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ORIGINAL RESEARCH ARTICLE

Exploring the current and future role of artificial intelligence in pharmaceutical market access: insights from a European survey

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ABSTRACT

Introduction: Artificial Intelligence (AI) is rapidly expanding across the pharmaceutical value chain; however, empirical evidence on its application in Market Access (MA) remains limited. Given the strategic relevance and regulatory complexity of MA, understanding current AI adoption and perception represents a significant evidence gap. This study provides one of the first exploratory, European-focused assessments specifically investigating the role of AI in pharmaceutical MA.

Methods: A structured, closed survey was conducted among European pharmaceutical MA executives and senior leaders. The questionnaire investigated AI adoption levels, governance and implementation models, perceived benefits and barriers, and current and future applications, with a focus on MA activities. The survey was distributed between June and November 2025 through targeted professional outreach and conference-based data collection.

Results: Fifty responses were collected. Overall, 44% of respondents reported structural AI implementation within their organizations, with MA being the most impacted function (59%), contrasting with previous analyses where MA was among the least affected areas. AI adoption was strongly linked to company size, favoring large companies. Key barriers to AI adoption in MA included limited availability of high-quality data, data integration challenges, lack of internal expertise, and regulatory uncertainty. Reported benefits were mainly operational, while respondents identified strong future potential in market analysis, forecasting, health economics and outcomes research, and pricing and reimbursement strategy.

Conclusions: AI is increasingly perceived as a valuable enabler in MA, although adoption remains heterogeneous and at an intermediate maturity stage. Effective integration requires robust governance, regulatory clarity, and AI-generated insights that support—rather than replace—human expertise.

Keywords: Artificial intelligence, AI-driven decision support, Market access

Introduction

According to the European Commission's definition, "Artificial intelligence (AI) refers to systems that display intelligent behavior by analyzing their environment and taking actions—with some degree of autonomy—to achieve specific goals" (1).

The use of AI in the pharmaceutical industry is rapidly expanding, offering an increasing number of opportunities to accelerate innovation and improve efficiency.

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AI is increasingly transforming the pharmaceutical industry across its value chain. In drug discovery, it enables the identification of novel candidate molecules and drug repurposing by analyzing large molecular datasets and predicting efficacy and safety (2, 3). For example, during the COVID-19 pandemic, AI systems such as AlphaFold2 accelerated research by elucidating key SARS-CoV-2 protein structures, supporting rapid vaccine development (4).

In clinical trials, AI facilitates patient matching, streamlines recruitment and retention, enhances real-time monitoring, and integrates diverse datasets to uncover correlations in treatment responses, thereby improving trial efficiency, patient outcomes, and success rates (5-7). In pharmacovigilance, AI allows faster and more accurate detection of adverse drug reactions from unstructured data, including electronic health records and patient reports (8-10). The use of AI in these contexts is increasingly shaped by regulatory frameworks, such as the draft *EU AI Act Guidelines for*

General Purpose AI Models published on July 18 2025, which introduce requirements for high-risk applications (11).

Beyond research and development, AI has been applied in marketing, sales, manufacturing, and supply chain management, enabling targeted communication to healthcare professionals, personalized campaigns, quality control through image recognition, and enhanced operational resilience (12-17).

A novel but promising application of AI lies in Market Access (MA) activities. AI can combine and analyze different types of data (e.g., demographics, epidemiological, and sales data) from multiple sources (e.g., administrative and healthcare streams), integrating them with local healthcare policies. By leveraging predictive and adaptive models, it enables improved anticipation of market changes and supports faster, more informed decision-making (18).

Furthermore, AI's potential to generate real-world evidence, thanks to its ability to process large amounts of different, unstructured data, would enable the collection of large amounts of information, which could be fundamental in supporting the value proposition of drugs in pricing processes (19).

For instance, IQVIA recently launched the *Market Access Insights* tool, which features an integrated AI engine that analyzes clinical and commercial data, combining it with HTA, regulatory, pricing, and reimbursement information to synthesize advanced AI-based analysis, insights, and in-depth healthcare expertise, providing a basis for developing evidence-based MA strategies (20).

Another example is the *Tellius* platform (21), developed to offer pharmaceutical companies a tool combining complex internal and external commercial data to derive actionable insights, allowing them to explore data, visualize it in different ways, reveal hidden opportunities, and provide predictions to guide companies towards more informed decision-making.

Furthermore, the evolving European HTA framework may represent an additional factor supporting the integration of AI into MA activities. The introduction of Joint Clinical Assessments (JCAs) under Regulation (EU) 2021/2282 has increased the complexity of evidence-generation requirements at the European level, requiring manufacturers to prepare detailed clinical evidence packages within stringent timelines (22). In this context, AI-based tools may increasingly be considered to support evidence generation, synthesis, and dossier development processes.

The integration of AI into various MA activities would therefore provide pharmaceutical companies with valuable support in better understanding market dynamics and aligning with payers' needs, accelerating approval and reimbursement processes, and increasing their likelihood of success (23).

Nevertheless, findings from a 2024 report by *Strategy&*, part of the *PwC Network* (24), which analyzed over 200 AI use cases in the pharmaceutical sector, indicate that AI is predominantly applied in operational areas such as supply chain management (39%), followed by R&D (26%) and commercial functions (24%), with only a small fraction dedicated to strategic market analysis (2–5%) and pricing (4–9%). The remaining 11% of use cases involve supporting functions, including IT, finance, human resources, and legal and compliance. These results suggest that, despite the significant potential of AI to enhance MA activities, both the real-world adoption of AI in this domain and organizational attitudes toward its implementation remain largely underexplored.

To address this gap, a survey was conducted among European pharmaceutical MA experts to gather information on the current and future use of AI, analyzing the advantages, disadvantages, and obstacles associated with its implementation, with a particular focus on MA activities. It also aims to understand the current sentiment of companies regarding the use of AI in the pharmaceutical sector, both within the companies themselves and by third parties (such as consulting firms), identifying hopes and/or fears related to the implementation of this innovation.

Methods

Survey: development, validation, and distribution

At the time of the survey design, no specific Italian or European guidelines for online questionnaires were available. Nonetheless, the questionnaire was developed with reference to the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) (25), to ensure the quality of the report itself.

A closed survey was conducted among a representative sample of MA executives, as well as top-level company representatives such as CEOs, Vice Presidents, and other C-level executives from pharmaceutical companies across Europe.

To reach the predefined target of approximately 50 completed responses, considered adequate for an exploratory analysis, the online survey was distributed to carefully selected target profiles, without any form of public dissemination. Responses were collected anonymously via single-use access links to prevent duplication, and the invitation included information on completion time and informed consent.

From June to July 2025, numerous target profiles were identified using an automated search function within a professional social networking platform. A predefined set of role-based criteria was applied to select individuals based in Europe, including MA Managers, Senior MA Managers, MA Directors, Senior MA Directors, and MA Associates, as well as senior corporate executives (e.g., CEOs and Vice Presidents). Eligible profiles were restricted to individuals employed by companies with an established operational presence in Europe, defined as at least one active site within the region. As the selection process relied on an automated tool, no manual deduplication at the company level was applied; therefore, multiple respondents from the same organization may have been included in the final sample. This limitation reflects the absence of a built-in filtering function to restrict selection to a single respondent per company.

Some participants were contacted via the social network's chat feature, while others were contacted via email, using the public email addresses available on the social network. Twenty responses were collected through this approach.

From September to November 2025, the survey was then distributed via email to other target profiles, resulting in the collection of a further 20 responses.

Finally, during a scientific conference held from 9 to 12 November 2025, another 10 responses were collected, with

the same role-based eligibility criteria consistently applied, as verified through participants' identification badges.

At the end of the entire distribution period, a total of 50 responses were obtained.

Survey: content

The survey was designed to capture four main respondent profiles (Table 1).

TABLE 1 - Types of respondent profiles

Profile	Description
Profile A	Organizations that have structurally implemented AI in their daily operations, excluding MA activities
Profile B	Organizations that have structurally implemented AI in their daily operations, including MA activities
Profile C	Organizations that have not yet structurally implemented AI, but intend to do so in the future
Profile D	Organizations that have not yet structurally implemented AI and do not plan to do so in the future

The table summarizes the main characteristics of the four respondent profiles captured by the survey.

The questionnaire had an adaptive structure, with question sequence depending on previous answers, resulting in four different paths corresponding to the profiles shown in Table 1. The survey's tree structure permitted a maximum of 23 questions for profiles A and B, and 15 questions for profiles C and D.

The questions covered the following topics:

- time spent using AI in daily activities, both through company tools and personal use;
- whether AI has been structurally implemented in the company and the chosen approach (make or buy);
- if AI is structurally implemented, which are the areas and activities concerned;
- if AI is not implemented, the reasons why, and any potential future drive to implement it;
- general obstacles and benefits associated with AI implementation;
- advantages, disadvantages, obstacles, and drivers related to AI implementation specifically in MA activities;
- perception and attitudes toward the use of AI by MA consultants.

For the complete list of questions included in the survey, please refer to Supplementary Table 1.

Survey: validation

Prior to distribution, the questionnaire underwent a structured internal validation process. This included an initial review of its macro-themes, number and distribution of items across domains, and estimated completion time to ensure overall coherence and feasibility.

Content validity was assessed through expert review by four internal specialists with extensive experience in AI. The experts evaluated the relevance, clarity, and comprehensiveness of the items in relation to the study objectives, ensuring adequate coverage of the constructs under investigation.

A subsequent pilot test was conducted using 20 internal respondents not previously involved in the project. Participants were purposefully assigned across the four predefined target profiles. The pilot phase aimed to assess clarity, redundancy, and usability of the questionnaire, as well as the operational performance of its branching logic, which enabled respondent classification into four primary profiles with further stratification based on subsequent answers. Overall, this step supported the refinement of internal consistency and the functional robustness of the instrument.

Results

Sample

The questionnaire reached 169 MA executives and senior company leaders from pharmaceutical companies across Europe. Of these, 27% (46/169) held Global roles, while among the remaining individuals, 11% (14/123) held positions related to Northern Europe, 36% (45/123) to Central Europe, 31% (38/123) to Southern Europe, and 21% (26/123) to the United Kingdom and Ireland.

A total of 50 responses were collected (response rate = 30%). Of the total respondents, 44% (22/50) indicated that AI has been structurally integrated into their organization, whereas 56% (28/50) reported that their companies have not yet formally implemented AI. Due to anonymization requirements, the geographic distribution of respondents could not be assessed as was done for the invited sample.

Likewise, respondents were not asked to indicate their company of affiliation when completing the survey, but instead to provide a self-declared indication of company size. Overall, 13 responses were received from large pharmaceutical companies (26%), 18 from medium-sized companies (36%), and 19 from small companies (including biotech and start-ups) (38%) (Supplementary Table 2).

Company size and adoption capacity

AI adoption varies by company size and function. Among the surveyed companies, 85% (11/13) of large pharmaceutical firms have implemented AI solutions, compared to 28% (5/18) of medium-sized companies and 32% (6/19) of small companies (Fig. 1).

Business functions most impacted by AI

The analysis shows that among all the companies that have implemented AI at a structural level (n = 22), MA is the most impacted function (59%, 13/22), followed by Digital (55%, 12/22), Marketing (45%, 10/22), and Medical (45%, 10/22) (Supplementary Table 3).

Employee-Led AI Adoption vs. Structural Implementation

Among respondents from companies without formal AI implementation, 43% (12/28) report regularly using online AI tools in daily activities, compared with 32% (7/22) of those

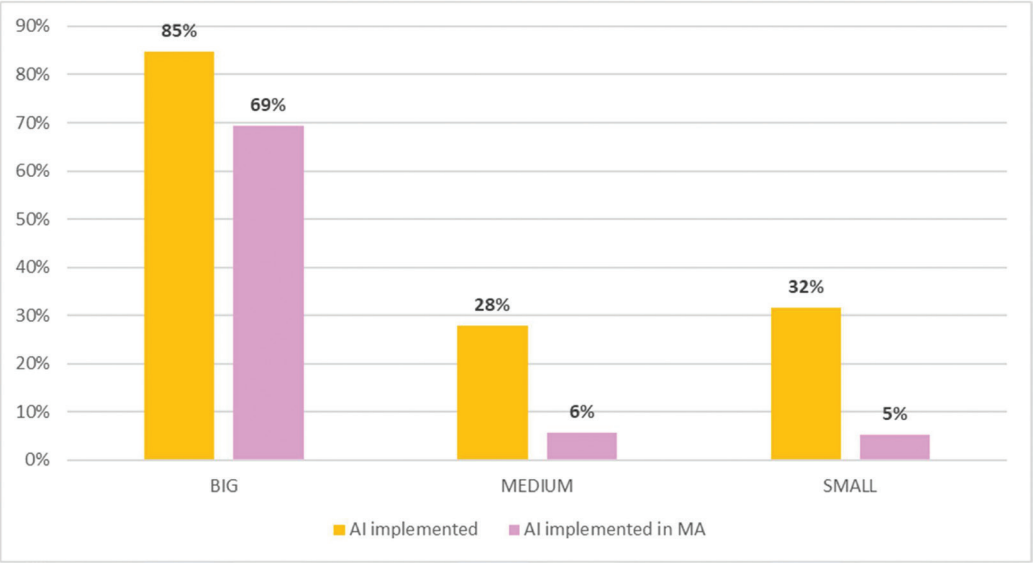

FIGURE 1 - Adoption of AI among the interviewed Pharma companies: Overall vs. MA (entire sample; N = 50). The figure reports the percentage of respondents indicating that AI has been structurally implemented in their company and the percentage reporting AI implementation within the MA function, stratified by company size (large, medium, and small).

from companies where AI has been structurally integrated (Supplementary Table 2).

Governance of technological innovation

Regarding implementation models, 50% (11/22) of respondents from companies that have already adopted AI reported choosing a "buy" approach (Supplementary Table 3), collaborating with external vendors or purchasing off-the-shelf software solutions.

Meanwhile, 23% (5/22) selected a "make" model, fully developing and integrating AI solutions and models in-house, and another 23% (5/22) opted for a hybrid approach (Supplementary Table 3).

The remaining respondents (5%, 1/22) stated that they initially purchased AI solutions and subsequently transitioned toward building internal capabilities and expertise (Supplementary Table 3).

Budgeting of technological innovation and assessment of Return on Investment (ROI)

Regarding the allocation of a specific budget for digital technologies among companies that have implemented AI, 50% (11/22) of respondents were unsure whether a budget had been allocated, 41% (9/22) confirmed that a budget was in place, and 9% (2/22) reported that no budget had been allocated (Supplementary Table 3).

In terms of return on investment (ROI), 55% (12/22) reported achieving an ROI but struggled to measure it accurately; only 9% (2/22) indicated a clearly positive and measurable ROI, while 32% (7/22) stated that they have not yet observed tangible results (Supplementary Table 3).

Main Obstacles to AI Implementation

The analysis highlights that the main perceived obstacles to AI implementation are the lack of internal expertise [50% (11/22) among respondents from companies that have already implemented AI, 68% (19/28) among those from companies that have not], legal and regulatory uncertainties [55% (12/22) among respondents from companies that have already implemented AI, 61% (17/28) among those from companies that have not] and difficulties in integrating data [32% (7/22) among respondents from companies that have already implemented AI, 43% (12/28) among those from companies that have not] (Tables 2 and 3, Supplementary Tables 3 and 4). Only a few respondents reported high implementation costs among the primary obstacles to adoption [5% (1/22) among respondents from companies that have already implemented AI, 11% (3/28) among those from companies that have not] (Tables 2 and 3, Supplementary Tables 3 and 4).

Drivers of Reluctance Toward AI Implementation

Among respondents from companies that have not implemented AI and do not plan to do so in the near future, the drivers of reluctance seem to be budget limitations (55%, 6/11) and concerns about data privacy or security (55%, 6/11) (Table 4, Supplementary Table 8).

Barriers to AI Implementation in the MA Area

Among respondents from companies that have implemented AI in MA, the main obstacles related specifically to AI implementation in this area were the lack of data to train algorithms (45%, 5/11), and difficulties integrating AI with existing systems (45%, 5/11), followed by concerns about the regulatory acceptance of AI-based evidence or models (36%, 4/11) (Supplementary Table 5).

Beyond implementation challenges, some respondents also reported negative outcomes associated with AI use in MA. These included difficulties in justifying AI-driven models during regulatory or payer reviews (36%, 4/11) and instances of inaccurate or biased recommendations affecting pricing

TABLE 2 - Obstacles to AI implementation (among the respondents from companies that already implemented AI [N = 22])

	Respondents from companies that have structurally implemented AI	
Which are the main obstacles your company is facing/faced in AI implementation?	N	% (22 total)
Lack of internal expertise	11	**50%**
Legal and regulatory uncertainties	12	**55%**
High implementation costs	1	**5%**
Difficulties in data integration	7	**32%**
No significant obstacles	0	**0%**
I'm not sure	6	**27%**
Other (Security/confidentiality)	1	**5%**

The table reports the responses to the multiple-choice question "Which are the main obstacles your company is facing/faced in AI implementation?", administered only to respondents from companies that had already implemented AI (N = 22). For each response option, both the number of respondents selecting it and the corresponding percentage are reported.

TABLE 3 - Obstacles to AI implementation (among the respondents from companies that have NOT implemented AI [N=28])

	Respondents from companies that have NOT structurally implemented AI	
Which do you see as the main obstacles to AI implementation?	N	% (28 total)
Lack of internal expertise	19	**68%**
Legal and regulatory uncertainties	17	**61%**
High implementation costs	3	**11%**
Difficulties in data integration	12	**43%**
No significant obstacles	4	**14%**
I'm not sure	1	**4%**
Other (lack of confidence in the output)	1	**4%**

The table reports the responses to the multiple-choice question "Which do you see as the main obstacles to AI implementation?", administered only to respondents from companies that had not yet implemented AI (N = 28). For each response option, both the number of respondents selecting it and the corresponding percentage are reported.

TABLE 4 - Reasons for reluctance to AI implementation (among the respondents from companies that have not implemented AI and do not plan to do so [N = 11])

	Respondents from companies that have NOT structurally implemented AI and do not plan to do so	
Which are the main reasons your company is reluctant about AI implementation?	N	% (11 total)
Unclear return on investment (ROI)	1	**9%**
Budget limitations	6	**55%**
Regulatory or compliance concerns	4	**36%**
Low perceived relevance to current business needs	4	**36%**
Concerns about data privacy or security	6	**55%**
Organizational resistance to innovation	2	**18%**
Other	0	**0%**

The table reports the responses to the multiple-choice question "Which are the main reasons your company is reluctant about AI implementation?", administered only to respondents from companies that had not implemented AI and did not plan to do so (N = 11). For each response option, both the number of respondents selecting it and the corresponding percentage are reported.

and reimbursement strategies (27%, 3/11) (Supplementary Table 5).

The importance of data is also a recurring theme among respondents from companies that have not yet implemented AI but believe that access to high-quality data could be one of the main drivers of AI adoption (64%, 18/28), together with the availability of evidence from real-world success cases (68%, 19/28) (Supplementary Table 4).

Current and Expected Future Benefits

Companies with fully implemented AI mainly report benefits in terms of increased operational efficiency (86%, 19/22) (Supplementary Table 3).

At the same time, these benefits coexist with significant challenges, particularly errors or bias in AI-generated outputs (41%, 9/22), along with concerns about over-reliance on automation (18%, 4/22). Compliance issues are reported but are not dominant (14%, 3/22) (Supplementary Table 3).

However, 55% (12/22) of respondents from companies that have already implemented AI stated that they have not observed significant negative effects (Supplementary Table 3).

Future and promising applications of AI in MA

For the entire sample, the activities most frequently mentioned as those where AI application is expected to grow the most in the future are Market Analysis and Forecasting (78%, 39/50), followed by Health Economics and Outcomes Research (HEOR) (58%, 29/50) and the enhancement of pricing and reimbursement strategies through predictive analytics (56%, 28/50) (Fig. 2, Supplementary Table 2). Additionally, market identification and prioritization was highlighted by 44% (22/50) of respondents as a key area for future AI expansion (Fig. 2, Supplementary Table 2).

Perception of AI Use by Consulting Firms

The use of AI by consulting firms is perceived as an added value by 56% (28/50) of the total sample (Supplementary Table 2). However, 24% (12/50) of respondents express concerns about the quality of AI-generated outputs (Supplementary Table 2).

The main concerns regarding consultants' use of AI relate primarily to data privacy, as reported by 72% (36/50) of respondents (Supplementary Table 2). This is followed by worries about over-automation and reduced human oversight (56%, 28/50), ethical risks and bias (48%, 24/50), and difficulties in evaluating AI outputs (36%, 18/50) (Supplementary Table 2).

Discussion

Artificial intelligence (AI) is progressing at an unexpected pace, and its application in the pharmaceutical industry is expanding exponentially; consequently, information in scientific literature can rapidly become outdated. This survey provides a timely update on AI use, focusing on MA, and examines implementation aspects, organizational attitudes, expectations, and concerns regarding its adoption.

The results from this exploratory analysis highlight a notable shift compared to the 2024 Strategy& (PwC) report

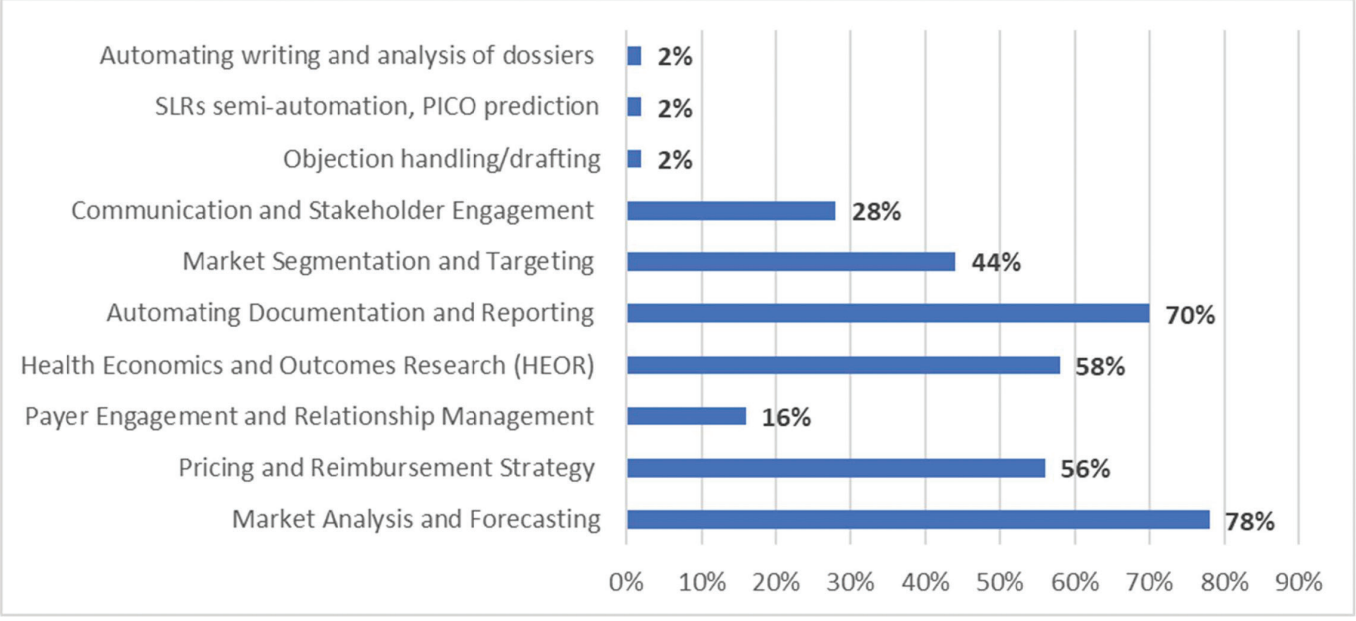

FIGURE 2 - Perceived Areas of Highest AI Application Potential in MA Activities (entire sample [N = 50]). The figure shows the percentage of respondents selecting each response option to the question "What do you think will be the MA activities in which AI application will grow the most in the future?", administered to the full sample of respondents (N = 50). Further details on this survey question and its results are provided in Supplementary Tables 1 and 2.

(24), in which MA was among the areas least impacted by AI. Today the landscape is considerably different, with MA representing the area with the highest AI adoption within pharmaceutical companies, underscoring both its strategic potential and the acceleration of AI integration in this domain.

Despite the positive trend, a clear gap remains in terms of maturity and investment capacity. Approximately half of the surveyed companies report structural AI implementation, but adoption is heavily skewed by company size, with a significantly higher rate of AI implementation among large companies than among medium and small companies, consistent with OECD (Organisation for Economic Co-operation and Development) findings on AI adoption in firms (26). Budget constraints remain a significant barrier, especially for small and medium-sized companies, limiting the scope and sustainability of AI initiatives in these organizations. The gap is further accentuated when considering AI implementation in MA activities.

This may be explained by the fact that MA operates in highly regulated environments, with strong reputational exposure, where explainability and traceability are crucial (27). Furthermore, in smaller organizations, MA teams are smaller and have a primarily operational focus (submissions, negotiations, price filing). In these contexts, AI becomes more of a nice-to-have than a priority. Furthermore, large companies have internal data, budgets, and data science capabilities and can develop use cases across different products (early pipeline, HTA strategy, scenario pricing, etc.), ensuring greater investment sustainability.

Interestingly, the presence of company-implemented AI does not always dictate daily usage by professionals. Readily accessible online AI tools allow employees to self-direct their AI use, often compensating for the absence of in-house systems.

This "Bring Your Own AI" (BYOAI) phenomenon, observed in this survey and supported by the 2024 Microsoft and LinkedIn Work Trend Index (28), indicates a misalignment between organizational provision and operational needs, highlighting employees' proactive role in adopting AI tools independently.

While bottom-up adoption may accelerate familiarity with AI, it also introduces significant compliance and data-security risks, particularly in MA. The use of unsanctioned, consumer-grade tools ("shadow AI") often falls outside formal governance, making it difficult to demonstrate the data governance, traceability, and human oversight required under the EU Artificial Intelligence Act, including the obligation to ensure a sufficient level of AI literacy (applicable since February 2025) (11). These risks are heightened by the nature of MA data, which includes commercially sensitive pricing and contracting information, as well as real-world data often qualifying as special-category health data under GDPR. Inputting such information into public or free-tier generative AI tools may lead to loss of confidentiality, uncontrolled cross-border processing, and potential reuse for model training, while also raising issues related to lawful basis, data minimization, and data protection impact assessments. This underscores the need for clear acceptable-use policies, access to vetted enterprise solutions with contractual data-protection safeguards, and targeted training to ensure that employee-driven experimentation does not translate into regulatory or reputational risk.

The preference for ready-to-use solutions reflects a strategy favoring rapid operational deployment over end-to-end in-house AI development. Current governance models are still emerging, and AI budgets are often embedded within broader IT/digital allocations, indicating a need for clearer investment oversight.

The economic value of AI is widely acknowledged yet rarely quantified in financial terms. This aligns with broader observations that AI benefits are often assessed qualitatively - through efficiency gains, accelerated processes, and enhanced decision support – rather than via measurable financial KPIs, a trend confirmed by Forbes (29).

The survey also underscores that the perceived obstacles to AI implementation are not merely attitudinal but structural, encompassing gaps in internal expertise, regulatory uncertainties, data integration challenges, and the availability of high-quality datasets. While the EU's Artificial Intelligence Act (Regulation (EU) 2024/1689) has entered into force and establishes a comprehensive risk-based legal framework for AI across sectors (11), sector-specific guidance for pharmaceuticals, particularly for MA, remains limited, emphasizing the need for regulatory clarity to facilitate safe and accountable AI adoption.

Experiences reported by companies already using AI in MA further suggest that barriers extend beyond internal organizational capabilities. The difficulties encountered in justifying AI-driven models during regulatory and payer reviews point to broader concerns regarding the acceptance and credibility of AI-generated output among external decision-makers.

Among companies with fully implemented AI, reported gains are mainly in operational efficiency, rather than in strategic, data-driven decision-making. This is unsurprising, as these benefits coexist with significant challenges, including errors and biases in AI outputs, which hinder confidence in high-stakes applications such as pricing, reimbursement, and MA. Consequently, human oversight remains essential, not only to validate AI-generated outputs but also to ensure accountability, mitigate risks, and support informed decision-making.

The issue of AI "hallucinations", the generation of plausible but incorrect outputs, is indeed widely discussed in the literature and is particularly concerning in medical contexts, where patient safety is critical (30-33).

Looking forward, survey respondents indicate that AI in MA holds potential not only to streamline operational tasks, but also to act as a strategic tool in critical areas, including evidence generation, scenario planning, and payer engagement.

The expectation that AI will expand primarily in market analysis, forecasting, and HEOR-related activities is consistent with the growing methodological attention devoted to machine learning and, more recently, to generative AI within HEOR. The ISPOR Machine Learning Task Force identified several domains in which machine learning may contribute to HEOR, including predictive analytics, causal inference, and economic modelling, and developed the PALISADE checklist

to support the rigorous evaluation and reporting of these approaches (34). More recently, the ISPOR Working Group on Generative AI reviewed the application of generative AI and large language models to systematic literature reviews, real-world evidence generation, and health economic modelling, concluding that current applications remain at an early stage of maturity and raise concerns regarding scientific validity, reliability, risk of bias, and equity, which continue to require human oversight (35). Taken together, these initiatives reflect an ongoing effort to standardize AI-supported methods and to mitigate the "black box" concerns that limit their acceptability among HTA bodies and payers.

Such standardization represents a precondition for the use of AI within evidence packages, as the potential efficiency gains must be reconciled with the evidence requirements underpinning HTA decision-making. Evidence submitted to HTA bodies and payers is expected to be generated through transparent and reproducible methods, with clearly documented data sources, analytical assumptions, and procedures allowing independent review and critical appraisal (36).

Assessment bodies such as G-BA in Germany, HAS in France, and NICE in the United Kingdom require full reproducibility of the analyses submitted to them: an AI-generated network meta-analysis or cost-effectiveness model is unlikely to be accepted and may be rejected, where the underlying extraction of clinical trial data cannot be transparently verified and independently replicated. The integration of AI into evidence generation for MA must therefore remain aligned with the core principles underpinning HTA, namely transparency of methods, quality of the underlying evidence, and independence of the assessment process (37), with documented human validation of AI-generated outputs prior to submission.

These constraints may also contribute to explaining the pattern observed in this survey, in which efficiency gains are reported more consistently than strategic, decision-oriented benefits, and in which difficulties in justifying AI-driven models during regulatory and payer reviews emerge as a distinct barrier.

Accordingly, the future role of AI in HEOR and MA is likely to depend less on its analytical capabilities than on the availability of validation and documentation frameworks able to withstand institutional scrutiny.

The use of AI by consulting firms is generally accepted, but only when it enhances product quality while ensuring transparency, data privacy, and process control, reinforcing the notion that AI should augment rather than replace human expertise.

Limitations

This study has several limitations that should be considered when interpreting its findings.

Firstly, the analysis is based on a relatively small sample (N = 50), which limits the robustness of the findings and precludes meaningful quantitative comparisons across subgroups; accordingly, the results should be regarded as descriptive, exploratory, and hypothesis-generating rather than as representative of the European pharmaceutical industry as a whole.

Secondly, participants were recruited through professional networks and at a scientific conference. This approach may have introduced selection bias, potentially over-representing professionals who are already engaged with, or favorably disposed towards, AI, as well as individuals who are more active in professional communities.

Thirdly, because the questionnaire was answered anonymously, it was not possible to exclude the possibility that more than one respondent belonged to the same company, which may have led to partial clustering of organizational perspectives.

Finally, the data are self-reported and reflect respondents' perceptions at a single point in time during a phase of rapid technological and regulatory change; as such, they capture perceived trends and early adoption patterns rather than objective, quantitatively validated measures of AI deployment or performance.

Larger, more structured, and cross-country studies are warranted to confirm and extend these preliminary observations.

Conclusion

In conclusion, this survey provides an exploratory snapshot of how AI is currently perceived and adopted within the pharmaceutical sector, suggesting increasing adoption, a growing awareness of its potential, and a still intermediate level of maturity. In MA, AI is widely perceived as highly promising; however, its value lies in its role as an enabling tool rather than as a stand-alone solution. In such a strategic and highly contextualized function, AI cannot replace domain expertise, the understanding of regulatory and payer "grey areas", informal dynamics, or the experiential knowledge acquired through practice. The transition from experimental use to a structurally embedded strategic lever therefore requires not only robust governance, technical capabilities, and credible use cases, but also the integration of AI outputs with human judgment and professional experience. These findings highlight both the opportunities and the inherent limitations of AI adoption in MA and provide a benchmark for future research and implementation strategies.

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