TELEMEDICINE DURING THE COVID-19 PANDEMIC: THE CASE OF URUGUAY

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Abstract

Telemedicine has been an important resource for achieving universal health coverage and mitigating access problems. The health crisis that arose as a result of the COVID-19 pandemic poses the challenge of increasing its incorporation and appropriation by users. This paper describes the use of telemedicine in Uruguay in the context of the pandemic, analysing the regulatory framework and the perception of health system users. **Methods**: We used information collected through interviews with qualified informants linked to the health system and two surveys, 2020 and 2021, on health and access to medical care during the pandemic in Uruguay. **Results**: During the health crisis, almost half of consultations were implemented through telemedicine. However, both users and institutions recognised that this modality was mainly carried out through telephone consultations, with great heterogeneity among providers. One of the possible problems of telemedicine refers to who defines the modality: the physician, the patient or the health centre, or whether it should be defined jointly. The survey results show that the consultation modality was mainly defined by users. Patients with chronic non-communicable diseases and those older than 54 years were among those who used non-face-to-face consultations the most. **Conclusions**: Telemedicine allowed for continuity of care during the COVID-19 pandemic in Uruguay. However, the surveys conducted and the available data show disparities in its use related to age, gender and health coverage, indicating that although it has potential, special attention should be paid to the supply and demand barriers that may arise in its implementation.

Keywords: telemedicine; COVID-19; telephone; Uruguay

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Introduction

The use of information technologies for medical care adopts a wide range of definitions: eHealth, telehealth, telemedicine and remote health care. All of them refer to the provision of health services through the use of information and communication technologies, when distance is a critical factor. It can be applied to the diagnosis, treatment and prevention of diseases and injuries, research and evaluation, and professionals' continuous training, in order to improve individuals and their communities' health.[1] Remote interactions can be synchronous (e.g., by telephone or video call) or asynchronous (e.g., when there is communication via email, text messaging, web and phone applications).[2]

Telemedicine was used during the health crisis caused by COVID-19, making it possible to continue providing care in the context of social distancing. Institutions adapted and improved existing processes, developed new technologies, and trained staff and users in order to extend its use. Beyond these circumstances, telemedicine was strengthened as a healthcare modality, highlighting its potential for the future. It allows geographically dispersed users to easily connect to get a second medical opinion and enhances efficiency. When the pandemic is over, in order to grasp telemedicine's growth, it will be necessary to maintain an adequate technological infrastructure and trained human resources, promote regulation, and develop well-designed payment systems, among others.

Telemedicine has some positive externalities. Firstly, it can facilitate remote decision-making to triage patients. In the context of the pandemic, it favours voluntary isolation to protect patients, physicians and the community from virus exposure. In normal situations, it increases the efficiency of the systems, as it enables the use of screening algorithms in diagnosis and admission processes.[3] Secondly, it has the potential to improve patients' education for detecting symptoms, foster preventive behaviours, favour early

detection of diseases, etc. As a result, health system costs may decline.

However, telemedicine can deepen inequalities if there are demand and/or supply barriers that are not taken into account when designing or implementing it. When proposing new models for telemedicine development, several issues must be taken into account. These include an ageing population, socioeconomic level, health status (visual, hearing, motor and cognitive impairments, prevalence of chronic diseases), specific technological skills, limited budgets, organisational, physical and technological characteristics, and cultural context.[4]

Regulatory context

Uruguay has a National Integrated Health System (SNIS for its acronym in Spanish, Law No 18.211), which guarantees the right to healthcare for all residents through public or private providers.[5] The system is covered by a National Health Insurance (SNS for its acronym in Spanish) scheme that is funded by mandatory contributions from workers, retirees, and employers. It finances healthcare for workers, retirees and their families at any of the SNIS providers. The SNIS has public providers (Administración de los Servicios de Salud del Estado, ASSE for its acronym in Spanish), private providers (Instituciones de Asistencia Médica Colectiva, IAMCs for its acronym in Spanish) and private insurance companies. Seventy-two per cent of the population is covered by the SNS, who mostly opt for private providers (80%). Within the latter, a small proportion corresponds to private insurance, which is only partially funded by the SNS. Population not covered by the SNS are either privately affiliated to providers or are free beneficiaries of public providers. The Constitution of Uruguay establishes that the State guarantees free health care through the public provider (ASSE) to all those who lack sufficient means.

Prior to the pandemic, there were few regulations regarding telemedicine. In 2020, the health authority took a series of measures in order to rationalise available resources (Resolution No 2 JUNASA of March 15, 2020; Ordinance N° 1.591/020). Citizens were urged to minimise hospital visits and healthcare providers were encouraged to use alternative means of care, including telephone and video consultations.

In April 2020, a specific telemedicine law was approved for the first time in Uruguay (Law No 19.869). It defines telemedicine in line with World Health Organization's proposition, and establishes its principles, namely: universality, equity, quality of service, efficiency, decentralisation, complementarity and confidentiality. During 2020 and 2021, a series of resolutions were issued giving guidelines to institutions depending on the specific health situation.

The aim of this paper is to describe telemedicine use in Uruguay in the context of the pandemic, analysing the regulatory framework and the perception of health system users.

Methods

In order to understand the effects in medical care during the pandemic in Uruguay, we conducted two surveys on health and healthcare access (ESAC, for its acronym in Spanish) in which participants gave informed consent before answering the survey.[6,7] We implemented a specific survey covering the subject using SurveyMonkey that included multiple choice questions. The first survey collected data regarding these issues between March 13 and May 30, 2020 and the second one between January 1 and May 31, 2021. The first period refers to the beginning of the pandemic, characterised by a limited number of cases and strong compliance with social distancing measures. The second period was characterised by higher levels of mobility and COVID-19 rates.

Surveys were carried out as a web-based self-administered questionnaire to individuals over 18 years old residing in Uruguay. Individuals were recruited by promoting the surveys in the institutional website and social media, and promoted in Facebook (through targeted ads). A total of 1,750 and 1,569 surveys were collected in both periods respectively. The use of the Internet as a method of data collection has as advantages high speed and low cost. However, selection bias due to education level attainment, age, social networks' usage, etc. can arise. To deal with these problems, there are various methods such as ranking, propensity weighting and matching.[8-10] However, the literature shows that the key is to find appropriate variables when weighting the sample data, which must be available and their population distribution known.

For both surveys, weights associated with the probability of selection of individuals were developed based on three characteristics: gender, education level attainment and region of residence. The weight is equal to the inverse of its probability of inclusion, therefore it is equal to the percentage of group i defined by the variables mentioned in the 2011 Population Census and the percentage of said group in each survey.

Moreover, we conducted four semi-structured interviews with qualified informants from to the health system that accepted to participate in the study, in order to learn about the experience from the providers' perspective. These informants were involved in telemedicine as providers or software developers. During the interviews we took notes and covered their perspective on technological and information developments regarding telemedicine, clinical history remote access, telemedicine use by medical specialty, payment systems differences between face-to-face and non face-to-face consultations, and current regulation and protocols regarding telemedicine use. All interviewees gave informed consent.

Results

The Ministry of Public Health (MSP for its acronym in

Table 1: Selected healthcare indicators by subsector and region, April 2020 to September 2020.

	Private providers (IAMCs)		Public provider (ASSE)		
Indicators	**Montevideo**	**Rest of the country**	**Montevideo**	**Rest of the country**	**Private insurance**
Number. of beneficiaries	1,255,144	883,702	393,714	1,015,236	104,420
Percentage > 64 years of age	17.0	17.7	13.0	12.3	10.2
Years Aging index	1.1	0.9	0.7	0.6	0.5
Face-to-face consultations (urgent and non-urgent) at home or in the office per member	3.0	3.6	2.4	2.0	4.9
Non-face-to-face consultations (telemedicine) per member	1.9	1.7	0.9	1.0	2.1
Outpatient consultations (face-to-face and non-face-to-face) per member per year	4.9	5.3	3.3	3.0	6.8
Number of institutions	11	25	1	18	6

Source: National Information System, Ministry of Public Health (MSP). Note: Ageing index: ratio of affiliates >64y over affiliates <15y. Consultations correspond to the average per affiliate in the semester.

Spanish) began reporting data relative to healthcare modality in April 2020, showing differences by type of institution and region. The public provider has a lower average number of consultations, around three (individual/year), one of them being in a non-face-to-face modality. On the other hand, private providers have an average of between three and five consultations (individual/year); two of them are non-face-to-face, depending on the region and type of provider. (Table 1)

Interviews with qualified informants linked to the sector showed that medical institutions mostly adopted two strategies: hiring services from an application developer for the implementation of telemedicine (acquiring a standardised product) or developing their own software adapted to their specific needs.

Most of the informants indicated that during the pandemic, telemedicine took place mainly through telephone consultations since the use of the video-call system was incipient. Applications developed varied between adding the video-call function and including other functionalities such as registering data in the medical history, issuing prescriptions, and requesting studies, among others. There seems to be great heterogeneity among providers in terms of the use of information and communication technologies. For example, not all institutions were able to issue electronic prescriptions or use digital payment systems. Although the pandemic accelerated some of these processes, disparities persist.

The adequacy of telemedicine for different medical specialities and instances of clinical contact was also highlighted in the interviews. Regarding the specialities, psychiatry and imaging were able to enhance the use of the tool. Moreover, qualified informants indicated that the usefulness of remote consultation depends on whether it is a first contact or a follow-up visit, if there is a need to examine the patient, if it is necessary to repeat medications or indicate paraclinical studies, among others.

As mentioned above, modality is also affected by demand factors. In this regard, the 2020 and 2021 ESACs provided information on the level of concern of the Uruguayan population regarding the specific moment of the pandemic. In 2021 41% of people said they were quite or very worried at the beginning of the pandemic, increasing to 50% at the time of the survey.

When consulted about the medical care they received in 2021, 63% said that they needed or had scheduled a medical consultation during the period, and 87% of them were able to have at least one in any modality. In 2020, these percentages were 34% and 77%, respectively (Table 2). In general, more women indicated needing or having scheduled a consultation than men, as well as those over 65 years old and those with non-communicable diseases (NCDs). The latter, as well as private health insurance users, had greater access to consultations.

Table 2: Access to medical consultations in polyclinic (%).

	2020	**2021**
Needed a consultation	34 [26-41]	63 [55-70]
Accessed at least one consultation	77 [69-85]	87 [81-94]

Source: Own elaboration based on ESAC 2020 and ESAC 2021. 95% confidence intervals in parentheses.

ESAC 2021 allows for an in-depth study of some specific aspects of telemedicine. Almost half of the consultations were through this modality, mainly telephone consultations chosen by the health provider. In turn, face-to-face consultations were mainly chosen by the individual (48%). (Table 3)

Table 3: Who defined the modality of the consultation by modality (%).

2021		
	Telemedicine	On-site
Defined by the person	35 [23-46]	48 [39-58]
Defined by the health centre	64 [52-75]	48 [39-58]

Source: Prepared by the authors based on ESAC 2021. 95% confidence intervals in parentheses.

When analysing individual characteristics, the 55-64y age group showed the highest proportion of non-face-to-face consultations (59%), with those aged 54 y or more having the highest prevalence of diagnosed medical conditions in the sample (82%). In the same line, 70% of the total number of consultations made through telemedicine corresponded to patients with a diagnosed non-communicable disease (NCD).

As shown in Table 4, the main reason for consultation in telemedicine was medication repetition (68%), while for face-to-face consultations, it was "feeling sick" (58%). The medical specialities consulted also showed differences. Consultations to general medicine and clinical specialities had a higher percentage of telemedicine, while surgical and gynaecological specialities presented a higher percentage of face-to-face consultations.

Table 4: Reason for consultation and medical speciality consulted by modality (%).

	2021	
Reason for inquiry	**Telemedicine**	**On-site**
Repeat medication	68 [52-85]	29 [13-46]
Routine control	47 [41-54]	50 [44-57]
Delivery of analysis results	57 [48-66]	43 [34-52]
I felt sick, I felt unwell	37 [20-54]	58 [41-75]
Medical speciality consulted		
General Practitioner/Internist	56 [40-73]	38 [22-55]
Gynaecologist	42 [34-50]	58 [50-66]
Surgical Medical Specialty	20 [13-26]	80 [73-86]
Clinical Specialty	61 [53-69]	38 [30-45]
Other	45 [31-59]	49 [36-63]

Source: Prepared by the authors based on ESAC 2021. 95% confidence intervals in parentheses.

In terms of satisfaction, those who had telemedicine consultations reported a lower level than those who had face-to-face consultations. This is particularly true with respect to the outcome of the consultation and the possibility of transmitting to the physician what was happening. (Table 5)

Finally, there was a higher level of satisfaction among private insurance users in several aspects of care, such as problem solving, physician's treatment and in the possibility of coordinating the consultation without major difficulties or delays.

Discussion

Telemedicine has demonstrated its potential to achieve universal health coverage and improve equity of access. Public health crises, such as the COVID-19 pandemic, pose the challenge of increasing diffusion and incorporation speed. Telemedicine consolidation needs to address the supply and demand barriers mentioned above, such as investment in technological infrastructure; information systems improvement (electronic medical records, definition of clinical content standards, development of care indicators, etc.) and working on digital literacy barriers.

On the supply side, both medical centres and specialised companies responded by adopting digital tools and technologies. The aim was to provide timely care while minimising exposure in order to protect healthcare workers and patients. However, this integration has been uneven, affected by technical barriers (technological infrastructure, Internet access, accreditation and staffing of medical and IT specialists), financial barriers (associated with payment systems), regulatory and organisational barriers.[11]

Given that the technological infrastructure includes both the environment and portability elements (equipment, access, information technologies, systems and processes, sustainability and trained personnel), implementation costs may imply an economic barrier. Evidence points to the importance of incorporating mobility, usability, adaptability and interoperability features into the infrastructure, as well as security. In fact, the vulnerability of some applications, such as Zoom, shows that ensuring privacy and security while handling personal data is key.[12]

As for payment systems, they can constitute a financial barrier, and appropriate incentives should be designed, taking into account the differences between medical specialities.[13,14] Differences between face-to-face and non-face-to-face consultations should also be taken into account. Moreover, training programmes and further development of protocols are needed to facilitate the transition of physicians to online healthcare delivery methods.[15] These issues should be addressed by the regulator from a comprehensive policy.

Table 5: Satisfaction with medical care received, by modality.

2021		
Question	**Telemedicine**	**Other consultation modalities**
I managed to solve what I needed	4.1 [4.0-4.3]	4.5 [4.3-4.7]
I was able to tell the doctor what was happening to me	4.2 [4.0-4.4]	4.6 [4.5-4.8]
The treatment I received from the doctor helped to solve what I needed	4.3 [4.1-4.4]	4.5 [4.4-4.7]
Overall, I was satisfied with the outcome of the consultation	4.1 [3.9-4.3]	4.5 [4.3-4.6]
I managed to coordinate the consultation without major difficulties or delays	4.1 [3.8-4.3]	4.3 [4.1-4.5]

Source: Prepared by the authors based on ESAC 2021. 95% confidence intervals in parentheses. Scale 1 to 5, where 1 is "Not at all agree" and 5 is "Strongly agree".

From the demand side, patients play a key role in the effectiveness of telemedicine, but there are barriers associated with their socioeconomic level, health status and specific technological skills, which affect the quantity and quality of this consultation type.[16,17] The digital gap, understood as differential Internet access based on social and economic factors, is a real factor that impedes telemedicine.[18] This may be a particular problem for older cohorts, even more in an ageing society such as Uruguay's where 14.4% of the population is over 65 years old. According to Chá, they have at least one NCD, pointing out the potential of telemedicine in this case.[16]

Other key aspects are Internet access, Wi-Fi signal and bandwidth connectivity.[19,20] Uruguay is in good condition in terms of infrastructure and Internet access. More than 61% of the population live in households with a telephone, and cell phone penetration is over 90%.[21] Regarding Internet connection, 88% of households have access, while 71% do so through a broadband connection. In particular, the high penetration of Internet connectivity in all income quintiles stands out, from 84% of households in the lowest income quintile to 95% in the highest. Furthermore, there is a reduction in the gap between households of higher and lower socioeconomic levels, from 66% in 2010 to 11% in 2019.[22]

Conclusions

Historically, telemedicine has emerged as an important resource for achieving universal health coverage and improving equity in access to medical care. During the COVID-19 pandemic, it provided continuity of care in a context of mobility restrictions. However, surveys and available data show disparities in its use related to age, sex and health coverage.

In this regard, we believe that in order to increase diffusion and appropriation of telemedicine by users, supply and demand barriers should be addressed. First, investment in technological infrastructure should be made, and information systems should be improved (electronic medical records and system interoperability). Second, protocols should be defined, especially regarding the appropriate type of consultation considering medical speciality and patient characteristics, as well as establishing checklists to ensure that virtual consultations meet the same quality standards as face-to-face ones. Finally, it is important to mitigate digital literacy barriers by automatic identification of patients who require prior support for a successful telemedicine consultation.

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