



# BRIDGING THE GAP BETWEEN RURAL– URBAN HEALTH CARE DIVIDE THROUGH TELEMEDICINE

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## Abstract:

Although, there had been substantial improvements in the health care sector, getting access to diagnosis and treatment has remained a great challenge for the rural population. 75% of the populations of India live in villages, while 75% of doctors work in cities, resulting in limited access to basic health care in rural areas. In order to avail even primary health care services, people in villages in these days need to travel long distances which adds to their expenses, besides other complications of convenience and all. Health care, being the fundamental need of people at large, it becomes necessary to ensure that such facilities are available at the door steps, which ought to be, accessible, affordable, and sustainable. In this scenario, the role of Telemedicine, as a cheapest and fastest way to disseminate specialized healthcare to remote regions of the country, assumes significance. This is a viable option to mitigate the gap between supply and demand of health care services. In recent times due to COVID-19 the need of Telemedicine services has become the felt need, due to sudden surge in demand for consultation and assistance. Both the central and state governments have started to rethink their strategy and have tried to speed up in resolving the long pending hurdles in expanding the coverage of Telemedicine networks. The present paper aims to highlight the present state of Telemedicine Network in India and necessary measures to be taken in order to address the ongoing crisis in this sector.

**Keywords:** Telemedicine, Health SAT, Digital Medical Library Network, Rural Health Problems.

## Introduction:

India lives in villages, but a quality health care facility still eludes the local populace. Although health is a state subject as per the federal structure of India, due weightage has not been given by individual states to this particular sector, resulting in the sorry state of affair that continues in the health sector till date. Though of late, it is a welcome step to notice that Govt. of India only in the recent past introduced multiple health related insurance schemes/policies to cover the bulk of the populace, so as to ensure that no section of the society is deprived of quality health care due to financial crunches and which has started showing results. Besides the above, in order to address the problem of accessibility and reach, Govt. of India played a catalyst to popularize Pan India e-Health schemes/facilities, and brought out policies to accommodate private players/ entrepreneurs in this field. The concept of Telemedicine is nothing new and was initiated decades back in 2001. A pilot project of Telemedicine was launched by ISRO, in the same year, linking Chennai's Apollo Hospital with the Apollo Rural Hospital at Aragonda village, in the Chittoor district of Andhra Pradesh. It was launched with the collaborative support of Department of Information

Technology (DIT), Ministry of External Affairs, Ministry of Health and Family Welfare and the state governments of respective states.

The development of Telemedicine services was further augmented by setting up of standardized Telemedicine practice guidelines by the department of Information Technology, Government of India, and setting up of National Telemedicine Taskforce by the Health Ministry of India in 2005. This paved the way for the successful implementation of various other projects. As a result, it could successfully establish Telemedicine services in India that include mammography services at Sri Ganga Ram Hospital, Delhi; Oncology at Regional Cancer Center, Trivandrum; Surgical services at SGPGI Lucknow, School of Telemedicine and Biomedical Informatics and many more, among other potential centres to cater to the bulk of the population.

Technological advances such as burgeoning of fiber optic cables, the expanding bandwidth and licensing of private internet service providers immensely helped the pan India roll out of Telemedicine networks. The roll-out of an exclusive network devised by ISRO, which is capable of connecting 384 hospitals with 60 super-specialty hospitals, as well as to 306 remote/rural/medical colleges across the country through its satellites, has been set up. And as a result, it has enabled thousands of patients in remote places of different states of India gain access to consultations with the experts for diagnosis and treatment.

It is worthwhile to mention that, for Telemedicine to be effective, appropriate tools and devices are essential alongside a trained hand. Appropriate tools allow clinicians in reaching and periodically monitoring patients who have difficulties attending specialist visits, especially for those who are affected by chronic diseases, which require continuous follow up. Two of the major such diseases covered by Telemedicine are cardiovascular disease and diabetes, besides some other chronic complications.

Primarily, Telemedicine services were initiated to provide medical assistance either in rural areas, where access to primary health care is physically difficult, and secondly, it was aimed at improving the chronic disease managements, in cases of emergencies. If we consider the functional areas of convenience, then, Telemedicine has mainly three components: (Manivannan et al. 2011)

- (i) Store and Forward: The initial and most crucial step is to acquire medical data, such as medical image, bio-signals etc, followed by transmitting these data to a doctor or medical specialist for assessment. This also facilitates the clinician to store and forward process on the basis of recorded history of the reports and audio/video information in lieu of physical examination.
- (ii) Remote monitoring: Faster and accurate diagnosis through Radiographic images (Tele-radiology) such as X-rays, MRI, PET/CT is equally challenging as it is required to be sent from one location to another.
- (iii) Interactive services: This is another dimension of Telemedicine, particularly in Tele-psychiatry, which utilizes video conferencing for patients residing in rural areas for psychological counseling. It needs wide range of services to the patients and providers, such as - consultation between the psychiatrists, drug therapy monitoring and patient counseling, diagnosis and assessment, medication therapy management etc. In addition to these, phone conversations, online communication help to provide real-time interaction between the patient and the service provider. Live video allows the provider, patient and specialist to all communicate together to achieve the best outcome for the patient. This “clinician-interactive” Telemedicine services are cost-effective than in-person clinical visits.

Over the years, the onset of either epidemics or pandemic has led to the implementation of novel digital technology strategies, which have also triggered the use of Telemedicine during the diverse state of infection more frequently, such as SARS epidemic in 2003 and later MERS-COV in 2013 and the recent past COVID-19 pandemic as well as the ongoing second wave of it. Over the last years, digital geo-localization tools have played a crucial role, and have substantially contributed in the improvement of these services.

Telemedicine market has witnessed spectacular growth during the last decade mainly because of timely convergence in the areas of Information technology, Communication & Healthcare along with launching of central e-health schemes by the Ministry of Health & Family Welfare.

*“The National Knowledge Commission, a high level advisory body to the Prime Minister of India formed with the objective of transforming India into a knowledge society, has also set up a Working Group for the development of an Indian Health Information Network”. [National Knowledge Commission Overview.pdf (rclis.org)]*

This working group has proposed to design, develop, and integrate an end-to-end electronic health care informatics network in India, to improve public health, health research, and the delivery of health care.

In addition, wireless broadband technology has become more advanced, while the ratio of cell phone and internet use has become nearly universal. Patients are now more conversant and comfortable in handling images and videos, transfer of medical images like X-rays and scans, and real-time audio and video consultations is no more a far cry. Consistent Improvement in internet infrastructure such as bandwidth speeds, information storage databases, web service backups, standard formats for data transmission, digitalization of information and establishment of EMRs (electronic medical records) have made e health and Telemedicine stress-free and cost-effective.

The modern day Telemedicine uses available computing devices of the patient or the physician and inexpensive, self owned equipment like Smartphone cameras, wearable biosensors, etc., for gathering clinical data which is much easier to use without any special training. The recent Telemedicine practices reduce travel expenses, save time, reduce medical costs, and provide easier access for the common man to specialist doctors without disrupting their daily responsibilities. It also makes the life of healthcare providers easy by decreasing the load of missed appointments and cancellations, increasing revenue and patient attendance, as well as improving follow up of health outcomes.

The Ministry of Health in the Government of India has ventured several projects i.e. Integrated Disease Surveillance Project (IDSP), National Cancer Network (ONCONET), National Rural Telemedicine Network, National Medical College Network and the Digital Medical Library Network for easy access of public health data. Some other schemes such as National Telemedicine Task Force formed by the Health Ministry and Telemedicine practice guidelines by the Department of Information Technology, Government of India have streamlined Telemedicine services in India.

*“International projects like the Pan African e-Network Project and the SAARC (South Asian Association for Regional Co operation) Telemedicine Network Projects have also been taken up as an initiative of the External Affairs Ministry, strategically placing Indian Telemedicine in the global scenario. (Chand et al. 2012)*

Telemedicine is one field, which has been successful in invoking a keen interest in the private sector, in making them take an active part in public health management. Some of the prominent private players in the field of Telemedicine in India include - Apollo Telemedicine Enterprises, Narayana Hrudayalaya, Amrita Institute of Medical Sciences, Asia Heart Foundation, Aravind Eye Care, Escorts Heart Institute, OTTET Telemedicine, etc. these private players have set up their own Telemedicine units and are running those successfully with a collaborative support of the Government, both the central and of the concerned state governments. ISRO, too, provides guidance and required the latest technology.

ISRO's Telemedicine network has come a long way in the past few years by spearheading its expansion to connect 45 hospitals in rural areas along with 15 super-specialty hospitals.

*The remote nodes include the islands of Andaman and Nicobar and Lakshadweep, the hilly regions of Jammu and Kashmir, Medical College hospitals in Orissa and some of the rural/district hospitals in other states. (Singh et al. 2020)*

Telemedicine services within the country come under the combined jurisdiction of Ministry of Health and Family Welfare and therefore the Department of Information Technology.



*Telemedicine division of MoHFW, GOI has found out a National Telemedicine Portal for implementing a green field project on e-health by establishing a National Medical College Network (NMCN) for interlinking the Medical Colleges across the country, with the purpose of e-Education and a National Rural Telemedicine Network for e-Healthcare delivery.[cheliyan et al.2019]*

As a constituent of the e-health wing of the National Health Portal (NHP), National Digital Health Authority of India (NDHAI)/National e-health authority (NeHA) has been mooted with a vision of achieving top quality health services for all Indians which would be cost-effective and secure at the same time with the judicious use of ICTs in health and related fields. To address this, MoHFW developed an ideal Electronic Health Records (EHR) in 2013 and a modified version of the same was introduced in 2016. Since, Telemedicine practices in India is additionally extended to the fields of ancient medication, The National Rural AYUSH Telemedicine Network aims to market the good things about ancient ways of healing to the global population through Telemedicine. (Chellaiyan et al. 2019)

AROGYASREE is another web based mobile Telemedicine conglomerate that integrates multiple hospitals, mobile medical specialists and rural mobile units/clinics. The project is an associate initiative of Indian Council of Medical Research (ICMR). They have collaboration with a team of scientists from University of Karlsruhe, Deutschland United Nations agency dedicated and are conducting a research on the look of associate ECG jacket which could be used for the continual watching of a patient's ECG while one is not under hospitalization. (Chellaiyan et al.2019)

The Telemedicine model developed by Orissa Trust of Technical Education and Training (OTTET) with The State Government in a Public Private Partnership (PPP) mode is successfully providing promotive & preventive healthcare facilities, besides specially designed software programming for diseases management and improving health care in rural areas. It is worthwhile to note here that the Telemedicine initiative by OTTET focuses on sustainability plans to involve local youths in e- medicine services, facilitates to set up the e-health nodes and centers at Govt. run PHC, CHCs as well as at sub divisional hospitals. These centers create both direct and indirect employment opportunities while addressing the primary objective of health issues in rural pockets.

Despite various initiatives undertaken by the government and private sectors, several rural pockets are still devoid of getting this facility, which is a matter of concern. This disparity in access to healthcare between urban and rural areas is believed to be bridged if due importance is given to Telemedicine technology, and if all the tools are integrated into the existing mechanism of healthcare delivery, i.e. the establishment of Telemedicine facility in primary health care centers along with network of physicians, laboratories, collaborators expertise, more trained manpower to handle the tools and devices, and above all due awareness.

Service seekers ought to be made aware of the fact that Telemedicine is yet another viable option at their disposal to avail quality health care facility and which is crucial for the diagnostic and other consultation services available in specialty hospitals. Staying within the comforts of their home and without much hassle, one can connect to the doctor's to get best services over phone. This is quite interesting to find that being encouraged by the Govt. initiatives and favorable policies; some of the private sectors have developed their own networks and have set up facilities to provide health care services. However, such initiatives are quite limited and confined to the urban pockets and its peripheral areas. These need to be extended further with regard to coverage and accessibility for the rural masses.

However, the sphere of Telemedicine has witnessed commendable growth during the last couple of years, primarily because of advances in related technologies and their subsequent convergence, promulgation of central e-health schemes, attractive health insurance policies by both public and private players in the field and above all the outbreak of the pandemic COVID-19 that literally exhausted the existing hospital infrastructure to accommodate patients in a massive scale. It did put an unprecedented pressure on the entire health care mechanism to collapse. This in a way did give boost to address the bottlenecks i.e. the slow pace of unfinished Telemedicine projects to complete early.

In response to the COVID-19 pandemic, the Indian government published new guidelines for Telemedicine practice in March 2020 to facilitate access to medical advice, as COVID-19 impeded access to routine healthcare for chronic patients either urban or from remote locations. Later, the Ministry of Health launched e-Sanjeevani OPD a patient-to-

doctor Tele-consultation service in April 2020. It has recently completed more than a million or so Tele-consultations. Many more Telemedicine apps like DocsApp, Practo and mFine etc. have surfaced in the recent past to facilitate and monitor which played the vital role during the Pandemic in managing non-emergency cases as well as chronic medical conditions. It is encouraging to note that there have been manifold rise in the Tele-consultations since March 2020, so also the scope of both diagnostic and e-pharmacies as complementary to Tele-consultations.

Thanks to the increased deployment and development of digital technologies, that during the COVID-19 pandemic, when mandatory social distancing is the law of the land, Telemedicine is the safest interactive system between patients, either infected or uninfected, or the clinicians. Development of appropriate tools allowed clinicians to reach out and periodically monitor individuals who have difficulties attending specialist visits, especially those who are affected by chronic diseases, or require continuous follow up. Two of the major clinical areas covered by Telemedicine are cardiovascular disease and diabetes. New evidences and technological improvements in Telemedicine application in diabetic retinopathy (DR) have shown efficacy and usefulness in screening. Moreover, despite an initial increase for devices and training costs, Tele-ophthalmology demonstrated an honest cost-to-efficacy ratio; although, no national screening program has yet focused on DR prevention and diagnosis.

It is accepted that lack of knowledge during the COVID-19 Pandemic strongly limits the likelihood of management of the disease, yet despite limitations it was one of the best available options before the public to punctuate themselves in fighting the disease on the basics of expert advices from far ends.

### **Conclusion:**

With the advent of emerging modern information and communication technologies (ICTs), health care delivery through Telemedicine has migrated from hospitals and clinics into homes. Although this is a not a substitute to traditional medicine and methods of treatment, people in far-flung areas have availed this mode of medical examination during COVID-19 pandemic. There are certain limitations, i.e. information provided through Telemedicine is inundated by questions of liability, privacy and confidentiality. To avoid that, priority has to be given to the shared information/health data, and in this scenario, adherence to the confidentiality guidelines becomes utmost important. It is therefore important to strengthen the informatics channels as well as penalty provisions or other viable but stringent laws to fix accountability in the event of data theft or leakage. Besides that, a successful Telemedicine program requires secure and high- speed internet connection, which is lacking in rural areas and educating the people on technological applications. Several other factors such as uninterrupted electric supply, patients fear, and unfamiliarity with the applied technologies, diversity in languages, etc. make it difficult to meet the desired objectives. The most important bottleneck on the way of penetration of Telemedicine is the paucity of Medical Practitioners in the rural areas, apart from dearth of Skilled IT professionals needed; in case of system malfunctioning or related technical snags, the challenges are much bigger. Unless that is resolved, communication between the service provider (Doctor) and the service seeker (Patient) can't be hassle-free.

To sum up all those above observation, we can come to conclusion that- In spite of various support system i.e. video conferencing, m-health (mobile health) to execute patient monitoring and treatment through Telemedicine, it is yet to reach its full potential in family medicine practices. Further, Telemedicine can be a support system in medical specialties where external signs are important in identifying the problem, such as dermatology, but this may be unsatisfactory as the diagnosis may go wrong because of poor quality of image. These issues need to be addressed, to make the Telemedicine service more effective. While Telemedicine cannot replace the normal medical consultations and hospital visits for emergency conditions and all those medical procedures, it'll actually scale back the pressure on the health care system during large scale crisis like the current pandemic, particularly, in a thickly settled country like India and other Asian nation with disproportionate health care facilities. Hence, the Govt. ought to initiate awareness campaign on Telemedicine as well as should guarantee credible security around patient's privacy and their health information. Telemedicine, which is only one component of the much diverse digital health plan, will certainly have a crucial role to play in the success of providing health care services to the needy, particularly in the rural areas.

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