

Speaking for Ourselves

Electronic health and medical records for comprehensive primary healthcare in India

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India contributes to 18% of the global population. How India performs in delivering comprehensive primary healthcare (CPHC) will contribute towards the attainment of Sustainable Development Goals 3.7 and 3.8 targets of universal health coverage.¹

In India, under the National Health Mission (NHM), CPHC is delivered through a medical officer who manages a primary health centre catering to 20 000–30 000 population (50 000–60 000 in an urban setting). With the help of village-level frontline workers, an auxiliary nurse-midwife (ANM) caters to a population of 3000–5000 (10 000 in urban settings).² An ANM manages 12–15 data registers and one person's data are recorded into multiple registers. Service indicators are manually generated every month and fed into the electronic health management information system (HMIS).^{3,4}

eHealth applications, which include electronic health/medical records (EHRs/EMRs), have the potential to contribute towards universal health coverage.⁵ EHRs involve maintaining digitized health records of individuals belonging to the service area of a health facility. The baseline data for EHRs are individual-level sociodemographic and clinical data collected and updated by the ANM during the annual household survey. CPHC provided to individuals under the NHM can be updated on this EHR platform. EMRs are for patients who visit a health facility to seek

services irrespective of whether they belong to the service area or not. The EMRs can also be linked with the EHRs.

There are many advantages of EHRs/EMRs, one being that the seamless generation of HMIS-related data alleviates the work burden for an ANM. Another being the access to patient information in real time within a health team (Box).⁶ EHRs provide a real-time picture of disease burden, which can help in providing better response to disease outbreaks or adjust the focus of service delivery programmes. With the need for integration of long-term care for chronic diseases in the NHM, the development of electronic systems to capture longitudinal data is essential for ensuring continuity and quality of care.

Since 2016, EHRs related to maternal and child health are being generated using tablet-based (mobile hand-held computer device) *Anmol* (meaning 'unique') application in many states of India.⁷ The NHM has plans to roll out population-based screening for non-communicable diseases (NCDs), namely diabetes, hypertension, and oral, breast and cervical cancers supported by a tablet-based NCD application in 200 districts.⁸ Kerala was the first state to implement a comprehensive eHealth programme

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Examples of easier access to patient information within a health team at health centres as a result of the use of electronic health/medical records

1. Patient's complete baseline information is available at the outpatient department (e.g. past history, family history)
2. Patient's record of previous investigations is available which avoids needless repetition of investigations
3. Alerts/reminders for new patients detected or for follow-up of patients reach the frontline health staff. In this way, patients lost to follow-up can also be tracked
4. Patient referrals from primary health centres in terms of specimen referral (say blood specimen for confirmation of dengue) or physical referral (say suspected appendicitis) can be tracked easily. When these referral outcomes are updated, the medical officer at the primary health centre can follow-up at the clinic or frontline health worker can follow-up through home-visits
5. Cohort-wise data of patients diagnosed/registered for treatment can be easily maintained
6. Patients registered for treatment can be transferred out electronically to other hospitals (public or private), if required, ensuring continuum of care
7. A review of the electronic health records may help to review various health programmes in near real-time through direct visualization of the indicators

that includes EHRs and EMRs.⁹ Haryana has developed an EMR for its public health facilities.¹⁰ *Aam aadmi Mohalla* clinics ('common man community clinics') in Delhi use a tablet-based EMR.¹¹

To ensure optimal functioning and usage of these EHR/EMR initiatives in India, the following points need to be considered.

First, the workload of frontline service providers should not increase as a result of EHRs/EMRs. Multiple, parallel eHealth initiatives may lead to situations where there is one tablet device for each health programme and each application requires repeated entries of baseline data (individual level socio-demographic and clinical data). These can be addressed by (i) doing away with paper-based registers after a pre-defined period of simultaneous data collection in paper-based registers and applications; (ii) considering a comprehensive public health management application where EHR applications of various programmes are built into one application; and (iii) ensuring that the various applications are present in the same tablet and they are interoperable (these parallel applications should be able to 'talk' to each other). While ensuring interoperability, patient confidentiality should be maintained and issues related to data ownership addressed. The eHealth applications and databases should be in line with India's EHR standards (2016).¹² The standards include clinical informatics standards, data ownership, privacy and security aspects and the various coding systems. The use of standardized vocabulary such as SNOMED-CT must be mandatory. The data structures of the baseline data must be standardized. India is in the process of formulating its digital information security in healthcare act (DISHA, 'direction'), which is a step in the right direction.¹³

Second, the EHRs/EMRs should have an option for offline data capture followed by syncing with the cloud as and when the internet is available. Many examples of EHRs mentioned earlier have this option for offline data entry in hand-held tablets. This will ensure that service delivery will not get affected by poor or interruptions in internet either in the health facilities or in the field.

Third, a strong support system is necessary to ensure smooth uptake, provide help and address any concerns about user interface and technical glitches. Periodic operational research around these systems will help in understanding the enablers and barriers and improve the coverage and quality of uptake of EHRs/EMRs.

Finally, the initiatives will not be worthwhile unless the frontline service providers benefit from generating EHRs/EMRs. Regular and timely analysis of data should be ensured at various levels of healthcare starting from where it has been generated, if necessary by hiring expertise from local teaching/academic institutions.

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