Telehealth in Latin America and Brazil: Current Status and Perspectives

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Topics

• Quick views of LA and Brazil
• Historical evolution of telehealth
• Recent developments
• Telehealth particularities in Latin America
• Research & development
• Technical and scientific events
• Examples of ongoing projects
• The future of telehealth in Latin America
Why Telemedicine in LA

• Several countries with continental dimensions, large distances and difficult access to many communities

• Large areas with low populational density and poor human development

• Extreme inequalities of distribution of health care resources
A Quick View of Latin America

- 33 countries
- 8.6% of world population and 4% of land area
- 520 million inhabitants
- 20 million km²
- 98% Spanish and Portuguese speaking
- Large regional disparities in human development
- Low priority for health and education development
A Quick View of Brazil

- Fifth largest country and 10th largest economy in the world
- 8.5 million km²
- 187 million inhabitants
- Most advanced economy, health care, digital and telecommunications sectors in Latin America
- 20 million Internet users
Distribution of Physicians in Brazil

- Total of 290,000 physicians
- Área of 200 km near Greater São Paulo: 85,000 physicians
- State of São Paulo: 100,000 physicians
- 20 largest cities: 82.5% of physicians
- 150 largest cities: 89% of physicians
- Cities with 100 physicians or more: 260
- 11% physicians dispersed in 3050 cidades
Distribution of Physicians

• Amazonas: 2,300 physicians in the state, but 2050 in the city of Manaus!
• More than 1,200 counties have no resident physician
• 112 medical schools (the majority is located in capital cities), 9,000 new physicians graduate each year, but only 25% have access to medical residence.
Evolution of Telemedicine

- Final 50’s
  - First Tests

- Meio 70’s
  - Increase in Applications
  - Failure Intermission

- Início 90’s
  - Rebirth
  - Self sustained projects

Latin America
Status of Development

• More developed: Mexico, Brazil, Argentina, Costa Rica, Cuba
• Intermediate: Colombia, Venezuela, Chile, Uruguay
• Less developed: most of Central America, Caribbean, Guyanas, Paraguay, Bolivia, Peru, Ecuador
Historical Antecedents

- 1983-1992: Development of Brazilian packet switching network, text messaging services and file transfer (RENPAC, BITNET)
- 1985: First telemedicine projects
  - Store & Forward at 1.2 kbps via PSN
Recent Developments

• 1993-1996: Consolidation and expansion of digital infrastructure: Research Network, commercial Internet, ISDN, dedicated fiber optical networks, high performance computing and networking, satellite-based communications

• 1997: Privatization of telecommunications industry

• 1998-2000: First hospital-based telemedicine projects

• 2002-2004: First government-sponsored planning and projects
Telecommunications in Brazil

- 25 million fixed telephone lines
- 52 million mobile phone lines
- 32 broadcasting and telecommunication satellites, including 3 Brazilian-owned
- 4.5 million km fiber backbones
- 89% cities have wired communications, but only 10% with broadband
- All current technologies implemented
- Strong research, development and innovation
Applications Funding in Brazil

- **FUST**: Universalization of Telecommunications Tax Fund: a 1% tax levied on all telecom bills. US$ 30 million per month, US$ 900 million assets.
- To be applied in health, education, digital libraries, satellite-based access in remote communities, handicapped people, social assistance projects, e-government.
- **FUNTTEL**: Technological Development of Telecommunications Tax Fund: 0.5% levied on all telecom bills.
Academic Internet 2 in Brazil
Most Common Applications

**USA**
- Radiology
- Cardiology
- Dermatology
- Psychiatry
- Home care
- Emergency Medicine
- Pathology

**Brazil**
- Cardiology
- Radiology
- Clinical Psychology
- Pathology
Telemonitoring: Electrocardiogram

Portable monitor

Stethoscope

Call center
Current status in Latin America

• Great potential for expansion and universal adoption
• Still in the beginning: very few projects, most are pilot or showcasing
• Recent significant growth, both in the private and public sectors
• Still no model for financing and payment of telehealth services
• Countries in the region differ widely from one another
• Insufficient development of telemedicine as a separate technical specialty or discipline
Telemedicine as a Discipline

- Appearance of R&D and training centres
- Building of a specialized community (first associations, conferences, publications, sites, lists)
- Institutional support, first large scale projects
- International cooperation projects
- Training programmes for specialists
- Appearance of first specialized companies in the market
- Market development
Institutional Support

- Ethical and professional regulamentation of telemedicine and electronic patient record by the Federal Council of Medicine, 2002
- Technical Chambers for telemedicine and distance education in the Federal Council of Medicine
- Creation of the Health Information and Informatics Area in the Ministry of Health, 2002
Technical and Scientific Meetings

- Brazilian Congress of Biomedical Engineering, since 1978
- Brazilian Congress of Health Informatics, since 1986
- TELMED: International Conference on Telemedicine and Distance Education, since 1999
Interesting Ongoing Projects

- Telemedicine for the Family Health Programme
- Amazon Telehealth Project (SIVAM)
- Pediatric Oncology Network
- Telecardiology
- International Medical Second Opinion
- Teleautopsy Teaching Programme
- The Edumed.net Consortium
AMAZON

TELEHEALTH PROGRAM

Programa de Telesaúde da Amazônia

http://www.edumed.net/amazon
The Edumed.Net Consortium

- Satellite and videoconferencing national network for distance education in health and telehealth
- Consortium of 27 universities, research centres and medical associations for generating certified quality content and services
- Started on June 2000, led by the Edumed Institute, a not-for-profit institution
- Targets the non-academic health sector (hospitals, government, etc.)
National Network for Distance Education and Telehealth

EDUMED.NET

University

Satélite digital
Internet
Videoconferência

Hospitals

Associations

Health Centres
Technologies

• WWW
• Tele e videoconferencing
• On demand audio and video
• Digital satellite TV
• Digital libraries
Ongoing Edumed Projects

• MIDAS and EduVirt Projects
  – Wireless municipal Intranet for education and health
  – Pilot project at Sobral, Northeast

• Amazon Telehealth Programme
  – Rural Health Internship
  – Aboriginal Telehealth

• Digital Multimedia Library (EdumedSAT)

• Distance Continued Education in Health Sciences

• Pediatric Oncology and Telecardiology Projects

• CHUM-Edumed Case Teleconferences
MIDAS and EduVirt

Targets villages and counties with less than 50,000 thousand inhabitants (90% of the 5,560 Brazilian counties)

- Universal access to Internet
- Decreasing the digital divide
- Public e-libraries
- Telehealth
- Distance education
- Satellite broadband connectivity
- Wireless distribution
DVB-RCS Satellite Connection

TV

Internet
Bidirectional Satellite

Internet

IRD

Bidirectional Satellite Content Generation

Remote Rooms

HUB

TV

VCR

Internet

IRD

Modem

360E switch

Streaming Video

MPEG-2

Streaming Video

MPEG-2

IP
Wireless Broadband Network

- Access to Internet
- Access: Point
- Subscriber Modules

- Up to 1200 SM per AP
- Up to 15 km coverage
- 3,6 Mbps bandwidth
Acesso a Internet via Telemar
Portable Telehealth

- Biosignal telemonitoring devices (ECG, spirometry, stethoscope, etc.)
- Glucometer, thermometer, pulse oxymeter
- PDA
- Teleconference software
- Internet-enabled mobile or satellite phone
- Wireless network enabled
- Satellite VSAT modem

*Simulated product*
Funções do Sistema

• Monitoração e transmissão de sinais vitais
  – ECG, temperatura, pulso, pressão sanguínea, glicemia, sons cardíacos e pulmonares, pCO2, pO2, fluxo e volumes respiratórios, etc.
    • Via modulação sonora ou comunicação de dados

• Transmissão de imagens
  • Pele, face, olhos, boca, eventos traumáticos, etc

• Teleconsulta e segunda opinião
  • Voz via celular
  • Text via SMS, WAP e Internet
Requirements for Advancing

• Market development and maturation
  – Decentralization of hospital-based care
  – Family health, increase in coverage
• Development of specific culture and acceptability
• Increase in technology transfer, offer, local expertise and manpower
• Large pilot projects with self-sustainability horizon
• Consolidation of a suitable economic model
Projects for the Future

- Multi-institutional training in telehealth, with international cooperation
- Development of a low-cost videoconferencing terminal and telehealth peripherals
- Massive expansion through federal and international funding
- Integration of telehealth to primary and family care
- Regulatory alliance
- Extensive use of standards
- Enterprise-public-academic alliance
Telehealth Sites in Brazil

- Instituto Edumed: www.edumed.net/
- Telemedicina: www.telemedicina.org.br
- Telesaúde: www.telesaude.org.br
- Edumed Newsletter: www.yahoogroups.com/group/edumednewsletter
- Telemedicine Newsletter: www.yahoogroups.com/group/telemednewsletter
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