CONCEPT NOTE
on
NATIONAL TELEMEDICINE NETWORK (NTN)

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1. Introduction

The Concept Note is aimed at providing an integrated approach towards achieving online medical consultation for providing health services to citizens in urban and rural areas of the country by creating Information Communication & Technology (ICT) infrastructure at Government Health Care service delivery centres.

2. Background: Tele-Medicine in India

Large parts of the country still suffer from lack of adequate health care facilities. Under such a scenario technology can play an enabling role and in particularly reaching to unreachable areas as well as to provide a higher level of care on a cost effective basis.

Keeping in view the benefit which can be reaped from the ICT innovations in Telemedicine, MoHFW is in the process of establishing the National Medical College Network wherein 41 Govt. Medical Colleges are being networked in the first phase riding over National Knowledge Network with the purpose of e-Education and e-Healthcare delivery. A National–cum-Regional Resource Centre and five Regional Resource Centers are also being set-up. Building on the existing scheme, it is now proposed to link District and Sub-District/CHC/PHC facilities so as to build a Continuum of care across institutions.

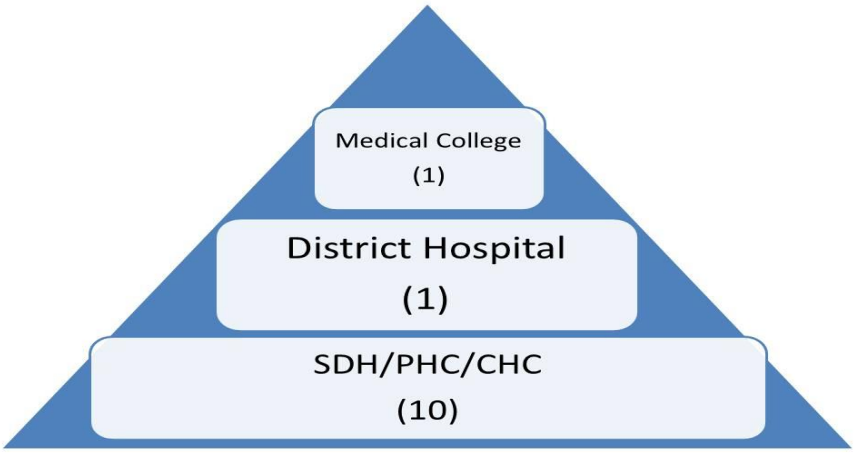
3. Proposed Telemedicine Solution

The Health care system in India, at present, has a three-tier structure to provide health care services to its people. The primary tier comprises three types of health care institutions: Sub Centre (SC), Primary Health Centre (PHC) and Community Health Centre (CHC). The Second tier, District Hospitals and Sub-Divisional Hospitals to provide Healthcare services in districts and urban areas of the State. The Tertiary healthcare tier comprises of Super Specialty Hospitals or Medical colleges providing tertiary care services to the citizens.

With more than 190 Government Medial Colleges , 750 District hospitals, 1024 Sub-Divisional Hospitals, 5263 CHC's and 25020 PHCs, (Source : Rural Health Statistics, MoHFW) the quantum of Government institutions is considerably large and also the geographical spread is vast. Therefore it is proposed that the Department will follow an incremental approach to implement the National Telemedicine Network (NTN) initiative in consultation with State Governments on Public Private Partnership (PPP) model.

In the first phase of National Telemedicine Network project, it is proposed to connect District Hospital with SDH/PHC/CHCs at remote/rural locations in the ratio of 1:10. The District hospital will itself be networked with Medical College in every State.

With implementation of NTN, every State would have at least a Medical College linked with a District Hospital which in turn shall be inter connected with 10 SDH/PHC/CHC. Diagrammatical representation for every State is as follows:



For maximizing the effective reach and providing services at the doorstep of the citizens, the States are rationalized according to their population (Source: CENSUS 2011). The States under High Population category shall shortlist minimum 5 Medical Colleges, 10 District hospitals and 100 CHC/PHCs under NTN project. Similarly, States under other two categories shall identify and shortlist Government Healthcare Facility according to their readiness as per following matrix:

Suggested Government Healthcare Facilities under National Telemedicine Network				
Category	**Description**	**State/UT**	**Medical Colleges**	**Ratio of District Hospital to SDH/CHC/PHC**
Type - 1	High Population (Population > 5 Crores)	Uttar Pradesh, Maharashtra ,Bihar, West Bengal, Andhra Pradesh, Madhya Pradesh, Tamil Nadu, Rajasthan, Karnataka & Gujarat	5-10	1:10 (One District to be connected with minimum 10 SDH/CHC/PHC)
Type - 2	Medium Population (5 Crores <Population> 2.5 Crores)	Orissa, Kerala, Jharkhand, Assam, Punjab, Chhattisgarh, Haryana	3-5	1:10

Type - 3	Low Population (Population < 2.5 Crores)	Delhi, Jammu and Kashmir, Uttarakhand, Himachal Pradesh, Tripura, Meghalaya, Manipur, Nagaland, Goa, Arunachal Pradesh, Puducherry, Mizoram, Chandigarh, Sikkim, Andaman and Nicobar Islands, Dadra and Nagar Haveli, Daman and Diu & Lakshadweep	2-3	1:10

4. Salient features of National Telemedicine Network (NTN)

In this project, it is envisaged to provide Citizen-centric Services at Government Healthcare Facilities utilizing Telemedicine platform in every State/UT.

- Under the ambit of National Medical College Network (NMCN), MoHFW has already shortlisted 41 medical colleges in 25 States/UTs. List of Medical Colleges is available at **Annexure: II.**
- A Tele-Consultation Centre would be created at every facility.
- A mobile telemedicine unit is also envisaged for every District.
- A Diagnostic lab would also be set up at District Hospital and Sub District/PHC/CHC.
- It is proposed to provide Tele-consultation in the disciplines of Medicine, Ophthalmology, ENT, Oncology, Cardiology and Dermatology in the first phase.
- To create dependable ubiquitous and high speed network backbone, all available and future network technologies such as NKN, NOFN, SATCOM (satellite communication) and terrestrial high speed internet shall be utilized.
- Telemedicine Practitioners/Doctors shall be incentivized.
- A Sustainable Operating Model shall be created by State Govt.

National Resource Center and the Regional Resource Centers of MoHFW shall be delegated the task to oversee the implementation and to technically support the State Governments in implementing the project.

5. Health Care Infratructure

A Telemedicine Centre shall be created at Government Healthcare Facility (Primary, Secondary and Tertiary institutes) to provide Tele-consultation and Diagnostic services.

5.1. Infrastructure at Medical Hospital

The Telemedicine center at the Medical College will lean on the existing NMCN Scheme to have the required infrastructure for Tele-consultation with following components:

a. **Tele-consultation Facility:** A panel of doctors shall be available at Medical Colleges for Tele-consultation with District Hospital and Primary Health Centre.

b. **Diagnostic Lab:** A diagnostic lab shall be created at the Medical hospital to provide basic diagnostic tests service to the patients.

5.2. Infrastructure at District Hospital

Tele-consultation facility at District Hospital shall comprise of advance Medical equipment, capable of performing medical examinations and also to store the digital imaging data of patient. The District hospital shall consist following Infrastructure to provide Tele-consultation and diagnostic services to the citizen:

a. **Tele-consultation Facility:** Doctors available at District hospitals shall be available at Tele-consultation facility/room for consultation with PHC and also to refer the case to Medical Colleges if required.

b. **Diagnostic Lab:** A diagnostic lab shall be created at the District hospital to provide basic diagnostic tests service to the patients.

c. **Mobile Tele-medicine Unit:** A mobile van shall also be provided for every District to reach the underserved areas for Tele-Consultation.

5.3. Infrastructure at Sub Divisional Hospital/CHC/PHCs:

a. **Tele-consultation Facility:** The infrastructure at primary care shall be equipped with basic Telemedicine equipment for collecting the vital statistical of patient.

b. **Diagnostic Lab:** A diagnostic lab shall be created at the SDH/PHC/CHC to provide diagnostic test service to the patients.

The proposed ICT infrastructure at every Government Healthcare Facilities including the tentative cost is defined at **Annexure: I.**

6. Source of Funding

States/UTs are encouraged to adopt any of the following financial models to establish Telemedicine Network in their respective Government Healthcare Facilities:

6.1. Public Private Partnership (PPP)

Public-Private Partnership or PPP in the context of the health sector is an instrument for improving the health of the population. The Private and Non-profit sectors are also very much accountable to overall health systems and services of the country. The States may utilize following operating models:

a. Transaction Based Operating Model

In this type of setting, the private partner sets up the whole facility (Tele-Consultation and Diagnostics lab) and provide services to the citizens utilizing the Government Healthcare Facilities free of cost and the State reimburse the amount to the partner based on the number of transactions every month. However State has to clearly define the amount per transaction and type of transaction.

b. Rental Based Operating Model

In Rental Model, the private partner sets up the whole facility (Tele-Consultation and Diagnostics lab) at the Government Healthcare facilities and provides the services to the citizens. However, in this model the State pays a fixed rental for every equipment utilized in the facility monthly or quarterly. Private Partner sustains the operations and also provides the manpower which is also based on rental.

c. Build Own Operate and Transfer Model (BOOT)

BOOT is a form of project financing, wherein a private partner receives a “concession” from the State Government to finance, design, construct, and operate a facility stated in the concession contract. During the concession period the private partner owns and operates the facility with the prime goal to recover the costs of investment and maintenance while trying to achieve higher margin on project. Since the financing is completely owned by the Private Partner, State Government doesn’t pay anything to partner, however State Government has to clearly spell out the “Concession” given to the partner for setting up and operating the project. The rates of services can be fixed by the State Government or proposed by the private partners. The sustainability is created from charging the patients approaching PHC/CHC for diagnosis.

6.2. Corporate Social Responsibility (CSR)

Corporate Social Responsibility (CSR) has been defined by the World Business Council for Sustainable Development (2000) as: "The continuing commitment by business to behave ethically and contribute to economic Social development while improving the quality of life of the workforce and their families as well as the local community and society at large".

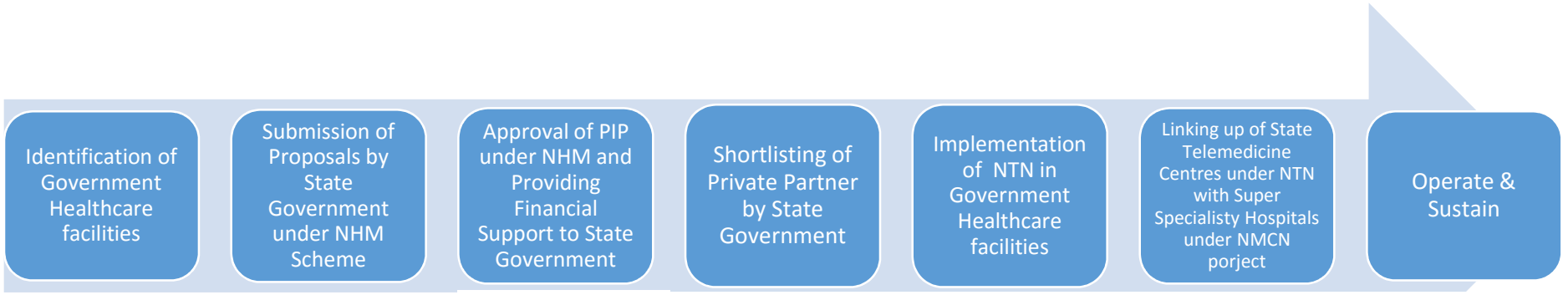
Therefore, States/UTs may approach the Corporates to create and operate the NTN project from financing under Corporate Social Responsibility (CSR) fund. The State Government has to provide the basic infrastructure to the Corporates primarily space and permission of operations. Corporates design, create and set up facility for patients. State Government has no liability of paying to Corporate and they operate it as a social responsibility towards society.

7. Responsibilities of Stakeholders

Since PPP model is an amalgamation of numerous stakeholders, therefore associated responsibilities needs to be clearly spelled out in the proposals. Based on the existing PPP models, the basic tasks and activities for Stakeholders under the ambit of National Telemedicine Network (NTN) are defined as follows:

MoHFW	STATE GOVERNMENT	PRIVATE PARTNER
Financial Support under NHM Scheme	Shortlisting of Private Partner for PPP	Setting up of Tele-Medicine and Diagnostic Lab
Technical Support for setting up of Tele-medicine Centres	Fixation of rates for Tele-Consultation & Diagnostic services for non-beneficiaries	Providing Manpower for Operations
Linking up of Government Healthcare facilities with Super Specialty Hospitals under NMCN Scheme for Tele-Consultation	Finalization of Operating Model and payment mechanism	Providing services to the patients as per rates fixed by State Government
	Guidelines for utilization of existing Civil infrastructure at District Hospital, PHC or CHC.	Coordination with Super Specialty Hospitals under NMCN for Tele-Consultation Services
	Submission of proposals under PIP for financial support by MoHFW	Incentivizing Doctors in consultation with State Government
	Providing necessary approvals & administrative coordination	
	Providing local Government Doctors for Tele-Consultation purpose	

8. Lifecycle of NTN under NHM scheme



- Needs Assessment
- Feasibility study
- Shortlisting of Medical College, District Hospital and SDH/PHCs / CHCs
- Incorporate domestic and global learnings
- Identify institutional structures & capacities for implementation

- Preparation of PIP Proposal
- Define Operating Model
- Identify IT enablement opportunities and requirements
- Define funding requirements
- Define monitoring and evaluation approach

- Submission of Proposal to MoHFW under PIP of NHM scheme
- Define implementation approach and phasing plan (functional and geographic)
- Assess detailed funding requirements and business model
- Getting approval on the submitted proposal

- Prepare Request for Proposals (RFP)
- Select bidder based upon evaluation
- Negotiate contract with the selected private sector partner
- Clarify desired outcomes and payment mechanism
- Execute contract

- Setting up of ICT infrastructure at Government Healthcare Facilities (DH/PHC/CHC)
- Setting up of Tele-Consultation Infrastructure
- Setting up of Diagnostic Lab at Government Healthcare Facilities
- Providing Manpower

- Linking up of Tele-Consultation Centres at District Hospital with Super Specialty Medical Colleges (NMCN project)
- Providing necessary Technical support from NRC and RRCs of MoHFW
- Training and capacity building by NRC and RRCs

- System operations and maintenance
- Rollout services and systems
- Sustained change, capacity building and communications

9. Outcome /Impact

The envisaged outcomes and the areas of impact from NTN include:

- Improved outreach of the specialist services to the rural part of the country
- Reduction in the service delivery time
- Creation and transmission of Aadhaar linked Electronic Health Record (EHR)
- Timely access to the right clinician resulting in cost reduction
- Creation of database for disease patterns and facilitates appropriate strategies to counter it.

10. Approximate Budget

It is proposed that this project will be supported by MoHFW, GoI under NHM scheme initially for 2 Years and based on the impact analysis, the project shall thereafter be scaled up across the Country covering every Government Health Facility.

Based on the current scope, the approximate budget for every facility in a State would be as follows:

S. No.	Budget Head	CAPEX (In Cr)	OPEX for 2 years (In Cr)	Total Cost per Facility for 2 years
I.	**Tertiary Care Units** (Medical College)	0.075Cr	0.11 Cr	**0.185 Cr**
II.	**Secondary Care Units** (District Hospitals) Facilities	0.10 Cr	0.184 Cr	**0.284 Cr**
III.	**Primary Health Care Units** SDHs/ CHCs/ PHCs	0.075Cr	0.11 Cr	**0.185 Cr**
IV.	**Mobile Telemedicine Unit ***			
a)	New Mobile Unit	0.40 Cr	0.108 Cr	**0.508 Cr**
b)	Upgradation of existing Mobile Unit	0.20 Cr	0.028 Cr	**0.228 Cr**

***Note:** **States/UTs are motivated to upgrade the existing MMUs provided under NHM scheme to provide the Tele-Consultation service also. However, in lack or shortage of existing MMUs, States may propose to create new Mobile Telemedicine Unit as per the indicative details provided above.**

ANNEXURE: I

Proposed Infrastructure at Medical College, District Hospital and SDH/CHC/PHC

S. No.	Item Description	Estimated Value (in Rupees)		
		Medical College	SDH/ CHC/ PHC	District Hospital
(A)	**Equipment Cost**			
1	Telemedicine Equipment for capturing Patient parameters viz. BP, Temperature, SPO_2 , Pulse rate, ECG, stethoscope, blood sugar and interface with IT system	5,00,000	5,00,000	5,00,000
2	IT Hardware/Software including All in one Desktop PC, Web Camera, Mike & Head Phone, Speakers for providing Telemedicine solutions	2,00,000 (1 set)	2,00,000 (1 set)	4,00,000 (2 set)
3	Training costs	50,000	50,000	1,00,000
	Total (A)	**7,50,000**	**7,50,000**	**10,00,000**
(B)	**Annual Recurring Cost for 2 years**			
1	Telemedicine Technician	3,60,000	3,60,000	3,60,000
2	Annual Maintenance Charges Hardware/software	2,00,000	2,00,000	4,00,000
3	Incentives to HRH @ Rs. 1000 x 20 days per month @ Rs. 2,40,000 per year x 2 yrs	4,80,000 (10 consultation /day)	4,80,000 (10 consultation /day)	9,60,000 (20 consultation /day)
4	Terrestrial Connectivity (2mbps- scalable)	60,000	60,000	1,20,000
	Total (B)	**11,00,000**	**11,00,000**	**18,40,000**
	Grand Total (A+B)	**18,50,000**	**18,50,000**	**28,40,000**

B. Mobile Telemedicine Unit (At each District)

S. No.	Item Description	Estimated Value (In Rupees)	
		New Mobile Unit	Up gradation of existing Mobile Unit
(A)	**CAPEX**		
1	Automobile Van with integrated DG set, bed and other provisions	20,00,000	N/A
2	Recommended Medical Equipment	10,00,000	10,00,000
3	Telemedicine Hardware / Software (Including PC etc.)	5,00,000	5,00,000
4	Van Equipment integration, Installation & Commissioning, Training costs	5,00,000	5,00,000
	Total	**40,00,000**	**20,00,000**
(B)	**OPEX for 2 yrs.**		
1	Telemedicine Technician	Existing resource from DH will be utilized	Existing resource will be utilized
2	Contractual Driver with fixed consolidated salary	4,00,000	Existing resource will be utilized
3	Contractual Cleaner	2,00,000	Existing resource will be utilized
4	Fuel and Van maintenance	2,00,000	Existing resource will be utilized
5	Annual Maintenance Charges Hardware/software per node	1,80,000	1,80,000
6	Bandwidth cost per year per node	1,00, 000	1,00, 000
	Total	**10,80,000**	**2,80,000**
	Grand Total	**50,80,000**	**22,80,000**

Note: The requirements defined above is indicative only and States/UTs are encouraged to propose better solution if required.

ANNEXURE: II

S. No	MEDICAL COLLEGE	STATE/UT
A.	**National Resource Centre (NRC)**	
1	SGPGI, Lucknow	Uttar Pradesh
B.	**Regional Resource Centres (RRCs)**	
1	PGI, Chandigarh	Chandigarh
2	JIPMER , Puducherry	Puducherry
3	AIIMS , Delhi	Delhi
4	NEIGRIHMS , Shillong	Meghalaya
5	KEM , Mumbai	Maharashtra
C.	**Medical Colleges in States/UTs**	
1	Indira Gandhi Institute of Medical Sciences (IGIMS), Sheikhpura	Bihar
2	Darbhanga Medical College, DMCH Road, Laheriasaria, Darbhanga	
3	Patliputra Medical College, Dhanbad Po-BCCL Township, Dhanbad	Jharkhand
4	VSS Medical College, Burla,Veer Surrendra Sai Medical College, Burla) , Dist, Sambalpur	Odisha
5	Baba Raghav Das Medical College, Gorakhpur	Uttar Pradesh
6	MLB Medical College, Jhansi National Highway 25,Jhansi	
7	Burdwan Medical College, Burdwan	West Bengal
8	Gauhati Medical College, P.O. Indrapur, District. Kamrup	Assam
9	Jorhat Medical College, Kushal Konwar Path, Barbheta, P.O. Jorhat	
10	Assam Medical College, Borbari, Dibrugarh	
11	Regional Institute of Medical Sciences, Lamphelpat, Imphal	Manipur
12	Agartala Government Medical College, P.O. Kunjaban, Agartala	Tripura
13	Goa Medical College, Bambolin	Goa
14	B.J. Medical College, Asarwa, Ahmedabad	Gujarat
15	Government Medical College, Majura Gate, Surat	

S. No	MEDICAL COLLEGE	STATE/UT
16	Government Medical College, Near Hanuman Nagar, Nashik	Maharashtra
17	Government Medical College, Panchakki Road, Aurangabad	
18	Chattisgarh Institute of Medical Sciences, Sardar Vallabh Bhai Patel Hospital, Bilaspur	Chhattisgarh
19	Netaji Subhash Chandra Bose Medical College, Jabalpur , Nagpur Road, Jabalpur	Madhya Pradesh
20	Mahatma Gandhi Memorial Medical College, Indore Ujjain State Highway, MR10, Crossing Sagar Road, Near Toll Tax Post, Tehsil Sanwer, Indore	
21	Maulana Azad Medical College, Bahadur Shah Zafar Marg	New Delhi
22	Dr. S. N. Medical College, Jodhpur (Raj.), Shastri Nagar, Residency Road, Jodhpur	Rajasthan
23	Rabindra Nath Tagore. Medical College, (RNT Medical College), Udaipur	
24	Government Medical College, Rampur Road , Haldwani	Uttarakhand
25	Dr. Rajender Prasad Govt. Medical College, Tanda	Himachal Pradesh
26	Maharaja Agarsen Institute of Medical Research and Education, Hisar	Haryana
27	Government Medical College, Bakshi Nagar, Jammu	Jammu & Kashmir
28	Guru Govind Singh Medical College, Sadiq Road, Faridkot	Punjab
29	Govt. Medical College and Hospital, Circular Road, Amritsar	
30	Rangaraya Medical College, Kakinada	Andhra Pradesh
31	Guntur Medical College, Kannavari Thota, Guntur	
32	Karnataka Institute of Medical Sciences, P.B. Road ,Karnataka Institute of Medical Sciences, Hubli Dyanagar, Hubli	Karnataka
33	Mandya Instt. of Medical Sciences, Mandya	
34	Govt. Medical College, PO Kozhikode , Calicut	Kerala
35	Thoothukudi Medical College, Thoothukudi	Tamil Nadu