ECONOMIST IMPACT

Navigating the promise and potential pitfalls: AI and health equity

Commissioned by EMD Serono

Contents

About this report

Navigating the Promise and Potential Pitfalls: AI and Health Equity, a report produced by Economist Impact and commissioned by EMD Serono, explores how Artificial Intelligence (AI) can mitigate and/or exacerbate entrenched health disparities in the United States (US). Based on desk research, expert interviews, and a survey of 600 healthcare providers, executives, payers, and patient advocates, the report lays out the key opportunities and challenges of incorporating AI into US healthcare delivery and data workflows, with emphasis on access and equity.

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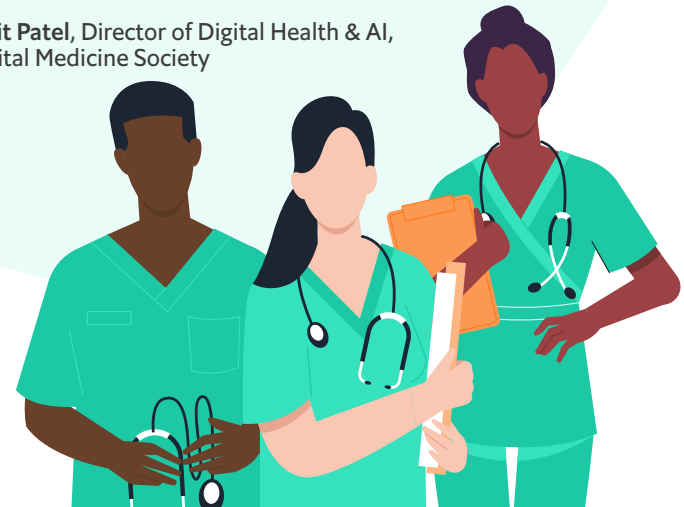
Health equity at a crossroads: the rising role of AI

The United States' (US) healthcare system is beset by significant disparities, spanning race, ethnicity, gender, age, and geography.[1] Tackling these entrenched health disparities calls for innovative solutions, and one promising approach is the growing use of Artificial Intelligence (AI) in healthcare.

"If done right, [AI can] amplify health equity. Done wrong, it can exacerbate the disparities, transforming [AI] from an opportunity to a liability."

Smit Patel, Director of Digital Health & AI, Digital Medicine Society



AI is increasingly becoming a pivotal tool in healthcare, driving advances in predictive analytics, medical imaging, treatment personalization, administrative tasks, and drug development and discovery.[2,3] Reflecting on its growing adoption, our survey of 600 healthcare professionals and patient advocates reveals that nearly half (46%) of respondents currently use AI several times a week, with one in five (19%) using it daily. In contrast, only 8% report never using AI. This widespread use is accompanied by positive sentiment; 85% of our survey respondents expressed favorable attitudes regarding AI use in healthcare.

This widespread optimism stems from the growing recognition of AI's potential to enhance efficiency and decision-making in medical practices. For example, AI image analysis has already demonstrated diagnostic speed and accuracy, which suggests it is capable of supporting clinicians in making quicker, more accurate decisions.[2] AI has also shown promise in improving administrative workflows within healthcare settings.[3,4] Apart from clinical and administrative applications, some AI systems are intended for direct use by patients—via mobile apps, for example, which can make healthcare services more accessible, provide treatment reminders, and offer personalized care plans.[5]

Beyond these applications, AI is increasingly being employed as a tool to understand and address health disparities.[6] According to our survey, 84% of respondents believe that AI has the ability to improve diagnostic accuracy and reduce disparities in outcomes, while 79% believe it can bridge health inequities. AI's ability to analyze large, complex datasets can reveal insights into health determinants that are often overlooked or under-explored, thereby enabling more targeted interventions. Furthermore, its ability to model real or virtual environments and operate with varying levels of autonomy makes it an attractive solution to tackling the complex and large-scale challenges of health inequity.[7,8]

However, using AI in healthcare comes with its own set of challenges and risks. "If done right, [AI can] amplify health equity," says Dr. Smit Patel, Director of Digital Health & AI, Digital Medicine Society. "Done wrong, it can exacerbate the disparities, transforming [AI] from an opportunity to a liability." The quality of the data that powers AI systems is essential to how well they perform. If the data or the algorithms are biased, AI could inadvertently exacerbate disparities.[9] There are also concerns linked to data use, privacy, ethics, patient-centered care, and real-world applications that have yet to be fully explored.[10]

84% of respondents believe that AI has the ability to improve diagnostic accuracy and reduce disparities in outcomes

Advancing health equity: positive implications of AI

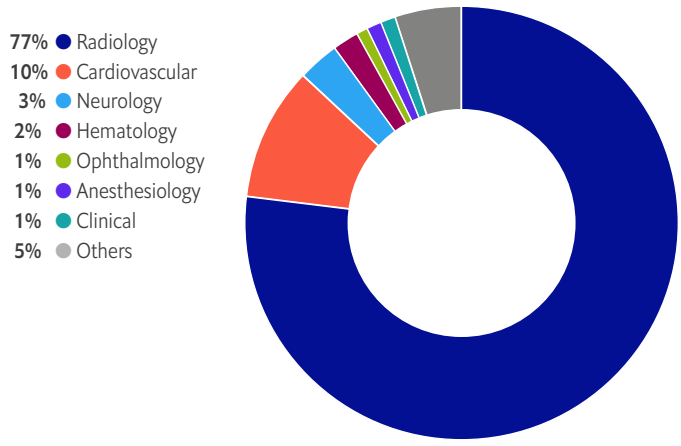
A driver of preventive and predictive healthcare

AI holds great potential to advance preventive healthcare strategies, which can help to reduce inequities. The large volume of imaging data in radiology, for example, paired with AI's ability to automate repetitive tasks and improve diagnostic accuracy, have made radiology a leading therapeutic area for AI adoption.[11] However, despite these advancements, disparities persist; diagnostic imaging utilization has declined among minority patients, reducing the data available to improve outcomes for these populations.[12,13]

AI has also demonstrated a significant impact on screening. For example, AI applications have greatly advanced in the field of diabetic retinopathy (DR), an eye condition linked to diabetes that disproportionately affects Black, Hispanic, and Native American individuals, who experience lower screening rates compared to other groups.[15,16,17] In addition to its use in preventive care, AI has also shown an ability to predict and diagnose health issues, including various types of cancer, before they arise, opening the door for earlier interventions and better patient outcomes.[18,19,20,21,22,23]

Our survey reveals that 55% of healthcare providers and executives primarily use AI for diagnostic assistance, followed by predictive analytics (46%). In terms of patient outcomes, two-thirds of respondents believe that these are the areas where AI will deliver the most value. Respondents working in the public healthcare sector are especially enthusiastic about AI's potential in predictive and preventive applications, indicating that they see an opportunity for AI to enhance diagnostic capabilities and efficiency, despite the resource constraints commonly faced by this sector.

Figure 1. FDA-authorized AI-enabled devices by specialty[14]
October 2023



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of the healthcare providers reported teaching themselves the fundamentals of AI

As AI evolves, its ability to provide proactive, data-driven healthcare solutions will expand, and lead to more precise and personalized care. This could fundamentally change healthcare delivery, shifting it from a reactive approach to one focused on prevention, with the potential to reduce healthcare costs and improve patient outcomes.[4] "One thing that will be ubiquitous is our ability to drive predictive AI diagnosis and treatment early on," says Dr. Patel. "[This will allow] us to focus on preventive healthcare for many diseases, rather than relying on our current sick healthcare system that prioritizes treatment."

Enhanced health system administration and economic impacts

AI is increasingly used to streamline routine tasks such as scheduling, note-taking, billing, and patient data management, which helps to reduce the administrative burden on healthcare providers.[24] AI is also increasingly employed by healthcare providers to complete prior authorization requests and assist insurance companies in reviewing them.[25]

Meanwhile, generative AI models such as ChatGPT, a platform that creates readable, text-based content from large amounts of existing data, can serve as virtual care assistants. These models can help to address the social needs of patients, offer lifestyle recommendations, provide preventive care, offer symptom assessment, and assist with the self-management of chronic diseases.[26,27] However, challenges related to data accuracy, bad advice, and privacy concerns need to be addressed to prevent compromising patient welfare and trust.[28]

Survey responses from healthcare providers suggest a preference for human involvement in areas requiring emotional intelligence and trustworthiness, while perceiving AI as a trustworthy tool for more administrative or operational tasks. One advantage of using AI for workflow-related and administrative work is that it can be implemented with limited risk of impacting patient outcomes.

"We've seen early excitement and hype around clinical AI solutions," says Dr. Jerrold Jackson, Director of Partner Enablement at Mayo Clinic Platform. However, he adds, there is "more early traction along the lines of trust and transparency … with administrative solutions … Because they're often [perceived as] safer". This perception of safety, as well as efficiency, is echoed by Dr. Kenneth Patrick Seastedt, a thoracic surgeon at the Roswell Park Comprehensive Cancer Center in Buffalo, New York, "I definitely see a big opportunity to reduce the burnout and burden of all the paperwork that providers have to deal with nowadays. I do think there's a big opportunity for this type of [support] where the risk to the patient is quite low."

Our survey found that confidence in using AI for administrative tasks is notably higher among providers and executives in private healthcare as compared with those in public healthcare (80% v. 66%). This may suggest differences in access to resources and training opportunities. In fact, a third of the healthcare providers in our survey reported teaching themselves the fundamentals of AI, while only 10% felt that they had taken part in sufficient training opportunities offered by their employer. As Dr. Seastedt notes, there is a need to "increase awareness and [provide] training for providers that are planning on using some of these tools".

If implemented successfully, AI will likely reduce costs and improve cost-effectiveness within the US health system. Early studies suggest savings, both overall and in specific disease areas such as DR, although the evidence remains limited.[4,15]

Challenges to health equity: risks posed by AI

Algorithmic errors and data bias

AI systems are only as reliable as the data and algorithms upon which they are built. One of the greatest risks to widespread adoption of AI, particularly in the context of health equity, is that existing disparities, errors, and gaps in data processes can lead to significant oversights and mistakes. If this happens, explains Dr. Leo Anthony Celi, a Senior Research Scientist and Clinical Research Director of the Laboratory for Computational Physiology at Massachusetts Institute of Technology (MIT), "the raw ingredients are going to lead to AI that is inequitable by design because the raw materials reflect structural inequalities".

Racial and ethnic minorities are frequently under-represented in data sets, largely due to variations in access to care and healthcare-seeking behaviors.[29] These data gaps have the potential to perpetuate health disparities and affect the generalizability of the data.[30] "If individuals aren't well represented ... then we shouldn't expect the decisions [regarding] individuals to always be the best ones," says Dr. Colin G Walsh, Associate Professor in the Department of Biomedical Informatics at Vanderbilt University. "Having data and community representation that reflect the communit[ies] that we're trying to develop a tool for is really critical," he explains.

Furthermore, biases in human reporting can contribute to data biases. For example, studies using language processing algorithms to assess clinical notes, which are made following patient interactions, have found differences in how healthcare providers describe patients. For example, healthcare providers were more likely to use violent or negative descriptors or imply non-compliance with treatment, depending on the patient's ethnicity.[31]

Biases can also arise from the algorithms themselves and the data on which they are trained on. Algorithmic bias occurs when an algorithm's design, such as its objectives, assumptions, and prioritization of outcomes, result in an unequal performance, allocation, or disadvantages for a particular social group.[32,33] Separately, data bias arises from flaws or imbalances in the input data, which can influence the algorithm's behavior. The way algorithms are designed and implemented can compound these challenges. Because many algorithms often function as "black boxes", the lack of transparency in their decision-making can leave the end-user unaware of how conclusions or recommendations are reached.[34]

67%
of respondents expressed concerns about the potential for discriminatory algorithmic bias and unfair outcomes

This lack of transparency can further exacerbate the potential for biased outcomes. In fact, over two-thirds of respondents to our survey (67%) expressed concerns about the potential for discriminatory algorithmic bias and unfair outcomes. Meanwhile, a relatively small portion of respondents believed that AI can reduce decision-making bias (24%) or improve trust in the healthcare system (20%).

To ensure that AI contributes positively to health equity, constant diligence, vigilance, and proactive accountability are required; this effort must stretch well beyond data use and algorithmic design. "The solutions will not just pertain to the data; they will not just pertain to the algorithms," says Dr. Celi. "The solutions will pertain to how we learn, how we work with each other… We need to revamp our legacy systems of thinking, of education, of regulation [and] of innovation," he explains.

Challenges to patient-centered care

As patient-centered care becomes more widely recognized as a core principle of healthcare delivery, the integration of AI presents an opportunity to reinforce this approach. "It starts with patients," says Dr. Patel. "For a very long time, we have ignored patients… We have created solutions for patients without [their] involvement… As we build new tools, it's critically important—no matter who the stakeholder is—if they think about a 'trusted partner,' they should think about patients." For AI to play a foundational role in healthcare delivery, great care will need to be taken to ensure that the patient voice does not become lost amid the vast information garnered from big data and AI algorithms. This concern is shared by our survey respondents as well, with 46% apprehensive about the potential impacts on patient-centered care, echoing a wider concern among respondents that AI may lack the empathy and nuance to recognize the complexities of individual experiences, cultural context, and the emotional aspects of patient care.

Transparency and understanding are key to the successful adoption of AI in clinical decision-making. Without these foundational elements, healthcare providers could face a loss of trust, especially among patients already weary of the healthcare system. In fact, standards for AI transparency and explainability were cited by survey respondents as a top policymaking priority; this was especially prominent among patient advocates, with 85% emphasizing that transparency should be a key focus.

Part of building trust is ensuring that under-served communities are given a voice in AI implementation. "There is a need to give a seat at the table to people whose voices have been muted in how we innovate, evaluate, and regulate," says Dr. Celi. "Addressing trust is not simple; what we need to prescribe is a change in who gets to decide, define, and design what 'trust' is. Therefore, it's not just about the 'what' but also 'who' and the 'how' that will be key."

Ensuring transparency and comprehensive physician education around AI tools are crucial not just for the therapeutic alliance, but also for enabling equitable access to AI technologies and quality care across different patient groups. For nearly two-thirds (65%) of healthcare providers surveyed, access to AI technologies was cited as a factor that ought to be a key priority for policymakers.

Ethical challenges and privacy concerns

Data use is particularly sensitive in healthcare, and AI is required to comply with the US Health Insurance Portability and Accountability Act (HIPAA) data privacy and security requirements to protect patient information.[35] However, the development of AI algorithms requires that developers, including commercial entities, have access to large amounts of high-quality patient data, raising, in turn, regulatory, privacy, and security concerns. For example, AI-driven data segmentation (for example, around cost and service use) may allow for more targeted interventions; however, it can also impact insurance coverage decisions, raise ethical and privacy issues, and potentially increase the vulnerability of already at-risk patient populations.[36]

In addition, the use of cloud computing and data storage for AI applications makes patient data vulnerable to cybersecurity and privacy issues.[10] It's important for all stakeholders, including policymakers and regulators, developers, researchers, and healthcare providers, to ensure that AI use does not compromise patient privacy or trust. Our survey revealed clear interest, and a potential lack of knowledge, regarding the impact of AI on patient privacy and data security. Providers, payers, executives, and patient advocates all ranked this as a policy priority, with 85% of patient advocates emphasizing its importance.

"Regulations so far are not keeping pace with where technology [is] and they need to pick it up."

Dr. Rav Seeruthun, CEO and Founder of health-equity.ai

Regulatory and policy gaps

An under-developed policy and regulatory environment reflects the relatively nascent status of AI in healthcare. According to experts interviewed, current regulations are too generic and struggle to keep up with the rapid pace of technological advancement. "The regulations are cookie cutter," says Dr. Rav Seeruthun, CEO and Founder of health-equity.ai. "And the problem with cookie cutter regulations, [is that] they don't cover [everything]... Regulations so far are not keeping pace with where technology [is] and they need to pick it up."

Regulation that balances trust and transparency while encouraging innovation is needed, says Dr. Patel. "The industry prefers fewer policies and regulations to foster innovation and thrive in the gray areas of business practices. From the government's perspective, more regulations can be helpful, but we know that creating and implementing these new policies take considerable time and effort, often spanning several years."

Nearly nine out of 10 survey respondents were concerned about the lack of transparency in US government AI policies, particularly regarding AI decision-making and algorithm-based claim determinations. Similarly, 89% of payers felt that regulatory guidance was unclear and inconsistent. Across all respondents, there was a call for more regulations, especially related to data privacy, security, and ethical applications.

According to Dr. Patel, regulatory frameworks for clinical and operational AI need to be tailored according to varying risk-levels. "Operational tools that do not impact patients carry different levels of risk and should be addressed separately from clinical AI, which involves algorithms that directly affect patient outcomes."

The unknowns

64%

of respondents indicated that they wished they knew more about the cost implications of AI implementation

The potential benefits and challenges associated with AI use in healthcare are important to consider. However, AI is rapidly evolving, both within healthcare and beyond, which is characterized by unpredictable outcomes and speculation that could have profound, unforeseen consequences. These "unknowns" may explain why survey respondents, specifically patient advocates, were more than twice as likely to express fear (25% of respondents) than anxiety or pessimism (12%) about the use of AI in healthcare. This suggests that patient advocates, who are deeply involved in supporting patients' overall well-being, may have greater concerns about the ethical challenges and potential risks associated with integrating AI into healthcare delivery.

AI adoption in healthcare is likely to create new challenges for health equity at every step. Despite best intentions and careful planning, unintended consequences are almost inevitable. One key issue is the inherent limitation of AI accuracy. As Dr. Celi explains, "AI is never going to be a hundred percent accurate. We know that the 10% that will be given incorrect diagnosis and treatment recommendations are the ones who are already marginalized. So, [while] societal outcomes might improve on average, [it will be at] the expense of people... at the bottom, who will be pushed down even further."

Another key uncertainty is how to scale AI technologies while ensuring healthcare financing and reimbursement. "The goal is for these technologies to scale and to be impactful across the health system, in a sustainable manner," says Dr. Ricardo Baptista Leite, CEO of HealthAI-The Global Agency for Responsible AI in Health. "I don't think anyone has yet found the right health technology assessment model to determine that fair pricing." This uncertainty about potential cost implications is echoed by our survey respondents; nearly two-thirds (64%) indicated that they wished they knew more about this aspect of AI implementation.

As policymakers and health systems look to the transformative potential of AI, they must tread cautiously and be mindful to ensure that AI fulfills its potential to improve, not worsen, health equity and access to care. "As we design systems that utilize AI to improve healthcare, we must simultaneously develop tools to ensure these systems remain vigilant," says Dr. Walsh. "If we don't design them to be vigilant, we may not realize they are underperforming. This is not only a design challenge but also a collaboration challenge and an algorithmic one."

Conclusion—ensuring that AI works for all

One thing seems to be certain about the use of AI in the US healthcare system: it will be transformative. However, concrete steps must be taken to ensure AI-enabled healthcare tools are accessible to everyone, including under-served communities, and are used to raise the standard of care for all patients. If not carefully implemented, AI could exacerbate existing inequities. "What we will be seeing if nothing is done, is a widening of the gap between those who have the resources to access these technologies and those who will inevitably be left behind if their health systems are not designed to promote equity from the onset," says Dr. Baptista Leite.

To ensure that AI is implemented in a way that reduces rather than exacerbates health inequalities, it is vital to plan with potential pitfalls in mind. This will be the shared responsibility of a range of stakeholders, including policymakers and regulators, developers, researchers, healthcare providers, advocacy groups, and patients.

These stakeholders will have to pay close attention to development across a range of key areas of focus:

- **Algorithmic vigilance—combating bias in data and algorithmic design**
  AI algorithms have the potential to revolutionize health data use to create a transformative, preventive, and predictive health system. Algorithmic vigilance is crucial for ensuring that AI systems are designed to prevent adverse effects and remain fair, especially by including under-served communities in the development, deployment, and monitoring process.
- **Need for diverse voices—ensuring patients have a "seat at the table"**
  The needs, concerns, perspectives, and rights of patients must be prioritized and considered at every step of AI systems, from concept to implementation. Their active involvement will ensure that AI tools are designed to be "patient first", directly benefiting the end-user. This includes ensuring that algorithms are trained using inclusive and representative datasets.
- **Patient-centered AI use—placing a high value on transparency, patient awareness, and trust**
  Trust is hard-earned, especially among some patient groups. Reflecting a key priority of our survey respondents, regulators and policymakers must work to ensure that standards are developed to ensure AI transparency and explainability. Reliance on AI without proper understanding or communication could erode trust, especially among already skeptical patients. Trust is vital and must be earned through transparent approaches that prioritize long-term health system benefits, patient privacy, and data integrity. Access is also key; policymakers must ensure equitable access to AI technologies and resources.

"It starts with patients... As we build new tools, it's critically important—no matter who the stakeholder is—if they think about a 'trusted partner', they should think about patients."

Smit Patel, Director of Digital Health & AI, Digital Medicine Society

- **Risk mitigation—building safeguards to anticipate, manage, and eliminate unintended or negative consequences of AI use**
  AI has the potential to advance health equity and improve care for all. Yet, if implemented in silos, it could entrench, exacerbate, or even create inequalities. To mitigate the unintended consequences of AI use, the involvement of, and collaboration between, all stakeholders is required.
- **Regulation, policymaking, and oversight—adapting approaches to the new challenges created by AI**
  Regulators and policymakers face many challenges regarding AI integration in healthcare, not least coordinating stakeholders across policymaking, the technology industry, and the healthcare sector. In addition, there is a need to expand and increase the rigor of AI regulation in healthcare.[37,38] Policymakers and regulators must work with developers, healthcare providers, insurers, and patient groups to ensure that patients' needs and rights (and data) are safeguarded and protected. Guidelines for ethical AI use and patient consent must be prioritized.
- **Healthcare financing and reimbursement—implementing a fair, impact-based pricing model**
  Uncertainty exists around how the costs of AI should be managed, and what those costs ultimately are. The potential for economic benefits and efficiency gains hinges on collaboration between stakeholders to devise a pricing model that ensures both value and equitable access, without creating additional cost-related barriers for patients.
- **AI that works for all—implementing a system operated by trusted partners with a focus on transparency, ethics and equity**
  All stakeholders are responsible for working together to ensure that AI solutions are developed and applied responsibly and ethically, emphasizing transparency and equity.

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