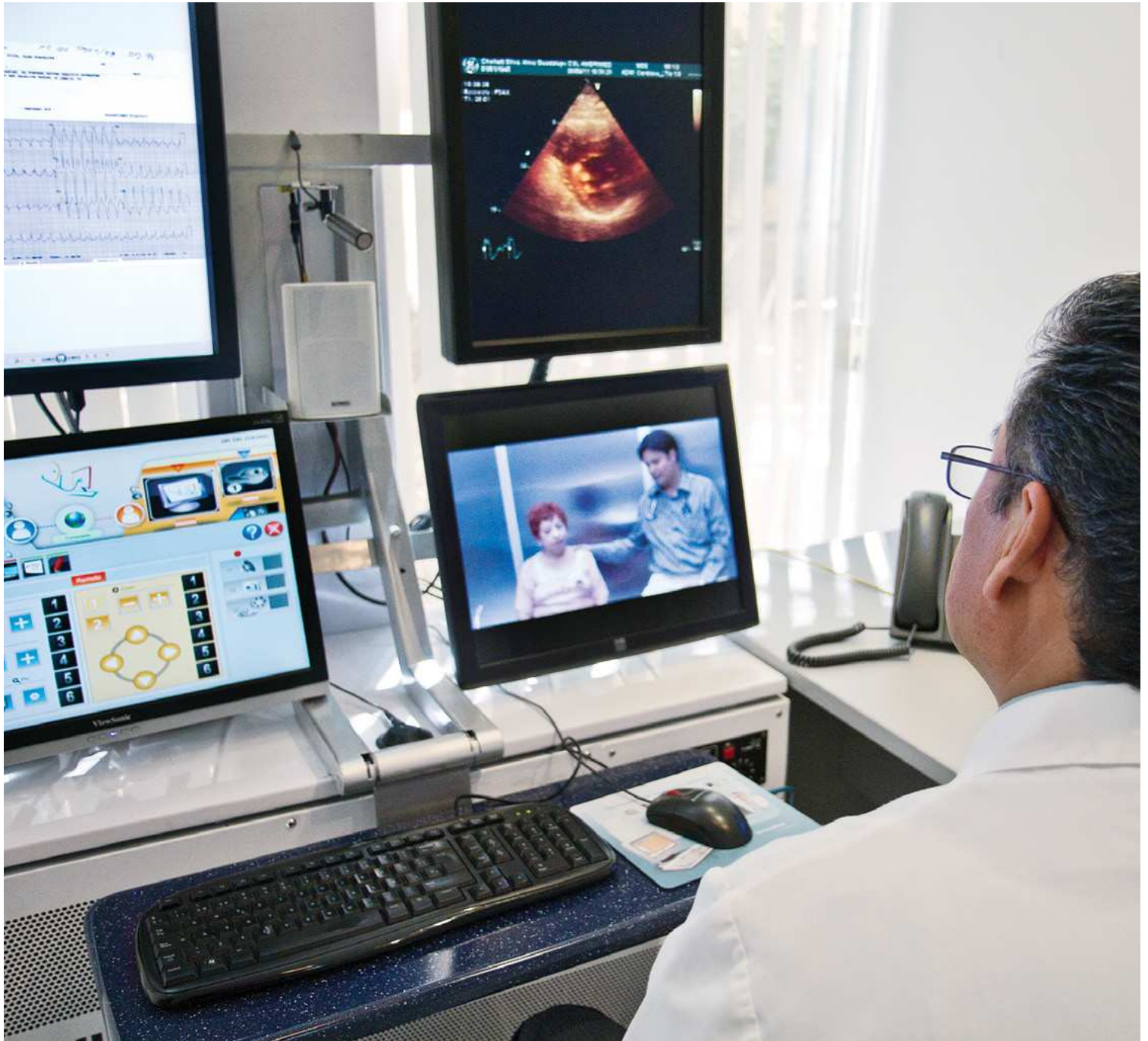


Policy in Focus

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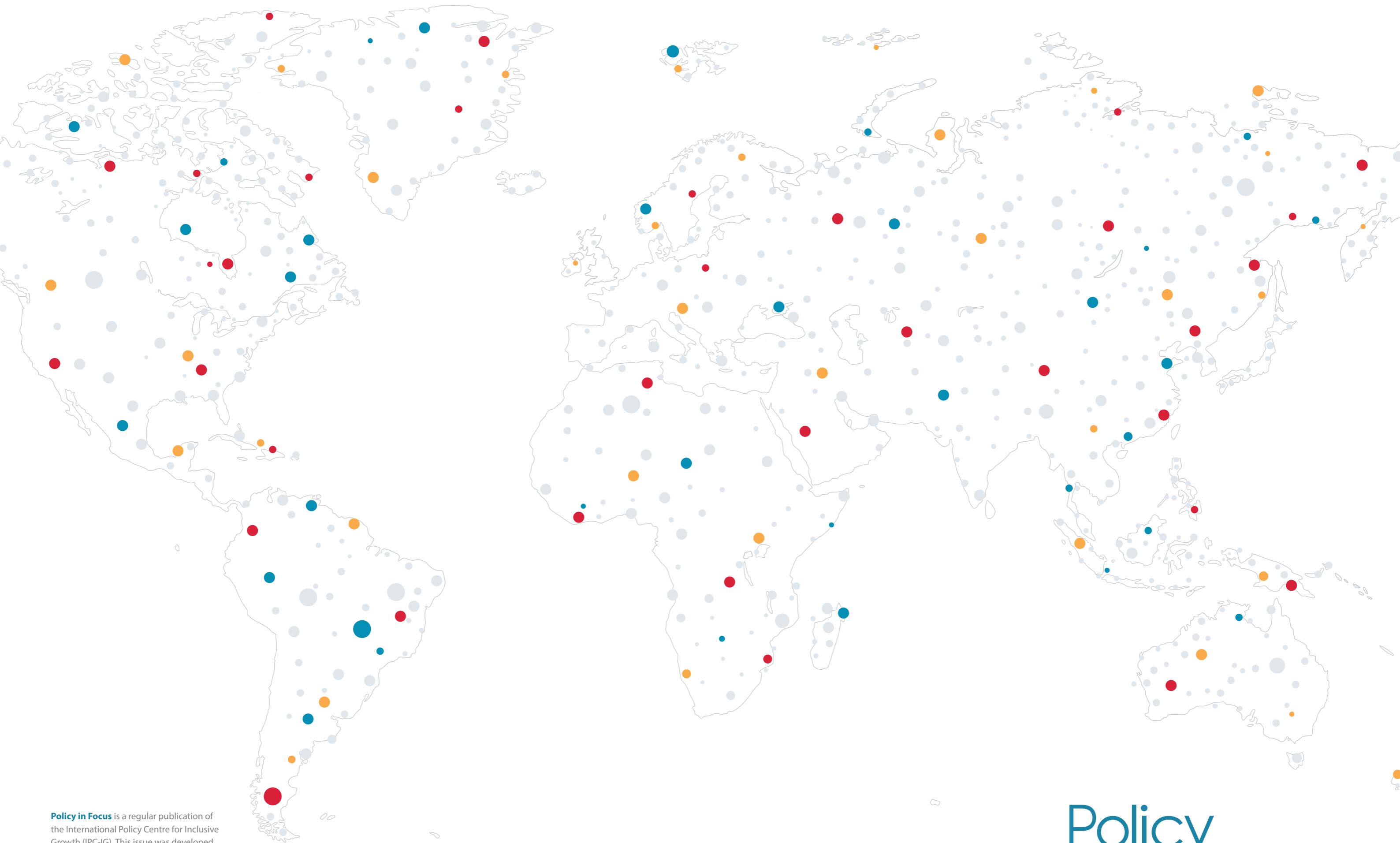
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Policy in Focus

Summary



The International Policy Centre for Inclusive Growth (IPC-IG) is a partnership between the United Nations and the Government of Brazil to promote South–South learning on social policies. The Centre specialises in research-based policy recommendations to foster the reduction of poverty and inequality as well as to promote inclusive growth. The IPC-IG is linked to the United Nations Development Programme (UNDP) in Brazil, the Ministry of Planning, Budget and Management of Brazil (MPOG) and the Institute for Applied Economic Research (Ipea) of the Government of Brazil.

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Development of telehealth services in Latin America: the current situation

by Alaneir de Fátima dos Santos,¹ Mônica Penna de Abreu,¹ Maria do Carmo Barros de Melo,¹ Cláudio de Souza,¹ Luis Ary Messina² and Humberto José Alves¹

Public health systems struggle to provide care to meet the needs of populations (Clark and Goodwin 2010). In this context, telehealth initiatives can play a significant role in reducing barriers to access and improving the quality of diagnosis. The development of telehealth activities in Latin America, despite advances in recent years, still faces many challenges.

The use of telehealth services³ is uneven worldwide. According to the World Health Organization (WHO), in less developed countries where the available structure is limited, it has been lower than what is possible. Activities that have already been implemented feature sub-standard use or frequency of use. Whereas more developed countries have geared services towards diagnosis and control, developing countries face challenges related to connecting basic services to higher levels of the health system (WHO 2013).

The challenge of incorporating telehealth resources is significant. Some Latin American countries feature nationwide telehealth programmes, relying to some degree on open forums to strengthen processes. These forums, in addition to the ones comprising Ministries of Health and universities from different countries, include various entities for cooperation in the region, such as the Economic Commission for Latin America and the Caribbean (ECLAC), the Pan-American Health Organization (PAHO), the Inter-American Development Bank (IDB), and the Latin American and the Caribbean Economic System (SELA). The article presents an overview of telehealth in Latin America and constructs a timeline for its development.

Methodology

Following a literature review conducted regarding telehealth in Latin America, using data since 1985, a data collection instrument was developed, targeted at

telehealth managers of the Ministries of Health of all Latin American countries, covering the National Telehealth Projects (NTPs), their objectives and characteristics. The Telehealth Centre of the Medical School of the Federal University of Minas Gerais developed a distance education course for 407 managers of Ministries of Health and major universities. The participants presented essays validating the data collected in their respective countries. Next, a timeline of telehealth was built, and the data were systemised, allowing for an overview of the development of NTPs in Latin America. For the purposes of this article, countries of South America and Central America (including Cuba, Haiti and the Dominican Republic) and Mexico were considered to belong to Latin America.

Results and discussion

Table 1 displays the main telehealth initiatives in Latin America since 1968, highlighting NTP milestones. Considering their characteristics, it is possible to identify three clear stages in the development of telehealth in Latin America.

The initial stage was based on an exchange of experiences between Latin American countries and the USA. During this period—from the 1970s up to the 2000s—the experiences of Mexico, Panama and Costa Rica stand out.

It has been observed that Mexico was the first country in Latin America to introduce telehealth resources. In 1995 it launched the first NTP in the region, focused on providing distance teleconsultation services. Continuing to innovate, in 2009 it started using standards in the medical information technology (IT) field. The Mexican NTP remains a model for the region as a whole (Gertrudiz 2010).

Since 1986 Argentina has been connecting its hospital units with an important development in medical IT. By the end of the 1990s there were 2,000 interconnected health institutions performing teleconsultations. In 2000 Argentina

launched its NTP; however, it was not possible to fully implement the project (Oliveri 2010; Riccur 2011).⁴

In 1996 Costa Rica launched its telemedicine project in primary care. The project was ambitious from the start; however, it happened to be discontinued over time (Ortega 2011).⁵

In 2002, in a partnership between the Ministry of Health and the University of Arizona, Panama launched an NTP in radiology and pathology which covered rural areas and penitentiaries (Vega 2010).

In the early stages of the development of telehealth in Latin America, the initiatives were isolated and fragmented, mainly influenced by the USA. However, a new stage began in 2003, when local telehealth initiatives became connected to the development of telehealth in European countries, with the aim of using resources for projects to exchange experiences between Europe and Latin America and demonstrate their results. The Alliance for the Information Society (@LIS) and EUROsociAL programmes, established by the European Union and Latin American countries, now have an impact on telehealth in Latin America. Demonstration projects carried out in various Latin American countries contribute towards strengthening capacities in telehealth.

Primary care now plays an important role in telehealth, and there are already some continuous forums—still restricted to few countries—for the exchange of experiences between Latin America and Europe (EUROsociAL 2008).

As a result, many countries took their first steps towards NTPs: Ecuador launched its NTP in 2006 (Lopes et al. 2010), and Brazil and Colombia did the same in 2007 (Galegos 2014). These were important experiences, usually focusing on providing teleconsultation, connecting primary care to distant experts. Colombia also deploys telehealth resources across semi-intensive care.

TABLE 1: Telehealth milestones in Latin America

Year	Milestone
1968	Ramiro Iglesias (Mexico) receives electrocardiogram from NASA's Apollo 8 spaceship
1986	Argentina: National Survey Network—PAHO
1995	Mexico: National Telehealth Programme
1996	Costa Rica: NTP—which will later be more slowly developed
1998	Argentina: The Garrahan Hospital connects with Patagonia to perform teleconsultations
2000	Argentina: 1 st Congress on Medical Informatics NTP in Argentina: but it does not materialise
2002	Panamá: NTP Brazil: University of São Paulo—Virtual Man Project
2003	European Community: Project @LIS—Telehealth Healthcare Network, TELMED, EHAS, RedCLARA Brazil: BHTelessaúde, Belo Horizonte; and Health Net, Pernambuco state Argentina: tele-Ophthalmology
2004	Europe/Latin America: RedCLARA
2005	Panamá: telehealth for rural areas and the penitentiary population
2006	Colombia: remote health care Brazil: Telemedicine University Network (RUTE) Ecuador: NTP
2007	Brazil: NTP Colombia: NTP EUROsociAL Project. I eLAC 2007: Regional Action Plan on the information society in Latin America and the Caribbean, Rio de Janeiro American Telemedicine Association Latin-American & Caribbean Chapter (ATALACC)
2008	II eLAC 2010, El Salvador ECLAC committee for e-health.
2009	Brazil: Regional Policy Protocols for Telehealth in Latin America, financed by the IDB SELA: I seminar on telehealth Latin American Journal of Telehealth
2010	El Salvador: an NTP is in the process of preparation Quito: creation of the Latin American Telemedicine and Telehealth Iberoamerican Association PAHO and Amazon Cooperation Treaty Organization (ACTO) Pan-Amazonic telehealth structure
2011	PAHO: eHealth Action Plan
2012	Mercosul Research Network Guatemala: NTP
2013	Cuba: transmission of ultrasound image in the Hermanos Ameijeiras Hospital, Cuba, and the provinces and the city of Washington, DC, USA
2014	III eLAC, Mexico Bolivia: NTP
2015	Peru: regulation framework

In 2007 the Brazilian telehealth project (Campos et al. 2009) became a milestone of telehealth development in Latin America, comprising many different initiatives: the Laboratory of Excellence and Innovation in Latin America, the Telemedicine University Network (Rede Universitaria de Telemedicina—RUTE), the Latin American Journal of Telehealth and the establishment of the Pan-Amazonian Telehealth Network (Santos et al. 2009).

With these positive Brazilian experiences, the development of telehealth was boosted among Latin American countries, establishing a new period of development for these initiatives and enabling the necessary conditions for actions by multilateral organisms, which began to

incorporate telehealth into their action planning. The issue of primary care, perceived as an important organisational strategy, is now significantly integrated into the development of telehealth.

There has been a steady increase in attempts by cooperation organisations to institutionalise telehealth, starting in 2009 with a committee set up by SELA (SELA 2014). In 2009 the IDB designed the project 'Regional development protocols of public policies for telehealth in Latin America', providing a set of integrated telehealth activities for countries of the region (IDB 2012). ECLAC contributed to reflection and analysis towards the formulation of policies, establishing the 'eSalud' adviser group in 2010—a forum

for the development of the information society in Latin America and the Caribbean. PAHO took an important step in 2011 with the approval of the eHealth Action Plan (PAHO 2011).

Both ECLAC and PAHO reinforce the guideline regarding the focus on the development of telehealth based on primary care. After 2010 many countries in Latin America started developing NTPs or building conditions to enable their eventual development: El Salvador (Marroquín 2013), Peru (Correa 2011), Venezuela (Sanchez 2012) and Bolivia (Ministerio de Salud Bolivia 2014). Peru approved a technical standard for telehealth in 2008, and in 2015 the regulatory framework was established.

TABLE 2: NTPs in Latin American countries

Country	Start year	General objective	Main features
Mexico	1995	To contribute to universal health care through a telehealth national system that favours access, quality and efficiency	Teleconsultation Primary care Distance learning ECG, retinography and ultrasound (in select locations)
Costa Rica	1994	To provide health care coverage to the population, improving access to high-quality, specialist medical care	Teleconsultation Videoconferences
Panama	2002	To increase the coverage and quality of health services, including in remote areas	Telemedicine services in x-ray and telepathology Telemedicine in prisons
Brazil	2007	To integrate family health teams with the reference university centres or services; To improve the quality of primary care	Teleconsultation during primary care Webconferences Distance learning ECG and retinography
Colombia	2007	To improve the health conditions in remote areas and in conditions of social vulnerability	Teleconsultation—primary care units Webconferences Distance learning Telemedicine in semi-intensive care, tele-ECG and tele-x-ray
Ecuador	2009	To strengthen the health care model through a network of reference and counter-reference from primary care	Teleconsultation—primary care Webconferences Distance learning
Peru	2010	To develop, implement and spread a telehealth system to improve health services	Teleconsultation
El Salvador	2011	To implement health training and consulting projects for family health teams	Teleconsultation—primary care teams and specialists Webconferences Distance learning
Venezuela	2012	To increase medical assistance coverage in remote rural areas by implementing a telemedicine system or a medical consultation system assisted by the Simón Bolívar satellite	Telehealth—primary care in rural areas (33 areas in total) Two training and virtual triage rooms
Guatemala	2012	To implement a telehealth project involving teleconsultations in primary care, tele-cardiology and tele-x-ray activities	Telehealth in primary care and hospitals with digital x-ray
Bolivia	2014	To democratise specialist medical care, reducing the incidence of diseases and health costs, training doctors and providing an adequate, fast response to health emergencies	Telehealth centres equipped with: general examination camera, vital signs monitor, electrocardiogram, ultrasound probe, digital otoscope and basic medical mobile cart, among others Primary, secondary and tertiary health care level

In 2013 Bolivia implemented the Bolivia Telehealth Project.

There is currently a more accelerated process of NTP qualification, boosted by PAHO, ECLAC and the IDB, with the participation of the countries that already have telehealth projects in place, such as Brazil, Mexico, Colombia and Ecuador. Publications on telehealth initiatives in Latin America are being produced; discussion forums are being implemented; qualification processes involving governments and Latin American universities are being developed, in addition to the establishment of a Latin American Committee for Best Practices in Telehealth, involving the main countries and organisations in Latin America. However, some countries still do not have

a functioning NTP: Argentina, Uruguay, Paraguay, Dominican Republic, Honduras, Nicaragua, Chile, Cuba and Haiti.

A predominance of teleconsultation and distance courses is observed, linking primary care to other levels of health care. In addition, more complex telehealth activities are being developed: tele-radiology, tele-pathology, tele-cardiology, tele-retinography and semi-intensive care.

In the last stage, it was observed that the theme of telehealth became appropriated by Latin America's own dynamics, particularly after the start of the NTP in Brazil. Several organisations are now converging efforts to help develop telehealth as a tool to improve health:

PAHO, ECLAC, IDB and SELA began to create e-health boards, with telehealth occupying an important part of their agenda. Table 2 details the NTPs within specific country contexts.

Conclusion

Despite the discontinuation of some projects (particularly in Argentina and Costa Rica), there are consolidated telehealth activities taking place in several countries (Mexico, Ecuador, Brazil, Colombia and Panama) and new projects being developed nationally (El Salvador, Peru, Venezuela, Bolivia and Guatemala). Most of these programmes focus on the relationship between primary levels of care and other levels of complexity, by performing teleconsultations and various educational activities. Forums



Photo: Universidad Técnica Particular de Loja. Medical appointment using the telehealth system, Ecuador, 2007 <<https://goo.gl/6lj426>>.

for exchanging experiences, developing policies and identifying best practices are under way, driven by PAHO, ECLAC, the IDB and the countries that already have a significant degree of development in telehealth. Though much has occurred in regards to the development of telehealth services in Latin America, there still remains much more to do. This article, among other studies, can hopefully contribute to the further development of such services in Latin America moving forward. ●

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Photo: PUCPR. Telehealth laboratory at a university in Paraná, Brazil, 2014.

“Telehealth initiatives can play a significant role in reducing barriers to access and improving the quality of diagnosis.”

“ There has been a steady increase in attempts by cooperation organisations to institutionalise telehealth.



Photo: Malova Gobernador. Centre of operations at the Culiacán General Hospital, Sinaloa, Mexico, 2013 <<https://goo.gl/ebjsgt>>.

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1. Medical School of the Federal University of Minas Gerais, Minas Gerais, Brazil.
2. Telemedicine University Network (RUTE), Rio de Janeiro, Brazil.
3. Telehealth can be defined as the use of electronic information and telecommunications technologies to support long-distance clinical health care, patient and professional health-related education, public health and health administration. Technologies include videoconferencing, the internet, store-and-forward imaging, streaming media, and terrestrial and wireless communications.
4. The project was discontinued for audit-checking of the computer equipment. When the audit was completed, there had been a change of government.
5. The government did not continue in subsequent administrations.

A Brazilian policy for telehealth focused on scientific network support to health care, research and education

by Brazilian National Research and Education Network (Rede Nacional de Ensino e Pesquisa—RNP)¹

National Research and Education Networks (NRENs) worldwide are expanding capacities and bridging federal authorities in the fields of science, technology, innovation, education, assistance and health to discuss, finance and work together and comprise an academic telehealth community. The World Health Organization (WHO) promotes universal health coverage as a goal for equitable access to health services without driving people into poverty. The National Telehealth Programme from the Brazilian Ministry of Health focuses its policy on primary health care but also on the NRENs, using information and communication technology to bring health care to people in remote areas of the country and to those who need health services most. In this article, we present some salient features of the Brazilian NREN that include both training of students and professionals, as well as the remote, online provision of services and diagnosis.

Brazilian national telehealth initiatives

There are three major Brazilian telehealth initiatives: the Brazilian Telehealth Programme, the SUS Open University (UNA-SUS) and the Telemedicine University Network. Up until now, little administrative data on such initiatives have been made publicly available. Nevertheless, for this article, the coordinators and stakeholders of this project have prepared some specific information with the aim of expressing the dimension of the projects, their coverage and the overall funding situation. Requests for further information on these data should be sent directly to the authors through their listed emails.

The Brazilian Telehealth Programme

The Brazilian Telehealth Programme is coordinated by the Secretariat of Work and Health Education Management (SGTES) of the Ministry of Health. It seeks to improve

the quality of the service and basic care of the Unified Health System (*Sistema Único de Saúde*—SUS) and to promote tele-assistance and tele-education along with the SUS Open University (UNA-SUS), facilitating the access of patients to health care services and professionals, as well as encouraging their training. Telehealth and telemedicine centres in faculties and teaching hospitals are equipped with cutting-edge equipment. Over 200,000 participants have already registered for e-courses administered by UNA-SUS, in collaboration with teaching hospitals and faculties.

Currently, telehealth services are provided by the National Telehealth Programme in 14 of Brazil’s 27 states, engaging 30,000 professionals from the Family Health Programme (*Programa Saúde da Família*—PSF), who perform remote diagnostics in the following specialties:

- cardiology (electrocardiogram (ECG), Holter and map);
- ophthalmology (retinography);
- pulmonology (spirometry, polysomnography);
- radiology;
- neurology (electroencephalogram); and
- dermatology.

Data from 2008 to September 2015 indicate that the Brazilian Telehealth Programme counted on 46 reference nuclei in 23 of the 27 states in the country, providing 8,257 assistance points in 4,222 of the 5,570 municipalities. This coverage allowed for 2,567,523 tele-diagnoses to be recorded during the period, as well as 3,326,141 tele-consultations and 2,057,517 tele-education sessions. It is noteworthy that, on average, the professionals who use the programme reported an 80 per cent reduction in patient referrals. They also expressed an average satisfaction level with the service of around 90 per cent.

Telehealth projects initiated under the Brazilian Telehealth Programme are becoming fully institutionalised services,

made available to society as part of the public health service through partnerships with state health departments. This is mostly the case in the nine states where programme activities originally started in 2007: Amazonas, Ceará, Pernambuco, Minas Gerais, Goiás, Rio de Janeiro, São Paulo, Santa Catarina and Rio Grande do Sul.

A flagship case is Minas Gerais. The initiative has expanded to cover 780 municipalities (out of a total of 853) through 1,000 service points. Between 2000 and 2010 this initiative performed around 2.5 million tele-ECGs and around 75,000 teleconsultations (Universidade Federal de Minas Gerais 2016).

A similar situation is exemplified by the health service of Rio Grande do Sul, where telehealth reaches all 497 municipalities of the state. Through a toll-free line, it provides remote support to 35,000 care units across the country. So far, the initiative has provided over 65,000 tele-consultations and over 7,000 spirometry exams. Additionally, it has produced 11 apps for medical decision-making support (Universidade Federal do Rio Grande do Sul 2016).

In the state of Rio de Janeiro the tele-education initiative has provided training for 48,974 health professionals, including upper- and middle-level professionals. Since 2015 its tele-education initiative offers a remote Master’s Degree qualification in telemedicine and telehealth, which includes Portuguese-speaking students from different parts of Brazil and abroad (Universidade do Estado do Rio de Janeiro 2016). Since 2008, Amazonas has seen the initiative grow to provide 24/7 remote ECGs to 61 municipalities in the state.

Finally, the programme currently assists 290 of the 294 municipalities in the state of Santa Catarina, with the largest concentration of care units per municipality—1,294, or over four per