

Ethical Challenges in AI-Powered Personalized Medicine

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AI-powered personalized medicine can transform the health sector by ensuring that treatment is based on each person's genetic, clinical, and lifestyle information. When applied to datasets such as the Cancer Genomic Atlas (TCGA), it raises many ethical questions, especially regarding fairness, bias, and equity.

Data bias and underrepresentation are two of the major concerns. Most AI models have been trained on data sets that have a higher concentration of patients with a particular ethnic background, most commonly, it is either white/ European descent, or other minority groups continue to be chronically underrepresented. This leads to biased predictions and treatment plans that do not transfer to different populations. To illustrate this point, when an AI model that uses data of one demographic is used to propose the treatment of cancer among the underrepresented demographics, it is possible to get misdiagnosed or ineffective cancer treatment.

Also, algorithmic opaqueness is a challenge. Most machine learning models are also black boxes, whereby clinicians cannot comprehend or demonstrate why a specific treatment plan was proposed. This restricts the trust between the patients and may result in low implementation by the medical professionals.

With these challenges, developers should make initiatives to approve fairness strategies. Fixing this can be done by making the data diverse by creating training sets that contain people of different ethnicities, genders, and age levels. It will be helpful to collaborate with hospitals and institutions worldwide and compile inclusion datasets. Additionally, apply explainable AI (XAI) methods, enabling clinicians to interpret model predictions and making them more transparent and accountable.

Finally, involving ethics review boards to develop models and deploy them in society can eliminate the rising problem of social implications. By designing fairness in the AI application development chain, I will move towards a place where personal medicine will help everyone, not only based on their background.