

Promoting telemedicine in Latin America in light of COVID-19

Francesc Saigí-Rubió¹

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ABSTRACT

The Faculty of Health Sciences at the Universitat Oberta de Catalunya (Barcelona, Spain) was officially designated a 'World Health Organization (WHO) Collaborating Centre in eHealth' on 5 April 2018. The Centre aims to provide support to countries willing to develop new telemedicine services; to promote the use of eHealth; and to study the adoption and use of mobile health in countries of both the Region of the Americas and Europe. On 11 March 2020, WHO declared COVID-19 a global pandemic given the significant increase in the number of cases worldwide. Since then, the Centre has played an important role in addressing COVID-19 by undertaking fruitful cooperative activities. Lockdowns and social distancing in response to the high contagion rate of COVID-19 were the main triggers for a challenging digital transformation in many sectors, especially in healthcare. In this extreme crisis scenario, the rapid adoption of digital health solutions and technological tools was key to responding to the enormous pressure on healthcare systems. Telemedicine has become a necessary component of clinical practice for the purpose of providing safer patient care, and it has been used to support the healthcare needs of COVID-19 patients and routine primary care patients alike. This article describes the Centre's contribution to the work of the Pan American Health Organization (PAHO) and WHO in supporting Latin American and European countries to develop new telemedicine services and guidance on how to address COVID-19 through digital health solutions. Future actions are also highlighted.

Keywords

COVID-19; Telemedicine; eHealth strategies; Latin America.

"Telemedicine is regarded as one of the major innovations in health services, not only from the technological but also from the cultural and social perspectives since it benefits accessibility to health care services and improves the quality of medical care and organizational efficiency" (1).

The results of the World Health Organization (WHO) Third Global Survey on eHealth underscore the need to develop national strategies and policies to illustrate potential modes of collaboration between the health and social sectors (2).

The Faculty of Health Sciences at the Universitat Oberta de Catalunya (UOC – Barcelona, Spain) has been carrying out training and research actions in the field of telemedicine since 2008. In collaboration with the Pan American Health Organization (PAHO)/WHO, many have focused on Latin America

with the common goal of promoting digital health worldwide. As a result of this collaboration, the Faculty of Health Sciences at the UOC was designated a 'WHO Collaborating Centre in eHealth' on 5 April 2018 to provide support to countries willing to develop new telemedicine services; to promote the use of eHealth; and to study the adoption and use of mobile health in countries of both the Region of the Americas and Europe.

A WHO Collaborating Centre is an institution such as a research centre, a faculty or a university institute designated by the WHO Director-General to carry out activities in support of WHO's programmes. There are currently 700 such centres located in more than 80 Member States. These collaborate with WHO on topics such as nursing, occupational health, communicable diseases, nutrition, mental health, chronic diseases and

¹ Faculty of Health Sciences, Universitat Oberta de Catalunya (UOC), Barcelona, Spain. ✉ Francesc Saigí-Rubió, fsaigi@uoc.edu

health technologies (3). This article describes the contribution of WHOCC-eHealth – to use its short name – to the work of PAHO and WHO in supporting Latin American and European countries to develop new telemedicine services and guidance on how to address COVID-19 through digital health solutions.

PAHO/WHO SUPPORT STRATEGIES

WHOCC-eHealth offers full support to regional initiatives led by PAHO’s Department of Evidence and Intelligence for Action in Health (EIH). This Department’s activities focus mainly on supporting those countries in the region that want to digitalise their health services. Through the ‘IS4H Basics’ initiative (4), PAHO establishes conceptual frameworks for decision-making, which, among other aspects, include those relating to policies, legislation, safety and workforce development. Within this framework of action, WHOCC-eHealth provides PAHO/WHO with empirical knowledge and technical contributions from a pragmatic, action-centred perspective. These include the set of systemic practices of telehealth, as well as its various explanatory dimensions beyond that of technology.

On 11 March 2020, WHO declared COVID-19 a global pandemic. It was then that PAHO undertook the development of a series of technical notes to help Latin American countries

overcome the pandemic through the appropriate use of information and communication technologies (ICTs). These technical notes covered various aspects aimed at addressing COVID-19 through the digitalisation of health services, and they offered guidelines as to how these new digital services should be projected and to what changes would be needed at political, legislative, technological, organisational and cultural levels. All of these technical notes are openly available from the COVID-19 Factsheets section on the PAHO Information Systems For Health website (5). WHOCC-eHealth’s participation is summarised in Table 1.

WORKSHOPS AND SEMINARS

On 13 May 2019, PAHO/WHO called upon WHOCC-eHealth and a group of experts to produce and announce, within the framework of a two-day Writeshop (18-19 June 2019), a PAHO Technical Note on the potential of Information Systems and Technologies to reach Indigenous peoples. A Writeshop is an intensive process aimed at bringing together a variety of significant stakeholders alongside drafting and editing experts to produce a publication or document in a very short space of time. The specific objective of the Writeshop was to develop a workspace to create an ideal vision, to discuss relevant topics

TABLE 1. Activities carried out by WHOCC-eHealth in support of PAHO/WHO strategies

	Technical notes	Workshops/seminars	Tools
2019		PAHO. The potential of Information Systems and Technologies to reach Indigenous peoples. Health Research and Education Collaborative Networks. Washington DC, USA. 2019. Academic Network of Public Health Postgraduates. RITMOS Workshop Ecuador 2019. Quito, Ecuador. 2019	
2020	Teleconsultations during a pandemic. Electronic Health Records (EHR) and Interoperability: Understanding two key concepts for a better Public Health response. Understanding the Infodemic and Misinformation in the fight against COVID-19. The potential of frequently used information technologies during the pandemic. Why Data Disaggregation is key during a pandemic.	PAHO. COVID-19: The Potential of Digital Health and Health Information Systems in the Fight Against the Pandemic. Internet. 2020 Uruguayan Society of Telemedicine. Second International Telemedicine Forum Montevideo 2020: Telemedicine after Coronavirus. Montevideo, Uruguay. 2020	PAHO. COVID-19 and TELEMEDICINE Tool for assessing the maturity level of health institutions to implement telemedicine services.
2021	Digital Health: A Strategy to Maintain Health Care for People Living with Noncommunicable Diseases during COVID-19. COVID-19 Information Systems and Digital Health: After-Action Review of the First 100 Days in Quarantine. Webinar Series, Share-Listen-Act, COVID-19: The Potential of Digital Health and Information Systems for Health (IS4H) in the Fight against the Pandemic. COVID-19 and the role of information systems and technologies at the first level of care. COVID-19 and the importance of strengthening Information Systems. Introduction to Semantic Interoperability. Artificial Intelligence in Public Health.	UOC. Lessons from the pandemic: more international collaboration, better health. A session of the eHealth What If Forum 2021 What if the digitalization accelerated by COVID-19 enabled us to transform health systems? Internet. 2021 PAHO. From the evolution of Information Systems for Health to the Digital Transformation of the Health Sector. Internet. 2021	PAHO. Rapid Assessment Tool for Critical Data Gathering. PAHO. Tool for assessing the maturity of mobile health applications under development. PAHO. Tool for assessing the suitability of mobile health applications

Source: Own elaboration from the data carried out by WHOCC-eHealth

and to produce a set of recommendations aimed at promoting the adoption of Information Systems and Technologies to improve Indigenous people's health and healthcare. The solutions proposed in this document had to be aligned to the specific cultural and health system needs of the population, and also be technologically appropriate within the limits of the social, cultural, environmental and economic conditions of the setting to which they would be applied. Also proposed was a series of recommendations for policies, funding, research and education, together with the implementation of continuous monitoring and assessment of the process in order to evaluate and adjust service operation.

On 1 June 2019, in the grips of the COVID-19 pandemic, PAHO's Department of Evidence and Intelligence for Action in Health, in collaboration with the Inter-American Development Bank's (IADB's) Health and Social Protection Division and Latin American networks, launched the Share-Listen-Act webinar series, 'COVID-19: The Potential of Digital Health and Health Information Systems in the Fight Against the Pandemic', where WHOCC-eHealth presented the seminar 'COVID-19 and Telemedicine: Ready, steady, click'. This initiative was designed to help Latin American countries to implement and deploy telemedicine effectively in their health systems (6).

Many of the seminars and workshops developed by WHOCC-eHealth were also delivered in the framework of the RITMOS network, where RITMOS stands for Red de Investigación en Tecnologías Móviles en Salud in Spanish, or Research Network on Mobile Technologies in Health in English. The RITMOS network is a project led by the UOC and funded by the CYTED Ibero-American Program of Science and Technology, which brings together 90 researchers from 22 research teams at universities, hospitals, firms and public sector bodies across 11 countries (Spain, Argentina, Bolivia, Chile, Colombia, Ecuador, Honduras, Mexico, Peru, Uruguay and the United States). Supranational bodies such as PAHO/WHO and Doctors without Borders also participate in it. The aim of the network is to strengthen ties between universities, society, the technology sector, health and healthcare providers, medical professionals and health authorities to promote and normalise the use of mobile technologies in health services (7). The 'RITMOS Workshop Ecuador 2019' took place in Quito on 21 November 2019, an event led by the RITMOS network. In this event, the presentation and discussion of different eHealth experiences developed in Ecuador and other Latin American countries contributed to the design and implementation of Ecuador's National eHealth Strategy and served as a basis for initiating the process of preparing a Telemedicine Law Project in Ecuador (8).

The 'Second International Telemedicine Forum Montevideo 2020: Telemedicine after Coronavirus' took place in Uruguay on 29-30 June, an event delivered in the framework of the RITMOS network together with the Uruguayan Society of Telemedicine. This event focused on the use of telemedicine and mobile health in Latin American countries during the pandemic and discussed its potential and the obstacles encountered. This event also served to launch the study on international telemedicine in Uruguay, a project financed by the Inter-American Development Bank (9).

PAHO held the Information Systems for Health (IS4H) Conference 'From the evolution of Information Systems for Health to the Digital Transformation of the Health Sector' on 9-16 February 2021. Its aim was to create, among the countries of the

Region of the Americas, a dialogue of reflection on their experiences with respect to their information systems and digital health during the COVID-19 pandemic, and also within the framework of the PAHO IS4H Action Plan. As a result of the conference, PAHO published Eight Guiding Principles of Digital Transformation of the Health Sector: A Call to Pan American Action, aimed at guiding countries of the Region of the Americas in the processes of digital health transformation (10).

Finally, in the framework of the UOC eHealth Center and the RITMOS network, the 'Lessons from the pandemic: more international collaboration, better health' session of The What If eHealth Forum 2021 entitled 'What if the digitalization accelerated by COVID-19 enabled us to transform health systems?' took place on 1 December 2021 at the UOC eHealth Center with the aim of strengthening collaboration between and with the countries of Latin America and the Caribbean region. This session was broadcast over the Internet and included several interviews with experts from the Central American Health Informatics Network (RECAINSA), Continental University in Peru, the Ministry of Health of Colombia, and the Italian Hospital of Buenos Aires (11).

TELEMEDICINE SOLUTIONS TO ADDRESS COVID-19

In order to develop, implement and deploy telemedicine in Latin America, two key aspects must be taken into account: firstly, that telemedicine legislation varies by country, and secondly that any health institution interested in implementing telemedicine services should assess its level of maturity before doing so. For the purposes of the latter, PAHO and the IADB, in collaboration with WHOCC-eHealth and other institutions and experts in telemedicine and information technology (IT) use in the field of public health from the Region of the Americas, created a tool to measure the maturity level of health institutions to implement telemedicine services (11,12).

WHOCC-eHealth has also been actively involved in the development of the Rapid Assessment Tool for Critical Data Gathering designed to rapidly assess health and health-related institutions and evaluate their capacity to gather critical, high-quality data in the COVID-19 pandemic response. The tool assesses institutional commitment to the timeliness and quality of data used for decision-making at all levels. It facilitates self-assessment to redefine pandemic priorities, identifies the capacity gap within international, national and subnational data systems, and assesses the ability to provide reliable and constructive data (13).

Finally, to contribute to PAHO's work on implementing mobile health-related policies, two tools have been developed: one aimed at guiding the healthcare organisations of the Region of the Americas in the design and development of mobile health applications, and the other aimed at assessing the suitability of mobile health applications based on quality criteria. Both tools, which are intended to become part of the IS4H toolkit developed by PAHO for the region, have been tested and assessed, and the results are ready to be published.

SCIENTIFIC RESEARCH AND PUBLICATIONS

Generating research-based evidence and spreading knowledge are essential tasks for any WHOCC. In order to promote the use of eHealth in the countries of the region of the Americas,

one of the Terms of Reference (TOR) established by the WHO, and in collaboration with the PAHO Digital Health Strategy in the Region of the Americas, was to design and validate a shared health model (Sharing Health) and to study how it could contribute to reducing social inequalities in health. A Sharing Health model based on the use of digital platforms has been developed. Blood donation via digital platforms was used as a case study for new strategies to recruit blood donors and foster donation given the restrictions imposed during the COVID-19 pandemic (14).

WHOCC-eHealth also investigated eHealth's relationship with robotics and artificial intelligence (IA). To that end, a Eurobarometer database of 28,000 users was used to analyse people's main motivations and their trust in robotics and IA devices in healthcare (15).

The COVID-19 pandemic has thrown up many challenges for health services worldwide, and it has led to one of the century's greatest social crises. It has also been a test of the maturity of digital health technologies, whether for front-line care, surveillance or the discovery of new strategies. In mid-2020, the WHO Regional Office for Europe asked for WHOCC-eHealth's technical support to carry out an overview of the application of digital data and solutions to support surveillance strategies and draw implications for surveillance in the context of the COVID-19 pandemic and beyond. The resulting report was produced in conjunction with the University of Utah School of Medicine and University College London (16).

In late 2020, the WHO Regional Office for Europe again asked for WHOCC-eHealth's technical support to carry out a second study, in this case on the requirements for improving routine health information systems (RHIS) for health systems management, including the identification of best practices, opportunities and challenges in the 53 countries and territories of the WHO European Region (17)(18)

The COVID-19 pandemic has underscored the urgent need for health services that are resilient, coherent and strong in terms of the ability to anticipate, prevent, detect and effectively prepare for health threats such as those potentially resulting from climate change and future epidemics. These services also need to be aligned with the Sustainable Development Goals (SDGs) (19). In mid-2020, the IADB asked WHOCC-eHealth to conduct a study on the possibilities of developing international telemedicine in Latin America and setting out some strategy and public policy recommendations to drive their adoption (20). We understand international telemedicine or cross-border telemedicine to be the use of ICTs to enable the transfer of medical information for diagnostic, therapeutic and educational purposes among professionals and between professionals and patients living and working in different countries. Besides the advantages of national telemedicine, the international dimension provides access to a much larger network of specialists that may make up for any care shortcomings or weaknesses of the recipient countries, thereby improving patient access to health services and offering better quality care (9).

NEW OPPORTUNITIES AND CHALLENGES

While telemedicine can significantly improve health-care access, use, quality and results, it is crucial to have staff trained in telemedicine to make this possibility a reality. In Latin America, there is an unmet need with regard to training

professionals in telemedicine. In addition, there are significant barriers to telehealth standardisation and to its full consolidation and expansion, and it continues to have little more than a token presence in clinical and healthcare settings in the Americas and the wider world. WHOCC-eHealth has become a highly specialised centre in the field of eHealth and, as such, it intends to respond to the needs and objectives of PAHO and WHO effectively and efficiently, thereby broadening its contribution to the development of digital health in the future. In order to assist PAHO and WHO with their activities, among WHOCC-eHealth's objectives for the 2022-2024 period is the provision of technical support to develop relevant training materials and learning objects. These materials should assist the Member States in their effort to incorporate telemedicine into their national plans and improve its use throughout the Regions of the Americas and Europe. Likewise, it will provide technical support for the design, development and implementation of tools and technical guides related to telehealth and the reduction of social inequalities in health in the Regions of the Americas.

DISCUSSION

In Latin America and Europe, telemedicine allows people to access medical services in remote areas or in places where experts are in short supply. It is presented as a practical option to narrow the health divide and address problems related to health inequality between and within countries, and to combat climate change and its impact (21,22), thereby accelerating the achievement of SDGs 3, 13 and 17, and helping to achieve SDGs 4, 5, 8, 9, 10 and 16. There is a large number of studies showing a correlation between well-being and the development of telemedicine services (23)(24). The social-distancing measures imposed as a result of the COVID-19 pandemic, together with a lack of specialists and, on occasions, the sheer size of a country are factors that have driven the implementation of a variety of new telemedicine services in health systems to improve the health situation of populations (25–29). The potential of telemedicine services to mitigate the consequences of the COVID-19 pandemic has been widely acknowledged (30), so much so that telehealth has been described as a “virtually perfect solution” to COVID-19 (29)(31). However, despite the fact that healthcare services can largely be provided remotely via digital technologies (32), this change has not become fully consolidated (33). It is within this context that PAHO and WHO, together with Collaborating Centres like WHOCC-eHealth, have a significant role to play in their definitive normalisation. On this particular point, there is a manifest need to improve knowledge of the processes, critical factors and strategies for integrating ICTs in general, and telemedicine in particular, into healthcare systems by identifying what transformations occur in the ICT-organisation interaction (34). Having reached this position, it is important for Collaborating Centres to help PAHO and WHO in one way or another to influence decision-making at a political level, both nationally and internationally.

This manuscript presents in a descriptive way all the actions carried out within the framework of the WHO Collaborating Center. Even though an attempt has been made to structure the information in a way that facilitates its comprehension, its exposition does not always follow a logical thread. Another aspect to bear in mind is that the more analytical studies derived from

the WHOCC-eHealth actions are presented in the different publications cited. Nevertheless, all the actions presented here are useful for the understanding the challenge of providing all the evidence and support that PAHO and WHO need for the formulation of strategies to enable widespread adoption of telemedicine.

In the various initiatives led by PAHO and WHO to foster the development and implementation of new telemedicine services, Collaborating Centres like WHOCC-eHealth collaborate with research on how to mitigate potential barriers and risks.

Collaborating Centres like WHOCC-eHealth may assist PAHO and WHO actions with the design of dynamic approaches to the use of telemedicine interventions in Latin America and Europe.

Conflicts of interests. None declared.

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Fomentar la telemedicina en América Latina en vista de la COVID-19

RESUMEN

La Facultad de Ciencias de la Salud de la Universitat Oberta de Catalunya (Barcelona, España) fue oficialmente designada centro colaborador de la Organización Mundial de la Salud (OMS) en el ámbito de la salud digital (también denominada “cibersalud” o “eSalud”) el 5 de abril del 2018. El centro está destinado a prestar apoyo a los países que deseen crear nuevos servicios de telemedicina, promover el uso de la salud digital, y estudiar la adopción y el uso de la salud móvil en países de la Región de las Américas y Europa. El 11 de marzo del 2020 la OMS declaró la COVID-19 una pandemia mundial dado el aumento significativo del número de casos en todo el mundo. Desde entonces, el centro ha desempeñado un papel importante en la respuesta a la COVID-19 mediante la realización de fructíferas actividades de cooperación. Los confinamientos y el distanciamiento social en respuesta a la alta tasa de contagio de la COVID-19 fueron los principales desencadenantes de una compleja transformación digital en muchos sectores, especialmente en la atención de salud. En esta situación de crisis extrema, la rápida adopción de soluciones digitales y herramientas tecnológicas fue clave para dar respuesta a la enorme presión sobre los sistemas de salud. La telemedicina se ha convertido en un componente necesario de la práctica clínica con el fin de proporcionar una atención más segura a los pacientes, y se ha empleado para apoyar las necesidades de atención de salud de los pacientes con COVID-19 así como los pacientes habituales de los servicios de atención primaria. En este artículo se describe la contribución del centro a la labor de la Organización Panamericana de la Salud (OPS) y la OMS al prestar apoyo a los países de América Latina y Europa en la creación de nuevos servicios de telemedicina y brindar orientación sobre cómo abordar la COVID-19 con soluciones digitales de salud. También se destacan las acciones futuras.

Palabras clave COVID-19; telemedicina; estrategias de eSalud; América Latina.

Promoção da telemedicina na América Latina frente à COVID-19

RESUMO

A Faculdade de Ciências da Saúde da Universitat Oberta de Catalunya (Barcelona, Espanha) foi oficialmente designada, em 5 de abril de 2018, “Centro Colaborador da Organização Mundial da Saúde (OMS) em eSaúde”. O centro tem como objetivo prestar apoio aos países dispostos a desenvolver novos serviços de telemedicina; promover o uso da eSaúde, ou saúde digital; e estudar a adoção e o uso da saúde móvel em países da Região das Américas e da Europa. Em 11 de março de 2020, a OMS declarou a COVID-19 como pandemia global, dado o aumento significativo do número de casos no mundo inteiro. Desde então, o centro tem desempenhado um papel importante no enfrentamento da COVID-19, empreendendo atividades frutíferas de cooperação. Os *lockdowns* e o distanciamento social em resposta à alta taxa de contágio da COVID-19 foram os principais desencadeadores de uma transformação digital desafiadora em muitos setores, especialmente na área da saúde. Neste cenário de crise extrema, a rápida adoção de soluções digitais de saúde e ferramentas tecnológicas foi fundamental para responder à enorme pressão sobre os sistemas de saúde. A telemedicina se tornou um componente necessário da prática clínica, com o objetivo de oferecer um atendimento mais seguro aos pacientes, e tem sido usada para apoiar as necessidades de saúde tanto dos pacientes com COVID-19 como dos pacientes da atenção primária de rotina. Este artigo descreve a contribuição do centro para o trabalho da Organização Pan-Americana da Saúde (OPAS) e da OMS no apoio aos países latino-americanos e europeus para desenvolver novos serviços de telemedicina e orientação sobre como enfrentar a COVID-19 por meio de soluções de saúde digitais. Ações futuras também são destacadas.

Palavras-chave COVID-19; telemedicina; estratégias de eSaúde; América Latina.
