ROLE OF ARTIFICIAL INTELLIGENCE IN THE MEDICAL FIELD OF VIKSIT BHARAT, 2047

Pawar Adityaraj

2nd Year Medicine Student
Davao Medical School Foundation Inc., Davao, Philippines

Abstract

Today's Bharat is a fastest growing and changing country in the modern world. The best thing about today's Bharat is that it is ready to adapt to the new scenario and make herself flexible to fix into the modern world. Bharat has medical scientists, medical history and its own medical philosophy to progress and even guide the world. Bharat has already proved this during the Covid 2019. Having said this, the future of Bharat in the field of Medicine is full of opportunities and challenges. The place of Artificial Intelligence in the medical field of Bharat is worth considering, but the AI will never ever replace the human Doctor. Robotics (in surgery), nano technology, Biotech (in precision and personalised medicines/therapies), AI/ML (in image recognition and diagnostics), the technology will also advance with higher maturity and use of augmented reality (better visualizations), tele-medicine and wearable devices. These will give rise to some broad trends and 2047 will shape new Bharat's healthcare, when it will be called as the Viksit Bharat or the Developed Bharat.

Keywords: Viksit Bharat, Artificial Intelligence, Mediclaim.

INTRODUCTION

Artificial intelligence (AI) research is growing rapidly in the medical field all over the world. In healthcare, Artificial Intelligence projects attracted more investment than AI projects in any other sector of the global economy. However, amidst excitement, equally doubtful, there is also an urgent advice to exercise some caution on increased expectations. The present paper is an attempt to have a closer look at current trends in medical AI and prospects for general practice. Scot J. Adams says-

Artificial intelligence (AI) presents a key opportunity for radiologists to improve quality of care and enhance the value of radiology in patient care and population health. The potential opportunity of AI to aid in triage and interpretation of conventional radiographs (X-ray images) is particularly significant, as radiographs are the most common imaging examinations performed in most radiology departments. (Scot-2021)

In the above cited quote, what Scot J. Adams says is applicable to Bharat and their futuristic ideas as well. Informing clinical decision making through insights from past data is the essence of evidence-based medicine. Traditionally statistical methods accomplish this task by characterising patterns within data as mathematical equations. For example, linear regression, line of best fit, suggests' machine learning, though, AI provides technologies that uncover complex associations that cannot be easily reduced to a single equation. For example, neural networks represent data through many interconnected neurons, like the human brain. This allows ML systems to arrive at solutions to a complex problem in the same way as a physician – by carefully weighing evidence to reach rational conclusions. However, as opposed to a single physician, these systems can observe and rapidly process an almost unlimited number of inputs simultaneously. For example, an AI-powered smartphone app now available in North London1.2, efficiently handling the task of transporting millions of people to Accident and Emergency (A&E). Other than this, these systems can learn from each incremental case and within minutes, more cases can be uncovered than can be seen by one physician in several lifetimes. That's why this AI-powered app detects suspicious skin wounds or why AI is being trusted in tasks where experts often disagree, such as identifying pulmonary tuberculosis on chest radiograph. Although AI is a broad field, this article focuses specifically on ML techniques due to their ubiquitous use in important clinical applications.

In addition to simply demonstrating improved efficacy, new technologies entering the medical field of modern Bharat, must be integrated with current practices, must obtain appropriate regulatory approvals and the most important thing, medical staff and patients must be motivated to invest in a new paradigm. But Bharat has its own weaknesses. We have a considerable class of society that still is bellow poverty line. If we want to take this Medical Technology to the masses in Bharat, we need to be more techno-savvy. These challenges have given rise to several emerging trends in AI research and adoption in Bharat. And the future, therefore, is bright.

AI excels at well-defined tasks.

Bhartiya medicinal research must be more focused on tasks where AI is able to effectively demonstrate its performance in relation to a human doctor, as there would always be shortage of human doctors in Bharat. Usually, these functions have clearly defined inputs and a binary output that is easily validated. For example, in classifying suspicious skin injuries, the input is a digital photograph, and the output is a simple binary

https://www.gapbodhitaru.org/

classification: nonthreatening or malignant. Under these circumstances, the researchers simply should demonstrate that the AI had better sensitivity and specificity than dermatologists when classifying previously unseen photographs of biopsy-validated injuries. These methods and technologies have already been included inn the European hospitals. And if today's India really wants to become a Viksit Bharat, we must embrace the new way.

AI is supporting doctors, not taking their place.

Dr. *Mullainathan S, Obermeyer Z in one of his research papers findings says-*
Our study showed the diagnostic evaluation of a real-time AI clinical decision-support tool became less accurate than the original. Although real-time sensitivity and specificity of the AI tool was still acceptable as a decision-support tool in the ED, we propose that continuous training and evaluation of AI-enabled clinical support tools in healthcare are conducted to ensure consistent accuracy and performance to prevent inadvertent consequences. (*Mullainathan S, Obermeyer Z, 2022*)

There can be a misunderstanding about the role of the AI in medicinal areas. Bhartiya mind takes its own time to trust the changes. Machines lack human qualities like empathy and compassion, and so patients should understand that the consultations are being led by human doctors. Other than this, patients cannot be expected to trust AI immediately, a technology surrounded by distrust. So, AI usually handles tasks that are necessary, but they are quite limited in scope so that the primary responsibility for patient management is left to a human doctor. A clinical trial is underway using AI to calculate target areas for head and neck radiotherapy more accurately and far faster than a human being. An interventional radiologist is still ultimately responsible for delivering therapy, but AI has an important background role in protecting the patient from harmful radiation. Therefore, the human doctor will never ever be replaced by an AI. But the new Bharat needs to invest more into this field, we want to become a hub of medicinal market-both in pharmacy as well as in diagnostics.

AI Supports services with poor resources.

A single AI system can support a large population and is therefore ideally suited to situations where human expertise is a scarce resource. Hence, it's more suitable for the populated countries like India. There is a lack of radiological expertise at remote centres in many TB-prevalent countries, including Bharat. Using AI, radiographs uploaded from these centres can be interpreted by a central system. A recent study shows that AI has shown 95% sensitivity and 100% correct diagnosis of pulmonary TB, as per the data available. Other than this, under-resourced operations where patients are experiencing unsatisfactory waiting times, AI is also attractive as a triage system, especially in Bharat.

In 2008, Google tried to predict the seasonal spread of influenza using only search terms entered their search engine. Because people's search habits change dramatically with each passing year, this model predicted the future so poorly that it was immediately discontinued. Moreover, anonymised and digitized data at the source is even better because it helps in research and development.

AI will extract important information from the patient's electronic footprint. Firstly, it will save time and improve efficiency, and after adequate testing it will also directly guide patient management. Take the example of consultation with a patient with diabetes; currently a physician reading outpatient letters, spends a significant amount of time examining blood tests and finding clinical guidelines from multiple disconnected systems. On the contrary, AI can automatically formulate the most important risks and actions given the patient's clinical records. It can automatically convert the recorded dialogue of the consultation into a summary sheet for the therapist's approval or revision. Both applications will save a lot of time and can be implemented much faster because they assist physicians rather than replace them.

As these systems become better validated, they will be given more responsibility in future. For a diabetic patient, a rigidly defined statin initiation threshold, one-size-fits-all, problem can be determined by AI on an individual basis, rather than by an algorithm, considering the patient's history. This research needed for medicine will only be possible through AI that intelligently summarises large amounts of medical information. Since AI is capable of monitoring millions of inputs simultaneously, it will therefore play an important role in preventive medicine. AI can then proactively suggest consultation when it determines that a patient is at high risk of developing a particular diabetic complication requiring intervention whereas it would be impractical to entrust a human being with the responsibility of closely monitoring every test result and every diabetic patient's appointment in a practice in real time. And if we are thinking to master this for Bharat, we really need to be realistic, about operating this system here. The fact remains, still, that Bharat is much behind the western countries in this area of research. And Bharat needs to be more serious about this in coming times.

The AI-based system will also bring expert diagnostic expertise to primary care in Bharat, especially in remote areas where medical experts find difficult to reach. If an image of a skin lesion is sufficient to diagnose its cause, such images can be captured in the GP practice and sent to specialist dermatology AI systems for immediate analysis. Low-risk patients will get immediate reassurance, while high-risk patients will experience shorter referral wait times as clinics will only receive selected cases. This concept is not limited to skin lacerations, AI can do retina scan and radiographs have also shown the ability to interpret many different types of image data,

https://www.gapbodhitaru.org/

including ultrasounds. Many of these images can be taken with relatively inexpensive and widely available equipment.

Future AI research in modern Bharat should be directed towards carefully selected tasks that broadly conform to the trends outlined in this paper. Integrating these systems into clinical practice in Bharat, requires building a mutually beneficial relationship between AI and physicians, where AI provides greater efficiency or cost-effectiveness to physicians and physicians provide the necessary clinical exposure needed for AI to learn complex clinical case management. Throughout the process it will be important to ensure that AI does not obscure the human face of medicine as the biggest obstacle to widespread adoption of AI will be the public's hesitation to embrace this increasingly controversial technology. And Bharat will have its own challenges in this regard.

Better telecom connectivity, immediate availability of home diagnostic devices (such as pulse oximeter and blood pressure monitor), growing acceptance of tele-consultation by both doctors and patients (accelerated due to pandemic), and Bharat's vast geographical expanse is making primary care remote. Experts suggest that 85% primary care may shift to tele-consultation in Bharat, with the help of AI. This change has the potential to address Bharat's persistent challenges related to the availability of health care professionals in remote and rural areas. With the expansion of Health and Wellness Centres (HWCs) as part of the National Health Policy, the integration of tele-consultation is set to revolutionise the landscape of primary care.

Tertiary care in Bharat is on the verge of transformation with emerging alternative business models. But traditionally, it has been dominated by large multi-specialty hospitals, which is driven by the need for substantial fixed costs and a large pool of medical professionals. However, more procedures will be conducted due to the increasing trend in precision surgery. Advances in virtual/augmented reality (VR/AR) will facilitate remote robotic procedures, which will reshape the landscape of tertiary health care, if at all the new Viksit Bharat shows interest in this direction. A departure from the extensive multi-specialty setups seen today expect a shift toward specialised medical centres that focus on specific conditions. The advent of remote robotic centres will bring tertiary care services closer to citizens. And that will really empower Bharat.

Other than this, the pharmaceutical industry must prepare for the transition from largely chemistry-based approaches to personalised biology-focused treatments.

Bharat stands as a major leader in pharmaceutical exports, which is backed by a wealth of chemical expertise. The nation has started the journey towards biosimilars, this sector is set for rapid expansion soon. As biotechnology continues to progress, including breakthroughs such as Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) and nanotechnology, the healthcare landscape is moving towards precise and personalised treatments. India's pharmaceutical industry has largely been strengthened by its existing proficiency in standardised production methods as well as a focus on personalised treatment protocols.

If Bharat really means to rise to that level of 'Viksit Bharat' there must be a sea change in the approach at the governments end as well. This should begin with huge changes, not small. The exodus of the medical students from Bharat to foreign countries is taking billions of Indian rupees out of our country. When a medical aspirant can become a medical expert out of Bharat, why can't he do the same degree in his own country. Just to satiate the thirst of handful few medical college owners, the whole country cannot be put at stake. Viksit Bharat aspiring government must think in this regard.

REFERENCES

[1] Adams, Scott J.; Henderson, Robert D. E.; Yi, Xin; Babyn, Paul (February 2021). "Artificial Intelligence Solutions for Analysis of X-ray Images". Canadian Association of Radiologists Journal. 72 (1): 60–72. doi:*10.1177/0846537120941671*. ISSN 0846-5371. PMID 32757950. S2CID 221036912.

[2] Mullainathan S, Obermeyer Z (May 2022). "Solving medicine's data bottleneck: Nightingale Open Science". Nature Medicine. 28 (5): 897–899. Doi: *10.1038/s41591-022-018044.PMID 35534570S2CID*.

[3] Coiera E (1997). Guide to medical informatics, the Internet and telemedicine. Chapman & Hall, Ltd.

[4] Petersson L, Larsson I, Nygren JM, Nilsen P, Neher M, Reed JE, et al. (July 2022). "Challenges to implementing artificial intelligence in healthcare: a qualitative interview study with healthcare leaders in Sweden". BMC Health Services Research. 22 (1): 850. doi:*10.1186/s12913-022-08215-8*. PMC *9250210*. PMID 35778736.

https://www.gapbodhitaru.org/