

A STUDY OF INFORMATION FLOW AND PRESERVATION OF ELECTRONIC HEALTH RECORDS OF GOVERNMENT HOSPITALS

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ABSTRACT

The Government of India has focused on digitizing its health care, including Electronic Health Records (EHR) to provide better patient data management, seamless coordination between healthcare providers, and improving healthcare research. This paper, based on secondary information analysis and a primary survey, discusses the policies to support EHR adoption in India, the status of EHR adoption the policy gaps, infrastructure barriers, financial barriers, and other obstacles. It provides the Government of India and the health service providers with recommendations to overcome the obstacles faced and successfully implement EHR systems. For EHR to be successful, there is a need for increased funding from the private sector, the government, and partnerships/collaborations. The paper suggests ways to streamline the data collection and compilation process and address the infrastructure gaps. It presents examples of how India can learn from global best practices of implementing EHR.

KEYWORDS: Electronic Health Records; India; Health Policy; Health Information Technology; Universal Health Coverage

INTRODUCTION

As a developing country, with the second-largest population in the world, India has an ever-growing need for quality health care. Digitalizing health care is one of the key objectives of the government to ensure equal access to treatment at a reasonable cost. The Indian government is also keen on affordable drug discoveries and health care research through the use of data generated in the country. Electronic Health Records (EHR) is at the core of India's goals of digitalizing the health care system and moving towards universal health coverage (UHC). India is taking cognizance of the benefits of EHR systems in terms of improved patient coordination, increased patient participation, improved medical research, and reduction in health care costs. In 2018, the Government of India (GoI) launched the UHC scheme, known as the Ayushman Bharat Yojana. This national health insurance scheme has two main components –

- (i) the Pradhan Mantri Jan Arogya Yojana (PM-JAY) which aims to provide an INR 5,00,000 cover to the bottom 40 percent of the population for secondary and tertiary care and
- (ii) the establishment of around 1,50,000 health and wellness centers across the country for primary care, especially in rural areas.

As a result, health data is being regularly collected for the said beneficiaries and there is a mandate from the government to digitize these records and take steps towards implementing EHR systems. Several national-level policies such as National Digital Health Blueprint (2019) are being formulated to create a pan-India digital health record system. At the provider-level, large health systems like Tata Memorial Hospital and Max Hospitals Private Limited have implemented electronic medical record (EMR) systems and are moving towards EHR. However, the status of EHR adoption is not aggressively tracked, and through our survey, we try to understand the progress India has made in EHR adoption. In this study, exploiting India's ongoing drive of digitalizing health care in the country, we discuss the obstacles in realizing EHR systems in India and provide recommendations to help the GoI. In the subsequent sections, we discuss

- (a) The policies in place to support EHR adoption in India
- (b) The realities of EHR adoption in India
- (c) Barriers experienced in the implementation process, and
- (d) The way forward to successfully implement EHRs in India.

HEALTH RECORD IN GOVERNMENT HOSPITALS

Health Record of any individual is a record which maintains all health details of an individual from conception or birth till death of that individual. This record includes all health diagnosis reports, doctors' review on the health of the individual, vaccination and also regular check-up done at home. Health records when maintained electronically help the physicians in faster diagnosis and cuts down costs for unnecessary repetitive diagnosis.

An Electronic Health Record (EHR) needs to be maintained with some standards, which will help health centers to maintain inter-operability. There is a need to have pre-defined standards for information capture, storage, retrieval, analytics and exchange and it includes text, images and clinical codes which are used globally. HIMSS defines inter-operability (2013) as the ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged. Data exchange schema and standards should permit data to be shared across clinician, lab, hospital, pharmacy, and patient regardless of the application or application vendor. In a country like India in remote and hilly regions the access to networks is very low.

In the areas where interoperability is possible, use of similar structures and common vocabulary or codes will be better understood (example SOMED CT (Systematized Nomenclature of Medicine Clinical Terms) or ICD 10(International Code for Diseases, Version 10)).

To achieve complete inter-operability, multiple layers of network transfer protocol will be required along with standardized data information, description, vocabulary and code sets. This

will also require continuous up gradation of the software, rules and regulations, codes and guidance from the authorities. Health Record Systems have to be secured by all means and cannot be accessed without proper authorization. Hence, the healthcare providers have to consider the following security measures:

- Ensure complete confidentiality, integrity and availability of the electronic health records that are created, transmitted, received or maintained.
- protect against any anticipated threat to the security of EHRs.
- provide protection against inappropriate use and disclosures of electronic health record that are not permitted under Privacy standards.
- Ensure that their workforce will follow the rules and regulations set for security policies and to follow the procedures.

After the NHP 2002, the next NHP was in 2017. The aim of this policy was to strengthen the role of Government in health systems. HIMMS is one of the objectives of this policy along with electronic database at all health care systems at district level by 2020.

POLICIES TO ENABLE EHR ADOPTION IN INDIA

India follows a quasi-federal structure of governance and health is a state subject in the Constitution of India. Therefore, it is up to the state governments' discretion to implement policies formulated by the central government. Health care policies are largely formulated and implemented by the Ministry of Health and Family Welfare (MoHFW) and the government's policy think-tank, National Institution for Transforming India (NITI) Aayog, supports the MoHFW in its endeavors. A number of schemes like the "Ayushman Bharat Yojana" is jointly managed by the MoHFW and NITI Aayog. Some key policy and strategy documents supporting the move towards EHR include MoHFW's National Digital Health Blueprint (NDHB) of 2019 and the NITI Aayog's Health System for New India: Building Blocks (NITI Aayog, 2019), released in 2019. The NDHB (2019) provides an action plan for realizing digital health. It recognizes the need to establish a specialized organization, the National Digital Health Mission (NDHM) to drive the implementation of NDHB and facilitate the evolution of a national digital health ecosystem. The key features of the blueprint include a federated architecture, a set of architectural principles, a five-layered system of architectural building blocks, Unique Health ID (UHID), privacy and consent management, national portability, EHR, applicable standards and regulations, health analytics, MyHealth App for increased patient participation, multiple access channels like call centers for support, and the Digital Health India portal for increased data sharing between healthcare providers and patients. While the NDHB (2019) lays out the blueprint to create a National Health Exchange (NHE) accessible to all citizens, the NITI Aayog (2019) discusses the key issues being faced as well as components and standards required for the success of digital health in India. The report outlines six "pillars" of digital health in India. These include the selection of a governance entity, registries for health data, a strategy for the development of a unified health information system, design for health insurance information systems, EHRs for patients and health care providers, and the creation of a health information

infrastructure for the integration of all the mentioned components. Given that the policies are fairly recent, the next section presents the current status of EHR adoption in India.

STATUS OF EHR ADOPTION

In India, EMR adoption gained popularity in the last decade. In our sample, all private hospitals have some form of EMR system while the Government hospitals said that in villages and remote areas, there are digital access issues, and they maintain paper records. Only 8 out of the 13 hospitals were using the EMR system to record clinical data. They used this data for analysis, for quality assurance and to identify areas of improvement in hospitals. The other 5 EMR systems had health information systems (HIS), which were being used for billing and inventory management. EMRs provide improved patient data tracking. However, EMRs are not designed to be shared outside a particular practice which makes EMRs hard to be shared across medical facilities like labs, pharmacies, and specialists. All hospitals that were surveyed have plans to either expand their EMR systems towards EHR or implement an EMR system to ease the process of recording and sharing data and leverage the same to improve health outcomes. For example- a CTO pointed out that they intend to create a bio bank of diagnostic images and use it in the future for appropriately designing care for cancer. However, given the low IT budgets of the hospitals and other issues, these goals and their implementations are at a nascent stage.

NEED TO INCREASE FUNDING BY GOVERNMENT AND PRIVATE SECTOR

As per the National Health Policy of 2017, the government wants to increase Government health expenditure to 2.5 percent of GDP by 2025 from 1.5 percent in 2017. Survey participants pointed out that the target of 2.5 percent should be aggressively pursued, with a focused budget allocation towards digitization, along with attracting more investment through conducive policies and incentives. This should also include the cost of training medical professionals with the EHR systems, rules, and standards. There should be clear targets of complete digitalization of district-level hospitals and primary health care centers.

Focus on Pan-India Minimum Quality of Health Care Delivery through Private Partnership

Private hospitals account for close to 60 percent of the health care system in India. These are concentrated in urban areas while Government hospitals have a larger presence in rural areas. There is a need to equip all hospitals with basic technology, infrastructure, and training. Following this pilot survey, a pan-India survey of hospitals to understand needs and gaps can help facilitate this.

LOW GOVERNMENT HEALTH EXPENDITURE

The Indian government spends only 1.13 percent of its gross domestic product (GDP) on health care (NITI Aayog (2019). Data from the Organisation for Economic Co-operation and Development (OECD) shows that India's average spending on health care is lower than that of both developed and developing countries.

A. Infrastructure Readiness

The government hospitals pointed out that in many hospitals there is a shortage of computers for basic data entry and the data storage facility is extremely poor. According to survey participants,

there has to be a basic level of technology usage across hospitals for digital healthcare government initiatives in digitalization to be successful. In addition, as of 2018, more than 4 percent of the Indian population did not have access to electricity and only 20 percent of the population used the internet. Given that a large number of rural hospitals are Government hospitals, uniform EHR implementation is difficult without addressing this issue.

CONCLUSION

The GoI and the Indian health care industry understand the widespread benefits of implementing EHR systems. As a result, they are committed to adopting these systems on a grand scale. As of date, the adoption of such systems is limited to the private health industry. Our survey identified several issues at the government and health care provider levels impeding the efforts towards EHR adoption. Based on the findings, we make recommendations towards increasing funding, focusing on business and government partnerships, streamlining the data collection process, enforcing minimum viable standards, and addressing infrastructure barriers to increase EHR adoption in the country. India can learn from global best practices of implementing EHR and customize it to the country's requirements. It was found that 23% of the Government hospitals in India considered for study had implemented EHR and the others still used the manual system to maintain the health records. Along with analysis of questionnaire, observation method was also used and it was observed that most of the hospitals were yet to start implementing and using EHR. Even though the software is provided by the Government there are practical difficulties in implementation and using EHR. In most of the hospitals there are not enough computers to implement EHR. It was found that the Government hospitals which had implemented EHR software were not using it for maintaining health records, it was used for registration, billing, pharmacy, discharge summary and other modules but clinical modules were yet to be used. Various reasons identified during the study were, it was more difficult to use EHR in hospitals where there were too many patients, since saving records electronically took a little extra time and it was difficult to use. Some hospitals were using EHR only for out-patients and were in process of adopting it for in-patients. Hospitals where EHR was not implemented had about 96% respondents willing to shift to electronic method from the manual method. The reasons identified for not implementing EHR were lack of approval from authorities (15%), software not user friendly (80%) and lack of funds (5%). Literature review showed that during initial stages of EHR implementation, many countries in U.S and Europe used the method of extra incentive to doctors if they used EHRs. This method was used only till EHRs became popular. In India, it was found that it is very difficult to pay incentives to use EHRs and instead making EHR usage mandatory in hospitals would be helpful.

It was found that the hardware and network supporting EHR available at work place has significant influence on the ease of documentation in EHRs while seeing patients. If the speed of the network is slow and there are large numbers of patients waiting to be diagnosed then it is very difficult for the doctors to record the observations in EHR. From this study we recommend that hospitals should implement software for EHR which is user friendly and secured. Give sufficient training to the users so that they are comfortable to use it regularly and record all

health observations electronically. Good IT infrastructure and support system is very essential for smooth usage of EHRs.

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