





TELEMEDICINE: THE INDIAN PERSPECTIVE

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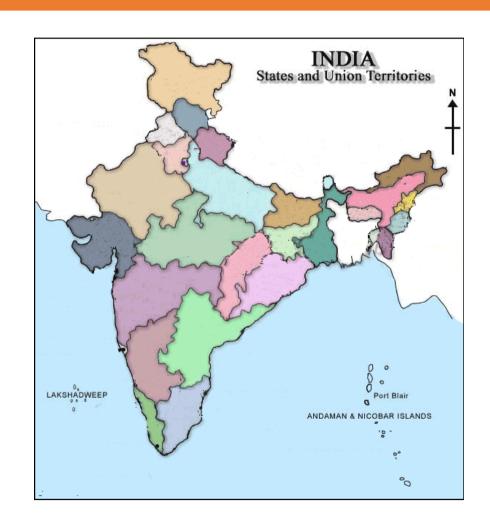
Convenor & Secretary TSI NCR Chapter; Organising Secretary TELEMEDICON 2019 (Nov 2019)

Agenda

- Introduction
- Background: Evolution of Telemedicine Program in India
- Current Telemedicine Policy& Practices
- India International Telemedicine Practices
- Way Forward
- Conclusion

India: Demand and supply gap

- 2nd most populated & 7th largest country
- Diverse Geography (Inaccessible hilly regions, islands, desert, coast and tribal areas)
- 70% Rural population Vs 70% Medical Experts & upto 80% for super specialities Urban areas



Great Potential of Using ICT for improving Healthcare



Strategy of Government of India for ICT application in Health

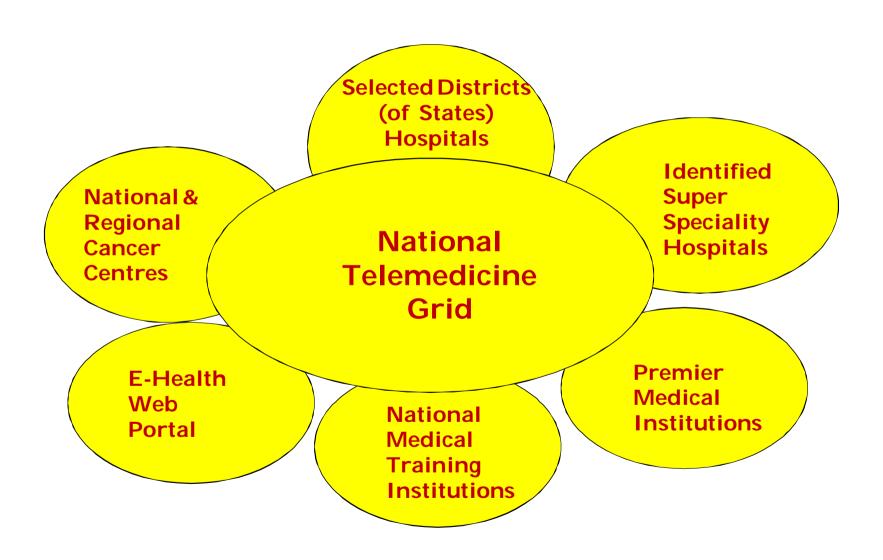
- <u>Capacity Building</u>: Access to CME and skill up-gradation programmes, as well as back-up support on telemedicine.
- Pan India uniform SW: Deployment of Countrywide HIMS
- <u>Diverse use of ICT</u>: The use of ICT in health education, public health status analysis and expansion of health related research.
- All DH to be linked to leading tertiary care centres.
- Mobility: M-Health, the use of mobile phones to speed up transmission
- Overall Slow progress in implementation despite advances in technology

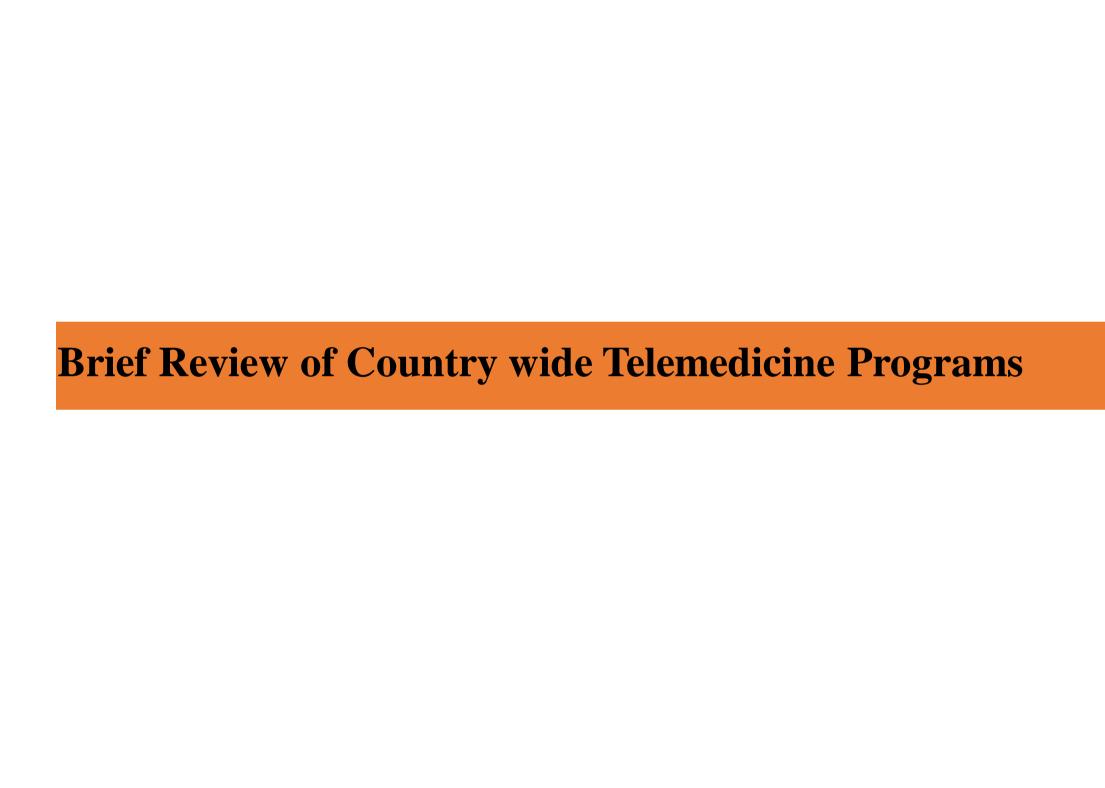
Evolution of Telemedicine in India

- concept of using ICT in the field of medicine initiated at SGPGIMS in 1999
- DIT sponsored project connected SGPGI-Lucknow, AIIMS-New Delhi & PGIMER-Chandigarh.
- Telemedicine Society of India (TSI) formed in 2001, regd 2006.
- TELEMEDICON: Annual international event of TSI- 1st held at SGPGIMS (2001)
 - National Task Force (2005) constituted by MoHFW, Gol for
 - TM to enter the mainstream of Healthcare delivery, draft a National Policy on TM and CME, to work on inter-operability
 - To define a National TM Grid, its standards and operational aspects, identify & evaluate all players and projects involved in TM in India, standards & structures of EMR and patient data base including National Cancer TM Network

Upcoming TELEMEDICON19: 15th-17th Nov, Delhi

Constituents of National Telemedicine Grid





Major Implementing Agencies



Government of India



Ministry of Health and Family Welfare Government of India

INDIA

Ministry of External Affairs



- **State Governments**
- **Medical Institutions (public & corporate)**

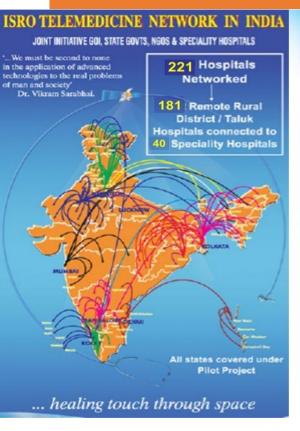


Dept of Electronics & Information Technology (DIT) Ministry of Communication & IT, Govt. of India

- Research & Development leading to Indigenous Technology Development Integrated Telemedicine System (platform + Software) eSanjivani
- Pilot deployment
- Specialty specific platform and network
 - Tele-Oncology System e.g. OncoNET Kerala
 - Tele-radiology
 - Software and system for Tropical Diseases
 - Cancer Screening and follow up using Telemedicine Bus
- Standardization activities in e-health/Telemedicine
- Prepared a framework for IT Infrastructure for Health

http://deity.gov.in/content/medical-electronics-telemedicine-division-projects-0

ISRO Telemedicine Network (Since 2001)



Current Status
ISRO TELEMEDICINE
NETWORK

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



"...we must be second to none in the application of advanced technologies to the real problems of man and society. Dr Vikram Sarabhai

Snapshot of Telemedicine activities in India

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

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

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)

Uttaranchal

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

Bihar

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

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.

Tamii 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

State Level Telemedicine Networks

Odisha: http://health.odisha.gov.in/PDF/telemedicine/Odisha_TMNetwork-An_overview.pdf

- SGPGIMS, Lucknow connected to three medical colleges: MKCGMC, Berhampur;
 SCBMC, Cuttack; VSSMC, Burla
- Six District Hospitals (Koraput, Kalahandi, Rayagada, Sundergarh, Mayurbhanj & Bhubaneswar) connected to SCB Medical College, Cuttack
- Patient-end Nodes: 22; Specialist Nodes: 3; Server at State-level Node for data handling: 1 (Cuttak)

Maharashtra: https://www.nrhm.maharashtra.gov.in/telemed.htm

- Control node: Sir J.J. Hospital Mumbai
- Speciality nodes: 06 Medical Colleges
- 62 Patient nodes: 23 DH; 39 SDH/RH

Punjab: http://punjabhealth.co.in/RSBY_overview.aspx?ID=qpbhdKadhac=

All District Hospitals and three Medical Colleges (GMC Amritsar, Patiala & Faridkot) in the States
are connected to Post Graduate Institute of Medical Sciences (PGIMER), Chandigarh

Karnataka: PPP model (SWAN) http://nmcn.in/kar_tm.php

 26 DH; 11 specialty hosp; "Primary Health Centre Management Information System" in 1,000 selected Primary Healthcare Centres (PHCs). To be expanded to 2335 PHCs.

West Bengal Telemedicine Network

- Implemented by Webel ECS Ltd. Kolkata for DIT.
- Telemedik SW developed by Department of computer science IIT, Kharagpur

Project 1

- DIT sanctioned Rs. 150 Lakh (1998-99). Project completed in 2003.
- School of Tropical Medicine, Kolkata connected to Habra State General Hospital, 24th Pargana, North and MJN Hospital, Coochbehar.
- 512 Kbps West Bengal's State wide area Network (SWAN) was used.

West Bengal Telemedicine Network

Project 2: 2002-2004.

 NRS Medical College, Kolkata & Medical College & Hospital, Burdwan connected to District Hospital, Purulia; Birbhum; Murshidabad & Medical College & Hospital, Midnapur.

Project 3: Sanctioned in 2014.

 03 Referral centers; Calcutta Med. College, North Bengal Med. College, Chittaranjan National Cancer Institute, Kolkata connected to Darjeeling, Raigunj & Tamluk District Hospitals and Arambag Sub. Div. Hospital, Hoogly.

Awards

National e-Governance Award, 2004 – from Govt. of India under Category "Outstanding Performance in Service Delivery"

Skoch Challenger Award, 2005
 Manthan –American India
 Foundation Award, 2006 under "e-Health" Category

http://nmcn.in/wb_tm.php

National Cancer Grid (NCG)







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COLLABORATION FOR CANCER CARE

Navya brings you cancer treatment decisions from world leading experts

Get an expert opinion in 1 to 3 days from specialists at Tata Memorial Centre and National Cancer Grid.

Navya has accurately made over 26,000 expert treatment decisions in oncology.



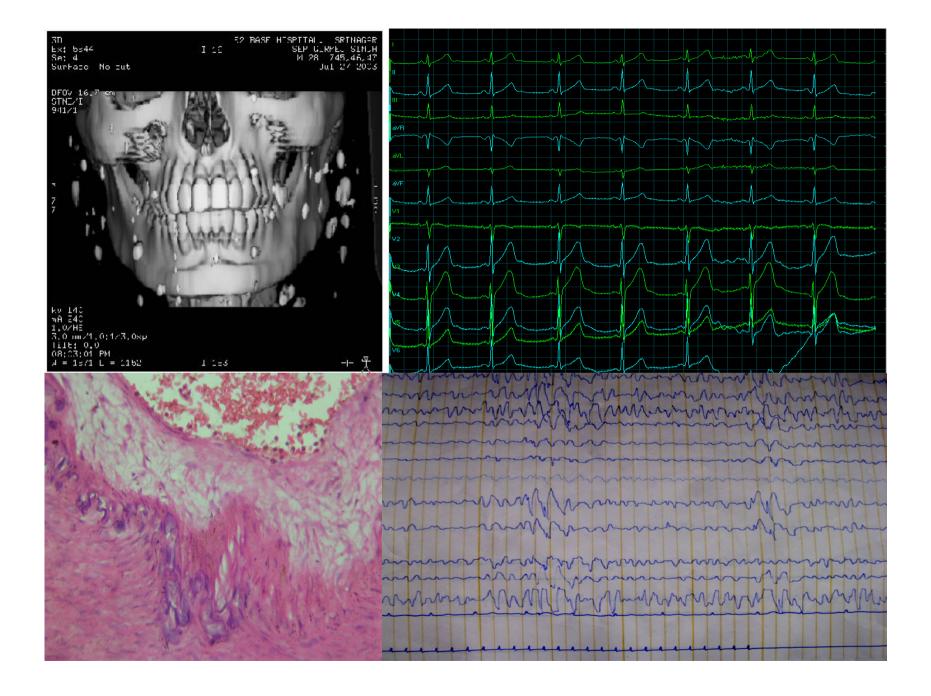
Navya in partnership with **Tata Memorial Centre and National Cancer Grid empowers Cancer Patients** with Online Second **Opinions** from cancer experts.

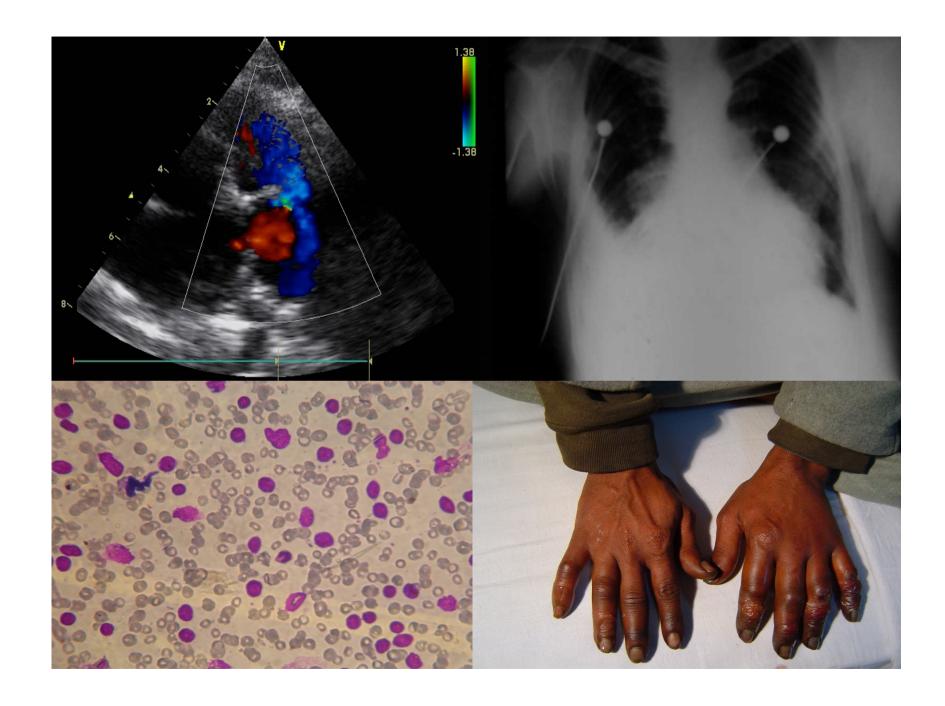
Indian Armed Forces Medical Services

- Pilot project implemented (2005); Army Hospital (R&R) connected with hospitals at Udhampur, Srinagar, Leh, Partapur, Kargil, Port Blair
- Indian Armed Forces Medical Services: 65 Telemedicine Centers with help of ISRO (hub and spoke model) 2018
- Combat Medical Support
- Mobile: vehicle based, man pack
- Indian Navy to establish nodes for Virtual Healthcare on ships. 65
 Crores earmarked in 2015.









Mobile Telemedicine Bus



PGIMER Chandigrah (RRC) Asha Jyoti



SGPGI's (NRC) Mobile Telemedicine Bus

Mobile Telemedicine Kiosk



Portable Mobile Telemedicine Kiosk



Yolo Health Kiosk

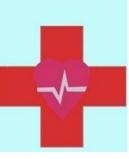


Health Policy Implementation



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





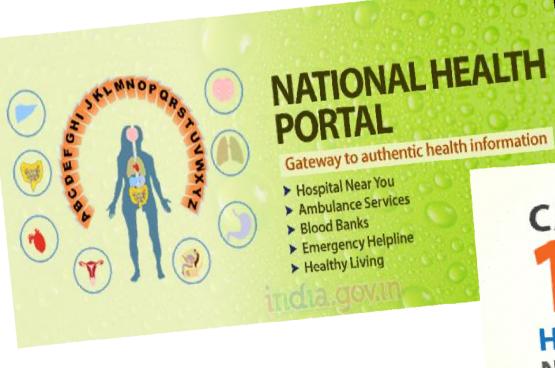


National Health Mission (NHM) National Rural Telemedicine Network (NRTN)

- 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 compilation, storage & retrieval of data (Data Base at Regional District Hub) and
- Central Data Center at MoH&FW, archival and distribution across network

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

Digital India Mission





1056
Health Helpline
NRHM



Direct Intervention System for Health Awareness

Telemedicine Programmes at Major Academic Medical Institutions

- Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow, Uttar Pradesh www.sgpgi-telemedicine.org, www.nrct.in, www.stbmi.ac.in
- All India Institute of Medical Sciences, New Delhi https://www.aiims.edu/en/departments-and-centers/central-facilities.html?id=7731
- Post Graduate Institute of Medical Education & Research, Chandigarh http://pgimer.edu.in/PGIMER_PORTAL/PGIMERPORTAL/Department/Global/JSP/home_dept_jsp?CP=Eng&deptid=d53&B2=GO
- Tata Memorial Hospital, Mumbai https://tmc.gov.in/
- Sri Ram Chandra Medical Centre, Chennai http://www.sriramachandra.edu.in/telemedicine.htm
- Amrita Institute of Medical Sciences, Cochin <u>http://www.amritahospitals.org/SubPages/Centre-for-Digital-Health</u>
- SCB Medical College, Cuttack <a href="http://scbmch.ac.in/index.php?option=com_content&view=article&id=153<emid=182">http://scbmch.ac.in/index.php?option=com_content&view=article&id=153<emid=182

National Resource Center (NRC) SGPGIMS, Lucknow



Tele-presence Suite for Surgical skill sharing

Sharing of Surgery at Multiple Location

E-Tumour Board & Decision Support System



- •Live Robotic Surgery transmitted from other countries (Korea).
- •Doctors connect from Different parts of countries in Live Interactive Mode in real time as well as through Mobile and Desktop;
- •Live Streaming available through NMCN portal



Tele-Rheumatology



SCBMedical College Cuttack

Nuclear Medicine Followup Tele-Clinic



Kiosks in Wellness Centers using PHRMS

- My Health RecordDeveloped by CDAC
- https://myhealthrecord.nhp.gov.in/login





Corporate Telemedicine

Initiatives of Private sector in mobile health solutions

- Apollo Telemedicine Networking Foundation
 Apollo Hospital Group, Chennai, Hyderabad, New Delhi
 http://www.apollohospitals.com/initiatives_tele.php
- Narayana Hrudayalaya (TM Cardiac Care, Support Extending To Cayman Islands, Malaysia & Mauritus)
 http://www.narayanahospitals.com/services/telemedicine/introduction/
- Care Telemedicine (Remote Consultation Help)
- Escorts Heart Institute & Research Centrehttp://www.fortisescorts.in/services-treatment/telemedicine-ehas
- Amritha Institute (TM Service To Islanders)
- Max Healthcare http://www.cio.in/case-study/max-healthcares-telemedicine-push
- CMC Vellore
 http://clin.cmcvellore.ac.in/otherwebsite/mission_support/Telemedicine.asp

Tele-ophthalmology

 Ministry of Health & Family Welfare under National Programme on Control of Blindness (NPCB)

www.mohfw.nic.in/NRHM/.../NPCB_15Jan_Latest.pps

http://www.indiagovernance.gov.in/files/gkc_oneworld_teleopthalmology_in_tripura.pdf

- Vision Care- Arvind Tele-Ophthalmology
- (1000 consultations/day)

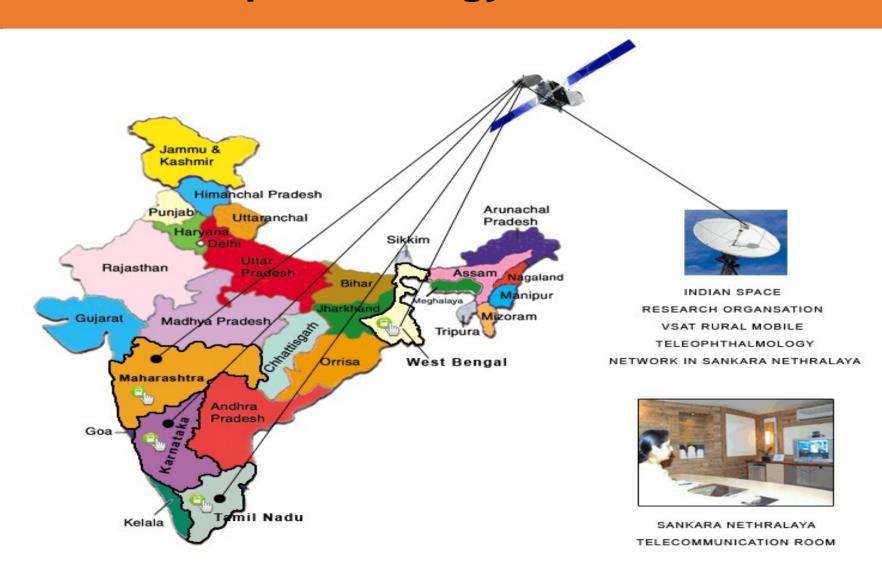
http://www.aravind.org/telemedicine/va.htm

Shankar Nethralaya

http://www.sankaranethralaya.org/teleophthalmology.html



Tele-Ophthalmology Network



Tele-Radiology



Best example of business model has been developed at Bangalore by the Teleradiology Solutions http://www.telradsol.com/

TELEHEALTH ECOSYSTEM













Startups



Tele health Initiatives in India

- Pilots and 'Proof of concept' studies in Telehealth replaced with large projects commissioned by State Governments in PPP mode.
- World Bank funding mega project to develop 7500 eHealth Centers in AP with Telemedicine facility (2018)
- Consortium of Raminfo with two collaborating partners won tender of Govt of AP under NHM for Standardisation of Telemedicine facility at Sub-Centers in various districts of AP.
- 150 Telemedicine nodes to be established by Govt of Rajasthan under NHM at PHCs and Sub Centers
 - 100 nodes Medingo
 - 50 nodes Glocal Health Services Pvt Ltd
 - Gen Physician consult-INR 50; Specialist consult INR 100
- Maestros Electronics & Telecommunication Systems Ltd in agreement with Gandhi Foundation, Tamilnadu to set up Telemedicine Network with 3,300 CareMate kiosks. Project cost 80 Crore.

उत्तराखंड: टेली मेडिसिन सुविधा से जुड़ेंगे चारधाम, तीर्थयात्रियों को दी जाएगी निशुल्क सुविधा

न्यूज डेस्क/अमर उजाला, देहरादून Updated Wed, 04 Apr 2018 10:22 PM IST

यमुनोत्री, गंगोत्री, बदरीनाथ और केदारनाथ में टेली मेडिसिन की निशुल्क सुविधा उपलब्ध कराने को एचपी कंपनी तैयार है। शारान का दावा है कि एक महीने के भीतर टेली मेडिसिन की सुविधा शुरू हो जाएगी। इसके अलावा 14 अप्रैल से पिथौरागढ़ जिला अस्पताल में आईसीयू की सुविधा भी मरीजों को मिलना शुरू हो जाएगी।

सचिव स्वास्थ्य नितेश झा के अनुसार अभी एचपी कंपनी टेली मेडिसिन के माध्यम से राज्य के चार अस्पतालों और श्रीनगर मेडिकल कालेज (स्टूंडियो) में रोगियों को स्वास्थ्य सुविधा उपलब्ध करा रही है। इसके परिणाम काफी बेहतर आएं हैं।

अब इसी तर्ज पर चारधाम में सुविधा देने की तैयारी है। टेली मेडिसिन की सुविधा के लिए स्टूडियो का निर्माण दून मेडिकल कालेज में किया जाएगा। जहां के विशेषज्ञ डॉक्टर चारधाम में चयनित चार अस्पतालों से जुड़ेंगे और वहां पर आने वाले रोगियों के इलाज में मददगार होंगे।

एक महीने के अंदर सुविधा शुरू करने का लक्ष्य रखा गया है। इसके अलावा पिथौरागढ़ के जिला अस्पताल में आईसीयू की सुविधा मरीजों को मिल सकेगी। यह राज्य का पहला जिला अस्पताल होगा, जहां पर आईसीयू की सुविधा मिलेगी। आईसीयू का निर्माण हंस फाउंडेशन के माध्यम से किया गया है।

Telemedicine at Temples

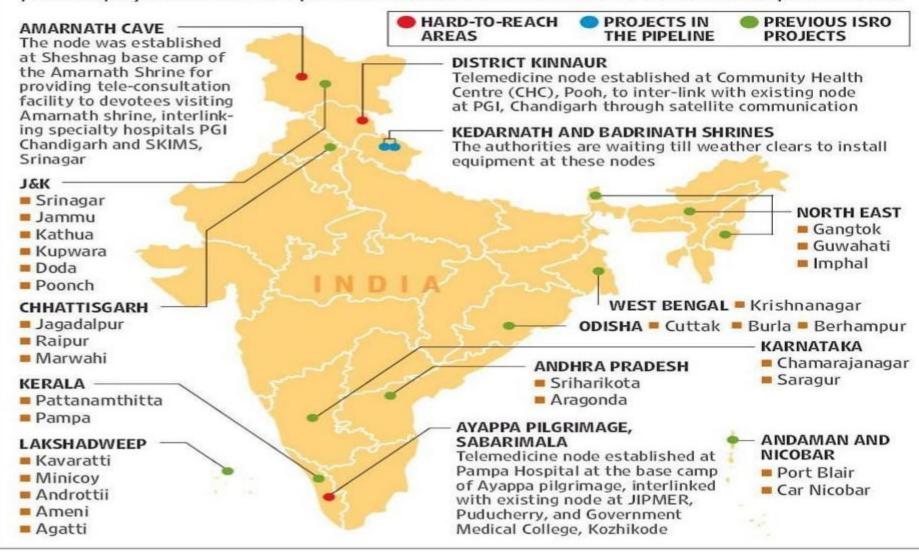


Tele-medicine at Pilgrimages

- MoHFW with D/o Space has established TM Node at Pampa hospital base camp of Ayappa pilgrimage linked with existing TM Node at JIPMER, Pondicherry and Govt. Medical College, Kozhikode (Calicut) for providing remote super speciality healthcare services.
- TM node at **CHC**, **Pooh**, **HP** linked with PGIMER, Chandigarh providing speciality care access to citizens at snowbound locations.
- MoHFW replicating this Tele-medicine model for Chardham Yatra to Kedarnath and Amarnath temples

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



International Initiatives (MEA)

SAARC Telemedicine Network Networking of JDWNRH Bhutan, Indira Gandhi Children Hospital, Kabul, Afghanistan & Patan Hospital, Kathmandu, Nepal with SGPGIMS, Lucknow & PGIMER, Chandigarh with academic activities

Pan-African e Network Project 47 African countries joined for tele-healthcare & education

ASEAN (CLMV) e-Network connecting Cambodia, Laos, Myanmar, Vietnam (CLMV) countries with reputed Indian medical institutions and universities under ASEAN-INDIABilateral Cooperation program (2009)

Central AsiaeNetwork under process of deploying eNetwork for tele-education & medicine in five central asian countries Kazakhstan, Kyrgyzstan, Tajikistan Turkmenistan & Uzbekistan



India's Telemedicine - outcomes



Limited and
Centralized Health
Care Delivery
Infrastructure

Distributed and
Virtual Health
Care delivery
Info-structure

Learnings & Issues

- PPP model, revenue sharing by the partners works best
- Pocket-Friendly: Average charges per consultation INR 40/- to 80/-
- Private partner sets up infrastructure at public health facilities & monitored by State.
- Most sought after specialities dermatology, orthopedics, paediatric, neurology (epilepsy clinics) and for emergency cardiology.

Barriers to Telemedicine

- Optic fibre laid up to panchayat levels but no or very little access to doctors
- Coordination between CMO and District Hospital Incharge: Chief Medical Officer in the district who has PHC,CHC, peripheral hospitals under him whereas district hospital with all specialists is not under him

Legal Aspects

- Licensure & Reimbursement issues vary from state to state or overseas
 - **Solution**: IRDA & Universal Medical Licensure/national telemedicine license?
- Credentialing: physician specialists in a hub and spoke model must have telemedicine credentials at all hospitals.
 - **Solution**: Streamlining the credentialing process with a common set of requirements would allow physicians to apply for credentials at many hospitals in one go (Limitations of medical exam without face to face consultation or clinical examination.)
- Privacy and confidentiality Issues: Exposure of the patient information may lead to litigation, punitive actions like suspension/loss of license, fines, or even jail (if criminal breach)
 - **Solution:** Strict control to prevent unauthorized access to confidential personal information.

Way Ahead

- ICT as an integral component for delivering healthcare & not add-on
- Policies and regulations at Nation level for regulatory mechanism for Telehealth practice:
 - data privacy and confidentiality,
 - development of healthcare and Legal Standards,
 - reimbursement of services rendered by service providers and compensatory mechanisms for service seekers
 - EHealth/Medical informatics to be introduced as a part of medical education in medical colleges
- Integrated eHealth approach to information management for universal healthcare.
- Regulatory mechanisms to be identified for Telehealth activities

Conclusion

- Digital India Mission has strengthened adoption of Telemedicine in Indian Health Delivery System
- National Medical College Network & Rural Telemedicine Network, can overcome access using Indian Satellite System
- Use of mHealth in rural & home based care through rapid deployment of Mobile Broad Band and reducing cost of Smartphones hold great promise
- Time for every hospital/clinic/diagnostic center to have facilities for teleconsults as there exists a real business oriented ROI driven model for Telehealth
- Geography has become history; distance has become meaningless

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







TELEMEDICON 2019 Telehealth: From Illness to Wellness 15th International Telemedicine Conference Telemedicine Society of India 15th-17th Nov 2019 Indian Spinal Injuries Centre, New Delhi