English

A panoramic view of the incorporation of telehealth resources in Guatemala

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Abstract

The development of telehealth actions in Guatemala follows the structuring of telehealth actions in Latin America, still quite early. Objective: this article aims to construct a panoramic view of the telehealth situation in Guatemala, presenting the main on going experiences in the country. Methodology: an analysis was made of the scientific production related to the telehealth situation in Guatemala, as well as the documents produced by OPAS, OMS and national health programs. The websites of the Ministry of Health of Guatemala and the main telehealth projects in Guatemala were visited. Results: the development of telehealth in Guatemala is still very incipient, despite the establishment of a national telehealth commission in 2012. There is no structured national telehealth project. The most significant process of incorporation of ICT refers to the computerization of the hospital structure. There are also innovative processes involving data capture from echocardiography by technicians who send data at a distance and the use of mobile devices by health agents. Conclusion: the actions of telehealth in Guatemala are very incipient.

Keywords: Guatemala, Telemedicine, Telehealth

Resumen

Una visión panorámica de la incorporación de los recursos de telesalud en Guatemala

El desarrollo de las acciones de telesalud en Guatemala sigue el ritmo de la implementación de las acciones de telesalud en América Latina, aún bastante inicial. Objetivo: este artículo tiene por objeto la construcción de una visión panorámica de la situación de la telesalud en Guatemala y la presentación de las principales experiencias en marcha en el país. Metodología: se realizó una evaluación de la producción científica sobre la situación de la telesalud en Guatemala y se analizaron los documentos producidos por OPAS, OMS y los programas nacionales de salud. Se visitaron los sitios web del Ministerio de Salud de Guatemala y de los principales proyectos de telesalud en Guatemala. Resultados: el desarrollo de la telesalud en Guatemala es muy incipiente, pese a haberse constituido una comisión nacional de telesalud en 2012. No existe estructurado un proyecto nacional de telesalud. El proceso más importante de la incorporación de las TIC se refiere a la informatización de la estructura hospitalaria. También hay procesos innovadores involucrando la captura de datos de ecocardiografía por parte de los técnicos que envían datos a distancia y el uso de dispositivos móviles por parte de los agentes sanitarios. Conclusión: las acciones de telesalud en Guatemala son muy incipientes.

Palabras clave: Guatemala, Telemedicina, Telesalud

Resumo

Uma visão panorâmica da incorporação dos recursos de Telessaúde na Guatemala.

O desenvolvimento das ações de telessaúde na Guatemala segue o compasso de estruturação das ações de telessaúde na América Latina, ainda bastante inicial. Objetivo: este artigo objetiva construir uma visão panorâmica da situação de telessaúde na Guatemala, apresentando as principais experiências em curso no país. Metodologia: foi realizada uma análise da produção científica relativa a situação de telessaúde na Guatemala assim como foram analisados os documentos produzidos pela OPAS, OMS e programas nacionais de saúde. Foram visitados os sites do Ministério da Saúde da Guatemala e dos principais projetos de telessaúde na Guatemala. Resultados: o desenvolvimento de telessaúde na Guatemala ainda é muito incipiente, apesar de ter sido constituída uma comissão nacional de telessaúde em 2012. Não existe estruturado um projeto nacional de telessaúde. O processso mais significativo de incorporação de TIC refere-se à informatização da estrutura hospitalar. Também existem processos inovadores envolvendo captura de dados de ecocardiografia por técnicos que enviam dados a distância e a utilização de dispositivos móveis por agentes de saúde. Conclusão: as ações de telessaúde na Guatemala são muito incipientes.

Palavras Chave: Guatemala, Telemedicina, Telessaúde

INTRODUCTION

Guatemala is a Central American country, limited to the west and to the north by Mexico, to the east by Belize, by the Gulf of Honduras and by Honduras, and to the south by El Salvador and the Pacific Ocean. Its capital is Guatemala City, which is also its largest and most populous urban center.

The country has an area of 108,889 km², being the third largest of the subcontinent, surpassed only by Nicaragua and Honduras, respectively.

Guatemala has its history marked by the Mayan civilization that inhabited the territory of the country during all the post-classic period, until the conquest of the Yucatán by the Spaniards. Guatemala is the most populous central american country, and the second most densely populated. In 2017, its population is around 16,905,136 people, being 48.7% male and 51.3% female[1].

The population is formed mainly by indigenous and descendants. The official language is Spanish, also having 23 other Mayan, Xinca and Garífuna languages. It is considered a multicultural, multilingual, multiethnic country, as well as rich in natural life[2].

In spite of its relatively small territorial extension, Guatemala counts on a great climatic variety, product of its mountainous relief that goes from the level of the sea until 4,220 meters on that level. This leads to the existence of diverse ecosystems in the country ranging from the mangroves of the Pacific wetlands to the cloudy forests of high mountains.

The national territory of the Republic of Guatemala is composed of 8 Regions, 22 Departments and 335 Municipalities, in which the National Health Network is established, which, in addition to the Municipal, Departmental and Regional Health Service Networks, group to the Hospitals.

Guatemala, despite being a small country, has problems[3] with the infrastructure of communications, so there are rural communities that access is complicated to provide specialized medical care. The care of these communities is provided by Coverage Extension programs of First and Second Level Health Care. The number of specialized doctors is scarce in the hospital network, so they can not cover all the areas and regions of the country, in addition the conventional mechanisms of continuous education to technical assistance staff become increasingly honored and complicated in logistics and evaluation. For all these reasons it is perceived that in the country, it is necessary to initiate telehealth projects that support the universalization of the provision of health care services to the entire Guatemalan population.

According to the OMS, the telehealth could be defined as "the provision of health care services, where distance is a critical factor, by health providers who use information and communication technologies for the exchange of information valid for the diagnosis, treatment and prevention of diseases and injuries, for the research and the evaluation, and for the continuing training of health professionals, all in the interest of advancing the health of individuals and their communities"[4].

The telehealth contributes to universal health coverage, and it is particularly valuable for people living in remote areas, vulnerable groups and aging populations. In general, the telehealth services or programs are grouped into remote assistance services, patient management services, distance training for professionals and evaluation and collaborative network research. In relation to remote assistance services, they can refer either to the remote monitoring, diagnosis or treatment of the patient, as well as to the telemonitoring services of patients - often chronic - that often include records of biological parameters[5].

The OMS in 2016, through a specific committee to observe the development of the process of incorporation of ICT in the health area, constructed[6] a panorama of the telehealth actions of in the international scope that shows that more countries are reporting telehealth programs, and that many of these Programs are well established. It also points out that:

> *"more than half of responding Member States (57%; n=70) said that there was a specifc national telehealth policy in their country or that there was a reference to telehealth within their national eHealth policy; approximately three quarters of responding countries having a teleradiology programme, and roughly half reported a telepathology programme, a remote patient monitoring programme and a teledermatology programme; about one third of responding countries reported a telepsychiatry programme; these values are all higher than in the 2010 survey; 60% of the teleradiology programmes were said to be established (again a higher fgure than in 2010), while other programmes were said to be mainly at the pilot or informal stage; almost one quarter of responding countries reported that there had been an evaluation of a government-sponsored telehealth programme in their country; the main barriers to the implementation of telehealth were said to be a lack of funding to develop and support telehealth programmes, a lack of infrastructure (equipment and/or connectivity), competing health system priorities and a lack of legislation or regulations covering telehealth programmes."*

The OMS concludes that the results from the present survey strongly suggest that more countries are implementing more kinds of telehealth programs.

The OPAS in 2016 systematized[7] how is the process of incorporating telehealth resources in the American region:

• 52.6% of the Member States of the American Region of the OPS/OMS have a national Eletronic Health Registries (RES);

• 26.3% of Member States have the legislation that supports the use of their national RES;

• The lack of funding to develop and support the RES programs and the lack of evidences on the effectiveness of the RES programs present themselves as the most prevalent barriers;

• 36.8% of the Member States directly refer to telehealth in their policies or strategies;

• only 2 countries (10.5%) reported that they have established telehealth programs, namely the teleradiology and telepathology programs; however, the teleradiology program is the most frequent program in the Region of the Americas, with 17 countries that confirmed the use of this type of programs (as pilot, informal or established).

The OPAS makes the following recommendations: (1) strategies and national policies need to be developed to illustrate possible ways of intersectoral collaboration between the health and social sectors; 2) unique interoperability of health systems remains a challenge for the Region of the America due to the lack of integration between existing information systems; 3) potential telehealth approaches and solutions should be aligned with the country's specific health and cultural needs, technologically appropriate and within the limits of the social, cultural, environmental and economic conditions of the environment in which they are to be implemented, promoting self-sufficiency, and medium-term objectives. For this, it is necessary to build an aggregate model (implementation framework).

The incorporation of telehealth in healthcare generates enormous expectations as a means of containing costs and improving the quality of care, as it facilitates access and availability of health care services in rural areas that would be difficult to obtain otherwise. And is that the telehealth facilitates the equity in the access to care services regardless of geographical location; it reduces the waiting times (both in the diagnosis and in the treatment), avoiding major problems; it enables remote consultations from primary care to referral hospital, reducing the number of referrals; and it affects in terms of training and competence both at primary and hospital level[8].

It is within this framework of development of telehealth actions in Latin America and in the world that the importance of knowing how the process of telehealth development in Guatemala is found.

This article proposes to locate the process of implantation of telemedicine resources in Guatemala, presenting the main experiences in course in the country.

METHODOLOGY

Several steps were gone through. Initially, an analysis was made of the scientific production related to the telehealth situation in Guatemala, based on several descriptors involving e-health, telehealth and telemedicine in the last ten years. The documents produced by PAHO and WHO involving data on the incorporation of information technology in Guatemala were analyzed. The last national health programs of Guatemala were researched to observe the behavior related to the process of incorporation of ICT. Also, the websites of the Guatemalan Ministry of Health and the main telehealth projects were analyzed and, finally, the data found were validated by the national telehealth coordination in Guatemala.

RESULTS

In 2011, Guatemala's national telehealth coordination[3] affirmed that Guatemala is starting with the implementation of telemedine and telehealth projects in an isolated, uncoordinated way and with specific programs that support the delivery of health care services. There is still no National Tele-Health Committee that integrates all efforts at the Ministerial level, through social insurance or academic and private initiatives. At the public health level, there are still no established policies on networks, telemedicine and medical informatics, currently the efforts being carried out are isolated works, and very specific, depending on the group of interest that generates them.

It will be in 2012, jointly with PAHO and the Technical Vice Ministry, that is constituted the National Telehealth Committee that intends to incorporate the efforts that are made at public, private and academic level. These efforts were isolated and not widespread in the health sector. According to this document of the national telehealth coordination, during this period, the following initiatives were identified in the area:

1. Hospital Information System (InfHos)

The InfHos is the Hospital Information System, developed by the Vice-Ministry of Hospitals, through the Hospitality Strengthening Program, which has been developed since 2009.

The objective of the implementation of this system is to standardize the processes in the hospital network to facilitate the work of the personnel working in the hospitals, and with this to improve the patients' care since it is performed in a more agile, simple and controlled way. It also aims to establish the IT infrastructure to build future telemedicine projects, and reference-counter-reference.

The system is composed of 8 specialized computer modules for each functional unit of the hospital, including: Clinical Documentation and Admission Module; Pharmacy and Exact Dosage Module; Clinical Laboratory Module; Operating Room Module; Imageneology Module; Human Resources Module and Administrative Module.

Each of these modules aims to streamline, control and improve the processes that are carried out in each of these hospital units, generating information that facilitates the work, evaluation and relevant production to the decision making both at the local level (hospital) and at the central level (mspas).

At that time, the system was implemented in 14 hospitals, representing 32% of the hospital network.

2. TeleCardiology Project (interHospital)

This project involves the Guatemalan Cardiovascular Surgery Unit (UNICAR) with the Ministry of Health through its Regional Hospitals, with the support of the Heinmena Foundation of the United States[9]. The objective of the project is to set up a telemedicine system in which patients from hospitals in areas distant from the capital city do not have to travel for echocardiograms but can be treated at the hospital and sent digitally to the UNICAR Center, where the specialists interpret and issue a diagnosis. The UNICAR center is the center specialized in cardiovascular surgery, which makes it the center of reference of most public hospitals. The implementation of this project has facilitated that patients do not have to physically move to the capital, favoring the patient's attention and comfort. In addition to the echocardiogram sent, work is currently being carried out on the inclusion of part of the electronic clinical record with which it is counted, through the Hospital Information System InfHos, so that the specialist doctor has more information about the patient. The project was to be implanted in the country's regional hospitals; in 2012, it had already been started with two hospitals, on the south coast, the Regional Hospital of Escuintla and in the southwest the Regional Hospital of Coatepeque.

One of the main functions is the training of local technicians in the taking of echocardiograms, and the presentation and discussion of cases at the level of medical doctors and specialists[9].

3. Telemedicine in First and Second Level (Tula Salud Project)

In the area of Alta Verapaz, in the northern region of Guatemala, the telehealth pilot project[10] is being implemented, targeting the most distant and disadvantaged communities in the region. This is thanks to the work of the TulaSalud NGO, whose purpose is to collaborate with the Ministry of Health to reduce maternal and child mortality and improve the health services of the country's rural population, emphasizing in the interculturality, the gender approach and the use of information and communication technologies[10].

The lines of action in these years of work can be summarized in:

1. Tele Education.
2. Tele Health (or M-Health) or Tele Medicine.
3. Tele Training.
4. Support to the Risk Management Board of Alta Verapaz.

In relation to Tele Education, in order to provide the rural communities with priority municipalities of the country with nursing personnel from the local level, who speak the language of the population, with job stability and cultural relevance, together with the National School of Nursing of Cobán, under the coordination of the Department of Human Resources Training of the Ministry of Health, execute 3 distance education programs, using the internet and a methodological package that is based on the integration of teaching and service and pedagogical mediation:

- Training of Community Nursing Assistants;
- Training of Nursing Technicians, in 7 head offices and 7 departments of the country;
- Diploma in maternal neonatal, directed to nursing assistants.

4. Virtual Office Project

In 2011 the National Council of Science and Technology (CONCYT) with the support of Taiwan's mission of service

for investment and trade of Central America, it was implemented[11] the virtual office project that seeks to expand the opportunities of patients to have systematic and professional medical care, regardless of geographical location, social and / or economic status. The objective of the project is to take advantage of the new Information and Communication Technologies (ICTs), to expand the medical consultation assisted in an access point by specialized doctors and in the other linked points, by doctors or paramedics that link the patients with the specialist.

The project applies the concept of Virtual Office to favor patients traditionally excluded from health services, which consists of providing computer and telecommunications resources to health service organizations, considering other communication alternatives to take advantage of medical experience without giving importance to the geographical location of the specialists. The virtual clinic will assist in the practice of tele-consultation, tele-diagnosis, medical meetings for second opinions, remote monitoring and digital storage of data or medical records.

5. Research Network in the Ministry of Health

In the Ministry of Public Health and Social Assistance (MSPAS)[12] the research and participation network is being created, which brings together all the epidemiologists of the hospital network and health areas, in coordination with the National Epidemiology Center (CNE). Through face-to-face meetings and virtual meetings, with the objective of providing follow-up and discussion of the cases that arise in the network that provides services. In addition, it establishes policies, measures and standards for the presentation of information. The Epidemiology Network (RNE) is an articulated and decentralized Network of Functional Units of Epidemiology at the central level of MSPAS, Health Areas, Municipal Districts and Health Services at all levels. The axes of action of the network are: public health surveillance, public health research, analysis of the health situation and generation of decision scenarios, emergencies and disasters prevention and control of diseases.

6. Hospital Network for Care of Complicated Acute Innutrition

The main goal of the project[13] is to contribute to reduce the mortality of children under five with acute acute innutrition who enter hospitals, establishing virtual facilitating monitoring using the Web technology with the use of videoconference tools for the improvement of care of the care processes of children under five with complicated acute innutrition hospitalized.

The activities of this network include: creation and facilitation of an environment for analysis and decision making on impact, process and resource indicators and use of Web technology, using the “Elluminate” tool for the “virtual facilitator monitoring” that allows to have a cost-effective benefit in the quality care of children under 5 years with complicated acute innutrition in hospitals.

7. Other initiatives

At the national level there are other efforts to implement telemedicine and health projects that are being implemented in particular. Among these, we can mention:

- Hospitals and private clinics that carry out telemedicine projects, mostly tele-radiology projects.
- Private Universities: which generally carry out training programs with the medical schools of foreign universities for the training of students.
- San Carlos de Guatemala University: the public university of Guatemala is starting with the mechanism of tele-education in health for doctors in training.
- Social Security: presents initiatives in specific telemedicine programs and tele-education.
- Hospitals and private clinics that carry out telemedicine projects, mostly tele-radiology projects.

In 2013, Guatemala launches Guatemala’s e-health strategies[14], in a joint effort with OPAS, whose overall objective is to improve the access to the health services and their quality, through the use of information and communication technologies (ICT), especially at the community level.

It has the following specific objectives:

- Elaborate the legal and financial framework for the implementation of the components of the national e-health plan;
- Develop and implement inter-ministerial policies, plans, programs and e-health interventions, in populations at risk and in vulnerable situations.
- Establish national priorities on the use of ICTs to improve the delivery of public health services in the country.
- To have human resources trained in ICT for the implementation of e-health at the national level.

The e-health strategies for Guatemala have the following components: electronic registration; telehealth; mHealth; eLearning; permanent education; accreditation and standardization.

By 2014, the UNICAR's telecardiology project had already materialized with the structuring of the virtual communications portal . A Siemens image and communication archive system (PACS) was used to establish a communication between the digital bridge between UNICAR in Guatemala and Sanger Heart and Vascular Institute in Charlotte, North Carolina. The bridge allows the transfer of images, such as echocardiograms and provides immediate consultation with the cardiologists with headquarter in Charlotte and cardiac surgeons, as well as the participation of Guatemalan counterparts in common clinical and scientific conferences. This service is 24 hours a day free and available.

This bridge is being used to connect 14 rural hospitals in Guatemala and in El Salvador identified by UNICAR to establish the echocardiographic network program in Guatemala. As part of this program, health providers (nurses or technicians) are sent to Sanger Heart and Vascular Institute in Charlotte, where they undergo 3 months of intensive training in echocardiography.

Upon their return home, technicians are further trained on the local computer and then moved to one of the network villages. When technicians are ready, the hospital is provided with an echo lab where tests can be performed. The tests performed are digitally referred to PAC system already installed from UNICAR, interpreted by Unicar cardiologists, after which appropriate measures, such as clinical treatment or transfer to UNICAR, can be taken.

The first city connected to the network program was Quetzaltenango. The public health sector in Quetzaltenango, the second largest city in Guatemala, previously had absolutely no public access to echocardiography with the only machine located in a private clinic, which is too expensive for the general population. The only way to get the required test was to travel by bus 5-6 hours to the capital. Now, having been able to install a high-capacity Siemens imaging unit at the regional public hospital of the San Juan de Dios Hospital, which serves the two million Guatemalans living in the northern part of the country, and placing a Trained Guatemalan technician Charlotte to operate it, the population has free access to echo studies.

At the end of October 2013, the program helped to establish four eco laboratories in Guatemala's rural hospitals (Cuilapa Hospital, Santa Rosa, San Benito Petén Hospital and Totonicapán Hospital) and in El Salvador (El Pro-Familia Hospital).

In November 2014, the program continued its mission of improving cardiac services in Central America with the opening of two echo labs in the regional hospitals of Zacapa and Quiché, in Guatemala.

In Guatemala, eight rural hospitals now have these laboratories and have provided more than 12,300 echocardiograms to thousands of patients.

Another telehealth project that persists over time is the TulaSalud project[16], which started its actions as such on January 2, 2009 and it is currently running in partnership with the Alta Verapaz Health Area Directorate, the regional hospital of Cobán , and the National School of Nursing in Cobán, Tele Medicine Project in Alta Verapaz 2011-2015, whose goal is "to contribute to the strengthening of primary health care through the use of ICT, prioritizing comprehensive care for women and the child, in indigenous communities, rural and postponed Alta Verapaz. "Their actions, however, have extended beyond the department of Alta Verapaz through their distance education projects.

The project is structured covering the three levels of assistance.

First Level of Attention of Tele Medicine Project in Alta Verapaz

It is implemented with the help of the Telefacilitator (Member of the community with basic knowledge in health, community facilitator of the extension program of coverage of the Ministry of Health) elected with the participation of the community organization, Health District, Health Services Provider and TulaSalud; who provides basic health care, especially in the recruitment and follow-up of women during their pregnancy, delivery, puerperium, and monitoring the nutritional status of the child, without neglecting the care of the common disease in the general population .

The project in the first level of attention is structured so that the Telefacilitator attends on demand and by offer, in a coverage area constituted by a community center (Headquarters or domicile of the TeleFacilitator) and satellite communities located at an average hour of distance walking tour. The telefacilitador provides basic health care, aided by medical surgical equipment, a medicine kit basic. Also, carries out health education through educational talks, counseling, home visits especially to pregnant women, children with some degree of innutrition and follow-up of patients cared for in the health services. In addition, it has a cellular telephone with an unlimited

call plan for numbers within the Tele-Medicina network, this telephone is a key tool to improve the accessibility of the community to the health services network, shortening distances, time and contributing to the best use of resources

The telefacilitators are strengthened in their knowledge through distance and in-person training. For the distance training, the telefacilitators were equipped with an audio equipment that has an interface to connect the cellular telephone, establishing communication in two ways, making possible the participation of members of the community fomenting in them the self care of the health.

Second Level of Attention

In the services of the second level of care, medical, paramedical and technical support staff are strengthened, according to programs prioritized by the Ministry of Health through distance education using information and communication technology. The districts were equipped with computer equipment, connectivity, and cell phone with unlimited call plan to Tele-Medicine network numbers.

The second-level services can establish videoconferences between them and the third level, for the purpose of presenting clinical cases and / or having a second opinion of a specialist and establishing medical forums. Also strengthening the knowledge of providers at these two levels, resulting in improved quality of care.

Third Level of Attention

The services of the third level of care specifically the Regional Hospital of Cobán, has implemented a program of Continuing Medical Education, which develops weekly; TulaSalud provided audio visual equipment to develop the programmed scientific activities. These are transmitted through the Elluminate Live platform, to the coverage districts of the Tele-Medicine project.

The Indigenous Attention Module (Intercultural Care) is supported and strengthened through the use of the cell phone with which information on the patient's clinical status is provided to the Reference Districts, members of the community of origin and their relatives.

A Tele-Medicine module has been set up at the Regional Hospital, which operates 24 hours a day with the purpose of attending special cases presented by second-level care staff (Permanent Care Center, Comprehensive Maternal and Child Care Centers and District Hospitals) with the objective of having a second opinion of a specialist, orientation for the approach at the local level and / or coordination of transfers of the mentioned services to the Regional Hospital.

The project has worked with 125 tele-CFs, who were providing services to 466 rural communities or closer than a quarter million inhabitants.

The data are significant. It was realized 116,275 medical consultations, monitoring of 6,783 pregnant women, and coordination of 2,014 emergency transfers. According to study realized about the project)[17], the project has demonstrated a significant decrease in maternal mortality and in child mortality in the intervention group compared with control group.

In 2016, in Guatemala, the health improvement project tulasalud is launched by the health improvement project, through e-Healthy Community, focusing on maternal, neonatal and child health, with activities expected up to 2020.

Regarding the computerization project of hospitals in Guatemala, it is now observed that it is already in operation in fifteen large hospitals in the country, covering all the modules designed.

Currently, in order to get a sense of the process of incorporating information resources in the health sector in Guatemala in 2015, the Government of Guatemala, in responding to the WHO questionnaire on the development of e-health[18], states that it has a national policy on information, but responds not to a national e-health or telehealth policy. It also states that it does not allocate public funds to e-health as it does not have an electronic registration system in place.

Regarding the legal structure, only the following items had positive responses: protects the privacy of personally identifiable data of individuals irrespective of whether it is in paper or digital format; allows individuals to specify which health-related data from their EHR can be shared with health professionals of their choice; governs civil registration and vital statistics e governs national identification.

With regard to telehealth, there were no responses to specific implementation items (teleradiology, telepsychiatry, remote patient monitoring, telepathology and teledermatology). It affirms to have actions regarding distance education involving students, doctors, dentists, pharmacists, nurses and public health area.

It should be pointed out that the official document of the Health and Social Security, Model of Comprehensive Health Care[19] are practically not mentioned regarding the process of incorporation of information technologies, be it telehealth or e-health.

In 2016, an overview of the e-health strategy in Guatemala identifies three main aspects[20]:

• Investment in projects: we know that in the Ministry of Health, the computer area is not a priority, so investment in computer infrastructure, network equipment, is relegated to the need to acquire necessary inputs such as medicine, food and salaries of health care personnel. That is why the few advances that have been made have been with the support of international cooperation.

• Sustainability of projects: at the end of financing and support from agencies outside the Ministry, projects are usually completed, one of the great challenges is to achieve sustainability in the project's time and for the Ministry to maintain and institutionalize the projects.

• The legal framework: in order for e-health and telemedicine projects to be institutionalized, it is necessary to create a legal and operational framework at the level of government entities. There is actually a legal empty that prevents the use of electronic medical record management, the physical record is a legal medical document that can not yet be replaced by other electronic means. Although there is an e-health strategy in the Ministry of Health, it is not supported by a ministerial agreement that allows the operation and formation of projects in this area.

It is also identified the key issues that would need to be addressed for the development of e-health in Guatemala:

• Legal framework: we see how other countries in Latin America such as Brazil, Uruguay, Argentina and Colombia have done many years of work in legislation to legally validate electronic medical records. And how the e-health strategy has been included in the institutional structure of the different health entities such as ministries of health, social insurance and organizations.

• Search for e-health financing projects: we know clearly that cooperation projects are a catalyst for working on the issue. It is necessary to search for projects that even promote socialization, promotion and training for health personnel in the subject of e-health, the lobby that is carried out in the health services is an ant work, that although it is generating changes, it is a very slow process. Due to the experience in some projects, when hospitals or other services start with e-health projects, they are initially reluctant, but when they reap the benefits of implementation, they have completely taken over the projects. These cooperation projects are the seed to start operating the projects at institutional level.

• National Policy: it is very important to have authorities at the political level involved in the issue of e-health, since if there is no national policy on the subject, it is very difficult to raise and convince the average authorities of the implementation of these projects. If the leaders of the institutions are convinced of the solutions of e-health and telemedicine they offer to the health system of the country, it is much simpler, to look for financing, to promote the legal and operative framework of the e-health strategy.

These are the main activities and reflections on the telehealth projects under way in Guatemala.

DISCUSSION

It is observed that in Guatemala there is still no established national telehealth policy. This context is in line with the reality of the Americas, where, according to PAHO[6], only 36.8% of countries recognized that there is a national telehealth strategy in their country that can help universal health coverage. Even at the international level, a WHO survey claims that 42% of respondents said that there was no national telehealth policy and there was no reference to telehealth within their national eHealth policy. Thus in more than half of the countries (57%), the telehealth was identified at a national policy level, something that is likely to be useful in promoting its adoption[7].

Despite the lack of a national telehealth project, Guatemala has several ongoing telehealth projects, with experiences of several years of operation. These are innovative projects, involving mobile technologies and even a very innovative process with training of technicians in echocardiography, who send images to specialists. These initiatives are in line with what has been observed in countries where two-thirds of respondents say they already have initiatives in the area of image[7].

Regarding the incorporation of information resources, Guatemala's most significant initiative refers to an ambitious project of incorporating information resources into the hospital network, which progressively comes computerizing public hospitals, with several modules implemented.

The most fragile aspects of the process of incorporating telehealth resources in Guatemala refer to the lack of even mention in health programs of the role that telehealth can play along with the lack of a state funding project clearly directed toward to this end. The telehealth also facilitates the viability of organizational models such as continuity of care and patient-centered care, applying concepts of globality and interoperability to healthcare organizations, resulting

in new organizational and networking environments. Thus, the implementation of ICTs at the level of social assistance would provide the possibility of improving comprehensive care and monitoring not only of chronic patients, but also of diseases with low prevalence, and would also facilitate their education in preventive medicine and public health.

According to PAHO[7], with the support of integrated public policies, telehealth should aim to change not only the organization of health care, but also through these changes to influence the improvement of planning and financing, guiding the planning towards its integration and reducing the costs for the adequacy of the structures that support the attention, and of the professionals to the functions that they should really perform in the present society, where people are the greatest asset. These changes, which should occur with the appropriate introduction and generalization of ICTs, should be at the macro level - state government - at the Meso level - which would affect health care structures such as hospitals and health centers - and Micro-level with specific applications in clinical units and health partners. But for this, a governance structure is essential to ensure its efficient and sustainable implementation, which is the only way to ensure the benefits that it will bring to the financing, planning and delivery of health services.

It should be stressed, however, implementing telehealth is not easy. Accordig to the WHO[7], successful implementation requires an holistic approach, which includes the technology, organizational structures, change management, economic feasibility, societal impacts, perceptions, user-friendliness, evaluation and evidence

In other words, the way forward should be to use telehealth strategically to address global health priorities, rather than – as widely perceived – using telehealth tactically to address local problems. This will require planners to take a diferent perspective, as traditionally telehealth is assumed to be driven by the technology.

With this intention, in May 2016, the PAHO/WHO presented the Framework for the Implementation of a Telemedicine Service[21] in order to provide solutions for the successful implementation of telemedicine and telehealth services (and, in general, eHealth) in environments and health systems. Based on an understanding of the context within its broader configuration, along with the challenges and opportunities that exist, it describes the reality that entails implementing telemedicine services in real health environments, analyzing the interactions that occur in the implementation process of ICTs and organizational transformations, management models, cultural changes and healthcare services. Finally, it reflects on the key aspects for its prioritization, design, implementation, integration and evaluation.

Therefore, the challenges for the implementation of telehealth projects in Guatemala are still significant, with a need to advance in many respects. Its isolated projects allow the accumulation of experiences and capacities gradually so that the country can accumulate until the implementation of a national telehealth project is possible.

CONCLUSION

Guatemala, as well as most Latin American countries, does not yet have a national telehealth program. There are important and innovative ongoing experiences in the country, which work with mobile technologies and remote echocardiogram reading, as well as teleconsulting between the first level of attention and the others. But it still has a long way to go.

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