

Telemedicine:  
Healthcare at the  
doorsteps of Rural  
India

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## Telemedicine: Healthcare at the doorsteps of Rural India

**Key words:-** Telemedicine, Health care, Rural India Medical Database, Internet, Medical Councelling

*70% of population is still residing in remote areas in India where health facilities are not in good condition. These are several problems delivering health care in these areas. It has inadequate resource supply. Telemedicine immersed one great hope in providing good health services in rural areas. The present research article gives an analysis of role and importance of telemedicine in rural areas.*

Economically, India often seems like two separate countries: village India supported by traditional agriculture, where tens of millions-one fourth of population-live below the poverty line, and urban India, one of the most heavily industrialized areas in the world, with an increasingly middle-class population and a fast-growing economy. Rural Development has always been a problem child for Indian government, but, nevertheless, it can never be left unhandled. The reason is very simple, 70% of population is still residing in the remote corners of India.

Development of a state begins from the development of the rural districts of the state. Often the infrastructure facilities available in the town and other rural areas are not given much importance. These facilities are very helpful for the growth of any state and are left unnoticed by several people. Rural development is concerned with economic growth and social justice, improvement in the living standards of the rural people by providing adequate and quality society services and minimum basic needs. Rural infrastructure contributes more to the economic development of the country.

One of the very crucial element in the infrastructure is adequate health facilities. The majority of India's population live in the villages, and when they fall ill, they experience great hardship in procuring the services of a hospital or doctor. They have to cover long distances to reach a hospital often, after a long and tiresome journey, either walking, or by bullock cart, or in a crowded bus. When they arrive, they are puzzled by the strange, new surroundings, and the number of other patients all crying to be seen and treated for a wide variety of complaints. After they arrive, there is a long list of formalities and procedures before they face the doctor which means endless waiting, and hoping.

Indian health system is plagued by the stereotyped efforts of the government and private players. The results are dismal. Thus, to revitalize the system, we require an out of box thinking. It requires proper analysis of the environment and internal capacities so that whatever steps are taken, it should be compatible with the requirements of the rural population. Apart from all other measures, introduction of ICT in rural

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healthcare is one such weapon that can be used to take the benefit of medical sciences to a large section of people spread out in remote and inaccessible villages. The dawn of communication technology, especially SatCom, has heralded a new era of telemedicine. Starting as a point-to-point system connecting the doctor and the patient alone, it has evolved into multipoint connectivity through servers, linking remote hospitals, rural units and super specialty hospitals in different parts of the country. Local doctors can access latest information about health schemes and seek advice from specialists. Medical databases facilitate better diagnosis. Quality of treatment can be increased by giving access to more qualified doctors through audio-visual aids, interactive websites and video conferencing. So, IT can play a crucial role and be a differentiator between haves and have-nots.

**Problems in delivery of healthcare in rural areas:**

The rural healthcare system of India is seriously affected by inadequate resource supply, thereby leading to underdevelopment of rural infrastructure. That is evident from the fact that investment in healthcare is only 1.2% of the total GDP.

Being a service industry, role of human resource is very important. The opportunities for higher emoluments and career growth in the urban and semi urban areas, due to privatization of health systems, have further aggravated the situation. Now, the doctors are getting more reluctant in joining public hospitals in remote areas. Even if they join, the rate of absenteeism is very high.

In absence of qualified and trained doctors, the main providers of health care in rural areas are unqualified private practitioners, who have either no training or training in alternate system of medicine but prescribe allopathic medicines. Proximity and economy in treatment is the main reason for their predominance. Moreover, their ability to treat general diseases by prescribing broad spectrum antibiotics further reinforces their confidence in the rural people.

The monetary benefits in the public health sector are too low to attract the graduate doctors to the remote rural areas.

As a result, the rural health system is plagued and the rural people are deprived of one of the basic requirement i.e. proper health facilities.

**Telemedicine: A silver lining in the dark cloud**

It is the transfer of medical information via telecommunication technologies for the purpose of consulting or for remote medical procedures or examination. (en.wiktionary.org/wiki/telemedicine). Telemedicine, as defined by the World Health Organization, is the delivery of healthcare services when distance is a critical factor using information and technologies for exchange of relevant information to aid in the diagnosis and treatment of diseases. Telemedicine is proving to be the most powerful system for providing medical facilities in the remote and isolated areas. Because of the issues cited above it became difficult, rather impossible, for a rural person to take the advantage of specialized treatment. With the increasing percolation of Information and Communication Technologies in the rural India, telemedicine is being applied in almost all medical domains and can be used by a person suffering from simple fever to any other complex disease. Thus, Telemedicine can be viewed as simple as two health professionals

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discussing a case over the telephone, or as complex as using satellite technology and video-conferencing equipment to conduct a real-time consultation between medical specialists in two different countries.

#### Telemedicine: Types and Mechanism

Telemedicine can be done on synchronous and asynchronous bases. Synchronous telemedicine, also known as real time medicine, requires the presence of both the parties at the same time and a communication link between them.

Asynchronous telemedicine, also known as store and forward telemedicine, involves acquiring medical data and transmitting it to a medical specialists at a convenient time for offline assessment. It does not require the presence of both the parties at the same time.

Home-health telemedicine allows the remote observation and care of a patient. The equipment consists of vital signs capture and video conferencing capabilities, and alarm can be set from the hospital nurse's station.

#### Telemedicine in India:

ISRO is pioneer in giving birth to telemedicine in India. The launch of satellite SatCom has initiated the process. ISRO is a government organization with the prime objective to develop space technology and its application to various national tasks. As a part of application of space technology for health care and education, under GRAMSAT (rural satellite) programme, ISRO has initiated a number of Telemedicine pilot projects. These projects consist of, linking through Indian National Satellite (INSAT), remote/rural areas like Jammu, Kashmir & Ladkhakh in north near Himalayas, Offshore Islands of Andaman and Lakshadweep, North Eastern States District Hospitals/ Health Centres. With the steady growth of Telemedicine application, it is also envisaged to develop an exclusive "HEALTHSAT" for meeting the health care needs of the country at large. The technology of DVB-RCS is proposed to be adopted for the future Telemedicine Network.

The Apollo group of hospitals was a pioneer in starting a pilot project at a secondary level hospital in a village called Aragonda 16 km from Chitoor (population 5000, Aragonda) in Andhra Pradesh. Starting from simple web cameras and ISDN telephone lines today, the village hospital has a state-of-the-art videoconferencing system and a VSAT (Very Small Aperture Terminal) satellite installed by ISRO (Indian Space Research Organisation).

ISRO has also developed the concept of Village Resource Center (VRC) and implemented it through a partnership with M S Swaminathan Research Foundation (MSSRF). This satellite based project, ISRO-MSSRF-VRC, aims for digital connectivity to remote villages for providing multiple services such as telemedicine, tele-education and remote sensing applications through a single window.

Presently ISRO's Telemedicine Network consists of 245 Hospitals - 205 Remote/Rural/District Hospital/Health Center connected to 40 Super Specialty Hospital located in the major cities with the following highlights.

It is not only ISRO which has been helping Indian government in achieving its objective of "greatest good to greatest number".

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DIT(Department of Information Technology) as a facilitator with the long-term objective of effective utilization / incorporation of Information Technology (IT) in all major sectors, has helped in a big way.

The telemedicine software system has also been developed by the Centre for Development of Advanced Computing, C-DAC which supports Tele-Cardiology, Tele-Radiology and Tele-Pathology etc. Asia Heart Foundation, State governments, NIC( National Informatics Center) are the very few names without whom the long cherished dream that every citizen must have immediate access to the appropriate specialist for medical consultation , have not started materializing.

**FEW SUCCESS STORIES:**

**NeuroDbase:** A unique customised electronic medical record system for Indian Neurologists, Neuropsychiatry Online, a joint effort by the Neurosciences India Group and IIT Madras to provide internet-based counselling to people living in rural areas.

**Pubmedinfo.com:** A unique public portal for health related information was released by Baskara Narayana, Director, Satellite Communication, Indian Space Research Organisation. The occasion was the M.V. Arunachalam Endowment Lecture on Space Technology for Bridging the Health Divide.

**Apollo Hospital:** "Our mission is to bring healthcare of international standards within the reach of every individual. We are committed to the achievement and maintenance of excellence in education, research and healthcare for the benefit of humanity" - Dr. Prathap C. Reddy (Founder and Chairman, Apollo Hospitals Group).

**Aragonda:**

Aragonda is a remote village in the Chittoor district of Andhra Pradesh with minimal healthcare facilities. Registered Medical Practitioners supported the Primary Health Center, catering to the adjoining villages. With the introduction of Apollo Telemedicine, Aragonda became India's first model telemedicine village. Apollo Hospitals set up a 50 bed secondary care center with state of the art equipment Telemedicine Center and other facilities including CT Scan, Ultrasound, X-ray.

The hospital is staffed by qualified and dedicated healthcare professionals and supported by doctors from across the Apollo Hospital Group via telemedicine.

**Government of Gujarat:** Government of Gujarat and Apollo Telemedicine Networking Foundation started Mobile Telemedicine project at various locations in Gujarat. GOG initiated this project keeping in the mind the natural calamities which struck Gujarat and loss of lives mainly due to lack of medical support. The telemedicine facility connects the district hospitals/health centers with super specialty hospitals for providing expert consultation to the under-served population.

Telecom services provider Ericsson and the Apollo Telemedicine Networking Foundation plan a national campaign for introduction of telemedicine services in India. The effort, to be launched later this year, is an expansion of a 2007 pilot project which brought mobile broadband services to 18 villages and 15 towns in rural India, according to Ericsson India President Mats Granryd. The long-range goal is to provide affordable and accessible healthcare to millions of India residents nationwide



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**Sanjeevani:** Three tertiary level hospitals of North India ,namely, All India Institute of Medical Sciences, New Delhi, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow , Post Graduate Institute of Medical Education and Research, Chandigarh are linked together which are specialists in Teleradiology, Telecardiology and Telepathology. The project "Development of Telemedicine Technology" (sponsored by Ministry of Communications and Information Technology, Government of India) was launched in April 1999. One of the two implementing agencies is Centre for Development of Advanced Computing (formerly Centre for Electronics Design and Technology of India) at Mohali. The centre at Mohali has developed an integrated Telemedicine solution ("Sanjeevani")

These are the very few projects to site. Escorts, Narayana Hrudayalaya (NH) Bangalore and Batra are the other popular corporate hospitals and each of them is in one way or the other involved in Telemedicine endeavors. International names like Fortis have also started reaching remote corners of India. Apart from this, the Central Government and State Governments have also started showing interest in this package of technology having high social implications. .

Advantages of application of telemedicine

- Healthcare can be brought to every nook and corner of the country.

- Reduced patient displacement for quality treatment

Decrease in the visits of medical specialists to the patient

It is a cost effective method of health care delivery. The cost of delivery gets reduced by 40%

More efficient and effective use of medical and technological resources

Improved diagnostic and therapeutic quality of care

Create new opportunities for education or training for isolated or rural health practitioners by audio-visual aids and interactive media.

**Problems in Implementation of Telemedicine in India**

1. Lack of health infrastructure and services.

2.Shortage of healthcare personnel with technical background.

3.Improper penetration of internet and communication technologies in rural areas.

4.Lack of training facilities with regard to the application of information and communication technology in medicine. Terms like HIS, RIS, PACS etc are unheard of by the medical/healthcare community.

5.Applications of ICT are not an integral part of the curriculum of medical colleges.

6.Psychological divide: Apart from all the above cited bottlenecks in the implementation of telemedicine, the greatest hindrance is psyche of the rural people. They have blind faith on the expertise of local health practioners. A high degree of skeptics prevail in the minds of rural persons when they resort to telemedicine, a situation where we are not in direct conversation with the doctor.

7.Public hospitals always face cash crunch because of the purpose for which they are created. They lack in the latest technology and infrastructure. The whole process of telemedicine gets hampered because they are the delivery channels for service of telemedicine.

8.No adequate policy initiatives for full-fledged development of

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9.Inadequate legal and administrative framework to incorporate telemedicine service in the national health care systems.

**Conclusion:**

In the words of C. K. Prahalad, "By making computing AFFORDABLE, through innovative BUSINESS models, we can convert the 'digital divide' into a 'DIGITAL DIVIDEND'".

The role of IT in advancing the growth of national economies through improved efficiency and productivity, and expanded market reach is acknowledged now. So, the next step on the road ahead is adequate and strategic attention so that these new opportunities provided by IT are not purely limited and accessible only by the larger corporations within national economies but to the rural buyers as well. The application of IT solutions for the development of rural India opens up a vast range of possibilities. These opportunities lie in enhancing the quality of life of rural people. Providing medical facilities at reasonable cost and at the doorstep is one such step on the road ahead. The prerequisite is equal participation from all the members of society along with the private players. When majority of population residing in remote corners, the productivity of a country can be increased only by making a common man - hale and hearty, because-

"He Who Has Health Has Hope; And He Who Has Hope Has Everything"

**References:**

1. The World Factbook 2001, CIA Publication, Office of Public Affairs.
2. Asia And The Pacific In Figures 2000, Statistics Division, United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)
3. www.hindilyrix.com/quotes/health-quotes.
4. WHO World Health Report 2000 "Health Systems : Improving performance"
- 5.Sanjay P. Sood & J.S. Bhatia, Internet as the backbone for Telemedicine : How far/close are we? Presented at All India Seminar, Challenges ahead with Information Technology, organized by IE & SLIET, Longowal, 19 - 20 January, 2002.
- 6.International Trade in Health Services A Development Perspective, UNCTAD-WHO Joint Publication, Geneva, 1998.
- 7.www.apollohospitals.com
- 8.Telecommunications, Concepts, Development, and Management, Second Edition, pages 280-282, W. John Blyth, Glencoe/McCraw-Hill Company,1990.
- 9.Abhishek Agrawal, 2008, Application of IT in Rural Development, <http://blog.xebia.com/2008/09/01/application-of-it-in-rural-development/>
- 10.Bhatnagar S.C., 2004, "e-Government from vision to implementation- a practical guide with case studies", SAGE Publications Pvt Ltd, New Delhi
- 11.www.erodetownship.com
- 12."Revitalizing rural health care delivery: Can rural health practitioners be the answer?" Kapil Yadav, Prashant Jarhyan, Vivek Gupta, Chandrakant S Pandav, Centre for Community Medicine, All India Institute of Medical Sciences, New Delhi

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- 13."Rural healthcare system in India: the challenges and remedies",  
Revant R Gupta  
14.Hindu Business Line  
15.[www.telemedicine.org](http://www.telemedicine.org)