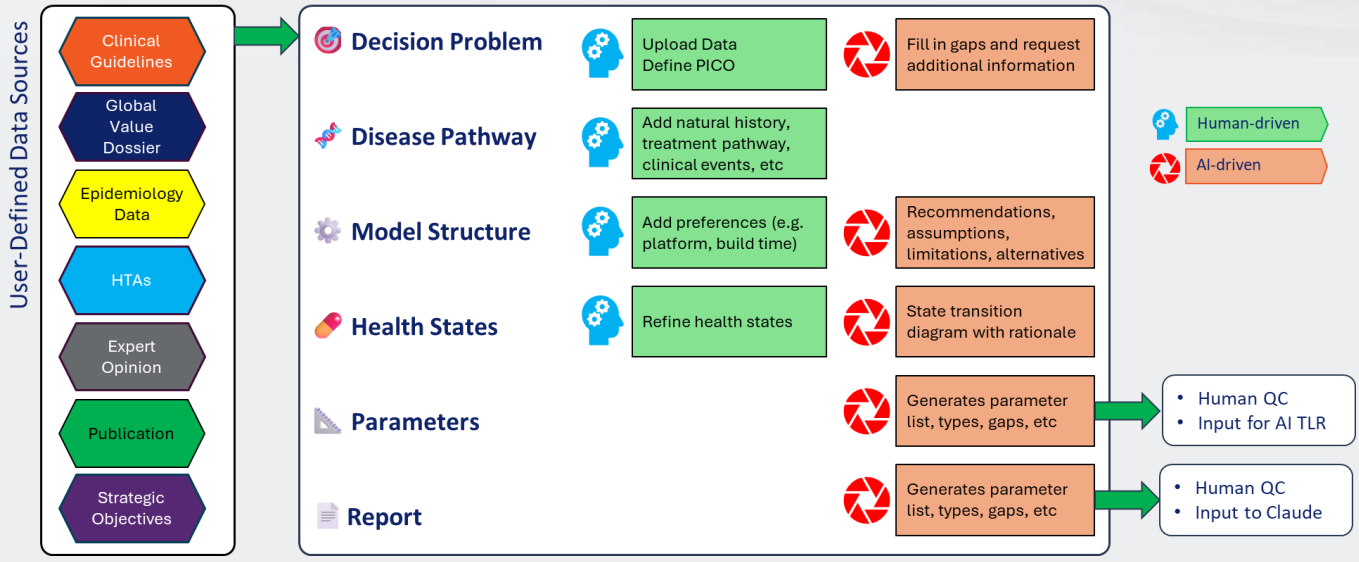
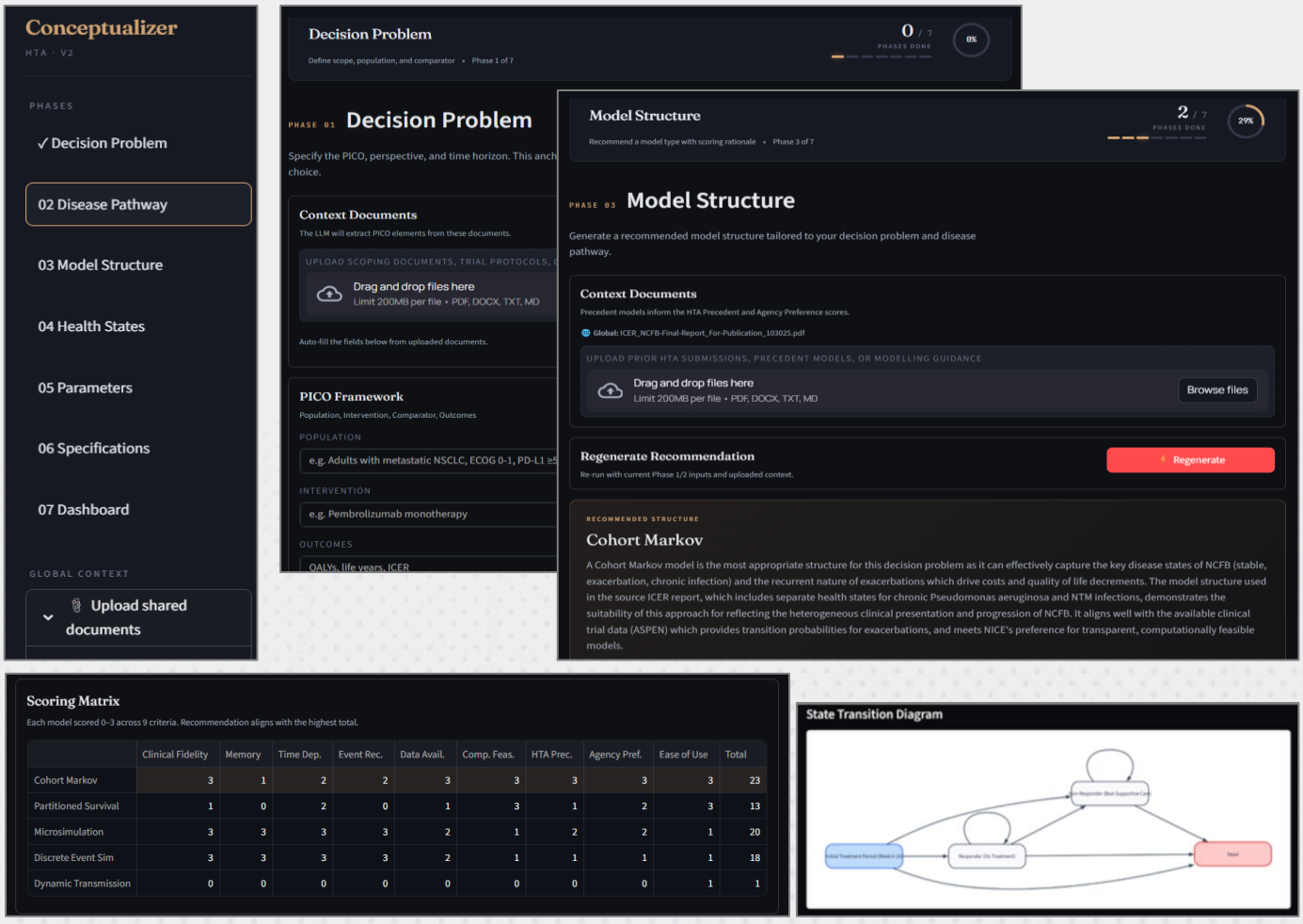


Figure 4: Screenshots of concept and specifications AI tool



PharmaQuant AI-Agentic Tools: Targeted Literature Review (TLR)

An automated TLR tool offers rapid, auditable, end-to-end evidence collection (Figure 5). This can be used to identify peer-reviewed input data sources, e.g., resource use, unit cost, HRQoL, and mortality data. The review will include/exclude studies, extract data, create a PRISMA diagram, and summarize findings. Figure 6 includes screenshots of the PharmaQuant tool.

Figure 5: Outline of AI-agentic tool for inputs and assumptions

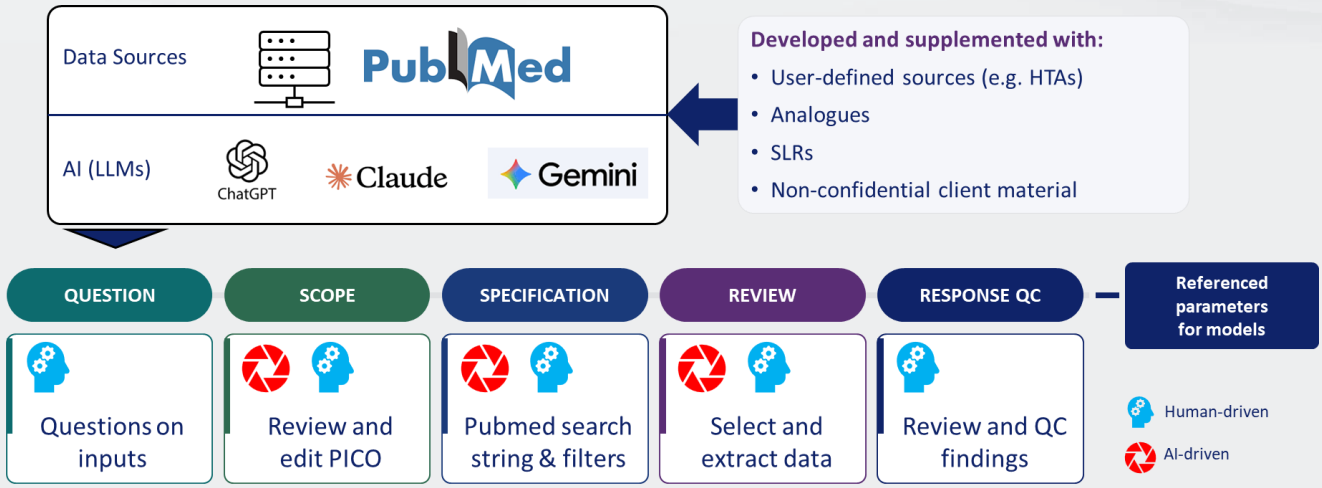
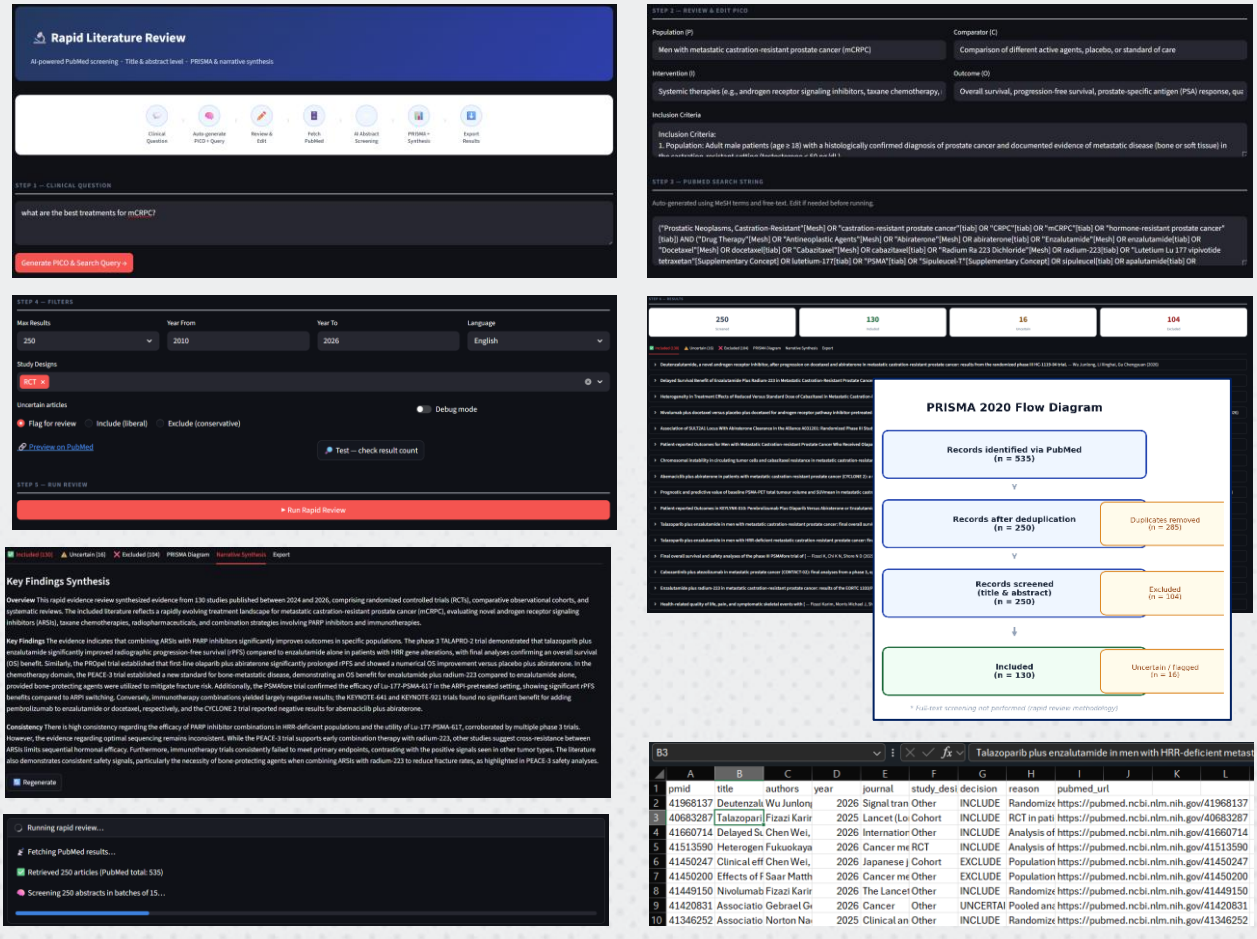


Figure 6: Screenshots of PharmaQuant AI TLR tool with autogenerated PRISMA diagram and Excel export



PharmaQuant AI-Agentic Tools: Excel Model Development

Model specifications and inputs will be fed into Claude and other add-ins to develop the Excel model.

The process followed is shown in Figure 7. Figure 8 shows case studies of Excel models developed using this process

Figure 7: AI-agentic process for developing Excel health economic models

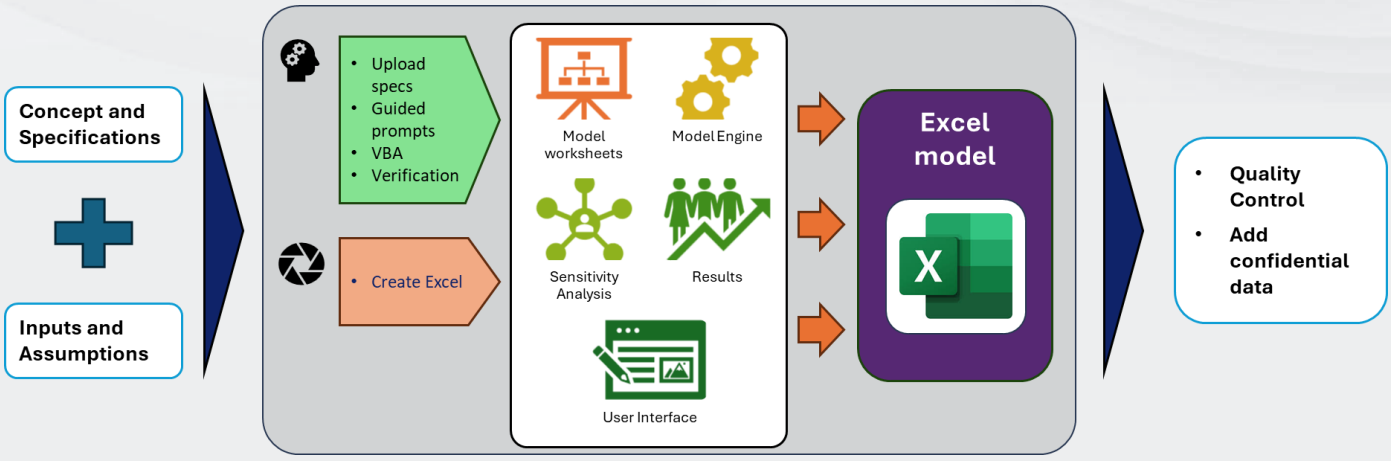
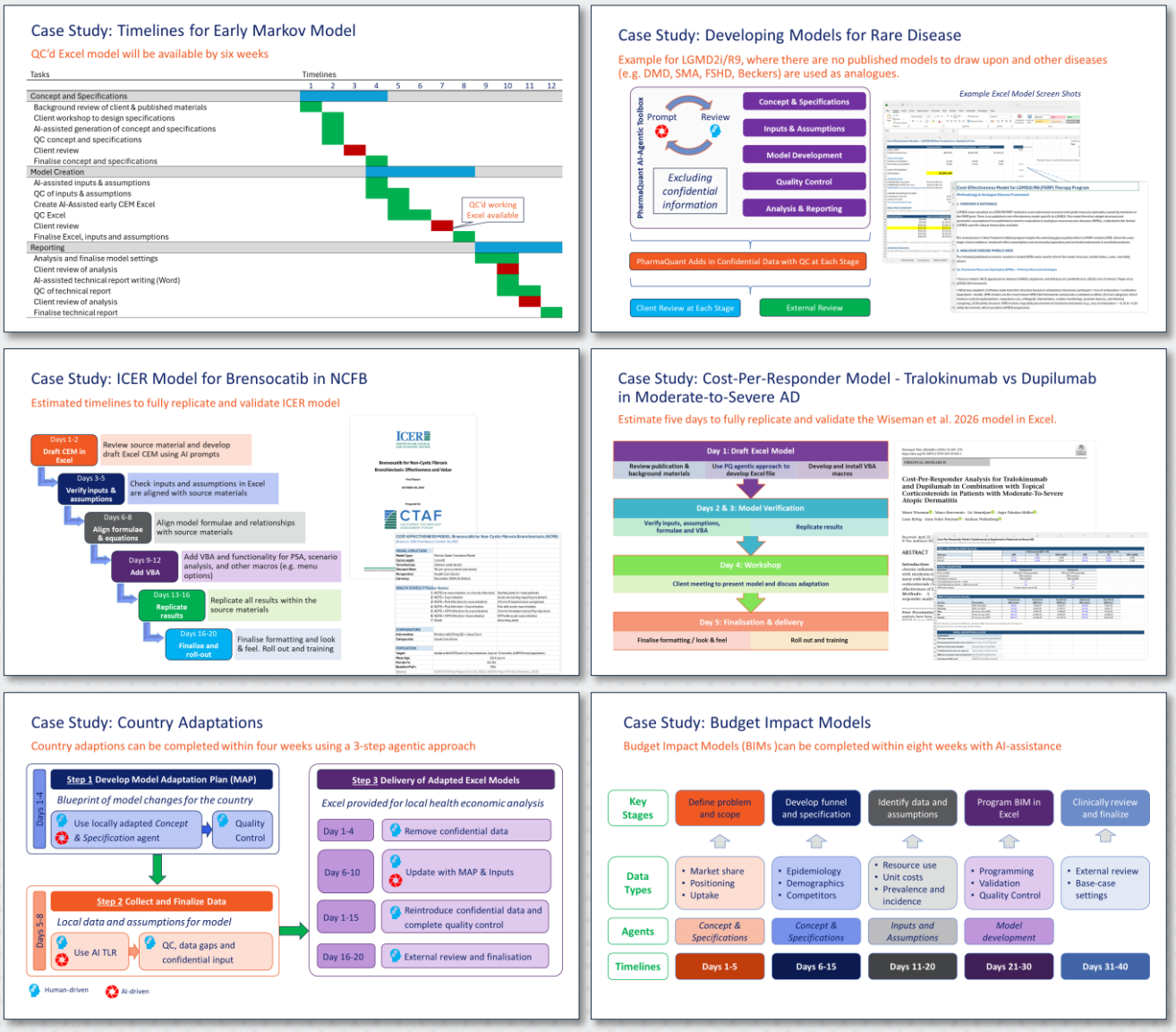


Figure 8: Example use-cases of models generated using PharmaQuant methods with processes

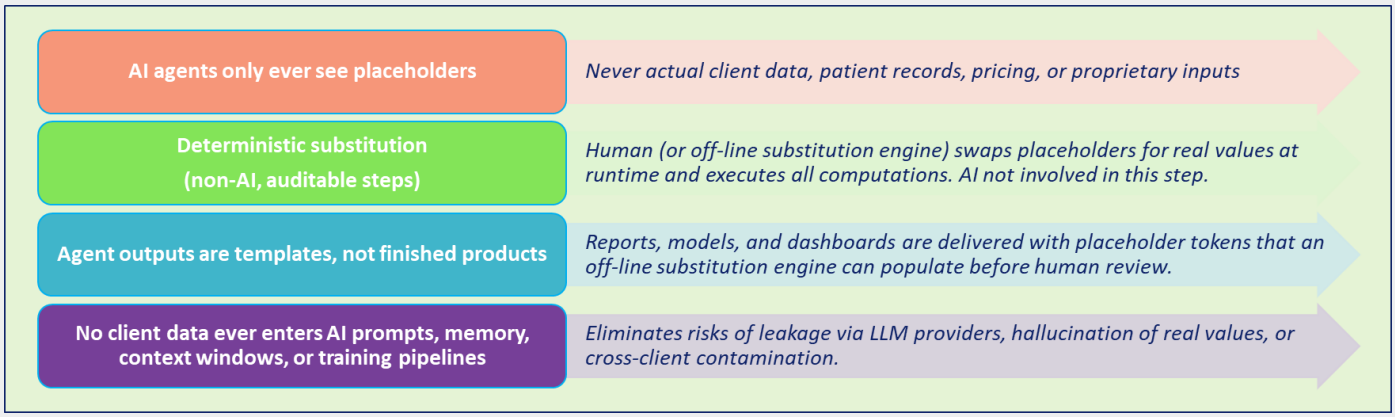


Data Confidentiality: Challenges and Considerations

Once data are submitted to large language models, organizational control over confidentiality cannot be guaranteed. This presents particular challenges in situations where data security is paramount. AI governance policies continue to evolve and must be regularly monitored and adhered to.

Given the pace of change, all methodological documentation should be clearly date-stamped to ensure transparency and reproducibility. Where data substitutions occur, these should be captured in a structured audit trail, ensuring that the underlying data layer remains fully traceable and verifiable.

Figure 9: PharmaQuant safety and guardrails: Using placeholder-only architecture



Conclusion

PharmaQuant is at the forefront of using AI to develop health economic models and is actively adapting to this fundamental shift in how health economic models can be developed quickly and safely. We have specialist users, SOPs, and training in place for developing health economic models using AI.

For further information, please contact

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to arrange a demo and discuss further opportunities available with AI-enabled HEOR.

Visit us at https://www.pharmaquant.org

1. PharmaQuant (2026). The 10-minute CEM: Can the Claude AI Add-in for Excel Transform Health Economic Modeling? *Available at:* https://www.pharmaquant.org/artifact/whitepapers/2026/10-minute-CEM-whitepaper.pdf

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