

I would like to comment on two papers which are highly correlated to my current research.

Dranove, D. and C. Garthwaite, "Artificial Intelligence, the Evolution of the Healthcare Value Chain, and the Future of the Physician"

Sahni, N., Stain, G., Zimmel, R. and D. Cutler, "The potential Impact of Artificial Intelligence on Healthcare Administrative Spending"

Building Physician Trust in AI

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In general, AI offers two major functions in healthcare. One function is to speed up the routine work, create the efficiency of clinical operations and reduce administrative spending (Sahni et al., 2022). Great examples include reading films like radiologists and delivering medical information during patient transfer. The other function is to make clinical recommendation on diagnoses and treatments through clinical analytics. For example, AI could advise patients to select physicians and provide recommendations on treatment plans to physicians. In this short note, I am going to focus on a small but growing area relating to the second function: how to make physicians trust AI?

To increase the value of AI in clinical recommendation and make AI and human beings work in harmony, it is important to understand the interactions between AI and physicians and build physician confidence in AI. Below I will discuss on this issue from three aspects.

First, human beings naturally do not welcome unsolicited suggestions and sometimes have negative feelings on opinions different from their own. In the clinical operations, some apps which use AI to generate medical recommendations are often embedded in the electronic medical record (EMR) systems. The AI-generated recommendations automatically pop out on physicians' screens. According to the interview with a famous AI-health company which we collaborate with, a large portion of physicians who use such systems feel being annoyed by AI and asked if there is a way to turn it off. In response to these requests, the company offered a button through which physicians can freely choose whether to read an AI-generated recommendation.

The background data shows that the acceptance rate for AI-generated recommendation is much higher when physicians turn on the buttons by themselves. When a physician is very certain about his medical judgement, the pop-out recommendation place little or even negative value on his utility. When he is puzzled by a patient's symptom and would like to discuss with other doctors for a second opinion, AI may be a good alternative for them to consult with. Under that scenario, AI-generated recommendation is welcomed by physicians and very likely to be accepted. Hence, allowing physicians to freely choose whether to seek opinions from AI would greatly decrease the tension between physicians and AI and promote physician trust in AI.

Second, human beings have different personalities. Some people are strong-opinioned, and others are very agreeable. Using different conversation methods with people with different personalities can increase the efficiency of communication. The development of psychology and

natural language processing (NLP) methods facilitate us to train AI to communicate the same idea in different ways. One of my works examines the impact of physicians' personality traits on their medical conducts and clinical performance (Ding et al, 2022). We apply the NLP method to identify physicians' personality traits and use clinical data to validate these personality measures. If we could incorporate users' personalities into the AI algorithm, the efficiency and effectiveness of communication between physicians and AI would improve significantly, which ultimately make the AI-generated recommendation more acceptable to physicians.

Third, accuracy is the key for physicians to gain confidence in AI. Recently a question-answering bot, ChatGPT, becomes popular. However, it soon gets some resistance from some communities. For example, Stack Overflow temporarily bans ChatGPT because of its high frequencies in providing wrong answers (The Register, Dec 5, 2022). ChatGPT is a new bot produced by Open AI and is capable to communicate in a way like human beings. One of the biggest challenges for such communication bots is the coding issues which result in low accuracy in answering questions.

In addition to coding challenges, data management is another issue for the accuracy of recommendation generated by AI. Both Dranove and Gaithwaite (2022) and Sahni et al. (2022) stated in their papers that access to clean data is crucial in training AI. The existence of practice variations may create barriers for what AI is learning and whether the trained algorithm could pass the external validation.

In summary, clinical analytics in theory can assist physicians to make accurate diagnoses and offer correct treatment plans. However, in practice, it faces the same challenges as insurers' utilization review. As Dranove and Gaithwaite (2022) said, "This creates a tension- is it better force potentially biased physicians to conform to norm, or allow them to make their own decisions, factoring in idiosyncrasies. ... AI does not eliminate this tension, but may tilt the calculus."

In the future, several research questions shall be addressed regarding how to build physician trust in AI. Below I list a few of them and look forward seeing the answers: (1) how does AI feed information to physicians? (2) what is the impact of using AI recommendations on health outcomes? (3) why do we need physicians if AI can make better clinical decisions than them? And (4) what are the incentives for physicians to build trust in AI?

References:

Dranove, D. and C. Garthwaite, "Artificial Intelligence, the Evolution of the Healthcare Value Chain, and the Future of the Physician"

Ding, JN, Lu, S.F. and K. Kannan, "What Can Online Personal Statements Tell Us? Insights about Physicians' Personality Traits and Their Medical Performance"

Sahni, N., Stain, G., Zimmel, R. and D. Cutler, "The Potential Impact of Artificial Intelligence on Healthcare Administrative Spending"