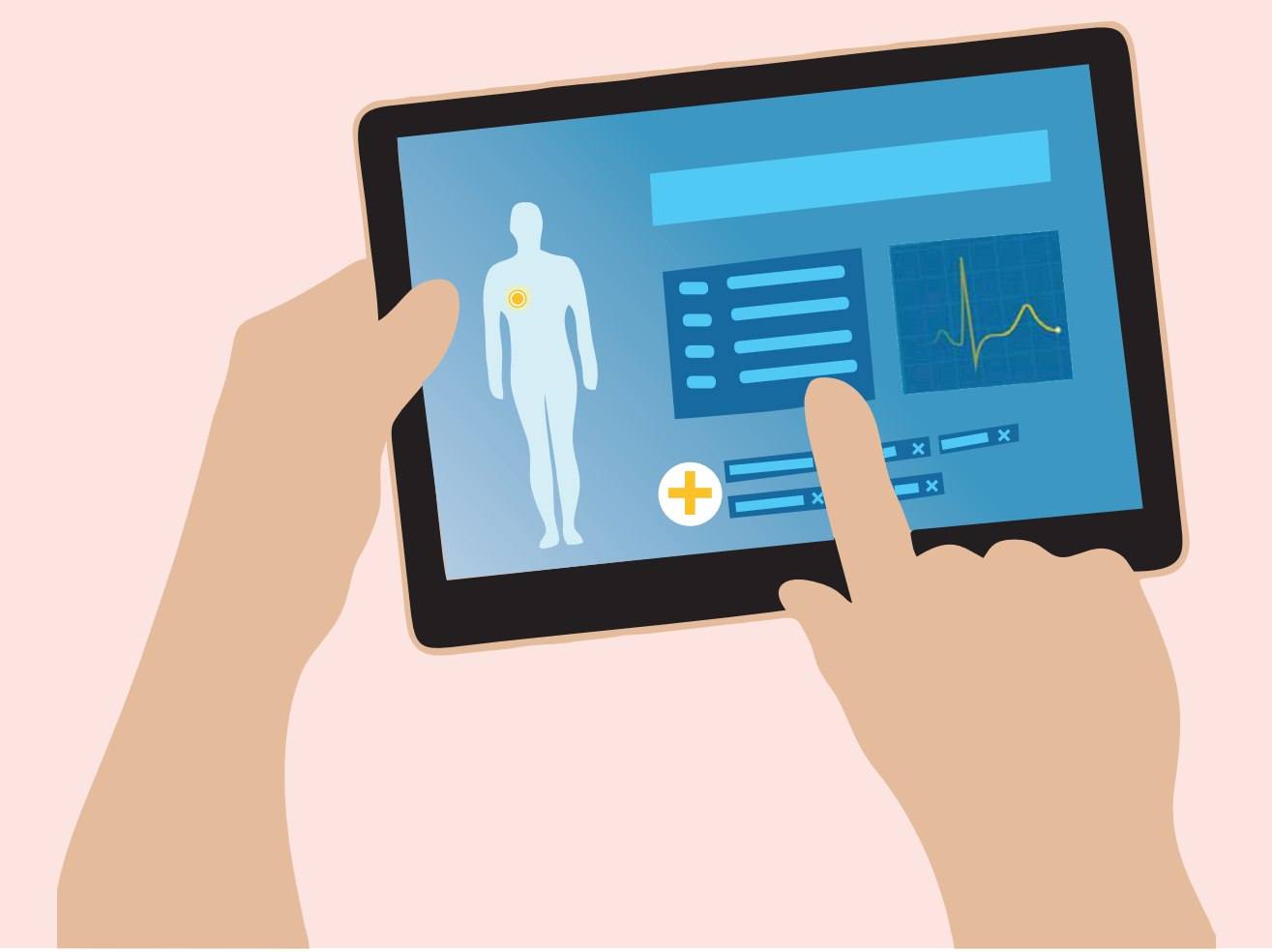
Operationalising Electronic Health Records to Capture Beneficiary Data at Urban Primary Health Centre within NCD programs in Mysuru, Karnataka

Introduction

An electronic health record (EHR), or electronic medical record (EMR), is the equivalent of a manual beneficiary health record in digital format. As per EHR standards of India[1], an Electronic Health Record (EHR) is a collection of various medical records that get generated for a beneficiary during any clinical encounter. Its digital format ensures higher rates of accuracy and completeness, by eliminating manual errors that routinely plague the documentation system in the health sector. EHRs may include a range of data, which include demographics, personal statistics like age, weight, vital signs, medical history, medication details, allergies, immunization status, laboratory test results, radiology images and billing information.



Available on: https://scopeblog.stanford.edu/2017/11/13/digital-divide-for-electronic-health-records-worth-investigating-researcher-says/ Accessed on 12-02-2019

[1]Electronic Health Record (EHR) Standards for India 2016, Standards Set Recommendations V2: Available at https://mohfw.gov.in/sites/default/files/17739294021483341357.pdf. Accessed on 04-02-2019

Context

With around 6 million deaths annually, India shares more than two-third of the mortality in the South-East Asia region caused due to non-communicable diseases (NCDs). It is likely that the NCD burden in India will significantly worsen in the future; it is estimated that people with diabetes will increase from 69.2 million in 2015 to 123.5 million by 2040. Hypertension, cardiovascular diseases, diabetes, and some cancers together will affect 52.1 million individuals by 2030. There is a two-fold challenge i.e. to manage the large cohort of NCD cases effectively and to prevent new additions into this cohort. Clearly, there is a need for integration of NCD prevention, promotion, treatment and care approaches at the primary health care level.

However, absence of adequate tools, processes, and data systems affect proper program design, planning and implementation. There is a need for systems that can generate and track population level data to help understand the burden of disease better. This with help in designing suitable disease prevention and control models. One way to do this is to leverage technology for quality data collection, collation and analysis to generate knowledge that can contribute to strengthening NCD programmes in India. In this context, the use of Electronic Health Records can be a useful way to help generate the much needed real time data on NCDs which can help service providers and programme managers to take evidence-based decisions to improve service delivery.

This technical brief talks about the EHR system implemented at an urban primary health centre (UPHC) at Kumbarakoppalu in Mysuru city as part of a larger project which aims to develop a continuum of care model for NCDs. Karnataka Health Promotion Trust (KHPT) implements this project with financial support from the Landmark Group. The brief discusses the process, technical structure, benefits, and implementation experience of the EHR system. This EHR is currently capturing health information of patients with diabetes and hypertension. The plan is to expand EHR to include patients with other NCDs and for all the patients visiting the UPHC.

The EHR system at the UPHC

EHR system (Fig 1) was established in the UPHC in August, 2018. We trained one project staff who currently functions as the EHR operator. The operator captures investigation and treatment related data of beneficiaries during each visit to the UPHC. The data captured is accessed by the monitoring and evaluation specialist. This specialist analyses the data and shares the results with the program team. The program team then shares the key findings with the UPHC medical officer, who in turn uses the information to map the needs of patients and plan the services.

Fig 1: Snapshot of the functional EHR system at the Kumbarakoppalu UPHC

Process flow of the EHR

The EHR at the UPHC follows a linear process capturing holistic patient information and aids in provision of end-to-end treatment, care and support services. The EHR system begins as early as identifying and preparing a list of beneficiaries (generated through analysing screening records) scheduled for confirmation of diagnostics and treatment. This is followed by registration of such beneficiaries in the EHR system once they reach the UPHC for accessing the service. Registration involves recording of demographic details and generation of a unique ID for each individual beneficiary. Medical history and anthropometric measurements are also captured during the registration stage. On specific occasions, upon advice of the medical officer, beneficiaries who are not in the existing list (new resident of the UPHC catchment area or migrants) are also allowed to be registered in this system. Beneficiaries are selected for each particular laboratory test based on a pre-determined eligibility criteria based on socio-demographic and previous health record of clients. Once the beneficiaries undergo laboratory tests, the results from the tests are captured and stored automatically in the EHR system. At the last stage, beneficiaries obtain the test results along with the prescription as a single printed report generated by the EHR. Additionally, the system offers scope for auto-generation of the follow-up date customised for each individual beneficiary. The overall process flow (Fig 2) is simple, beneficiary-centric and efficient in handling registration, service provision and the follow-up stages of treatment, care and support.

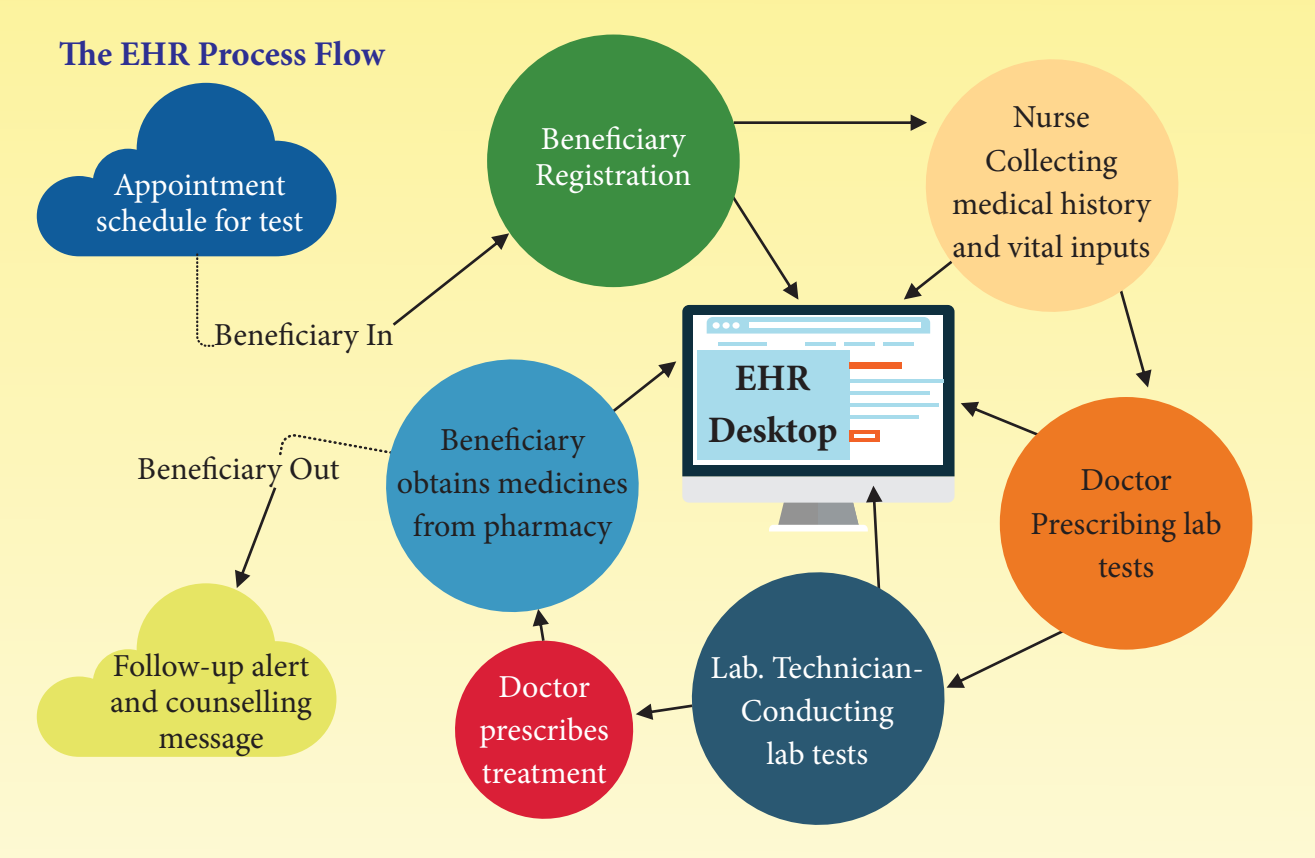


Fig 2: The EHR process flow at the Kumbarakoppalu UPHC under the NCD project

Technical structure of the EHR

The EHR is hosted on a computer desktop running with 64-bit processor and Windows 10 operating system. The entered data is synced to a cloud server with the help of internet with the speed of 2 mbps or higher. This server is hosted by Neurosynaptic Communications Private Limited (NCPL), which is KHPT's technical partner. The log-ins to assess data remotely in a dashboard has been supplied to KHPT, the service providers and project staff at the UPHC by NCPL.

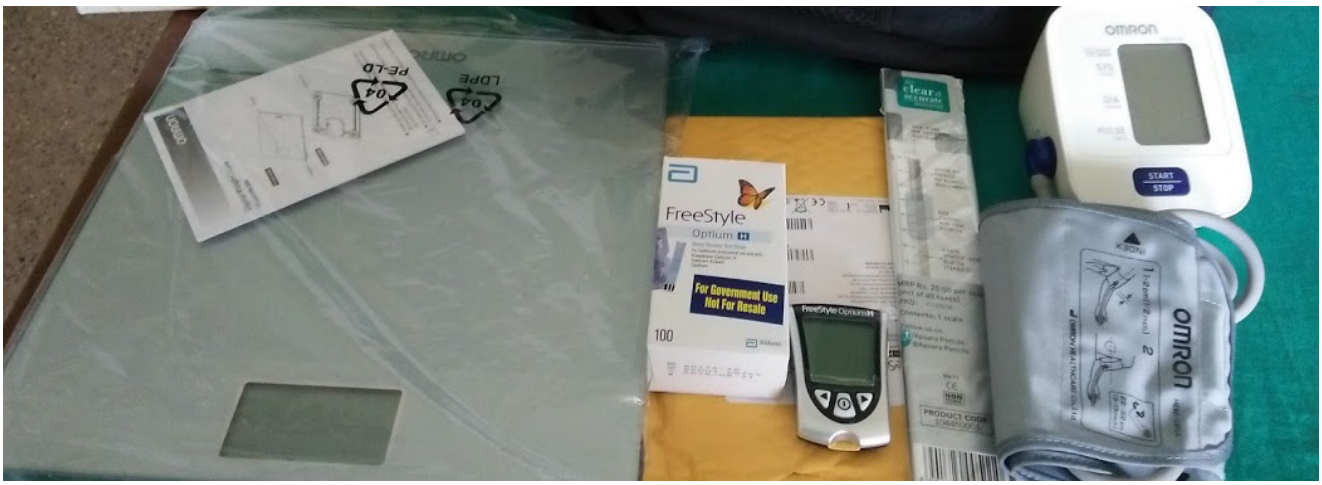
Benefits of the EHR

The EHR system has following salient features and benefits the intervention implementation in the following ways:

- The EHR system is designed to capture and store an array of beneficiary data such as demographics, anthropometric measurements, previous medical records, treatment history, vital parameters with test visuals like ECG graph, X-ray film etc.
- It has inbuilt validation and quality checks to ensure data entry accuracy and captures records of every beneficiary across time for longitudinal follow-up.
- It eliminates the need to track down beneficiary's previous paper- based medical records.
- The system generates beneficiary follow-up dates and sends alerts or reminders before and on the day of follow-up.
- It provides accurate, up-to-date, and complete information about beneficiaries at the point of care.
- It enables quick access to beneficiary records for more coordinated and efficient care.
- Key information from this system could easily be shared with beneficiaries.
- It helps service providers reduce medical errors, save time, improve productivity and enables safer and reliable prescribing
- It identifies and prioritises beneficiaries in terms of attention they need and urgency of care.
- It improves interaction and communication between the service provider and beneficiary.
- It enhances privacy and security of beneficiary data.
- It reduces costs through decreased paperwork.
- It enables the data to be collated and aggregated for managers to plan and implement NCD programs at the population level.

Way forward

We aim to further simplify the data capturing process based on the learnings from the EHR system. We are in the process of setting up systems which allows for the captured data to be made accessible to the beneficiaries. For this, we are exploring two different modalities; one which involves a text message gateway system where the data captured is shared with the beneficiaries through a short text message; second, where data is generated in the form of a PDF document and is shared with the beneficiaries via email/whatsapp We are also in the process of establishing systems to generate automated results which will enable the medical officer to get direct access to the results and plan services accordingly. This would help in sustaining the system when scaled up across the district or state.



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