ROLE OF TECHNOLOGY IN ATTAINING HEALTHCARE: A CRITIQUE

Dr. Vikrant Sopan Yadav
Associate Professor,NICMAR University, Hyderabad
Orcid ID: 0000-0003-2807-1276
vyadav@nicmar.ac.in

ABSTRACT

Advanced technologies like Artificial Intelligence (hereinafter referred to as AI) have been increasingly used for detection and treatment of chronic diseases, delivery of health services, and drug discovery. M- Health, digital health platform have made medical knowledge easily available to layman. Complex surgeries are being performed with an ease, with help of modern AI operated robotic techniques. This research paper is an attempt to give brief overview of use of modern technology in medical profession which help in achieving human right to health. It also analyses the ethical-legal issues involved in use of technology in healthcare. Author has also proposed several recommendations for use of technological advances in better healthcare service. Some of the prominent recommendations includes, e-Health policy to address all medico legal issues, promotion of digital healthcare education, imposing principle of direct liability in cases of adverse impact of use of technology etc.

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Right to Health

According to the United Nations High Commissioner for Human Rights, "The right to health contains freedoms such as the right to be free from non-consensual medical treatment, such as medical experiments and research or forced sterilization, and to be free from torture and other cruel, inhuman or degrading treatment or punishment." (Office of the United Nations High Commissioner for Human Rights and WHO)

The right to health has been recognised as a human right in almost all human rights statutes. The Indian Constitution, too, has recognised the fundamental right to the best possible bodily and mental health. The Supreme Court has held that "the right to live with human dignity, enshrined in Article 21, derives from the directive principles of state policy and therefore includes protection of health." (Bandhua Mukti Morcha v. Union of India, 1984)

Law on Technology and Right to Health

Convention on the Rights of the Child: Art. 24(c) Requires state parties "To combat disease and malnutrition, including within the framework of primary health care, through, inter alia, the application of readily available technology and through the provision of adequate nutritious foods and clean drinking water, taking into consideration the dangers and risks of environmental pollution."

As per the estimates of WHO, "at least 2 billion people use a drinking water source contaminated with faeces." (WHO, 2019)Technological inventions such as Clean Water AI (Clean Water AI, n.d.) can help in in ensuring clean water to all. In recent COVID times, many states across the globe used drones to deliver COVID vaccines in remote locations. Such endeavour was accomplished successfully in remote parts of in Manipur, Nagaland and Andamans and Nicobar Islands of India. (WHO, 2021)

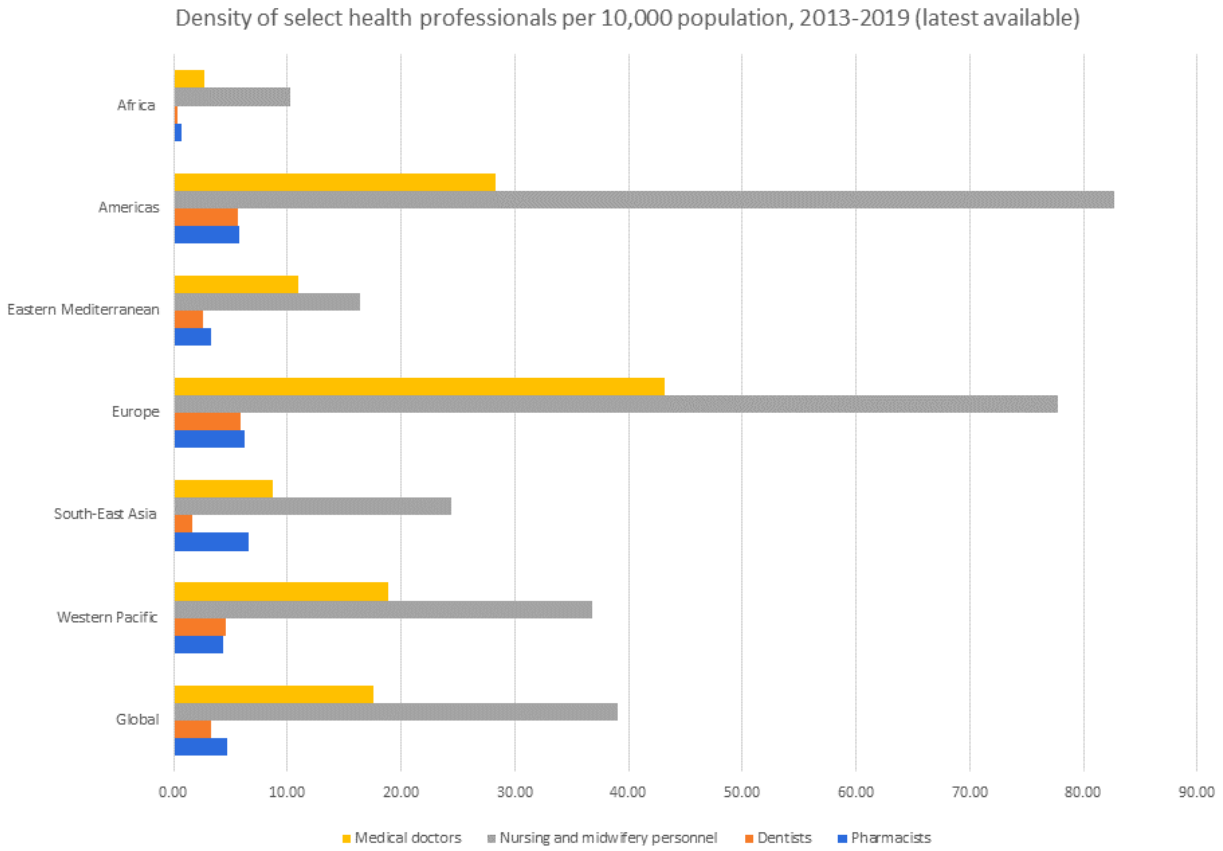
Technology provides greater accessibility to risk free medical treatment. However, the current set of laws, both national and international, have failed in taking the cognizance of technological developments and its role in better protection of right to healthcare. In achieving universal access to health services there is a need of strong legal regime to assure equitable and affordable access to medicines, vaccines and healthcare facilities with aid of technological inventions.

Need of Technology

2 Medical doctors per 10,000 **population in Africa**	9 million **additional nurses needed by 2030**	18 Million **more health workers are required by 2030**

***Table 1:** Inadequate health workforce (WHO, 2021)

In entire world, African region is the most backword region in terms of availability of health care professionals.



***Graph 1:** Density of select health workforce per 10 000 population. (WHO, 2021)

It is clearly evident from aforementioned statistical datasets provided by WHO, that the current healthcare workforce is not adequate enough to cater the healthcare needs of world population. This has often led to blatant violation of basic human right such as right to health, access to healthcare, right to adequate standards of living etc. Advance AI technology may fill up this gap and help in improving access to healthcare. "Today, empowered by the vast amount of health information available online and on apps, and by the array of health and fitness wearables, many people are much less dependent on their doctors for advice. Chatbots are also being used to revolutionise communication within hospitals and patients." (Hyacinth, 2018)

With faster and affordable access to internet technology, the awareness about diseases and the possible treatment/precautionary measures, has increased a lot. For e.g. "75% of the UK population goes online for health information." (Taylor, 2015)

With technological advancements, the cost of healthcare is rising but investments in health are not rising. India invests only 4.69% of its gross domestic product (GDP) on health which is much lower than even other developing countries.

Overview of use of Technology in Healthcare

With increasing number of technological innovations, the use of technology for better access to standard healthcare facilities is also increasing. In modern days, Artificial intelligence is being used to improve the patient experience. Liverpool's Alder Hey Children's Hospital is

collaborating with IBM Watson to develop a 'cognitive hospital,' which will include an app to help patients engage with each other. The app seeks to identify patient concerns prior to a visit, provide on-demand information, and provide physicians with information to assist them in providing suitable therapies. (Alder Hey Children's NHS Foundation Trust, 2016)

Google's DeepMind has taught machines to read retinal scans with at least as much accuracy as an experienced junior doctor. (Health Managment, 2019)A Google AI spinoff has constructed an artificial intelligence (AI) network DeepMind which has taken a giant step forward in addressing one of biology's most complex challenge i.e. predicting a protein's three-dimensional form from its amino-acid sequence. (Callaway, 2020) It would significantly speed up efforts to comprehend the building blocks of cells, allowing for faster and more advanced medication development. (Callaway, 2020)

Radiology - Image analysis plays a vital role in diagnosis and identification of medication. AI solutions are being developed to automate this process to make it faster and error free. This will help radiologist in driving efficient and error free report generation. (Marshall, 2021)

Surgery – AI powered Robotic toolsare being used to carry out complex tasks in keyhole surgery, such as tying knots to close wounds, suturing, stitching, tissue retraction, puncturing, cochleostomy, anesthesia or even diagnosis." (Yohannes Kassahun, 2015)

Medical imaging – AI could cut the cost and time spent in analysing scans, enabling for more scans to be done in order to better target treatment..It has shown encouraging results in diagnosing pneumonia, breast and skin cancers, and eye diseases. (Pranav Rajpurkar)

Screening for neurological conditions – "AI tools are being developed that analyse speech patterns to predict psychotic episodes and identify and monitor symptoms of neurological conditions such as Parkinson's disease." (Bedi, 2015)

Patient Risk Identification - AI systems can provide real-time support to healthcare professionals by analysing volumes of historical medical data to help identify at-risk patients.

Re-admission risks are being focused, with patients who have a higher likelihood of returning to the hospital within 30 days following discharge.

Remote Monitoring

This enables patient health monitoring outside traditional clinic setup. It includes, bio sensing wearable's that help in tracking health activities, monitoring and detecting real time health changes. It also helps in networking the health professionals and patients for long term treatment and emergency care.

Robotics

"The medical robotics domain includes robotic systems that provide support in medical processes of healing (surgery) and care (diagnosis).Assistive robotics covers systems that provide assistance in task-related healthcare processes, either to carers or to patients, in care facilities. This assistance involves logistic tasks, surveillance, bed transfers, etc. The rehabilitation robotics domain covers a range of different forms of post-operative or post-injury care where direct physical interaction with a robot system will either enhance recovery or act as a replacement for lost function." (Edwin Daniel Oña, 2019)

Ethical issues

As observed hereinabove, the technology has been playing pivotal role in transforming the accessibility and quality of healthcare services that are being provided. However, use of technology has also raised few ethical-legal issues, they are as follows;

- Erroneous decisions of Artificial Intelligence based medical tools resulting in medical negligence may raise issues pertaining who are liable? The current set of legal norms is silent on such issues. In 2015, during clinical trial, an AI app erroneously instructed doctorsto send home patients with asthma.In the said instance, AI app demonstrated inability to take contextual information into account. (Rich Caruana, 2015)

- The current legal framework also fails to address the issues like, privacy threats, ownership of patient data (required for development of new AI solutions) and its confidentiality, regulation of Smartphone/ m-health services, its standards and liabilities etc.
- Although AI applications have the potential to eliminate human prejudice and mistake, the data used to train them might reflect and reinforce biases. (Dilsizian SE, 2014)
- Privacy issues: In healthcare, AI uses a data that is highly private and sensitive. The risk of AI systems getting hacked to obtain access to sensitive data, or that it being spammed with phoney or biassed data may not be negated and is very difficult to detect. "AI technologies that analyse motor behaviour, (such as the way someone types on a keyboard), and mobility patterns detected by tracking smartphones, could reveal information about a person's health without their knowledge." (Rafael Yuste, 2017)
- Legal restrictions: The new EU General Data Protection Regulation (GDPR) prohibits a decision making based solely on automated processing that produces legal or similarly significant effects. It states that information provided to individuals when data about them are used should include "the existence of automated decision-making …meaningful information about the logic involved, as well as the significance and the envisaged consequences of such processing for the data subject". (EU, 2016)
- AI depends on digital data. Any inconsistency quality of data restricts the potential of AI.

Recommendations/Contribution of Paper

To address the above mentioned issues, author proposes following recommendations;

- Universal Health Coverage (UHC) (policy of WHO focussing upon access to health care) as part of Sustainable Development Goals should focus on use of technology to tackle the deficit of health care professionals. This will help in improving the access to healthcare.
- Develop a comprehensive e-Health policy to address all medico legal issues analysed hereinabove. A joint platform of Medico-Legal professionals (like the one in USA) is recommended in this regard.
- Promoting digital healthcare education to ensure better and faster access to healthcare, and to provide create and spread awareness about legal regulations controlling such digital healthcare.
- Define Privacy standards for patients and recognise right to forget given to the patient as well as to the legal heirs of deceased patient.
- In states recognising AI robots as legal persons, the Direct Liability Model of Gabriel Hallevy should be implemented, thereby holding the AI system liable for actions or inactions, whatever the case may be, resulting in wrong or human right violation. However, in legal systems wherein AI has not been recognized as a person, the legal persons and/or natural persons benefitting by use of such AI technology and/or the developers may be held liable depending on the error or fault committed.
- All such use of AI technology must be permitted only subject to prior third party insurance against any possible wrong resulting in damage to human being or their property.
- Set up a joint platform of techno-legal professionals to set (and to periodically update) the standards for e-health services and technology based medical services

CONCLUSION

With continuous evolution of technology, and its increased application in healthcare industry, the law also need to adjust itself in order to address the issues likely to arise out of the same. Inter professional platforms between legal, medical and technological experts is need of an hour to keep the laws in flux as and professionals updated about the same. Unfortunately, in countries like India, law making has, by and large, remained an alien territory for professionals other than legal ones. Now is the time to change

this approach and involve the professional of other fields such as, medical, technological, scientific etc. So as to make legal regime more practical and effective. Going ahead, the future work may stress on possibility of involving domain experts in framing legal policies.

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