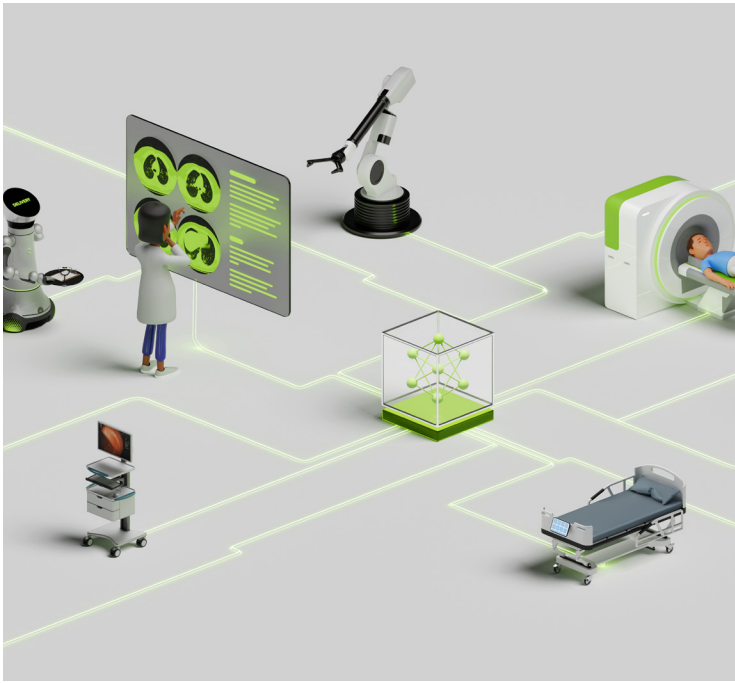
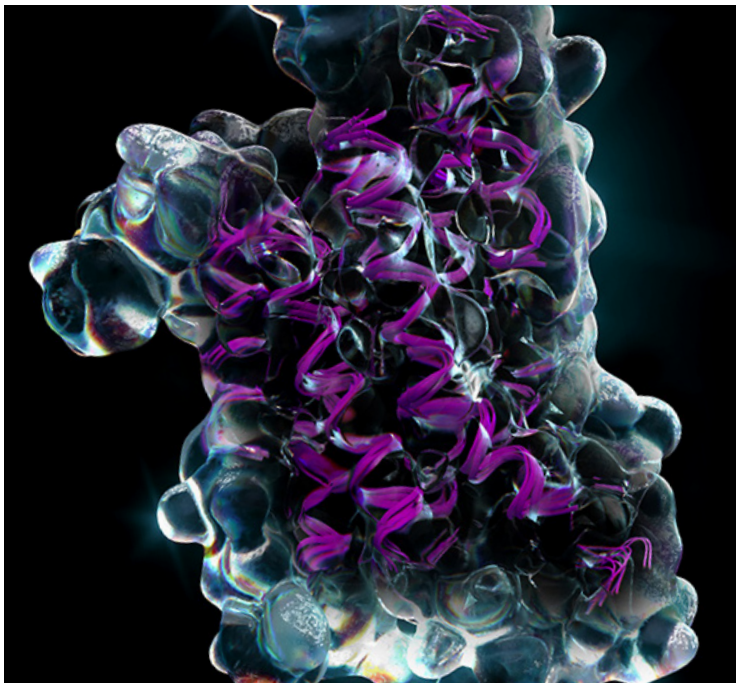
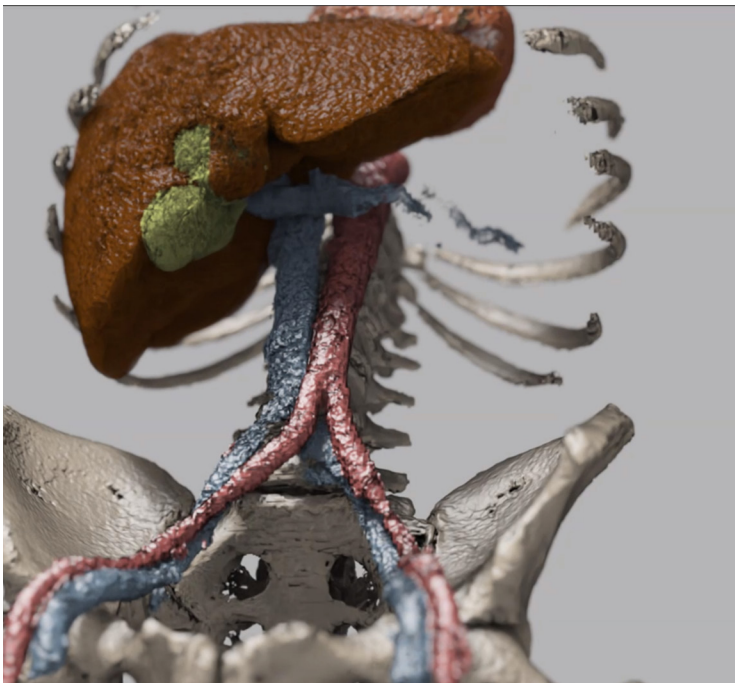
Survey Report

# State of AI in Healthcare and Life Sciences: 2025 Trends





## AI in Healthcare and Life Sciences: Strategic Insights for Industry Leaders

Healthcare, medicine, and the life sciences have a long and proud tradition of being at the forefront of science, discovery, and technological innovation. Many of the greatest achievements in human history have been from doctors and researchers pushing the limits of their tools and pushing through boundaries to create solutions that help people live longer, healthier lives. The inaugural *NVIDIA State of AI in Healthcare and Life Sciences* report was designed to explore how the healthcare industry is utilizing artificial intelligence, one of the most transformative technologies of our time.

The survey found that the healthcare industry is ahead of the curve when it comes to adoption and implementation of AI. Two-thirds of survey respondents are actively deploying AI solutions, and the breadth of use cases that they're using reflects the varied needs of the massive industry. From the use of foundational models to help discover new drug candidates, to applying generative and agentic AI to ease the administrative burden on hospital staff, to using visual AI and analysis in medical imaging to aid quicker, more accurate diagnoses, AI is having a profound impact on the healthcare industry. Because of this, more resources are being dedicated to the capabilities and applications of this technology.

> Two-thirds of respondents are already deploying AI to meet diverse needs.

> AI is having a profound impact on the industry—inspiring more investment and adoption.

## Perspectives From the Field

The survey was conducted from December 2024 to January 2025 and included more than 600 industry professionals across various segments of healthcare and life sciences. The segments include:

- **Medical technology, tools, and diagnostics,** including medical devices, imaging, and surgical robotics
- **Digital healthcare,** including telemedicine, telehealth, and health informatics companies
- **Pharmaceutical, biotech, and techbio,** including bioinformatics, clinical research, and genomics companies
- **Payers and providers**, including health insurance, clinical services, home healthcare, and hospitals

Respondents of the survey represent roles across the healthcare industry, including senior executives and management, along with individual contributors such as clinicians, providers, and academic researchers. Forty percent of respondents came from large companies with more than 1,000 employees.

> "In 2025, LLMs are expected to scale further in healthcare as EHR providers incorporate more AI-driven features, ranging from quick data summaries to clinical document generation."
>
> **Artur Olesch**,
> Digital Health Journalist

## Key Insights on AI in Healthcare and Life Sciences

**63%** said they're actively using AI.

AI usage is high for healthcare* compared to other industries, with 63 percent of respondents saying they're actively using AI and another 31 percent assessing or piloting AI projects.

*Usage benchmark of other industries measured at 50%.

**81%** said AI has helped increase revenue.

Respondents are seeing a present-day impact on their business operations. AI has helped 81 percent of respondents increase revenue, with 45 percent realizing these benefits in less than a year after implementation.

**68%** believe their company's AI investments are not enough.

Only a third of respondents think their company is investing enough in AI to take advantage of the growing number of use cases.

**37%** are investing in six or more use cases.

Of respondents from large organizations, 37 percent are investing in six or more use cases. Small and medium-sized companies are investing in three to five use cases, with smaller budgets limiting them from pursuing more.

**66%** of pharmaceutical and techbio organizations are investing in generative AI.

They're turning to generative AI applications to accelerate research and development with a focus on therapeutic discovery and design. For over half of respondents from other healthcare and life science fields, top use cases are in AI agents and applications for generating clinical notes.

## Healthcare and Life Sciences Shows Robust AI Adoption

### AI adoption in healthcare and life sciences is robust, but different industry subsegments prioritize different use cases of AI solutions.

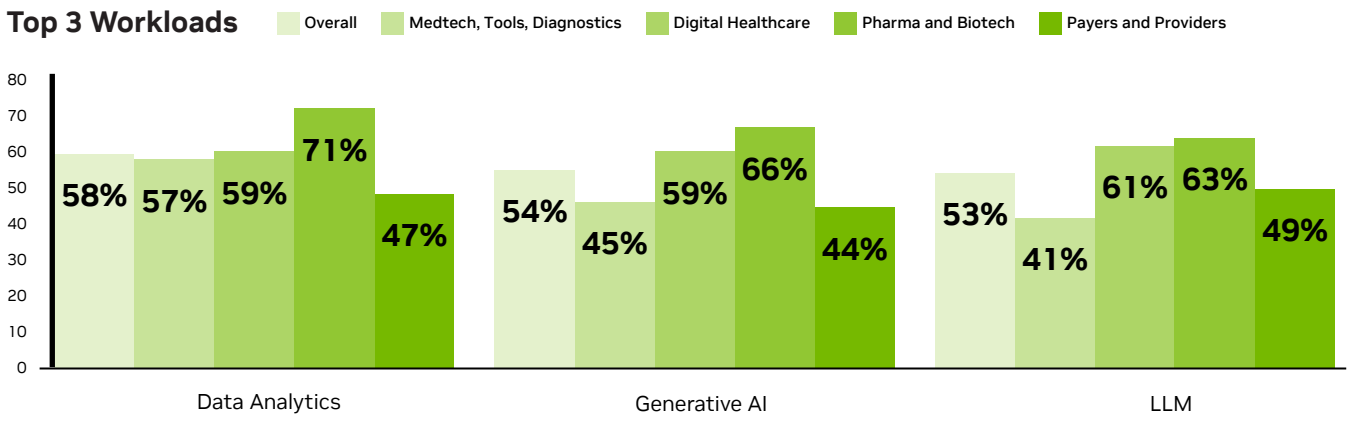
Healthcare and life sciences has experienced significant adoption of AI, with 63 percent of all respondents in the survey stating that they're actively using AI. Another 31 percent said that they're assessing or piloting AI projects.

Furthermore, certain segments of the industry have significant experience implementing AI solutions, with 45 percent of respondents from medical technologies companies and 42 percent of respondents from pharmaceutical and biotech companies saying that they have actively been using AI for more than two years.

The top three AI workloads cited by respondents across these fields are data analytics at 58 percent, generative AI at 54 percent, and large language models (LLMs) at 53 percent. The three top workloads hold true for just about all industry segments, in varying orders. The exceptions are payers and providers, which list conversational AI as its top workload at 54 percent, and medical technologies, which lists data processing among its top three at 55 percent.

> "The applications where I see the biggest impact are going to be within the pharmaceutical industry, by taking years off the time it takes to currently bring a new drug to market."
>
> **Maneesh Juneja**,
> Planetary Health Futurist

See the chart below for each industry's investment in the most popular workloads.

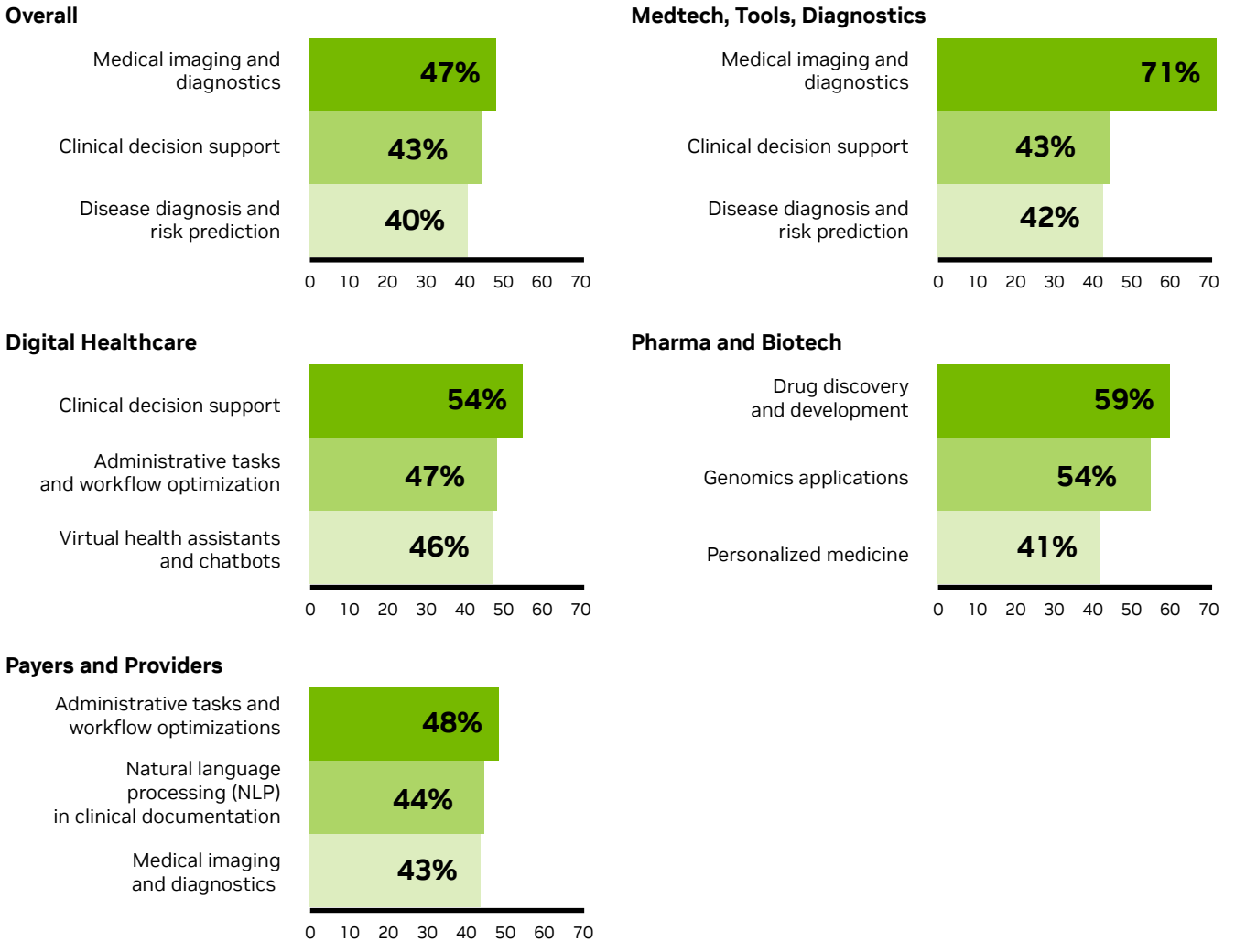



The top use case that the medical technologies segment is investing in today is medical imaging and diagnostics, cited by 71 percent of respondents. The pharmaceutical and biotech segment's top use case is drug discovery and development at 59 percent. Digital healthcare's top use case is clinical decision support at 54 percent. And the payers and providers industry segment's top use case is administrative tasks and workflow optimization, according to 48 percent of respondents. See the chart below for the top use cases for each industry segment.

**71%**

of respondents cited investing in medical imaging and diagnostics.

## Top 3 AI Use Cases



The healthcare and life science industries show the significant breadth and depth of AI's potential across every segment. From back-office administrative support, to using image recognition to analyze medical imagery, to using LLMs for drug discovery, AI has found its way into every aspect of the industry.

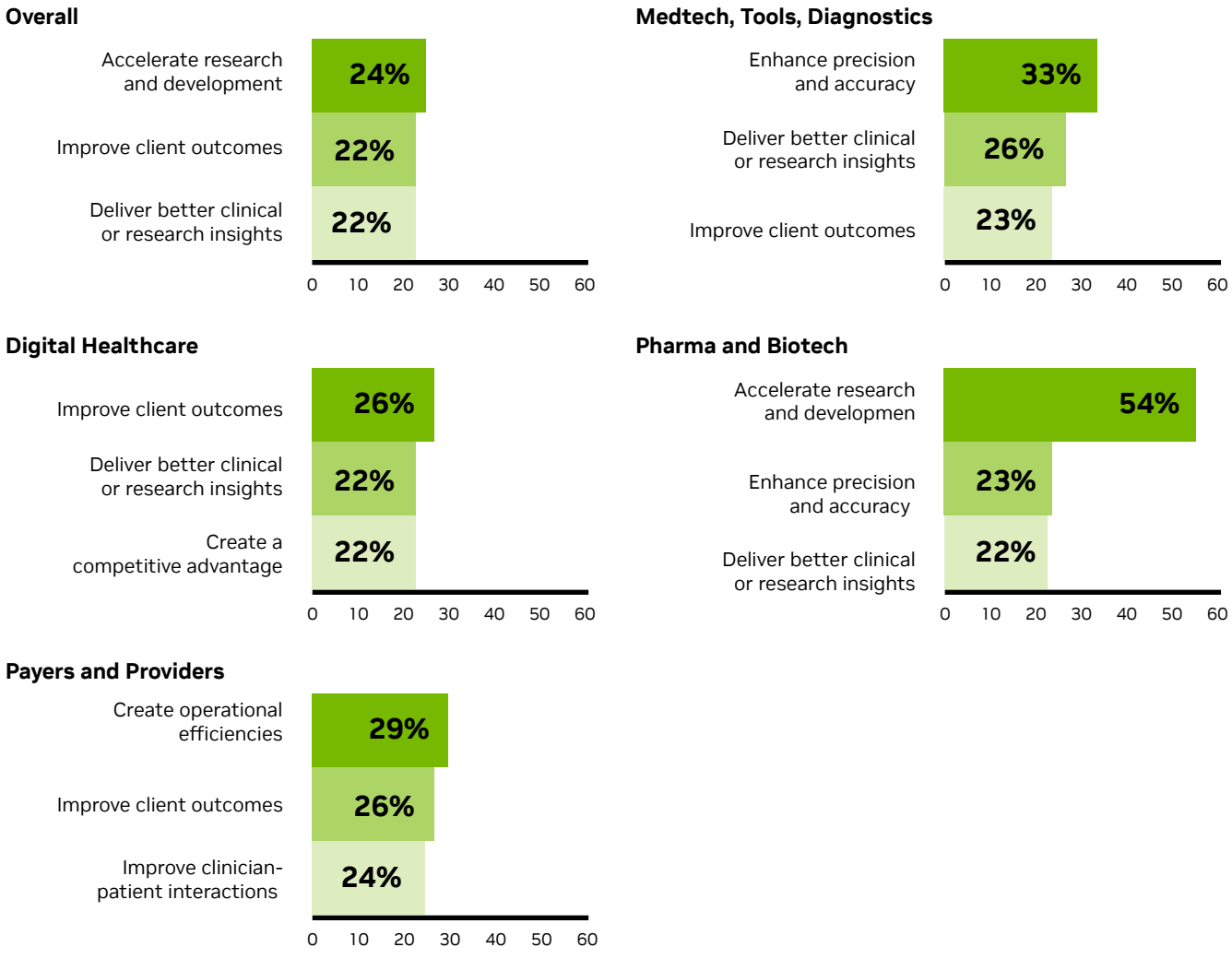
## Goals, Perceptions, and Challenges

### Research and development is the top goal, while data privacy remains a critical focus.

Each industry subsegment within the survey approaches AI integration with different goals in mind. The patient-facing segments tend to have goals that will improve patient care and optimize operational efficiency, while the tool makers and researchers are looking for analysis, precision, and research outcomes.

Among total respondents of the survey, the top goals are to accelerate research and development at 24 percent, improve client outcomes at 22 percent, and deliver better clinical or research insights at 22 percent. And yet, it's no surprise that the top goal of a segment like pharmaceuticals and biotech is to accelerate research and development, cited by 54 percent of respondents in that field.

### Top 3 AI Goals



The top challenges of implementing AI in healthcare and life sciences are data issues, such as privacy and sovereignty, according to 33 percent of respondents, followed by lack of budget and insufficient data sizes for model training, both at 30 percent. An interesting data point in the survey shows that challenges differed depending on the size of the company. Respondents from small and medium-sized companies (defined as those under 1,000 employees) understandably cited lack of budget as the top challenge in implementing AI, while respondents from large companies (above 1,000 employees), which often have a bigger regulatory and governance burden, cited data privacy and sovereignty as the top challenges.

Regardless of company size or industry segment, a large majority of survey respondents—86 percent—agreed with the statement, "AI is important to my organization's future." The industry is also excited for AI's potential to make a great difference in the near future, with 83 percent of overall respondents agreeing that "AI will revolutionize healthcare and life sciences in the next three to five years."

How might that revolution manifest? When asked which areas respondents anticipated the most significant impact of AI in healthcare and life sciences in the next five years, the top responses were advanced medical imaging and diagnostics at 51 percent, virtual healthcare assistants at 34 percent, and precision medicine (treatment tailored to individual patient characteristics) at 29 percent. The overall response was significantly buoyed by the medical technology segment, with 75 percent of respondents in that field stating that advanced imaging and diagnostics would be the most impactful. This signifies a large amount of confidence in the field to innovate with AI to make a difference in their products and technologies.

**When Implementing AI, Company Size Matters**

**<1000** Employees

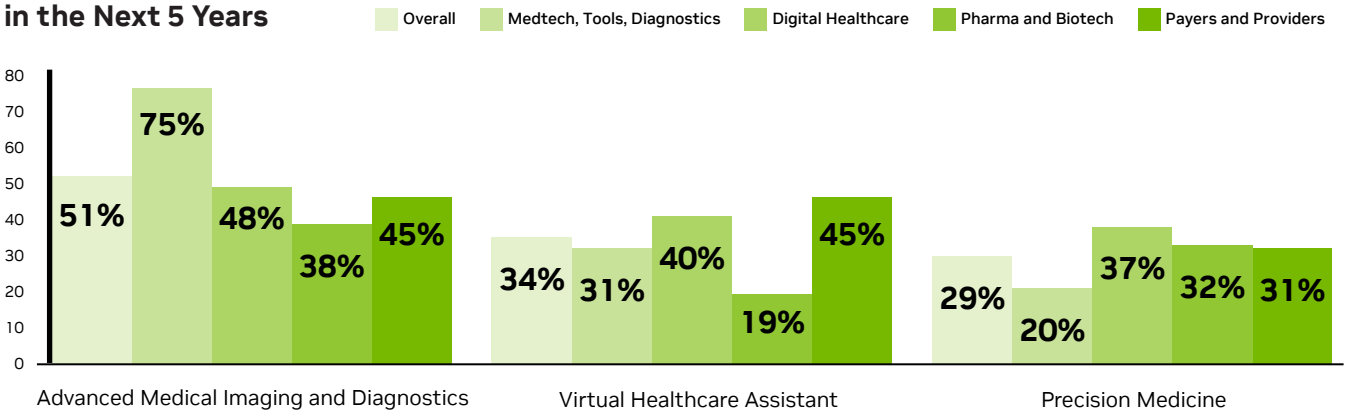
Budget was cited as the top challenge.

**>1000** Employees

Data privacy and sovereignty are the top challenges.

> "By illuminating what was previously unseen, AI empowers clinicians to act with greater precision and confidence, raising the standard of care to unprecedented levels."
>
> **John Nosta**, NostaLab

**Top 3 Impactful Areas in AI in the Next 5 Years**




Given this optimistic outlook, it comes as no surprise that respondents generally believe that their organizations should be spending more on AI solutions. Among all industry segments, only 32 percent agreed with the statement, "My organization invests enough money in AI."

## Generative AI Is Everywhere

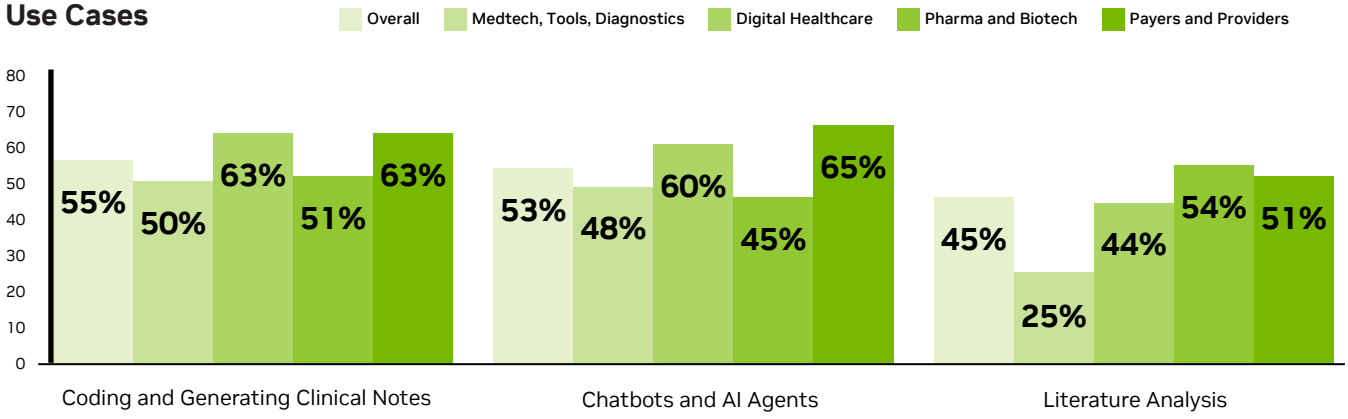
### Digital healthcare is the standout adopter of generative AI solutions.

Generative AI has seen notable adoption across the survey. Generative AI is an application of AI that uses neural networks to identify patterns and structures within existing data to generate new and original content, such as text, images, video, audio, 3D assets, and more. Of respondents who said they are utilizing generative AI workloads, 63 percent said that they're actively using it and 36 percent saying they're assessing generative AI pilots and trials.

Seventy-one percent of respondents in the digital healthcare field are actively using generative AI, leading other industry segments: 69 percent for pharmaceutical and biotech, 60 percent for medical technologies, and 44 percent for payers and providers.

The healthcare and life sciences industries are investing in much of the same generative AI use cases as other industries. Coding and document summarization, specific to clinical notes, was the top use case at 55 percent. Medical chatbots and AI agents were second at 53 percent, and literature analysis was third at 45 percent. The one notable exception to these top three was within the pharmaceutical biotech industry segment, whose respondents stated that drug discovery was the top use case at 62 percent. Medical training and education were also listed among the top three for digital healthcare and medical technology and tools—48 percent and 39 percent, respectively.

**Top 3 Generative AI Use Cases**




For a significant portion of respondents, generative AI has had an almost immediate business impact on their organizations, with 45 percent saying that their organizations are actively using generative AI and have seen a return on investment (ROI) in less than a year. The use cases that those respondents said provided the greatest ROI from generative AI were coding and generating medical notes, followed by medical chatbots and drug discovery.

## Positive Business Impact and Continued Investment

### AI is helping to increase revenue and reduce costs, with early success inspiring increased budgets in 2025.

Forty-one percent of respondents indicated that AI has had a positive impact on the acceleration of research and development. Creating a competitive advantage was second at 36 percent, followed by reduced project cycles, delivering better clinical or research insights, and enhanced precision and accuracy at 35 percent each.

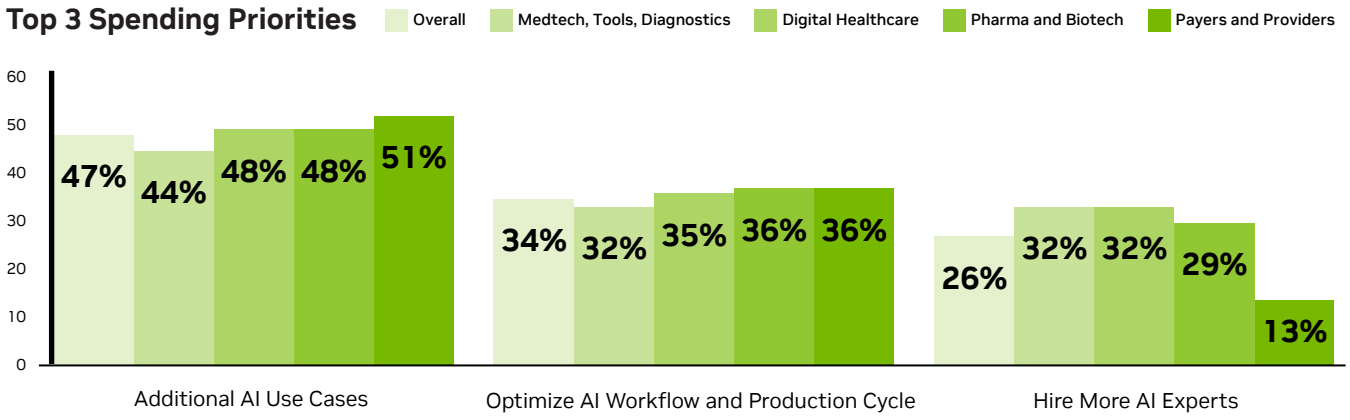
Impact has also been felt on the bottom line. Eighty-one percent of respondents said that AI has helped increase annual revenue. AI has also helped 73 percent of organizations reduce their operational costs.

**81%**

of respondents said that AI has helped increase annual revenue.

Given the positive results across a broad range of AI use cases in the healthcare and life sciences industries, it comes as no surprise that 78 percent of survey respondents said that their budget for AI infrastructure would increase in 2025. More than a third of the respondents noted that their investments in AI will increase by more than 10 percent.

Where will that additional budget be applied? Overall, the top three spending priorities cited by respondents were identifying additional AI use cases at 47 percent, optimizing workflow and production cycles at 34 percent, and hiring more AI experts at 26 percent. Those three investment priorities were the same for all industry segments except payers and providers, who noted that investment would go to engaging third-party partners to accelerate AI adoption and providing AI training to their staff.



## Looking Forward

The healthcare and life science industries represent a massive proving ground for AI, and they're stepping up to the challenge. Few other industries are tackling such widespread use cases for AI—for instance, the diverse applications of generative AI. Generative AI can help with back-office tasks such as summarizing and creating documents, as well as extracting and analyzing data from reports. But generative AI can also be used to find new protein structures and rapidly analyze chemical interactions, leading to great potential in drug discovery. Generative AI can also help interact with patients through chatbots and AI assistants, easing the burden on clinical and administrative staff.

From therapeutic discovery and design to analyzing the human genome, AI is accelerating our understanding of disease and catalyzing new research. AI is starting to revolutionize pathology, the science of finding the cause and effect of diseases, specifically through lab testing of organic samples. Pathology is historically slow, a manual process of studying slides under a microscope, but physical AI applications are speeding up the process of analyzing samples and foundation models are helping researchers find key insights in that data faster.

In the near future, healthcare and life sciences will see greater adoption of cutting-edge AI technologies like AI agents that will help automate time-consuming processes on behalf of all researchers, scientists, engineers, physicians, and nurses. Physical AI, using large training datasets like world foundation models, will support the development of surgical robots that will partner with surgeons to conduct life-saving operations.

AI has the extraordinary potential to do good for the health and well-being of all humanity.

> "The roll out of Agentic AI will reduce the burden of administrative tasks, not just for healthcare professionals and researchers, but for patients and their caregivers."
>
> **Maneesh Juneja**,
> Planetary Health Futuris

## Ready to Get Started?

To learn more about AI technologies for healthcare and life sciences, visit: nvidia.com/en-us/industries/healthcare-life-sciences/



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