



Original Contribution

Human-AI Collaboration in Decision-Making: Opportunities and Risks in Healthcare

Shahzadi Shadman

Assistant Manager , Research Hub, Islamabad, Pakistan,
Email: shadman1567@gmail.com

Ali Asghar Bhutto

Pharmacist, Liaquat University of Medical & Health Sciences (LUMHS) Jamshoro, Pakistan
Email: aliasgharbhutto7@gmail.com

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A B S T R A C T

The incorporation of artificial intelligence (AI) into clinical workflows heralds a paradigm shift in human-AI collaboration in health care. AI solutions provide important decision-support advantages ranging from diagnostics to personalized treatment planning. That said, these developments also bring with them concerns of trust, accountability and ethical deployment. We explore these domains by considering the opportunities and the dangers of human-artificial intelligence decisions for healthcare, which we contextualise with an emphasis on diagnostic performance, ethics and clinical implementation. We performed a literature review and a perception-based survey of 110 healthcare professionals. The results were synthesized to provide a balanced perspective on how AI enhances the abilities of the human expert, while simultaneously creating some vulnerabilities. Results show that AI improves speed and precision in diagnosis, but increases data bias, decreases human control, and creates ambiguity regarding liability. Open human-AI collaboration can provide considerable value at an institutional scale, but must be underpinned by rigorous ethical standards, transparent processes and collaborative processes across disciplines in the field of health care systems. It comes down to human-AI collaboration in healthcare decision-making.

Introduction

Recent years have witnessed a rise of artificial intelligence (AI) in healthcare, which represents a major shift in clinical decision-making. From rule-based expert systems to deep learning networks, AI technologies have become an important assistance to physicians during diagnostic assessment, triage, and treatment recommendation (Topol, 2019). Most models today are increasingly focused on leveraging machine intelligence not in replacing clinicians but in complementing them, wherein human expertise is augmented by machine precision (Jiang et al., 2017).

While AI's application in health care has a lot of advantages, it is also beset with with formidable ethical, legal, and operational challenges. These include accountability in AI aided decisions, transparency in model behavior, trust in human physicians at the expense of increasing potential to rely on the algorithm. This paper delves into the twin faces of this transformation — a candid evaluation of who the winners and losers are in the partnership between humans and AI in healthcare.

Literature Review

Some of the more successful AI tools have been shown to be useful in the fields of medical imaging, diagnostics, and electronic health record (EHR) analysis. Convolutional neural networks (CNNs) have demonstrated the ability to perform as well as radiologists at detecting pneumonia and breast cancer (Esteva et al. 2017). AI powered decision support systems have also been used to make emergency room triage more efficient, by piloting a system that analyses thousands of patient data sets per minute (Rajkomar et al., 2019).

But human-AI collaboration also brings with it some risks. Since black-box algorithms rarely provide interpretability, clinicians could remain doubtful about any rationale provided by the AI (Ghassemi et al., 2021). In addition, AI systems based on biased data may lead to discriminating results, having a strong impact on underrepresented populations (Obermeyer et al., 2019). A data-driven AI tool providing analysis that plays a role in a medical mistake raises legal and ethical questions of accountability — including who gets sued if an AI tool's analysis contributes to a mistake.

Methodology

The study had a two-pronged approach to study were

Systematic Literature Review

As detailed in Methods, we systematically reviewed academic databases including PubMed, Scopus, and IEEE Xplore to identify articles published between 2015 and 2024. Search Terms AI in healthcare Clinical decision-making AI risks Human-AI collaboration

Questionnaire to Healthcare Professionals

Methods: We conducted a structured survey of 110 professionals (clinicians, hospital administrators, medical researchers). The perceived opportunities and risks of AI in healthcare were evaluated by the participants using a 5-point Likert scale.

Methods and materials: Data were collated and analysed using the method of thematic content analysis and basic descriptive statistics.

Results

The Opportunities and Risks of Human-AI Collaboration in Healthcare

Refer to bar graph above.

Interpretation:

Efficiency (81%) and diagnostic accuracy (85%) were identified by survey respondents as key opportunities. On the flip side, there were also high noted risks including issues with patient trust (66%), accountability gaps (62%) and data bias (58%).

Table 1: Summary of Opportunities and Risks

Refer to the table above.

The table summarizes main benefits and dangers of human-AI collaboration in clinical settings and shows that although technology intensifies and hastens medical decisions, it further endangers the health care system to new kinds of risks.

Table 2: Summary of Survey Responses (n = 110)

Domain	% Agree or Strongly Agree
AI improves diagnosis speed	84%
AI lacks clear accountability	63%
AI reduces physician workload	77%
Patients may distrust AI-supported decisions	66%
Human oversight must always be retained	91%

Discussion

AI is not a substitute for clinicians, but rather a powerful partner to help improve decision making. The results show that AI is not a replacement to clinicians, but a powerful partner to help improve decision making. When humans and AI join forces, it can allow for earlier diagnoses, better allocation of resources, and personalized care pathways. However, this partnership must be approached with caution.

Close to the top of the list is the concern of explainability and trust, and this is a recurring theme across the AI landscape as well. Because AI systems rarely provide transparent rationales for their outputs, this makes it more difficult for clinicians to assess or overrule them. If not managed carefully, this black box nature can erode trust in medical intuition (Ghassemi et al., 2021).

As a result, bias and inequity in AI models can compound existing disparities in healthcare. For example, one of the most cited studies by Obermeyer et al. (April 2019) determined that an algorithm for prioritization of care had a racial bias that systematically underestimated the needs of Black patients.

Then there is the question of accountability also left unanswered. The blurring of liability — who to point the finger towards if something goes wrong — when human-AI decisions are made together of course also poses a legal grey area, necessitating institutions and legislators to clear-up.

Conclusion

The use of artificial intelligence in health care decision making is proving exceptionally beneficial, especially with respect to timeliness, accuracy, and data management. But trust, ethics, and fairness considerations pose significant hurdles on the road to realizing machine-learning and AI at scale.

The future of healthcare will most likely be defined as augmented intelligence where humans are the ethical and final authority and provide support by adopting available AI → but they remain as the critical cornerstone of a human-centered healthcare system. This vision will never come to fruition without transparent systems, consistent validation, and vigilant oversight by humans.

Recommendations

Require Humans in the Loop: Make sure every AI recommendation is always reviewed by a licensed healthcare professional.

Favor Explainable AI: Drive transparency in model logic and enhance the physician trust.

Bias Auditing: Test AI systems against demographic and data-based bias on a routine basis.

Develop Protocols For Accountability: How legal responsibility is shared between AI and man in the decision process.

Communicate with Patients: Maintaining clarity and confidence in the role that AI plays will help patients feel comfortable.

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