20 CHAPTER

E-Governance & Telemedicine

20.1 E-GOVERNANCE INITIATIVES

Information & Communication Technology (ICT) can improve the delivery of healthcare services and management of the public health system. MoHFW is therefore promoting eHealth or Digital Health i.e. use of Information & Communication Technology in the direction of "reaching services to citizens" and "citizen empowerment through information dissemination" to bring about significant improvements in the public healthcare delivery.

To improve efficiency in health care delivery, extend health care to rural areas and provide better quality at low cost certain eHealth initiatives using ICT were undertaken by MOHFW across the country. The purpose of such initiatives is to:

- Ensure availability of services on wider scale,
- To provide health care services in remote & inaccessible areas through telemedicine,
- To address the health human resource gap by efficient & optimum utilization of the existing human resource,
- To improve patient safety by access to medical records & reducing healthcare cost,
- To monitor geographically dispersed tasks & effective MIS for meaningful field level interactions,
- To help in evidence based planning & decision making,
- To improve efficiency in imparting training & capacity building.

The broad programmes/activities covered under eHealth are as below:

Progress & Achievements

There is need to achieve convergence amongst various IT systems to provide services in a robust and efficient manner and to provide timely response in the event of disease outbreak. Therefore, eHealth section has prepared plans to move towards a comprehensive, nationwide integrated e-Health system as opposed to the prevailing situation of isolated IT systems with little sharing of data or inter-operability of systems. It is working on overall development of eHealth ecosystem to support growth and adoption of eHealth in the country by promoting Metadata & Data Standards, Electronic Health Record Standards, Inter-operability & Data Exchange Platform, Application Certification Programmes, Regulation of Data Security/ Privacy/Confidentiality etc.

Given the integral role of technology in the healthcare delivery, National Health Policy, 2017 envisaged extensive deployment of digital tools for improving the efficiency and outcome of the healthcare system. In addition, the policy intends to strengthen the health surveillance system and to establish country-wide health information exchange network by 2025.

MoHFW has taken various initiatives in 2018-19 towards its aim of implementing e-Health in an integrated manner across central and state levels. These activities/tasks are highlighted as below:

Interoperable Electronic Health Records

MoHFW has envisaged establishing a system for interoperable Electronic Health Records (EHRs) of citizens to be created, made available and accessible online to facilitate continuity of care, better affordability and better health outcome and better decision support system. Following initiatives have been undertaken:

A. **EHR Standards:** (revised version of 2013 Standards) has been notified in December, 2016. The EHR Standards include standards for Disease Classification, Medicine and Clinical terminology, Laboratory Data exchange, Digital Imaging and Communication etc. for semantic inter-operability.

B. **Metadata & Data Standards (MDDS):** To enable semantic interoperability among healthcare applications MDDS standards were developed following the guidelines of Ministry of Electronics and Information Technology (MeitY) and open standards policies of GOI. The MDDS standards have more than 1000 data elements to be used in healthcare applications and are aligned with the global health IT standards. The approved MDDS standards have been notified by MeitY in August, 2018.

C. **National Identification Number (NIN) to Health Facilities in India:** a unique identification number, which a key requirement for achieving inter-operability and creation of EHRs, is being assigned to all health facilities (both public & private) to facilitate inter-operability among health IT systems deployed. So far approximately 99% of public health facilities have been allocated NIN. The process for setting up mechanism for allocating NIN to private facilities is underway.

D. **Hospital Information System (HIS):** HIS is being implemented for computerized registration and capturing EHR/ EMR of patients in Public Health facilities upto PHC level. This will also facilitate workflow management leading to better delivery of services to patients and improvement in efficiency of processes in these facilities. So far, financial assistance provided to 21 States/ UTs for implementation of HIS application. Current status of HIS implementation is as below:

- eHospital (NIC): implemented in more than 320 hospitals
- e-Sushrut (C-DAC Noida): more than 80 Hospitals in State of Maharashtra (1), Telangana (3), Rajasthan (72) and Delhi

(1); State wise roll out plan received from Telangana.

E. My Health Record: provides a single online personal medical record storage platform to citizens of India to enable them to manage their own medical records in a centralized way, which greatly facilitates the storage, accessibility and sharing of personal health data.

My Health Record can be accessed from anywhere, anytime by the patients and also by physicians, thus increasing flexibility for a patient to visit any doctor without carrying the burden of physical files, and thus benefit both the citizens and the physicians. It helps the physician to understand patient's past medical history which is important to the treatment to be given and will have following benefits:

a) It helps in recovering medical records which might be lost in physical form.

b) The data stored in a standardized format can be used for data analytics to understand disease trend, etc.

c) Reduces medical error and improves patient compliance.

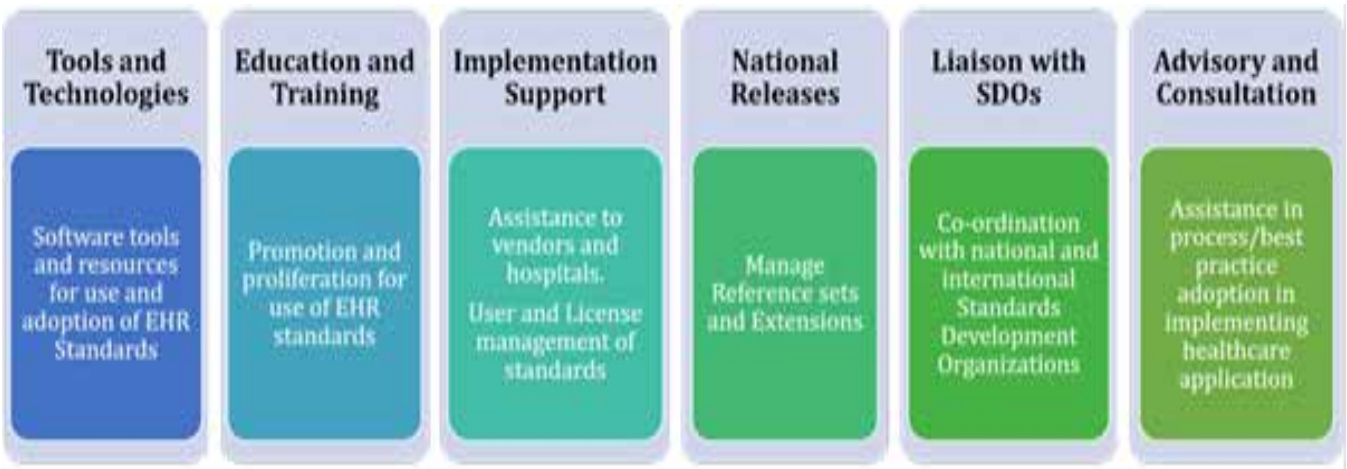
d) Helps patient in taking second opinion and provides emergency medical records for unconscious/unattended patients.

The beta version is hosted at https://myhealthrecord.nhp.gov.in

National Resource Centre for EHR Standards (NRCeS)

MoHFW has established a Centre of Excellence for EHR standards i.e. National Resource Centre for EHR Standards (NRCeS) at C-DAC, Pune to accelerate and promote adoption of EHR standards in India. NRCeS is a single point of contact for assistance in developing, implementing and using EHR standards in India. NRCeS provides the knowledge base for EHR Standards and associated resources and facilitates acceptance of and adherence to EHR standards. For more information, please visit: https://www.nrces.in/

NRCeS offers different services to facilitate adoption of the entire set of notified EHR Standards for India in healthcare applications.



National Digital Health Blueprint (NDHB)

The Committee constituted by the MoHFW to create an implementation framework for the National Health Stack (NHS) proposed by NITI Aayog, has come up with the National Digital Health Blueprint, after surveying the global best practices in adoption of digital technologies holistically. The document has specific details of the building blocks required to fulfil the vision of NHP 2017 as also the institutional mechanism and an action plan for realizing digital health in a comprehensive and holistic manner. The key features of the blueprint include a federated architecture, a set of architectural principles, a 5-layered system of architectural building blocks, Unique Health Id (UHID), privacy and consent management, national portability, EHR, applicable standards and regulations, health analytics and above all, multiple access channels like call centre, Digital Health India portal and MyHealth App.

The following vision of NDHB itself provides a citizen centric and wellness centric approach and has included security & privacy as one of the pillars for digital systems:

"To create a National Digital Health Eco-system that supports Universal Health Coverage in an efficient, accessible, inclusive, affordable, timely and safe manner, through provision of a wide-range of data, information and infrastructure services, duly leveraging open, interoperable, standards-based digital systems, and ensuring the security, confidentiality and privacy of health-related personal information."

The NDHB envisages achieving following objectives:

- To establish state-of-the-art digital health systems
- To establish national and regional registries
- To enforce adoption of open standards
- To create a system of Personal Health Records
- To promote development of enterprise-class health application systems
- To ensure national portability
- To promote the use of Clinical Decision Support (CDS) Systems.

The NDHB document has been submitted to Secretary (HFW) by Shri. J. Satyanaryana, Chairman of the Committee for further consultation with stakeholders.

Online Services

A. On line Registration System (ORS): is a framework to link various hospitals for online registration, payment of fees and appointment, online diagnostic reports, enquiring availability of blood online etc. As on date, more than 190 hospitals including hospitals like AIIMS, New Delhi & other AIIMS (Jodhpur; Bihar, Rishikesh, Bhubaneswar, Raipur, Bhopal); RML Hospital; SIC, Safdarjung Hospital; NIMHANS; Agartala Government Medical College; JIPMER etc. are on board ORS. So far, more than 20 lakh appointments have been transacted online.

B. MeraAspatal (Patient Feedback System): 'application is an IT based feedback system to collect information on patients' level of satisfaction using a multi-channel approach viz. Short Message Service (SMS), Outbound Dialing (OBD), Web Portal, and Mobile Application. The application automatically contacts the patient (outpatient after the closure of the OPD and the inpatient at the time of discharge) using the above tools to collect information on patients' level of satisfaction. Currently about 2711 hospitals have been covered and more than 33.75 lakhs feedback received so far.

Global Agenda on Digital Health

A. Resolution of Digital Health: MoHFW worked to move the **Resolution of Digital**

Health in 71st World Health Assembly, 2018 to prioritize Digital Health in Global arena which was agreed upon unanimously.

B. Global Digital Health Partnership: The GDHP is a collaboration of Governments, territories, Government agencies and the World Health Organization. It has been created to provide an international forum to facilitate global collaboration and co-operation and to share policy insights and evidence of best practice in the implementation of digital health services. Currently, 24 countries and World Health Organization (WHO) are the members of GDHP.

- India successfully hosted the 4th Summit and symposium of GDHP in Feb, 2019.
  - This event received the participation from 35 countries, Academia, Industry and Start-ups
  - Adoption of Delhi Declaration on Digital Health for Sustainable Development
  - India also got the chairmanship for GDHP for next one year to extend the GDHP Secretariat services.

Online Consultation- Telemedicine

i. National Medical College Network (NMCN)

National Medical College Network (NMCN) is being established with the purpose of e-Education and e-Healthcare delivery, wherein 50 Government Medical Colleges are being interconnected, riding over NKN (National Knowledge Network – high speed bandwidth connectivity). National Resource Centre (NRC) with required centralized infrastructure and 7 Regional Resource Centres (RRCs) have been established as below:

1) NRC cum Central RRC -SGPGIMS, Lucknow
2) RRC, North - PGIMER, Chandigarh
3) RRC-Central - AIIMS, New Delhi
4) RRC-South - JIPMER, Puducherry
5) RRC-East -IMS, BHU, Varanasi
6) RRC-West - KEM, Mumbai
7) RRC-North East-NEIGRIHMS, Shillong
8) RRC-South II- SCTIMST, Thiruvananthapuram

Following Facilities have been created at these centres:

a) State of the art digital lecture theater with integrated 3D projection system at NRC
b) Tele-Medical Video collaborative environment (Virtual Tumor Board) for cancer patient management at NRC
c) Centralized Multipoint Control Unit (MCU) integrated with gatekeeper facilities
d) Centralized web casting / streaming solution

Current Status: The installation is complete in 46 colleges

ii. National Telemedicine Network (NTN)

National Telemedicine Network (NTN) initiative was approved with the vision to provide telemedicine services to the remote areas by upgrading existing Government Healthcare Facilities (MC, DH, SDH, PHC and CHC) in States. Challenges faced in the present healthcare system viz. lack of specialist and inaccessibility of doctors in rural areas is addressed by use of information technology in delivering healthcare services.

The States/UTs are being supported under National Health Mission (NHM) through their State PIPs. 10 States have been financially supported for strengthening State Telemedicine initiatives under NTN in the last four years. To create reliable, ubiquitous and high speed network backbone, all available and future network technologies such as NKN, NOFN, SATCOM (satellite communication) and terrestrial high speed internet are being utilized.

A sustainable operating model will be created by State Government.

iii. Tele-Radiology (NIC-Delhi)

CORS (CollabDDS Online Radiology Services) is a web interface among different health communities for resolution of radiological and dental issues. CORS is accessible to local as well as remotely situated doctors for seeking guidance from expert radiologists. Radiologists in return provide doctors with diagnosis/diagnostic reports. Using CORS, doctors can either upload cases for forwarding to experts or can conduct real time collaboration with the experts, thereby reducing the turn around time.

The CORS project was launched with the objective of providing Online Radiology interpretation on reports, for Continuing Medical Education (CME) for Medical Officers with an effort to mitigate the lack of Radiologists at primary healthcare institutes.

The project got soft launched on 31st August, 2018 for 79 PHC/CHC/DH.

iv. SATCOM based Tele-Medicine Nodes at Pilgrim places

In line with the Honorable PM's vision, setting up of new Tele-medicine Nodes at Pilgrimage places has been envisaged using Space Technology Tools for tele-medicine facility between identified remote patient end health facility and specialty hospital in collaboration with Department of Space for health awareness. Screening of Non-Communicable Diseases (NCDs) and specialty consultation will be provided to the devotees visiting the following places.

- Kashi Vishwanath Temple, Varanasi, (UP)
- Maa Vindhyavasini Mandir, Vindhyachal Dham, Mirzapur (UP)
- Sheshnag, Amarnath Pilgrimage (J&K)
- Pampa Hospital, Ayyappa Temple at Sabrimala in Kerala

Currently, the identified patient nodes are proposed to be interlinked with specialist nodes in their respective State. However, the tele-consultation can be obtained from any of the super-specialty nodes setup across the country such as PGIMER (Chandigarh), SGPGI (Lucknow), AIIMS (Delhi), JIPMER (Puducherry) etc.

v. JIPMER BIMSTEC – STRENGTHENING REGIONAL HEALTHCARE:

In an effort to provide better access to health care facilities in the developing nations, especially in the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) region, Hon'ble Minister of State, MoHFW, inaugurated the JIPMER-BIMSTEC Telemedicine Network on 13th July, 2017. The aim of JIPMER-BIMSTEC Telemedicine Network is to improve regional cooperation in the field of health care by strengthening Telemedicine based patient care services and share medical knowledge among BIMSTEC countries. An MoU was also signed with Morocco for inclusion in BIMSTEC Network for telemedicine services.

vi. TELE-EVIDENCE:

Tele-evidence, a modality via which doctors can testify in the judicial process utilizing the video conferencing facility without visiting the courts. The project is operational in PGIMER, Chandigarh since March 2014 and more than 8,500 summon cases have been attended till date. The tele-evidence facility streamlines the process of doctors appearing in courts in response to summons and saving their time not only for patient care but also for medical education and research.

Office Automation

A. e-Office: In recognition of the long-felt need for efficiency in Government processes and service delivery mechanisms, MoHFW has started implementation of e-Office for significantly improving the operational efficiency of the Government by transitioning to a " Paper Less Office" , to

reduce processing delays and to establish transparency and accountability. MoHFW has shown its complete commitment towards implementation of e-Office and over 75% of the work in the Ministry has been shifted to electronic mode. Support for digitization of old physical file, hand holding support to the staff, allocation of DSCs/ e-Sign and bug fixing have been provided by eHealth section.

B. Video Conference facility: To increase the efficiency of the officers and speeding up office procedure and also to make work more collaborative and for anytime availability of officials to discuss important matters irrespective of geographical locations, software based video conferencing system has been implemented. All the Officers in MoHFW are using this Video Conferencing application. This facility has also been extended for State Principal Secretaries (H&FW) and Mission Directors of NHM.

Centre for Health Informatics

The Centre for Health Informatics (CHI) has undertaken various activities relating to e-Governance/e-Health for improving the efficiency and effectiveness of healthcare system during the period April, 2018 to March, 2019. Brief detail of CHI achievements and initiatives is as under:

i. New Portal / Websites

- **Health and Wellness Centers (HWC)-** (https://ab-hwc.nhp.gov.in/)The Centre for Health Informatics, MoHFW has implemented the project for monitoring Health and Wellness Centers (HWCs) under Ayushman Bharat Scheme. HWCs deliver comprehensive primary healthcare by upgrading existing health facilities- Sub Health Centres (SHCs) and Primary Health Centres (PHCs) or infrastructure development. CHI developed HWC Portal for monitoring progress of the project.

- **CPHC-NCD Program-** Application for population based prevention, control and screening for Non-Communicable Disease Programme (NCD Screening). In this project, all the necessary infrastructure, software, middleware, third party software, sitting space, call centre setup and other assistance will be provided by the MoHFW through CHI.
- **LaQshya-** Developed Portal / Dashboard for LAQSHYA, which is an initiative intending to improve the quality of care in Labour Room and maternity operation theatres. The dashboard and data is being filled by States. CHI assisted in the development of the portal.
- **National Programme for Health Care of Elderly (NPHCE):** Developed NPHCE Portal / dashboard for monitoring the programme. EHR Data is being filled by

States. CHI assisted in the development of the portal.

ii. New Initiatives and Activities

- **Rashtriya Bal Swasthya Karyakram (RBSK)** – CHI is assisting RBSK programme by making out-bound calls to the beneficiaries and informing about safe motherhood and new born health.
- **Mental Health -** Mental Health website and dashboard is under development after briefing about the programme done by the division.
- **Emergency Medical Response (EMR)-** EMR website and dashboard is under development after briefing about the programme highlights and achievements by the division.
- **VAEIMS** (Vaccine Adverse Event Information Management System)- is a system to facilitate the collection, collation, transmission, analysis and feedback of India's vaccine safe data (AEFI data) from the periphery of the health care system. The application is hosted through CHI.

iii. Portals/Websites

- **National Health Portal (NHP): (www.nhp.gov.in)** was set up with the objectives to improve health literacy, improve access to health services, decrease burden of diseases through awareness and to provide as a single point of access for consolidated healthcare related information to the citizens of India. NHP is continuously adopting various new initiatives in the form of voice-web, mobile applications, mHealth, digital platform, digital media etc. for dissemination of authentic health information.

- **Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA):** (https://pmsma.nhp.gov.in/)CHI has developed PMSMA Portal, Dashboard and created Helpdesk for supporting the programme. The programme started in November, 2016, aims to provide assured, comprehensive and quality antenatal care, free of cost, universally to all pregnant women.

iv. Development of Dashboards

- **MoHFW Budget:** Developed Budget Dashboard of MoHFW for tracking the budget provisions, allocation and expenditure.
- **Digital Transaction -** Developed an online reporting mechanism (MIS) for monitoring total number of transactions (digital & physical) for hospitals/institutes across the country.
- **National Health Policy-2017:** To track the progress and action taken to achieve the aims of National Health Policy.

- **Central Dashboard:** To monitor and track KPI of all connected dashboards of MoHFW.
- **International Health (IH/IC):** e-Monitoring system for managing foreign country tours of delegations for various events, workshops, conferences, invites, JWGs, bilateral meetings, etc.
- **Pradhan Mantri Swasthya Suraksha Yojana (PMSSY):** To track physical and financial progress of all AIIMS across the Country.

v. **Mobile Applications:** Following are the active mobile applications of MoHFW.

vi. **mHealth**

- **mCessation (Quit Tobacco):** Developed with the collaboration of WHO, mHealth initiative aims to reach out to tobacco users of different categories who want to quit tobacco use and support them towards successful quitting. The facility can be availed by giving a missed call to 011-22901701 or by registering at Quit Tobacco Programme at NHP.
- **mDiabetes:** Developed this application for generating awareness about diabetes, providing information regarding healthy lifestyle including healthy diet necessary exercise and better adherence to drug and self-care.
- **NHP Health Kiosks-** CHI has developed and installed Health Information Kiosks at various Central and State Government Hospital premises for providing quality health related information to all the citizens. 50 kiosks have been deployed and planning done to deploy 150 more is being done.
- **Cyber Security-** CHI is also involved in providing effective Cyber Security in health, incidence response resolution and cyber crisis management.

vii. **Media Campaign**

- **Twitter / Facebook / YouTube / Instagram:** NHP is connected with people through social media providing information about health, diseases, healthcare, health services and activities of MoHFW. NHP Social Media has received tremendous response globally. The numbers of followers are increasing day by day and the post count has reached in lakhs.
- **Print Media:** Carried out advertisement campaign in Hindi and English in three monthly magazines- i.e. The Dialogue, Exotica, and Airports India about subjects related to health and healthcare services and NHP's activities on Health.

Digital Payments

The Digital India programme is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. In lieu of the same following activities have been undertaken by the MoHFW:

i. Ministry of Health & Family Welfare requested all the public and private Health Care Organizations (HCO) for enabling all customer touch points with digital payment acceptance infrastructure via time to time advisories issued to State/UTs, Central Government Institutions & Empaneled Hospitals/Diagnostic centres under CGHS.

ii. Advisories issued to State Nodal Agencies (SNAs) of States/UTs under RSBY for use of digital modes for financial transactions.

iii. Sensitization meetings held in a planned manner with:

   a. State Nodal agencies and representatives of RSBY

b. Indian Medical Association

c. All India Organization of Chemists & Druggists (AIOCD), Digital Health Platforms (DHP) & National Payment Corporation India.

iv. IEC material displayed at various locations in the healthcare facility depicting "Patients/ Citizen can pay by means of UPI, BHIM, Mobile Wallet, Credits & Debits Cards". Health Facility enabled all customer touch points with Digital Payment Infrastructure. Following methods of Digital Payments are in progress at Health facilities:

v. Advisories issued vide letter dated 02.07.2018 to all States/UTs and Central Govt. Hospital/Institutes for the promotion of digital payments and targets for FY 2018-19.

vi. Advisories issued vide letter dated 27.10.2017 to all States/UTs and Central Govt. Hospital/Institutes for integration of BHIM App & Bharat QR code in the payment gateway of hospitals.

vii. Target: A target of 110 Crore transaction has been assigned to the Department of Health and Family Welfare for FY 2018-19.

Conclusion

Digital health has huge potential of improving the healthcare delivery system and capable of changing the landscape of healthcare industry across the globe. Government of India has been increasingly focusing on eHealth/Digital Health to bring about improvements in Indian public healthcare delivery by progressively using Information & Communication Technology under the overall objective of Digital India.