

TELEMEDICINE AS A SOURCE OF UNIVERSAL HEALTH COVERAGE IN PAKISTAN

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ABSTRACT

The combination of information and communication technologies (ICTs) for sustainable healthcare through telemedicine focuses on both changes in the access of healthcare information services as well as wider dissemination of healthcare related skills and professional expertise of medical community. Many developing countries are deficient in healthcare services and suffer from a shortage of doctors and other healthcare professionals. In Pakistan, the inadequate allocation of doctors/specialists, infrastructures of telecommunications, roads and transport make it more difficult to provide healthcare in remote and rural areas. Where clinics and hospitals exist, they are often ill-equipped. The aim of this paper is to share knowledge about the use of telemedicine solutions in the health sector in order to propose strategies and actions to formulate tactical recommendations for policy makers and advisors as well as researchers. The examples in this paper illustrate that telemedicine has clearly made an impact on healthcare.

Keywords: Information and communication technologies, Telemedicine, Healthcare services, Telemedicine solutions.

1. INTRODUCTION

Telemedicine, literally medicine at a distance, is the delivery of healthcare consultations over long distances using medical data shared with information and communication technology. This field takes account of clinical medicine (diagnosis, treatment, and documentation) and academic medicine (research, education, and training). A few features of telemedicine have been in place since the influx of the telephone and have been effectual in limited and rare situations, typically only limited to aiding the delivery of healthcare in remote locations and in bounded support of education and training. Recent advances in information and communication technology and the potential for global communications elevated telemedicine as a serious force in healthcare. Telemedicine now has the potential to make a difference in the lives of many more people, as it can improve the delivery of healthcare in a country by bringing a wider range of services, such as cardiology, radiology, mental health services and dermatology to communities and individuals in underserved urban and rural areas [1]. Fundamentally, telemedicine

involves the utilization of modern information technology tools, especially two-way interactive audio/video telecommunications, computers, and telemetry, to deliver health services to patients in remote areas, and to facilitate information exchange between primary care physicians and specialists at distance from each other. A telemedicine system is an integrated healthcare network offering ample health services to a defined population through use of telecommunications and computer technology. Depending upon the level of technology employed, telemedicine can decrease professional isolation of the rural primary practitioner in several ways, e.g. two-way interactive video consultation with specialists links the isolated practitioner with the specialist community of a large medical care. This virtual support system and contact with professional colleagues should increase collaboration between the rural or otherwise isolated practitioner. Telemedicine technology also has the potential to link the primary practitioner with online services, providing them opportunity to evaluate the latest medical literature, thereby strengthening links to the professional medical community and improving the quality of healthcare for the rural population [2].

2. DISCUSSION

The improvement of any technology observably does not occur in a vacuum, making perfect forecasts and predictions even more intricate. The social and cultural milieu may alter, limit, or even prevent development of new ideas and technology development as well as the acceptance and/or implementation of both [3]. Telemedicine systems use a variety of strategies to accomplish monitoring, such as technologies which allow patients to upload monitoring data directly to a healthcare system or to enter it into home computer, whereby it can be transferred to a provider. Further utilization of high-bandwidth phone or cable television infrastructure to apply two-way interactive audio, video, and medical diagnostic instrumentation and the close monitoring, offered by these approaches, may allow better healthcare through early detection of problems or more accurate dosages of medications and biologic agents, potentially reducing costs. Today, telemedicine systems are supported by state-of-the-art technologies like video conferencing; high-resolution monitors; high-speed computer networks and switching systems; and telecommunications superhighways, including fiber optics, satellites and cellular telephony [1]. Store-and-forward telemedicine

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system gather medical data, store it, and then forward it to be examined later. This system provides the ability to capture and store digital, still or moving images of patients, as well as audio and text data. Store-and-forward systems eradicate the need to have the patient and the specialist available at the same time therefore it is an asynchronous, non-interactive form of telemedicine. It is usually employed as a clinical consultation (as opposed to an office or hospital visit). Whereas, home-based telemedicine system enables physicians and health providers to monitor physiologic measurements, test result, images, and sounds, usually collected in a patient's residence or a nursing facility. Home-based telemedicine system also improves patient-provider communication for appropriate treatment and medication. There is also cost saving with the store-and-forward system compared to the real-time method, and the savings come from not needing costly video-conferencing equipment or a high-bandwidth line to support it. This is an important issue, especially in developing countries, where the costs of high-bandwidth Internet connections are very high. An advantage of the store-and-forward method in terms of functionality is that the telemedicine kit (as portable kit shown in Figure-1) can be transported to locations that do not need to have Internet connections. This is an important capability to be used in rural areas, because it allows the health practitioners to make virtual visits to patients' homes or to give consultations at a nearby health center and forward the information to a specialist for diagnosis at a later time.



Figure-1: The Portable Telemedicine Kit [Ref. 4]

3. IMPROVING THE FUNCTIONING OF HEALTHCARE SYSTEM

According to WHO, the use of ICT in healthcare is not simply about technology, but a means to reaching a series of desired outcomes, such as [5]:

- a) health workers making better treatment decisions;
- b) hospitals providing higher quality and safer care;
- c) people making informed choices about their own health;
- d) governments becoming more responsive to health needs;
- e) national and local information systems supporting the development of effective, efficient, and equitable health systems;
- f) policymakers and the public becoming more aware of health risks; and
- g) people having better access to the information and knowledge they need for better health.

The developing world has comparatively little experience or success with telemedicine because of the high costs associated with internet connectivity, high-end videoconferencing systems and sophisticated peripheral medical devices. Expensive technologies are simply out of the reach of health organizations in developing countries, which may have more immediate priorities (such as providing nutrition, sanitation and vaccinations to the population). To make things worse, developing countries have very high patient-per-doctor ratios [6].

4. NEED OF TELEMEDICINE IN PAKISTAN

Investigation on the impact of ICTs on healthcare discloses an enormous range of opportunities for significant cost reductions and service enhancements, through what is often broadly referred to as tele-health. The four key areas of tele-health applications are:

- i) Payer applications including management of government funding and delivery programmes, health insurance and the use of e-commerce and electronic communication to coordinate healthcare organizations and activities throughout the system;
- ii) Provider applications including the application of e-health in private for-profit, not-for-profit and public hospitals and clinics, the use of e-commerce and Internet based systems linking and integrating health services;

- iii) Practitioner applications including the adoption of practice management tools, clinical tools and online communication systems, telemedicine and remote diagnostics, the use of clinical decision support systems and evidence based care in diagnosis and treatment; and
- iv) Patient applications including new forms and locations for care delivery, the emergence of the internet and of informed consumers and of new information and health intermediaries, and the use of online pharmacies.

Pakistan has a vast network of healthcare facilities but, coverage, accessibility, cost and quality of health care remain critical issues. The health care system in Pakistan comprises public as well as private health facilities. In the public sector, districts have been given power of developing their own strategies, programs and interventions based on their local needs. About 70% of the population live in rural areas while the percentage of doctors working in rural areas is only about 22% [7]. The estimated human resource available for healthcare in the country included 139,555 doctors, 9,822 dentists and 69,313 nurses. The current population-doctor ratio is 1,183 patients per doctor and 16,914 per dentist. Health care is also provided to the public through vast health infrastructure facilities now consisting of 968 hospitals, 4,813 dispensaries, 5,345 Basic Health Units, 572 Rural Health Centers and 293 TB Centers. However, the health care system as a whole needs to be strengthened further at all levels.

Pakistan is a third world country where people are, by and large, deprived of proper medical facilities especially those living in remote areas. The correlation of Telemedicine can facilitate the patients and educate the healthcare providers for the purpose of improving patient care. In Pakistan, Professor Rashid Jumma, former Director General, Jinnah Hospital, Karachi and former head of the neuro & surgery department, started telemedicine service in June 2005 in Gambat then Jacobabad, Ghotki and Mirpur Khas. In February 2007, the Electronic Government Directorate, Ministry of Information & Technology, Government of Pakistan, took control of the Telemedicine operation in the four districts of Sindh and also started Telemedicine in the eight districts of Punjab on the VAST network. The project of Telemedicine in Sindh is now being carried out by the cooperation of the Ministry of Information Technology, Government of Pakistan and Engro Chemical, Pakistan [8].

5. CONCLUSIONS

There are still significant gaps in the facts between where telemedicine is used and where its use is supported by high-quality evidence. Further indigenous and targeted research that provides high-quality data will provide a strong contribution to understanding how best to deploy technological resources in health system of Pakistan. The detection of a number of critical requirements for the successful implementation of ICTs projects and programmes in the health sector of Pakistan includes [9]:

- a) Purpose, strategies, and scope of services to be provided;
- b) Audience, customers, and users (targeted populations);
- c) Value of health and healthcare to the individual and community;
- d) Current ways to assess individual and collective health problems (community health);
- e) Needs of the individual, community, and nation;
- f) Institutional user needs and commitments; and
- g) Competencies of the organization implementing or hosting the ICTs system.

In remote rural areas, where there are comparatively few doctors, telemedicine can improve access to healthcare through reducing the need for patients or doctors to travel. Pakistan is in an inimitable situation for building its Telemedicine infrastructure with its highly qualified medical practitioners and an emerging technological industry, the country has the opportunity to create a multitude of products and services to furnish this evolving area. Telemedicine has a potential to benefit the Pakistani healthcare system in terms of preventive care and disease treatment.

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