Telemedicine to fight against medical deserts

Telemedicine in India
Evolution, Current Scenario and Future Perspective

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Agenda

• Introduction
• Background: Evolution of Telemedicine Program in India
• Current Telemedicine Practices
• Current Policy & Practices
• India International Telemedicine Practices
• Further Reading
• Conclusion
Who We Are
Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS)
Tertiary Care Supespecialty Hospital
Evolution of Telemedicine Program in India
Evolution of Telemedicine in India

• Telemedicine activities at SGPGIMS were initiated in the year 1999 in the form of testing the concept of information and communication technology in the field of medicine.

• DIT has also sponsored the telemedicine project connecting three premier medical institutions - viz. SGPGI-Lucknow, AIIMS-New Delhi and PGIMER-Chandigarh.

• Telemedicine Society of India (TSI) formulated.

• 1\textsuperscript{st} Telemedicine Society of India Conference held at SGPGIMS

• Live Surgery Transmitted during 5\textsuperscript{th} Post Graduate Course of Endocrine Surgery (PGES)
ISRO Telemedicine Network (Since 2001)

Current Status
ISRO TELEMEDICINE NETWORK

315 nodes
263 Remote Hospitals,
8 Mobiles &
44 Speciality Hospitals
Video Links

- Telemedicine at Hilly Region
  https://www.youtube.com/watch?v=wqgGCy9sjqU

- Telemedicine at Andaman & Nicobar island
  https://www.youtube.com/watch?v=8XVPimu7X50

- Telemedicine at Kumbh Mela
  https://www.youtube.com/watch?v=mbkuMksbeOY&t=44s
Current Telemedicine Practices
Odisha State Telemedicine Network

Maharastra State Telemedicine Network

Control node
Sir J.J. Hospital Mumbai

Speciality node
06 Medical Colleges

62 Patient Nodes
23 District Hospital + 39 Sub District / Rural Hospitals

https://www.nrhm.maharashtra.gov.in/telemed.htm
Punjab Telemedicine Network

• Punjab Health system under Ministry of Health & Family Welfare (MoH&FW)
• Telemedicine Project, Punjab was launched on pilot basis at the three Hospitals of Punjab with the aid of ISRO and the assistance of PGIMER using Satellite technology (V-SAT) on 13.04.2005
• Web Based eSanjeevani Telemedicine Software Developed by Center for Development and Advance Computing (CDAC), Mohali
• All District Hospitals and Three Medical Colleges in the States are connected to Post Graduate Institute of Medical Sciences (PGIMER)

http://punjabhealth.co.in/RSBY_overview.aspx?ID=qpbhdKadhac
Tata Memorial Centre and National Cancer Grid and Navya bring you evidence based expert treatment decisions.

Navya has accurately made over 18,000 expert treatment decisions in oncology.

Get an expert opinion in 1 to 3 days from Asia’s largest leading expert cancer centers.
Mobile Telemedicine Kiosk

Portable Mobile Telemedicine Kiosk

Yolo Health Kiosk
Policy & Future PAN India Telemedicine Practices
Health Policy implementation

**BUDGET 2018-19**

Health

**National Health Protection Scheme**

- Will be the world’s largest government funded health care programme
- Covering over 10 crore poor and vulnerable families
- Providing coverage upto 5 lakh rupees per family per year for secondary and tertiary care hospitalization
National Health Mission (NHM)
National Rural Telemedicine Network (NRTN)
Telemedicine in Sub-center, PHC, CHC, DH

• Design, development and implementation of
  • Low cost rural telemedicine infrastructure
  • Village Tele-ambulance System and rural emergency healthcare services/ Trauma care module
  • Rural Health Knowledge Resource through web portal and e-CME module
  • Technology platform for harvest, compilation, storage (Data Base) at Regional District Hub and Central Data Center at MOH & FW, archive and distribution across network

www.mohfw.nic.in/National%20Rural%20Telemedicine%20Network%20for%20India...
Digital India Mission

NATIONAL HEALTH PORTAL

Gateway to authentic health information

- Hospital Near You
- Ambulance Services
- Blood Banks
- Emergency Helpline
- Healthy Living

CALL 1056

Health Helpline
NRHM

Direct Intervention System for Health Awareness
National Medical College Network

07 Regional Resource Center (RRC) & 01 National Resource Center (NRC)

Promote telemedicine through e-Education and e-Healthcare delivery

Connect 41 Government Medical Colleges to National Knowledge Network (Phase 1)

Will connect remote 500 PHC/CHC/SDH to 50 District Hospitals

www.nmcn.in
Network Architecture
National Medical College Network
National Resource Center (NRC)
SGPGIMS, Lucknow

Tele-presence Suite for Surgical skill sharing

Sharing of Surgery at Multiple Location
National Resource Center (NRC)
SGPGIMS, Lucknow

Inner View of Integrated Operation Theatre
• Live Robotic Surgery was also transmitted from Korea.
• Doctors connected from Different parts of countries in Real Live Interactive Mode as well as through Mobile and Desktop; Live Streaming available through NMCN portal
Tele-Radiology (CollabDDS)

- National Informatics Centre, New Delhi, All India Institute for Medical Science, New Delhi, Indian Institute of Technology-Bombay and Council of Scientific, Industrial Research (CSIR) joined together for the effective development of CollabDDS application.

Centers
- PGIMER, Chandigarh
- JIPMER, Puducherry
- SGPGI, Lucknow, UP
- KEM Medical College & Hospital, Mumbai, Maharashtra
- AIIMS, New Delhi
- NEIGRIHMS, Shillong, Meghalaya

http://www.collabdds.gov.in/
Special Interest Group (SIG) APAN43 - Endocrine Surgery
Asia Pacific Advance Network (APAN)
APAN44 - Endoscopic Club E-conference (ECE)
Nuclear Medicine Followup Tele-Clinic
Endocrine Surgery (EESENCE)
Endocrine Surgery Alumni collaborative learning (SESAN) through web VC collaboration
Kiosks in Wellness Centers using PHRMS

• My Health Record Developed by CDAC
• https://myhealthrecord.nhp.gov.in/login
Electronic Resources in Medicine (ERMED)

- Electronic Resources in Medicine (ERMED) Consortium is an initiative taken by DGHS & MOHFW to develop nationwide electronic information resources in the field of medicine for delivering effective health care.
- 242 high quality online e-journals are presently purchased from 5 leading publishers.
- [http://www.ermmed.in/](http://www.ermmed.in/)
Corporate Telemedicine

Tele-Ophthalmology Network

INDIAN SPACE RESEARCH ORGANISATION
VSAT RURAL MOBILE
TELEOPHTHALMOLOGY NETWORK IN SANKARA NETHRALAYA

SANKARA NETHRALAYA
TELECOMMUNICATION ROOM
Tele-Radiology
Startups

Home Health care Services

https://www.portea.com/

Online Pharmacy

https://www.1mg.com/
Telemedicine at Temples
OVER YEARS, VARIOUS STATE GOVERNMENTS’ AND THE HEALTHCARE INDUSTRY HAVE BEEN PARTNERING TO MAKE SEVERAL SERVICES AVAILABLE TO THE MASSES

**Punjab**
Construction and operation of new super specialty hospitals in Mohali and Bhatinda, Punjab – Max Hospital

**Uttaranchal**
Mobile health clinics in collaboration with Uttaranchal Institute of Scientific research, Bhimtal (NGO)

**Rajasthan**
Diagnostic PPP with Sawai Mansingh Hospital and Soni Hospital. Public Health Engineering Department, Rajasthan is also involved in the development of a multi specialty hospital in Jaipur district under PPP

**Bihar**
State of Bihar Initiated an unique telemedicine project for delivering service in alternative medicine – Ayurveda, Yoga, Unani, Sidha & Homeopathy (AYUSH)

**Kerala Telemedicine Network**
Onconet - Cancer Care For Rural Masses, (in six hospitals), Telemedicine Kerala for Taluk hospitals, (in eight hospitals), Telehealth and Medical Education Kerala, (in 18 hospitals), Rural Telemedicine Project for primary care in Tirur taluk, (in 11 hospitals)

**Andhra Pradesh**
B Braun PPP for dialysis. PPP Model: Eleven dialysis centres were established in district hospitals – in Chittoor, Guntur, Hyderabad, Kakinada, Kurnool, Srikakulam, Vijayawada, Visakhapatnam and Warangal.

**Tamil Nadu**
Nexus PPP with government for one centre with 15 dialysis machines. Apollo PPP with one centre and nine dialysis machines

© Confederation of Indian Industry
Tele-medicine in collaboration with D/o Space at Pilgrimages

• MoHFW in collaboration with D/o Space has established a Telemedicine Node at Pampa hospital at the base camp of Ayappa pilgrimage which is interlinked with existing Telemedicine Node at JIPMER, Pondicherry and Govt. Medical College, Kozhikode (Calicut) for providing remote super speciality healthcare services.

• Telemedicine node has been setup at CHC, Pooh, Himachal Pradesh interlinked with PGIMER, Chandigarh with the purpose of providing access to speciality care to citizens inhabited at snowbound locations.

• MoHFW is in process of replicating this Tele-medicine model at Chardhams, Kedarnath and Amarnath temples and has proactively taken State Government and Department of Space on board for successful and smooth implementation.
TAking HEALTHCARE SERVICES TO ALL
A look at the centres set up in hard-to-reach areas this month, projects in the pipeline and the previous projects where ISRO provided satellite links to connect the centres to hospitals in cities

AMARNATH CAVE
The node was established at Sheshnag base camp of the Amarnath Shrine for providing tele-consultation facility to devotees visiting Amarnath shrine, interlinking specialty hospitals PGI Chandigarh and SKIMS, Srinagar

J&K
- Srinagar
- Jammu
- Kathua
- Kupwara
- Doda
- Poonch

CHHATTISGARH
- Jagadalpur
- Raipur
- Marwahi

KERALA
- Pattanamthitta
- Pampa

LAKSHADWEEP
- Kavaratti
- Minicoy
- Androttii
- Ameni
- Agatti

DISTRICT KINNAUR
Telemedicine node established at Community Health Centre (CHC), Pooh, to inter-link with existing node at PGI, Chandigarh through satellite communication

KEDARNATH AND BADRINATH SHRINES
The authorities are waiting till weather clears to install equipment at these nodes

NORTH EAST
- Gangtok
- Guwahati
- Imphal

WEST BENGAL
- Krishnanagar
- Buda
- Berhampur

ODISHA
- Cuttak
- Bhubaneswar

ANDHRA PRADESH
- Srikakulam
- Aragonda

AYAPPRA PILGRIMAGE, SABARIMALA
Telemedicine node established at Pampa Hospital at the base camp of Ayappa pilgrimage, interlinked with existing node at JIPMER, Puducherry, and Government Medical College, Kozhikode

KARNATAKA
- Chamrajanagar
- Saragur

ANDAMAN AND NICOBAR
- Port Blair
- Car Nicobar
National Resource Center for EHR Standards(2013)
Network Readiness

- National Knowledge Network (NKN)
- National Optic Fiber Network (NOFN)
- State Wide Area Network (SWAN)
India International Initiatives
Ministry of External Affairs Project, Govt. of India

**SAARC Telemedicine Network**
- Implementing Agency: Telecommunications Consultants India Ltd. (TCIL)
- Connectivity: Satellite & fiber optic network
- Networking of one/two hospitals in each of the SAARC countries with 3-4 Super Specialty hospitals in India
- Current Status: JDWNRH, Bhutan, Indira Gandhi Child Hospital, Kabul, Afghanistan & Patan Hospital, Kathmandu, Nepal with SGPGIMS, Lucknow & PGIMER, Chandigarh with academic activities

**Pan-African e Network Project**
- Implementing Agency: TCIL
- 53 countries of the African Union
- Connectivity: Satellite & fibre optic network
- Activities: tele-healthcare & tele-education
- Current status: 47 African countries joined the project
SAARC Telemedicine Snapshots
Snap Shot of PAN Africa Telemedicine Studio
ASEAN (CLMV) e-Network

• Under ASEAN-INDIA Bilateral Co-operation program, ASEAN (CLMV) e-Network Project was proposed

• A delegation from CLMV Countries were invited to participate in a workshop in New Delhi held on 25-26, March 2009 to share Indian experience in Telemedicine & Distance Education. Pan-African e-Network operation was demonstrated at TCIL HUB & Data Center

• Subsequently a delegation from India visited CLMV countries from 25th Jul to 7th August 2011 to carry out Telemedicine and Tele-education Need assessment Study.

• The project once operational will facilitate CLMV countries to get connected reputed Indian medical institutions and universities
Central Asia eNetwork Project

- Ministry of External Affairs, Govt. of India is in the process of deploying eNetwork for tele-education and tele-medicine in five central asian countries in the same way as in PAN Africa eNetwork
- Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan & Uzbekistan
Further Reading

- National Medical College Network  www.nmcn.in
- National Resource Center for eHealth Standard  https://www.nrces.in/
- http://www.sankaranethralaya.org/mobileunits-teleophthalmology.html
- ISRO Telemedicine  https://www.isro.gov.in/applications/tele-medicine
- Telemedicine Society of India  http://www.tsi.org.in/
Conclusion

• Indian Telemedicine Programme is getting matured with indigenous technology, system and process

• Digital India Mission has further strengthened the policy for adoption of telemedicine in Indian Health Delivery System

• However, Large country with over billion population, diverse social and cultural background, federal nature of governance where health is a state subject are acting as impediments for rapid acceptance

• Difficult Geographical regions - North and North East, Deserts and Rural Communities having poor connectivity are challenges

• Future success: Medical College Network, Rural Telemedicine Network, Reaching out mountains and deserts using Indian Satellite System

• Rapid deployment of Mobile Broad Band and reducing cost of Smartphones hold great promise for mHealth deployment in rural settings and home
Thank You