SUSTAINABLE DIGITAL HEALTH MARKET

EMR Implementations in India

Major Public EMR Implementations

eHospital – 2017

Description: National health management system with robust EMR functionality

Scope: Clinical

Health Domain: General

Scale: Multiple states implementing

ANMOL – 2016

Description: National mHealth solution to capture health beneficiary data by auxiliary nurse midwives

Scope: Administrative (patient registration and tracking)

Health Domain: Reproductive and child health

Scale: National rollout to 293,000 auxiliary nurse midwives

PM-JAY – 2018

Description: National universal healthcare insurance system to manage health records and transactions across private and public healthcare

Scope: Administrative (payments)

Health Domain: General

Scale: National, implemented in 25 out of 29 states, represents 50-60% of health transactions across public and private health facilities

Electronic Medical Records Overview

Electronic Medical Records (EMR) have been a significant area of focus in digital health over the last decade. The value they provide in improving patient continuity of care and reporting has led donors and governments to invest tens of millions of dollars into developing EMR systems in low and middle-income countries (LMICs).

The term EMR encompasses a wide range of solutions, from sophisticated, multi-function clinical record systems that link with other digital health systems to solutions with primarily administrative functionality, such as billing or patient tracking. Some clinical EMRs capture general patient data, while others are for specific disease or health domains. The scale of implementations varies widely as well, from systems designed for national use to those deployed at a subnational level or in a small number of facilities. Understanding these dimensions is critical to any consideration of the health and composition of EMR market dynamics in LMICs.

EMR Implementation Context in LMICs and India

Most **national-scale** EMR implementations in LMICs, particularly in sub-Saharan Africa, are donor-funded solutions with advanced clinical functionality adapted from global goods, such as OpenMRS or Bahmni. In India, by contrast, most systems are bespoke government solutions in which record functionality's creation supports functions such as hospital management or insurance. In most LMICs, including India, national-scale EMR implementations are driven by program needs and are typically designed for specific diseases or programs, such as HIV and immunization.

Subnational and **facility-based** EMR implementations are often solutions designed for administrative or billing purposes. These implementations often use local commercial off-the-shelf products that capture patient data in a facility setting, often a district or private hospital. States in India commonly implement the National Informatics Centre's *eHospital*, a hospital Health Information System with advanced clinical EMR functionality. Many subnational or facility-based EMR implementations, especially those designed for billing and patient tracking, see clinical functionality added over time.

Drivers of a Sustainable Digital Health Deployment

Several key factors influence the market dynamics- and hence sustainability- for any digital health solution in a country, including EMRs. These factors include:

- Total market demand,
- Level of government ownership and funding capacity (for public-sector implementations),
- Budgeting and availability of funding for both capital expenditures (CapEx) and operating expenditures (OpEx),
- Availability of affordable quality solutions tailored to user and program needs, and

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- Supply of local human capacity to deliver against customer requirements.

Many of these factors relate directly to a country's digital health market maturity. Countries in earlier stages of market development lack the ingredients required for healthy market functioning.

Critical Success Factors of EMR Market Dynamics in India

The state of Uttar Pradesh, and India in general, hosts a robust EMR market, with a variety of both clinical and administrative solution implementations. The market engages hundreds of local private-sector vendors and government implementers. India's market benefits from strong demand, information communications technology (ICT) capacity within the government, available annual funding for EMR solutions, and a robust local supply of solutions supported by strong human capacity. The section below provides an in-depth look at a few of these strengths.

Government Funding and ICT Capacity

Relative to other LMICs, India's government has provided greater financial support for digital health implementations and has developed and retained ICT talent within the government. For example, the National Informatics Centre (NIC) developed and supports eHospital, a comprehensive EMR implemented at the state level. In contrast, the National Health Authority (NHA) developed, implemented, and supports the EMR functionality of PM-JAY, India's national insurance scheme. There are several other robust national, domain-specific EMRs, albeit of limited scope, throughout the country, including ANMOL (Auxiliary Nurse Midwife Online). Collaboration between government, donors, NGOs, and local private sector organizations is strong, improving the quality and scalability of EMRs.

Robust Engagement from Local Vendors, Including the Private Sector

While government agencies are actively involved in developing and supporting EMR systems, the local private sector is also highly engaged, both in the development and implementation of proprietary solutions and in the implementation of the government-owned solutions described above. For example, local private sector vendors augment government ICT capacity where needed through India's qualified vendor list, creating collaborative public-private partnerships. Local system implementers, including foreign Indian-registered firms, frequently compete for national and state government-funded EMR implementations when government solutions do not meet needed system requirements. Beyond national and state procurement, the local private sector delivers end-to-end bespoke or commercial off-the-shelf EMR solutions in the private healthcare sector. This level of private-sector engagement in delivering EMR systems builds the local knowledge base and further strengthens the market's ability to deliver both clinical and administrative solutions.

Future Directions

In India, governments' funding capacity and the practice of budgeting for long-term operating expenditures (along with robust private-sector demand) have stimulated a strong digital health market, including for EMRs. India's robust ICT capacity allows the government and local vendors to deliver EMR solutions and support them with local talent, driving down the total cost of ownership. However, poor interoperability between the numerous digital health deployments, from EMRs to lab systems to surveillance systems, reduces government decision makers' visibility into national health data and impacts their ability to achieve health outcome goals.

The factors that have enabled India's success in fostering a healthy EMR market are not yet present in many other LMICs. In these countries, creating a healthy market for solutions such as EMRs will require both time and investment in government and local vendor capacity building. Donor-supported activities have the potential to grow the local private sector and increase both government and private sector ICT capacity. When adequate ICT capacity and sufficient market demand exist, the local private sector will be able to develop, deliver, and support EMRs at scale, thereby increasing the long-term health of these markets. Strategic donor OpEx funding could foster government and private-sector capacity and significantly increase system sustainability over the long term.

> **"Development of systems is not a big deal. The capacity is there in India, the ICT skillset is high, and [software] development is not a challenge."**
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> *– Government of UP Health Official*

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