e-Health Initiatives in India
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India Demography & Health Delivery System
India

Total Area: 3,287,590 sq. km
No. of Provinces: 29
Union Territories: 6
Coastal line: 6,700 km
## Health Delivery System

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Electronic Medical Record and Hospital Automation
EMR & Hospital Information & Management System (HIMS)

• Application
  – Large corporate hospitals
  – Academic Medical Institutions
    (SGPGIMS, Lucknow; Institute of Medical Sciences, Sevagram; SRMC, Chennai; AIMS, Kochi; CMC, Vellore)

• Solution Providers
  – Center for Development of Advanced Computing (CDAC)
  – Wipro GE Healthcare
  – Tata Consultancy Services (TCS)
  – Siemens Information Systems Ltd (SISL)
  – Vepro (PACS)
Brief review of Telemedicine projects around the country
Telemedicine Infrastructure

Telemedicine
(more than 400 platforms)

• Major Implementing Agencies
  – Indian Space Research Organisation
  – Department of Information Technology, Ministry of Communication & IT
  – Ministry of Health and Family Welfare
  – State Governments
  – Medical Institutions
State wise location of Telemedicine platforms

- J & K (12)
- HP (27)
- Uttarakhand (3)
- Punjab (5)
- Karnataka (30)
- Kerala (29)
- W Bengal (9)
- Maharashtra (4)
- Madhya Pradesh (1)
- AP (13)
- Chhattisgarh (19)
- Jharkhand (1)
- Rajasthan (44)
- Haryana (2)
- Delhi (4)
- Assam (3)
- Tripura (7)
- Andaman & Nicobar (6)
- Lakshadweep (5)
- Tamilnadu (13)
- Meghalaya (1)
- Sikkim (1)
- North East States (21)
- Nagaland (3)
- Manipur (1)
- Bihar (1)
- Orissa (8)
- Tripura (7)
- Mizoram (2)
- Jharkhand (1)
- Jharkhand (1)
- Andhra Pradesh (16)
- Gujrat (1)
- Madhy Pradesh (1)
- Pondichery (5)
- Pondichery (5)
- Medical Colleges
- Medical Institutes
- Corporate Hospitals
ISRO's TELEMEDICINE NETWORK - ESTABLISHED SO FAR

245 Hospitals --- 205 Dist/ Rural Hospitals, -- 40 Super Specialty Hospitals

- J&K
  - Srinagar-GMC
  - Srinagar- SKIMS
  - Jammu
  - Katua
  - Leh
  - Kargil
  - Kupwara
  - Doda
  - Poonch

- Chhattisgarh
  - Jagadalpur
  - Raipur
  - Marwahi

- Andaman & Nicobar
  - Port Blair
  - Car Nicobar

- Andaman & Nicobar
  - Guwahati
  - Waltwaker CC, Chiplun

- B. Barua CC
  - North East
    - Udaipur(TP)
    - Guwahati(AS)
    - Imphal-1(MP)
    - Jorhat.(AS)
    - Shillong(MG)
    - Mokokchung(NL)
    - Naharlagun(ap)
    - Gangtok(SK)

- West Bengal
  - Krishnanagar
  - Malda

- Apollo, Chennai
  - AHF, Kolkata
  - TMC, Mumbai

- Apollo, New Delhi
  - AIIMS, New Delhi

- Andhra Pradesh
  - Aragonda
  - SHAR, Sriharikota

- Kerala
  - Pampa
  - Pattanamthitta
  - Kannur

- Lakshadweep
  - Kavaratti
  - Minicoy
  - Androttii
  - Ameni
  - Agatti

- Kerala Cancer net
  - Cancer center Kannur

- Kathaika
  - Chamarajanagar
  - Stranger
  - Maddur.
  - Sagar.
  - Chitradurga
  - Karwar
  - Bagalkot.
  - Mandya.
  - Tumkur.
  - Sirsi

- 2,50,000 patients treated

- 8 Mobile Vans
**DIT - Initiatives**

- Telemedicine module for Tropical Medicine in West Bengal - Webel (Kolkata), IIT, Kharagpur and School of Tropical Medicine, Kolkata
- Telemedicine and Telehealth Education facilities in Kerala - 3 specialty hospitals with 4 District/ Rural Hospitals
- Telemedicine network (CME programme) for Naga Hospital Kohima with Apollo Hospital, Delhi
- Onconet Network - Kerala and Tamilnadu States
- State wide Telemedicine network based on terrestrial communication in the state of Himachal Pradesh, Tamilnadu, Punjab
- Telemedicine network for Tripura – 2 referral hospitals with 4 nodes
- Networking of District Hospitals of Mizoram & Sikkim with Apollo Hospital, Delhi
- Setup Community Information Centers in 30 blocks of the North Eastern states and Sikkim in collaboration with National Informatics Center using NICNET
Telemedicine Networking at SGPGIMS
Telemedicine at SGPGIMS, Lucknow

- Application project
- Constancy, project planning and implementation of network in states
- Tele-health care & Distant Education in Medicine
- Tele-mentoring
- Research and Product development
- Organizational Activities
- Telemedicine Awareness
- National & International collaboration in policy initiatives, technical knowledge exchange & HRD
Telemedicine Activities at SGPGIMS

Tele-education

Tele-health care

Research & Development

Capacity Building
All India Institute of Medical Sciences, New Delhi

- J & K network, Haryana (Rohtak Medical College, Ballabgharh Community Centre)
- SCB Medical College Cuttack,
- Guwahati
- SRMC, Chennai
- AIMS, Kochi

Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh

- Mata Kaushalya Hospital at Patiala
- Sub-divisional Government Hospitals at Dasuya and Ajnala in Hoshiarpur and Amritsar in Punjab state
Amrita Institute of Medical Sciences, Kochi

- 36 Telemedicine Centers all over India
- Emergency Medical Center at Pampa

Apollo Telemedicine Network Foundation

- Corporate Group of Hospitals having branches in India and Abroad
- Networked all its hospitals and use in-house software
- Telemedicine consultancy and software providers
- Active participants in the Standardization and ITIH activity
- Installed a number of peripheral telemedicine nodes through franchise under Apollo Health Street Company

Fortis Hospitals

- HIS & PACS
- 13 nodes
Tele-cardiology

Asia Heart Foundation

Escort Heart Institute

Narayana Hrudayalaya, Bangalore
Telemedicine for Cancer Care

Regional Cancer Centre, Thiruvananthapuram

Tata Memorial Hospital, Mumbai

SGPGIMS Radiotherapy Network, Lucknow
Mobile Units
Tele-ophthalmology & mamography

Shankara Nethralaya
Aravind Eyecare Hospital
Sir Ganga Ram Hospital
National e-Governance Action Plan (NeGP) (DIT Initiatives)

100,000, Common Services Centers (80 services) by 2007

- Health
  - Vaccination Schedule
  - Maternity Care
  - Family Planning
  - Medicines
  - Ambulance Services and Transportation
  - Hospital / Primary Health Centers information
  - Blood Bank
  - Life Saving Drugs
  - Doctor’s Database
  - Appointment with Doctors
  - E-Diagnostics
  - Materials Management System (Medicines)
Govt of India Initiative
Village Resource Centers (VRCs)

- 600,000 villages
- Communication and remote sensing satellite provided by ISRO
- Information on agriculture, health, education, natural resources
- Initially in the Andaman and Nicobar Islands & Wayanad and Palakkad areas of Kerala and in some parts of the northeast

Tele-health Industry
(Hardware & Software)

• Center for Development of Advanced Computing
• Apollo Telemedicine Network Foundation
• Online Telemedicine Research Institute
• Televital India
• Vepro India
Standardization & Policy initiatives
(National Task Force)
Policy Initiative

• National Health Information Infrastructure & Standardization (www.mit.gov.in)
  – Undertook initiative, in a project mode, for defining “The framework for Information Technology Infrastructure for Health (ITIH)” to efficiently address information needs of different stakeholders in the healthcare sector
  – Prepared documents “Recommended Guidelines & Standards for Practice of Telemedicine in India” to standardize services of different Telemedicine centers

• National Broadband Policy (Telecom Regulatory Authority of India)

• Dedicated Satellite for Education (EDUSAT) & health (HEALTHSAT)

• Revision of Medical Curriculum in process

• National Telemedicine Task Force, Ministry of Health & FW, Govt. of India
National Task Force on Telemedicine

Terms of References

• To work on inter-operability, standards for data transmission, software, hardware, training etc.
• To define a national telemedicine grid and consider its standards and operational aspects
• To identify all players and projects currently involved in telemedicine in India and evaluate their performance, capacity and replicability.
• To prepare pilot projects for connection of super specialty hospitals/medical colleges with district hospitals and/or Community Health Centers/Primary Health Centers especially keeping in mind to provide access to remote areas
• To prepare national cancer telemedicine network
• To examine possibilities of utilization of stand alone centers of department of communication in rural areas
• To define standards and structures of electronic medical records and patient data base which could be accessed on a national telemedicine grid
• To enable telemedicine centers in teaching institutions to impart training to all government medical/dental/nursing colleges in three years time
• To prepare curriculum and projects for CMEs through telemedicine
Recommended Guidelines & Standards for Practice of Telemedicine in India
Major national & international Projects in near future
National/ Internation e-Health Projects under planning/ implementation

• Ministry of Health & FW Project
  – Integrated Disease Surveillance Project
  – Tele-ophthalmology project
  – National Telemedicine Grid
  – National Onconet Project
  – National Medical College Network
  – National Digital Medical Library Consortium

• Ministry of External Affairs Project
  – SAARC telemedicine network
  – Pan-African e network project
E health Capacity building, Scientific Societies, Education, Research & Development
e-Learning in Health Sciences

- Online Open Access Bibliography
  - NIC-ICMR (MEDLARS)
- Collaborative Knowledge sharing through telemedicine network
Education & Training in e Health towards Capacity building

- Apollo - Anna University, Chennai (certificate course)
- School of Telemedicine and Biomedical Informatics Telemedicine, SGPGIMS (structured courses)
  - Hospital Information System, Biomedical Informatics, Medical Multimedia and Image management, Medical Knowledge Management, Artificial Intelligence, Virtual Reality and Robotics
- National Institute of Health & Family Welfare (Tele Training Center) – MoH&FW
Research & Development
DIT Initiatives

• Center for Development of Advance Computing
  – HIS, SGPGIMS
  – Telemedicine Software (Mercury & Sanjeevani)
• Media Lab Asia Initiative
  – In collaboration with many premier medical and technical institutions
Research publications

- SGPGIMS, Lucknow
  - www.sgpgi-telemedicine.org

- Apollo Hospital
  - www.kganapathy.com/listofpublications
National Scientific Activities

• Medical Computer Society of India

• Telemedicine Society of India

• Indian Medical Informatics Association
Critical issues for integration of e-health in Medical Tourism
Critical Issues on e health integration

- Interoperability of platform, software, EMR and connectivity
- Acceptance by stake holders
- Licensing, legal, ethical and social issues
Thank You

www.sgpgi-telemedicine.org