

# Telemedicine for Rural Mass-Current Initiatives and Future Scope

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](mailto:skmishra@sgpgi.ac.in) / [skmishra\\_1956@yahoo.com](mailto:skmishra_1956@yahoo.com)



# Agenda

- Current Initiatives for rural healthcare delivery
- Mobile Telemedicine
- Tribal Telemedicine in Himanchal Pradesh
- National Rural Telemedicine Network
- National Ayush Telemedicine Network
- CollabDDS
- Women Healthcare Mobile Outreach
- Tele-Ophtalmology , Tele-Radiology
- State Telemedicine Networks
- Policy & Future PAN India Telemedicine Practices
- Telemedicine in Temples
- Conclusion

# Mobile Telemedicine Bus for Rural Healthcare Delivery



# Mobile Telemedicine Kiosk



Portable Mobile Telemedicine Kiosk



Yolo Health Kiosk



# Sky Health Centers

World Health Partners & Melinda Gates Foundation





## Impact India Foundation & Indian Railway



- ▶ Lifeline Express is WiFi enabled, which helps doctors and experts sitting in metropolitan cities examine patient's diagnostic reports and other images

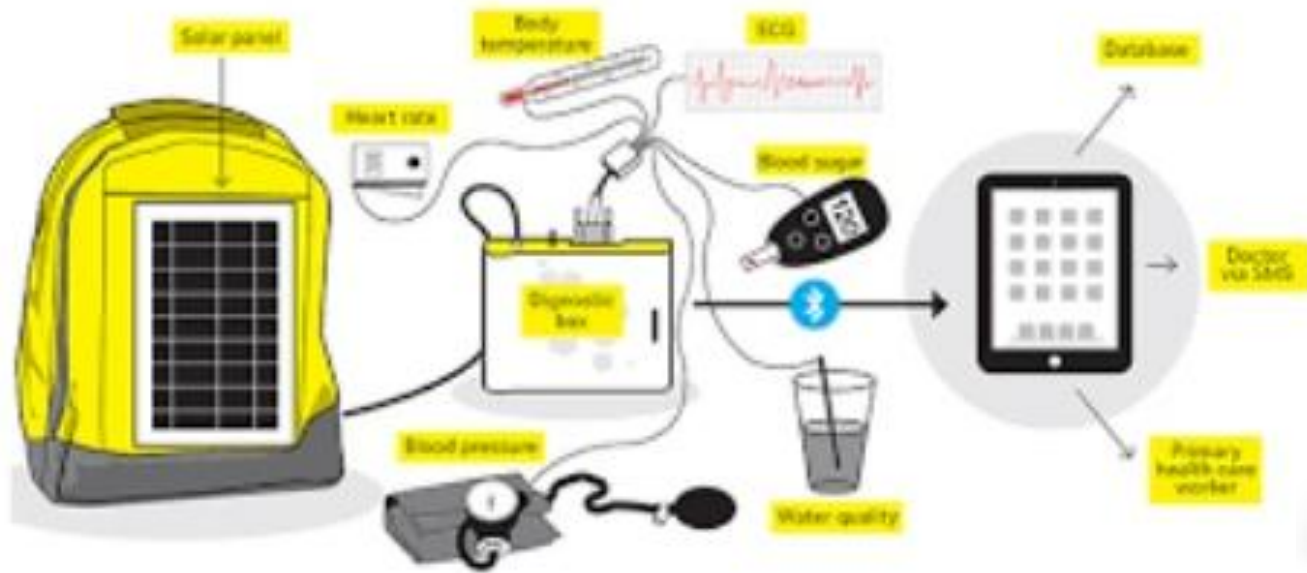
<http://www.rediff.com/news/report/pix-on-board-the-lifeline-express-worlds-first-hospital-train/20180416.htm>



# Swasthya Slate

SWASTHYA SLATE – LAB IN A RUCKSACK FOR OFF-GRID VILLAGE PRIMARY CARE

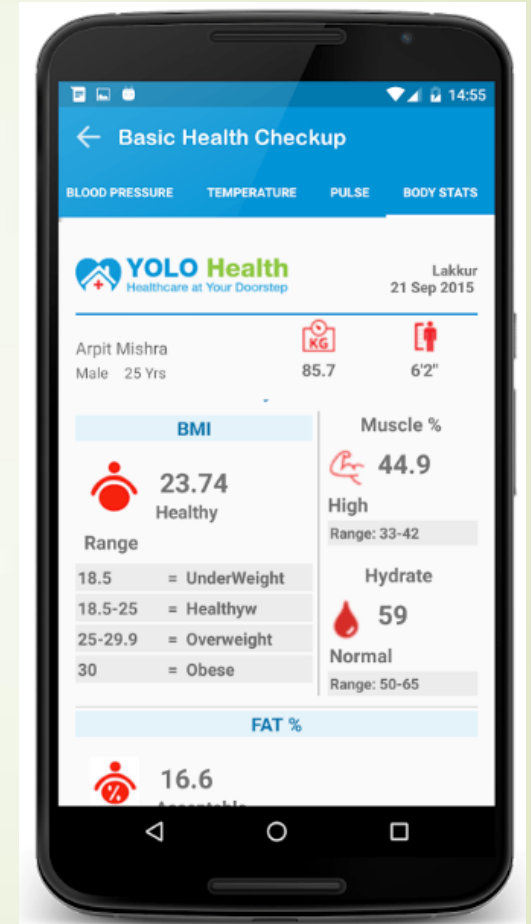
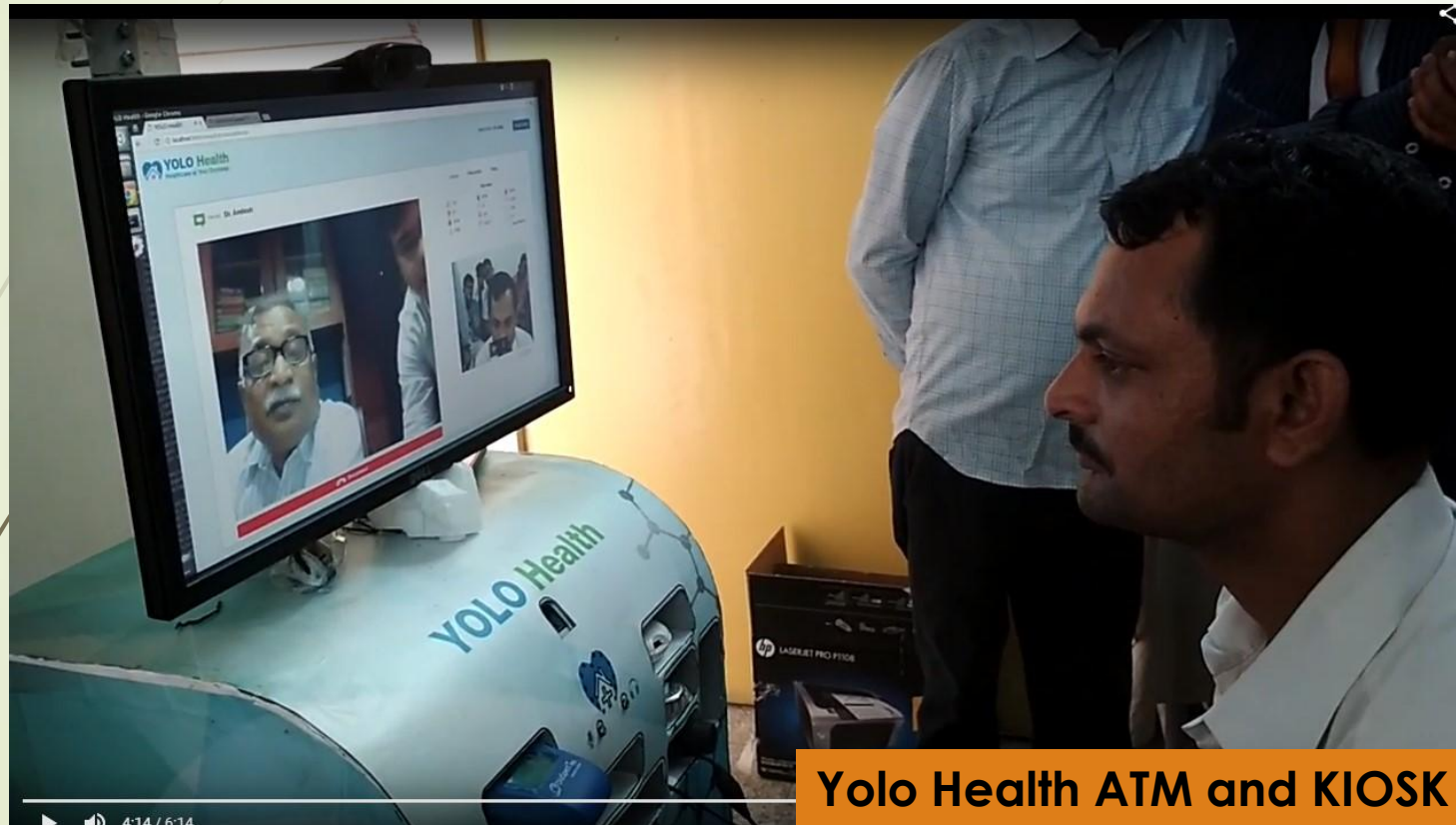
Swasthya Way of Diagnostics



<http://www.iffcolive.com/this-small-tool-has-the-potential-to-change-indias-health-system>

Oditelecon2018; 22<sup>nd</sup> April 2018

# ATM Based Kiosk for Rural Healthcare





# AmbuPod, a patent(pending) telemedicine enabled clinic and micro-Ambulance



# Tribal Telemedicine at Himanchal Pradesh

- Public Private Partnership (PPP) Model
- Apollo Tele Health services is providing 24/7, quality, affordable, remote health care, to 34,000 citizens of **Lahaul and Spiti** (height of 14,000 feet in the Himalayas) **in Himachal Pradesh.**
- People living there connected through satellite to specialists of Apollo Hospital sitting in New Delhi and Hyderabad.

<http://caho.in/?p=3754>

## **Telemedicine in the Himalayas: Operational Challenges—A Preliminary Report**

Ganapathy Krishnan, Chawdhry Vineet, Premanand Satgunam, Sarma Arunabh, Chandralekha Jothivaithilingam, Yogesh Kumar Kotte, Kumar Saroj, and Guleri Rajesh. *Telemedicine and e-Health*. May 2016, ahead of print.

doi:10.1089/tmj.2015.0249



# Tribal Telemedicine in Himanchal Pradesh



<https://vsee.com/blog/apollo-hospitals-establishes-telemedicine-stations-in-the-himalayas/>

Oditelecon2018; 22<sup>nd</sup> April 2018

# National Rural Telemedicine Network

## Hierarchical Structure of NRTN

**LEVEL-1:** Primary Health Center (PHC) / Community Health Center (CHC) *connected to a District Hospital*

**LEVEL-2:** District Hospital *connected to a State Hospital / National Super Specialty Hospital*

**LEVEL-3:** State Hospital / National Super Specialty Hospital *connected to each other*

**LEVEL-M:** Mobile Telemedicine Unit covering few villages *connected to nearest PHC / CHC or directly to District Hospital*



# National Rural Ayush Telemedicine Network

- Network of telemedicine centers acting as next generation delivery point for AYUSH treatment at District Health Centers and Public Health Centres .
- Ensuring accessibility to good quality healthcare at the doorstep these centers minimize the gap in the Health Sector in Bihar and seeks to promote the benefit of healing to a larger population in a natural way under AYUSH system of medicine.

# Collabdds

Developed by NIC, Pilot Test funded by NKN & PAN India Expansion by MoH&FW



<https://collabdds.gov.in/>



# Women Healthcare Mobile Outreach



- PGIMER, Chandigarh & Clinton Foundation in association with Philips Healthcare & RAD-AID International
- Integrated mobile women's health outreach program to provide screening and referral for breast cancer, cervical cancer, and osteoporosis to over 7,000 underserved patients over five years in Northern India, in the Punjab province and City of Chandigarh

<https://www.clintonfoundation.org/clinton-global-initiative/asha-jyoti-womens-healthcare-mobile-outreach-program>

Oditelecon2018; 22<sup>nd</sup> April 2018





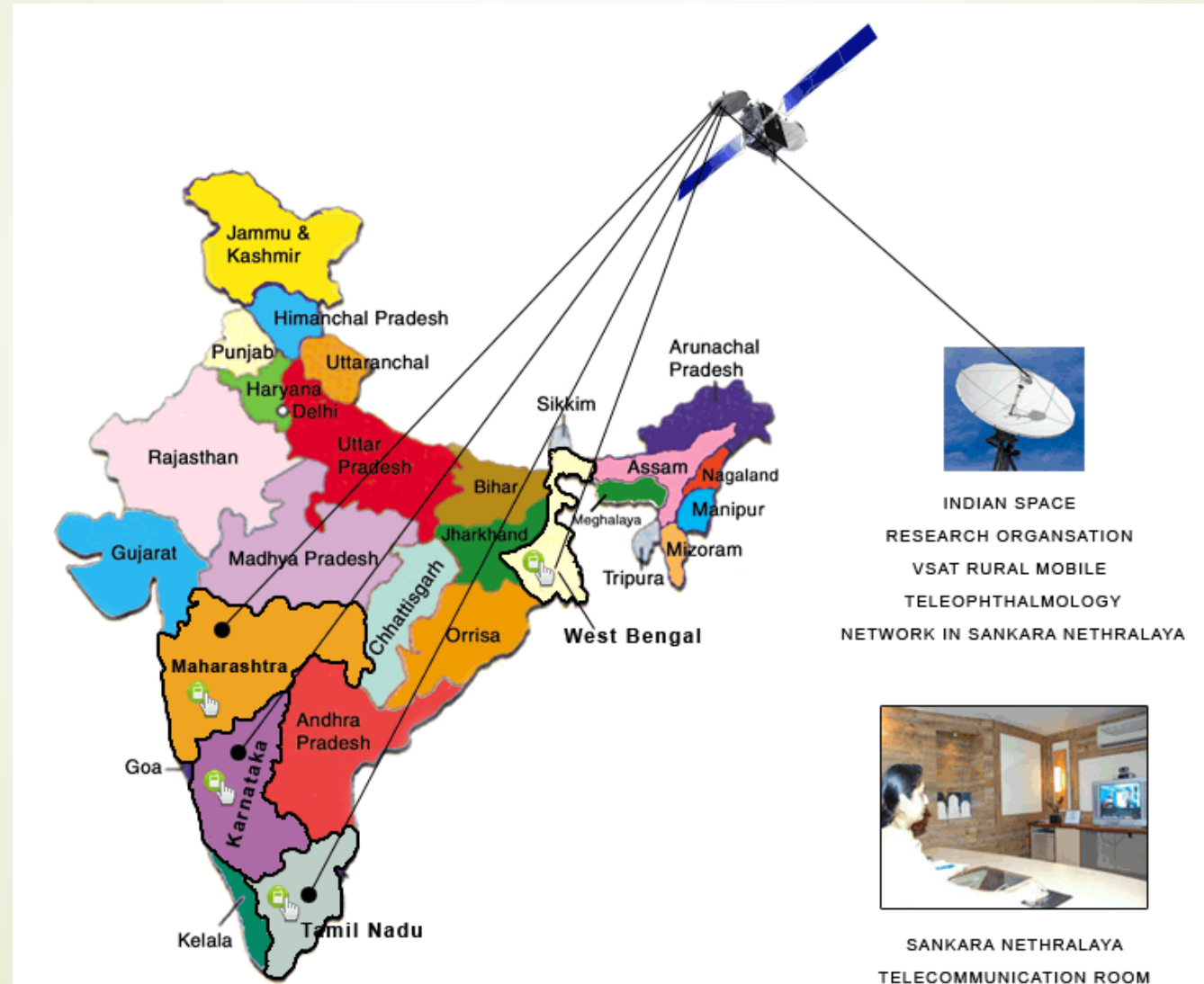
# Tele-Eye Care Service in CHC

Chief Minister N. Chandrababu Naidu undergoing eye test after launching tele ophthalmology services, e-eye kendra at Undavalli in Guntur district (Feb, 2018)



- Public Private Partnership (PPP) with Apollo Hospitals for services.
- In the first phase, these services would be available in 60 community health centres of the State and later it would be expanded to the remaining 55 health centres.
- Eye care will be provided through digital medical equipment and telecommunications technology, even when a patient is at a remote health centre.

# Tele-Ophthalmology Network



con2018; 22<sup>nd</sup> April 2018

# Tele-Radiology for Tripura



- Telerad in MoU with Govt. of Tripura.
- Begins in Sep 2016
- **Reported 15662 cases in between Sept 2016-Aug 2017**
- Provides services to 23 sites in the state



# Common Service Center Scheme (CSC)

The screenshot shows the website for the Common Services Centres Scheme (CSC) under the Department of Electronics and Information Technology, Ministry of Communications and Information Technology, Government of India. The page features the CSC Health Clinic logo and the Digital India logo. The navigation menu includes HOME, HEALTH CLINIC, ABOUT US, SERVICES (highlighted), PROJECTS, TRAININGS, GALLERY, and BLOG. A language selection dropdown is set to Hindi. The main content area is titled "Apollo Tele Health Services-- ATHS" and contains text describing the challenges of healthcare in India and the partnership with Apollo Tele-health Services. It mentions a need for 23,00,000 paramedical work force and a partnership to provide tele consultations. A "Register Now" button is visible, along with a "VLE Service Registration" link.

**Common Services Centres Scheme (CSC)**  
Department of Electronics and Information Technology  
Ministry of Communications and Information Technology  
Government of India

**CSC Health Clinic**

**Digital India**  
Power To Empower

Select Language

HOME HEALTH CLINIC ABOUT US **SERVICES** PROJECTS TRAININGS GALLERY BLOG

### Apollo Tele Health Services-- ATHS

India is a land of two worlds in relation to health care services to its people. On one end of the spectrum we have cutting edge technology, advancements in clinical sciences, skill sets among the medical fraternity to perform some of the most complex health interventions and procedures, making India a health care destination for even some of the developed countries. On the other end of the spectrum we have needless mortality due lack of service provisioning in some remote parts of the country. The public health system has been striving to address this challenge of health care service provisioning to such difficult geographies but they are plagued by inherent challenges of scarcity of medical professionals, incentive and motivation for such skilled resources to provide their services in such locations. The estimated doctor population ratio in India is 0.7: 10002 compared to Global average of 1.4, we have a deficit of almost 2.8 Lakh Doctors similarly there is a need for almost 23,00,000 paramedical work force to meet the health care service requirements of the Country.

Apollo Tele-health Services has signed a partnership agreement with the Common Services Centers Scheme of the Government of India to enable "Primary and 2nd opinion services through tele consultations" to CSCs in the Country. The primary objective of the collaborative partnership is to provide grass root level access points for Health Literacy among the communities, develop health seeking behaviour and to promote preventive health care services among the rural populace.

The key requirements of Apollo Telemedicine are:

- 512 Kbps Broadband Internet connection

Register Now

VLE Service Registration

[http://164.100.115.10/health/?page\\_id=23](http://164.100.115.10/health/?page_id=23)

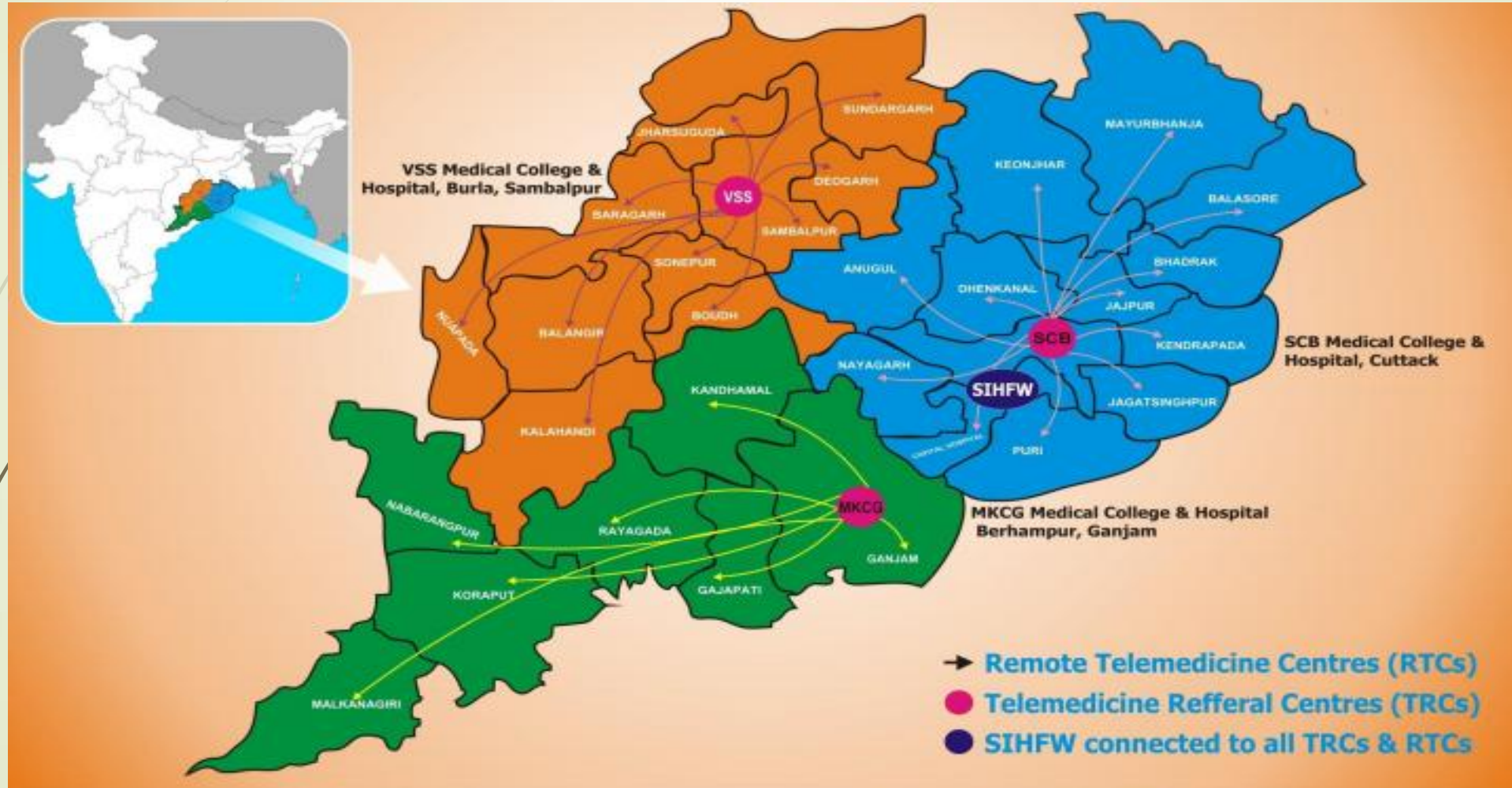
2018; 22<sup>nd</sup> April 2018



# ***State Telemedicine Networks***

Oditelecon2018; 22<sup>nd</sup> April 2018

# Odisha State Telemedicine Network







# Statistics at a Glance

(Odisha State Telemedicine Network)

- ▶ total number of tele-consultations and tele-follow ups till end of **May 2017** are **16,556**.
- ▶ During the period from **August 2001 to May 2017** sixteen batches of postgraduate trainees have been benefited in the three Govt. medical colleges of Odisha through **online teaching on 3141 topics**
- ▶ The State Institute of Health & Family Welfare, Bhubaneswar has conducted **till end of May 2017** a total number of **490 training courses** for benefit of medical professionals and para-medical staff of different districts.

<http://health.odisha.gov.in/PDF/telemedicine/OdishaTM%20Activities.pdf>

# Maharashtra 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>

Oditelecon2018; 22<sup>nd</sup> April 2018



AGE, HEALTHY NATION

# NATIONAL HEALTH MISSION, MAHARASHTRA

## STATE HEALTH SOCIETY, MAHARASHTRA

Govt. of Maharashtra



Marathi Website

### Physical Progress Report

Year	Total No. of Patient Referred/Opinion received
2008-09	538
2009-10	3640
2010-11	4243
2011-12	16109
2012-13	21135
2013-14	27884
2014-15	26572
2015-16	31980
2016-17 ( till May 2016 )	4238
<b>Total</b>	<b>136339</b>

### Health institutes included for Telemedicine Project :

Sr. No.	Type of node	Phase-I (2007-08)	Phase-II (2008-09)	Phase-III (2010-11)	Phase - IV (2014-15)	Total
1	Controlling node	0	1	0	0	1
2	Specialist node	1	3	1	1	6
3	Patient node	5	22	30	5	62
	<b>Total</b>	<b>6</b>	<b>26</b>	<b>31</b>	<b>6</b>	<b>69</b>

<https://www.nrhm.maharashtra.gov.in/telemed.htm>

Oditelecon2018; 22<sup>nd</sup> April 2018



# 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=](http://punjabhealth.co.in/RSBY_overview.aspx?ID=qpbhdKadhac=)

# Statistics at a Glance

(Punjab Health State Network)

	<u>Year</u>	<u>No. of consultations</u>
i.	2008	450
ii.	2009	814
iii.	2010	4141
iv.	2011	3962
v.	2012	3827
vi.	2013	4073
vii.	2014	4677
viii.	2015	8641
ix.	Till August 2016	6109

## Telemedicine Centres in Punjab

1. Govt. Medical College Amritsar.
2. Govt. Medical College Patiala.
3. Govt. Medical College Faridkot .
4. Civil Hospital Amritsar.
5. Civil Hospital Bathinda.
6. Civil Hospital Barnala.
7. Civil Hospital Ferozepur.
8. Civil Hospital Fatehgarh Sahib.
9. Civil Hospital Gurdaspur.
10. Civil Hospital Hoshiarpur.
11. Civil Hospital Jalandhar.
12. Civil Hospital Kapurthala.
13. Civil Hospital Ludhiana.
14. Civil Hospital Mansa.
15. Civil Hospital Moga.
16. Civil Hospital Muktsar.
17. Civil Hospital Nawansahar.
18. Civil Hospital Ropar.
19. Civil Hospital Sangrur.
20. Civil Hospital SAS Nagar.
21. Civil Hospital TarnTaran
22. Civil Hospital Pathankot

### ISRO Assisted Centres:

1. Mata Kaushalya Hospital, Patiala
2. SDH Dasuya, Hoshiarpur,
3. SDH Ajnala, Amritsar




# **Policy & Future PAN India Telemedicine Practices**

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# 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



The graphic features a central red cross with a white heart and a white ECG line inside it. The background of the graphic is light blue. The text is in bold black and red fonts. The logo of the Press Information Bureau (PIB) is visible in the top right corner of the graphic.

# Wellness Scheme under Ayushman Bharat Yojana (National Health Protection Scheme)



- Hon'ble PM Launches First Wellness center under Aushman Bharat Yojana in Maoist Area at Bijapur (Chattisgarh) on 15<sup>th</sup> April 2018
- Government plans to open 1.5 lakh health and wellness centres by 2022 to deliver comprehensive primary healthcare to communities.
- Provide insurance cover to 40% of India's population for secondary and tertiary care

Oditelecon2018; 22<sup>nd</sup> April 2018



## DigiGaon initiative

- It will be launched which aims at provision of telemedicine, education and skills using of digital technology.
- Aim to double the income of the farmers by 2022
- Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) is extended to 6 Crore rural households to accomplish the mission of DigiGAON
- The effective digitization of rural India will be the key of success for Digital India or DigiGaon initiative.
- Akodara in Gujrat, the first DigiGaon of India



# CSC



# 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-...](http://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

india.gov.in



CALL  
**1056**  
Health Helpline  
NRHM



Direct Intervention System for Health Awareness



# National Cancer Grid (NCG)



[ABOUT US](#) | [TESTIMONIALS](#) | [NEWS](#) |  
[BLOG](#) | [CONTACT US](#) | [LOGIN](#)

## 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.



NATIONAL  
CANCER  
GRID

COLLABORATION FOR CANCER CARE



# National Medical College Network

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



#TransformingIndia

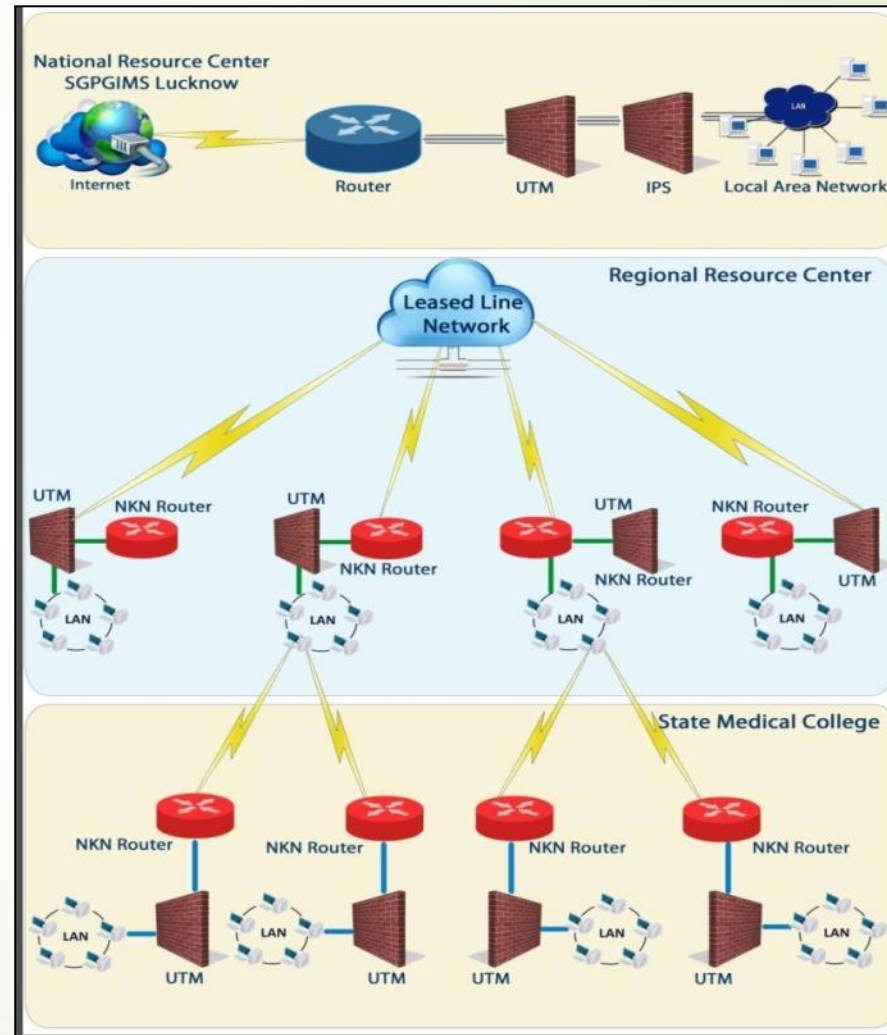
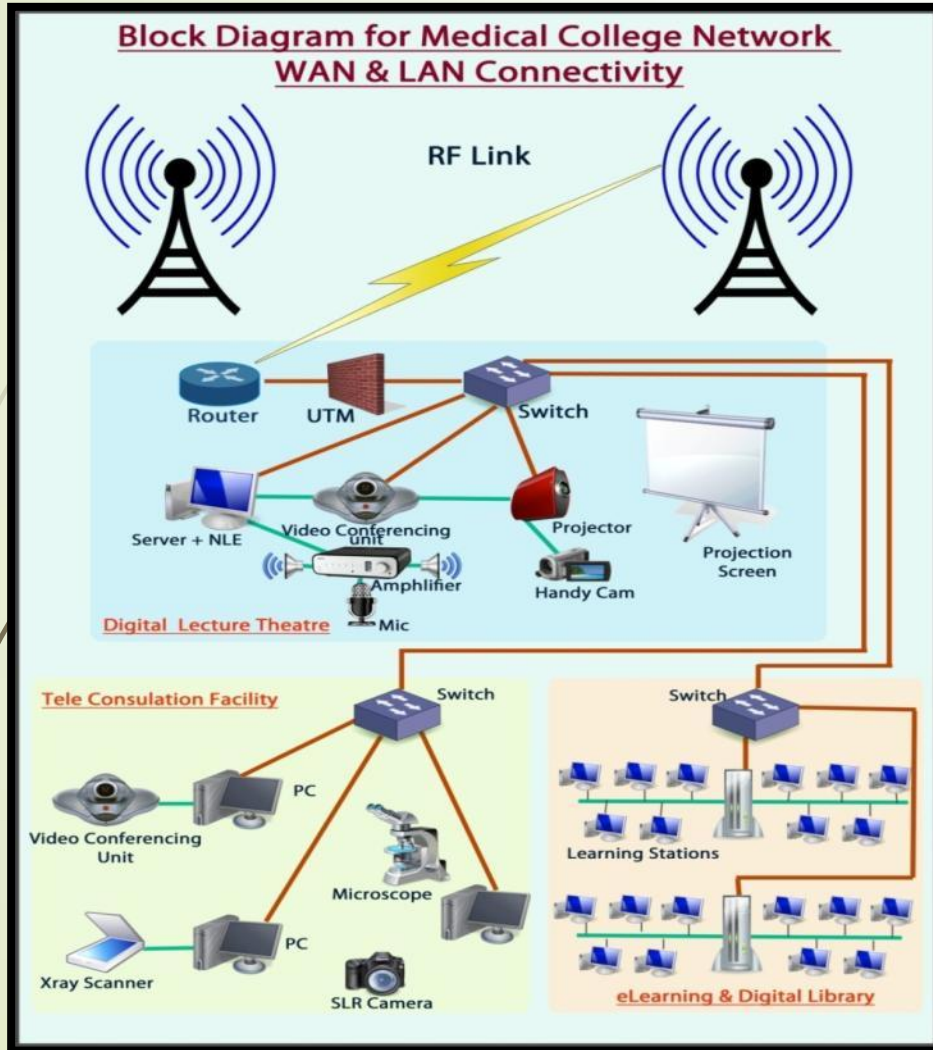
18; 22<sup>nd</sup> April 2018

[www.nmcn.in](http://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  
12<sup>th</sup> April 2018



# 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

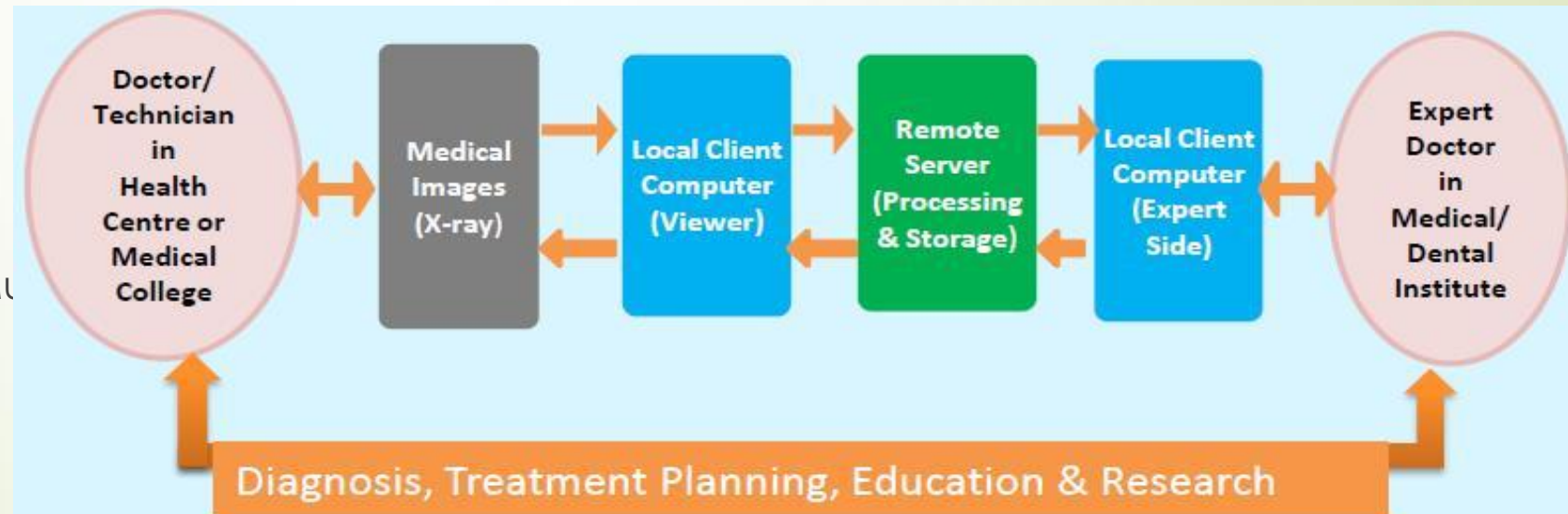
Oditelecon2018; 22<sup>nd</sup> April 2018

# 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





# Tele-Rheumatology



SCB Medical College Cuttack

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# Nuclear Medicine Followup Tele-Clinic



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# Startups

## Home Health care Services

**PORTEA**  
HEAL AT HOME

OUR SERVICES ▾ ABOUT US BLOG MY ACCOUNT

1800 121 2121

GET WELL SOONER  
WITH HOME HEALTH  
CARE SERVICES

PHYSIOTHERAPY LAB TESTS NURSING SERVICES DOCTOR CONSULTATIONS VIEW

<https://www.portea.com/>

## Online Pharmacy

**1mg**

MEDICINES LAB TESTS ASK DOCTOR ARTICLES

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Featured ▾ Fitness & Supplements ▾ Diabetes ▾ Healthcare Devices ▾ Personal Care ▾ Health Conditions ▾ Ayurveda ▾

Homeopathy ▾

POPULAR HEALTH PRODUCT CATEGORIES

Dabur Vitamins & Supplements Diabetes Supplements Skin Care

<https://www.1mg.com/>

Oditelecon2018; 22<sup>nd</sup> April 2018



# 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 की 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।

## 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

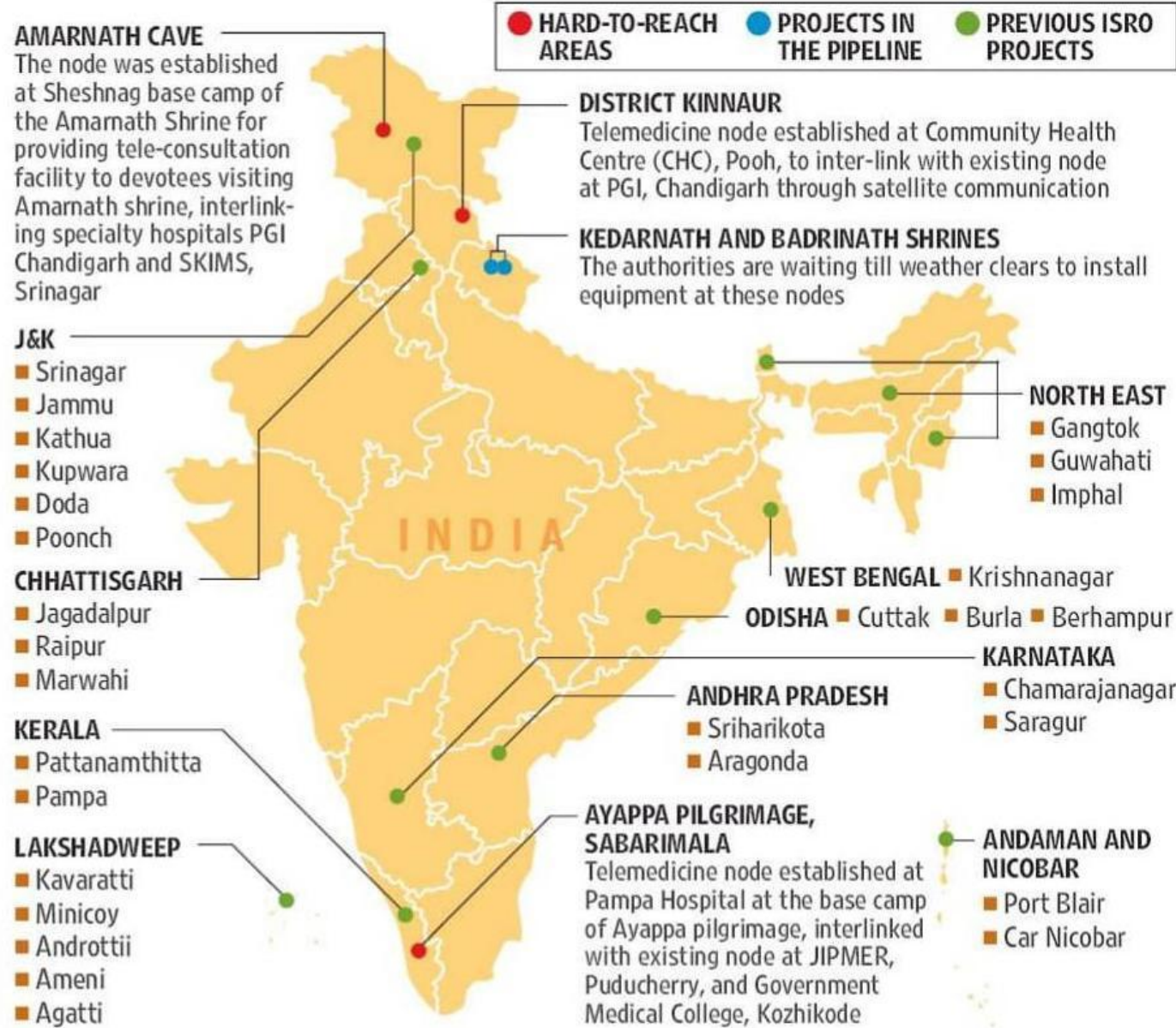


# Tele-medicine in collaboration with D/o Space at Pilgrimages

- ▶ 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

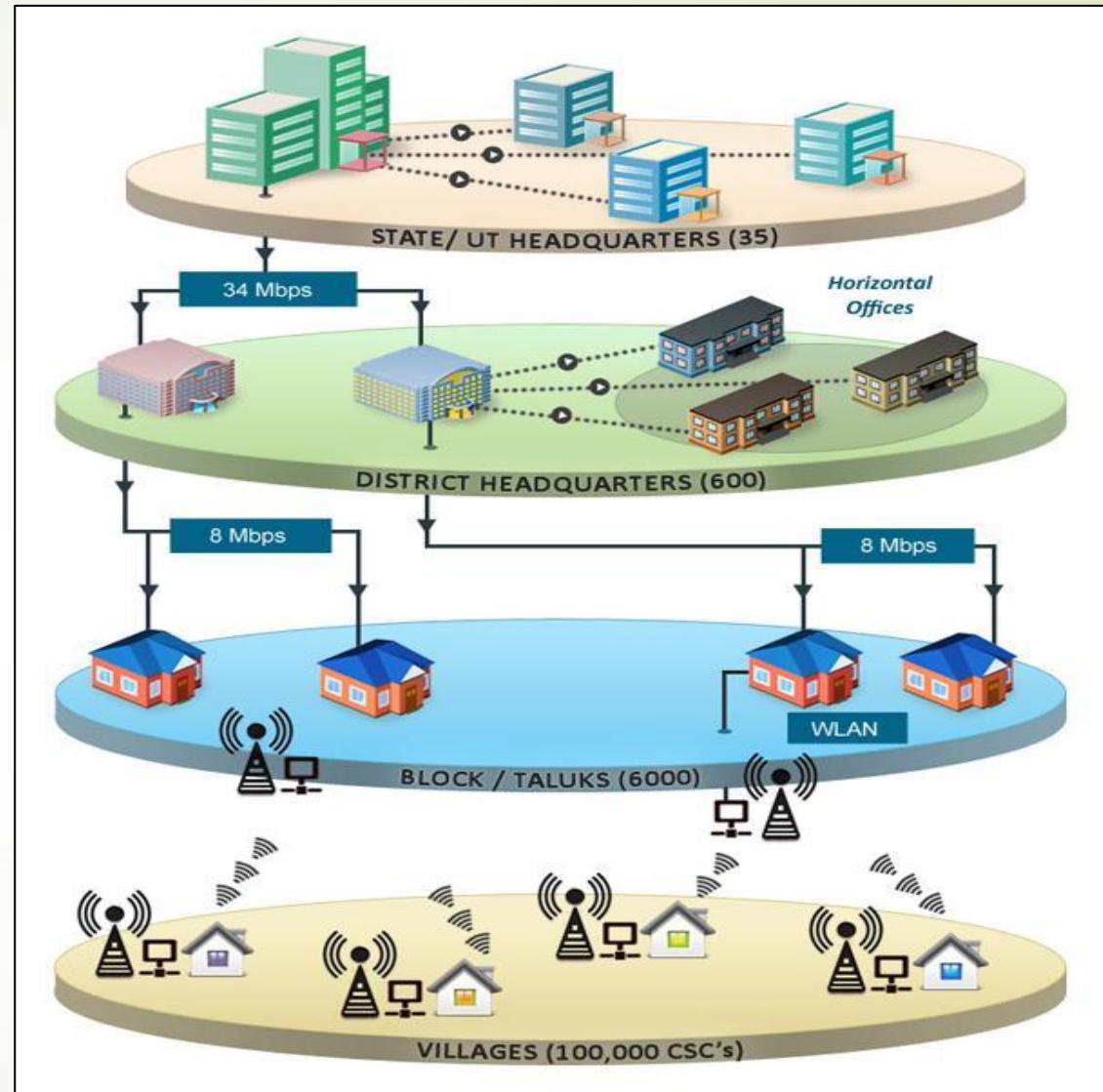
A look at the centres set up in hard-to-reach areas this month, projects in the pipeline and the previous projects where ISRO provided satellite links to connect the centres to hospitals in cities





# Network Readiness

- National Knowledge Network (NKN)
- National Optic Fiber Network (NOFN)
- State Wide Area Network (SWAN)



# 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

Oditelecon2018; 22<sup>nd</sup> April 2018