

## HEALTH MANAGEMENT INFORMATION SYSTEM (HMIS): BASIC CONCEPT AND EVOLUTION, ELECTRONIC VS PAPER-BASED MEDICAL RECORD SYSTEM

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### ABSTRACT

Government of India has initiated various public health programs that have received remarkable success. Despite launch of various programs, Indian health system still holds 118<sup>th</sup> position among 191 Who Health Organization (WHO) member countries performance (WHO, 2000). Reason for this poor upstanding being the poor management of health programs as the initiatives needs various types of tasks such as regular monitoring of the, health status of population, giving access to the population, maintaining drugs stock and its consumption patterns, etc. So, Programs to be effectively carried and implemented required timely and accurate input at each level to understand the flow of the

system to take necessary step in case of any debt. This can be achieved by the introduction of Health Management Information System. HMIS is defines as a process of collection, processing and reporting the relevant information to healthcare providers and managers for effective and efficient planning and service delivery. The advantage of introducing HMIS involves cutting down the overall cost of healthcare and saves time. However, the main problem associated with HMIS is its implementation. Managers take strategic pathway to make HMIS implementation effective and efficient. HMIS had evolved from the paper based health record to the electronic based record i.e. Electronic Medical record. In the todays world of digitalization, EMR holds a unique position as keeping EMRs provides direct access of patient health records anytime anywhere, which largely reduces time, saves cost and helps in informed clinical decision making by providers.

## INTRODUCTION TO THE HMIS SYSTEM<sup>[1]</sup>

*“Health Management Information system (HMIS) is defined as a process of collecting, processing, and reporting the relevant information to healthcare providers and managers for effective and efficient planning and service delivery”.*

It acts as a useful tool in managing the various public health initiatives. A well organized and accurately implemented HMIS can enormously improve the delivery of initiatives that can be helpful to derive the desired outcomes.<sup>[3]</sup>

A health management information system (HMIS) is a process whereby health data (input) are recorded, stored, retrieved and processed for decision-making (output). Decision making broadly includes managerial aspects such as planning, organizing and control of health care facilities at the national, state and institution levels. This can be done manually (Paper based system) as it is being done in most of India, or it can be maintained in a computerized system (EHR System).<sup>[3]</sup>

### Advantages of HMIS<sup>[4]</sup>

Implementing HMIS can significantly help in:

- 1: Cutting down the cost over healthcare
- 2: Saves time
- 3: Informed clinical decision making that improves patient care.
- 4: Reduces the inventory level for drugs and other required inputs.
- 5: Increases the quality of service in terms of patient care.

“However, implementing HMIS is not easy as it requires changes at each level, has some operational outbreaks that can significantly affect the effective and efficient implementation of system.<sup>[4]</sup>

### Strategies to develop and implement HMIS

- Requires strong political and technological support.
- Healthy culture that can value and use the gathered information through HMIS.
- Adoption towards changes.
- Ensuring inputs at every level of hierarchy that will be helpful in improving the system.

### HMIS is divided into following five subsystems<sup>[5]</sup>

**1: Epidemiological surveillance:** It is the systematic collection, analysis and sharing of health data which is helpful in the managerial execution of the health programs. It is helpful in the identification/notification of diseases and risk factors, which is helpful in driving the control measures for disease.

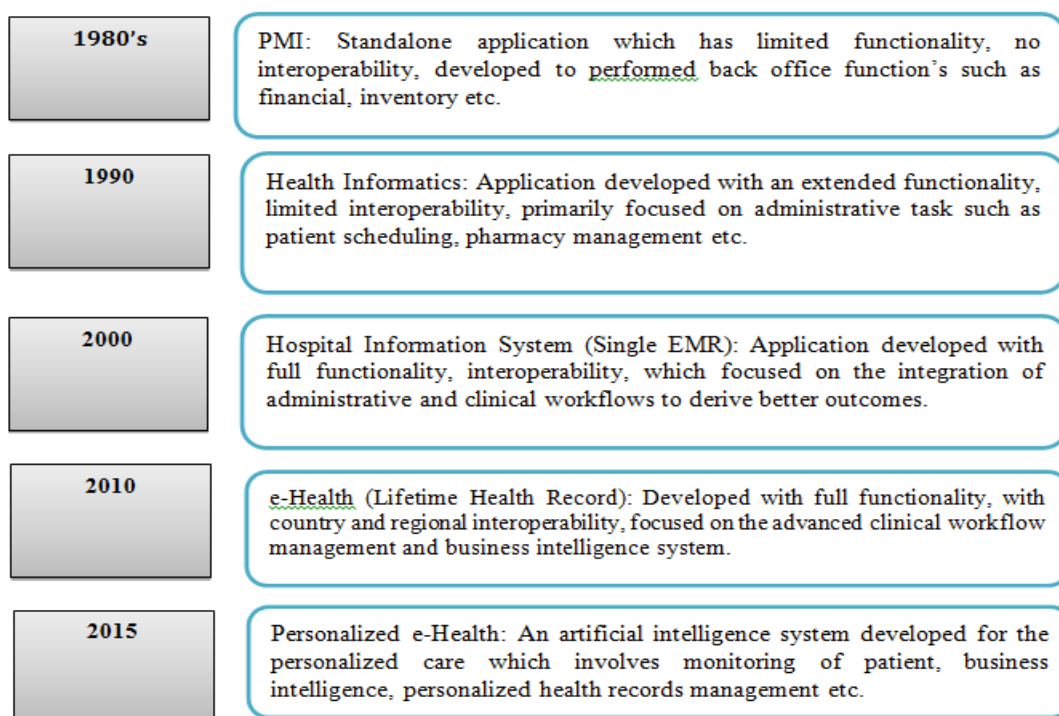
**2: Routine service reporting:** It is the process wherein hospital/health center provides reports over the performance of the various services executed within the sheds of health programs.

**3: Specific program reporting:** It is the process wherein hospital/health center provides data over various specific programs under execution in a country e.g. AIDS Program, Malaria Prevention Program, DOTS etc.

**4: Administrative systems:** This sub-system involves all reporting relating to account and finance, product management starting from its procurement to its use, people management, asset management etc.

**5: Vital Registration:** This sub-system is for the valid registration of the people on occasion of its birth, deaths, migration etc.

### Evolution of Healthcare Information Technologies



**Problems associated with HMIS Implementation in India<sup>[8]</sup>**

There exist various problems associated with the existing HMIS in India:

- Structural issues
- Procedural issues
- Content issues
- Technological issues
- Human resources related issues

**1: Structural issues:** There exist many institutions that effectively deal in the collection, storage and transfer of health data to the Health and Family Welfare; problem arises with the decentralized structure of the organizations due to which co-ordinations lacks within district, state and concern organizations.

**2: Procedural issues:** These issues are related with the presence of extra information, encryption issues, problems with hospitals, absence of feedback and others. Problems arise when information is gathered in-depth and are not used properly. Information is collected from the Public Health Centre's and other hospitals every month and is not used. All together some logical information is often missed due to which the principle of HMIS is affected.

**3: Content related issues:** The HMIS system processes the health data in such a way that only summaries reach to the higher levels due to which the key points on which decisions need to be made are overlooked by key policy makers and managers.

**4: Human resources related:** This is probably due to lack of training and development both at district and state level. It is more often seen that the district statistical officers are promoted from the clerical cadre's level that lacks the relevant competencies which is required at PHC and Hospitals.

**5: Technological issue:** This is probably due to lack of adoption or resistant to change. Government of India is trying its level hard to digitalize each and every sector but it is due to lack of adoption for which implementation is still a challenge in India.<sup>[3]</sup>

**EHR- (Electronic health record)/ EMR**

“An electronic health record (EHR), or electronic medical record (EMR), is the systematic collection and storage of patient and population health information in a digital format”.

These EHR's can be shared between different organizations connected through network. EHRs includes data related to demographics, medical history, medication, immunization, allergies, diagnostic results, personal statistics like age and weight, billing information etc.

### Why EHR/EMR?

- 1: EMRs are helpful in capturing and storing the patient information accurately and correctly for future references.
- 2: It is helpful for the clinician to make an informed clinical decision as using EMR enables clinician to review the patient history at a glance.
- 3: EMR reduces the risk of data duplication as a single file is created for patient that can be accessed through multiple channels at multiple locations.
- 4: EMR's automates and streamline provider (doctor) workflow and reduces their time during consultation to decide.

### Benefits of EMRs

- 1: It improves patient care
- 2: It increases patient participation.
- 3: Improves care coordination
- 4: Improves diagnostics and patient outcomes
- 5: Practice efficiencies and cost savings

### Difference between Electronic Medical Records and Paper-based Medical Records<sup>[9]</sup>

Electronic Medical Record	Paper-based Medical Record
EMR require no physical space for storage of data	It requires physical space for storage
EMR can be stored in cloud, where it can be accessed at any time any place.	Paper based is prone to deteriorate over time.
Direct access to your health records	It doesn't provide direct access to your health records.
It can reduce the unnecessary tests and procedures	It can't reduce the unnecessary test and procedures.
An electronic medical record platform requires less workforces to handle and support the paper files.	Paper records require additional workforces to handle and support paper files and to organize countless documents.
Reduce the manual work	Increase the manual work
EMR can provide a platform for advanced data analysis to develop better business strategy	Paper based can't provide platform for advanced data analysis.
Easy retrieval of patient records, based on demographic, gender, age, and so on	It requires more time to retrieve the patient records
Enhances continuity of care, anywhere anytime	It can't provide continuity of care anytime, anywhere it requires the physical documents.
EHR implementation is costlier at initial stage but the cost of record over the time will be decreases.	Paper based record is less costly than HER but the cost of record over the will be increases.
Easy to use and eliminates error caused by handwriting.	Easy to use but in paper based record more chances of error caused by handwriting.
Provider can exchange medical record faster electronically	Paper record can share by mail or fax and it is inefficient and waste of valuable time.
EHR reduces the redundancies across the providers allow easy access of complete health record.	Paper record are dispersed across the different medical facility and mostly incompleated which results into repetative tests & treatment.
Provide access to medical record anytime , anywhere.	Providers access to medical record is limited by location and office hours

## CONCLUSION

A well organized and perfectly implemented HMIS can enormously improve the healthcare delivery system in any country and can be helpful to derive the desired outcomes in the country from the various health initiatives. The problem associated with the implementation of HMIS involves: Decentralization of organizational structure, Lack of co-ordination, Inefficient utilization of resources and improper use of gathered information due to which the principle of HMIS is affected.

Computerization of the HMIS (EHR) is more feasible and has several advantages over the paper based records. It improves effectiveness, efficiency, of quality of care. The major advantage of EHR is that, it provides access to medical record anytime, anywhere and enhances continuity of care to the patients and for healthcare workers, it also reduces the time taken in generating the patient report, retrieval of data is easy and handy. It can easily collect data from different sources. Although EHR implementation is costlier at initial stage but the cost of benefits overwhelmed the cost of implementation when used properly.

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