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## FOLLOW UP OF THE LEGISLATION ADVANCEMENT ALONG THE IMPLEMENTATION OF THE BRAZILIAN TELEHEALTH PROGRAMME

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### Abstract

**Purpose:** Brazil adopted eHealth as a national healthcare and education policy decision from 2006. This paper presents the development of legislation, as it reflects the evolution of the Brazilian Telehealth Programme during this period, as well as lessons learnt. **Methods:** A model was adopted and analysed that aligned with the three main edicts that oriented the evolution of the programme. **Results:** Analysis identified stages of the life cycle of eHealth implementation within the evolution of 3 different stages of the Brazilian Telehealth Programme which were also reflected in the evolution of associated legislation. **Results of a pilot project from the first stage guided the implementation of the National Programme applied to primary health care in the second stage. Implemented throughout the country, new concepts were developed and the Programme integrated into the Unified Health System not only in primary healthcare, but also in medium and high complexity levels of care. Conclusion:** Implementation and consolidation of the Brazilian Telehealth Programme established new concepts and integrated telehealth into many services. These accomplishments were reflected in Brazilian legislation, which considers and applies eHealth as a national policy decision.

**Keywords:** Telemedicine; primary healthcare; delivery of healthcare; legislation; public policy; Brazil.

### Introduction

Since 2006, Brazil has adopted eHealth for healthcare and education as a national policy decision. Initially eHealth was a part of the Ministry of Health national policy for development and capacity building of human resources for health. During the intervening time, Brazil has implemented multiple initiatives for eHealth, including: the Brazilian Telehealth Programme (BTP),<sup>1</sup> Open University of the Unified National Health System (UNA SUS)<sup>2</sup> and the University Telemedicine Network (RUTE).<sup>3</sup> The Ministry of Health has been implementing the electronic health record (National Card of Health) and created the Center for Strategic Information in Health Surveillance (CIEVS). CIEVS, equipped with modern technology to receive information about outbreaks and epidemiological emergencies in any part of Brazil, has a specialised team on call 24 / 7 to receive information and notify the authorities in case of emergency.

The Brazilian Telehealth Programme (BTP) began in nine of 27 States, creating nine Centres of Telehealth connected to 900 Basic Health Units, mostly located in remote and isolated areas. (Figure 1 and Table 1)

At the time the main goal was to improve the quality of primary healthcare (PHC) of the Unified Health System (SUS), which has the challenge of providing healthcare to almost 200 million inhabitants. BTP now offers “teleconsulting” and Formative Second Opinion services for health professionals within SUS.<sup>4</sup> Internationally the term ‘teleconsultation’ refers to synchronous or asynchronous exchange between clinicians or between clinician(s) and a patient, but in Brazil the latter practice is not permitted by the Federal Council of



**Figure 1.** Map of Brazil with the nine states that took part in the Pilot Project (orange).

Medicine. To make this distinction, the term ‘teleconsulting’ is used to refer to where primary healthcare professionals use the BTP’s network to synchronously or asynchronously present questions to other health professionals and receive their responses (within 72h when asynchronous). Formative Second Opinion then utilises some of the clinical questions that arise frequently during these teleconsultations and, through a defined process, collates and summarises the questions and best evidence responses making them widely available (and searchable) on the network’s website. Both of these practices are considered learning or knowledge translation activities that share knowledge and professional experience. (Figure 2) During implementation, the monitoring and evaluation

**Table 1.** Coverage and Services Provided during the Pilot Project.

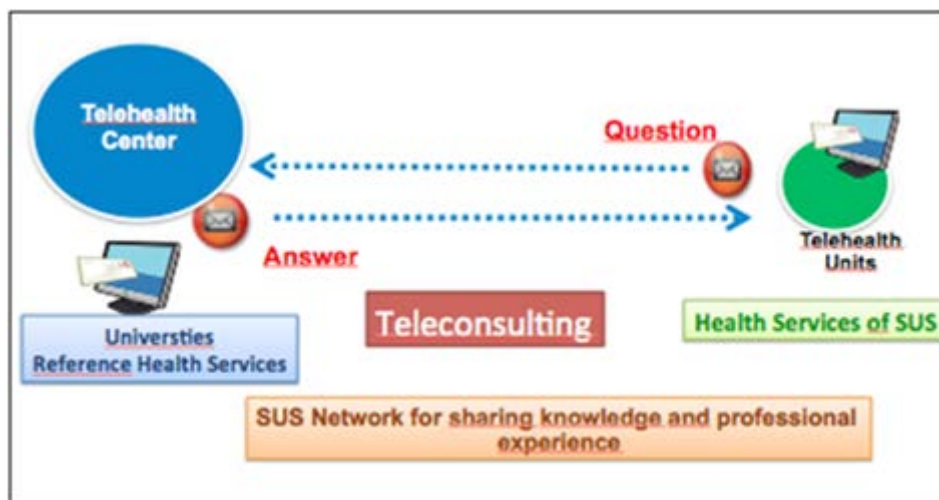
Coverage	Number
Telehealth Centres	9
Basic Health Units connected	899
Municipalities	728
Family Health Teams	2,604
Health Professionals	26,000
<b>Services Provided</b>	
Teleconsulting Service	8,531
Tele-education	1,715
Telediagnosis	158,230

results led the Programme to be expanded. It assumed new goals, established standards, and gained sustainability through its integration with the patient flow regulatory system. The development of the Programme can be characterised by three different stages concerning its legislation. This study presents the evolution of legislation as it reflects the evolution of the Programme during this time, as well as some lessons learnt.

### Methods

A published conceptual framework was adopted to describe the evolution of the programme.<sup>5</sup> The following life cycle stages of eHealth implementation were considered: 1. Development, 2. Implementation, 3. Integration, and 4. Sustained Operation.

Brazilian eHealth related legislation was also reviewed, and three stages corresponding to different



**Figure 2.** Brazilian Telehealth Model of the Teleconsulting Network tested in the Pilot Project.

edicts were identified. These are briefly described below:

Brazilian eHealth related legislation was also reviewed, and three stages corresponding to different edicts were identified. These are briefly described below:

1. Ministry of Health Edict n. 35/2007.<sup>6</sup> This, the first edict by the Ministry of Health in 2007, established the Pilot Project. It defined criteria needed to implement the Pilot Project nationally, predominantly in remote areas within the five different regions of the country. For the Pilot Project, nine Telehealth Centres were implemented, distributed around the five different regions of the country, each one responsible for offering teleconsulting for health professionals of 100 Basic Health Units.
2. Ministry of Health Edict n. 402/2010.<sup>7</sup> This edict formally recognised the Pilot Project as a programme, creating the Brazilian Telehealth Programme and determining its national structure (present in each of the 27 states of the country) and expanding its role. The Programme was applied to the primary healthcare level. The evaluation of responses for the teleconsulting service assessed the standard of answers, and was mediated by a family doctor.
3. Ministry of Health Edict n. 2546/2011.<sup>8</sup> Based on the proven results, in particular the increased quality of PHC observed through teleconsulting, this 2011 edict expanded the Programme to higher complexity services and as a means to reinforce the network of healthcare delivery as a whole. Another aspect of this Edict is that it brought forward the concepts of teleconsulting, telediagnosis, and Formative Second Opinion, and also ensured that the telehealth services were incorporated into the list of healthcare services of SUS, the National Health System.

## Results

The four life cycle stages of eHealth implementation described by Khoja et al. were identified within the evolution of the three different stages of the Brazilian Telehealth Programme, as reflected in the evolution of its legislation.<sup>5</sup> These are described below:

**Stage 1 - Development.** There was an identified need at SUS for capacity building of workers for the Family

Health Strategy, which would strengthen primary healthcare, mostly in remote and isolated areas of the different regions of the country. This process upgraded the knowledge of healthcare workers to align with and improve the Family Health Strategy, the SUS programme for primary health care. Undergraduate courses have been historically oriented toward specialisation, influenced by the 1910 Flexner Report, disregarding the social determinants of health.<sup>9</sup> The educational policy of the Ministry of Health together with the Ministry of Education aimed at reorienting both education and the work process of health professionals to consolidate the healthcare model of SUS.<sup>10</sup> The approach designed for the telehealth pilot project was to create nine Telehealth Centres located at public universities, selected according to their previous experience in the use of information and communication technologies (ICT) for tele-education and healthcare through telehealth. Another criteria was to locate the Telehealth Centres in all the five different regions of the country, testing different combinations of Internet infrastructure and different conditions of health services. The Telehealth Centres were connected to 900 Basic Health Units (BHU), each equipped with a dedicated computer and webcam, from where health professionals could ask questions about their doubts in daily practice. The first edict that established the project determined that 80% of the BHUs should be located in remote and isolated areas. The assumption was that even under different conditions of the health services, human health resources, and epidemiological profile of the population, the availability of knowledge support for health professionals through the teleconsulting service could improve PHC at SUS.

**Stage 2 - Implementation.** The first edict (2007) establishing the Pilot Project was substituted by the edict of 2010, creating the Brazilian Telehealth as a National Programme, implemented throughout the country. The new legislation identified and outlined the structure for the management commissions that should coordinate the Programme at the municipal, state and national levels. It was recommended that representatives of each commission include health managers, health professionals, and those University's with Telehealth Centres. This implementation covered the PHC level of SUS. The National Commission of Telehealth has had representatives of the following Ministries and associations. (Table 2)

**Table 2.** Ministries and Associations represented on the National Commission of TeleHealth.

Ministry of Education	Federal Council of Medicine
Ministry of Science and Technology	Brazilian Society of Family & Community Medicine
Ministry of Communication	Brazilian Council of Telemedicine and TeleHealth – CBTms
Ministry of Defence	National Council of Secretaries of States (CONASS)
Public Universities	National Council of Municipalities (CONASEMS)

The transition from development to implementation stages involved many national level institutions, as well as sub-national commissions at different levels ensuring the governance of the Programme.

The Pilot Project demonstrated that the Amazon was the region where the programme was most needed. This region was extensive, with geographical barriers and many localities that could be accessed only after many days of travel by river.<sup>11</sup> That was also the region with the greatest connectivity challenges, particularly at the North of the Amazon River. A dedicated solution, consisting of an affordable communication antenna able to guarantee a minimum level of stable connectivity, was found by the State University of Amazonas. All 60 municipalities of the State of Amazonas have been connected, and take part in the Brazilian Telehealth Programme.

The Clinical Hospital Telehealth Centre of the Federal University of Minas Gerais (southeast region of the country), has specialised in tele-cardiology diagnosis.<sup>12</sup> The Telehealth Centre of the Federal University of Goiás (western region of the country, near the federal capital Brasília) developed a tele-ophthalmological system with a mobile retinographer, allowing isolated communities to receive early diagnosis of diabetic retinopathy, glaucoma and cataracts, the main causes of blindness.<sup>13</sup>

All nine implemented Telehealth Centres have offered the teleconsulting service applied to primary health care. Different teleconsulting platforms were developed and implemented by each Centre, but standards and specifications were established to guide development of the platforms.

Teleconsulting Standards:<sup>14</sup>

- Address directly in the short term, the applicant's demand;
- Have a formative role, by providing additional information;
- Content must be capable of being read within 15 minutes
- Consider the local healthcare context and means available for the resolution of the case in question

- Build capacity of teleconsultants and of health professionals noting good questions generate good answers (the local health professional must have had enough time with the patient to perform the clinical examination and medical history in a systematic and thorough way, before requesting the teleconsulting service).

After the adoption of the standards, a study evaluated a group of 294 uses of the teleconsulting service requested by physicians at the Telehealth Centre of Rio Grande do Sul. Referral of a patient to another service was avoided in about every second case, improving the clinical effectiveness and quality of primary health care.<sup>15</sup>

The website of the Brazilian Telehealth Programme<sup>1</sup> was designed as a virtual library of PHC, developed by the Latin American and Caribbean Centre on Health Science Information and the Pan-American Health Organisation, and known by its original name - Regional Library of Medicine (or BIREME, the acronym in Portuguese). One section provides frequently asked questions (FAQs) selected from uses of the teleconsulting service on the basis of their relevance. They are answered in the form of a “Formative Second Opinion” (FSO). The FSO was an innovation of the programme, reorganising scientific knowledge into a new format, starting with the most frequent questions and concerns of health professionals in their daily clinical practice.<sup>4</sup>

**Stage 3 - Integration.** The third piece of legislation of the Brazilian Telehealth Programme considers the integration of the programme with SUS, defining new concepts developed during the programme implementation that permit recognition and accounting of telehealth services within the SUS. Specified terms were identified which allowed telehealth services to be counted, and the Telehealth Centres were registered in the National Registry System of Health Services. Within Brazil, agreed terms were:

- Teleconsulting (synchronous or asynchronous)
- Teliagnosis
- Tele-education

- Formative second opinion

An asynchronous mode is used for most uses of the teleconsulting service. When the questions are more complex and the subject demands a multi-professional approach, a synchronous session is scheduled.

The actual edict establishes a maximum period of 72 hours for a response to be returned to the applicant, provided an urgent situation or emergency does not exist.

The BTP has been developed in accord with the National Policy for Permanent Health Education (*Política Nacional de Educação Permanente em Saúde - PNEPS*)<sup>18</sup> where teaching and learning are incorporated into the everyday routine of organisations and healthcare delivery, residency training,<sup>16</sup> and the National Programme for Physicians Providing in Remote and Isolated Areas<sup>17</sup> (a programme by the Brazilian Ministry of Health, implemented in 2013, with the aim of providing physicians to work for SUS in remote and isolated areas).

The Brazilian Telehealth Program is now fully implemented in 24 States, with two states in NW Brazil in the process of implementing the program, and one state in N Brazil (Roraima) where it is not yet implemented. The coverage and volume of services provided up to 2015 is shown in Table 3.

**Table 3.** Services provided and coverage of the Brazilian Telehealth Programme by 2015.

Coverage or Service	Number
BHUs connected	6,200
Municipalities	2,600
Teleconsulting service	326,141
Telediagnosis	2,567,523
Tele-education participants	2,057,517
Formative Second Opinion	888

**Stage 4 - Sustained operation.** The teleconsulting service originated as an initiative to improve the performance of health professionals at the primary health level. It was created and run by the National Secretariat of Human Resources for Health, which is responsible for the policy of education of physicians and health professionals. It has been incorporated into the work process of health professionals, and by the National Secretariat of Healthcare. Teleconsulting has been progressively integrated into the appointment flow as a necessary step when the health professional must decide if a patient should be referred for care to another health care level.

## Discussion

This study describes the four main stages of the Brazilian Telehealth Programme (development, implementation, integration, and sustained operation), placing them into the evolution of its regulatory legislation. These are considered the life cycle stages of eHealth implementation.<sup>5</sup>

Considering the KDS framework for eHealth evaluation, it is possible to identify many key similarities to it in the process of the Brazilian Telehealth Programme implementation. One is the “needs-based evaluation theory”, according to which any new solution should focus on “addressing social needs of the population”. The BTP was first designed to fulfil a gap in the performance of primary healthcare professionals within the public system, improving healthcare delivery all the way long.

The behavioural change theory (Prochaska’s Transtheoretical Model of Behaviour Change) described in the KDS Framework identifies five stages for the adoption of change by individuals or groups, but it is only at the fourth and fifth stages that change happens.<sup>5</sup> The BTP experience showed an initial resistance of health professionals to using the teleconsulting service. It is important that the health professional become confident with the service and understands it will properly fulfil his/her needs. The technology must be as simple as possible, and not function as a barrier. All HCP team members of BHUs must be motivated and willing to try to change the process, introducing teleconsulting as a new step. To aid this change, it is important that management be supportive and re-inforce the importance of change, understanding that it may take time for the new procedure to show results.

An edict by the Ministry of Health regulates the use of interoperability standards and health information for health information systems under SUS in municipal, district, State and federal levels, private systems, and the supplementary health sector.<sup>19</sup> This has created the conditions necessary for future integration of the teleconsulting platform with the electronic health record.

## Conclusions

The Brazilian Telehealth Programme started in 2007 as a pilot project in nine states, and was then transformed into a National Programme. This

Programme was first applied to primary care but positive results led to its expansion for the Unified Health System as a whole, including secondary and high complexity levels of care as well. The Programme also established new concepts and resulted in telehealth being included in the roll of available services. These accomplishments are reflected in Brazilian legislation, which consider and apply eHealth as a national policy decision.

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