Telemedicine to fight against medical deserts

Telemedicine in India
Evolution, Current Scenario and Future Perspective

Head, Dept. of Endocrine Surgery &

Faculty I/C, SGPGI Telemedicine Programme

National Coordinator, National Medical College Network (NMCN) Project

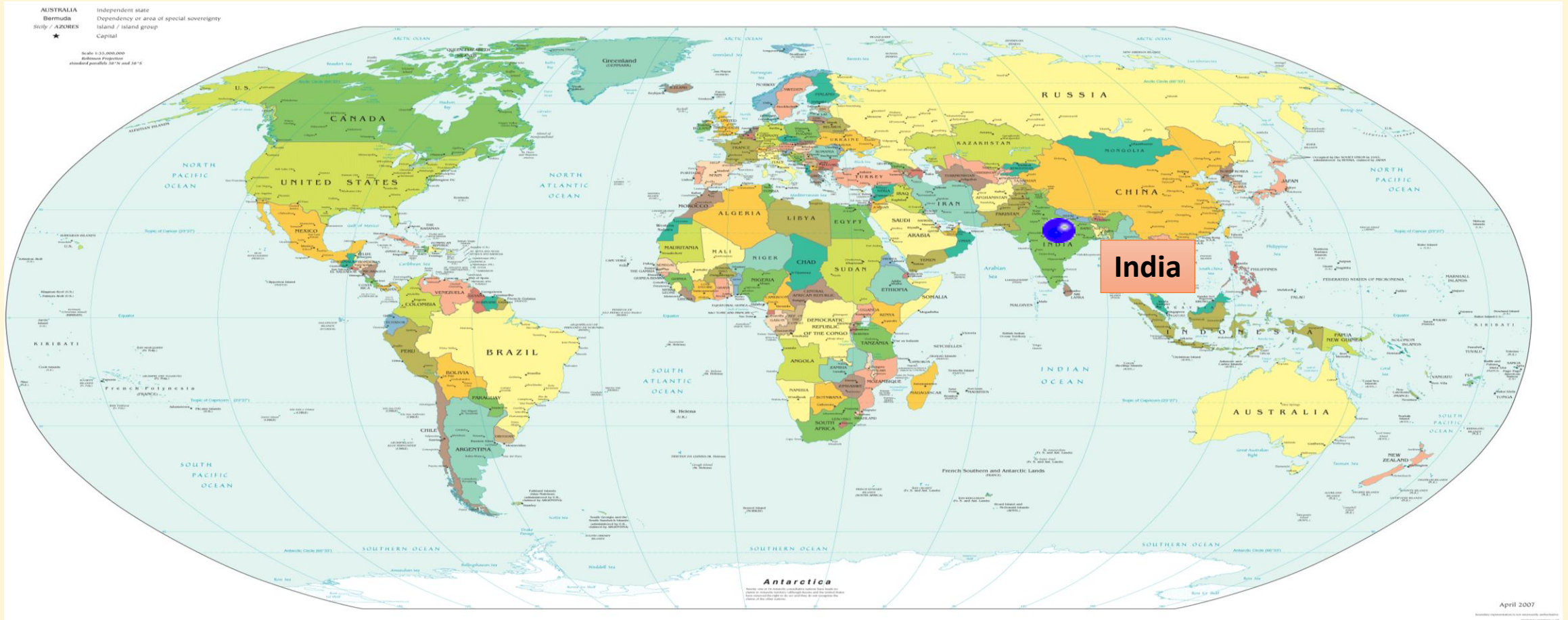Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGIMS) Lucknow, India

Email: skmishra@sgpgi.ac.in / skmishra_1956@yahoo.com
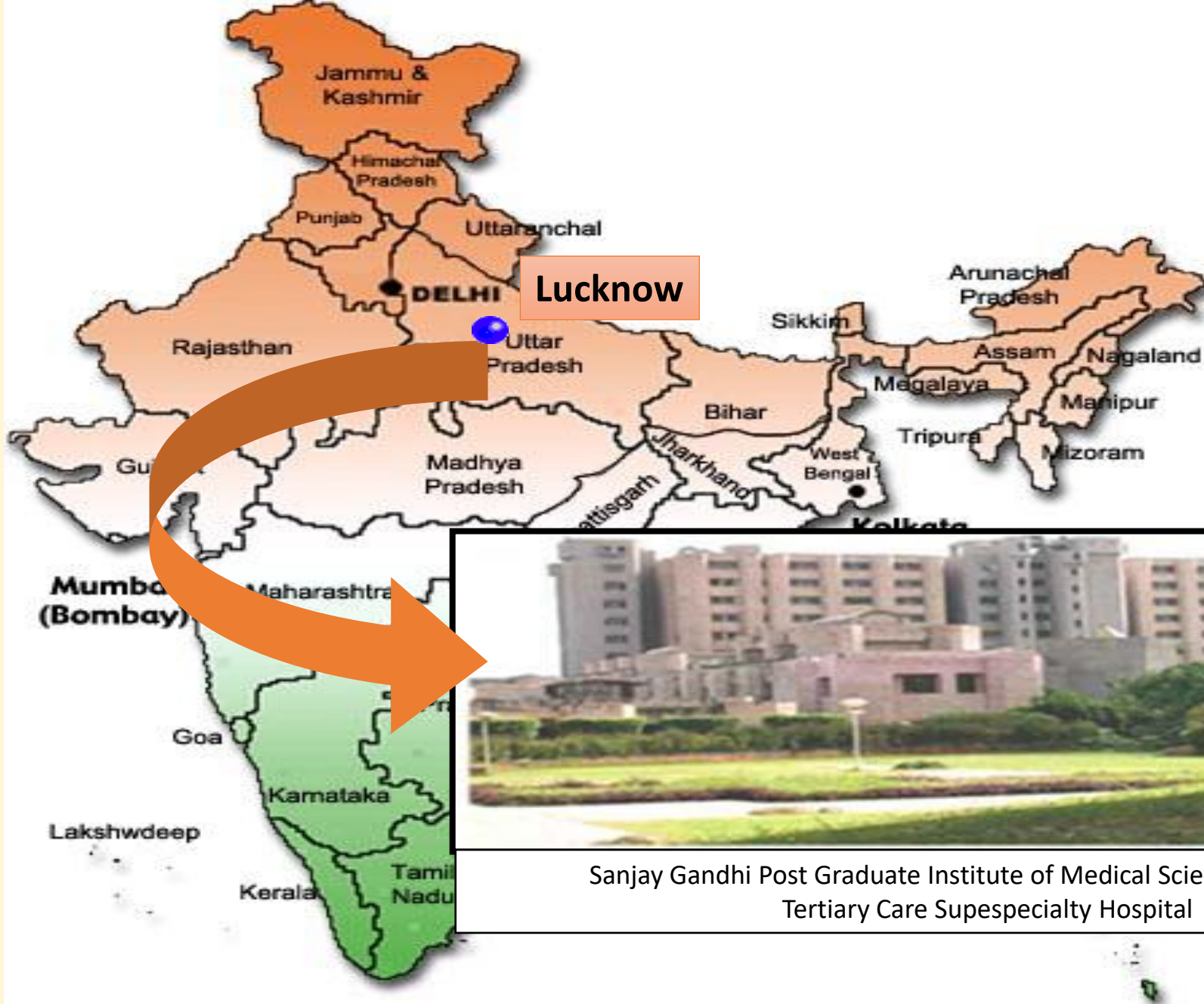
GENEVA HEALTH FORUM

Agenda

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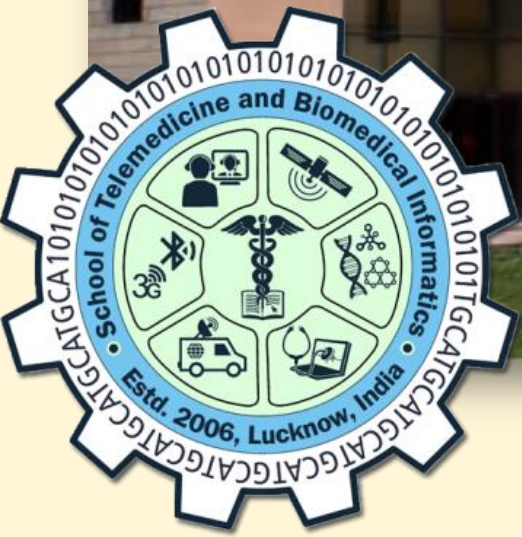- Conclusion

Who We Are

India

Lucknow

Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS)
Tertiary Care Supespecialty Hospital

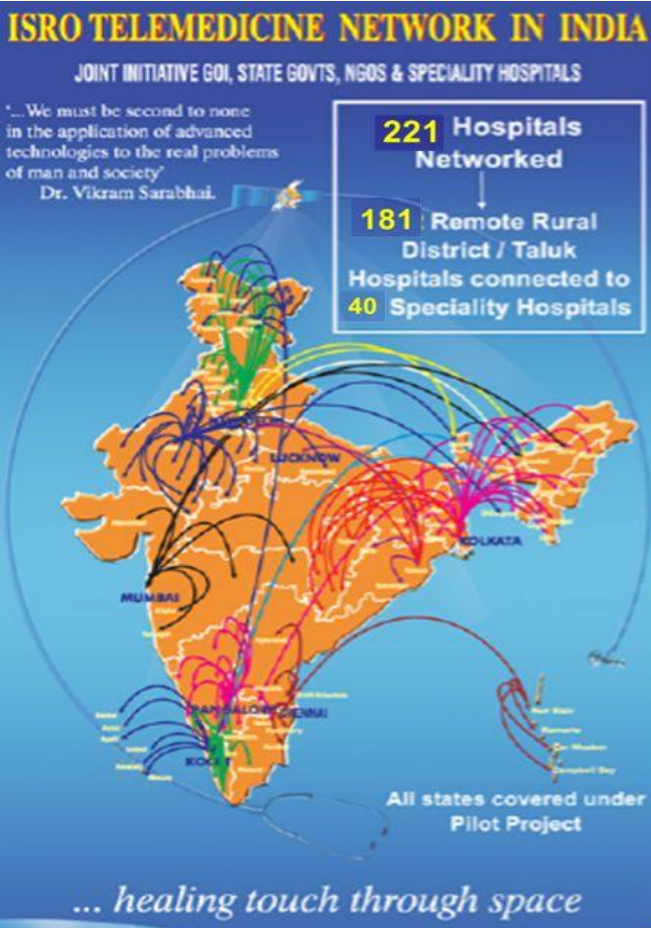# School of Telemedicine & Biomedical Informatics
Estd. 2006

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.

- 1st Telemedicine Society of India Conference held at SGPGIMS

- Live Surgery Transmitted during 5th Post Graduate Course of Endocrine Surgery (PGES)

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ISRO Telemedicine Network (Since 2001)

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

Odhisa State Telemedicine Network
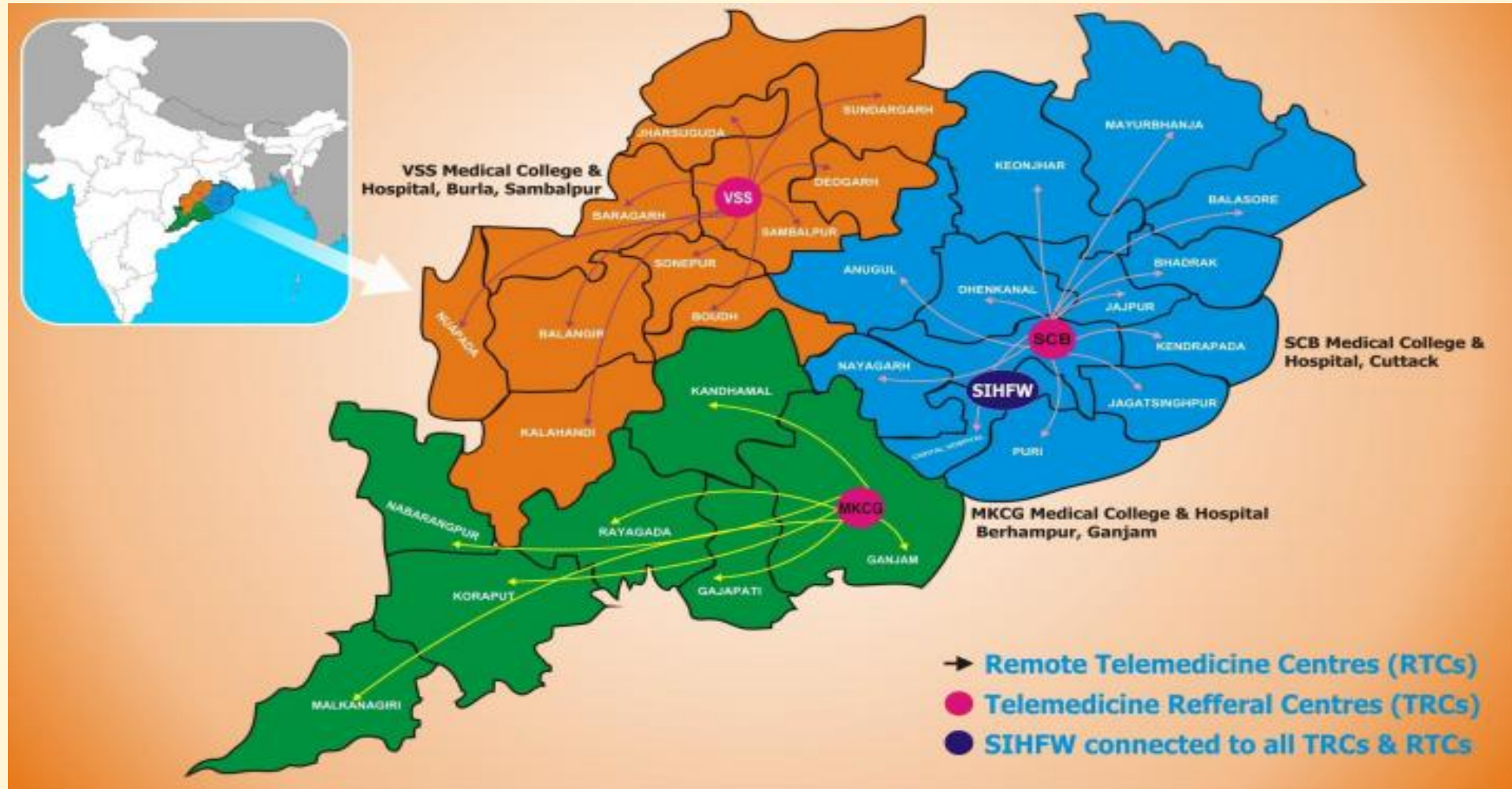
http://health.odisha.gov.in/PDF/telemedicine/Odisha_TMNetwork-An_overview.pdf

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

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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=

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National Cancer Grid (NCG)

navya

TATA MEMORIAL CENTRE
SERVICE RESEARCH EDUCATION

NATIONAL
CANCER
GRID
COLLABORATION FOR CANCER CARE

ABOUT US | TESTIMONIALS | NEWS |
BLOG | CONTACT US | LOGIN

NATIONAL
CANCER
GRID
COLLABORATION FOR CANCER CARE

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.

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Mobile Telemedicine Bus

PGIMER Chandigrah (RRC) Asha Jyoti

SGPGI's (NRC) Mobile Telemedicine Bus

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Mobile Telemedicine Kiosk

Portable Mobile Telemedicine Kiosk

Yolo Health Kiosk

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Policy & Future PAN India Telemedicine Practices

Health Policy implementation

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**%20**Rural**%20**Telemedicine**%20Network%20for%20India-...*

Digital India Mission

National Medical College Network

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

www.nmcn.in
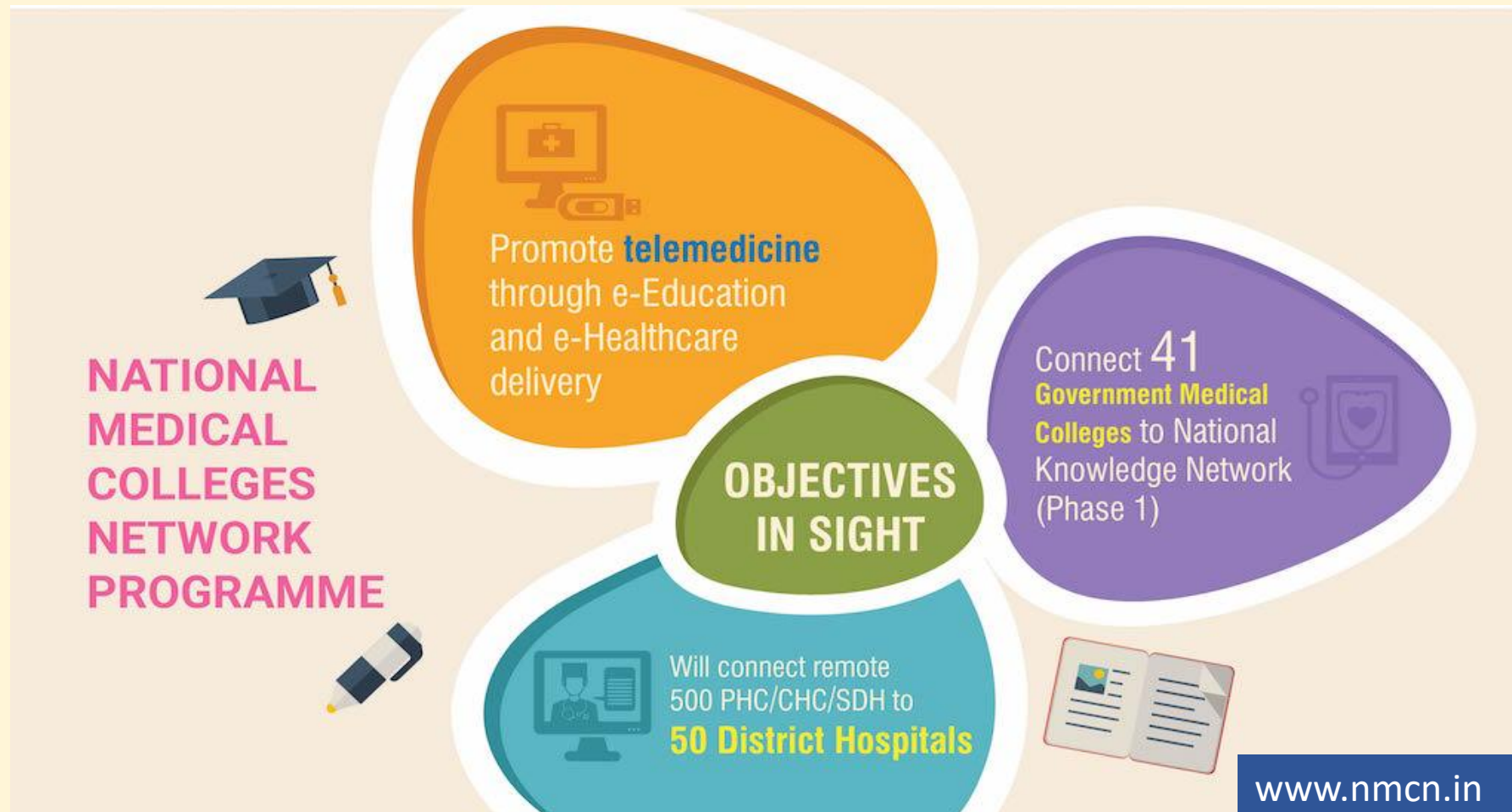
Network Architecture
National Medical College Network
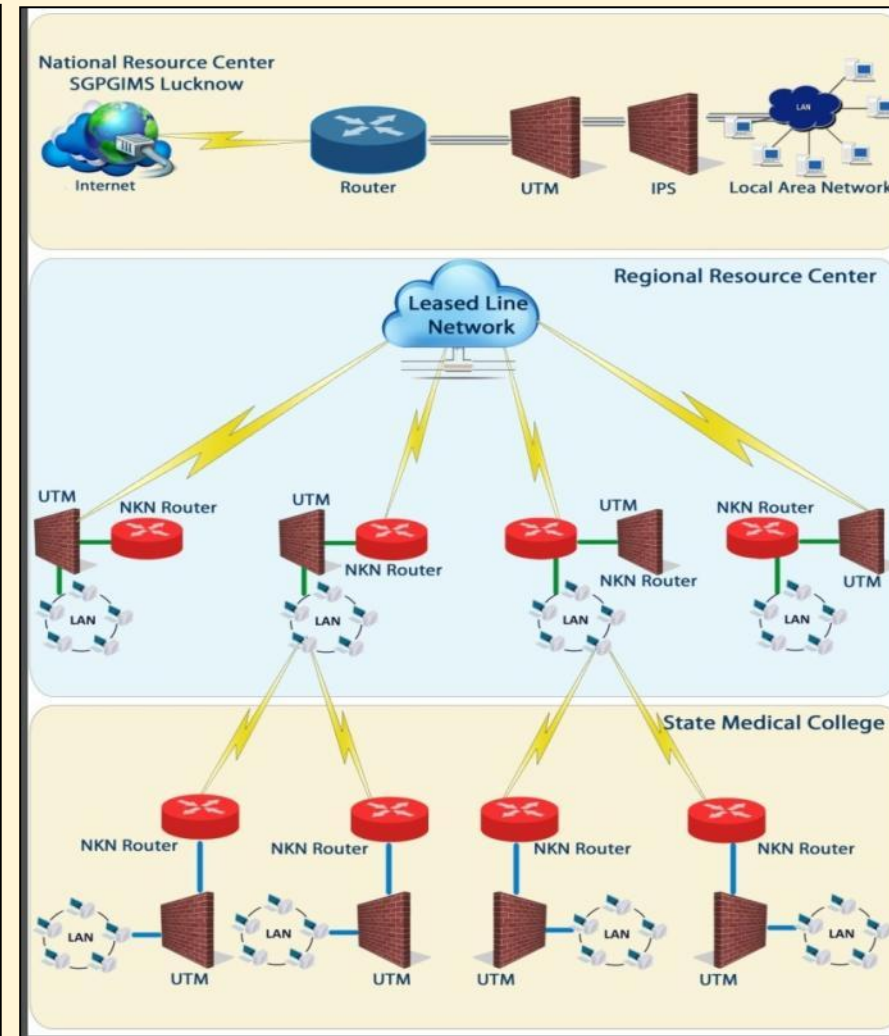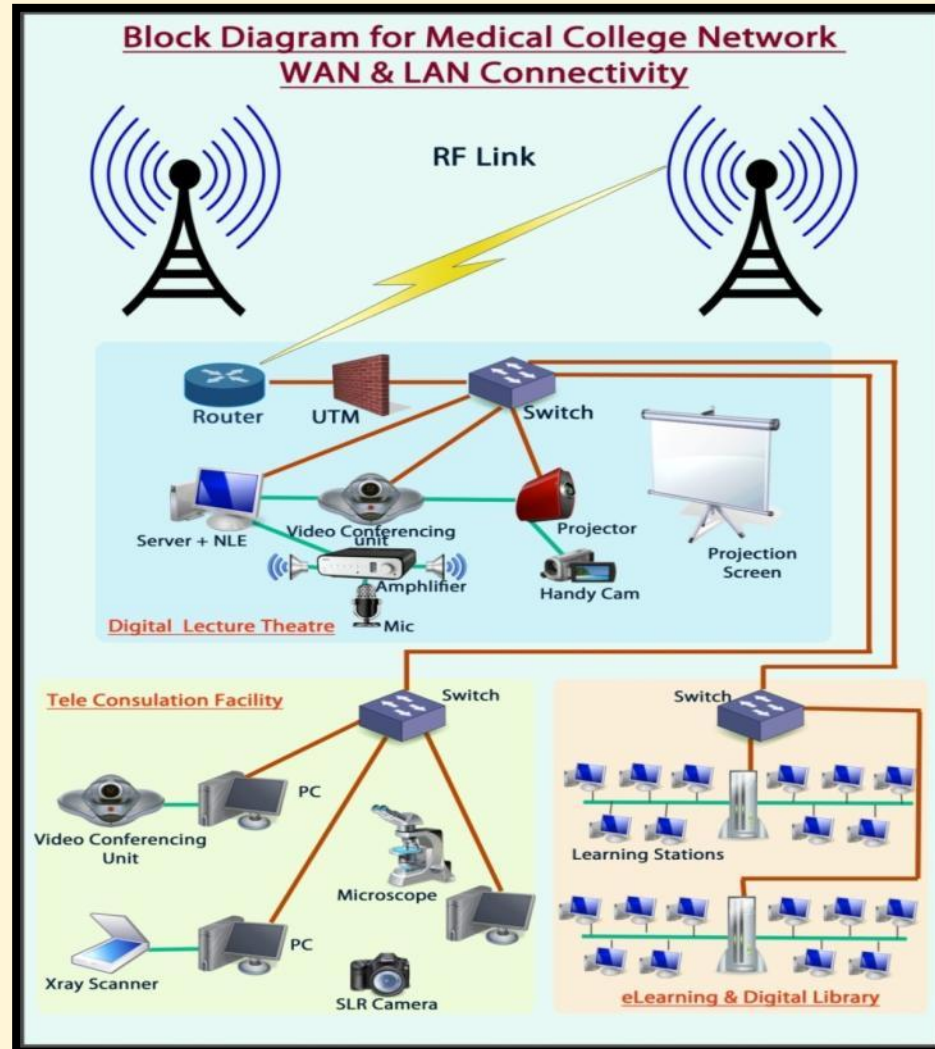
National Resource Center (NRC)
SGPGIMS, Lucknow
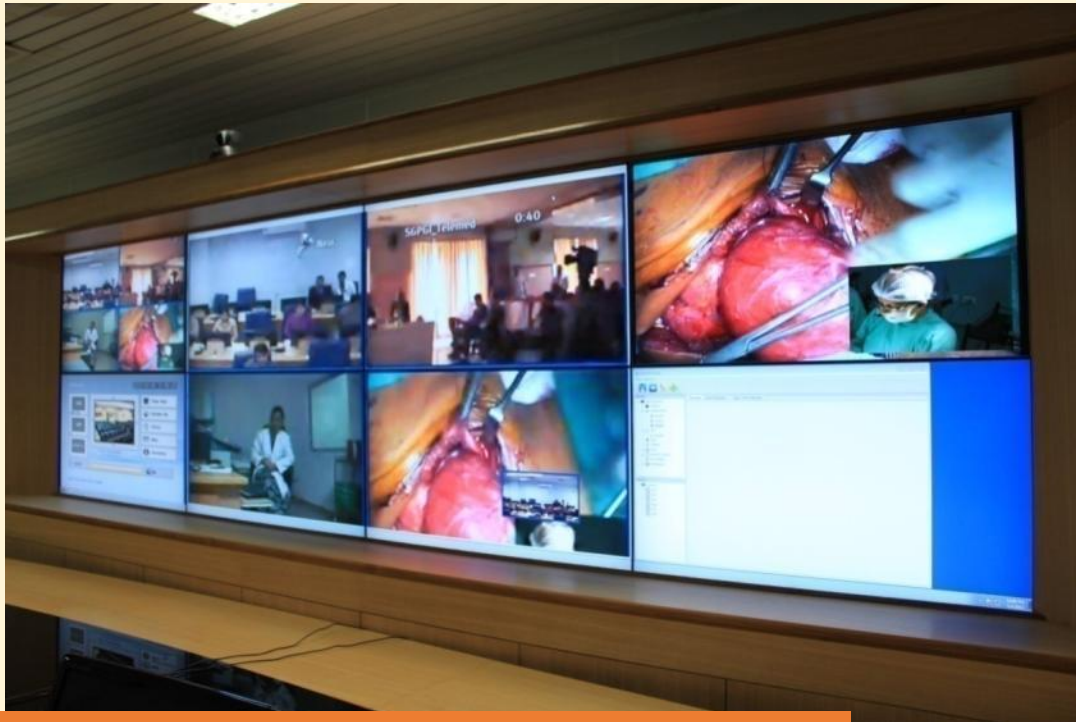
Tele-presence Suite for Surgical skill sharing

Sharing of Surgery at Multiple Location

National Resource Center (NRC)
SGPGIMS, Lucknow

Inner View of Integrated Operation Theatre

E-Tumour Board & Decision Support System

• 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

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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/

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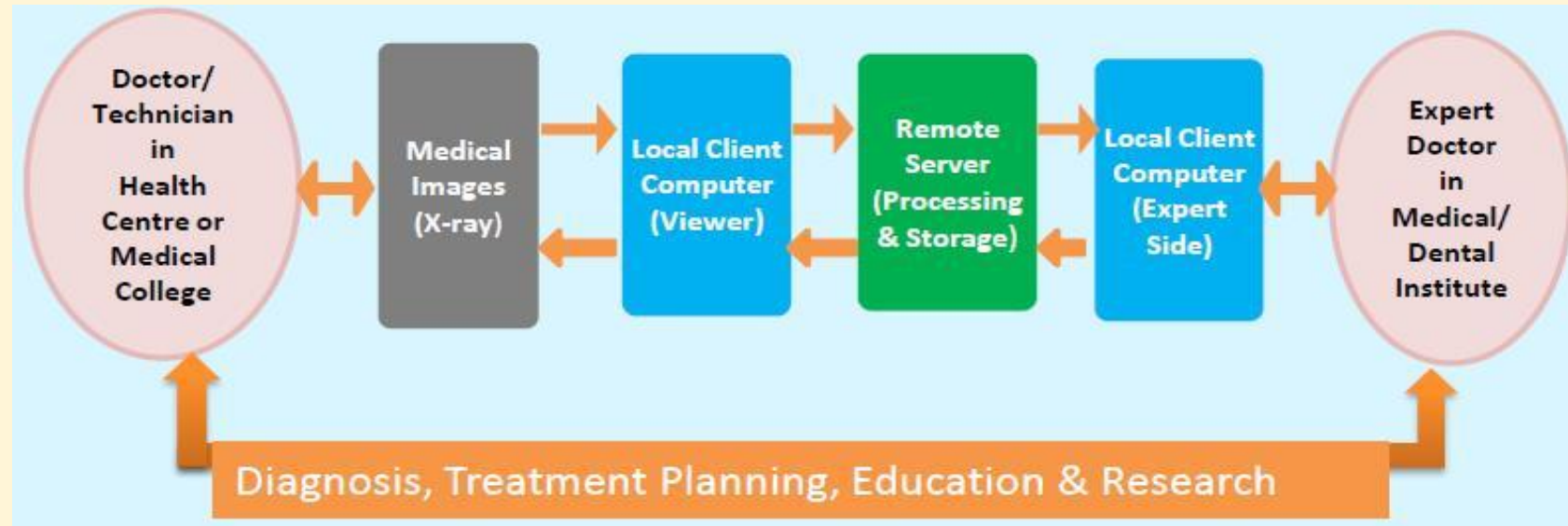
Asia Pacific Advance Network (APAN)
APAN44 - Endoscopic Club E-conference (ECE)
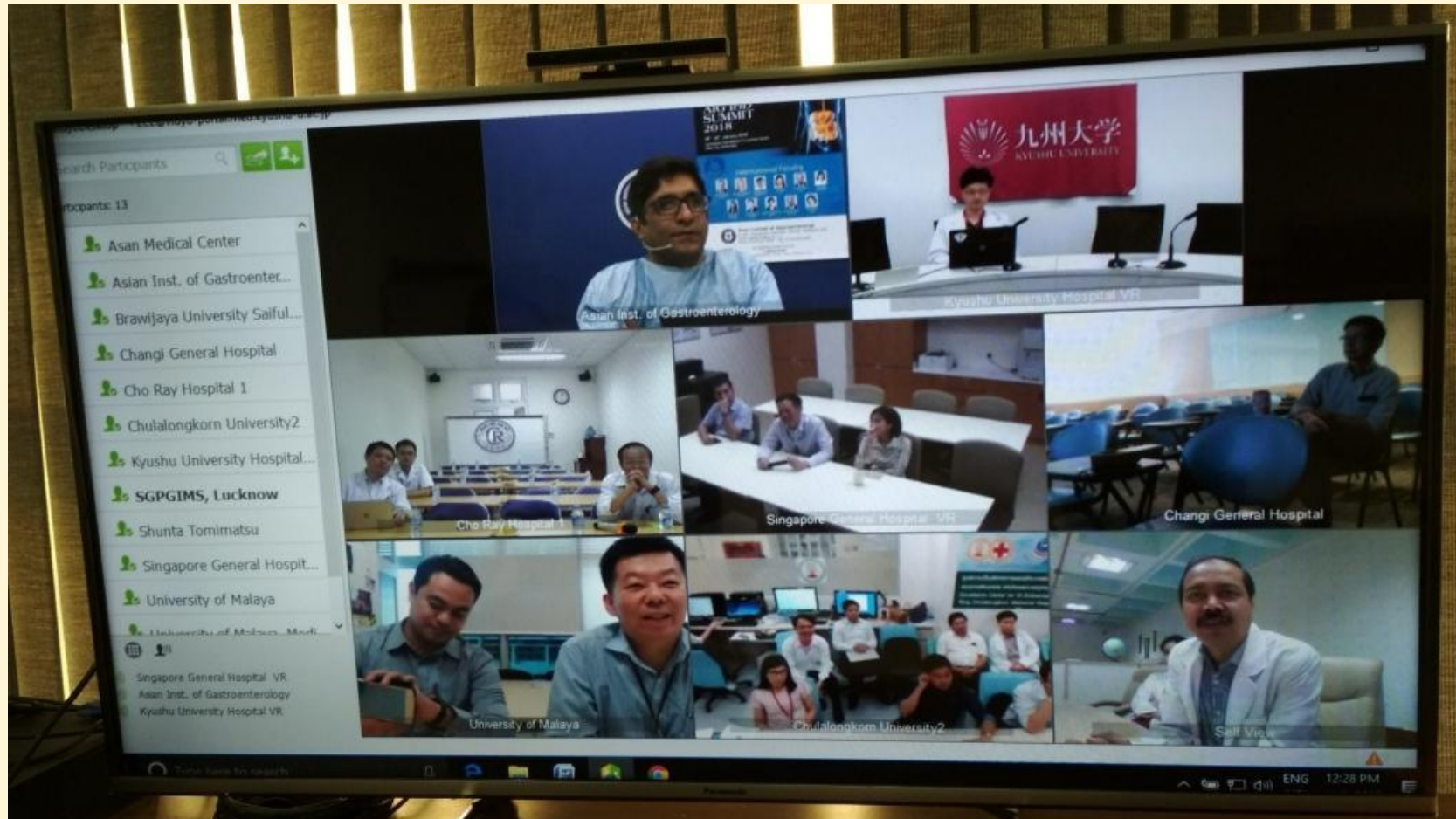
Tele-Rheumatology

SCB Medical College Cuttack

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Nuclear Medicine Followup Tele-Clinic

Endocrine Surgery (EESENCE)
Endocrine Surgery Alumni collaborative learning (SESAN) through web VC collaboration

Airport

Laptop, Airtel Broadband
3. Dr. Naval Bansal

Chandigarh, Punjab

iPhone 7 ; Vodafone Connection
Dr. Vivek Agarawal

Jaipur, Rajashthan

2. Deependra Kumar

Maharaja Agrasen Hospital, New Delhi

AIIMS New Delhi

RedMi 4 ; Vodafone Connection
Dr. Chitresh

STBMI, SGPGIMS Lucknow, Uttar Pradesh

Polycom HDX 9000 (ROOM)
1. **Dr. Saba Retnam**

KGMC, Lucknow, Uttar Pradesh

BSNL 1 Mbps Lease Line
Lifesize Room 220

Sahara Hospital, Lucknow, UP

4. Dr. Gaurav Agarwal
5. Dr. Pooja Ramakant
6. Dr. Kulranjan Singh
7. Dr. Roma Pradhan

Samsung E7 Mobile (Reliance JIO)
9. Prateek Mehrotra

Kerala Railway Station

One Plus 3 Mobile (IDEA) from Moving Train
8. Dr. Ranjith Kumar

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.ermed.in/

- Largest & most user friendly library in South East Asia Region.

- Started ERMED Consortium in 2008.

- Provides e-resources in response to request received from healthcare professionals across the nation.

- Subscribes 243 e-journals for ERMED Consortium.

Corporate Telemedicine

Tele-Ophthalmology Network

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

SANKARA NETHRALAYA
TELECOMMUNICATION ROOM

Tele-Radiology

Startups

Home Health care Services

Online Pharmacy

https://www.portea.com/

https://www.1mg.com/

Telemedicine at Temples

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

यमुनोत्री, गंगोत्री, बदरीनाथ और केदारनाथ में टेली मेडिसिन की निशुल्क सुविधा उपलब्ध कराने को एचपी कंपनी तैयार है। शासन 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 (स्टूडियो) में रोगियों को स्वास्थ्य सुविधा उपलब्ध करा रही है। इसके परिणाम काफी बेहतर आए 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।

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.

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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

● HARD-TO-REACH AREAS   **● PROJECTS IN THE PIPELINE**   **● PREVIOUS ISRO PROJECTS**

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

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

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

NORTH EAST
- Gangtok
- Guwahati
- Imphal

CHHATTISGARH
- Jagadalpur
- Raipur
- Marwahi

WEST BENGAL ■ Krishnanagar

ODISHA ■ Cuttak ■ Burla ■ Berhampur

KARNATAKA
- Chamarajanagar
- Saragur

ANDHRA PRADESH
- Sriharikota
- Aragonda

KERALA
- Pattanamthitta
- Pampa

LAKSHADWEEP
- Kavaratti
- Minicoy
- Androttii
- Ameni
- Agatti

AYAPPA 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

ANDAMAN AND NICOBAR
- Port Blair
- Car Nicobar

INDIA

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National Resource Center for EHR Standards(2013)

Network Readiness

- **National Knowledge Network** (NKN)

- **National Optic Fiber Network** (NOFN)

- **State Wide Area Network** (SWAN)
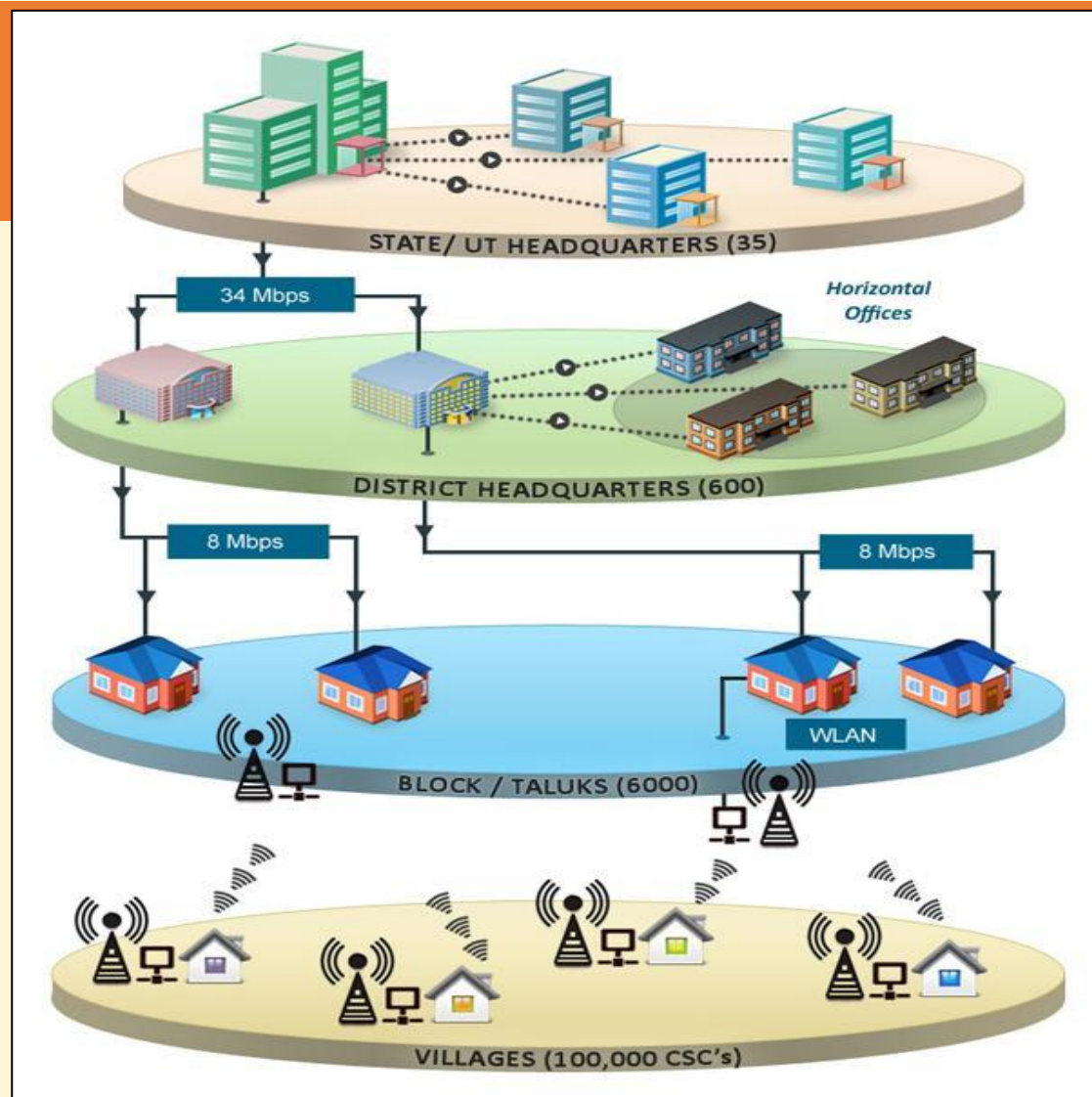
India International Initiatives

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

PAN - Africa Telemedicine Node
School of Telemedicine & Biomedical Informatics
SGPGIMS, Lucknow, U.P, India.

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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/
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- **Mishra, S. K.,** Bedi, B. S., Sathyamurthy, L. S., Singh, K. (2006). Current status of telemedicine & eHealth in India. *Advances in international telemedicine and eHealth: around the world*, Poland: Medipage.59-68

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

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Taj Mahal INDIA

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