AI in Healthcare and Health Insurance – A Roundtable Peer Discussion

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Artificial intelligence (AI) continues to reshape healthcare and health insurance, influencing how organizations collect, analyze, and apply data to support decision-making. For actuaries, AI is increasingly used to improve efficiency, deepen analytical insight, and expand the ability to evaluate risk, outcomes, and resource use.

In November 2025, the SOA Research Institute convened an expert panel to explore how AI is transforming the healthcare and health insurance landscape, the implications for actuarial practice, and the considerations surrounding governance, trust, and ethics.

The panel consisted of 11 participants, most of whom were actuaries representing consulting firms and health insurance providers. The panel also included a medical doctor engaged in AI research and a senior behavioral data scientist from a regulatory organization. Collectively, the panelists contributed perspectives spanning actuarial pricing, product development, analytics, data governance, and health outcomes research. This diversity of expertise provided a broad view of AI's current and potential roles across healthcare and health insurance.

This report integrates the key discussion themes that emerged during the panel. The perspectives presented are anonymized and reflect a balanced synthesis of viewpoints rather than individual opinions.

Executive Summary

In November 2025, the SOA Research Institute convened a panel of industry experts to discuss the advancements and implications of generative AI (GenAI) in healthcare and health insurance. The roundtable brought together actuaries and health professionals from consulting firms and health insurance providers.

Panelists agreed that AI, particularly generative AI, is rapidly changing how healthcare and insurance organizations process data, identify risks, and support strategic decision-making. Across organizations, AI tools are being used to enhance data analysis, streamline administrative activities, and support predictive modeling in underwriting, pricing, and care management. At the same time, panelists consistently emphasized that these technologies must be applied within strong governance frameworks along with transparency and clear professional accountability.

Several recurring themes emerged throughout the discussion. AI adoption and experimentation are expanding, although maturity levels vary widely across organizations and use cases. Governance and oversight were viewed as foundational requirements for managing bias, privacy, and accountability. Trust and validation remain central concerns, with actuaries expressing caution about relying on AI outputs without appropriate verification and human review. There were significant concerns about hallucinations and non-deterministic behavior in large language models. Panelists also noted that the actuarial skill set is evolving, with growing emphasis on data science literacy, ethical reasoning, and communication skills. Looking ahead, participants expect AI's influence to grow as healthcare systems increasingly rely on predictive analytics and automation.

Overall, the panel expressed cautious optimism about AI's potential. While AI can significantly enhance efficiency and analytical reach, panelists reinforced the continuing importance of professional oversight, interpretability, governance, and human judgment in ensuring responsible and effective use.

Section 1   The Expanding Role of AI in Healthcare and Health Insurance

AI adoption in healthcare and health insurance continues to accelerate, driven by advances in data processing capabilities, increased computing power, and the growing availability of detailed medical, behavioral, and demographic data. Panelists emphasized that AI is no longer viewed solely as an experimental technology but is increasingly embedded in day-to-day operations across many organizations. Actuaries are collaborating more closely with data scientists to apply machine learning techniques in claims analysis, risk stratification, pricing, and care management. For practicing actuaries, this shift is changing not only how analyses are performed, but also how insights are generated, reviewed, and communicated.

Panelists noted that AI is moving from isolated pilots toward broader operational use, particularly in areas where large volumes of structured and unstructured data must be processed quickly. AI applications now extend beyond traditional automation and analytics to include predictive modeling, personalized health interventions, and more advanced claims analysis. At the same time, adoption remains uneven across organizations. Some insurers and consulting firms have integrated AI directly into actuarial workflows, while others are still in earlier stages of experimentation due to data, governance, or systems constraints.

1.1 AREAS OF ADOPTION ACROSS HEALTHCARE AND INSURANCE

The panel described a wide range of AI applications across healthcare and insurance operations. Common areas of adoption include claims triage, utilization management, provider network monitoring, fraud detection, and wellness program design. While some organizations have integrated AI into forecasting and claims analysis, others are primarily experimenting with natural language tools for documentation and communication. Panelists observed that some of these applications often begin outside traditional actuarial departments and later expand into actuarial use once data pipelines and governance structures mature.

Several participants noted that AI adoption is often incremental, with organizations layering new tools onto existing processes rather than replacing them outright. Legacy systems, fragmented data environments, and inconsistent data quality were cited as ongoing challenges that slow broader implementation. As a result, organizations vary widely in how deeply AI is integrated into actuarial forecasting, reserving, and pricing activities.

1.2 ACTUARIAL USE CASES IN PRACTICE

Panelists emphasized that actuaries are increasingly using AI to augment core actuarial functions rather than replace established methods. Common use cases include pricing analysis, forecasting, experience studies, and scenario testing. AI allows actuaries to process larger datasets, explore more complex interactions, and test a broader range of assumptions than would be feasible using traditional approaches alone.

Participants stressed that AI is most effective when used in combination with actuarial judgment. While machine learning models can identify patterns and relationships, actuaries remain responsible for interpreting results, assessing reasonableness, and ensuring alignment with business objectives and regulatory requirements. Several panelists noted that AI has expanded its ability to ask better questions of the data, even when final decisions continue to rely on traditional actuarial frameworks.

1.3 GENERATIVE AI AS A PRODUCTIVITY MULTIPLIER

Generative AI was frequently described as a productivity-enhancing tool for actuaries and data scientists. Panelists highlighted its use in coding assistance, documentation, and exploratory analysis. Data scientists are using AI to automate routine analytics and produce code that is easier to replicate and maintain, freeing time for more complex problem-solving.

Several actuaries described using generative AI for what they referred to as "vibe coding," where AI-generated code enables analyses that would not have been feasible otherwise. Examples included generating Python programs to run Monte Carlo simulations for pricing level-funded products and exploring alternative scenarios to better understand how actual pricing compares with theoretical expectations. Panelists emphasized that while AI accelerates development, careful review and debugging remain essential.

Participants also noted the growing use of Excel and Copilot to generate code and perform modeling directly within actuarial datasets. These tools allow actuaries to initiate and iterate on analyses without waiting for dedicated data science support. However, panelists cautioned that this increased accessibility heightens the need for validation and documentation to ensure results are reliable and reproducible.

1.4 AI-ENABLED REVIEW OF REGULATORY SUBMISSIONS

Another frequently discussed application involved using AI to support the review of actuarial memoranda submitted to regulators. Panelists described using AI to compare filings against relevant Actuarial Standards of Practice and internal organizational guidance. Prior filings and historical regulatory objections were incorporated into these analyses to identify potential weaknesses or omissions.

Participants reported that AI-generated feedback often strengthened submissions by highlighting areas needing clarification or additional support. Importantly, panelists viewed AI as a complement to traditional peer review rather than a replacement. Human reviewers remain responsible for evaluating the appropriateness of recommendations and ensuring that filings reflect professional judgment and regulatory expectations.

1.5 ADVANCED DATA ANALYSIS AND REAL-WORLD EVIDENCE

Panelists also discussed using AI to perform more advanced data analysis, particularly when working with large national or multi-plan datasets. Examples included identifying real-world evidence patterns, analyzing treatment pathways, evaluating provider performance metrics, and assessing how risk evolves across populations and health plans.

Several participants noted that these applications are especially relevant in healthcare, where outcomes, utilization, and costs are influenced by complex clinical and behavioral factors. AI enables actuaries to analyze these dynamics at a level of detail that was previously impractical. At the same time, panelists emphasized that such analyses require careful framing and interpretation to avoid overstating conclusions or overlooking data limitations.

Section 2 Balancing Innovation with Ethical and Regulatory Oversight

Panelists emphasized that innovation in AI must be accompanied by strong ethical and regulatory oversight, particularly in healthcare and health insurance where decisions can materially affect individuals and populations. AI was viewed as a powerful enabler, but one that introduces new responsibilities related to data stewardship, fairness, and accountability. Participants repeatedly noted that successful adoption depends less on technical capability alone and more on the presence of clear governance structures.

Several panelists described how organizations initially restricted or paused AI use while developing internal policies. These early governance efforts were seen as necessary to establish boundaries around data use, acceptable applications, and oversight responsibilities. For practicing actuaries, this has meant increased involvement in discussions around governance, policy design, and risk management rather than treating AI solely as a technical tool.

2.1 GOVERNANCE AS A PREREQUISITE FOR RESPONSIBLE INNOVATION

Governance was consistently described as a prerequisite rather than an obstacle to innovation. Panelists emphasized that clear governance frameworks enable organizations to scale AI responsibly by defining roles, responsibilities, and escalation paths. In the absence of governance, participants noted that even well-performing models can create risk through misuse or misinterpretation.

Panelists highlighted the importance of aligning AI governance with existing risk management and compliance frameworks. Actuaries were seen as well positioned to contribute to these efforts due to their experience with model governance, documentation standards, and regulatory interaction. Several participants noted that treating AI models similarly to other high-impact analytical tools helps normalize oversight expectations across the organization.

2.2 DEFINING ACCEPTABLE AND UNACCEPTABLE USES OF AI

A recurring discussion focused on distinguishing acceptable uses of AI from those that raise concern. Several panelists expressed reluctance to rely on AI for analyses they could not independently understand or validate. This reluctance was not framed as resistance to technology but as a reflection of professional responsibility.

Participants described ongoing internal debates about where to draw boundaries. Many agreed that AI is most appropriate for accelerating work that actuaries already know how to perform, such as coding assistance, summarization, or exploratory analysis. In contrast, greater caution was expressed around using AI to generate conclusions or recommendations without sufficient transparency or explainability. These discussions continue to evolve as tools become more capable.

2.3 ALIGNMENT WITH PROFESSIONAL AND REGULATORY STANDARDS

Panelists stressed that the use of AI does not diminish actuarial accountability. Even when AI assists with analysis, documentation, or review, actuaries remain responsible for ensuring compliance with actuarial standards and regulatory expectations. Several participants theorized that regulators will increasingly expect organizations to explain how AI is used, how outputs are validated, and how risks are managed.

Maintaining alignment with professional standards was viewed as critical to sustaining trust. Panelists emphasized that actuarial judgment, documentation, and disclosure remain essential, regardless of whether AI tools are involved in the analytical process.

Section 3   Trust, Interpretability, and Accountability

Trust emerged as one of the most prominent themes in the panel discussion. Actuaries rely on evidence, validation, and transparency to support decision-making, and AI introduces challenges to traditional approaches for establishing confidence in results. Panelists consistently noted that trust must be built deliberately rather than assumed.

Participants emphasized that statistical performance alone is insufficient to establish trust, particularly in healthcare applications. Instead, trust depends on understanding how models behave, what data they rely on, and how outputs are reviewed, validated and used in practice.

3.1 TRUST AS AN ACTUARIAL IMPERATIVE

Panelists described trust as a core actuarial concern rather than a technical afterthought. In healthcare and insurance, small errors can have significant downstream effects, increasing the importance of interpretability and robustness. Actuaries were seen as playing a critical role in questioning assumptions, identifying limitations, and ensuring that AI outputs are appropriate for their intended use.

Several participants noted that trust is cumulative. It develops over time through consistent performance, clear documentation, and repeated validation rather than through one-time testing exercises.

3.2 VALIDATION PRACTICES AND HUMAN OVERSIGHT

Human oversight was repeatedly emphasized as essential to building and maintaining trust. Panelists described validation practices that involve comparing AI outputs with traditional actuarial analyses, reviewing results for plausibility, and monitoring performance over time.

Participants noted that tolerance for error is especially low in medical and clinical contexts. As a result, AI outputs are often reviewed by multiple layers of professionals before being acted upon. Actuaries were seen as central to designing validation processes that balance efficiency with rigor.

3.3 MANAGING HALLUCINATIONS AND NON-DETERMINISM

Hallucinations and non-deterministic behavior in large language models concerned the panelists and was discussed at great length. Panelists noted that these behaviors complicate validation and make it difficult to rely on single outputs. To manage these risks, organizations are using techniques such as limiting model scope, constraining prompts, and requiring human review of outputs.

Several participants described using multiple models or repeated queries to assess consistency. Others emphasized resetting interactions or simplifying requests to reduce unexpected behavior. These practices were viewed as interim solutions as tools continue to evolve.

3.4 ACCOUNTABILITY AND PROFESSIONAL RESPONSIBILITY

Panelists agreed that accountability for decisions must remain with human professionals. AI can inform analysis and support decision-making, but actuaries retain responsibility for applying judgment, context, and ethical considerations. Participants emphasized that clear accountability helps prevent inappropriate reliance on automated outputs.

Section 4   Perceived Risks and Emerging Challenges

The panel identified a range of risks associated with AI adoption. These risks were viewed as manageable but only if recognized and addressed proactively. Participants discussed technical, operational, ethical, and professional dimensions of risk.

4.1 TECHNICAL AND OPERATIONAL RISKS

Technical risks include limitations in data quality, model design, and performance stability. Panelists noted that AI models are sensitive to input data and may behave unpredictably when applied outside of their original training context. Operational risks arise when AI recommendations are misaligned with organizational processes, workflows or decision frameworks.

Participants emphasized that these risks increase when AI is deployed rapidly without sufficient testing or integration into existing controls. Actuaries were seen as important contributors to identifying these issues early through validation and monitoring.

4.2 BIAS AND FAIRNESS RISKS

Bias was a central concern, particularly given the societal and historical biases present in healthcare data. Panelists noted that biases related to socioeconomic status, race, or gender can be embedded in training data and reflected in model outputs. One participant described mitigating this risk by forcing models to follow well-specified deterministic pathways at key decision points.

Others emphasized the importance of understanding how data are generated and collected. Actuaries can apply corrective techniques once biases are identified, but doing so requires careful analysis and access to appropriate data.

4.3 COGNITIVE AND PROFESSIONAL RISKS

Participants discussed the risk of overreliance on AI and the potential erosion of analytical skills. This concern was described as "outsourcing our cognition." Panelists stressed that while AI can accelerate work, it should not replace critical thinking or professional skepticism. The importance of maintaining fundamental actuarial techniques and implementing quality control processes was emphasized.

Several participants noted that reliance on AI-generated outputs without sufficient understanding can reduce an individual's ability to explain or defend results. This risk was viewed as particularly relevant for early-career professionals.

4.4 RISK MITIGATION STRATEGIES

Risk mitigation strategies discussed by the panel included limiting AI to assistive roles, maintaining strong governance frameworks, and implementing rigorous validation and quality control processes. Participants emphasized that combining technical controls with professional oversight is essential to balancing innovation with reliability and accountability.

Section 5   Future Impact of AI in Healthcare and Health Insurance

Panelists discussed where AI is expected to have the greatest impact across different time horizons, emphasizing that the pace and nature of change will vary by application area. While some uses are already delivering measurable benefits, others are still emerging and will require additional validation, governance, and professional oversight before becoming widely adopted.

Participants consistently noted that AI's value in healthcare and health insurance will depend not only on technological advances, but also on how effectively organizations integrate these tools into existing decision-making frameworks.

5.1 NEAR-TERM OUTLOOK

Over the next six months, panelists expect the most visible progress to continue in operational efficiency and productivity. Automation of routine activities such as claims classification, document summarization, data reconciliation, and internal reporting is expanding across organizations. These applications were viewed as relatively low risk when paired with appropriate review processes.

For actuaries, near-term opportunities involve defining performance metrics, validating outputs, and quantifying whether efficiency gains translate into improved accuracy, reduced costs, or faster decision cycles. Panelists emphasized that even in these lower-risk applications, ongoing monitoring is necessary to ensure that automation does not introduce unintended errors or inconsistencies.

5.2 MEDIUM-TERM OUTLOOK

Within the next twelve months, panelists expect AI adoption to mature in areas involving predictive targeting, care management, and research applications. Health plans are piloting models to identify members at higher risk for chronic conditions, gaps in care, or adverse outcomes. These models are increasingly being used to support outreach prioritization and resource allocation.

Participants noted that AI is also expected to play a growing role in real-world evidence research and clinical trial support. Panelists described current research processes as highly labor intensive, particularly in cohort identification, data ingestion, and analysis. AI was viewed as a way to accelerate these processes, allowing researchers and actuaries to focus more on interpretation and study design rather than data preparation.

Panelists emphasized that while predictive models may become more sophisticated, actuarial input remains essential to ensure forecasts are credible, stable, and aligned with financial and regulatory requirements.

5.3 LONGER-TERM OUTLOOK

Looking further ahead, panelists anticipated more transformative applications of AI. These include diagnostic support in imaging and cancer staging, clinical decision support tools, and population-level simulations of health outcomes. Several participants suggested that AI may eventually outperform human clinicians in certain complex diagnostic tasks, particularly where large volumes of data must be synthesized.

From an actuarial perspective, these developments could influence strategic planning, benefit design, contracting, and public policy evaluation. Panelists cautioned, however, that such applications could raise significant governance and accountability questions and would require careful oversight before being relied upon in high-stakes decisions.

5.4 THE ACTUARIAL VALUE ACROSS TIMEFRAMES

Across all timeframes, panelists emphasized that actuaries add value by providing structure around uncertainty, validation, and governance. AI can extend analytical reach and speed, but actuarial oversight ensures that insights are translated into financially sound, ethically responsible, and defensible decisions. Participants noted that the profession's experience with model risk management positions actuaries to play a central role as AI applications become more complex and influential.

Section 6   Preparing the Actuarial Profession for an AI-Driven Future

The panel concluded that the actuarial profession must continue to evolve to remain effective in an AI-enabled environment. Rather than diminishing the role of actuaries, AI is reshaping expectations around how actuarial value is delivered and where professional judgment is most critical.

6.1 EVOLVING SKILL REQUIREMENTS

Panelists noted that while basic coding skills remain useful, they are becoming less central than higher-level analytical and interpretive capabilities. Increasing emphasis is being placed on problem formulation, understanding model behavior, and evaluating the appropriateness of AI outputs for specific use cases.

Several participants emphasized that actuaries should be cautious about relying on AI to perform tasks they cannot independently understand or explain. Maintaining the ability to validate and defend work products was viewed as essential to professional credibility.

6.2 THE ACTUARY AS INTERPRETER AND INTEGRATOR

Panelists consistently described the actuary's future role as one of interpretation and integration. Actuaries are expected to bridge AI systems, business stakeholders, clinicians, and regulators by translating complex outputs into actionable insights. Their ability to communicate uncertainty, clarify assumptions, and ensure compliance with professional standards supports responsible AI use.

Participants noted that this interpretive role becomes increasingly important as AI systems grow more complex and less transparent.

6.3 EMERGING SKILL AREAS

In addition to traditional actuarial competencies, panelists highlighted the growing demand for skills in product management, project management, and data engineering. These skills include designing and maintaining data pipelines, defining problem context, specifying success criteria, and validating outcomes against business and regulatory objectives.

Several participants suggested that developing these capabilities will help actuaries remain effective contributors as AI continues to evolve and reshape analytical workflows.

Section 7   Recurring Themes from the Panel Discussion

Several themes emerged repeatedly throughout the discussion. Collaboration among actuaries, clinicians, and data scientists was viewed as essential to ensuring models reflect both technical rigor and real-world context. Transparency was identified as a key driver of trust and accountability, particularly in high-stakes healthcare applications. Strong governance frameworks were seen as enabling innovation, rather than constraining it, by providing clarity around acceptable use and professional responsibility

Panelists emphasized that the actuarial profession's analytical discipline and commitment to public service position it as a stabilizing force amid rapid technological change.

Section 8 Conclusions

Panelists expressed both optimism and caution regarding the role of AI in healthcare and health insurance. While AI offers transformative potential to improve efficiency, insight, and decision support, its effectiveness depends on professional oversight, transparent governance, and continuous evaluation.

Several conclusions were emphasized throughout the discussion. AI was consistently viewed as an enabler of actuarial work rather than a replacement for professional judgment. Governance and ethical use were identified as non-negotiable elements for maintaining public and professional trust. Finally, panelists agreed that the actuarial skill set is evolving, with increasing emphasis on data science literacy, ethical reasoning, and communication alongside traditional technical expertise.

Section 9   Expert Panel Discussion Questions

Part of the discussion was getting feedback directly from the panelists on what is happening within their own organizations. The following are questions asked directly to the panel to stimulate the conversation.

Table 1
QUESTIONS

Topic	Question
Operationalizing AI	a. How is AI currently being integrated into actuarial workflows, and what are the most promising use cases? b. How do healthcare entities (insurers, health systems, government entities, etc.) need to change to optimally incorporate AI to improve health outcomes and reduce unnecessary costs?
Use Cases and Success Stories	a. How are health insurers using AI and what are specific examples of how actuaries are using AI? b. Can you provide a specific use-case where AI was helpful or outline a success with AI?
Ethics/Bias	a. What are the key risks and ethical considerations actuaries should be aware of when using AI in decision-making processes? b. When we talk about 'AI bias' in health insurance, what is our biggest fear?
Trust in AI	a. How can actuaries ensure the interpretability and accountability of AI models used in high-stakes environments?
Skill Development	a. As AI becomes more integrated into actuarial workflows, what skills should current actuaries develop to remain competitive?
The Future	a. Where do you see the most impactful areas for the use of AI in healthcare over the next 6 months, 12 months, 2 years? b. What do you envision as the best actuarial opportunities for AI to add material value?

Section 10   Acknowledgments

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