



# Reaching The Unreached By Delivering Ehealth Services In India: An Overview

**Dr Ramnik Kaur, Assistant Professor, Department of Public Administration, Punjabi University, Patiala.**

## Abstract

Currently, the healthcare sector has undergone a substantial shift. E-health and telemedicine, often known as virtual care, have grown significantly in India. The practice of offering medical services when patients and healthcare professionals are not near one another but instead communicate with each other through electronic channels is known as e-health. This paper will highlight the boom of e-health being supported and triggered by various factors such as the proliferation of smartphones, high-speed internet connectivity, and other digital platforms, offering numerous benefits to not only to patients and but healthcare providers as well. The Indian Ministry of Health and Family Welfare, Ministry of Communication and Information Technology, as well as certain state governments and the Indian Space Research Organization (ISRO), playing a significant role in the development of eHealth in India. It will also discuss the E-health's major obstacles despite its potential providing with some recommendations for better and vast acceptance.

A progression along the evolutionary path of information and communication technologies (ICT) in healthcare has been described as 'Digital Health' an era that constitutes a great leap forward and transcending technologies rather than just the next technological step. Digital health is embedded widely and has been accepted as the fourth industrial revolution - the use of virtual care, big data, analytics, and technologies developments. As compared to nearly all other industries, healthcare sector was widely viewed as a laggard in adopting new technologies. Recently, Digital health is emerging in health systems by strengthening the eHealth era, where a citizen centric approach to digital technologies has created the necessary foundational infrastructure.

During the peak of COVID19, healthcare services were offered on social media platforms. Many people received aid by sharing their requirements through WhatsApp, Instagram, Twitter and Facebook. Messages regarding the availability of oxygen cylinders, hospital beds, lifesaving drugs, home-cooked meals and other essential equipment were often seen circulating on social media platforms. It was during this time that many mental health applications and online therapy sessions were introduced to provide people with safe spaces to talk about anxiety, loss, loneliness and other mental health issues bought on by the pandemic. During this

time, state governments also released dashboards outlining the contact information for various hospitals and live status updates for hospital beds<sup>1</sup>.

Digital health is basically the utilization of electronic communication or information technology-based processes, tools and services to facilitate better healthcare services. To revolutionize ways to attain higher standards of access to health services there is an urgent need of utilization and scaling up of digital health solutions. Such an effort is also likely to protect and promote well-being and health of the people. As we can see in the recent pandemic people are avoiding public places such as parks, hospitals, clinics in a bid to avoid contacting the disease. In addition to that, phenomenal penetration of smartphones and various mobile apps, including the ones designed for providing health-related services are likely to drive the demand for digital health services.

## **eHealth in India**

As defined by the United Nations Foundation, eHealth is “using information and communication technology (ICT)—such as computers, mobile phones, and satellite communications—for health services and information.” eHealth can be understood as a term for collectively describing the use of electronic information and communication technologies in the health care sector. eHealth refers to technologies used across the value chain in the health care industry from clinical trials to educational, research, and administrative purposes, both at the local site and across geographies or regions. It has improved the efficiency in health care delivery, extended health care to rural areas, provided better quality of health care at a lower cost, enhanced the use of evidence-based medicine, emphasize preventive health care, empowered patients and consumers, and supported relationships between patients and health professionals<sup>2</sup>. It consists of different electronic health data exchange such as:

- Telemedicine is described as the remote delivery of healthcare services including examinations/tests and consultations using telecommunication services. Though this the healthcare providers get the opportunity to evaluate and treat patients without their physical presence.
- mHealth (mobile health) refers to the practice of medicine and welfare supported using mobile smart devices. Provides health information to the public through text messages, and give the public direct access to health information through call centers, or querying data bases with text. With the increasing number of smartphones consumers, these devices can be used to effectively use digital technology to support healthcare facilities, address the growing health concerns and support the use of m-health services.
- Electronic Health Records (EHR) is a systemized collection of patient history stored electronically that can be accessed across multiple formats. This helps in keeping track of each patient’s conditions and care with electronic health records.
- Big Data: Big data is expected to be a gamechanger in this space by providing a lower rate of medication errors.

<sup>1</sup> <https://www.statista.com/outlook/dmo/digital-health/ehealth/india>

<sup>2</sup> eHealth Magazine. Available online: <http://www.ehealthonline.org/>

- Virtual Reality: Virtual Reality has already started making its mark in the digital health world by providing support in treating anxiety, post-traumatic stress and stroke, among others. Virtual Reality is slated to play a major role in complicated surgeries.
- Wearables: Wearable sensors to monitor the health helps in tracking an individual's body functions. In the age of smartwatches, fitness bands, sugar monitors etc, wearables are playing an important role in making patients aware of the likelihood of a health emergency. With wearables tracking heart rate, exercise levels, sleep quality etc, these can play a key role in providing up to date monitoring of high-risk patients.
- Artificial Intelligence (AI): The power of artificial intelligence can be seen in areas such as precision medicine, medical imaging, drug discovery and genomics. Additionally, the use of chatbots and virtual assistants shall see a sharp increase in the times to come.
- Blockchain: Blockchain technology has already been deployed to create digital versions of medical charts.

The World Health Organisation defines three key areas of e-Health<sup>3</sup>:

- Delivery of health information and records, for both the professionals as well as the consumers.
- Using the power of information technology and e-commerce platforms to improve the public health infrastructure.
- Use of e-commerce and e-business practices in health management systems.

In India, the digital health market was valued at INR 116.61 billion (\$ 1.57 billion) in 2018. The market is estimated to reach INR 485.43 billion (\$ 6.53 billion) by 2024, expanding at a compound annual growth rate of approximately 27.41 per cent during the 2019-2024 period. According to India's e-Health Market Opportunity Report 2021, the e-health market is projected to hit \$ 10.6 billion in revenue by 2025. The telemedicine market has the maximum potential within e-health in India and is expected to touch \$ 5.4 billion by 2025, growing at a compound annual growth rate of 31 per cent. Emerging as a strong market for wearables, India has sold approximately 2 million units in 2017 and is expected to reach 129 million units by 2030. India's surgical robotics market is estimated to expand at a compounded annual growth rate of 20 per cent between 2017 and 2025 and achieve a size of \$ 350 million by 2025. According to a recent report it is estimated that even though e-pharmacy is at a nascent stage in India, it is expected to reach \$ 4.2 billion by 2025. The overall larger health tech market in India is slated to reach \$ 21.3 billion by 2025 acquiring 3.2 per cent of the global health tech market pie. India is now also home to 133 health tech start-ups that have seen increased demand during the lockdown.

### **Role of Ministry of Health and Family Welfare**

The Indian Ministry of Health and Family Welfare, Ministry of Communication and Information Technology, as well as certain state governments and the Indian Space Research Organization (ISRO), are

<sup>3</sup> WHO (World Health Organization) Website <http://www.who.int/en/>

playing a significant role in the development of eHealth in India. Below are a few advantages of e-health provided by the ministry- and state governments in India<sup>4</sup>.

- **Efficiency:** Using modern technology within healthcare enables professionals to reduce inefficiency, save time and accurately diagnose and treat diseases.
- **Reduction in cost:** More efficient treatments lead to reduction in cost. One potential way is by dodging duplicative assessment through improved communications between healthcare providers and electronic medical records.
- **Empowerment:** e-Health services enable both the consumers and healthcare providers to feel more empowered by making available the knowledge base of medical data and health records over the internet.
- **Better relations:** e-Health services can enable better relations between the patient and the expert since it provides clear and easier channels of communication.
- **Equity:** e-Health is a great concept for reducing the gap between the haves and the have nots. It enables equitable healthcare access irrespective of age, race, gender, ethnicity, geography etc. Digital health also enables access of better healthcare facilities to remote locations.
- **Education:** e-Health services are beneficial for educating healthcare professionals of any medical advancements. These services can also be beneficial for consumers to educate themselves about personalised preventative healthcare.
- **Faster decision making:** With the advent of decision-making software and increased automation, decision making in medical situations have become much faster and more efficient. Patients need to merely input their symptoms in order to understand their symptoms and possible options of treatment.

Healthcare services in India remain unevenly distributed especially in rural India, as there is unreliable access to medical and healthcare services. In the absence of an organised modern healthcare system, traditional practices remained widely prevalent, often posing a fatal risk to patients who tend to be caught unaware of potential diseases and cures. In order to extend the delivery of healthcare services and expand the public healthcare system to all corners of the country, the Ministry of Health and Family Welfare (MoHFW) has undertaken measures to promote digital healthcare with a view to empower citizens through the dissemination of crucial information. Among the first steps taken by the Modi government was establishing the National eHealth Authority (NeHA) in 2015 that would serve as a promotional, regulatory and standards-setting organisation in the health sector. NeHA has a goal to ensure the development and promotion of the eHealth ecosystem in India and enable the organisation, management and provision of effective people-centred health services to all in an efficient, cost-effective and transparent manner.

In view of the risks posed by the lack of penetration of health services, the MoHFW, through a comprehensive nation-wide e-health programme, hopes to address the gap in human resources and ensure efficiency, improve patient safety through access to medical records, reduce healthcare costs, improve training and capacity building, and aid in evidence-based planning and decision making. To this end, the ministry outlined

---

<sup>4</sup> Ministry of Health and Family Welfare, Government of India Website <http://mohfw.nic.in/>

various initiatives in the National Health Policy, 2017 that aim to deploy digital tools to improve the efficiency and outcome of the healthcare system in India.

The first aspect of digitising health services in India is the Interoperable Electronic Health Records (EHRs). EHRs are an online repository of medical records of citizens that facilitate continuity between different healthcare providers, ensure affordability of service, and promote a better decision support system. Standards for EHR have been determined and notified in December 2016. A key element of electronic records is interoperability, or the ability of computer systems to use and exchange information. The guidelines for this were determined and notified by the Ministry of Electronics and Information Technology in August 2018 under which all public and private health facilities have been issued a National Identification Number (NIN). So far, 99 per cent of public health facilities in India have been allocated a NIN<sup>5</sup>.

Furthermore, a Hospital Information System (HIS) is being implemented for computerised registration and capturing of patients' EHRs. The HIS improves efficiency and leads to better delivery of services to patients. These digital repositories are also accessible to individual patients themselves on a single online personal medical record storage platform. This centralised platform improves accessibility and sharing of personal health data, making it easier for patients to track their medical histories and share with physicians at ease.

The MoHFW has also implemented a framework for the National Health Stack (NHS) that has recommended a National Digital Health Blueprint. The blueprint details a pathway for the holistic adoption of digital technologies based on global best practices. Key features of the blueprint include a federated architecture of five layers: Unique Health ID (UHID), privacy and consent management, national portability, EHR, applicable standards and regulations, health analytics and above all, multiple access channels like a call centre, Digital Health India portal and MyHealth App.

Indeed, India's experience with the tremendously successful Aarogya Setu app is a testament to the growing public ease with e-health services. Developed in a record 21 days, the Aarogya Setu app quickly became the most downloaded Covid-19 tracking app in the world. However, the app continued to serve the Indian people in another crucial matter: checking for the availability of and registering for Covid-19 vaccines. India's vaccine rollout, aided in large part by the Aarogya Setu app, has been internationally acclaimed. The evidence of its success is apparent in the number of people India has managed to vaccinate. As of 5 January 2022, we have administered nearly 1.5 billion vaccines with the drive just opening to children below 18 years of age<sup>6</sup>.

A number of new portals and websites have also been introduced to promote better penetration of health services and related information. The MoHFW has launched a website to monitor Health and Wellness Centers (HWCs) under the Ayushman Bharat Scheme. HWCs deliver comprehensive primary healthcare by upgrading existing health facilities like Sub Health Centres (SHCs) and Primary Health Centres (PHCs) or aiding in relevant infrastructure development. To improve the quality of care in labour rooms and maternity operation theatres, a dashboard called LAQSHYA has also been launched the data for which is updated by

---

<sup>5</sup> [www.meity.gov.in](http://www.meity.gov.in)

<sup>6</sup> <https://aarogyasetu.gov.in/>

states. An application that prevents, controls and screens for Non-Communicable Diseases (NCDs) is also maintained by the MoHFW.

Other ministry initiatives include a programme that makes information calls about safe motherhood and natal care to beneficiaries, a website dedicated to mental health awareness, an emergency medical response website and a website that facilitates the collection, collation, transmission, analysis and feedback of India's vaccine safe data from the country's peripheries. The National Health Portal (NHP) is perhaps the most popular undertaking that aims to improve health literacy, improve access to health services, decrease the burden of diseases through awareness and serve as a single point of access for consolidated healthcare-related information for Indian citizens.

### **Challenges for eHealth in India**

The challenges for an efficient, sustainable eHealth system are numerous<sup>7</sup>:

#### **Incentivisation**

Incentivising all the stakeholders involved is a major challenge and raises the question of who will pay the bill since the cost of infrastructure, medical drugs, doctors' fees, and other operating costs could be very high. Hence, there is a need to divide these costs among different entities.

#### **Cost Containment**

Providing health care to India's population is costly, and introducing ICT would require extra upfront investment. There is a need to manage the costs in such a way that the overall cost of health care goes down. This could be achieved if the overall health care budget includes more money for ICT. An eHealth programme would need to generate large numbers of beneficiaries for costs to be justified.

#### **Information Exchange**

Health information exchange needs to be demand driven, with proper access and control mechanisms in place. The challenge is to motivate and encourage key stakeholders—patients, medical service providers, insurance companies and the government—to pull as well as push the right kind of information from the system. David Thomas, Managing Director and Head of Global Health at the Matrix Knowledge Group, UK, said, "Informatics is a major challenge in India and telematics is a major challenge in government hospitals."

eHealth for India: Reaching the Unreached

#### **Adoption and Resistance**

In India and across the globe, there is reluctance on the part of patients and doctors in fully adopting eHealth. The right kind of technology must be utilized in the right way so patients as well doctors feel comfortable in

---

<sup>7</sup> Indian Journal of Medical Informatics, "E-health - drivers, applications, challenges ahead and strategies: a conceptual framework." Available online: [http://www.iami.org.in/journal1/E-health%20%20IJMI%20\(2\).doc](http://www.iami.org.in/journal1/E-health%20%20IJMI%20(2).doc)

adopting eHealth practices. Companies not only have to prepare the best technical systems but also make sure that they are easy to understand and use. Success will require multiple public awareness programmes on the benefits of eHealth.

### **Staffing at Different Levels**

eHealth is not just about having technology in place. It should also have an identifiable, approachable and well-qualified human interface. Getting the right people to use these technologies in order to provide proper health care services is very important. Hence, there is a need to hire the right people and train them properly so that they are well equipped to carry out the task of providing health care to remote areas.

### **Evaluation**

Evaluation of the processes needs to be fair and done by an independent third-party observer. There is a need for benchmarks in order to track progress. These could be taken from best practices from local projects or from notable projects in other countries such as Sweden, Singapore, etc. An independent body could be created for this purpose which would provide ratings. The resulting evaluation would provide a continuous learning loop which would also inform the eHealth framework itself.

### **Power Sharing**

The entire system of health care should be such that it can be driven by both central and state government. Power, responsibility, accountability, rewards and risks must be well defined in advance so as to avoid any conflict of interest.

### **Managing Information**

The information collected should be media rich - containing video, image, text, etc. This information should be properly archived, accessible, retrievable, secure, and readable from remote locations using different technology platforms. "One patient, one record" needs to be implemented, so as to avoid duplication of information. Innovative and cost-effective health informatics solutions need to be created to meet this goal.

### **Education**

eHealth is not just about providing health care service when someone is unwell, but it should also be used to promote preventive health care to improve the standard of living and reduce health care costs in the medium-to-long term. This will also help in improving and enabling higher productivity elsewhere in society. But achieving this requires bringing people into the system and educating them about the different preventive measures to avoid disease outbreaks like H1N1, or other seasonal diseases.

## Recommendations

- Use of mobile currency—mobile currency, or talk time, can be offered to people on the ground in order to compensate them for their efforts. Telecom companies can be stakeholders as they can engage in a positive social cause while promoting themselves. This can also be undertaken as part of the Corporate Social Responsibility activities of the company.
- People need to be encouraged to work not only for material incentives but also for the societal benefits of eHealth. Working together to collect and spread health information benefits everyone.
- A differential pricing mechanism can be implemented to cover the cost of providing health care services. Since the government subsidizes health care, high-income earners, whether in villages or cities, can pay the full amount for health care services, and the saved subsidy can be used to further subsidise services for the poor.
- Some medical practitioners are reluctant to participate in eHealth because they are unaware of the benefits and effectiveness of the ICT technologies in health care services. Educating these practitioners about the potential to reach patients in rural areas might encourage them to use these technologies.
- Physical network infrastructure: Connect all stakeholders involved (patients and practitioners) to push and pull information. Use all forms of network infrastructure (wireline and wireless infrastructure) to connect with rural India for health care services. Encourage deployment of commercial networks, which would result in expanding bandwidth.
- Digital infrastructure: Enable a standardized, media-rich, voice, data and video content capability. Use a cloud computing model and offsite hosting of applications to provide remote IT expertise.
- Human infrastructure: Provide trained medical practitioners at all levels in the value chain. Create an “Integrated Skill Development Program” to meet the challenges of the shortage of trained human resources in rural India.
- Policy infrastructure: Ensure a policy environment which provides rules for information exchange, provides adequate incentives for the stakeholders and improves control and capability of the overall system at all levels.

## Conclusion

The evolution of e-health services will play a pivotal role in assisting India in attaining Universal Health Coverage. The COVID-19 pandemic has catalysed the widespread adoption of e-health services, leading to its remarkable transformation. e-Health services save patients valuable time but also enhances their overall healthcare experience. Nonetheless, challenges remain, particularly for the Indian population, especially the elderly, about utilizing such services. To realize the vision of digital health, it is essential to strengthen healthcare services through the implementation of telemedicine, mHealth, Electronic Health Records, Big Data virtual healthcare, wearables, artificial intelligence (AI), and necessitating improved cooperation among all stakeholders (PPP) and concerted policy action.



## References

1. <https://www.statista.com/outlook/dmo/digital-health/ehealth/india>
2. eHealth Magazine. Available online: <http://www.ehealthonline.org/>
3. WHO (World Health Organization) Website <http://www.who.int/en/>
4. Ministry of Health and Family Welfare, Government of India Website <http://mohfw.nic.in/>
5. [www.meity.gov.in](http://www.meity.gov.in)
6. <https://aarogyasetu.gov.in/>
7. Indian Journal of Medical Informatics, “E-health - drivers, applications, challenges ahead and strategies: a conceptual framework.” Available online: <http://www.iami.org.in/journal1/E-health%20%20IJMI>