



INTERNATIONAL TELECOMMUNICATION UNION TELECOMMUNICATION DEVELOPMENT BUREAU

**WORLD TELECOMMUNICATION DEVELOPMENT
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PLENARY MEETING

Director, Telecommunication Development Bureau

ACTIVITIES IN THE FIELD OF TELEMEDICINE

Introduction

Developing countries face various problems in the provision of medical service and health-care, including funds, expertise, resources, shortage of doctors and other health-care professionals. Roads and transportation are inadequate and make it difficult to provide health-care in remote and rural areas; problems in properly transporting patients are often encountered.

For countries with limited medical expertise and resources, telecommunications can provide a solution to some of these problems. They enable medical expertise to be accessed by under-served locations using telecommunications. The widespread use of telemedicine services could allow universal health access. Telemedicine offers solutions for emergency medical assistance, long-distance consultation, administration and logistics, supervision and quality assurance, and education and training for health-care professionals and providers. Telemedicine can help counter tropical diseases and meet the particular requirements of various medical specialities.

In the developed countries, there has been an explosively growing interest in telemedicine and telehealth as a means to ease the pressure of health-care on national budgets. It may well be that some - certainly not all - of the technologies and experiences of the developed countries could be of help to developing countries in their desire to provide, especially, primary health-care. Telemedicine and telehealth should also be of interest to telecom operators since they generate additional traffic over existing networks and offer the opportunity to extend limited networks. The telecom and health "industries" can achieve synergies.

Decisions of the WTDC-94, AF-RTDC-96 and AR-RTDC-96

The World Telecommunication Development Conference, which was convened by the BDT/ITU in Buenos Aires in March 1994, recommended that the BDT study the potential of telemedicine to meet some of the needs of developing countries. In particular, the conference approved a Question (number 6) on telemedicine which was assigned to Study Group 2 of the ITU Development Sector, as well as Recommendation No. 1 on Application of Telecommunications to Health and Other Social Services. It is apparent from the work of the Rapporteurs' Group that telemedicine has considerable potential for developing countries. It also clear that there is limited telemedicine

experience in developing countries so far and that useful models are needed. Telemedicine needs to be implemented carefully and managed well. The impact of telemedicine on health-care structures can be significant. In this respect, telemedicine can be seen as a tool to reorganize or to build up new health-care structures. It also raises concerns about liability, confidentiality, competition and other policy and regulatory issues.

The African Regional Telecommunication Development Conference (May 1996) considered the presentation from ITU-D Study Group 2, Question 6/2 on *Telemedicine and Developing Countries*. The Conference approved Resolution 7: *Telemedicine in Africa*. The Regional Telecommunication Development Conference for the Arab States (November 1996) approved Recommendation COM2/A: *Telemedicine in the Arab Countries*. The Conferences requested the Director of the BDT to organize at least two large-scale trials of telemedicine, which would serve as "test beds" and models for a successful implementation of telemedicine. The Conferences demanded also that telemedicine services and delivery should be affordable, practical, profitable, self-sustaining and available to as many people in need as possible.

ITU and WHO

In 1995, the Secretary-General of ITU and the Director-General of WHO signed a Memorandum of Understanding (MoU) defining arrangements for cooperation in the field of telemedicine. Under the terms of the MoU, the two organizations will help to introduce "dedicated communication and informatics technologies to facilitate the provision of health and medical services" in a bid to improve the quality of life of people living in rural and remote areas, people whose basic needs are far from being met. For this purpose, special working relations were established between the Secretariats of the two organizations. The practical cooperation between ITU and WHO commenced within the International Programme on the Health Effects of the Chernobyl Accident (IPHECA) as regards health, telecommunications and informatics.

Recently WHO convened an international consultation at their Headquarters in Geneva (11-16 December 1997) on telemedicine in relation to the development of the Health-for-All policy for the twenty-first century. The consultation submitted a report which outlines the strategic elements of the proposed policy as a "window of opportunity" with particular attention to the needs and capacities of developing countries. The elements include awareness and promotion, capacity-building, standards, regulation, quality of services, cost-benefit analysis, partnerships, financing and evaluation. Dr. H. Nakajima, Director-General of WHO, said, "WHO fully realizes that the rapid development of modern telecommunication technologies presents countries with a unique opportunity to improve the health of their populations".

BDT activities

In conjunction with the work being done in the context of Question 6/2 of ITU-D Study Group 2, the BDT has started the implementation of several small telemedicine projects and associated activities like expert missions, training seminars and specific studies in selected developing countries. All these activities are complementary to each other, and together they can be considered as the BDT Telemedicine Programme. Most of the pilot projects are based on requests from the countries themselves and the results of BDT's identification missions by telemedicine experts to the following countries: Bhutan, Cameroon, Mozambique, Tanzania, Thailand, Uganda, Viet Nam, Ukraine and Uzbekistan. The telemedicine expert, together with representatives of the Ministry of Health and other health-care staff in each country, identified their needs and priorities in the

introduction of telemedicine services taking into account the state-of-the-art of their telecommunication network and its evolution. The telecom operator is probably the right actor to play a leading role in stimulating and promoting the effective realization of the project.

Objectives

The telemedicine pilot projects and associated activities should be undertaken with the following objectives:

- 1) Demonstrate the potential, the benefits and the different approaches to introducing telemedicine services and - most important - to show what is feasible using the existing networks in developing countries.
- 2) Provide training in the field of telemedicine by conducting regional seminars/workshops in cooperation with regional WHO organizations and the Ministries of Communications and Health of the countries invited.
- 3) Act as a catalyst to establish telemedicine collaboration groups or alliances in different regions of the world, working closely with the Rapporteurs' Group on Question 6/2 of ITU-D Study Group 2. Example: The Midjan Group was set up to promote telemedicine in developing countries.
- 4) Foster the adoption of global standards required for systems and equipment in order to facilitate telemedicine and other related social services.

Expected results

Implementation of these objectives is expected to achieve the following results:

- The pilot projects will provide some practical experience for developing countries with regard to how to implement telemedicine services, with a particular emphasis on remote and rural areas.
- The pilot projects will bring together the different players who need to collaborate to ensure the successful implementation of telemedicine services. These include the telecom operator and/or local service provider, local medical services or other health-care professionals, equipment suppliers, as well as international collaborators such as satellite operators, telemedicine institutes, etc.
- The pilot projects will provide an opportunity to stimulate collaboration between developed and developing countries, and to provide a potential market for telemedicine industries in developed countries, while at the same time building up expertise in the developing countries. Successful implementation of telemedicine requires a win-win situation.
- The pilot projects will help identify any of the pitfalls and possible solutions and different approaches in different regions of the world. The way in which telemedicine services are implemented in different countries and regions may elicit a number of lessons which can benefit other countries and regions.
- Regional seminars and workshops are very important elements for success. Training will help to start the implementation of telemedicine services; it will also help to establish good working relations with doctors and health-care providers.

- BDT's catalytic role in the formation of telemedicine collaboration groups around the world would help ensure that alliances of players from different sectors (government, industry, telecommunications, health-care, public, private) are formed which are necessary for the provision of telemedicine services.

Partnership for implementation

A successful implementation of the pilot projects and associated activities requires good cooperation and coordination with the many different partners and organizations. The BDT budget and the Telecom Surplus revenue are mainly used to initiate the activities and to attract other potential players. No cash contributions can be expected from the beneficiaries, but their interest in the subject as well as local support could help to encourage those who have the resources to make these available. We trust that PTT Administrations and local operators in the countries concerned will help with the implementation of the projects by taking into account the very important social aspects of the projects, and provide some equipment locally available as well as manpower for installation and operation. The main contribution is, however, expected from members of the ITU Development Sector and any other potential partners. The BDT is also trying to organize, in partnership with other organizations, the presentation of different telemedicine projects for developing countries to be funded by the European Commission, the World Bank and others. The potential benefits to the partners in the project are considerable and include:

- 1) An opportunity to participate in the development of cost-effective telemedicine services.
- 2) An opportunity to provide and test the suitability of products and services for a new telemedicine environment.
- 3) Participation in the development of standards for systems and equipment for delivery of telemedicine services.
- 4) Association with a highly visible and worthwhile cause.

The success of a telemedicine initiative depends on the commitment of the participants and their ability to work together. In Annex 1 to this document the information about telemedicine activities is presented, including projects and missions which have already been implemented and those which will be implemented in 1998. The experience gained from the implementation of small pilot projects will allow in 1999-2000 to propose some other projects as in Annex 2.

World Telemedicine Symposium for developing countries

So far, virtually none of the telemedicine conferences and symposiums has focused on the needs of developing countries. The first World Telemedicine Symposium in Portugal (30 June - 4 July 1997) provided the first major opportunity to focus on developing countries, as well as a venue for the exchange of experiences, results, plans, views etc. It was organized by the Telecommunication Development Bureau (BDT) of the International Telecommunication Union (ITU), and was hosted by the Portuguese Telecommunications Administration through the Instituto das Comunicações de Portugal. The Symposium was attended by 178 delegates from 51 different countries and four organizations. The health sector was represented by 98 delegates from 35 different countries and one organization, and from the telecommunication sector 61 delegates participated from 30 different countries. Other sectors were represented by 19 participants from 6 countries and three organizations.

The output from this Symposium has provided important data for developing countries that are planning telemedicine services. This Symposium was supported by the European Commission to facilitate the attendance of representatives from developing countries. And also by Inmarsat,

Portugal Telecom, SatelLife, Welch Allyn and The Midjan Group. It was the first major event to bring together health-care and telecommunication experts to discuss telemedicine applications. The Symposium explored the rationale for developing telemedicine services in developing countries and the needs and constraints of developing countries in this domain. The Symposium discussed, *inter alia*, the various applications of telemedicine, experiences of other countries, policy issues, funding mechanisms, and strategies for bringing the health-care and telecommunication community together. The Symposium included WHO representation.

Conclusion

The main purpose of the Telemedicine Programme is to demonstrate several different telemedicine services in different developing countries, and to collect information on the usefulness, feasibility (taking into account the present status of existing telecommunication networks), appropriateness, costs and acceptability of telemedicine services and consultations for improving access to health services in urban and particularly in rural areas.

The pilot projects will be a good basis for the practical recommendation on how to benefit from the introduction of telemedicine services in developing countries. They will show everybody that telecommunication is also a very important tool in improving both the quality of and access to health-care regardless of geography, and - in particular - in areas where medical structures are inadequate or non-existing. It is hoped that the collective experience of these pilot projects will also provide information that will guide the introduction of telemedicine services by other countries, and help build realistic expectations of how telemedicine will affect health-care services in developing countries.

The main goal is to prepare a model of self-sustaining telemedicine communication systems that would operate without further outside financial support. The utilization of telemedicine networks for clinical application may not be sufficient to sustain a system. Therefore, it is very important to study and develop non-clinical uses of systems or networks. However, this task could only be done by the telecommunication partners of these telemedicine projects, and it will be a key factor for the future extension of telemedicine services.

Annexes: 2

ANNEX 1

TELEMEDICINE MISSIONS AND PROJECTS IMPLEMENTED OR UNDER IMPLEMENTATION

Country	Title	Date	Partners
Uganda	Telemedicine mission	1996	
Cameroon	Telemedicine mission	1996	
Mozambique	Telemedicine mission	1996	
Tanzania	Telemedicine mission	1996	
Uzbekistan	Telemedicine mission	1996	
Bhutan	Telemedicine mission	1996	
Viet Nam	Telemedicine mission	1996	
Thailand	Telemedicine mission	1996	
Ukraine	Telemedicine mission	1997	BASIC Association, Japan
Portugal	First World Telemedicine Symposium for Developing Countries	Jul 97	<ul style="list-style-type: none"> • European Commission (DG XIII) • Inmarsat • SatelLife, USA • The Midjan Group • Welch Allyn, USA • Portugal Telecom
Ukraine	Introduction of a PBX-based mobile personal handy-phone system in the Ukrainian National Emergency and Trauma Centre in Kiev	Oct 97	<ul style="list-style-type: none"> • Ukrainian Telecom • BASIC Association • NTT DoCoMo • Ukrainian National Emergency and Trauma Centre/Ministry of Health
Mongolia	Telemedicine mission	Jan 98	Asia Pacific Telecommunity, Thailand covered all expenses

Country	Title	Date	Partners
Mozambique	Teleradiology link between hospitals in Maputo and Beira	Jan 98	<ul style="list-style-type: none"> • Telecomunicaciones de Moçambique • Ministry of Health • WDS Technologies S.A., Switzerland
Mozambique	Regional workshop on telemedicine for English-speaking African countries	Jan 98	Alcatel
Malta	Telemedicine link between hospitals in Malta and Gozo	Mar 98	<ul style="list-style-type: none"> • Maltacom • Health Division, Government of Malta • Telia, Sweden • Malta Information Technology and Training Services Ltd
Ukraine	Mobile telemedicine services for victims of the Chernobyl nuclear accident	Mar 98	<ul style="list-style-type: none"> • BASIC Association, Japan • Ukrainian Telecom • Inmarsat • Ukrspace/National Space Agency of Ukraine • Ukrainian State Centre of Radio Frequencies • Ministry of Health/Hospital N2 in Kiev
Myanmar	Medical Information System for the Yangon General Hospital	Apr 98	<ul style="list-style-type: none"> • Yangon General Hospital, Bhutan • Ministry of Health • Ministry of P&T • BASIC Association, Japan • NEC, Japan • NTTI, Japan • Coronet, Japan
Kyrgystan	Telemedicine identification mission	Apr 98	
Russia	Workshop on telemedicine for the Russian Federation	May 98	

Country	Title	Date	Partners
Bhutan	Telemedicine link between Central Hospital in Thimphu and a small rural hospital	Jul 98	<ul style="list-style-type: none"> • Division of Health Services/Ministry of Health and Education • Ministry of Communications • Abe Sekkei Inc., Japan
Belarus	Satellite telemedicine link between hospital for children in Gomel region (Belarus) and Nagasaki University School of Medicine (Japan)	Sep 98	<ul style="list-style-type: none"> • Ministry of Health • Ministry of P&T • NTT, Japan • Sagakawa Memorial Health Foundation, Japan • Nagasaki University School of Medicine, Japan
Cambodia	Telemedicine identification mission	Sep 98	
Kenya	Telemedicine information network between private hospitals/clinics in Nairobi	Oct 98	<ul style="list-style-type: none"> • Ministry of Health • Kenya P&T Corp.
Argentina	Workshop on telemedicine for Latin America	Oct 98	
Ethiopia	Teleradiology and medical consultations in Tigray region	Nov 98	<ul style="list-style-type: none"> • Ethiopia Telecom • Ministry of Health • Bilton, Czech Republic • Inmarsat • The Midjan Group
Georgia	Telepathology link for second opinion Transtelephonic ECG	Nov 98	<ul style="list-style-type: none"> • Telecom Georgia • Ministry of Health • A.P.G. Medical Communication, Switzerland • Aerotel Ltd., Israel • Digit Image S.A., Switzerland
Cameroon	Remote monitoring of health conditions of pregnant women	Dec 98	<ul style="list-style-type: none"> • Digit Image S.A., Switzerland • The Midjan Group

TELEMEDICINE PROJECTS UNDER PREPARATION

Country	Title	Date	Partners
China	Construction and evaluation of telemedicine network in rural provinces in South and West China (Tibet, Yunan, Hainan and Jiangxi)	1999	<ul style="list-style-type: none"> • Shanghai Medical University • Inmarsat • Alcatel • WHO • Ministry of Health
Russia	Information platform for new telecommunication services, including telemedicine, in St. Petersburg	1999	<ul style="list-style-type: none"> • Siemens • Health Department of St. Petersburg • Telecommunication College
Burkina Faso	Telecommunication network for epidemiology	1999	
Senegal	Telemedicine link for consultation between three hospitals in Dakar, with an extension to rural areas	1999	<ul style="list-style-type: none"> • SONATEL • Ministry of Health • France Telecom • Institut Pasteur, France • Réseau national de santé publique, France • Université Claude-Bernard, France • IUSI • Ecole vétérinaire Fondation Marcel-Mérieux • The Midjan Group
Uganda	Telemedicine network between five hospitals in Kampala	1999	<ul style="list-style-type: none"> • Uganda P&T Corp. • Ministry of Health • Makerere University • The Midjan Group
Tanzania	Telepathology link between Muhimbibi Medical Centre in Dar-es-Salaam and KCMC hospital in Kilimanjaro	1999	<ul style="list-style-type: none"> • Tanzania Telecommunication Co. Ltd. • Ministry of Health

Country	Title	Date	Partners
Lebanon	Medical information network in Beirut	1999	<ul style="list-style-type: none">• Ministry of P&T• Ministry of Health
Yemen	Teleradiology link between two hospitals in Sa'ana	1999	<ul style="list-style-type: none">• Yemen Telecommunication Corp.• Ministry of Health
Zambia	Telehealth network based on Intranet	1999	<ul style="list-style-type: none">• Zambia Telecommunication Co. Ltd.• University of Zambia• Ministry of Health
Russian Fed., Ukraine, Belarus	Health-care patrol and remote diagnosis of population (mostly children in rural areas contaminated by the Chernobyl nuclear disaster) using a mobile radio system, include. satellite communication systems	1999	<ul style="list-style-type: none">• This regional project will be presented by the Governments of the countries involved to the InfoDev programme of the World Bank
