Implementing Scalability and Sustainability in the the Brazilian Telemedicine University Network RUTE

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ABSTRACT
The Brazilian Telehealth initiative enables videoconferencing, diagnosis and formative second opinion, continuous and permanent education and web conferencing, by linking university and teaching hospitals via RNP (Rede Nacional de Ensino e Pesquisa), Brazil’s national research and education R&E network. It operates two significant national projects: The Telemedicine University Network, RUTE (Rede Universitária de Telemedicina www.rute.rnp.br) and the National Telehealth Primary Care Program, Brazil Telehealth (www.telessaudebrasil.org.br), respectively from the Science and Technology Ministry MCT and Health Ministry MS. The federative state enable municipal, state, national and international health institutions coordinate collaborative projects in research, innovation, development, management, education and assistance. Academia consortia and government entrepreneurial incentives stimulate market procedures and innovative products, services and processes. Large, difficult access remote underserved regions demand specialized eHealth procedures.

INTRODUCTION
RUTE’s main objectives are:
• Connect the University and Teaching Hospitals to Brazil’s national research and education R&E network through a 1Gbps City Fast Ring for R&E Institutions
• Formally create a Telemedicine Nucleus/Centers in each Hospital
• Homologate a Videoconference Room
• Create initial infra-structure for Teleconsult and Telediagnosis
• Train Personnel for Video- and Webconference
• Create and stimulate participation in SIGs – Special Interest Groups
• Enable continuous evaluation and auditing at the Centers and SIGs
• Stimulate government national geographical distributed eHealth incentives for entrepreneurial and academia innovation consortia

RUTE’s first phase, started January 2006, with resources available for 19 University Hospitals[1]. Second phase [2] started January 2007 with 38 Federal University Hospitals in all federal states and 26 health institutions according to an agreement between RUTE/RNP and Telehealth Brazil. Third phase, started May 2009 with 75 institutions, all public certified teaching hospitals, federal health institutions and the federal indigenous health department.

In 2007 the Ministry of Health integrates the Program Telehealth Brazil, implanting initially in 9 states remote Primary Care Program with the University Hospitals attending 100 Municipalities in each state, yielding at the moment 900 operational.

RUTE OPERATIONAL METHODOLOGY
The following procedures are implemented for setting the structure of the Telemedicine University Network operational methodology:
• Establishment of the organizational and technological infrastructure: national coordination, advisory committee made up of telemedicine experts of the country’s best teaching and research institutions, interest groups on specific health areas and also executive, maintenance, communication and operational teams of the national and local telemedicine and telehealth network;
• The Advisory Committee (CA-RUTE) recommends the procedures for the innovative use of the Telemedicine University Network;
• Each member institution establishes the telemedicine and telehealth Nucleus/Center with a physical area and a dedicated team;
• Member institutions establish SIGs to promote and develop collaboration activities on telemedicine and telehealth specific topics;
• Organize workshops to encourage everyone’s understanding of the collaboration work for the national integration on teaching, research and the improvement of health care service for the population[3].
• Enable evaluation and auditing at the Telehealth Centers and SIGs, by applying Indicators, such as: institutional compromise, functional competence, scientific competence, economic and financial accomplishment, innovation capacity, social benefit accomplishment, motivational accomplishment.
• Stimulate collaboration between the Telehealth Centers and entrepreneurs.
• Stimulate collaboration between the Telehealth Centers, private health care service and teaching units.

**NETWORK PARTIAL RESULTS**

RUTE member projects integrate at the moment 158 health institutions. It connects today 37eHealth Centers and 31 embryo-Centers fully operational.

RUTE performs daily routine VC or Webconference sessions, each specialty at least once a month, on pediatrics radiology, oncology, urology, children and adolescent health, dermatology, cardiology, ophthalmology, etc. There are 30 SIGs operational and at least 12 more in 2010. A total of ca. 250 sessions were held in SIGs in 2009 (Fig.1).

Fig.1: A NOTES transvaginal colecistectomy surgery performed and transmitted at ISCMPA by Prof.Dr.Luiz Alberto de Carli on Sept 30th 2008

There has been a 137% increase in the participation of institutions in the groups in 2009, from 89 to 211 institutions, including invited institutions. In some groups up to 400 people participated from remote areas in specific sessions on intensive nursing.

Telehealth Brazil shows already results implemented in 9 states, 9 RUTE Nuclei, assisting 2700 teams of the Health Family Program PSF in 900 municipalities, covering 11.000.000 inhabitants.

In addition, as it happens with the added value of the program Tele Minas Saúde (Minas Telehealth Fig.1) financed by the State Government Health Department and coordinated by Prof.Dr.Beatriz Alkmin, ECG formative second opinion is guaranteed for each of the 600 municipalities, on duty service 12 hours, 7 days per week shared with the following National University Hospitals: UFMG, UFU, UFTM, UFJF and Unimontes, yielding more than 900 consults and formative second opinion per day.

**INTERNATIONAL COLLABORATION**

The encouragement for the continuous development in this area comes from the following mechanisms:

• Cooperation signed between Internet2 and RNP in Health Sciences;
• Program for Innovative Continuing Medical Education in Dermatology, with the American Academy of Dermatology and the University of Miami;
• Laboratory of Excellence and Innovation in Telehealth – Latin America and Europe, in Belo Horizonte[3];
• Establishment of a SICOT Tele-Education Center on orthopedics and trauma in Rio;
• Regional Protocols for Public Policies on Telehealth in Latin America, an IADB project, started October 2009. The Health Ministries from the following countries signed the letter of compromise: Brazil, Colombia, Ecuador, El Salvador, Mexico, Uruguay, RNP and RedClara[4].

**CONCLUSION**

The main reasons for the continuity and success of the network in Brazil are: federal initiative and coordination, state initiatives, entrepreneurial incentives, entrepreneurial and academia consortia development and innovation, integration and synchronization between the three main complementary projects and members: RUTE (Ministry of Science and Technology), Telehealth Brazil and UNASUS Open University of the National Health System (Ministry of Health).

**REFERENCES**

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