

TELEMEDICINE DIVISION, MOHFW, GOVT. OF INDIA

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➤ Evolution of Telemedicine in India : Brief Summary

- 1996 : Deployment of First Indigenously Developed Hospital Information System Software by CDAC Noida at SGPGIMS, Lucknow, UP
- 1999 : Indigenous Development of Telemedicine Technology & Pilot
Deployments by DeitY, MCIT, Govt. of India at AIIMS, New Delhi, PGIMER Chandigarh & SGPGIMS Lucknow
- 2000 : SATCOM based Telemedicine Deployment by ISRO at Apollo Hospitals, Aragonda
- 2001 : First telemedicine network between three institutions AIIMS-New Delhi, PGI-Chandigarh & SGPGI-Lucknow
First National Conference on Telemedicine was held & a Scientific Body for promotion of Telemedicine in the Country – Telemedicine Society of India, was formed
- 2001-2003 : Major Medical Institutions (Govt. & Corporate) initiated Telemedicine activities and deployed hospital information system
- 2003-2004 : Deployment of SATCOM based TM nodes across the country
by ISRO for Tele-education and Tele-consultation services
- 2005 : MoHFW constituted Indian Task Force for Telemedicine
- 2006 : Planning Commission approved budget for e-Health including
Telemedicine in the 11th Five Year Plan
School of Telemedicine & Biomedical Informatics (STBI) was

set up at SGPGIMS, Lucknow by Govt. of U.P
PHFI was awarded Grant-in-aid to have MoHFW “Healthy
India” Website for Health Education from 2007-08 to 2012-

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- 2007 : STBI at SGPGIMS, Lucknow was made National Resource Centre for Telemedicine & Biomedical Informatics by DeitY Govt. of India
MoHFW, Govt. of India supported Tele-ophthalmology Project
In many parts of the country
MoHFW, Govt. of India supported Onco-NET Project
- 2009 : MoHFW, supported National Rural TM Network with Rs. 25-50 Lakh to start the pilot projects on Telemedicine
- 2010 : National Medical College Network Project Conceived.
SGPGIMS was made National Resource Centre for Telemedicine by MoHFW
- 2012 : MCTS Launched by MoHFW, Govt. of India
EMR/EHR Standards by Expert Group of MoHFW establishment
- 2013 : Initiation of Process of establishment of NMCN with Open Tender Basis.
MCIT Initiative of National Optical Fibre Network (2011) to provide high speed bandwidth connectivity upto every Gram Panchayat wherein 2,50,000 shall have connectivity. As a Pilot Project of Tele-consultation three sites (PHC/CHC) as one Telemedicine Centre each block have been connected with one medical college in the states for Telemedicine activities.

➤ **Three Major Initiatives of Govt. of India providing Bandwidth Connectivity are seen as potential for envisaging E-Health activities , especially Telemedicine :**

- Govt. of India has established National Knowledge Network (NKN), a state-of-the-art multi-gigabit pan-India network for providing a unified high speed network backbone for all knowledge related institutions in the country. It is designed to support Overlay, Dedicated and Virtual Networks and to seamlessly integrate with the global scientific community at multiple gbps speed. NKN has already

connected 831 institutions including 151 Medical institutions till date. It ensures that multiple choices are available to the users and takes ownership of delivering the packets end to end as per the requirements of the applications. Various applications envisaged are Countrywide Virtual Classrooms, Collaborative Research, Grid Computing, Virtual Library, Sharing of Computing Resources, Network Technology Test-bed and e-Governance etc.

- State Wide Area Network (SWAN) : Project supported by Gol, States to have bandwidth connectivity of 2mbps – 10 mbps (scalable to 100 mbps) upto Block Level. In health sector it translates into connecting all medical colleges to DHs, SDHs and CHCs upto Blocks level
- At present OFC connectivity is available in all the State Capitals, Districts and upto the Block Level. On 25.10.2011, Govt. of India approved setting up of National Optical Fiber Network (NOFN), to provide high speed bandwidth connectivity to 2,50,000 Gram Panchayats (GPs) in the country. Thus connectivity gap between GPs and Blocks will be filled. ICT applications such as e-Commerce, e-Banking, e-Governance, e-Education and Tele-medicine require high speed Internet connectivity and NOFN will facilitate this. Non-discriminatory access to the NOFN will be provided to all the Service Providers. BBNL, the SPV for the NOFN project, has embarked upon pilots in three blocks covering 58 GPs in three different states - Arian Block in Ajmer district (Rajasthan), Parvada in Visakhapatnam (Andhra Pradesh) and Panisagar Block in North Tripura district (Tripura) with one Telemedicine Centre in each block connected with medical college

➤ **Potential of Applications of ICT in India :**

- 74.04 % Literate Population
- We have today about 899.86 mn subscriptions (356.68 mn being rural) out of which 870.58 mn are wireless. (as on 30.09.13)
- Broadband subscriptions are 15.36 mn (as on 30.09.13)
- A World Bank study has estimated that a 10% increase in broadband connectivity leads to 1.38% increase in GDP. Broadband penetration in India at present is less than 2%.
- 159 Internet Service Providers in India

Telemedicine Division at MoHFW envisages:

- ❖ **Establishment of NMCN Project (Health Education Content Delivery, Skill Enhancement and Healthcare Outreach Services Project)**

Besides Health Education Content Delivery, Central Repository of Medical Education Content & Digital Medical Library Network (access to global knowledge resource and every health professional shall have that available for capacity building and skill development), Technology Enabled Skill Transfer & Mentoring, Platform for Interactive Distance Learning in an Adaptive Environment the Tele-consultation, Tele Follow-up services and m-Health shall be initiated. Virtual Class Rooms and Digital Lecture Theatres shall be utilized for Under Graduate Lecture Sharing, Remote Participation in CME, Skill Share among health professionals (Medical, Dental, Nursing and Others), Open Online Courses and Carrying out Structured skill-based online courses etc. are envisaged. Every medical institution shall have a Knowledge Park, its web portal and contribute to medical science knowledge hub, nationally and internationally and becoming a Virtual Health University.

NRC at SGPGIMS Lucknow is being supported since 2010 with HR and other activities of Telemedicine Project and National Medical College Network Project.

Since 12th FYP has only 122 crore allocated under e-Health including Telemedicine, 35 Govt. Medical Colleges have been taken up in the Phase-1. Remaining Medical Colleges shall be taken up in the next phase as per further financial sanctions

Allocation of states to the Regional Resource Centres :

- **National Resource Centre is at SGPGIMS, Lucknow
It is also RRC for Eastern States**
 - Uttar Pradesh
 - Bihar
 - Jharkhand
 - West Bengal
 - Odisha
 - Andaman and Nicobar Islands
- **Regional Resource Centre at PGIMER Chandigarh is for Northern States**
 - Jammu & Kashmir
 - Punjab
 - Chandigarh
 - Haryana
 - Himachal Pradesh
- **Regional Resource Centre at KEM, Mumbai is for Western States**
 - Maharashtra
 - Gujarat
 - Goa
 - Daman & Diu
 - Dadra & Nagar Haveli

- Lakshadweep
- **Regional Resource Centre at AIIMS Delhi for Central/other states**
 - Uttarakhand
 - Delhi
 - Madhya Pradesh
 - Chhattisgarh
 - Rajasthan
- **Regional Resource Centre at JIPMER Pondicherry for Southern states**
 - Andhra Pradesh
 - Tamil Nadu
 - Karnataka
 - Kerala
 - Pudducherry
- **Regional Resource Centre at NEIGRHIMS at Shillong for NE States**
 - Assam
 - Meghalaya
 - Tripura
 - Manipur
 - Sikkim
 - Arunachal Pradesh
 - Nagaland
 - Mizoram

❖ Establishment of National Rural Telemedicine Network :

It is envisaged that all health facilities shall be connected and hence a flow of Tele-consultation, Tele Follow-up from PHC to CHC to SDH to DH to Medical Colleges/Super-specialty hospitals shall be established.

Under NOFN as Pilot Project, to initiate w.e.f September 2013

1. PHC Fatehgarh in Arain block of Ajmer District is connected to JLN Medical College in Rajasthan,
2. CHC Panisagar in Panisagar block of North Triputra District to Agartala Govt. Medical College & GBP Hospital of Tripura
3. PHC Vadacheepurupalli in Parwada block of Vishakhapatnam Distt. is connected to King George Medical College & Hospital in Andhra Pradesh State for telemedicine services

Based on inputs and outcomes of Pilot projects, National Telemedicine Network shall be scaled-up all over country utilizing NKN, SWAN and NOFN bandwidth Connectivity

❖ M-Health :

Mobile phones, tablets, I-pads etc – e-gadgets shall be used for Mobile Health Services for Public Health Education, National Rural Telemedicine Network, Tele-education, EMR/EHR etc.

- ❖ **Healthcare on Wheels** : It is envisaged that Mobile van with diagnostic peripherals and medical team shall go to HTR areas to provide healthcare. Expert Tele-consultation shall take place using possible connectivity in the area (Dish for Satellite connection or Wi-Max or WiFi etc.)

➤ **Various Indigenous Softwares that have been developed by academic institutions, PSUs and Pvt. Sector institutions :**

✓ **Center for Development of Advance Computing (C-DAC)**

- Mercury® - Telemedicine solution
- Sanjeevani® - Telemedicine solution
- e-Sushrat® - HIS
- Tejas® - Tele-oncology
- e-Dhanwanthari® - Telemedicine Solution

✓ **Academic Institutions**

- Telemedik® - Telemedicine Software (IIT, Kharagpur)
- mHealth4U® - Portable m-Health Tools & Systems (SGPGIMS, Lucknow)

✓ **Private Companies**

- Prognosys®
- Tele-Vital®
- Maestros®

These softwares are being used by various institutions in the country for Telemedicine activities (Tele-consultation, Tele Follow-up,EMR, HIS etc.)

TELE-OPHTHALMOLOGY PROJECT AT TRIPURA :

- ✓ Implemented by the Ophthalmology Department, Department of HFW, Govt. of Tripura to combine advances in medical sciences and ICT to offer primary and preventive eye care services to the rural citizens of Tripura. (Details can be accessed from website : http://www.indiagovernance.gov.in/files/gkc_oneworld_teleophthalmology_in_tripura.pdf)

This Project received National awards for e-Governance 2008-09

ONCO-NET INDIA PROJECT : of MoHFW, Govt. of India

- Sponsored by Ministry of Health & Family Welfare, Govt. of India
- Knowledge enabled network between 27 Regional Cancer Centres (RCCs) each connected to four peripheral district hospitals(Total 108 Peripheral Centers) across India
- Implemented by National Informatics Center (NIC)

IDSP NETWORK PROJECT :

- **Integrated Disease Surveillance Project (IDSP)** was launched with World Bank assistance by Ministry of Health & Family Welfare, Govt. of India in November 2004
- IT network connecting 776 sites in States/District HQs and premier institutes has been established with the help of National Informatics Centre (NIC) and Indian Space Research Organization (ISRO) for data entry, training, video conferencing and outbreak discussion. (Details can be accessed from website : <http://idsp.nic.in>)

Following States / UTs are in different stages of Telemedicine Projects' Implementation :

- Andhra Pradesh
- Assam
- Bihar
- Chandigarh
- Dadra & Nagar Haveli
- Delhi
- Gujarat
- Haryana
- Himachal Pradesh
- Karnataka
- Kerala
- Madhya Pradesh
- Maharashtra
- Meghalaya
- Odisha
- Pondicherry
- Punjab
- Rajasthan
- Tamilnadu
- Tripura
- Uttrarakhand
- Uttar Pradesh

- Bihar State is the only State where Telemedicine is being utilized for AYUSH Services
- PPP Models exist in Gujarat, Maharashtra, Odisha, Uttarakhand
<http://gujhealth.gov.in/Images/pdf/eoi-tm.pdf>
<http://egov.eletsonline.com/2013/03/odisha-has-adopted-ict-as-development-tool>

TELE-RADIOLOGY SOLUTIONS, BANGALORE

- Best example of business model has been developed at Bangalore by the Tele-radiology Solutions
 Founded in 2002 to provide Tele-radiology services to hospitals in Singapore and hospitals in 20 countries globally
- Accredited by the US Joint Commission of Accreditation of Healthcare Organizations (**JCAHO**) & Singapore Ministry of Health has approved NHG Diagnostics, a member of the National Healthcare Group (Singapore) to use Tele-radiology Solutions for radiology interpretation services (Details can be accessed from website : <http://www.telradsol.com>)

MoHFW initiated establishment of National Rural Telemedicine Network (NRTN) for which Grant-in-Aid of Rs 19.83 crore in 2007-08 and 2008-09 was released to all the States / UTs to kick start the project and to states and institutions for the Pilot Projects

2012-13 = Rs. 2591.89 Lakhs allocated to to seven states (as per ROPs)

- | | | |
|-------------------------|---|---------------------|
| • Himachal Pradesh | : | Rs. 50 Lakh |
| • Maharashtra | : | Rs. 317.82 Lakh |
| • Punjab | : | Rs. 40 Lakh |
| • West Bengal | : | Rs. 45 Lakh |
| • Dadra & Nagar Havelli | : | Rs. 10.69 Lakh |
| • Assam | : | Rs.1559.92 Lakh and |
| • Tripura | : | Rs. 9.35 Lakh |

Since 2011 various states are being supported under NRHM for Telemedicine activities

- Ministry of External Affairs, Govt. of India initiated two Projects
 - **Pan-African e-Network Project**
 - **SAARC e-Network Tele-Medicine Project**

✓ **Pan-African e-Network Project** :

The basic objective of the Pan-African e-Network project is to help Africa in capacity building by way of imparting quality education to students, through the best Indian Universities/ Educational Institutions and to provide Tele-medicine services by way of on-line medical consultations to the medical practitioners in the patient-end locations from Indian medical specialists in various disciplines/ specialties/ sub-specialties, such as general/internal medicine, cardiology, neurology, pathology, dermatology, Urology, endocrinology, gastroenterology, oncology, gynecology, infectious diseases, ophthalmology etc.

Telecommunications Consultants India Limited (TCIL), a Public Sector Enterprise under Ministry of Communications & IT has been designated as implementing agency for this prestigious project. The Network is operational since April 2008.

All 5 of the selected Indian Universities and 12 selected Super Specialty Hospitals are connected through MPLS based IP Network to the Data Center at TCIL Bhawan, which is further connected to the Satellite Hub station at Dakar, Senegal through a IPLC link.

Till 31.07.2013, 535 Medical Consultations by various Indian SSH's

Till 31.07.2013, 3040 CME Sessions in English & 310 CME Sessions in French had been held from Super Specialty Hospitals.

List of **Indian Super Specialty Hospitals selected by MEA** for providing Tele-medicine consultation and CME Services

1. **AIIMS**, New Delhi
2. **Amrita** Institute of Medical Sciences, Kochi
3. **Apollo** Hospitals, Chennai
4. **CARE** Hospital, Hyderabad
5. **Escorts** Heart Institute and Research Centre, New Delhi
6. **Fortis** Hospital, Noida
7. **Healthcare** Global Enterprises, Bangalore
8. **Mool Chand** Khairati Ram Hospital, New Delhi
9. **Narayana Hrudayaylaya**, Bangalore
10. **Sri Ram Chandra** Medical College and Research Institute, Chennai
11. **Dr. Balabhai Nanavati** Hospital, Mumbai
12. **Sanjay Gandhi Post Graduate Institute of Medical Sciences**, Lucknow

✓ **SAARC e-Network Tele-Medicine Project**

This network provides Tele-Medicine and Continuing Medical Education (CME) services. TCIL (Telecommunication Consultants India Limited) - a Govt. of India Enterprise is implementing agency for setting up this network which is being funded by the Ministry of External Affairs (MEA), Govt. of India.

The SAARC Tele-Medicine e-Network project aims at:

- Providing on-line medical consultations at two hour per day per country, and off-line medical advice from Indian Medical Specialists to the doctors in the remote Tele-Medicine center at IGICH, Kabul, Afghanistan and Patan Hospital, Kathmandu, Nepal
- Continuing Medical Education (CME) to practicing doctors and working nurses/physicians' assistants to update their knowledge and skills

The network is currently operational in TWO countries at the following hospitals:

- Jigme Dorji Wangchuk National Referral Hospital (JDWNRH), Thimphu, Bhutan; (Contract completed: 2008-2011)
- Indira Gandhi Institute of Child Health (IGICH), Kabul, Afghanistan –Operational
- Patan Hospital, Kathmandu, Nepal. ---Operational

In India, two hospitals namely Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS), Lucknow and PGIMER, Chandigarh are offering the Tele-Medicine services and CME services.