(REVIEW ARTICLE)

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Digital health in your hands: A narrative review of exploring Ayushman Bharat's digital revolution

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Abstract

Background: "The Ayushman Bharat Digital Mission (ABDM)" is a revolutionary initiative started in India in September 2021 that aims to digitalize the country's healthcare industry. Initiatives like Ayushman Bharat Digital Mission, CoWIN App, Aarogya Setu, e-Sanjeevani, and e-Hospital provide healthcare services and facilities that reach every corner of India. This narrative review focuses on the mission's goals, objectives, innovations, significant features, progress, and worldwide scenery for digital health practices—India's healthcare scene by delivering universal health coverage and improving health outcomes. The assessment finds that ABDM is an important step toward a digitalized healthcare system that requires attention and assistance to overcome obstacles and reach its full potential.

Methods: The research utilized various databases including Research Gate, PubMed, Google Scholar, and government portals to conduct a comprehensive literature review. This review article provides a critical analysis and offers essential suggestions, ideas, and recommendations for the effective and rapid implementation of the Ayushman Bharat Program. Furthermore, it includes information about the program's ability to transform India's healthcare sector and achieve universal health coverage.

Conclusion: The revolutionary Ayushman Bharat Digital Mission (ABDM) aims to digitalize India's healthcare industry. It has made major achievements in improving healthcare access, increasing system effectiveness, improving care quality, and promoting teamwork amongst stakeholders in the healthcare system. By implementing strong data privacy and security protocols and developing infrastructure for India's diverse population, ABDM can play a key role in achieving national health coverage and improving health outcomes. ABDM may be vital in attaining national health coverage and greatly enhancing health outcomes with persistent work and strategic assistance.

Keywords: Ayushman Bharat Digital Mission (ABDM); Digital Health; ABHA; Telemedicine; Digital India Initiative; Health Facility Registry (HFR)

1. Introduction

In August 2020, the Honorable Prime Minister of India launched The National Digital Health Mission (NDHM). By providing patients with access to real-time health information, the objective is to create an integrated healthcare system that digitally connects practitioners and patients. This will promote rapid and organized healthcare(1). Later NDHM was renamed the "Ayushman Bharat Digital Mission" and was launched National Health Authority (NHA), an agency of the Government of India. In September 2021 by the Indian government(2,3). It develops and implements Digital Public Goods to improve the availability, accessibility, cost, and acceptability of health care using several building pieces. This objective aims to create an interconnected, efficient, and inclusive national digital health ecosystem. The interoperable frameworks, open protocols, and consent artifacts enable people, public and private healthcare providers, digital

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innovators, and other stakeholders to collaborate and advance equitable healthcare digitalization across the country(4)ABDM has the potential to be a game-changer in a nation where access to high-quality healthcare is severely limited and inequality in healthcare is common(5). By accepting digital technology, ABDM hopes to bridge the gap between healthcare practitioners and patients, improve patient participation, and facilitate the communication of health information(6). India's healthcare system is at a turning point. Universal health coverage (UHC) is a goal that digital technology is helping to achieve by making health services more accessible, inexpensive, and of high quality. Industry-wide digitization is proliferating and will eventually be accepted. Globally, the nexus between technology and health has demonstrated the capacity to enhance existing care delivery models, direct them toward patient-centeredness, and improve overall health outcomes(7)Through technology, global digital health is revolutionizing healthcare by increasing results, efficiency, and accessibility. While there are many chances to improve global health, overcoming the related obstacles is necessary to utilize the advancements in digital health (8) fully

The ABDM aligns with the government's vision of "Digital India" and represents a significant step towards transforming the healthcare sector into a more connected, efficient, and patient-centric model. Initiatives such as Ayushman Bharat Digital Mission, CoWIN App, Aarogya Setu, e-Sanjeevani, and e-Hospital have brought healthcare facilities and services to every part of India.(8)

Thus, this review aims to focus on the Ayushman Bharat Digital Mission's objectives, key characteristics, innovations, and global environment of ABDM's digital health practices. The review focuses on the mission's goals, techniques for implementation, worldwide scenery for digital health practices, and difficulties to shed light on how ABDM can change India's healthcare system and lead to universal health coverage.

Objectives:

- To evaluate the Ayushman Bharat Digital Mission's (ABDM) goals, innovations, and significant features.
- To assess its progress and global implications in digital health practices, and identify the challenges, and opportunities for achieving universal health coverage and improving health outcomes in India.

Source: Government of India

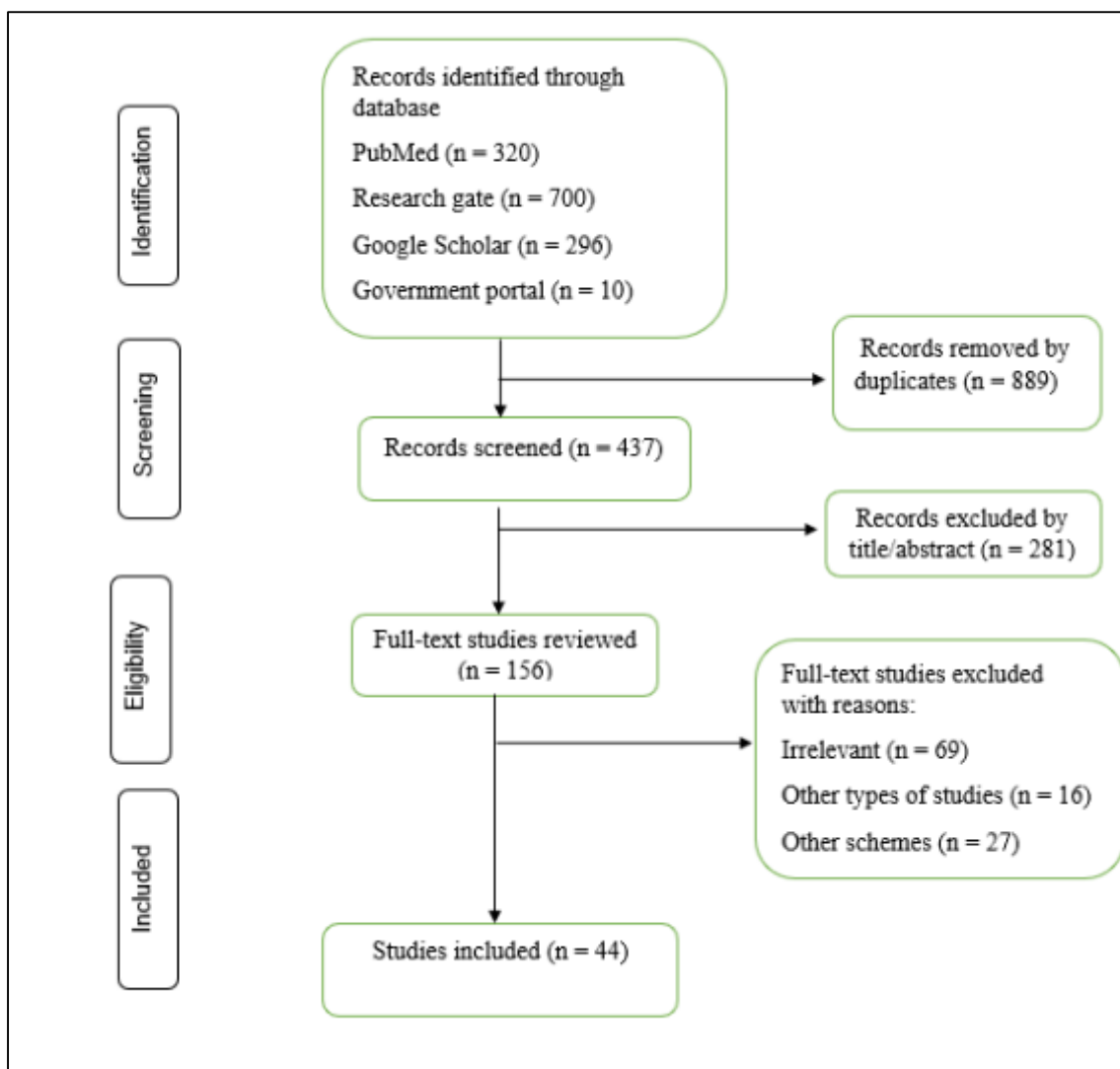**Figure 1** Ayushman Bharat Digital Mission

Figure 2 Flow chart illustrating the process by which articles were selected or rejected for inclusion in the study

2. Digital health practices all over the world

A broad overview of global best practices in digital health can inform how the world implements e-health initiatives. The UK's NHS, renowned for its excellence in healthcare, initiated its digital transformation by introducing NHS electronic care records. These records facilitated the sharing of patient information with their consent, streamlining processes for primary care practitioners and staff to arrange appointments with hospital doctors. Additionally, it established a framework for electronically transmitting prescriptions, exchanging patient data, and making electronic referrals to specialized centers. (4)

To facilitate patients' access to care, Australia was the first nation to design a population-centric approach for the implementation of My Health Record (MHR), a national repository of patient electronic health histories. MHR allows patients to opt in or out at any time to address data breach concerns and build confidence among the public. This approach teaches India valuable lessons, as permission, privacy of health data, and security of personal data are crucial concerns.(9)

The South Korean Ministry of Health developed a comprehensive plan for National Healthcare Information and Communication Technology (ICT) around 20 years ago. In Korea, healthcare institutions have become increasingly digitized, with nearly all hospitals implementing computerized provider order entry systems, patient management systems, electronic health record keeping, and insurance claim systems that use electronic data interchange to improve clinical decision support and access to healthcare. The promising Information and communications technology

intervention in Korean healthcare institutions provides significant lessons for our country, which is presently constructing a digitally enabled health claims platform. (4)

3. Overview of India's digital health scenario

Many Indian states, including Kerala, Tamil Nadu, and Rajasthan, have taken considerable steps towards developing digital health projects. Tamil Nadu was one of the first states in the country to launch a digital health initiative. The World Bank assisted in the development of a comprehensive state-wide Health Management Information System (HMIS), which streamlines clinical, logistical, and administrative operations. This will make the state's public health system more operationally efficient.(10).In 2015, Rajasthan began implementing e-health initiatives through national health programs like RMNCHA+, NIKSHAY, e-Aushadhi, and Non-Communicable Diseases. Other digital tools designed to help community health workers include the Health Information System for Government, the Computerized Human Resource Information System, E-Mitra, and ASHA Soft [4]. Similarly, Kerala took the lead in digitizing the healthcare sector in 2017 when it launched the e-Health Kerala plan. It generates a unique ID for each patient, allowing for the creation and linking of the patient's full medical history.(11)

The previous few years have seen a significant evolution in the private sector, and both major and small firms in the health technology space have benefited from the wave of healthcare digitalization. The health sector has advanced thanks to the government's supportive policies and the quick uptake of smartphones and the Internet. In 2021, the digital healthcare industry in India was expected to be valued at INR 524.97 billion. It is predicted to reach INR 2528.69 billion by 2027, with a 28.50% CAGR between 2022 and 2027(12). However severe fragmentation, a lack of interaction, inadequate data portability, and accessibility have beset the field of digital health, resulting in isolated and disorganized attempts to develop a digital health architecture for India.(13) Additionally, the Global Strategy on Digital Health 2020–2025 was established by the World Health Organization (WHO) to improve health for all people, everywhere, and at all ages(6)

4. Ayushman Bharat Digital Mission (ABDM)

SOURCE: https://abdm.gov.in/abdm

Figure 3 The NDHM ecosystem

The goal of the Ayushman Bharat Digital Mission (ABDM) is to establish the framework required to sustain the nation's integrated digital health infrastructure. To establish advanced digital health systems, manage vital data, and provide infrastructure for effortless sharing(14) And to promote the creation of enterprise-class health application systems, with a focus on achieving health-related Sustainable Development Goals. Digital highways will close the current distance between the various stakeholders in the healthcare sector.(15) To establish registers at suitable levels to ensure a single source of data for clinical facilities, healthcare experts, health workers, medications, and pharmacies(16)To develop a personal health record system based on international standards, accessible to individuals, healthcare professionals, and service providers with informed permission(17)
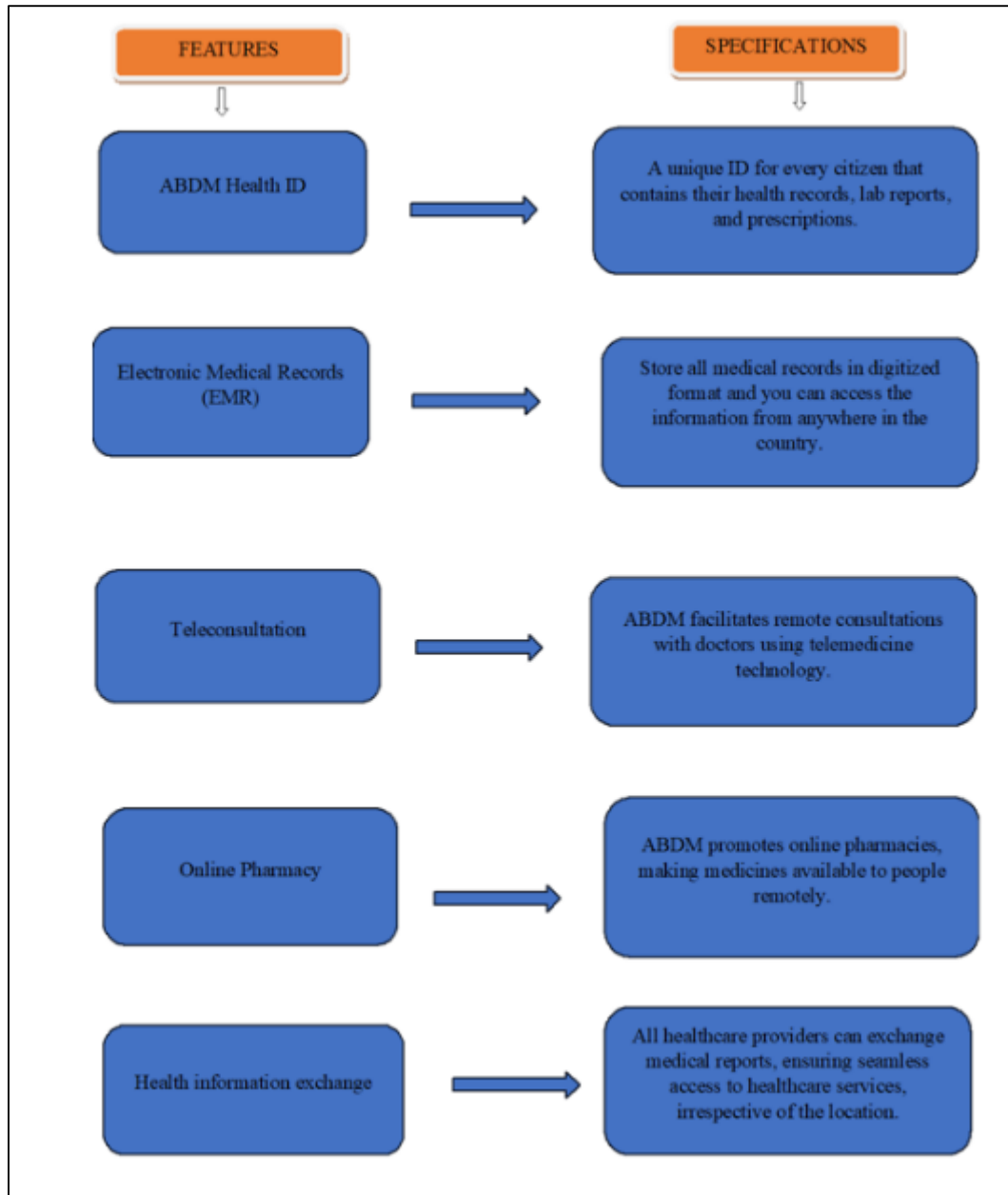
Figure 4 Key Features of the Ayushman Bharat Digital Mission.

5. Flowchart for creating an Ayushman Bharat Health Account (ABHA) number in the Ayushman Bharat Digital Mission (ABDM) scheme
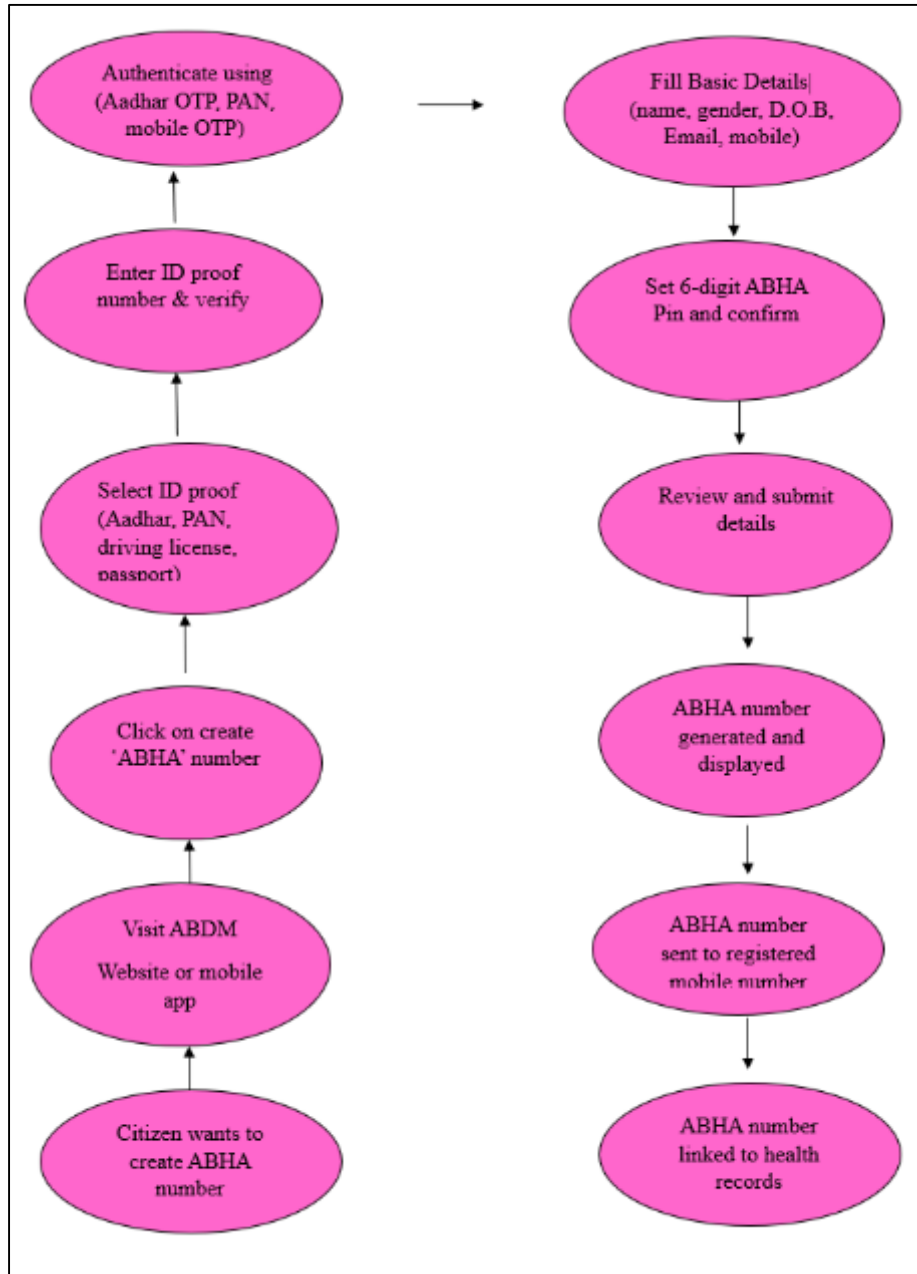
Figure 5 Steps to Create ABHA Number for Individuals

6. Flowchart for medical professionals to register in the Ayushman Bharat Digital Mission (ABDM) scheme
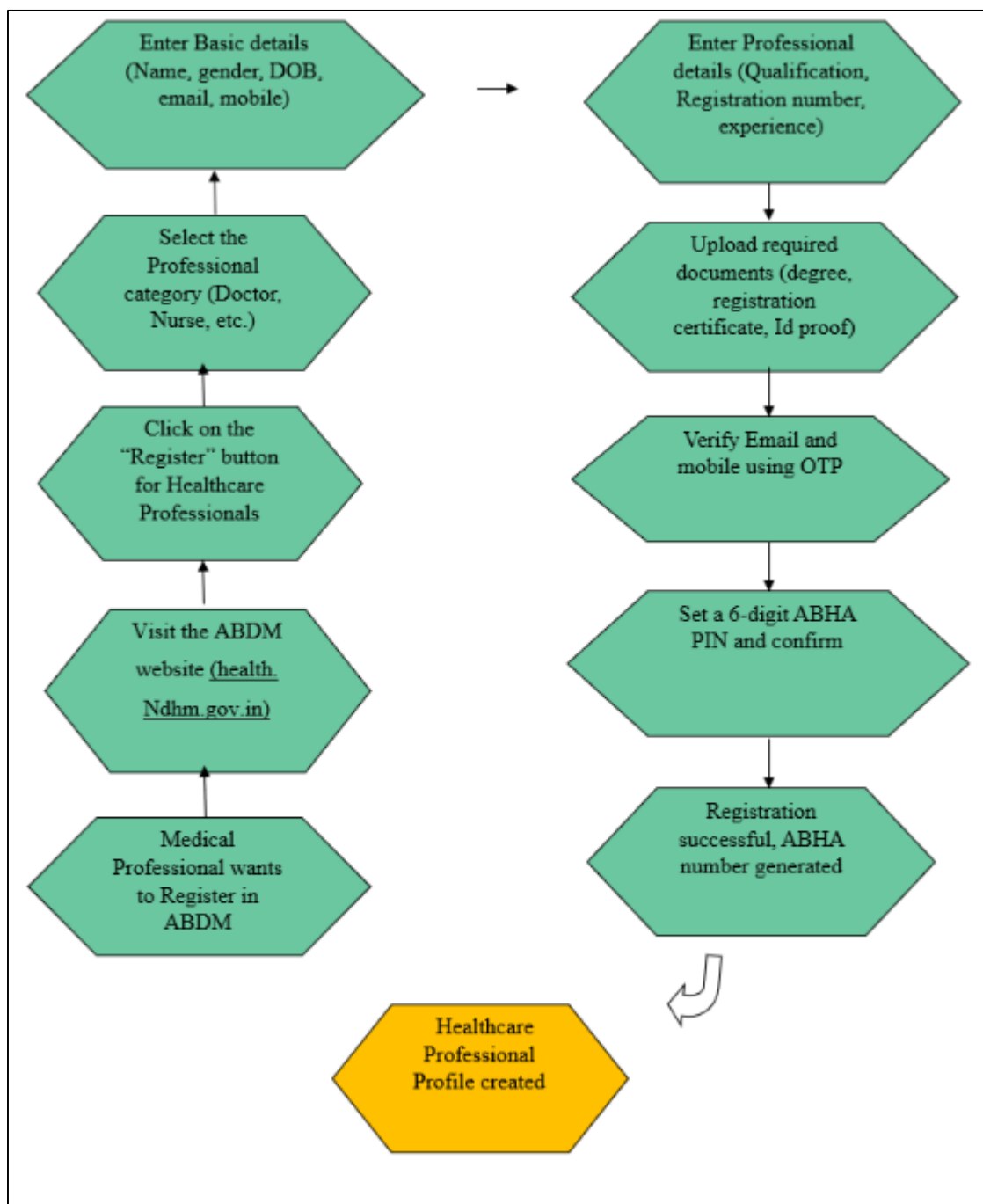
Figure 6 Steps to Create ABHA Number for Medical Professionals

7. Innovation in digital health during the pandemic

The COVID-19 pandemic created major challenges to healthcare systems throughout the world, resulting in one of the worst socioeconomic disasters of the 20th century. Before the pandemic, telehealth and e-pharmacies were not widely used. The majority of consumers and providers preferred usual in-person/offline involvement for health care delivery but lockdowns and other physical barriers, however, increased the need for digital health solutions and highlighted the necessity of more effectively integrating the latest technological advances into healthcare services in areas like telemedicine, remote clinical management, and surveillance. (1)

Among the prominent public digital solutions developed during the COVID-19 pandemic are the Covid Vaccine Intelligence Network (CoWIN) and Aarogya Setu. (18) CoWIN registered about a billion individuals for immunizations and administered over 1.78 billion doses of the COVID-19 vaccine, which could be traced remotely. With several nations interested in utilizing the application's open-source technology in vaccination campaigns, the CoWIN digital certificate emerged as secure and reliable evidence of universal immunization. (19)

The government has established standards for the practice of telemedicine to facilitate the continuing delivery of healthcare services to the general population.(20) Telemedicine is the practice of all medical professionals using information or communication technology to provide healthcare services when distance is a significant problem. It reduces hospital overcrowding, particularly during pandemics, and facilitates the interchange of reliable information for research and assessment, illness and injury diagnosis, treatment, and prevention.(21)

PM-JAY has registered over 28,350 hospitals and healthcare providers, supporting more than 519 million low-income families in India (as of May 31, 2023)(22). In addition, the Ayushman Bharat program has set up approximately 12 lacks (~1.2 million) in health and wellness facilities to provide basic medical treatment to populations in remote and rural parts of India.(23)

A recent Boston Consulting Group poll found that around 85% of physicians used teleconsultation during the shutdown and that 65% of physicians planned to use telemedicine in the post-Covid future. This shift from in-person doctor visits to telehealth solutions indicates a rise in patient adoption as well as an increase in the number of digital solutions available on the market. (24) Therefore, India has become one of the leaders with significant development potential in this sector, as indicated by increased participation and governmental and private investment in digital healthcare.
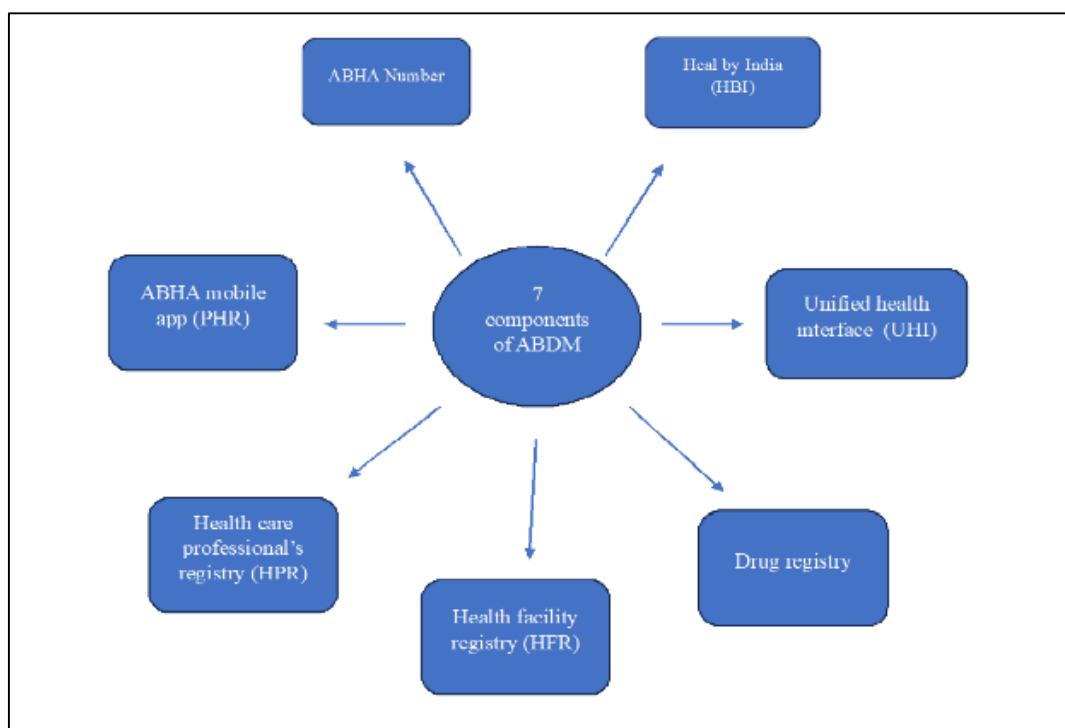
Figure 7 Components of ABDM

8. Utilization of ABDM

The National Health Authority (NHA) under its flagship scheme Ayushman Bharat Digital Mission (ABDM) introduced the Scan & Share service for faster OPD registrations in October 2022. Within five months of its launch, the service has been adopted by 365 hospitals with more than 10 lakh patients registered. It is significant that on Feb 23, 2023. the service had five lakh patient registrations. The sharp increase in numbers shows the effect and acceptability of the Scan and Share service(25)

ABDM aspires to achieve significant change in the country's healthcare sector. With almost 35 crore ABHA accounts and approximately 25 crore health records connected, 1.6 lakh HPR, and nearly 2 lakhs HFR produced, it is visible that healthcare professionals and the public alike extensively use ABDM.(26)

The NHA has reached an important milestone by registering 2 lakh health institutions to the Health Facility Registry (HFR), including clinics, hospitals, imaging centers, diagnostic labs, and pharmacies. An essential part of ABDM, the HFR aims to serve as a single, authorized source for verified data on healthcare institutions nationwide. About 75% of the certified facilities are managed by the government. The top four states with the most health facilities on HFR are Karnataka (46,179), Uttar Pradesh (31,417), Maharashtra (13,789), and Andhra Pradesh (13,345)(25)

Hospitals are providing digital registration services to their patients by directly sharing their ABHA profile with them using the Scan and Share work. Patients may now obtain fast registration tokens without waiting in line or providing a lot of information.

The Scan and Share service is currently functioning in over 5435 healthcare facilities across 546 districts in 35 Indian states and union territories. Additionally, an average of 1.3 lakh people utilize the scan and share service every day, showing its use and reach among citizens.(27)

 The average is around 25,000 OPD tokens per day, but the goal is to exceed one lakh daily. It also aims to expand the functionality to include more patient-provider interactions. Lucknow is helping more than 25,000 patients daily using ABHA-based Scan and Share functionality.(28)

Within less than a year, the initiative has achieved significant success. According to the ABDM website, as of September 12, 2022, a remarkable 24 crore ABHA numbers have been generated, with over 7 lakh health records app downloads, 1,44,371 health facilities, and 69,312 health professionals having enrolled. Likewise, in July of the current year, fifty-two digital health services and applications—32 of which are private—had merged with ABDM. A variety of technological stakeholders are included in this, such as Healthtech applications, Personal Health Records (PHR) apps, and Hospital Management Information Systems (HMIS)(29)

Source: Government of India

Figure 8 Initiatives of ABDM

9. Discussion

The Ayushman Bharat Digital Mission (ABDM) has the potential to revolutionize India's healthcare sector by providing a digital platform for healthcare services(30). Integrating digital health services and applications has increased patient-provider interactions, improved healthcare accessibility, and strengthened the Scan and Share service(31). With over 24 crore ABHA numbers generated and 7 lakh health records app downloads, ABDM has demonstrated significant adoption and usage(32)

Studies have consistently highlighted the positive impacts of digital health initiatives like ABDM, including improved healthcare outcomes, reduced financial burdens associated with healthcare services, and increased patient satisfaction. Incorporating electronic health records (EHRs) and health information exchanges (HIE) is particularly noteworthy, as these tools have proven effective in enhancing the quality and safety of care delivery.(33). The potential for such advancements cannot be overstated, as they align with global trends toward digital health and telemedicine, which are increasingly recognized as vital components of effective healthcare systems.

Improved Healthcare Accessibility and Efficiency: ABDM has enhanced healthcare accessibility and efficiency by providing digital tools like CoWIN for vaccination management and e-Sanjeevani for telemedicine. Over 35 crore Ayushman Bharat Health Account numbers and 1.6 lakh healthcare professionals have been registered digitally, demonstrating widespread public acceptance.(34)

Studies have shown that digital health initiatives like ABDM can improve healthcare outcomes, reduce costs, and enhance patient satisfaction.(35,36). The use of electronic health records (EHRs) and health information exchange (HIE) has also been shown to improve the quality and safety of healthcare services. (37)

However, challenges such as data privacy, security, and interoperability need to be addressed to ensure the success of ABDM.(38,39) . Furthermore, digital awareness and infrastructural issues could prevent the adoption of digital health services in rural and underprivileged areas.(40). Increased digital awareness and education efforts are essential to facilitate grassroots acceptance of these technologies.

Overall, the ABDM has the potential to transform India's healthcare sector; however, its success depends on resolving the difficulties and ensuring equal access to digital health services.

10. Conclusion

The revolutionary Ayushman Bharat Digital Mission (ABDM) aims to digitalize India's healthcare industry. It has achieved considerable advances in expanding healthcare access, improving the effectiveness of the system, enhancing care quality, and promoting teamwork amongst stakeholders in the healthcare system. By implementing strong data privacy and security protocols and developing infrastructure for India's diverse population, ABDM can play a key role in achieving national health coverage and improving health outcomes. ABDM may have a vital part in attaining national health coverage and greatly enhancing health outcomes with persistent work and strategic assistance.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest is to be disclosed.

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