

Telecare in the Brazilian Unified Health System: where we are and where we are heading

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Abstract *This article explores telecare from telehealth developments and the recent acceleration of the digital health transformation caused by the COVID-19 pandemic, focusing on the Brazilian Unified Health System (SUS). It addresses terminological issues, the scope of actions, the potential use for healthcare, and constraints and contingencies for telecare in Brazil, focusing on teleconsultations and interactions between health professionals and patients. Finally, it presents a set of propositions for the development of telecare policies and practices in Brazil, considering SUS principles, in two central themes: organizational political guidelines and operational propositions to organise services and healthcare delivery. The importance of clarifying the scope and limits of new technologies is highlighted in the attempt to avoid idealizations with proposed solutions to complex health problems. Telecare solutions should be compatible with SUS principles and with the recommended model of care, with the healthcare network coordinated and organised by primary care, ensuring access to health services and integrated and quality healthcare for the Brazilian society.*

Key words *Remote consultation, Telehealth, Digital health, Patient care, Unified Health System*

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Introduction: from telehealth to telecare

Until the mid-20th century, non-face-to-face communication between healthcare professionals and patients was mediated by letters or telephone. Information and communication technologies advancements were progressively incorporated into healthcare, including messages and video calls¹.

Digital health, as envisaged by the World Health Organization (WHO)², encompasses functionalities and applications, such as the analysis of large amounts of data, artificial intelligence, electronic health records, clinical decision support systems, among others³. Mobile health or mHealth refers to the use of wireless devices to provide health care, such as cell phones, tablets and monitoring devices⁴.

Telehealth, one of the digital health modalities, has been established internationally for at least a century⁵. However, its development as healthcare policy and strategy in the Brazilian Unified Health System (SUS) has only grown significantly since 2000s, with educational, training, diagnostic and monitoring purposes⁶. Examples of telehealth modalities include telediagnosis, teleconsulting and tele-education. Telecare, the focus of this article, brings together telehealth actions aimed to provide direct patient care at a distance mediated by different technologies (Figure 1).

The successful implementation of telehealth centers in Brazil began in 2007, with an important role played by the federal universities spread across the country. Telehealth low uptake by health professionals, especially medical doctors, together with the incipient integration of telehealth services with healthcare networks and access regulations constituted important challenges up to the mid-2010s⁸. Until 2020, telehealth was predominantly characterized by the interaction between healthcare professionals, although there were informal virtual care experiences and mobile emergency services involving interaction between healthcare professionals and patients.

The COVID-19 pandemic caused a global shift to virtual interactions between healthcare professionals and patients, here called telecare, sometimes supported by formal recommendations⁹. In Brazil, the pandemic scenario reversed norms that initially restricted telecare^{10,11}. Teleconsultations, a telecare modality with focus on clinical care, were developed in record time to ensure healthcare provision for the population, using telephones, instant messaging and video

calls¹². These decentralized and disjointed initiatives, often utilizing platforms that did not meet security requirements, aimed to guarantee access to care at distance¹¹.

Clinical effectiveness, safety, acceptance and benefits of telecare have been evidenced as long as technical, clinical and digital literacy requirements are met, without denying the limitations that this modality of care offers^{13,14}. It is difficult to state the exact global reach of telecare, both due to its recent exponential growth and lack of consensus on its terminology. However, differences between the countries that were already using telecare and those that tried to adopt it in response to the COVID pandemic restrictions were striking, given the structural and system integration differences¹⁵.

Reality of telecare in Brazil

Chart 1 presents the scope and format of telecare actions adopted in Brazil. It is important to highlight that there is no national and international consensus on telehealth terminologies.

One of the objectives of telehealth in Brazil is to qualify Primary Health Care (PHC) in SUS, with PHC professionals being its main users. A requirement for effective telehealth services is an adequate infrastructure, with quality equipment and internet connection. The advances provided by initiatives such as *Requalifica UBS*, *Programa Telessaúde Brasil Redes* and *E-SUS Atenção Básica* were not enough to address regional disparities. Until the beginning of the 2020s, less than 10% of Brazilian Primary Health Care Units had sufficient infrastructure to make a video call¹⁸ and less than 30% had an institutional mobile phone¹⁹.

Multiple initiatives developed in the public and private sectors during the COVID-19 pandemic, especially telescreening, teleconsultation and epidemiological telesurveillance (e.g., contact tracing), enabled access to healthcare services for people with COVID-19 symptoms and those with chronic conditions who needed continuous care^{11,12}. Numerous initiatives developed in SUS relied on the good will of healthcare professionals concerned with their patients and the creativity and innovation of healthcare practices and work processes¹².

However, the absence of national guidelines and regulations tailored to the specificities of the Brazilian public health system might lead to the misconception that private sector developments can be directly translated to SUS. Another absence from public authorities is the lack of na-

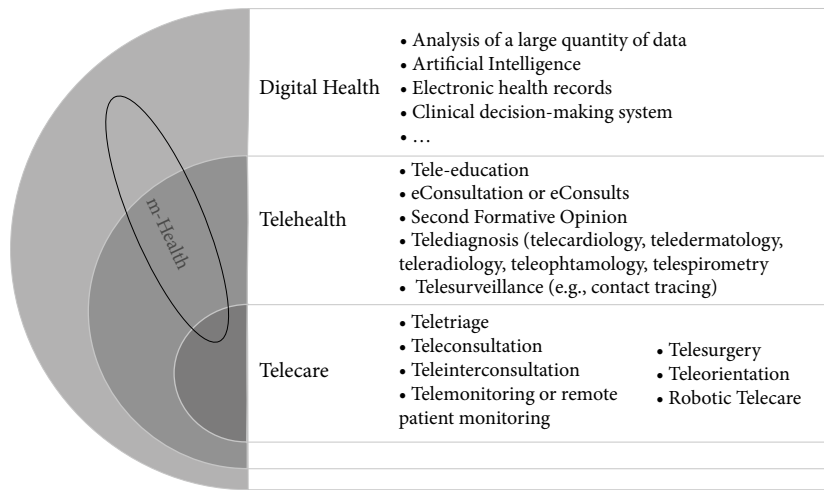


Figure 1. Graphic representation of the scope of digital health, telehealth, telecare, and mobile health or m-Health actions.

Source: Authors.

tional guidelines around working from home policies, a global burden²⁰.

Telecare involves storing and sharing sensitive data related to patient’s health or personal life; genetic, biometric, demographic, social and clinical data. Sharing this sensitive data through non-secure virtual means involves a security risk and is therefore considered inappropriate according to the Brazilian General Personal Data Protection Law (LGPD)²¹. Many teleconsultation platforms widely available exhibit both security flaws and use non-specific communication applications for telecare on private devices, easily intercepted.

Teleconsultation can be used in an additive, alternative or partially substitutive manner to traditional in person healthcare²². Teleconsultation use and communication means must consider, in addition to the equipment functionality and connectivity, healthcare professional and patient digital literacy levels, the case urgency (synchronous or asynchronous), reason and complexity of the consultation, limitations imposed by the chosen communication mean, and a viable alternative if the technology fails. The decision whether to use teleconsultation or not must be shared between the patient and healthcare professional. Apparently, managers or healthcare professionals were underprepared to conduct teleconsultations when it first started in Brazil, and there was insufficient administrative support to organize workflows¹².

The vast Brazilian territory presents multiple inequalities and different contexts within the public health system, with great performance of the private sector and numerous challenges for the effective implementation of health care networks²³. These characteristics, if ignored, can reinforce digital inequalities – a risk present in any digital health project. The digital divide is a prevalent issue in countries where telecare services are widely available, predominantly utilized by people with high socioeconomic status, high education level or living in great urban areas²⁴. This situation configures the paradox of telecare, whose main objective is to expand access to healthcare services, but the services end up restricting access to those who need it the most²⁵.

Currently, telecare has been flagged as strategic for SUS, whether due to the chronic problem of long waiting times for specialized care, delayed healthcare delivery during the pandemic and consequent complications or possible economy of scale in the current unfavorable financial scenario. It would be a waste not to use telecare and digital health to tackle both new and old problems. Digital health is a growing market, highly profitable and strategic from a data monetization and geopolitical point of view.²⁶ It is the federal government responsibility to ensure that digital health expansion is not driven by interests that diverge from the SUS principles of universality, equity and integrality stated in the Brazilian law.

Chart 1. Telecare actions, their interacting agents, means adopted, synchronicity, and examples.

Services	Interacting subjects	Means of communication	Synchronicity	Exemples
Telescreening or reception of spontaneous demand mediated by ICT	Health Professional ↓ Patient (individual or in group)	Telephone, video, e-mail, instant messages or specific platforms	Synchronous Asynchronous	First contact of care and referral to PHC or emergency department services
Teleconsultation	Health Professional ↓ Patient	Telephone, e-mail, chat, video	Synchronous Asynchronous	Mobile applications for teleconsultations
Teleinterconsultation or shared consultation	Health Professional(s) ↓ Health Professional(s) (with or without the presence of the patient)	Telephone, video	Synchronous	Remote guided ultrasound, multidisciplinary care
Telesurgery	Médico executor Cirurgião remoto Equipamento robótico ↓ Cirurgião local para manipulação instrumental ↓ Patient	Secure interactive technologies	Synchronous	Robot for minimally invasive surgery
Telemonitoring or Remote Patient Monitoring	Sensor (Patient) ↓ Dispositivo de coleta, transmissão, processo, manejo e armazenamento ↓ Profissional de saúde	Collection aggregated or implantable sensors (gadgets or wearables) or data reported by the patient or health professionals	Synchronous Asynchronous	Implanted cardiac devices, glucometers, or smartwatches monitored by the healthcare team, sometimes integrated to a mobile phone app via Bluetooth and shared via web based dashboard
Teleorientation	Health Professional ↓ Patient (individual or in group)	Web conferencing or instant messaging platforms with guidance that does not characterize teleconsultation (without questions about symptoms, treatments and lifestyle habits)	Synchronous Asynchronous	Health promotion activities (breastfeeding, smo of tobacco use, mental health, etc.)
Robotic call center	Inteligência artificial ↓ Patient (individual or in group)	Telephone, video, text message and robots	Synchronous	Chatbots Robots in hospitals

Source: Authors based on healthcare professional body resolutions CFM no. 2.227/2022¹⁶ and COFEN no. 696/2022¹⁷.

Needs and proposals

Discussions about telecare in Brazil were transformed by the regulation of teleconsultation in response to the COVID-19 pandemic and the

countless experiences developed in record time. The debate, previously focused on clinical effectiveness, patient safety and risk of dehumanize care, shifted to health data security, adoption and sustainability of innovative care models, equi-

ty, integration, and quality of access to telecare. Chart 2 presents some fundamental points and propositions of relevance for the development and sustainability of telecare policies and practices in Brazil.

Public policies on digital health must draw on guidelines to foster, promote, develop, map and evaluate experiences applicable to SUS. Digital health services must be regulated and supervised by the federal government and councils, similar to all other public health services. Working from home policies and formal recognition of telecare as part of healthcare in SUS portfolios are urgent to enable their inclusion in the routine of local systems, regardless of specific projects that are time-limited and subject to interruptions.

Digital health services must be evidence-based, ensuring relevance, quality and cost-effectiveness. They should not cause greater risk to patients nor induce unnecessary consumption of healthcare. Digital health services must be additive or partially substitutive to in-person appointments with the healthcare team responsible for that patient's care, and always according to the patient's choice.

Compliance of telecare services with the Brazilian General Personal Data Protection Law (LGPD) by protecting sensitive personal data must be monitored by the federal government and guaranteed through the development and use of safe and fit-for-purpose healthcare platforms. Clinical information storage must obey legislation and electronic health records data custodianship. Certification from regulatory bodies is essential to ensure security of platforms and applications used to share and store sensitive personal data²⁷.

Telecare must support and adapt to the local and regional healthcare networks and service organization, respecting intergovernmental coordination and the use of health information systems in different settings, not the other way around. Planning, management and public regulation of telecare services alongside with community engagement is essential to ensure universal and equitable access to care. This involves establishing clear guidelines for scheduling and regulating clinical workflows, ensuring comprehensive care coordinated by PHC. Integration and interoperability among health information systems, electronic health records, telecare services, referrals and exams will facilitate multidisciplinary teamwork, avoiding fragmented care.

Chart 2. Proposals for the development and sustainability of digital health and telecare policies and practices in Brazil.

Organizational and policy guidelines
<p>Infrastructure</p> <ul style="list-style-type: none"> • Guarantee stable internet network and access to adequate equipment • Health systems integration and interoperability • Regulation of the incorporation of technologies into service provision • Offer, use and supervise digital health tools, public platforms and collaborative communities in line with the LGPD (data security)
<p>Work management</p> <ul style="list-style-type: none"> • Increase digital literacy (population, healthcare professionals and managers) • Develop policies for people working from home • Inclusion of digital health and telecare subjects in the curriculum of healthcare courses • Education and professional development for health professionals in how to use digital technologies for healthcare
<p>Financial resources</p> <ul style="list-style-type: none"> • Tripartite responsibility for funding actions and services (from federal, state and local level government) • Inclusion of telecare in the scope of services offered by PHC and specialized care • Promote research, development, innovation, mapping and supervision of telecare services
<p>Consumer and community engagement</p> <ul style="list-style-type: none"> • Consumer and community engagement in defining coordination and public regulation of healthcare networks • Social participation to ensure universal and equitable access to services
Operational and organization proposals for clinical workflows and healthcare services
<ul style="list-style-type: none"> • Adequacy of telecare services to SUS principles and guidelines • Inclusion of telecare into clinical workflows coordinated by PHC networks • Respect local and regional context particularities • Inclusion of healthcare professionals from local and regional networks in telecare • Regional digital inclusion promotion actions • Adequacy of the use of digital health tools to the needs • Rational and adequate implementation of telecare services • Expansion of healthcare services scale • Analysis of the impact of telecare for restructuring healthcare in terms of productivity • Ensure SUS quality telecare services for the population

Source: Authors.

Virtual services that lack technical support can increase inequity of access if the needs of vulnerable populations, healthcare network coordination, conditions of use of digital tools and different levels of digital literacy are not observed. Therefore, the implementation of telecare models should not follow the logic of the market and monetization of care. Telecare disconnected from the healthcare network in place can result in greater fragmentation of care. The adoption of hybrid models with teleconsultation used in addition or partially substituting in person appointments, and which allow for teleconsultation to be conducted in local healthcare units where adequate infrastructure, technical support and referral systems are available, becomes highly recommended.

Telecare must be incorporated into existing local and regional healthcare networks, workflows and services, prioritizing care delivered by professionals with local health knowledge, maintaining coherence between recommended treatments and availability of local services, except in unique situations and remote areas. This set up promotes service sustainability, career stability and continuous professional development for healthcare professionals, fostering integrated and shared care between primary and specialized healthcare services.

Ongoing healthcare professionals' education and training in the use of telecare must be a responsibility of the services. However, including digital health content in the curriculum of healthcare students in federal universities is a federal government responsibility, aiming towards progressively higher quality virtual healthcare services. It is also a federal government responsibility to foster research on the topic. Telecare enables new arrangements when used reasonably, expanding access to healthcare services, and

maintaining the human and subjective work that characterizes healthcare. Telecare would only present risks if replaces completely the human contact making use artificial intelligence features or other technologies.

Final considerations

The present study seeks to contextualize the substantial uptake of telecare in Brazil, responding the need imposed by the COVID-19 pandemic and connections with the existing digital health agenda. We briefly presented telecare scope and problematized conditions and possibilities for the widespread use of telecare in Brazil. We therefore indicate some key aspects for the formulation of national guidelines, although preliminary and focusing mostly on teleconsultation, organized into two categories: 1) Organizational and policy guidelines and 2) Operational and organization proposals for clinical workflows and healthcare services.

We aim for this study to aid in translating the apparent consensus on the importance of the digital health transformation, beyond telecare, in a way that is both contextualized and aligned with SUS principles and the specific healthcare needs of the Brazilian population. We reiterate the potential of telecare to qualify, increase and modernize access to care, fostering integrated models of care by facilitating the interaction between health services and professionals aiming for continuous care. For this potential to be successfully accomplished, risks must be considered, taking into account different local contexts in the large territory of Brazil, the need of continuous funding and of strengthening SUS healthcare networks.

Collaborations

Project conception and experimental design: SC Catapan and EA Melo. Drafting and editing of the article: SC Catapan, EA Melo, AB Silva, MV Albuquerque and MCM Calvo. Submission: SC Catapan.

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