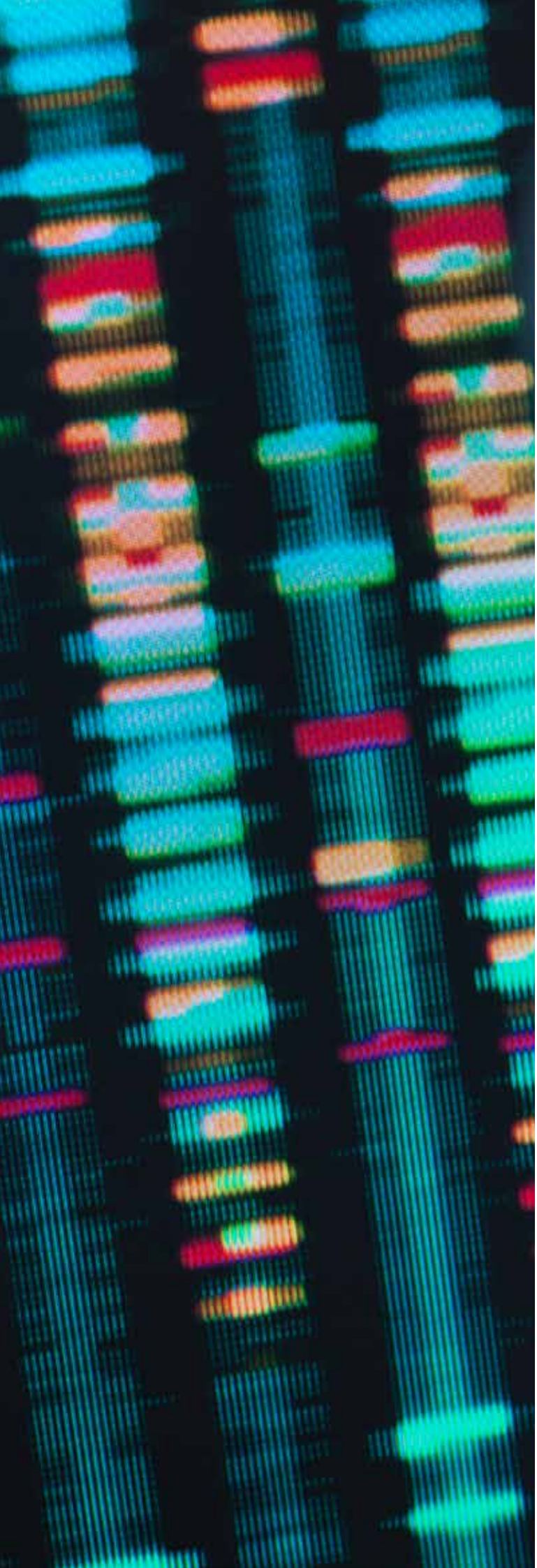
WHITE & CASE

New frontiers: How AI is transforming the life sciences industry

Taking the pulse of AI in the life sciences sector and exploring how organizations can maximize opportunities from this rapidly evolving technology to build healthier futures



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Foreword: Embracing change

By Strati Sakellariou-Witt, Andres Liivak, Bethany Hills, Dr. Katrin Helle, and Ajita Shukla

The convergence of artificial intelligence (AI) and life sciences is no longer a distant promise. Companies operating in the sector are actively embracing the technology and are already achieving measurable results. In the following exclusive report from White & Case, in association with *Mergermarket*, this new reality is explored in depth. Drawing on a proprietary survey of senior executives spanning human pharma and biotech, healthcare provision, medical devices and animal health, the report provides a comprehensive overview of where the sector stands and where it may be heading.

Recent market data demonstrates the scale and urgency of this shift. AI in the pharma market alone is projected to reach US$25.7 billion by 2030, up from around US$4 billion today, according to market research firm Mordor Intelligence. AI-driven drug discovery is also expected to exceed US$20 billion by 2030, per research organization Grand View Research, as firms seek faster routes to novel compounds and more precise trial matching. These forecasts underscore that AI is much more than merely a back-office optimization tool; it is becoming integral to how life sciences companies design, test and deliver therapies, with growing expectations from regulators, investors and patients alike.

Our findings confirm this transition of AI from experimentation to practical application. Tools are being embedded in product design, trial optimization, diagnostics, drug target identification and commercial execution. Organizations are also adapting internally—reassessing governance structures, workforce capabilities and legal frameworks to ensure AI can scale sustainably and in compliance with complex legal frameworks. Board-level involvement is growing, and forward-looking investment strategies are being developed to match the pace of innovation.

This research explores the sector's priorities and pain points in detail. The report begins by mapping current use cases and business goals, showing how companies are deploying AI to address real operational needs—from shortening development cycles to improving diagnostic accuracy. It then turns to the structural challenges that remain, including the legal and regulatory complexities surrounding general AI deployment and use, data protection, intellectual property (IP) and cross-border compliance. These risks are shaping how organizations approach partnerships, procurement and policymaking.

Investment is a central theme. Budgets are shifting from discretionary pilots to embedded line items, with many companies pursuing joint ventures, acquisitions or internal buildouts to accelerate capability development. Local sourcing is often favored, but appetite for cross-border expansion remains in markets with advanced regulatory pathways or concentrated AI talent.

In conclusion, the report examines how success is being defined and why it matters. Metrics such as diagnostic accuracy, cost reduction, and patient access are becoming essential to both internal planning and external validation. Encouragingly, the vast majority of respondents believe AI will improve patient outcomes, while investors increasingly view AI maturity as a signal of innovation-readiness and long-term value creation.

With AI moving rapidly up the agenda in boardrooms and regulatory agencies, understanding how to scale responsibly and legally is critical. This report offers a grounded view of what effective AI adoption in life sciences looks like today—and where the next key opportunities and risks lie.

Methodology

In 2025, White & Case, in partnership with *Mergermarket*, surveyed 200 senior executives of life sciences organizations. The organizations surveyed included human pharma and biotech companies (75), healthcare providers (50), medical device companies (50) and animal health companies (25). Respondents from each company type were split equally between EMEA (66), Asia-Pacific (67) and North America (67).

Key findings

1

AI is integral to business strategy

Three-quarters of life sciences companies say that AI is either crucial or very important to their business strategy. Within that, 68 percent of medical device companies and 56 percent of human pharma and biotech companies say AI is crucial to their strategy.

2

Budgets are rising

Sixty percent of respondents expect AI budgets to increase over the next 24 months, rising to 71 percent in human pharma. AI is moving from discretionary spend to a core line item supporting measurable improvements across the value chain.

3

Partnerships outweigh M&A

Sixty-two percent of companies plan to scale AI through joint ventures or strategic alliances, compared to just 26 percent prioritizing acquisitions. Human pharma shows more M&A appetite, while healthcare providers and animal health companies favor third-party buy-ins and/or VC investments.

4

Most AI investment will remain regional

The majority of respondents plan to invest locally, but 27 percent of Asia-Pacific–based firms expect to deploy their largest AI spend overseas—mainly in North America and EMEA—reflecting the maturity of those ecosystems.

5

Data security and integration top the list of practical barriers

More than half (55 percent) cite data security as an operational challenge to AI adoption, followed by implementation costs and legacy system integration. Skill shortages also continue to slow progress.

6

Legal concerns vary by company type

Patient privacy and contractual/licensing concerns are each cited by 42 percent of respondents. This rises to 66 percent of healthcare providers for the former. Contractual and licensing is the top legal concern for 60 percent of animal health companies.

7

IP liability remains a concern

Eighty-two percent of respondents express at least some concern about IP-related liability from AI use. Views differ by region: 46 percent of Asia-Pacific–based respondents are very concerned, compared with 27 percent in North America and 20 percent in EMEA.

8

Training and governance are inconsistent

Sixty-three percent of respondents have AI training in place, rising to 72 percent in human pharma. Just under half (48 percent) say AI governance is frequently discussed at board level, although this rises to 64 percent for medical device companies and 60 percent in North America across all company types.

9

Legal uncertainty is a brake on adoption

Sixty-six percent agree that a lack of legal clarity hinders AI deployment at their organization. This view is particularly strong in animal health, where 84 percent agree.

10

Investors expect credible AI strategies

Ninety-seven percent agree to some degree that life sciences companies will be significantly less attractive to investors without effectively maximizing the potential of AI in the next two years. Strong agreement is highest among animal health (64 percent) and human pharma (60 percent) firms.

11

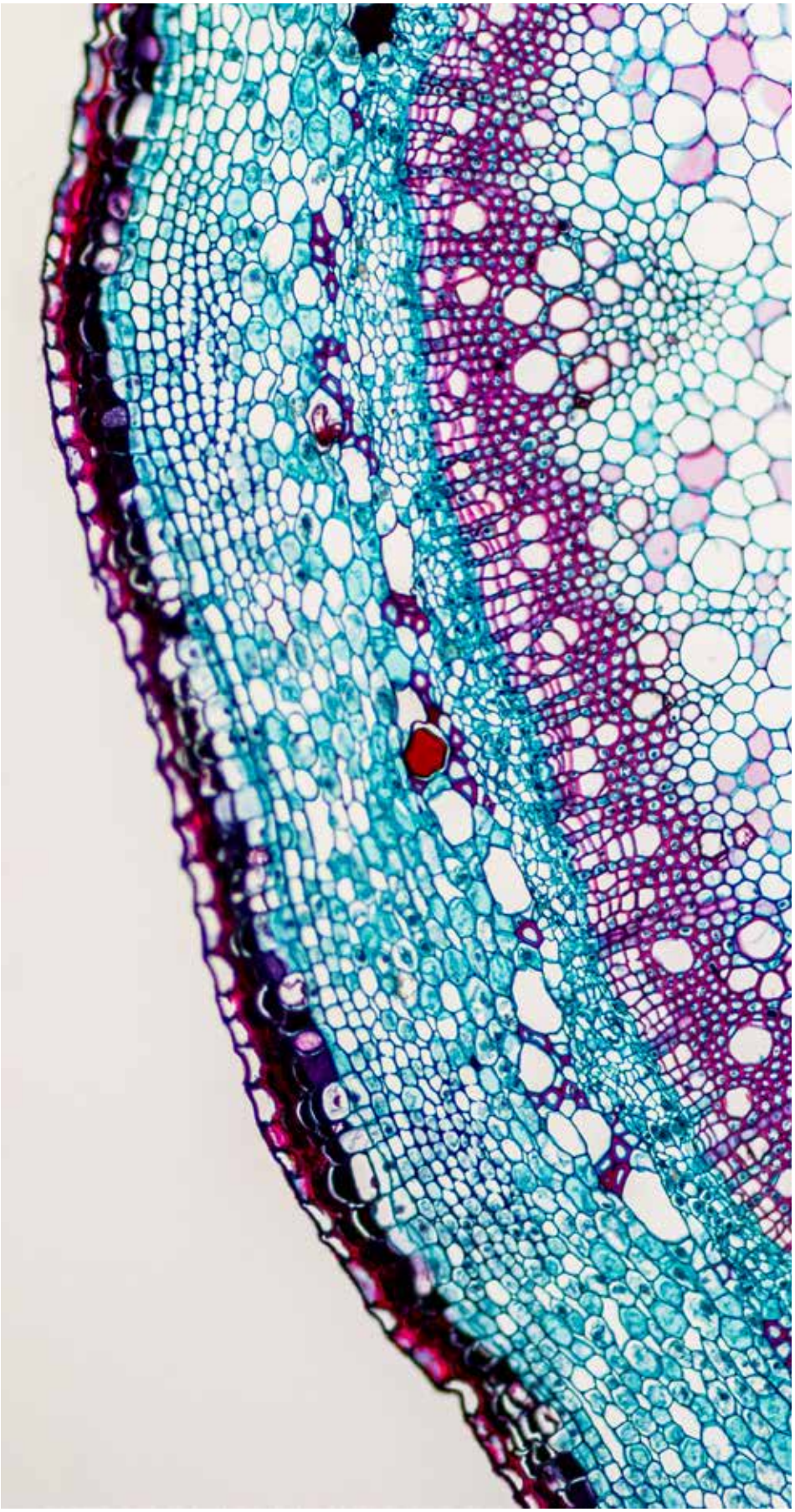
AI is expected to improve patient outcomes

Almost all organizations interviewed (98 percent) expect AI to deliver better outcomes for patients. Optimism is strongest in human pharma, where 68 percent anticipate significant improvements in the next 24 months, and in EMEA, where 70 percent expect major gains over this period.

12

Metrics for success depend on sector focus

Diagnostic accuracy is the leading success metric overall (44 percent), especially for medical device firms (58 percent). Healthcare providers prioritize patient access and health equity (58 percent), while animal health companies focus on cost reduction (52 percent).



The state of the market

KEY FINDINGS

■ AI adoption and maturity depend on the subsector, however only 17 percent of all respondents note that their AI strategy is very developed ■ Investment in AI in the life sciences sector is set to accelerate in the next 12 months ■ Use cases for AI are concentrated in areas that have historically delivered ROI and better customer and patient outcomes, such as R&D

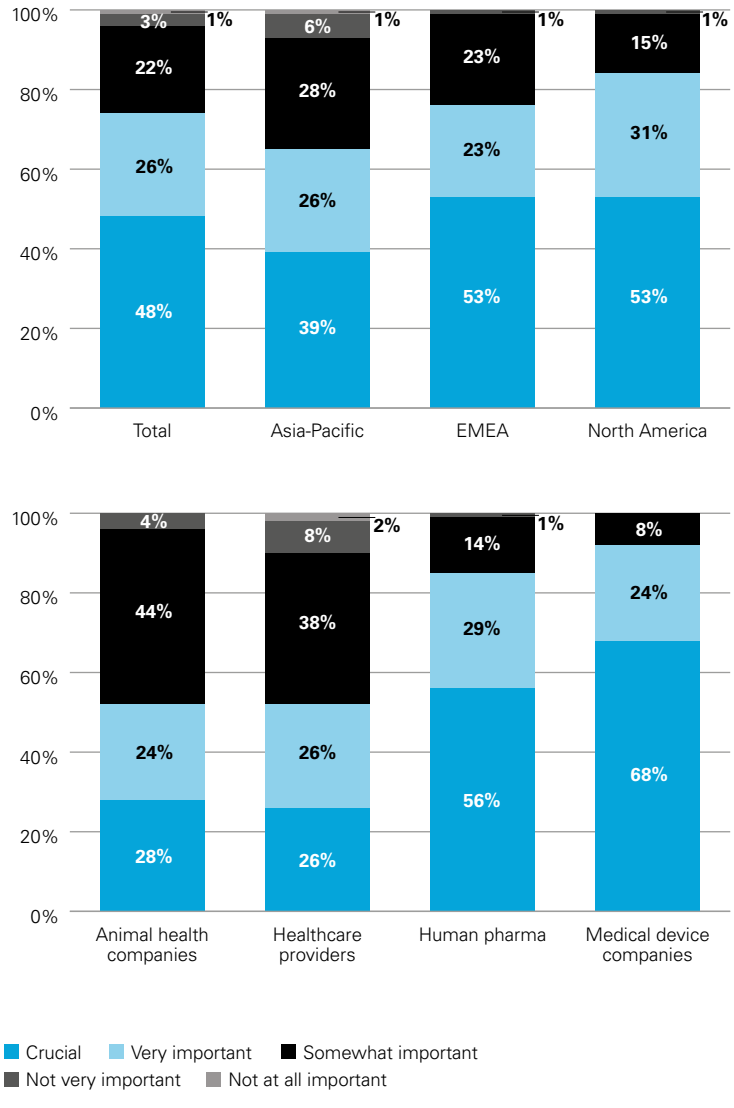
AI is reshaping the life sciences industry in ways that are no longer hypothetical. The question is no longer whether to adopt AI, but how, and where, it can drive the most value. Adoption, however, is advancing at different speeds across subsectors and geographies, and evolving regulatory frameworks are influencing how organizations scale, validate and govern these next-generation tools.

Across our entire survey sample, 74 percent of executives say AI is either crucial or very important to their business strategy. Within that, 68 percent of medical device companies and 56 percent of human pharma companies say AI is crucial to their strategy. By contrast, only 26 percent of healthcare providers and 28 percent of animal health firms share this view. Regionally, 53 percent of EMEA and 53 percent of North American respondents deem AI crucial, while Asia-Pacific more often selects very important (26 percent) or somewhat important (28 percent).

Even though healthcare providers less commonly view AI as crucial to their success compared with other life sciences segments, many are well attuned to the reality that further investment will be needed to keep pace with the market. "Given how widely AI is being adopted across the sector, it's important to our business strategy," says the CEO of a European healthcare provider. "That's why we're evaluating an increase to our AI budget."

Percentage of respondents who say AI is either **crucial or very important** to their business strategy

How important is AI to your overall business strategy?



Different stages of maturity

Despite the broad intent, strategy maturity is still developing. Only 17 percent of respondents describe their AI strategy as very developed. This maturity varies sharply by subsector: In human pharma, 67 percent say their strategy is very or moderately developed, compared with 48 percent of medical device companies, 44 percent of animal health companies and 24 percent of healthcare providers.

Planned spending suggests AI adoption is set to accelerate: 28 percent of respondents expect to invest more than US$50 million in AI over the next 12 months—up from 22 percent last year. Much of this capital is likely to go to functions and subsectors where the data and infrastructure already support deployment.

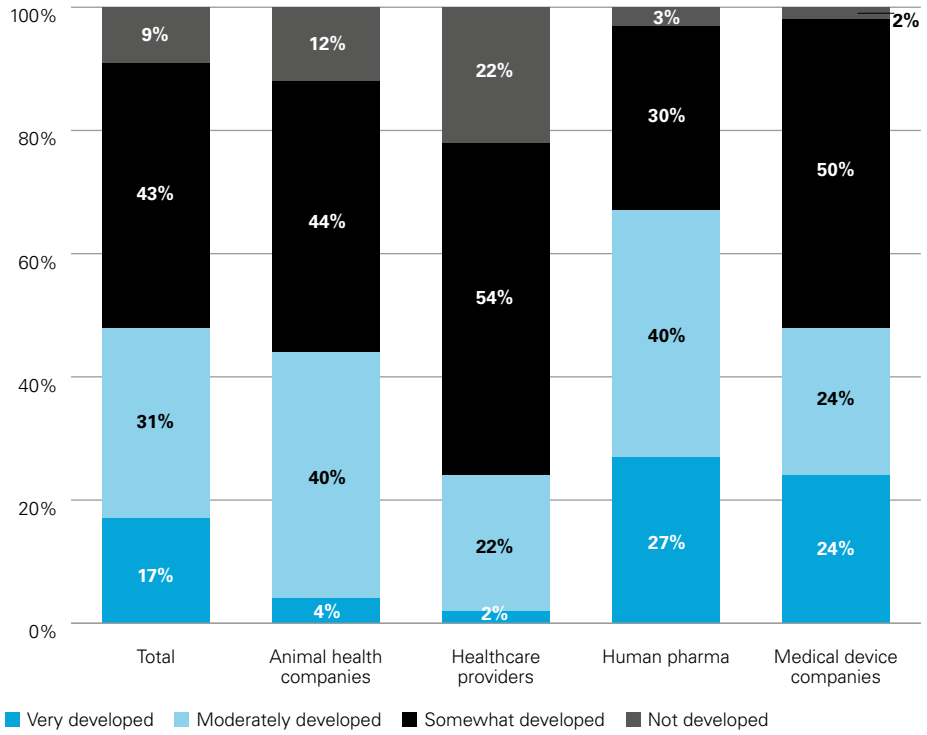
A wide variety of use cases

Use cases are clustering in areas that have historically delivered ROI and better customer and patient outcomes. In R&D, for example, 64 percent of all respondents use AI regularly, climbing to 88 percent in human pharma and 74 percent in medical devices, but falling to 22 percent for healthcare providers. This makes absolute sense as pharma companies manage substantial R&D budgets, which allows them to move toward AI initiatives, whereas healthcare providers often operate within tighter financial constraints.

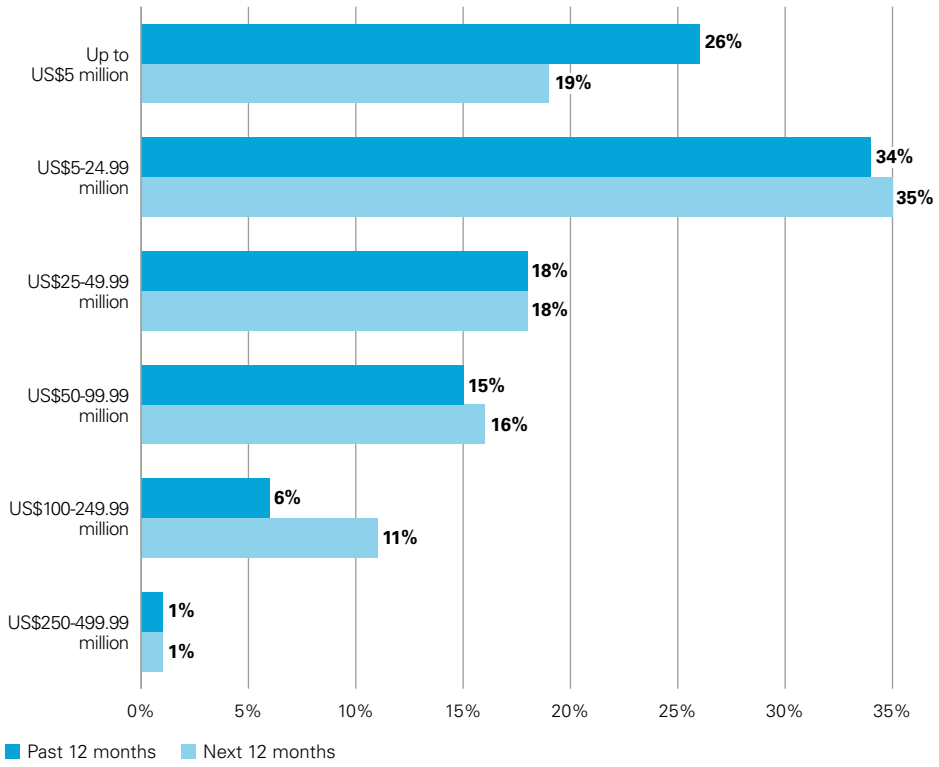
Despite these budget limitations, respondents are pressing ahead with clinical applications of AI. Not only do 75 percent of all respondents use AI regularly for medical purposes, such as diagnostics, treatment support and adherence, at least 62 percent reported this application across every company type, highlighting broad-based adoption for these purposes among practitioners, even in instances where organizations lack an established or mature strategy.

Supply chain management is another area in which AI is highly applicable, enhancing everything from demand forecasting to lead time tracking and inventory optimization. Our research reveals that 43 percent use AI regularly for supply chain management, led by human pharma and medical devices (54 percent and 52 percent, respectively), with slower

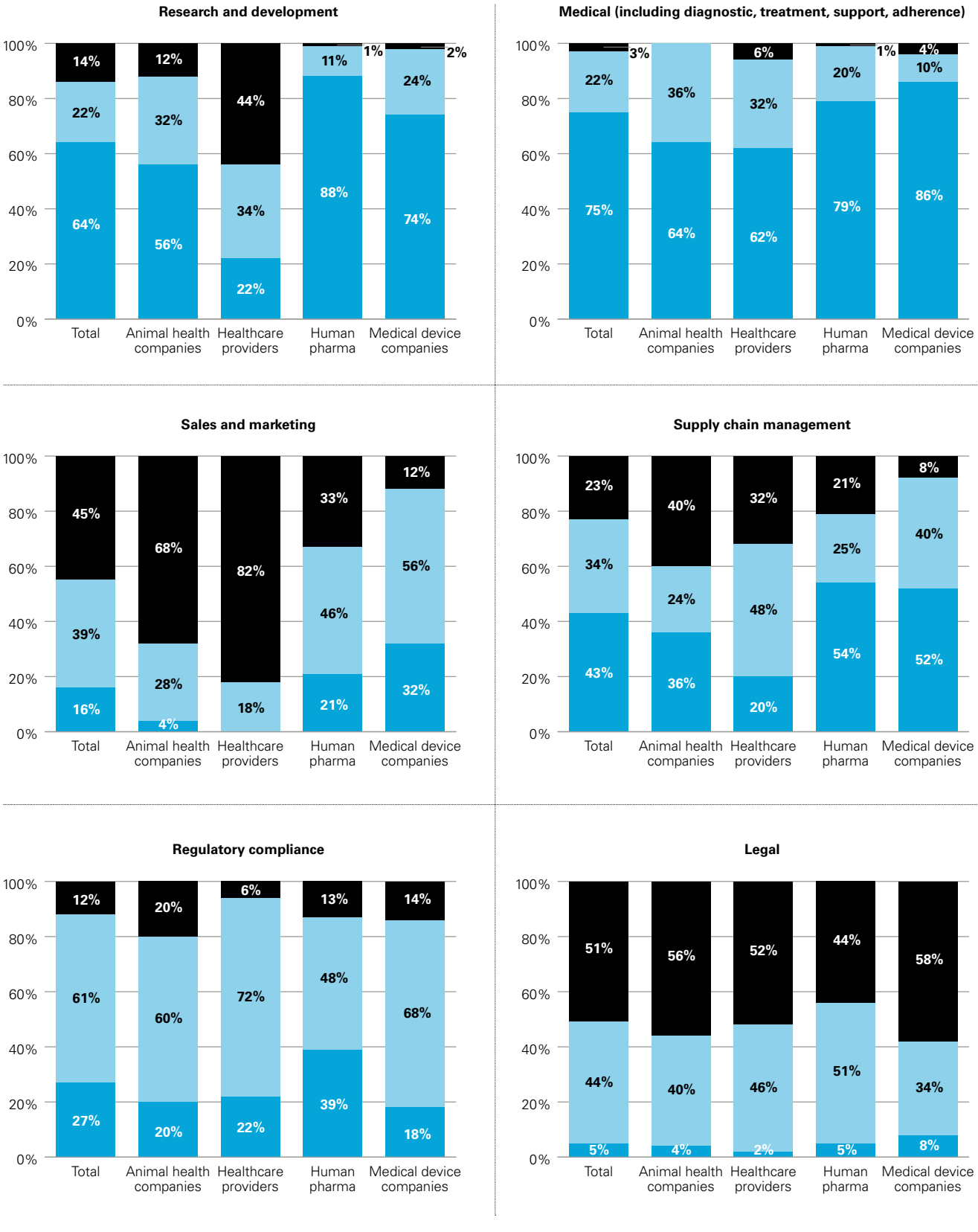
How developed are your company's AI strategies?



How much has your organization invested in AI-led initiatives over the past 12 months? And how much do you expect your organization to invest in AI-led initiatives over the next 12 months?



How frequently do personnel currently use AI within each of the following areas of your company?



uptake in animal health (36 percent) and healthcare providers (20 percent). Organizations without clean historical demand data or SKU (stock-keeping unit)-level visibility can expect limited benefit from AI-powered forecasting and supply scheduling until those prerequisites are in place.

Compliance-facing usage is also trailing the more technical domains of R&D and medical provision: 61 percent say they use AI for regulatory compliance only occasionally. In legal functions, 51 percent do not use AI at all and 44 percent use it only occasionally—evidence that governance-adjacent workflows are a step behind labs, imaging suites and factories.

However, the figure for the legal function is likely to rise sharply in the coming years. Unlike other areas with long-standing experience in modelling, bioinformatics and analytics—such as R&D and clinical development, where machine learning has been embedded for years and will continue to evolve at pace—most legal departments have only recently encountered AI in a form that genuinely fits their needs. For them, AI maturity effectively begins with the advent of LLMs, which can be used for routine manual tasks such as document automation and translation. What's more, there is evidence that multinational life sciences companies are developing proprietary LLMs to mitigate confidentiality and data governance risks. Legal functions are therefore earlier in their AI adoption curve.

Similarly, there is a notable lag in adoption across commercial business functions. Only medical device companies report a notable foothold in sales and marketing, for example, in which 32 percent use AI regularly. Across the sample as a whole, just 16 percent use the technology for these day-to-day commercial operations.

While use cases may differ within various businesses, depending on size and specialization, a vice president of a life sciences multinational notes that AI is broadly used across the whole organization, in operations, business intelligence, medical affairs, marketing, sales and market access. "We're using it for everything from health technology assessment submissions to productivity improvements."

Regulatory and legal considerations

As AI adoption in life sciences accelerates, companies face rising expectations from regulators—not just about whether AI works, but how it works; where it fits into existing processes; and what controls are in place to ensure safety, transparency and reliability. And the bar is not uniform across functions: The closer a system gets to patient safety or product quality, the more scrutiny it attracts.

In R&D and clinical development, guidance is emerging around the use of AI in target discovery, protocol design, data analysis and pharmacovigilance. The European Medicines Agency's (EMA) *Reflection paper on the use of Artificial Intelligence (AI) in the medicinal product lifecycle* indicates what regulators are looking for: clearly defined use cases, high-quality representative datasets, documented model pipelines and traceability from data inputs to final conclusions. These expectations are already shaping how assessors review submissions and conduct inspections.

Similar principles are shaping expectations in the US. The Food and Drug Administration's (FDA) Center for Drug Evaluation and Research has published draft guidance addressing how AI should be used to support activities that inform drug submissions, such as trial design, clinical data analysis and safety monitoring. The guidance stresses the need for human oversight, validation of model fitness and reproducibility across the model life cycle, particularly when AI-generated outputs are used in regulatory filings.

For AI integrated into regulated medical devices such as imaging tools, software for diagnosis or treatment support, and other Medical Device Software (MDSW) respectively, Software as a Medical Device (SaMD), the rules are firmer. Europe's AI Act introduces a high-risk category that captures, inter alia, AI-based medical devices. Systems in this category must meet obligations around quality management, data governance, explainability, human oversight and post-market monitoring. Most of these obligations take full effect August 2027, except for AI systems in connection with emergency calls, priority in emergency services or emergency healthcare patient triage systems, which are in scope from August 2026. If the European Commission's proposed amendments are implemented, the obligations regarding high-risk AI systems will come into force later.

In the US, the FDA has made room for adaptive AI through the use of Predetermined Change Control Plans. These allow developers to specify in advance which aspects of their models may change post-approval, along with the guardrails, monitoring protocols and performance thresholds that will be maintained. This creates a legal pathway for iterative learning, as long as the plan is detailed, risk-based and transparent.

AI used in manufacturing and supply chain settings is not governed by standalone AI rules. Instead, where systems influence product quality or production decisions, they fall under existing Good Manufacturing Practice (GMP) frameworks, requiring defined use, performance validation, audit trails and formal change control. However, FDA has issued a discussion paper and a draft guidance addressing AI in the manufacturing of drugs and finalized a guidance on "Computer Software Assurance for Production and Quality System Software" for devices, indicating continued movement toward regulation in this space.

The EU is also moving in this direction via proposed updates to its GMP guidelines, including requirements for the use of AI in the manufacturing of active substances and medicinal products. When AI is used in lower-risk areas, such as forecasting or logistics, proportionate controls still apply, centering on reliable data, documented assumptions and retained oversight.

Commercial functions, such as marketing, sales and launch planning, remain lightly regulated from a technical standpoint but are not risk-free. Issues around patient communication, algorithmic bias and AI-generated promotional content can all trigger legal or reputational concerns if left unmanaged. In these areas, firms are increasingly developing internal policies to ensure appropriate human review, record-keeping and content control.

Opportunities in AI

KEY FINDINGS

■ Each sub-sector has differing expectations when it comes to which AI use case will have the greatest impact ■ Human pharma sees personalized medicine and clinical trial optimization as having the greatest impact ■ Healthcare providers cite operational efficiencies ■ Medical device professionals note quality system optimization ■ Animal health companies highlight two priority use cases, animal monitoring, and wearables and diagnostics ■ Respondents most commonly highlight cost reductions as a top benefit of integrating AI into the product design phase ■ Organizations collectively note that a key benefit of integrating AI into the product commercialization process is data-driven decision-making

With life sciences organizations moving from experimentation to implementation, AI is becoming a core enabler of innovation across the value chain. The technology is now supporting real-time decisions, and the scope of opportunities for its application will open wider as AI tools become more intelligent. The nature of this opportunity, however, depends heavily on the nature of the business—whether it is designing new drugs or devices, optimizing clinical pathways or managing field-deployed devices.

In human pharma, expectations are highest in personalized medicine and clinical trial optimization, each selected by 56 percent of respondents. These are areas where AI can reshape processes end-to-end: identifying patients by biomarker profiles; designing more targeted trials; improving site selection and enrollment; and optimizing timelines through better forecasting. Pharmacovigilance and drug discovery (each 47 percent) also score highly, reflecting AI's growing role in surfacing safety signals from real-world data and prioritizing candidates earlier in the pipeline to avoid wasted spend downstream.

"Clinical trials do take time to complete and we need to finish each process effectively, with the right amount of data to draw conclusions," says the chief innovation officer of a US pharma company. "AI can expedite the process, so that products can hit the market sooner."

Percentage of human pharma respondents who expect **personalized medicine and clinical trial optimization** to have one of the greatest impacts in the pharmaceuticals/biotech sector strategy

A vice president of a life sciences multinational explains that AI is playing a key role in personalized medicine, particularly in the early steps. "For example, with personalized therapies, where the whole supply chain is inherently slow and complex, AI-enabled automation can help improve vein-to-vein [taking stem cells, developing treatment and then transferring to the patient] and time-to-patient processes. These are areas where we can gain efficiency, but it does require a lot of validation and regulatory compliance. You can't just overhaul manufacturing facilities overnight."

For healthcare providers, the focus is squarely on operational pressures. Respondents see the greatest potential in AI-enabled operational efficiency (62 percent), clinical trial optimization (58 percent) and remote monitoring (52 percent).

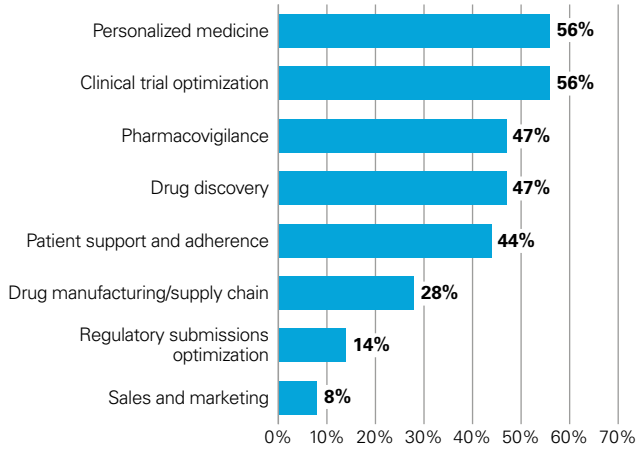
"The importance of engagement and keeping in touch with patients has increased. As healthcare providers, the responsibility of communicating falls on us, and we can optimize the process using AI," says the director of innovation of a Taiwanese healthcare provider.

The emphasis reflects real-world constraints: limited staffing, rising demand and the need to improve throughput without expanding headcount. AI is being used to manage patient flow, improve scheduling and identify trial candidates more efficiently. By contrast, robotic surgery (zero percent) and mental health treatment (six percent) are seen as niche use cases, limited by cost and integration challenges.

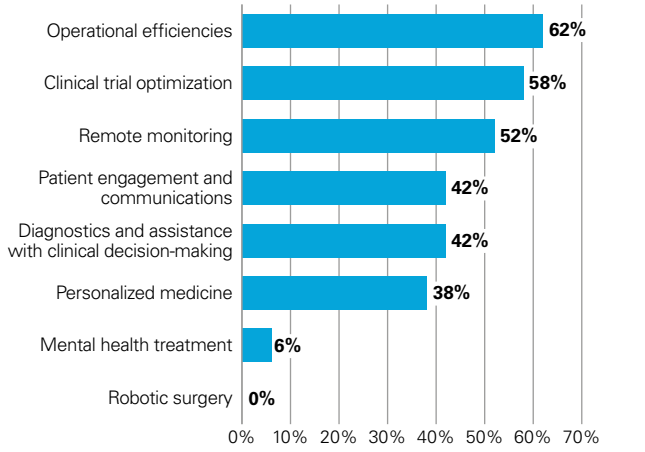
Meanwhile, among medical device companies, the leading area for AI impact is quality system optimization (56 percent), followed by post-market surveillance and new product development. These companies are using AI to improve how they detect and manage quality issues, triage complaints and respond to non-conformances—enhancing both compliance and efficiency. At the product level, devices for diagnostic tests (56 percent) and drug delivery systems (54 percent) are seen as the biggest beneficiaries of AI, thanks to their instrumented design and measurable outputs. More mature device types, such as ventilators and infusion pumps, are seen as slower to evolve due to safety and regulatory constraints.

Animal health companies report a broader spread of priority use cases, led by animal monitoring and wearables (48 percent) and diagnostic decision support (48 percent). These are closely followed by behavior analysis (44 percent) and trial optimization (44 percent). AI tools are being

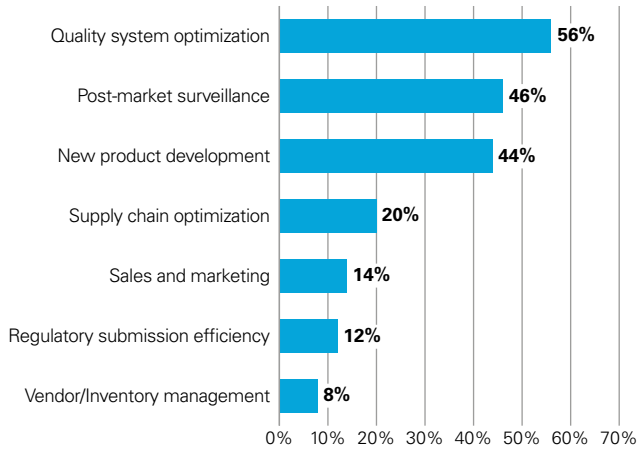
Human pharma: Which of the following use cases for AI will have the greatest impact in the pharmaceuticals/biotech sector?



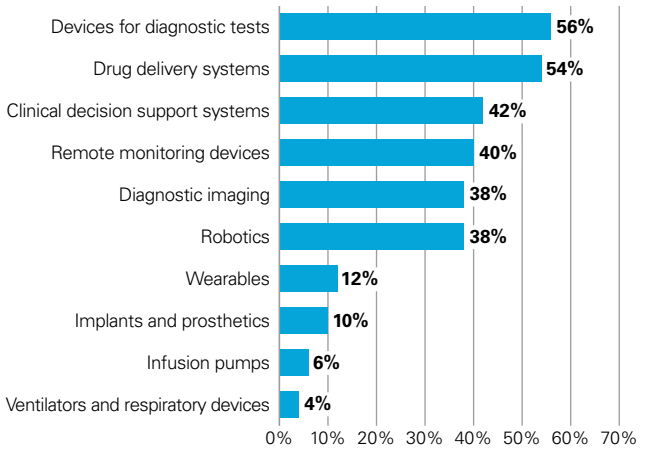
Healthcare providers: Which of the following use cases for AI will have the greatest impact in the human healthcare sector?



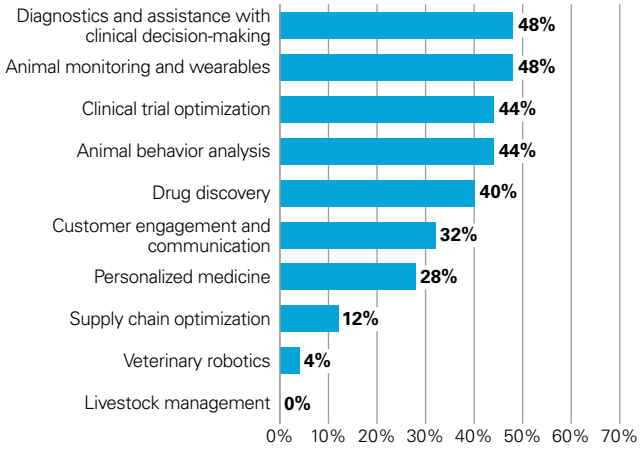
Medical device companies: Which of the following medical devices will AI have the greatest impact on?



Medical device companies: Which of the following use cases for AI will have the greatest impact in the medical devices sector?



Animal health companies: Which of the following use cases for AI will have the greatest impact in the animal health sector?



AI is becoming a core enabler of innovation across the value chain. The technology is now supporting real-time decisions and the scope of opportunities for its application will open wider as AI tools become more intelligent.

adopted to detect early signs of disease or welfare issues, assist with diagnosis, and streamline the set-up and execution of clinical studies. Robotics and livestock management platforms currently lag due to limited infrastructure and cost-benefit barriers, with just 4 percent and 0 percent, respectively, citing these as high-impact areas.

"Clinical decision-making is an area where AI will be very helpful," says the head of R&D of an animal health company in India. "With animals, the diagnosis process is slightly more challenging. Recognizing reaction to drugs and diagnosing issues effectively will be done using AI."

Product design benefits

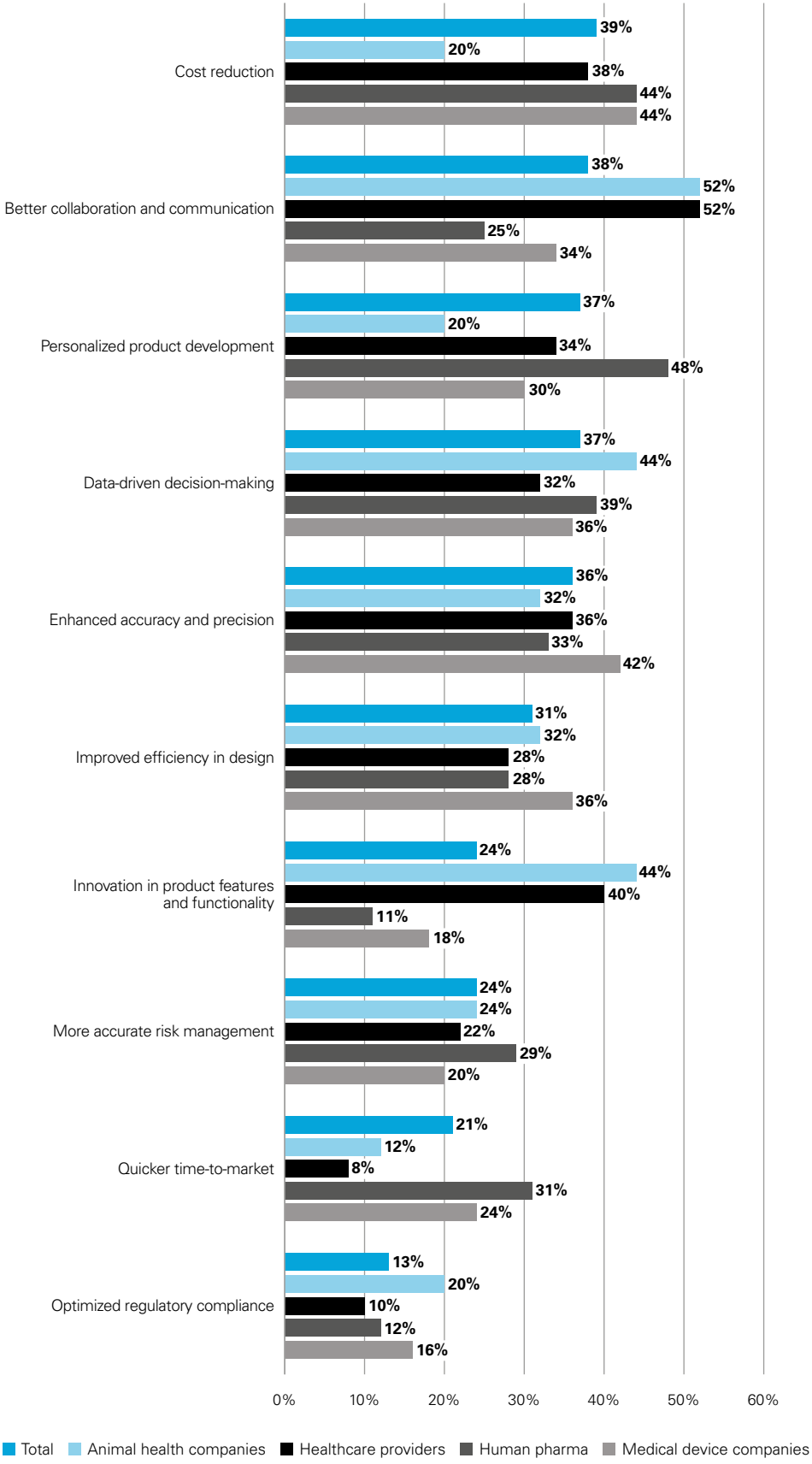
AI is quickly becoming a frontline capability in life sciences product design. Traditional development cycles often suffer from long feedback loops, where flaws or unmet user needs emerge too late. AI tools help teams simulate outcomes, incorporate usage data and refine concepts earlier and more efficiently.

Among all participants, 39 percent cite cost reduction as a top benefit of AI when applied to product design, with better collaboration and communication just behind at 38 percent. These goals often combine: Modeling and simulation can eliminate weak candidates early, reduce rework and keep cross-functional teams aligned on requirements, evidence and timelines. Here, cost reduction does not mean cutting corners, but redirecting budgets from dead ends to higher-probability successes.

The emphasis on collaboration is strongest among healthcare providers and animal health companies, where 52 percent of each see it as one of the biggest design benefits. In these settings, "design" often involves service configuration as much as engineering. AI-supported documentation and shared workflow tools help clinical, operations and informatics teams co-create specifications and protocols, translating promising ideas into workable solutions.

"Data-driven decisions can also reduce human errors," says the head of data and AI at a French animal health company. "Teams involved in the design phase can

What are the major potential benefits in the product design phase in the life sciences sector?



avoid redundant procedures by using AI more extensively in their everyday functions."

Increasingly, product teams are also applying AI earlier in the design life cycle, using data and predictive models to simulate patient behavior, flag likely failure points and iterate more effectively across technical and clinical teams.

Human pharma companies are more likely to highlight personalized product development, with 48 percent choosing it as the primary design benefit. That reflects a shift toward pipelines tailored by biomarkers and subpopulation data. AI supports this by helping teams identify biological variability earlier, anticipate delivery and diagnostic needs, and fine-tune product characteristics for the intended patient population.

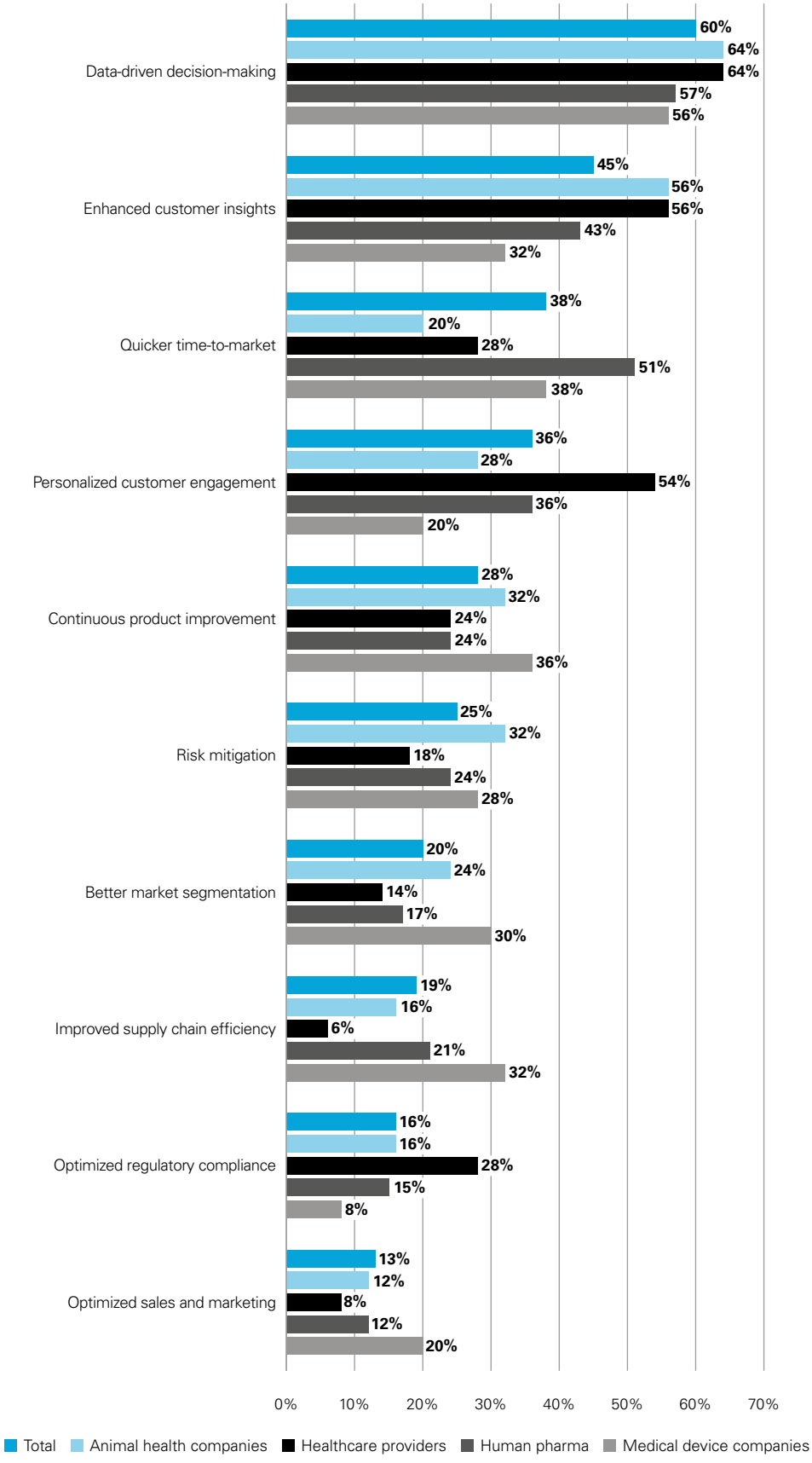
Medical device companies, by contrast, focus on enhanced accuracy and precision, cited by 42 percent. AI is being embedded in computer-aided design and simulation tools to refine sensor placement, signal processing and tolerances. The results are fewer late-stage changes, faster validation and stronger submissions for regulatory approval.

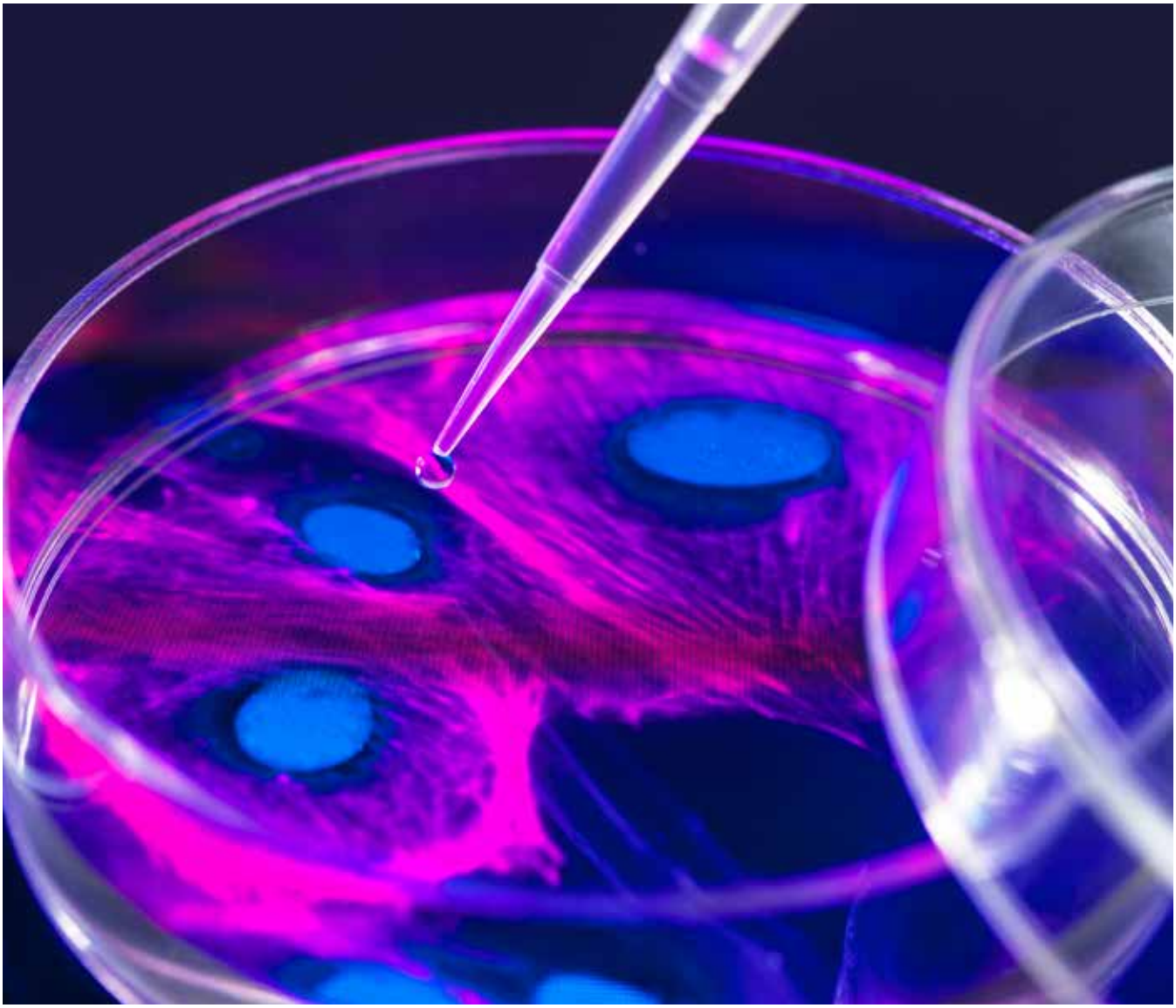
Empowering commercialization

In terms of bringing products to market, companies see the biggest benefits of AI in data-driven decision-making, selected by 60 percent of respondents, followed by enhanced customer insights (45 percent). Rather than sticking to fixed launch plans and assumptions, companies are using AI to adjust in real time, whether that means choosing which markets to enter first, focusing field teams where they'll have the most impact, or shifting marketing strategies as prescribing patterns change. The results are practical: faster time to first prescription; higher conversion from intent to initiation; and fewer patients falling through the cracks between approval and delivery.

The growing focus on customer insight reflects a shift from broad segmentation to more evidence-based targeting. Companies are combining multiple datasets—such as anonymized patient records, insurance claims, pharmacy orders and service call logs—to spot where

What are the major potential benefits of integrating AI into the product commercialization processes?





uptake is most likely, identify friction points that delay treatment starts, and fine-tune messaging to the needs of individual sites or clinicians. When this works well, sales funnels are more effective and supply chains are better matched to actual demand.

However, the most valued benefit depends on the company's role in the life sciences ecosystem. Over half of healthcare, for instance, highlight personalized engagement (54 percent). AI is helping tailor communication to match language and literacy, direct patients to the right services and support adherence based on individual needs. These tools are especially useful in complex care environments involving multiple providers and payers.

Human pharma executives, by contrast, place more weight on accelerating time to market (51 percent). Here, AI is allowing companies to move faster by identifying high-potential markets earlier, selecting trial sites and investigators with more precision and generating launch materials at greater speed. AI can also help time field deployment more effectively, using live data to guide engagement instead of relying on pre-set timelines. The overall effect is a shorter path from approval to adoption.

Companies are combining multiple datasets—such as anonymized patient records, insurance claims, pharmacy orders and service call logs—to spot where uptake is most likely, identify friction points that delay treatment starts, and fine-tune messaging to the needs of individual sites or clinicians.

Patient, commercial and regulatory concerns

KEY FINDINGS

■ Data security and high costs rank highest as the main practical obstacles to greater AI adoption ■ Patient privacy/Data protection and contractual and licensing issues are most commonly viewed as notably pressing legal concerns ■ A clear majority are concerned about potential liability for intellectual property (IP) infringement related to the use of AI systems ■ Fewer than half of all companies frequently discuss AI governance at board level

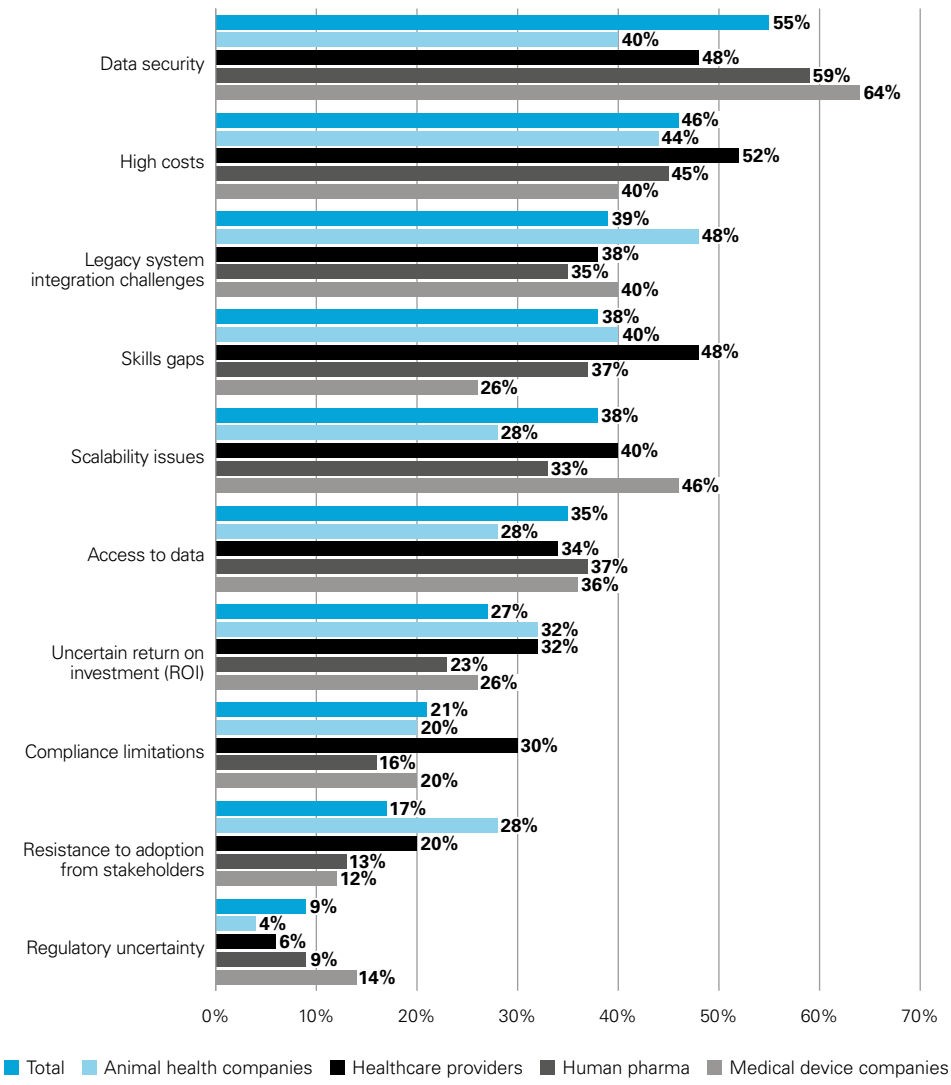
While the implementation of AI is growing apace, obstacles to deeper adoption still remain. These pressure points are consistent across subsectors: protecting sensitive data; integrating tools with legacy systems; clarifying legal and IP risks; and turning governance policies into real-world practices.

Data security tops the list of practical challenges, cited by 55 percent. The concern is clear: AI workflows often touch highly sensitive information—patient records, safety data, manufacturing parameters and commercial strategy. Missteps can trigger regulatory scrutiny, legal liability and reputational damage.

Security issues are made more complex by the way in which AI systems aggregate data from many sources, move it across teams and borders, and sometimes introduce third-party platforms into the mix. As one healthcare provider executive says: "Sensitive information may be exposed to cyber threats. Given the sophisticated cyberattacks that we see today, we do not want to risk broader use of data."

Rather than bolting on security as an afterthought, companies making steady progress tend to limit the volume of sensitive data in the first place. Common strategies include restricting how many systems a model touches, pulling only the fields needed and masking data for experimentation. Encryption in transit and at rest is standard,

What are the practical obstacles to broader use of AI in your company?



but there is growing emphasis on minimizing duplicates and knowing exactly where third-party vendors store or access data.

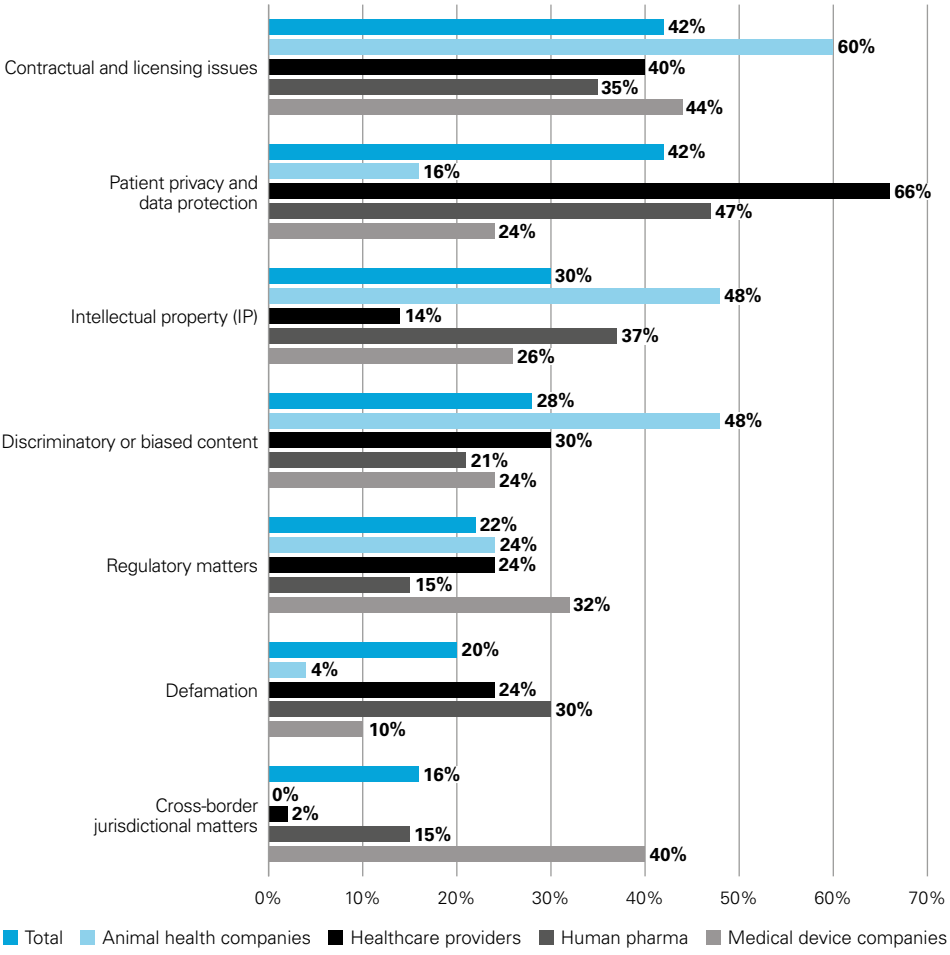
Security concerns sit alongside high costs (46 percent), legacy integration challenges (39 percent), scalability issues (38 percent) and skills gaps (38 percent) as day-to-day hurdles—and they are often intertwined. Older clinical and manufacturing systems were not designed for the volume and cadence of AI workflows, and connecting them safely takes time.

Indeed, there can be issues with integration because many AI tools are incompatible with outdated infrastructure and systems, meaning organizations may have an AI tool on the one hand and current infrastructure on the other, and these cannot be easily bridged.

Moreover, the talent needed to stitch modern data tooling into regulated environments remains in short supply, which can compound integration delays even when funding is available. "We've been struggling with skills gaps for completing AI-related projects," notes the head of technology of an animal health company in India.

Some respondents also cited the difficulty of retaining AI talent in competitive markets, particularly where public-sector salaries or rigid hiring structures make it hard to match industry benchmarks.

What are the key legal risks that relate to the implementation of AI?



Legal and IP concerns

Legal concerns are dominated by two issues: patient privacy and data protection (42 percent) and contractual/licensing risk (42 percent). The breakdown varies by subsector. Healthcare providers, for example, place far more weight on privacy (66 percent) than any other respondent type.

"If we are unable to protect patient data, we risk reputational damage," says the COO of a healthcare provider. "Mitigating the risk of legal claims and settlements is important to avoid any financial pressure on the company."

For pharma companies, this appears to be less of a concern because the use of AI in drug development involves mapping molecules and their mechanisms of action to try and identify targets. This means that there are inherently fewer privacy and individual personal data protection issues for those organizations.

Percentage of respondents who place **patient privacy and data protection** among their top two key legal risks relating to the implementation of AI

Animal health companies are more likely to cite licensing risk (60 percent), which aligns with their broader use of third-party tools and reliance on data from dispersed clinics and farms. Medical device companies, meanwhile, frequently highlight cross-border jurisdictional issues (40 percent) and licensing complexity (44 percent), given the multi-market nature of product development, field connectivity and post-market surveillance.

These concerns are not theoretical. Many valuable AI inputs—chemistry datasets, proprietary models, third-party databases and data sourced from contract research organizations (CROs)—are governed by restrictive contracts. Using them for training or fine-tuning without clear rights can lead to breach-of-contract claims, even when copyright law is less definitive.

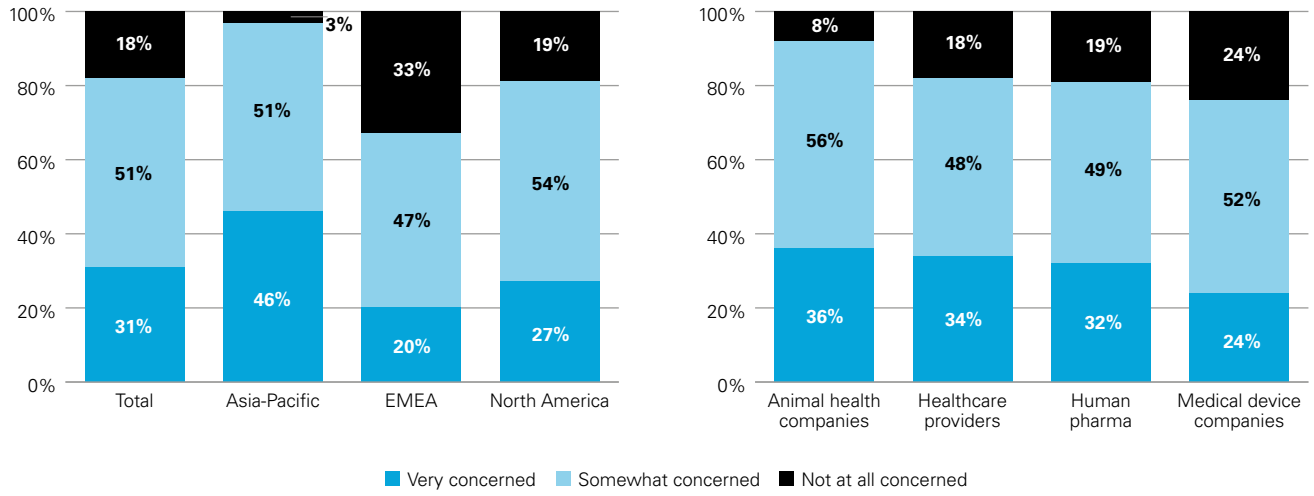
"There could be the risk of using copyright materials for training AI," says the director of innovation of a Taiwanese healthcare provider. "Developers who do not have complete knowledge of these issues may do so unknowingly."

The IP question

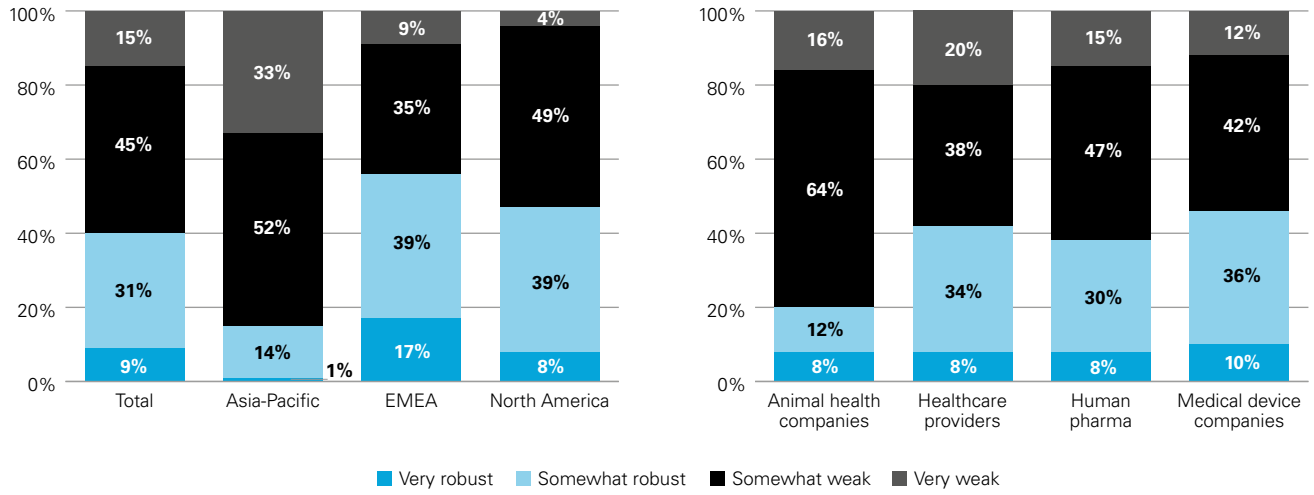
IP protection is also a grey area. While 31 percent of respondents are very concerned about potential IP infringement from using AI, another 51 percent are somewhat concerned. Just 18 percent are not worried. These views are fairly consistent across sectors.

Meanwhile, 60 percent of all respondents judge current protections for AI-assisted outputs to be weak, rising to 80 percent in animal health. In regional terms, in Asia-Pacific, the figure hits 85 percent,

Are you concerned about potential liability for intellectual property (IP) infringement related to the use of AI systems?



In your assessment, how robust are the protections provided by IP laws for products or content generated by AI?



compared with 44 percent in EMEA. Uncertainty over who owns model-influenced designs or content, and whether those outputs meet patentability or authorship thresholds, is a recurring theme.

Enforcement uncertainty compounds the problem. When model-assisted content is shared across jurisdictions, companies face a patchwork of standards governing authorship, database rights and inventorship, each of which can affect whether AI-influenced innovations can be protected or commercialized.

Governance, training and board oversight

Many companies are taking steps to improve oversight. A solid majority (63 percent) now have formal AI training programs in place, rising to 72 percent in human pharma. This trend is likely to accelerate.

Under the EU AI Act, companies that develop, deploy or use high-risk AI systems—including many tools used in clinical decision-making, diagnostics and other medical device software—must ensure that relevant personnel receive appropriate training.

> **When model-assisted content is shared across jurisdictions, companies face a patchwork of standards governing authorship, database rights and inventorship.**

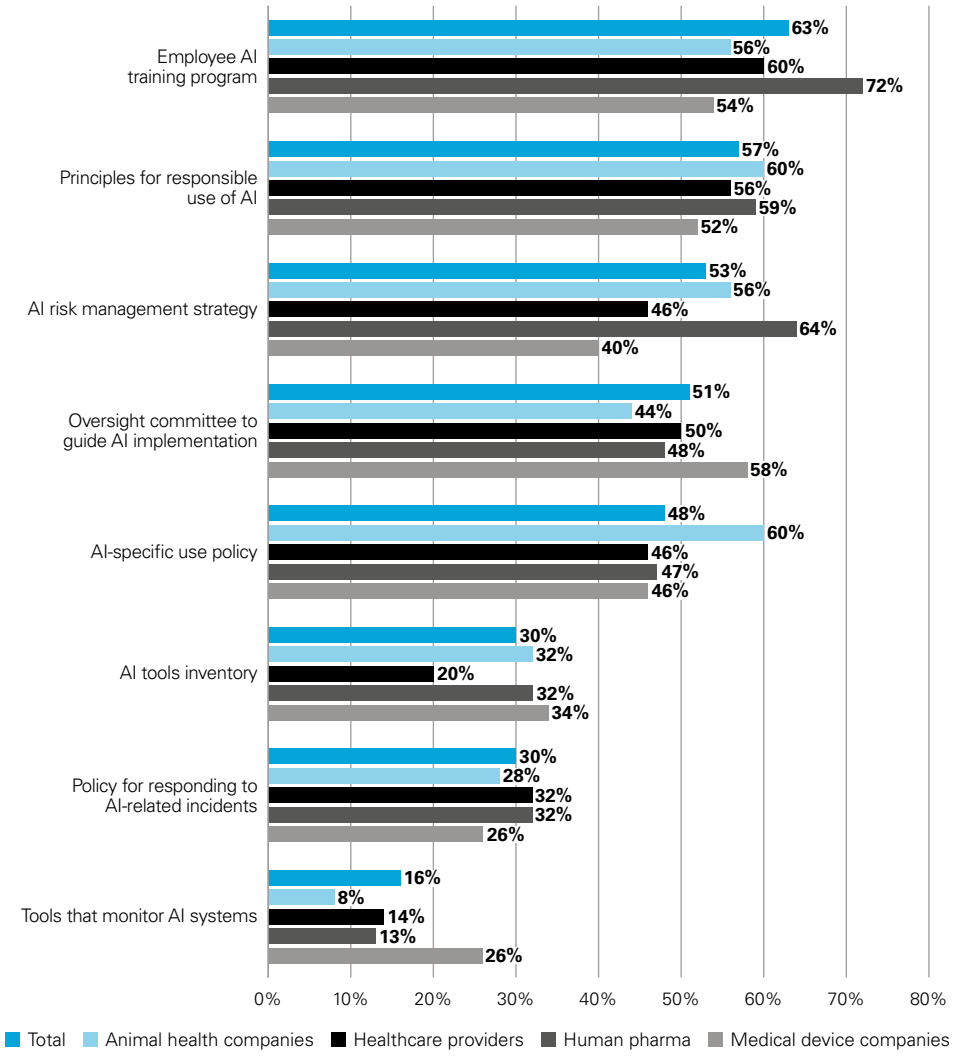
Training must cover how the system works, the intended use, known limitations and how to exercise meaningful human oversight, particularly where patient safety or product quality is at stake. This includes not only technical staff, but also those involved in the use, supervision and governance of AI systems. Under the EU AI Act, these requirements have been in effect since February 2025, meaning companies must act now to ensure compliance, particularly those operating in EU markets or selling high-risk AI systems there.

The goal is to ensure that humans remain meaningfully involved and accountable when relying on complex or opaque systems. In practical terms, this means companies must formalize training programs, keep records of participation and update materials in line with system changes or regulatory updates.

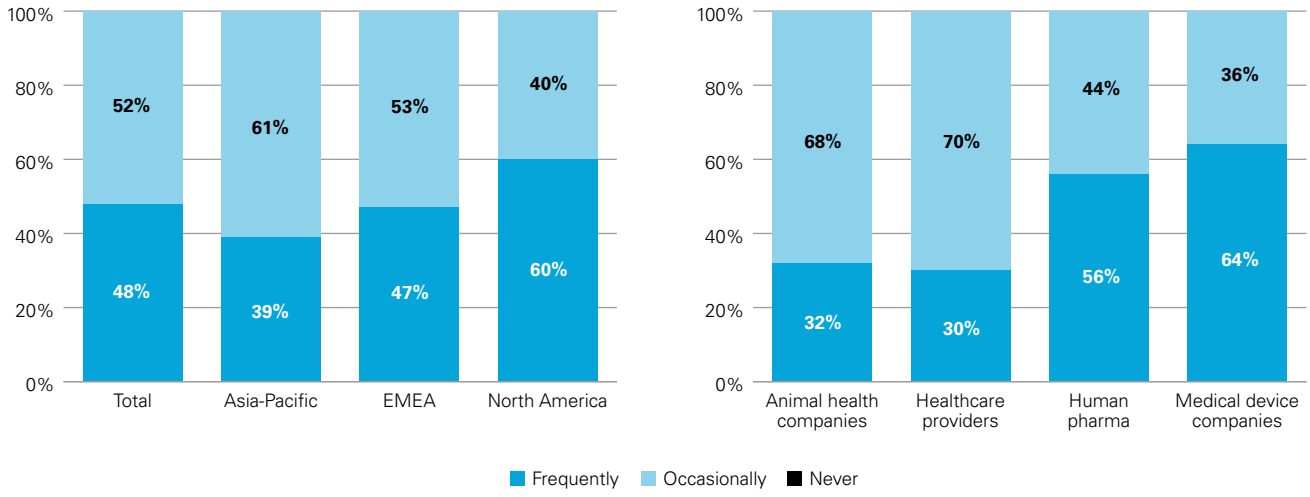
For multinational life sciences organizations, even if headquartered outside the EU, especially those marketing products in the EU, these training requirements are fast becoming non-negotiable. As a result, until a change of the AI Act, documented, role-specific training is shifting from best practice to regulatory obligation.

Human pharma also leads on broader governance. Nearly two-thirds (64 percent) report having an AI risk-management strategy, compared with 40 percent in devices. This reflects pharma's more advanced use

Which of the following do you currently have in place in your company?



Is the governance of AI implementation discussed at board level?



of AI in R&D and safety monitoring. Meanwhile, animal health firms report the highest incidence of AI-specific use policies (60 percent), driven by the fragmented nature of their clinical settings and data sources.

Board-level attention varies. Overall, 48 percent of respondents say AI is frequently discussed at the board level, but the figure rises to 64 percent in medical devices and 56 percent in human pharma. Only 32 percent of animal health companies and 30 percent of healthcare providers report the same. Regionally, North America leads (60 percent), followed by EMEA (47 percent) and Asia-Pacific (39 percent).

A vice president of a life sciences multinational notes: "AI is not a magic wand, so we're careful about piloting and ensuring compliance, especially on privacy and regulatory fronts. Internally, we've got AI tools available across the business, and there are flagship AI projects led by our executive committee focused on simplification and optimization."

Legal uncertainty

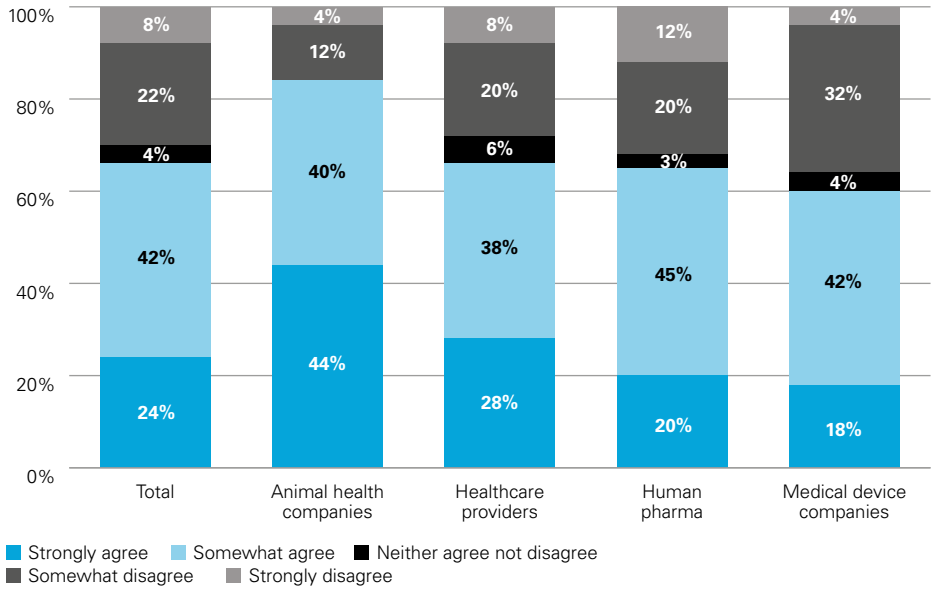
There is also a pervasive sense that legal frameworks are still catching up. Two-thirds of respondents (66 percent) agree that lack of legal certainty is a barrier to adoption. That figure jumps to 84 percent in animal health.

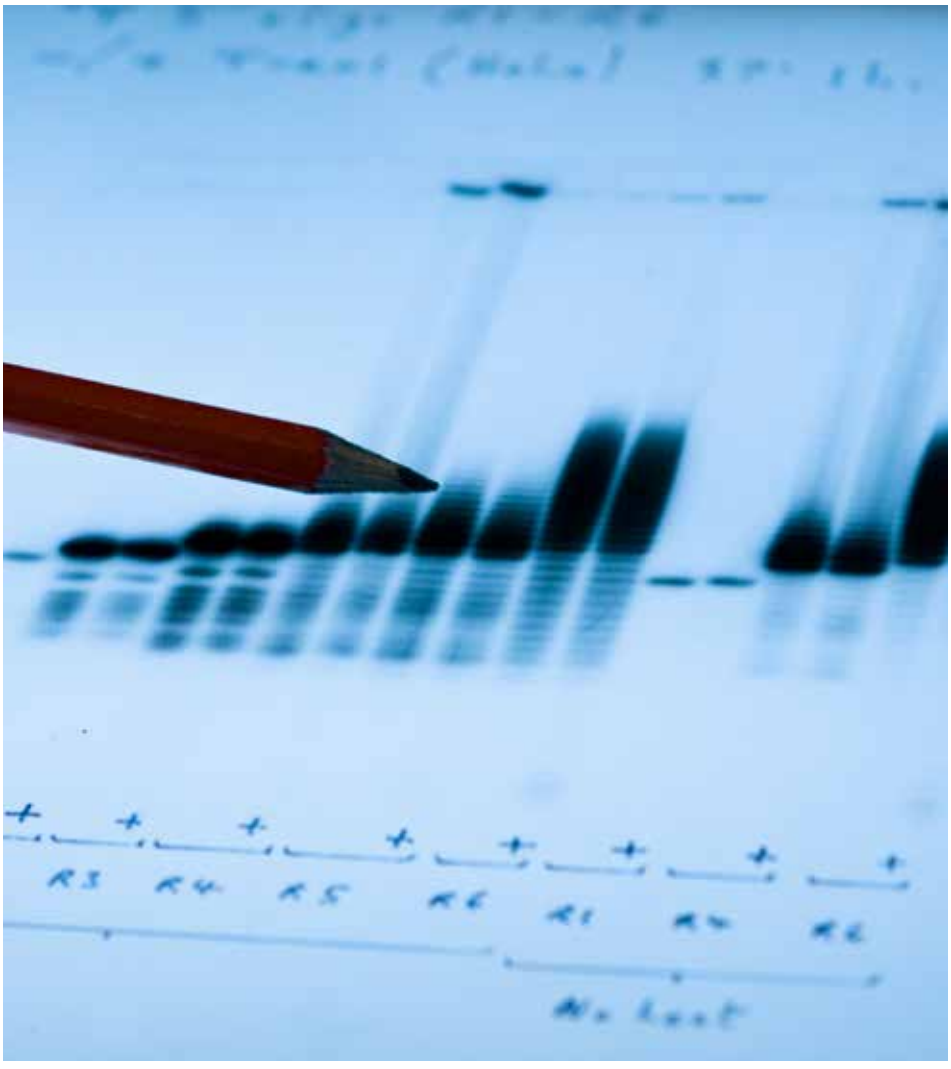
The concerns are not just theoretical. Respondents point to shifting requirements around documentation, life cycle monitoring, data transfers and contracting norms. In clinical settings, uncertainty also surrounds how professional accountability or product liability will work when AI contributes to decisions.

As the CEO of a healthcare provider based in Southeast Asia says: "Since AI is still evolving, and regulators are trying to control the scope of usage, some of the legal challenges remain unknown. Especially when it comes to selected aspects, the laws are changing and it creates uncertainty for us."

Even as regulatory guidance improves, the diversity of stakeholders and jurisdictions involved means AI governance will remain complex. For now, companies must build processes that are flexible, transparent and grounded in clear documentation, even when the rules remain in flux.

To what extent do you agree or disagree with the following statement: "Lack of legal certainty is a barrier to the use of AI in my company"





How companies are investing in AI

KEY FINDINGS

■ A clear majority of organizations intend to increase their budgets for AI in the next 24 months ■ Joint ventures/Strategic partnerships are the most popular method for growing AI capabilities ■ Most organizations expect their biggest spend on acquiring AI capabilities to be within their own regions rather than cross-border

Across the life sciences sector, funding is being tied more closely to operational goals. Risk and legal teams are setting boundaries around data use, model oversight and accountability, while finance teams are unlocking budgets where ROI can be clearly demonstrated. Against this backdrop, investment intentions are rising. Partnership models are the preferred route to scale, and most organizations plan to source capabilities close to home.

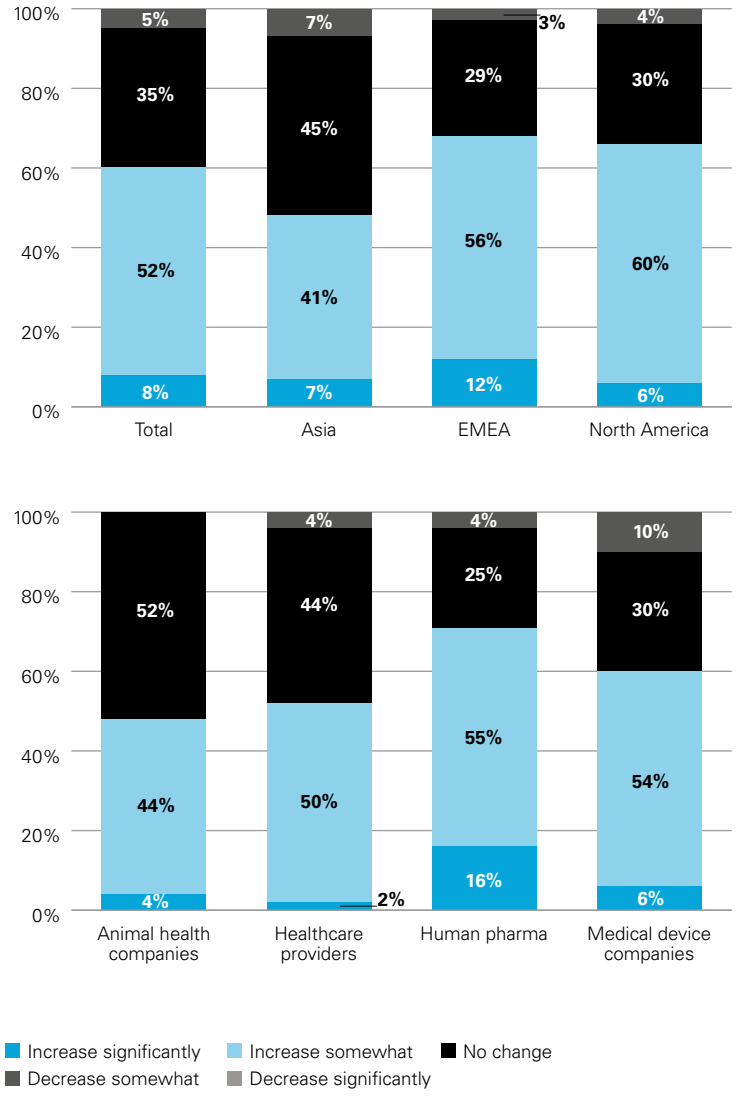
Most expect to spend more on AI in the next two years: 60 percent anticipate larger budgets within 24 months, rising to 71 percent in human pharma. This shift reflects a grounded approach. Teams are increasingly framing AI projects in terms of measurable outputs: fewer redesign cycles in development; improved enrollment forecasts in trial; earlier trend detection in safety; and greater predictability at launch. As a result, funding is moving from discretionary pilots to line items embedded in R&D, quality, supply chain and commercial plans.

"In order to make AI systems flexible and more fit-for-purpose, the spend has to be increased," says the CFO of a US healthcare provider. "However, we are still unsure about the value that can be derived from AI functions and how long it will take to see promised returns."

Research from the Boston Consulting Group indicates that returns are strongest when companies concentrate their resources. Across sectors,

Percentage of respondents who expect to increase their company's **allocated budget for AI** over the next 24 months

How will your company's allocated budget for AI change over the next 24 months?



organizations that focus on a small number of high-impact use cases (about 3.5 on average) report about 2.1× higher ROI than peers pursuing a broader range (6.1 use cases). The implication for life sciences is clear: Higher AI budgets are more likely to deliver value where scope is focused, data access is pre-cleared and outcomes are tracked against well-defined business goals.

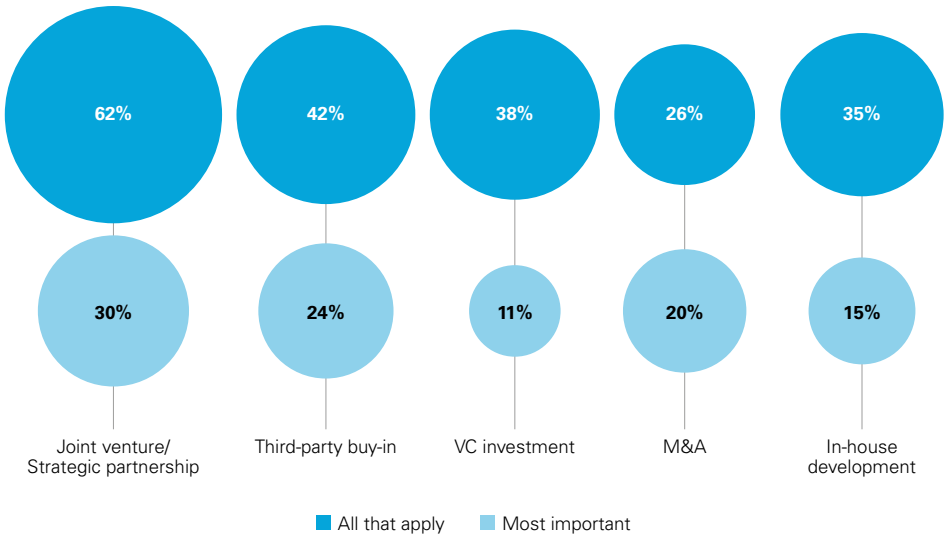
Growth strategies

Joint ventures and strategic partnerships top the list of planned expansion models. Some 62 percent of respondents plan to use partnerships in the next two years, and 30 percent cite this as their most important investment route. The logic is pragmatic: Partnerships offer faster access to trained models, specialized tooling and scarce AI talent—while allowing both parties to evaluate technical compatibility, data interoperability and governance fit before making further long-term commitments.

A vice president of a life sciences multinational explains the importance of partnerships over outright acquisitions, saying: "We've always been agnostic about where innovation comes from, whether internally or externally. That said, there's a definite trend toward more collaborations and licensing in the life sciences sector, especially to derisk. Acquisitions are costly and complex—you have to integrate systems and people, which isn't always straightforward. Licensing or partnerships allow us to set milestones and assess progress along the way. In some cases, that also includes an option to acquire later."

In September 2025, Eli Lilly launched TuneLab, opening up its AI/ML discovery models, trained on more than US$1 billion worth of internal R&D data, to external biotechs, with initial partners including AI-enabled drug discovery and development company insitro. In parallel in the fall of 2025, Lilly announced collaborations aimed at advancing AI-assisted drug discovery, including a collaboration with insitro to build novel ML models to advance small-molecule discovery, a collaboration with Insilico Medicines to generate and design candidate compounds using Insilico's pharma AI platform, and a collaboration with NVIDIA to build an AI supercomputer

How do you intend to grow AI capabilities in the next 24 months?



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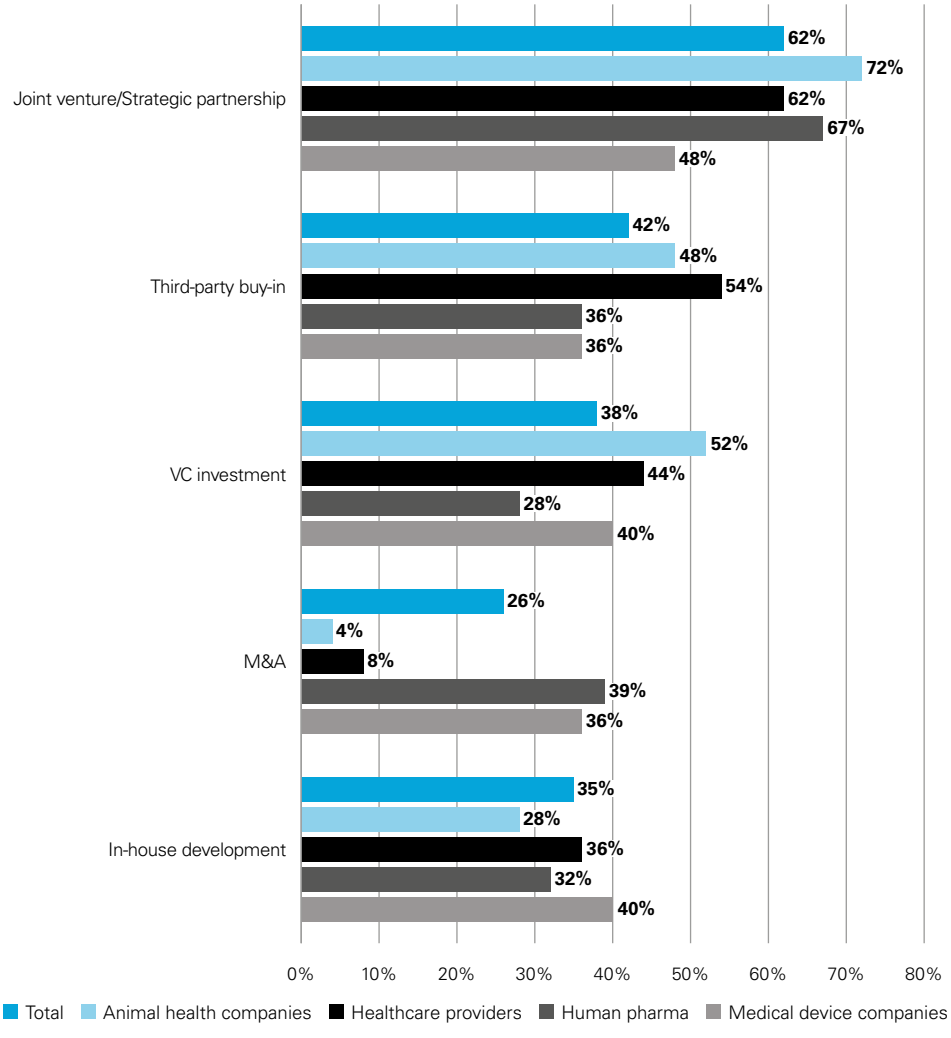


to expand the scope of designing and testing potential compounds across multiple therapeutic indications.

Such alliances are an increasingly common sight. The same month, Novartis and Monte Rosa Therapeutics struck a licensing deal worth up to US$5.7 billion in immune-mediated diseases.

Monte Rosa's AI-enabled QuEEN platform will be used to develop selective protein degraders, while Novartis leads clinical development and commercialization—clear evidence that AI-powered design is already reshaping early-stage drug development. This type of partnership model allows companies to combine their expertise and resources. A joint venture between a pharma or healthcare company and an AI company can often deliver stronger and faster results by combining the expertise of both parties.

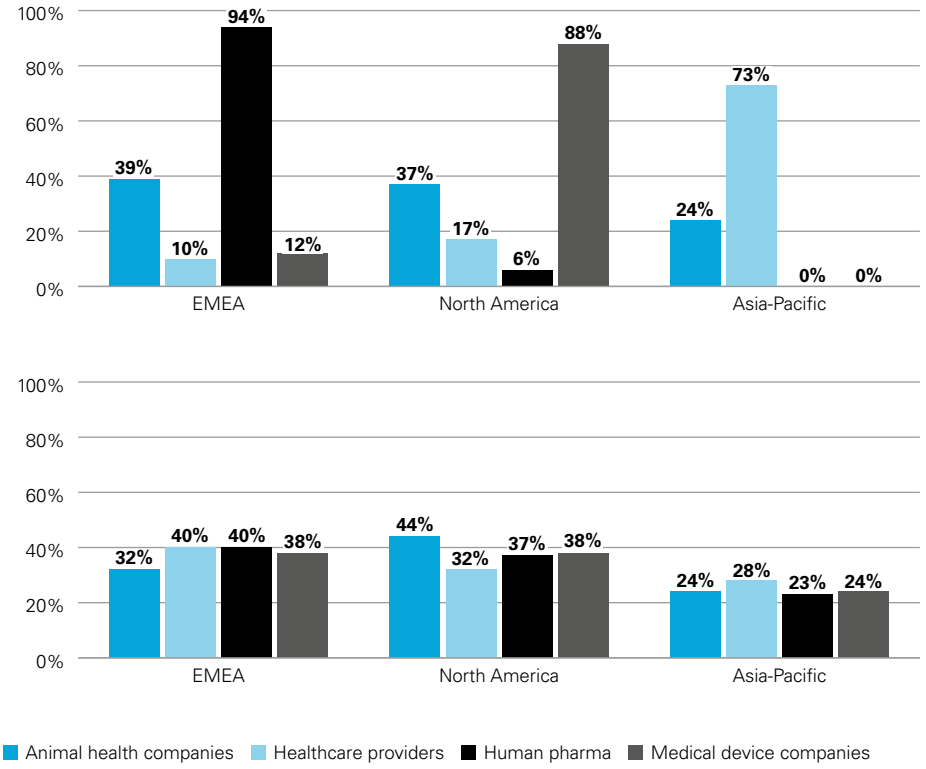
Life sciences companies working in association with a third party can lead to out-of-the-box thinking, which may be stifled when building internally. On the other hand, tech-native companies that also operate in healthcare often prefer to build in-house rather than partner, because they already have strong data-science capabilities and can rely on those internally.

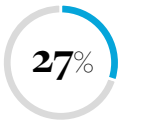
M&A remains on the table, where full control over platforms, datasets or people is essential. Among human pharma companies, 39 percent expect to pursue acquisitions to deepen their AI capability. These cases typically involve deep integration into R&D or quality systems, where proprietary models must be validated, improved and governed in-house over time. Due diligence focuses on data rights, open-source usage, code provenance, cyber risk posture, and whether operations can be reliably scaled and validated post-acquisition.

Elsewhere, third-party buy-ins and venture capital investments are more common. In animal health and healthcare providers, 48 percent and 54 percent, respectively, plan to pursue buy-ins, while 52 percent and 44 percent are looking at VC investments. Buy-ins suit use cases where a plug-and-play tool can be dropped into existing workflows with limited modification.

Venture investments, on the other hand, offer exposure to emerging tools and partnerships without immediate operational commitments. These are often structured with commercial options or first-look rights to deepen engagement if performance meets expectations.

Which region is likely to see the biggest spend by your company on acquiring AI capabilities in the next 24 months?





Percentage of Asia-Pacific–based respondents who expect their **primary AI investment** to go to either North America or EMEA

Regional investment

Most organizations expect the bulk of their AI investment over the next two years to remain regional. Local sourcing minimizes complications around data transfer, employment law and compliance—and is often better aligned with language, regulatory expectations and time zones.

That said, some firms are looking further afield. Asia-Pacific–based respondents are the most internationally focused: 27 percent expect their primary AI investment to go to North America or EMEA. This contrasts sharply with EMEA-based respondents, only six percent of whom expect their biggest AI investment to go outside the region, and only into North America. These findings reflect the gravitational pull of US-based AI vendors, startups and service providers, which are widely viewed as market leaders.

The US, in particular, is a natural target. Private investment in AI reached an estimated US$109 billion in 2024, by far the highest globally, while North America accounts for 49.3 percent of the global AI-in-healthcare market. The vendor ecosystem spans foundational model providers, life sciences-specific platforms, data engineering specialists and sector-aligned consulting firms.

Regulatory enablers are also stronger than in many other jurisdictions. The FDA maintains a public list of AI/ML-enabled medical devices and has authorized more than 1,200 to-date, 235 of them in 2024 alone, the most ever in a single year. The agency has also published frameworks around algorithm change control and Good Machine Learning Practice (GMLP), helping reduce ambiguity around compliance and review standards. This makes the US especially attractive for device makers and digital health companies seeking a clearer pathway to regulatory approval.

Conclusion: A healthy future for AI in the life sciences arena

KEY FINDINGS

■ A clear majority believe the impact of AI on life sciences in the next 24 months will be transformational ■ Diagnostic accuracy is collectively viewed as the most reliable metric for judging the success of AI ■ Nearly all respondents agree that life sciences companies will become significantly less attractive to investors unless they effectively adopt AI tools in the next 24 months ■ Almost all respondents believe AI will improve patient outcomes in the next 24 months

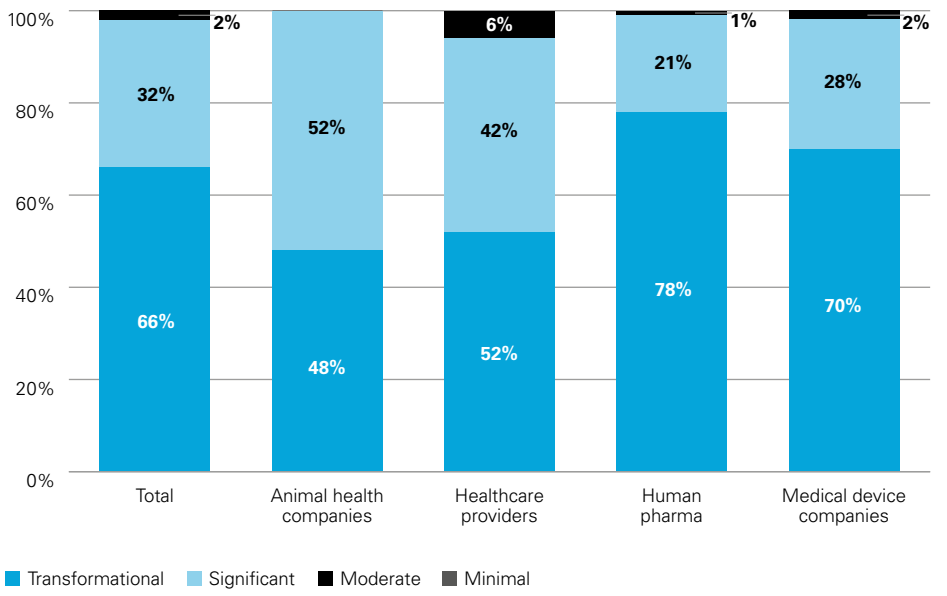
Embracing AI is a strategic imperative for companies across the life sciences value chain, with the technology now a prerequisite for innovation, efficiency and future-readiness. The overwhelming consensus from our survey respondents highlights the imminence of this change. Two thirds (66 percent) say AI's impact on life sciences in the next 24 months will be transformational.

This sentiment is strongest in human pharma (78 percent) and medical devices (70 percent), where AI is already being deployed for complex tasks such as drug discovery and diagnostic analysis. The share is lower, though still material, among healthcare providers (52 percent) and animal health companies (48 percent), reflecting tighter budgets, more fragmented data and heavier reliance on third-party tools.

"The impact will be huge. Companies that do not use AI frequently in their activities will fall behind the rest and the level of innovation will suffer," says the head of technology of a pharma company in Ireland.

This transformation cannot be achieved without first defining what success looks like. This ensures that budgets are aligned with outcomes, enabling further funding when positive results are delivered. Companies must set clear, measurable objectives so they understand exactly what they seek to achieve and whether those milestones are being

How would you describe the expected impact of AI on the life sciences sector in the next 24 months?



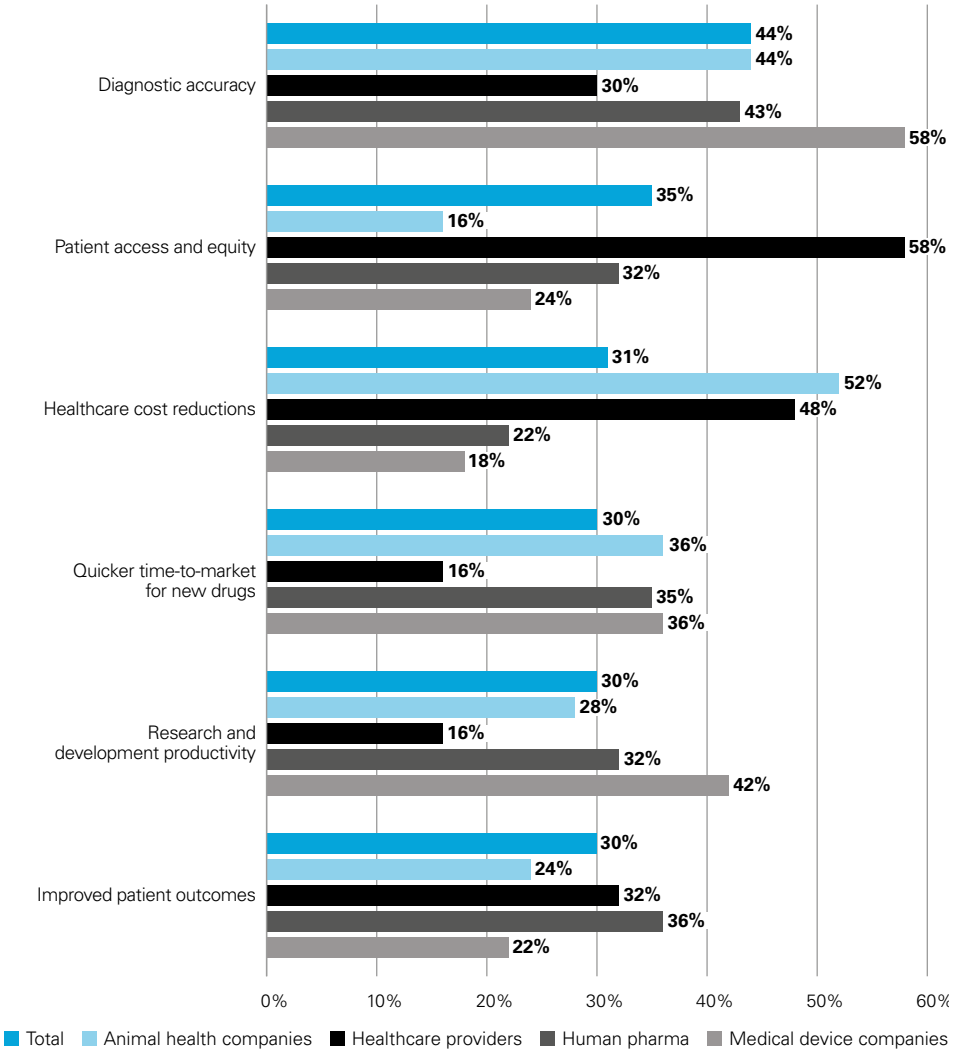
The overwhelming consensus from our survey respondents highlights the imminence of this change. Two thirds (66 percent) say AI's impact on life sciences in the next 24 months will be transformational.

met. AstraZeneca has publicly detailed internal tools, such as its Development Assistant, which allows clinical operations teams to query structured and unstructured data using natural language, backed by generative agents and retrieval-augmented generation. It was first launched as a proof of concept in mid-2024 and built into a production-ready MVP within six months, improving patient recruitment, site selection and clinical trial design.

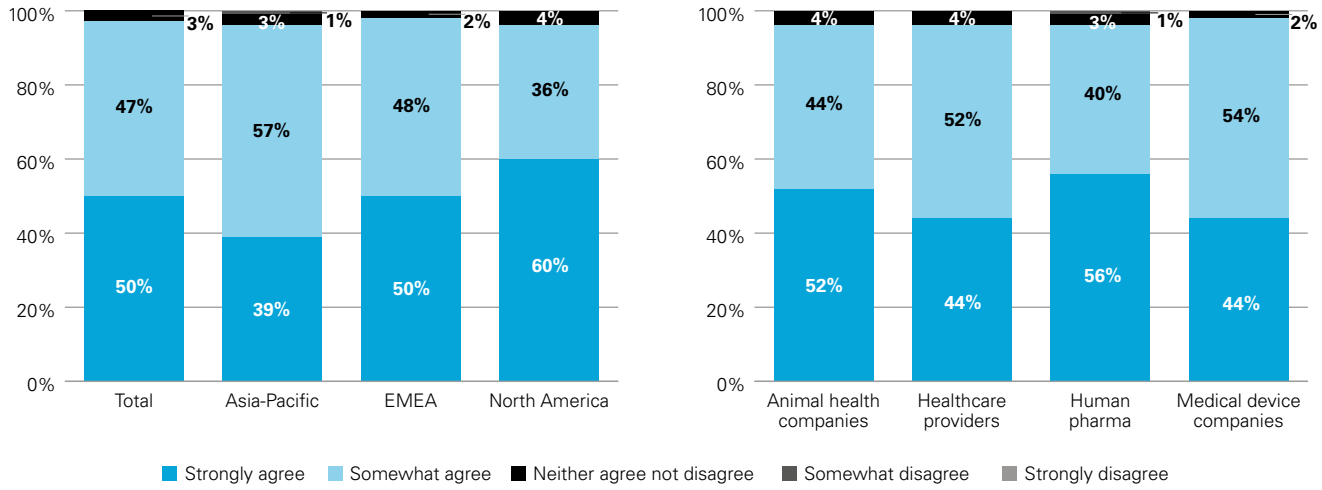
Metrics for success differ depending on each subsector's priorities. Diagnostic accuracy (44 percent) leads overall, rising to 58 percent for medical device companies. Meanwhile, healthcare providers, who are more directly concerned with patient-facing services, prioritize metrics related to patient access and health equity (58 percent). For animal health companies, the primary focus is on healthcare cost reductions (52 percent).

Access to capital has always been a competitive differentiator in life sciences, but with margins under pressure, R&D pipelines growing more complex and regulatory expectations intensifying, investors are becoming more selective. Increasingly, effective AI adoption is seen as a proxy for agility, data maturity and long-term value creation. Respondents are unanimous on this point: 97 percent agree that companies will be less attractive to investors unless

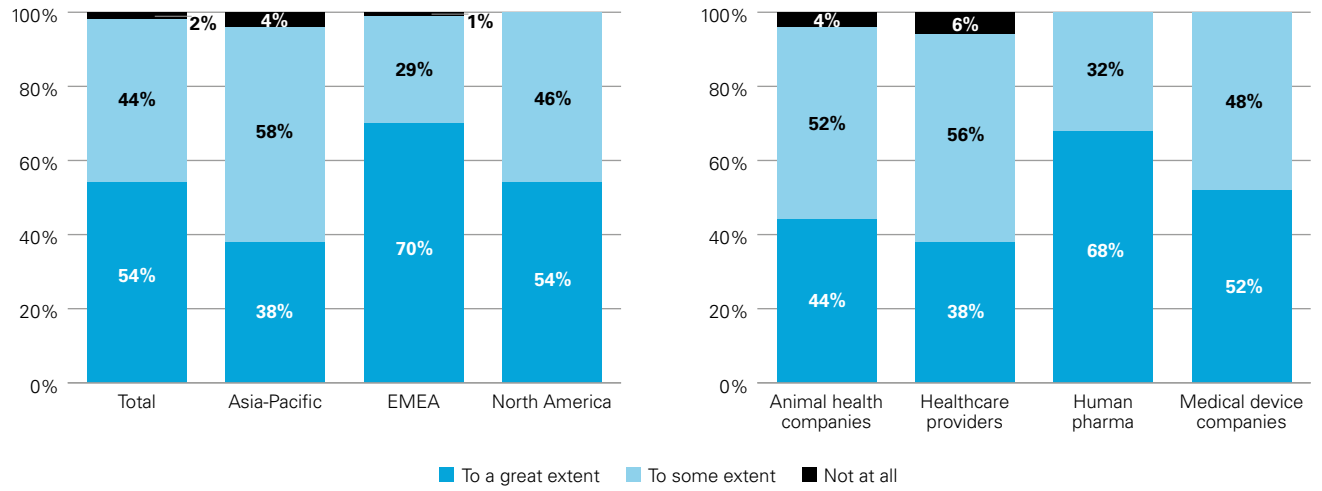
What are the most reliable metrics for judging the success of AI use in the life sciences sector?



Do you agree or disagree with the following statement: "Life sciences companies that do not effectively adopt AI tools in the next 24 months will become significantly less attractive to investors"?



Do you expect your company's use of AI to improve patient outcomes in the next 24 months?



they adopt AI effectively within the next 24 months. This includes 60 percent of North America-based and 50 percent of EMEA-based respondents who strongly agree. Asia-Pacific-based executives are more measured, with 57 percent somewhat agreeing.

While much of the focus on AI has centered on operational efficiency and commercial upside, its ultimate test will be its impact on care. Across the sector, the belief that the technology can improve patient outcomes is nearly universal—reflecting growing confidence in AI's ability to sharpen diagnoses, tailor interventions and support more consistent, equitable delivery.

Nearly every respondent (98 percent) expects AI to improve patient outcomes to at least some extent, and in many cases, the expectations are high. Seven out of ten life sciences companies based in EMEA anticipate a great improvement over the next two years, a bullish view that reflects the region's regulatory momentum around digital health and concrete progress in imaging, diagnostics and care coordination.

Human pharma firms also stand out for their optimism, with 68 percent expecting a significant step forward in outcomes by 2027, with the remainder still anticipating at least moderate gains. Much of this confidence rests on AI's growing role in uncovering novel treatment pathways, including by improving how candidates are modeled and prioritized.

Five key takeaways

With the learnings of this report in mind, five priorities emerge for companies aiming to translate their AI ambitions into concrete, lasting advantage:

1

Define success before scale

The organizations that adapt most strongly to the AI revolution will be those that decide early what success really means. Whether that is diagnostic accuracy, access/equity, cost reduction or speed of trial activation, measurable targets need to be set up-front. That clarity helps in allocating resources, selecting projects and comparing outcomes, making pilots more likely to scale and investments less likely to be wasted.

2

Prioritize high-impact data-ready use cases

The biggest gains will come from areas where data is cleaner, workflows are less burdened and feedback loops are tight. To achieve results, AI should not be deployed across functions for multiple purposes. Organizations need to choose use cases where underlying data readiness, regulatory alignment and measurable outcomes are favorable. ROI is consistently higher when AI is used selectively for well-scoped high-value problems rather than spread thin across the enterprise.

3

Build governance and legal clarity as enablers, not blockers

Across practical obstacles and legal concerns, three issues arise repeatedly: data security, IP/licensing and legal uncertainty. While these are undoubtedly challenges, they can also unlock investment when properly addressed. Companies that already have AI training, documented data provenance and oversight are more likely to meet investor and regulator expectations and are thus more likely to successfully scale. Embedding governance early avoids slowdowns later.

4

Investor optics matter

Failure to adopt AI effectively will damage attractiveness to investors. That means life sciences companies must treat good AI strategy, clean metrics and credible execution as signals to capital providers. High-quality AI execution can influence valuations, ease of access to venture or equity financing and the terms of partnerships. For companies in need of capital, the difference can be meaningful.

5

Patient outcomes will define reputational and regulatory success

Operational gains are necessary and will attract interest. However, the ultimate litmus test will be whether patients benefit from improved diagnostics, more precise and effective interventions, and better access to treatment. For regulators and payers, the priority is whether a drug, device or service is safer, fairer or more effective. Companies that build their AI with patient outcome metrics at the core will be better positioned both ethically and commercially.

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