English

Telehealth in El Salvador: current situation, challenges and obstacles

Marcia Inés Estrada Menjívar	Doctorate training in medicine, postgraduate as a teacher in Public Health, worker of the Ministry of Health in the clinical area. Address: Jocoaitique, Morazán. El Salvador, C.A Email: estrada.mar2059gmail.com
German Ernesto Linares Olán	PhD training in medicine, FOSALUD worker, Ministry of Health in the clinical area.
Carlos Luis Meléndez Maldonado	PhD training in medicine, with graduates in APSI, Epidemiology, worker of the Ministry of Health, in the clinical area.

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Abstract

Introduction: *The article presents an overview of telehealth resources, the challenges and challenges presented in El Salvador, based on the analysis of available documents.* **Objective:** *To analyze the situation of telehealth in El Salvador, its challenges and challenges according to the health of the population of the country.* **Method:** *This article is based on the existing literature review.* **Discussion and Results:** *A health reform is under way in the country which has brought immersion in the use of ICTs. In the area of telehealth there has been little progress, the most relevant being: Tele-education (Web conferencing program and virtual course platform, self-training platform excellencis), Family file and health map tablet version, SIAP, online information system, among others.* **Conclusion:** *Although there are no state policies in El Salvador that guarantee the implementation of telehealth, from the Ministry of Health, efforts have been developed within the framework of the Health Reform that has been implemented since 2009.*
Keywords: *Telehealth; Telemedicine; Health Policy.*

Resumen

Telesalud en El Salvador: situación actual, desafíos y retos. **Introducción:** *El artículo presenta un panorama de los recursos de telesalud: los retos y desafíos que se presentan en El Salvador, a partir del análisis de los documentos disponibles.* **Objetivo:** *Analizar la situación de la telesalud en El Salvador, sus retos y desafíos en función de la salud de la población del país.* **Método:** *El presente artículo está basado en la revisión bibliográfica existente.* **Discusión y Resultados:** *Está en curso en el país una reforma de salud la cual ha traído inmersa la utilización de las TICs. En el área de telesalud ha habido poco avance, siendo los más relevantes: la Teleeducación (Programa de web conferencias y plataforma de cursos virtuales, plataforma de autoformación excellencis), Ficha familiar y mapa sanitario versión tablet, SIAP, sistema de información en línea, entre otros.* **Conclusión:** *A pesar de que en El Salvador no se cuenta con políticas de estado que garanticen la implementación de telesalud, desde el Ministerio de Salud, sí se ha desarrollado esfuerzos en el marco de la Reforma de Salud que se implementa desde el 2009.*
Palabras-clave: Telesalud; Telemedicina; Politica de Salud.

Resumo

Telessaúde em El Salvador: situação atual e desafios. **Introdução***: O artigo apresenta um panorama dos recursos de telessaúde e os desafios que se fazem presente em El Salvador, com base na análise dos documentos disponíveis.* **Objetivo:** *Analisar a situação da telessaúde em El Salvador, os desafios de acordo com a saúde da população do país.* **Método:** *Este artigo é baseado na revisão de literatura existente.* **Discussão e resultados:** *Está em andamento uma reforma de saúde no país, que trouxe imersão no uso das TICs. Na área de telessaúde, houve pouco progresso, sendo os mais relevantes: Teleducação (programa de WebConferências e plataforma de cursos virtuais, plataforma de autotreinamento), arquivo de família e versão para tablet de mapa sanitário, SIAP, sistema de informações on-line, entre outros.* **Conclusão:** *Embora não existam políticas estaduais em El Salvador que garantam a implementação da telessaúde, do Ministério da Saúde, esforços foram desenvolvidos no âmbito da Reforma Saúde, implementada desde 2009.*
Palavras-chave: *Telessaúde; Telemedicina; Política de Saúde.*

Introduction

El Salvador is a country in Central America, it has a territorial extension of 21,041 km^2. It is the most densely populated of the American continent, it is bordered by Guatemala in the west and Honduras in the north and east, in the southeast the Gulf of Fonseca separates it from Nicaragua and to the south by the Pacific Ocean. Its territory is organized in 14 departments and 262 municipalities.

For 2019, the projected population is of 6,427,479 inhabitants, with a population density of 305,47 inhabitants/km^2.

The 2018 Report of Human Development, from UNICEF, places El Salvador in a classification of medium Human Development, in the 121st position, above Nicaragua, Guatemala and Honduras, with a value of 0,674, the life expectancy at birth of 73,8 for 2017.

Before 2009, the health system in El Salvador was characterized by a totally healing, assistance and excluding system. However, with the change of government in 2009, the focus shifts to health, going from an Integrated National Health System (with universal coverage and access) with a family and community focus, through the implementation of the Health Reform, which has developed in 10 axes:

1. Integral and Integrated Health Networks;
2. Medical Emergencies System;
3. Medications and other sanitary technologies;
4. Intersectorality and intrasectorality;
5. National Health Forum;
6. National Health Institute;
7. Single Information and Sanitary Vigilance System;
8. Human Talent Development;
9. Violence and Health;
10. Environmental Health.

After a decade of its implementation, it helped in the advance of many areas, from the installed capacity, going from 377 Health Units in 2009 to 754 Family Health Community Units in 2018, in other words a duplication of the establishments and 22 maternal waiting homes. At the end of the year 2018, we have a national coverage at a territorial level with 539 Family Health Community Units (in Spanish: ECOSF) integrated by doctor, nurse, nurse technicians, health promotors and a collaborative person of many services, installed in 187 municipalities, achieving a coverage of 71% in national level, under this modality.

Thirty-nine Specialized Family Health Community Teams were installed, that count with a specialist coverage for the first time in the basic healthcare level of attention: internists or family health doctors, obstetricians/gynecologists, pediatricians, phycologists, educators, nutritionists, physiotherapists, among others. The specialists carry out territorial approaches in order to serve the referred people. The hospitals maintain the same number of the 30, almost all have had important investments in infrastructure and the 30 hospitals have been strengthened with new and modern hospital equipment.

For the strengthening of the health services, more than 8,000 new jobs have been generated, which allowed the deployment of the ECOSF in the 14 country's departments. These hired personnel include health promotors, nurse staff, specialist in environmental health and specialized and general doctors and physiotherapy, psychology and education professionals, among others. All of this restructuring and operation of the networks has resulted that close to two million people now have a more permanent healthcare, that is closer to where they live.

In this way a new work scheme in the networks was constructed. The RIIS comes from the conceptual framework of the OPS document that was published in the year 2010 "Integrated Healthcare Networks: Concepts, Political and Band Breakage Options for its implementation in the Americas"; a symbiosis is created among the theory and the practice of the network work strategy.

As for the infrastructure and team of June 2009 to October 2017, it has been invested more than 426 million dollars in Infrastructure of 433 health establishments and in the equipment of all the hospital network and also equipment in basic healthcare, thanks to this investment in 2009 there is an increase of 374 new basic healthcare establishments. From the 30 national hospitals there has been expansion and remodeling work in addition to equipment.

Moreover, it is important to note that there hasn't been a record of epidemics since 2016 maintaining the lowest fatality rate by dengue in Latin America for 6 years. The public spending in health went from 60% (2008) to 67% (2018) and a reduction of the private spending from 40% to 33% for 2008 and 2008 and 2018, respectively. It is important to mention the growth in the budget since 2009 to 2018 from $458.98 to $701.64, respectively.

Similarly, it has allowed to terminate infant mortality and maternal deaths of 9.1 x 1,000 NV and 28.6 x 100,000 NV, respectively for 2018, outgrown target of the ODS for 2030. In this sense, El Salvador has carried out efforts to enhance the population's health.

In the telehealth subject, the advance has not been significate, and consequently in this article, we conducted a revision of the the implementation and fulfillment of these goals and others that were established in the way, in order to achieve the insertion of these technologies in the communication and information in the MINSAL.

Objectives

To analyze the situation of telehealth in El Salvador, its challenges and obstacles due to the health of the country's population.

Method

The present article is based in the bibliographic revision that exists at the level of the Health Ministry, as governing body oh health in the country, the institutional documents have been reviewed, from implemented health politics, within them: the National Health Policy 2015-2019, Strategic Institutional Plan 2015-2019, Work Report of the Health Ministry 2018, as well as documents that collect the experience and impact of the Healthcare Reform in El Salvador. On the other hand, it has been carried out a collection of the data obtained from the experience obtained about the different formats of the telemedicine that has been established, in other words, from the experience in the field about the implementation of these strategies with the health staff in the different health establishments of the country.

Current situation of telehealth in El Salvador

In El Salvador, there is a very poor approach of the telehealth theme, which has its beginning as of the legal and political framework that sustains the Healthcare Reform, some efforts have been made for the incorporation of Information and Communication Technologies (in Spanish: TIC) as described:

Strengthening of the information system in the local levels (executors).

Goal: 100% family Echoes (539) have mobile devices and enter data in the new family electronic card. All of the family echoes use the application of the family record information system (in Spanish: SIFF).

Goal: To implement the electronic sanitary map in 291 family echoes. All of the ECOSF use the sanitary map.

Goal: To sustain the connectivity of the Intranet in 318 establishments. A hundred percent of the establishments (318) are maintained connected.

Moreover, the Institutional Strategic Plan 2014-2019 includes some focus, limited to the strengthening of the Single Health Information System (in Spanish: SUIS), as can be read:

Strategic Axis 2, National Integrated Health System (in Spanish: SNIS).

> R.2.1.3. Single Health Information System (in Spanish: SUIS), standardized, integrated and operating.
>
> A.2.1.3.1. Standardization and integration of the Single Health Information System in the entities of the sector, through the formation of a subcommission of the SNIS's Governing Board.
>
> R.2.1.4. Institutions of the sector jointly contributing (according to its installed capacity), to the training of specialists and subspecialists doctors (joint residencies).
>
> A.2.1.4.1. Execution of pilot joint training projects for specialists and subspecialists doctors, through conventions between the MINSAL and the ISSS.
>
> A.2.1.5.1. Execution of joint pilot projects between the MINSAL and the ISSS for the integral healthcare of people with renal chronic disease, through conventions.

On the other hand, the National Health Policy 2015-2019, in the axis 7 Strategic health information, describes:

"The development and implementation of TIC, is necessary for the permanent modernization, innovation and update of the public administration, protection and social inclusion, whereby provides a boost to the application of sectorial politics that are related to public health; to improve the quality and agility of the services to the population; and facilitates timely, efficient and effective decisions in the whole level, by allowing the capture, processing, analysis, presentation and disclosure of the information.

Lines of action

To provide timely decision making and the improvement of the population's health, developing and implementing the adequate, accessible and sustainable TICs, specially the georeferenced family report, the single electronic medical record and the tools for data collection, analysis and monitoring of the social inequities in health".

No other regulatory framework that attaches priority to Telehealth was found. However, some advances in the matter were identifies, as detailed:

1. Strengthening of the local capacities in equipment, telecommunication services, human resources of support and staff training.

2. Creation of a Single Health Information System (SUIS), incrementing the number of notifying units from 311 in 2009 to 1,234 in 2018, including all public suppliers and some private, generating weekly sanitary information from all of the national territory, that is representative of the national health situation.

3. The data is processed and transformed into information to improve the sanitary monitoring, to control diseases and epidemics, to elaborate policies and plans and generally to make decisions of all kinds.

4. The Patient Care Integrated System (in Spanish: SIAP) is the basis for the generation of information, constitutes the online clinical file that in the future must be converted in the single file. Initially it is being implemented in the 30 hospitals and in some Family Health Community Units, and in it is included clinical history, digital imaging, laboratory exams, electronic health prescriptions, among others. The file guarantees agility, continuity in the care and improvement in the control of the resources, all leading to the better quality of care for the users.

5. The advance in the integration of the institutions of the national health system around the SUIS has meant that institutions like the ISSS and the COSAM register information of vital statistics (births and deaths) in the Morbidity and Mortality Information System via Web (in Spanish: SIMMOW) of the MINSAL, guaranteeing a bigger coverage in the registry of this kind of information, some of which serve to monitor the advance in the fulfillment of the ODS goals.

6. With the development of the SUIS achieved to the date in the health reform framework, it has been generated the capacities to incorporate the critical epidemiology as a strategical tool for the approach of the social determination of health, allowing the identification, measure and analysis of the interrelation among socioeconomic variables that conduct to inequities in health among the population groups, in order to propose appropriate solutions.

7. The digital safeguarding of the information has also experimented a noticeable improvement. The storage of information is performed in a "cloud" (server), the difference of the documents on paper that once destroyed, the information is lost. In turn, the resources have been optimized and the sovereignty has been fortified with the use of free software.

Table 1: Origram If Teleconference Virtual Courses Platform.

Theme	Speaker
Patients' rights and duties law, related to the humanization	Complaints handling offices, Superior council of public health
Promoting the rights of people with disabilities	Unit for the minsal right to health
What is humanization?	Section of capacitation of isss personnel
Forum "humanization of the health services"	Salvadorian institute of social security, national foundation of quality in health – minsal, national "nuestra señora de fatima" hospital, cojutepeque, Salvadorian institute of magisterial welfare, solidarity fund for health, superior council of public health, Salvadorian institute of integral rehabilitation
The self-care from the psychosocial and spiritual perspective	Mental health unit
Contribution of infirmary to the tb program	National infirmary unit
Cpr pregnant patient	Without
Record fot the identification of psychosocial risk in teenagers cared for in the hospitals	Component of teenagers
Technical guidelines for the decontamination of surgical medical material in the riss establishments	National infirmary unit of the minsal
Management of irrational ideas	Mental health unit
Auto from a distance training through the "excellencis" electronic tool	Management of health technologies, dirtecs
Presentation of the book: "reform in health: beyond the health services. Congress of the health reform in El Salvador"	Vice-ministry of health policies
Launch of the book: "the pathway and development of infirmary in El Salvador in Centro America and in the Caribbean. Angels Project: a human history of the Salvadorian and Japanese nurses"	National infirmary unit of the minsal and jica
Evaluation of health technologies for the incorporation of new al lime medications	Management of the health technologies (dirtecs)
Early detection and care for glaucoma	Field of ophthalmology of the zacamil national hospital
Ageing and nutrition	Geriatrics unit, minsal
Active and healthy ageing	Geriatrics unit, minsal
Secuality	Uanam

8. Implementation of the Family File in the Tablet version, that allows one to count with information about the person's health state, economy, work, social situation, family dynamic and sanitary situation, in real time.

9. The sanitary map module was developed, that facilitates in real time, information about the obstetric map (pregnant, postpartum and children with less than 1 year of age), geographic accidents, reference points of interest, sanitary situation and environmental situation of the community.

10. Another advance of the strategic information axis is the geo-positioning of diseases, inequities, sentinel surveillance and many other aspects that allow us to characterize better and better the conditions in which the population lives, studies and works, how their health is socially determined, their ways of catching a disease and dying.

In the area of the Development of Human Resources, axis 8, some results that were forwarded to the Tele-education can be highlighted:

1. The use of communication and information technologies to improve the access to the training of the RHS (Program of teleconference, virtual courses platform), counting with the MINSAL web conferences platform and the site http://saber.salud.gov.sv/, that since 2014 until 2019 has developed multiple interesting themes for the health personnel. An example of this, during 2019, can be highlighted in table 1.

2. Some virtual courses have been developed, and some that were taught during 2019 can be mentioned here:

Virtual Zika course.

Virtual DIVALAC course.

Blended learning courses of Introduction to the methodology of investigation in health.

Blended university diploma of surgical techniques of the National Women's Hospital, 2019.

Blended university diploma in care of HIV with focus of combined prevention 2019.

Blended university diploma of infirmary care in neonatal care 2019.

Blended course of good clinical practices, Rosales Hospital 2019.

Blended course of application of geographic information systems for the monitoring of environmental sanitation, 2019.

Virtual training course of mental health competences 2019.

Blended course of infirmary in palliative care, 2019.

Blended course about qualitative investigation with focus on gender, 2019.

Blended university diploma in intensive care for the Rosales Hospital 2019.

Virtual tutors: technological tools for online learning 2019.

3. On the other hand, there is a virtual platform for self training EXCELLENCIS, in which many self training themes have been developed, and here we detail some of the most important:

- Cancer prevention, august 2019
- Quinolones and fluoroquinolones for systemic use: why is it necessary to restrain its use, august 2019.
- Hand hygiene, april 2019.
- High blood pressure, diagnosis, classification and evaluation of the patient with HTA, november 2018.
- Evidence based medicine, introduction, october 2018.
- Diabetes mellitus type 2, pharmacological treatment, october 2018.
- Reviewed recommendations about the use of the CYD-TDV dengue vaccines, OMS, april 2019.
- Silver sulfadiazine, disproportionately adverse effects, September 2018.
- Diabetes Mellitus type 2, prevention, detection and diagnosis, july 2018.
- Medications that must be avoided. 2018 Update, july 2018.
- Obstetric emergencies, hypertensive disorders during pregnancy, may 2018.
- Obstetric emergencies, infections during pregnancy, march 2018.
- Obstetric emergencies, bleedings, January 2018.

Discussión

What obstacles does telehealth pose in the salvadorian society?

The World Health Organization in 1988 defined telemedicine as the distribution of health services in which distance is a critical factor, where the health professionals use information and communication technologies for the exchange of valid information for the diagnosis, treatment and prevention of diseases or damages, investigation and evaluation, and for the continued education of the public health providers, anyone who is interested in the development of the health of the individual and his/her community.

Many countries face nowadays numerous problems that are derived from the demographic model and the complete geographic distribution.

Telehealth in El Salvador poses great obstacles at the present moment, since that although there is a significate advance in this theme since the implemented health reform in 2009, there is still a lot to be done, and for that it is necessary to have a planning, a follow up and adequate evaluation of its implementation, because it cannot affect many aspects of the health system. Among these obstacles we can raise:

1) Alignment with the strategic and development plans of the health system.

2) Acceptability of the professionals.

3) Quality of the contents in the network.

4) Security of the data and confidentiality.

5) Legal and administrative framework.

6) The financing. Models of sustainable works.

7) Access to the Internet.

8) Technological aspects.

Regarding the theme about the alignment with the strategic and development plans of the distinct health systems, it still is one of the obstacles in e-Health in El Salvador. There is a perspective of evolution towards systems of grand complexity, both internally and in its relation to the systems in the own sanitary area (electronic clinical history, electronic prescription, prior appointment, second opinion, teleconsultation, etc.) and with other external systems as are the social, education, industry, telecommunications, feeding, urbanism, or information about the weather in a global level services. Therefore, it is necessary to encourage the investigation in this area in order to guarantee a correct integration of systems and to offer the sufficient confidentiality and operation guarantees to the users, taking account that the exchange of information is a crucial aspect in Telehealth.

The acceptability by the professionals also constitutes a current obstacle. The professionals need training and capacitation planes for the use of the new technologies of the sanitary services in order to guarantee a correct application of them. For that matter, it is also relevant to create guides, norms and protocols about how to introduce data in the sanitary information systems due to that in occasions many professionals introduce data with different criteria and focus, making it difficult to comprehend by other professionals or to compare it with other data. For example, in an electronic clinical history, the level of quality in a report of the professionals can vary when a standard criterion is not stablished, specially when free writing is allowed (Kapoor, 2014);

The security of the data and the confidentiality represent another important obstacle in Telehealth. Its development must be closely linked to the use of national and international legislation, since the development of technology in health, in its application, can lead to the vulnerability of the bioethical principles, particularly the justice and charity ones that were previously described. In this sense, the health professional that uses these devices has the obligation to secure that all the security norms and measures established to protect the confidentiality of the patient were applied (World Medical Association, 1999). However, still it is an aspect that requires a bigger analysis since, in occasions, the information doesn't fulfill the security and confidentiality criteria that are needed for the complexity of the new technologies and its integration in other systems.

Finally, from the social point of view, it mustn't be ignored that there are groups in the society with little or no access to the technology and, on the other hand, the accessibility of Telehealth to these groups must also be guaranteed. For example, those who live in places of difficult geographic access to a quality healthcare often belong to the sectors with lower incomes and with lower endowment of communications' infrastructure (Meza Bolaños, 2010). Finally, some of the concepts managed in technological environments aren't accepted by the whole population in simple terms. For example, (Ramos et al., 2009):

- People don't accept all that is technologically possible or that is available.

- The population needs certain capacities or abilities in order to acquire and use the technologies: money, time, abilities, aptitudes, language, etc., that are not homogeneously distributed among the population.

- The population can use the technologies in a very different way than what is planned by the providers (Internet, SMS…). New uses for the TICS that emerge as interaction of users and producers.

- The demand of the users is only covered if the price is attractive.

- There isn't a typical or of normal use product, but a diversity of uses and users. There is a difference among owners, users and those familiarized with the TICS. People have the technology but cannot use it, or they can use it, but don't have confidence in it.

The benefits of implanting the Telehealth system are many for all of the involved users: Hospitals, the Family Health Community Units. the Regional Health Management, the medical personnel and the users or the general population.

- Regarding the hospital, reduces the number of referrals of the population to medical centers

that are too far away from where they are from and allows the liberation of hospital resources (beds, consultations, etc.), by preventing unnecessary hospitalizations.
- It also avoids the displacement of the specialist doctors to the rural or remote zone, gaining time that can be applied in to caring for a bigger number of patients.
- It favors that the population goes to the health centers that is nearest to receive the required care, instead of being forced to travel to far away zones, with the consequent cost savings.
- The Telehealth tools encourages, moreover, the inclusion of the population inside the health system, and mitigate risks in case of emergencies.
- The Telehealth systems allow the formation of medical and technical personnel and elevates its personal and professional qualification, favoring the development of the country's human capital.

Thanks to the evolution of the telecommunications, nowadays it is possible to implement the Telehealth systems that get tangible and direct results, reducing the mortality and improving the life quality of the citizens. The return of the investment is bigger in the developing countries and in those that don't have a healthcare network with the sufficient capillarity.

If we want to improve the health systems it is necessary to include the technology as another technology of the service, specially the telecommunications big data technologies.

Challenges of the telehealth in El Salvador.

A first big challenge regarding e-health concerns the generation and strengthening of the institutionalism. By the resolution 91 from 2010 from the Health Ministry, it was created the management of the TIC, whose function is to administrate the informatics and communications equipment, as well as the planning and development of solutions for the strategic and quality information system in health in El Salvador [15]. In April of 2010 it was created a commission that had delegation to centralize the development of the group of existing systems in the MINSAL, through a ministerial agreement, with the prospect to orient them to the need of using free software in the development of new software [16]. If there is the conviction that the main role of telemedicine is to care for patients, then the project should be directed from a unit that provides health services. From this premise, whoever takes the management should be a unit that has the condition to evaluate the kind and quality of the provided care.

A second challenge is to expand the telemedicine network in the framework of the Health Ministry. Nowadays, the teams have the possibility to be installed over IP and, with a bigger technology, each center, office and department of consultation can be connected to the network. This can consolidate the development of the teleconsultation.

A third challenge is to integrate the service delivery of telemedicine with the data network of the distinct health centers, both public and private.

A fourth challenge is to spread the imaging services and integrate them to online services that are linked to the different hospitals and health units of the country.

A fifth challenge lies in the management of knowledge. On this is to equip each health professional of the needed knowledge for the use of the Communication Technologies in each health center.

A sixth challenge would be the management of economic resources. On this with a view to universalize Telehealth and therefore being able to reach farther places in the country and benefiting the patients. With this it would be able to achieve the break of the geographic barrier that the patients face in order to use the health services, providing them a care with quality and warmth.

A seventh challenge would be the creation of a legal framework that allows the security and the use of the users' information.

An eighth challenge would be to break the sociocultural barrier of the population regarding the use of the Communication and Information Technologies. In this sense it must be developed a national plan for how to use the informatics equipment from the state's institutions.

The development and implementation of the Information and Communication Technologies in the Health Ministry of El Salvador bases its strategy in the analysis, design, development and implementation of all the information systems in its establishments, as well as the gradual elimination and the dependence of private software and its substitution for the use and production of free and/or open code software tools. Thanks to this the achievement of technologic sovereignty is guaranteed, as well as an investment in efficient, effective and fundamentally sustainable technologies.

Conclusion

Although in El Salvador there isn't state policies that guarantee the implementation of Telehealth, from the Health Ministry, yes efforts have been developed in the framework of the Health Reform that has been implemented since 2009, from the creation of the Management of Information and Communication Technologies and the establishment of its institutional policies, as well as the budget location, that although hasn't been enough has allowed, as far as possible, the provision of equipment, technologies, modules and informatics systems, with palpable results in the institutional endeavors.

Some Telehealth forms can be identified in the Health Ministry, such as the Family Report Tablet version, Sanitary map, SIAP, tele-education, among others, that despite the

difficulties found in its implementation (network, teams, personnel attitude), we can highlight the advances that have contributed to guaranteeing the online health information, in real time, available for all the staff, both operative and analytic, as well as decision making, and from it to establish plans or strategies aimed to the improvement of the population's health. Moreover, it has facilitated the access to training and self training of the health personnel, in order to take health with quality and warmth to the whole population of El Salvador.

All of this has represented a positive impact in the results of health indicators of the country, being these achievements recognized, not only on a national level, but internationally as well. It is expected that with the change of authorities that nowadays live in the country and specifically inside the MINSAL, these advances can be strengthened and do not run the risk of a setback.

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