

The Role of Telehealth in the Covid-19 Pandemic: A Brazilian Experience

Rodolfo Souza da Silva (<https://orcid.org/0000-0001-6848-3385>)^{1,2}
Carlos André Aita Schmtiz (<https://orcid.org/0000-0002-9003-9704>)²
Erno Harzheim (<https://orcid.org/0000-0002-8919-7916>)¹
Cynthia Goulart Molina-Bastos (<https://orcid.org/0000-0002-2504-2915>)^{1,2}
Elise Botteselle de Oliveira (<https://orcid.org/0000-0001-9552-3282>)²
Rudi Roman (<https://orcid.org/0000-0002-2663-4314>)^{1,2}
Roberto Nunes Umpierre (<https://orcid.org/0000-0001-9841-5543>)^{1,2}
Marcelo Rodrigues Gonçalves (<https://orcid.org/0000-0001-8516-8547>)^{1,2}

Abstract SARS-CoV-2, the virus that causes Covid-19, is the third coronavirus to cause severe disease in humans and to spread globally in the past two decades. In this context, several national public health departments, including the Brazilian Ministry of Health, highlighted what was, until then, considered a support service to the health system: telehealth and telemedicine. We intend to present the actions carried out by a national telehealth service in Brazil, both as a Primary Health Care (PHC) support service to professionals and to patients, as well as discussing the potential to reorganize a health system. This is a prevalence study that summarizes the measures adopted by Brazilian Telehealth Center from the 9th to the 27th epidemiological weeks of 2020 to support the health services of the Brazilian Unified Health System (SUS). There was an increase of 76.8% in the demand for telephone teleconsultations during the evaluated period compared to the same period in 2019, with 28.8% of the entire demand arising from doubts related to Covid-19. The Covid-19 pandemic demanded a quick response, with the organization of materials about the disease, a new team to carry out telemonitoring and teleconsultation activities, in addition to the creation of a manual for teleconsultations in Primary Health Care.

Key words Telehealth, Telemedicine, Covid-19, Primary Health Care

¹ Programa de Pós-Graduação em Epidemiologia, Universidade Federal do Rio Grande do Sul (UFRGS). R. Ramiro Barcelos 2400, Campus Saúde. 90035-003 Porto Alegre RS Brasil. marcelorog@gmail.com
² TelessaúdeRS, UFRGS. Porto Alegre RS Brasil.

Introduction

SARS-CoV-2, the virus that causes Coronavirus Disease-2019 (COVID-19), is the third coronavirus to cause a severe disease in humans and to spread globally in the past two decades. As main reasons for the concern associated with the acute infection, atypical pneumonia and disseminated intravascular coagulation can be observed. Globally, COVID-19 reached more than 40 million cases in October 2020, with 1,132,676 deaths in ten months¹ and has caused major changes in societies on all continents². The World Health Organization declared the state of pandemic due to the disease caused by this coronavirus on March 13, 2020. In Brazil, the Ministry of Health had already declared a Public Health Emergency of National Importance on February 3 of the same year, and in less than five months it became the new epicenter of the pandemic³.

With an average number of 1,000 daily cases since epidemiological week 22, with no existing vaccine or effective treatment, social distancing measures for the general population and the isolation of cases and contacts appear as the main strategies to delay the expansion of COVID-19 so that the health system can respond to the increased demand for hospital beds, especially those in intensive care units⁴.

As the main point of contact for people and to coordinate patient care, with the aim of they can be monitored from their homes, we observed a strong emphasis placed on the gateway to the Brazilian health system – the primary health care sector. In this context, several national public health departments, including the Brazilian Ministry of Health, highlighted what was, until then, considered a health care system support service, i.e., telehealth and telemedicine. However, both are moving in a much broader direction, that of becoming a meta-service⁵, with a hybrid performance in the field of direct assistance, data repository, care transition and the actual organizer of people within the health system⁶. In Brazil, Law n. 13,989 of April 13, 2020 establishes the definition and authorizes the use of telemedicine, while the COVID-19⁷ epidemic lasts.

Located in the extreme south of Brazil, the technical and scientific telehealth center of the state of Rio Grande do Sul, linked to Universidade Federal do Rio Grande do Sul (TelessaúdeRS-UFRGS), has been developing multiple actions to support primary health care professionals of SUS for 13 years (Figure 1), having carried out by September 2020, a total of 211,512

teleconsultations, 81,461 telediagnoses (e.g., spirometry, dermatology, stomatology and ophthalmology) and about 460,000 actions of referral management of consultations from PHC to specialized services, with an avoidance rate of 74.78%. In previous instances, such as in the case of H1N1 (2009), Dengue and Zika (2015) epidemics, TelessaúdeRS-UFRGS acted in a prompt and coordinated manner, developing expertise in organizing rapid response teams to public health emergencies. After the changes in the Brazilian legislation related to the exercise of telemedicine during the pandemic, TelessaúdeRS-UFRGS started to complement its performance by also maintaining direct contact with people who seek care in the Brazilian public health system, through teleconsultation and telemonitoring activities.

The aim of this article is to present the actions carried out by a national telehealth service in Brazil, both in support of PHC providers and patients, in addition to discussing the potential for a health system reorganization.

Methods

This is a prevalence study that summarizes the measures adopted by TelessaúdeRS-UFRGS during the period from the 9th to the 27th epidemiological weeks of 2020 to support the Brazilian Unified Health System services throughout the country.

Through the database on teleconsultations carried out during this period, a descriptive analysis of the profile of health professionals requesting this service was carried out for questions related to COVID-19. Moreover, the teleconsultation topics were classified as background questions (suspected case/case definition, management and/or administrative doubts and use of personal protective equipment - PPE) or foreground questions (leave of absence/medical certificate/isolation, diagnostic testing and treatment), as proposed by Guyatt *et al.*⁸. Access to the TelessaúdeRS-UFRGS website, as well as to the specific hotspot on COVID-19, was evaluated and compared to the evolution in the number of teleconsultations per epidemiological week throughout the same period, both in the year 2020 and the previous year.

The variables used for the descriptive evaluation of the demand comprised the types of questions asked by the professionals, physicians and nurses, who requested the service; characteristics

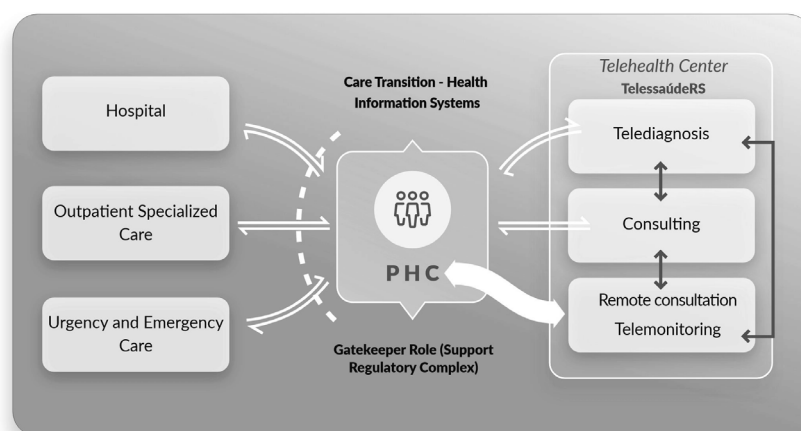


Figure 1. Flowchart showing the association between the teleconsultation, telediagnosis and remote consultation actions of TelessaúdeRS-UFRGS regarding the people and the health care network.

Source: Created by the authors.

of the questions (background or foreground); and the profile of the requesters (age, gender, profession, type of health service – PHC or non-PHC – and region of the country). Regarding the teleconsultation and telemonitoring actions, those carried out from April 8, 2020 to July 29, 2020 were addressed.

As this is a prevalence study with the assessment of an entire universe of requesters who performed telephone consultations with TelessaúdeRS-UFRGS during the aforementioned period, no sample calculations were performed. For the descriptive analysis, absolute and relative frequency, mean, standard deviations and proportions were used.

This study is part of the project “Clinical Support for Primary Health Care Professionals through Telehealth Tools” and was approved by the Hospital de Clínicas de Porto Alegre Research Ethics Committee.

Results

During the period comprising the 9th to 27th epidemiological weeks of 2020, 24,699 telephone consultations were carried out through the 0800 channel, of which 7,054 were requested by medical professionals or nurses and related to COVID-19. Among the physicians who requested advice on COVID-19, the highest prevalence was of female professionals (72.4%), with a mean age of 38.2 years, with a maximum age

of 82 years and a minimum of 22 years. Most requesters were physicians (62.5%), followed by nursing professionals (36.9%). These professionals were mainly allocated in the Southeast region (36.81%) and worked in PHC (57.4%). When evaluating the frequency of avoidance of referrals, it was 95.83%. Table 1 shows the aforementioned data classified between medical and nursing professionals.

Regarding the type of questions of health professionals about a new disease – COVID-19 – (Figure 2) during the analyzed period, the highest frequency was related to foreground questions, rather than background questions, with physicians and nurses being responsible for 99.4% of the 7,099 questions presented in the period. Figure 3 shows the most frequent teleconsultation classifications that comprised the types of questions, with the categories “suspected case/case definition”, “management/administrative”, “PPE”, “leave of absence/medical certificate/isolation”, “diagnostic testing” and “treatment”, being responsible for 80% of the total number of questions.

Regarding temporality, the doubts that were considered background questions were more frequently asked at the beginning of the pandemic until the 13th epidemiological week, while the foreground questions increased progressively over most of the period (Figure 3).

The demand for the 0800-teleconsultation channel of TelessaúdeRS-UFRGS, when comparing the periods from the 9th to the 27th epidemio-

Table 1. Characteristics of the requesting health professionals and outcomes of telephone teleconsultations at TelessaúdeRS-UFRGS regarding the outcome and type of question about COVID-19 in the period between the 9th and 27th epidemiological weeks of 2020.

Characteristic	Physicians	Nurses
Requesters		
Age (years)		
Mean (SD)	38.33 (11.59)	37.91 (8.26)
Minimum - Maximum	23-82	22-80
Gender		
Male n (%)	1,675 (37.77)	268 (10.23)
Female n (%)	2,760 (62.23)	2,351 (89.77)
Type of health service		
PHC n (%)	2,865 (64.60)	1,185 (45.25)
Non-PHC n (%)	1,570 (35.40)	1,434 (54.75)
Country Region		
Southeast n (%)	1,507 (33.98)	1,093 (41.73)
South n (%)	1,503 (33.89)	692 (26.42)
Northeast n (%)	821 (18.51)	433 (16.53)
Midwest n (%)	433 (9.76)	264 (10.08)
North n (%)	171 (3.86)	137 (5.23)
Teleconsultations		
Outcome		
Maintain in PHC n (%)	4,188 (94.43)	2,572 (98.21)
Refer to specialized care n (%)	43 (0.97)	12 (0.46)
Refer to the urgency and emergency network n (%)	204 (4.60)	35 (1.34)
Total	4,435	2,619
Basic questions		
Suspected case/case definition n (%)	1,498 (33.78)	1,126 (42.99)
Management/administrative n (%)	986 (22.23)	534 (20.39)
PPE n (%)	322 (7.26)	296 (11.30)
PPE n (%)	190 (4.28)	296 (11.30)
Advanced questions		
Leave of absence/medical certificate/isolation n (%)	2,090 (47.13)	956 (36.50)
Diagnostic testing n (%)	1,269 (28.61)	627 (23.94)
Diagnostic testing n (%)	475 (10.71)	261 (9.97)
Treatment n (%)	346 (7.80)	68 (2.60)

Source: Created by the authors.

logical weeks of 2019 and 2020, showed a 76.8% increase, with 28.8% of this demand being due to COVID-19 (Figure 4).

Figure 5 shows the increase in the number of accesses to the TelessaúdeRS-UFRGS website, mainly after the production of content related to COVID-19 (summarized questions, updated conduct manuals and materials for patients). These weekly accesses went from about 60,000 accesses per week in 2019 to almost 120,000 accesses per week in 2020.

The teleconsultation and telemonitoring actions carried out by TelessaúdeRS-UFRGS, in partnership with the Municipal Health Secretariat of the city of Porto Alegre and Hospital

de Clínicas de Porto Alegre (HCPA), from April to July 2020, consisted of 9,455 evaluations of patients from three main sources: a) previous hospitalizations for chronic respiratory diseases (asthma and chronic obstructive pulmonary disease), obtained from lists of public hospitals in the municipality; b) consultations at the HCPA cardiology outpatient clinics (ischemic heart disease and heart failure) that had been suspended due to the pandemic; and c) reviews of hospital discharge post-hospital admission due to COVID-19 and suspected or confirmed cases from PHC outpatient clinics and the HCPA emergency department. In the latter group, consisting of 3,951 assessments, 151 (2.7%) re-

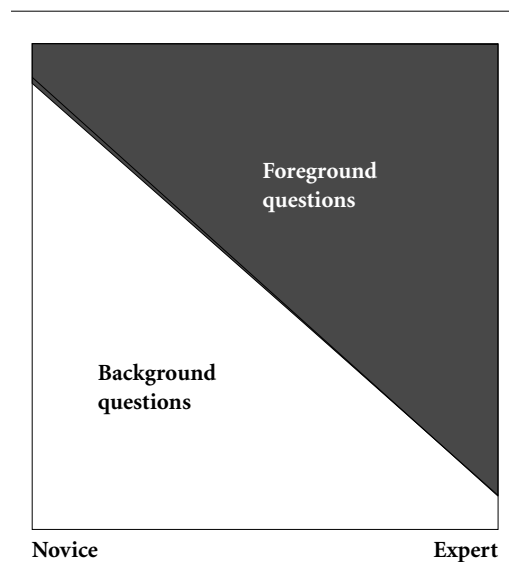


Figure 2. The evolution of medical doubts about a new disease over time. (Novice: newly graduated physician; Expert: experienced physician).

Source: Guyatt et al.⁸

quired in-person evaluation. In addition to these actions, a manual for remote consultation was developed to assist health professionals from all over Brazil to carry out this type of consultation⁹.

Discussion

The present study highlights the actions developed by a telehealth center (TelessaúdeRS-UFRGS) to face the COVID-19 pandemic, resulting in an abrupt increase in the number of teleconsultations activities and the reorganization of a pandemic rapid response team, which included the production of materials on the new disease, the creation of telemonitoring and teleconsultation services, as well as the development of a manual for teleconsultation in PHC⁹.

Quoted as the greatest health challenge of the 21st century, COVID-19 has impacted the human and financial capital of several institutions, with the consequent need for adaptations, including of health services¹⁰. Even experienced physicians, as well as those with less time of training, required information considered both basic, as

well as advanced, about the new clinical condition, and the decision-making support tools became more essential than never. The profile of telephone teleconsultations requesters related to COVID-19 consisted mostly of medical professionals with a higher mean age, following the trend demonstrated by the national medical demography, which shows a majority of females¹¹. In the same period, there was an increase in the relative and absolute frequency of the number of teleconsultations requested by nursing professionals. In relation to the type of health unit where the professional who contacted TelessaúdeRS-UFRGS worked, there was a significant increase in the number of other units with access to teleconsultations due to the inclusion of other establishments through the “Disque Saúde - 136” channel (Brazilian Ministry of Health hotline), demonstrating the need to support other levels of health care in addition to PHC, the hub of the *Telessaúde Brasil Redes* Program, of which TelessaúdeRS-UFRGS is part. Up to the 27th epidemiological week, it is also observed that most of the requesters were from the southeast region, the most populous in the country and the one that concentrated the highest absolute number of deaths in the country¹².

It is worth highlighting the outcomes of the teleconsultations: there is a maintenance rate of 95.83% in PHC, even higher than the rate observed in teleconsultations for other topics, which was 72% during the period. In addition to Roemer’s Law¹³, which highlights the importance of organizing demand in addition to increasing access, the fundamental role of telehealth services during the current pandemic was emphasized^{14,6,10,14,15}. Considering the need to qualify the offer proposed by Roemer, a telehealth-sensitive condition, one must be attentive to the questions that are brought up by the requesters¹⁶. According to what was proposed by Guyatt et al.⁸ regarding medical learning, the questions that are normally raised by a medical student should be considered background questions, and the search for questions that follow and, in most situations, require understanding of the background ones to make sense, are considered the foreground questions. The evolution of these doubts over time tends to be progressive, as shown in Figure 2.

To better understand what happened with the TelessaúdeRS-UFRGS teleconsultation service during the start of the pandemic acceleration in Brazil, the teleconsultations carried out between the 9th and the 27th epidemiological weeks of 2020 were analyzed. We observed that

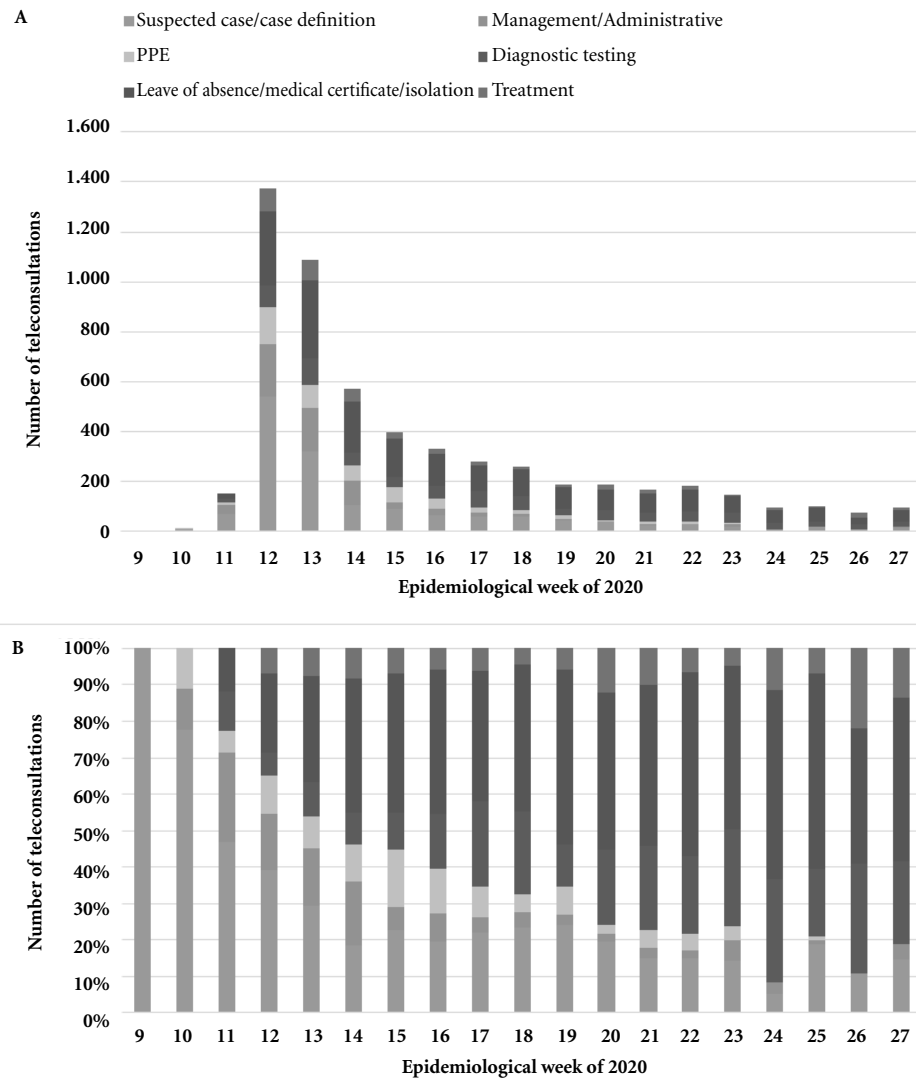


Figure 3. Evolution of health professionals' questions about a new disease – COVID-19–, in the period comprising 9th and 27th epidemiological weeks of 2020. Chart A shows the evolution of the absolute number of teleconsultations, whereas Chart B shows the teleconsultations as percentage values.

Source: Created by the authors.

the background teleconsultations related to COVID-19, which were presented as “suspected case/case definition”, “management/administrative” and “PPE”, were the predominant ones until the 13th epidemiological week (Figure 3-B). From the 14th epidemiological week onwards, there was a relative increase (albeit showing an absolute number decrease) in the progressive number of teleconsultation services related to topics that required constant review since the start of the

pandemic, being “leave of absence/medical certificate/isolation” “diagnostic testing” and “treatment”. Therefore, in an applied form, we see the medical learning theory being used as the basis for the creation of reference materials for health professionals⁸.

Another important aspect evidenced in this case study is the need to permanently maintain highly qualified teams, with expertise in public health emergency situations, as is the case of Te-

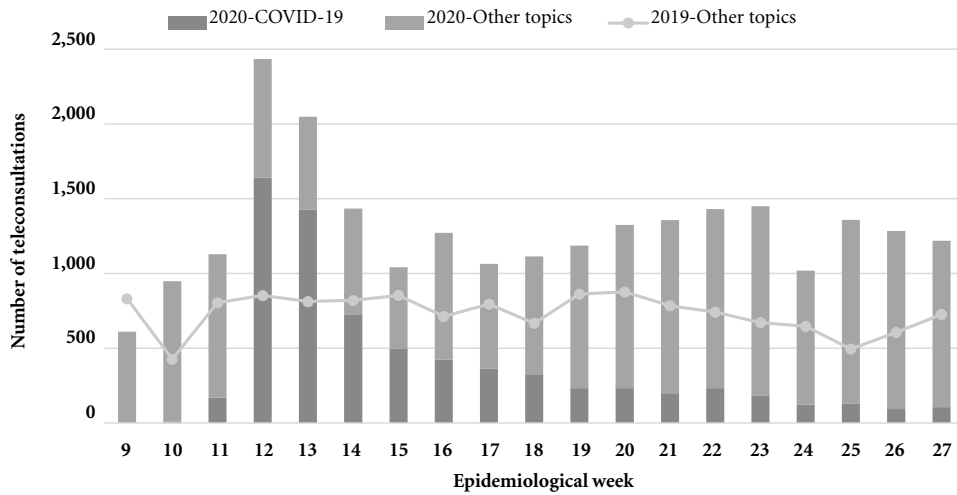


Figure 4. Comparison of the number of teleconsultations on the 0800 channel of TelessaúdeRS-UFRGS during the period between the 9th and 27th epidemiological weeks of 2019 and 2020, being in 2020 divided between requests related to COVID-19 or to other topics.

Source: Created by the authors.

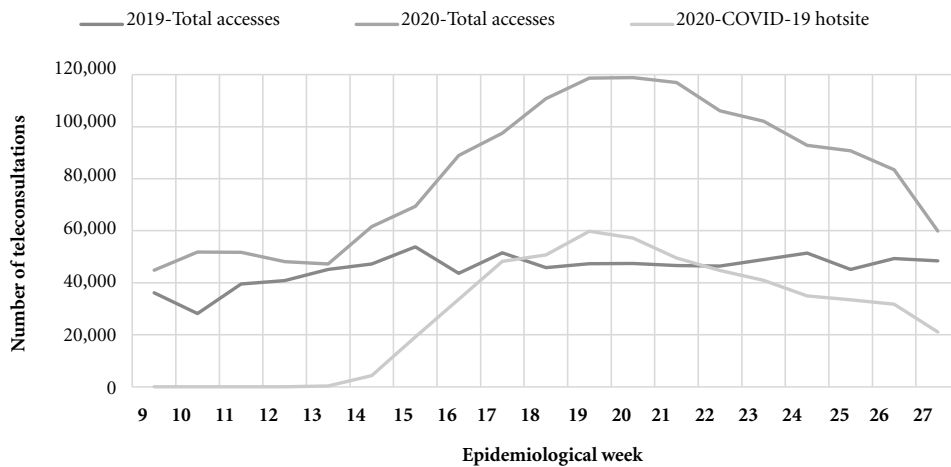


Figure 5. Comparison of the number of weekly accesses to the COVID-19 hot site in relation to the total weekly accesses to the TelessaúdeRS-UFRGS website between the 9th and 27th epidemiological weeks in relation to the same period in 2019.

Source: Created by the authors.

lessaúdeRS-UFRGS, which had previously intensively participated in past epidemics, such as those related to H1N1, Dengue and Zika¹⁷⁻²⁰. In addition

to the Rapid Response Team, it was essential to have an adequate infrastructure to increase the necessary human resources as a result of the high

demand, as well as information technology and government support, through the prompt release and management of resources. Similarly, one can compare this configuration to the secret deposits in Finland^{21,22}, built during the Cold War, and utilized during the COVID-19 pandemic, minimizing the impact of the economic deceleration and product shortage. This was only possible due to a culture of long-term planning, prevention of catastrophic events and flexibility in the face of contemporary challenges, into which all of humanity has been currently hurled.

Finally, starting from the need that information must be found in all points of care²³, although the technology necessary for the information systems to be interoperable already exists, obstacles still persist, such as the lack of a culture of information sharing, legal and regulatory aspects and administrative inefficiency²⁴. A large

telehealth center, such as the one presented in this article, with multitasking characteristics, allows the rationalization of expenditures in health resources, even though these resources are insufficient. Different actions must be articulated, such as teleconsulting, teleconsultation, telemonitoring, tediagnosis and tele-education, which makes it possible to reduce unnecessary referrals, unnecessary use of high technological density, in addition to reducing the physical circulation of people, which is currently important and in the post-COVID-19 world. Patient referral within the health systems, verifying needs according to the complexity of the cases and preparing PHC, emergency services, and hospitals to assist them will be an increasingly necessary task, and telehealth appears as an important protagonist of this action of coordination of different agents in the health system⁵.

Collaborations

Planning of the article: RS Silva, CG Molina-Bastos, EB Oliveira, R Roman and MR Gonçalves. Article design: RS Silva, CAA Schmtiz, E Harzheim, RN Umpierre and MR Gonçalves. Data collection: RS Silva, EB Oliveira and R Roman. Interpretation of the data: RS Silva, CAA Schmtiz, CG Molina-Bastos, RN Umpierre and MR Gonçalves. Data analysis: RS Silva, CAA Schmtiz, E Harzheim and MR Gonçalves. Draft article: RS Silva, CG Molina-Bastos, EB Oliveira, R Roman and MR Gonçalves. Critical review: RS Silva, CAA Schmtiz, E Harzheim, RN Umpierre and MR Gonçalves. All authors approved the published version, as well as agreeing to be responsible for all aspects of the work to ensure that issues related to the accuracy or integrity of any part of the work are properly investigated and resolved.

References

1. Johns Hopkins: University e Medicine. *Coronavirus Resource Center. Global map* [Internet]. Blatimore; 2020 [acessado 2020 out 23]. Disponível em: <https://coronavirus.jhu.edu/map.html>.
2. Wiersinga WJ, Rhodes A, Cheng AC, Peacock SJ, Prescott HC. Pathophysiology, transmission, diagnosis, and treatment of coronavirus disease 2019 (COVID-19): a review. *JAMA* 2020; 324(8):782-793.
3. Brasil. Ministério da Saúde (MS). Portaria nº 188, de 3 de fevereiro de 2020. Declara Emergência em Saúde Pública de importância Nacional (ESPIN) em decorrência da Infecção Humana pelo novo Coronavírus (2019-nCoV). *Diário Oficial da União* 2020; 4 fev.
4. Dumas RP, Silva GAE, Tasca R, Leite IC, Brasil P, Greco DB, Graboio V, Campos GWS. The role of primary care in the Brazilian healthcare system: limits and possibilities for fighting COVID-19. *Cad Saude Publica* 2020; 36(6):e00104120.
5. Harzheim E, Chueiri PS, Umpierre RN, Gonçalves MR, Siqueira ACS, D'Avila OP, Molina-Bastos CG, Katz N, Dal Moro RG, Schmitz CAA. Telessaúde como eixo organizacional dos sistemas universais de saúde do século XXI. *RBMFC* 2019; 14(41):1-9.
6. Centers for Disease Control and Prevention (CDC). Health Healthcare Workers. *Using telehealth to expand Access to Essential Health Services during the COVID-19 pandemic* [Internet]. Georgia; 2020 [acessado 2020 out 23]. Disponível em: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/telehealth.html>.
7. Brasil. Ministério da Saúde (MS). Lei nº 13.989, de 15 de abril de 2020. Dispõe sobre o uso da telemedicina durante a crise causada pelo coronavírus (SARS-CoV-2). *Diário Oficial da União*; 2020.
8. Guyatt G, Rennie D, Meade MO, Cook DJ. *Users' guide to the medical literature*. 3ª ed. Nova York: McGraw-Hill; 2015.
9. Aita CAS, Gonçalves MR, Umpierre RN, Molina-Bastos CG, Silva RS. *Manual de teleconsultas na APS*. Porto Alegre: Artmed; 2021 [no prelo].
10. Harzheim E, Martins C, Wollmann L, Pedebos LA, Faller LA, Marques MC, Minei TSS, Cunha CRH, Telles LF, Moura LJM, Leal MH, Rodrigues AS, Rech MRA, D'Avila OP. Federal actions to support and strengthen local efforts to combat COVID-19: Primary Health Care (PHC) in the driver's seat. *Cien Saude Colet* 2020; 25(Supl. 1):2493-2497.
11. Associação Médica Brasileira. *Demografia Médica 2018: número de médicos aumenta e persistem desigualdades de distribuição e problemas na assistência* [Internet]. São Paulo; 2018 [acessado 2020 out 23]. Disponível em: <https://amb.org.br/wp-content/uploads/2018/03/DEMOGRAFIA-M%C3%89DICA.pdf>.
12. Instituto Militar de Engenharia (IME). Grupo de Assessoramento Científico do IME: grupo multidisciplinar. *Sistemas de informações geográficas* [Internet]. Rio de Janeiro: IME; 2020 [acessado 2020 out 23]. Disponível em: covid19cientifico.ime.br.
13. Roemer MI. Bed supply and hospital utilization: a natural experiment. *Hospitals* 1961; 35:36-42.
14. Duckett S. What should primary care look like after the COVID-19 pandemic? *Aust J Prim Health* 2020; 26(3):207-211.
15. Krist AH, DeVoe JE, Cheng A, Ehrlich T, Jones SM. Redesigning Primary Care to address the COVID-19 pandemic in the midst of the pandemic. *Ann Fam Med* 2020; 18(4):349-354.
16. Katz N, Roman R, Rados DRV, Oliveira EB, Schmitz CAA, Gonçalves MR, Mengue SS, Umpierre RN. Acesso e regulação ao cuidado especializado no Rio Grande do Sul: a estratégia RegulaSUS do TelessaúdeRS-UFRGS. *Cien Saude Colet* 2020; 25(4):1389-1399.
17. Molina-Bastos CG, D'Avila OP, Umpierre RN, Faccini LS, Gonçalves MR, Harzheim E. Microcefalia e Zika Vírus: características e associações. *Rev Bras Med Fam Comunidade* 2016; 11(38):1-10.
18. Molina-Bastos CG, D'Avila OP, Umpierre RN, Gonçalves MR, Harzheim E. Zika Vírus. *Rev Bras Med Fam Comunidade* 2016; 11(38):1-3.
19. Universidade Federal do Rio Grande do Sul (UFRGS). Programa de Pós-Graduação em Epidemiologia. TelessaúdeRS (TelessaúdeRS-UFRGS). *RS contra gripe* [Internet]. [acessado 2020 out 23]. Disponível em: <https://www.ufrgs.br/telessauders/gripe/>.
20. Universidade Federal do Rio Grande do Sul (UFRGS). Centro Estadual de Vigilância Sanitária (Rio Grande do Sul). *RS contra Aedes* [Internet]. Porto Alegre; 2016-2017 [acessado 2020 out 23]. Disponível em: <https://www.ufrgs.br/rscontraaedes/>.
21. Stephen S, Issac A, Jacob K, Vijay VR, Radhakrishnan VR, Krishnan N. COVID-19: weighing the endeavors of nations, with time to event analysis. *Osong Public Health Res Perspect*. 2020; 11(4):149-157.
22. Anderson C, Libell HP. *Finland, 'prepper Nation of the Nordics,' Isn't worried about masks* [Internet]. The New York Times; 2020 [acessado 2020 out 23]. Disponível em: <https://www.nytimes.com/2020/04/05/world/europe/coronavirus-finland-masks.html>.
23. Brasil. Ministério da Saúde (MS). Secretaria-Executiva. Departamento de Monitoramento e Avaliação do SUS. *Política Nacional de Informação e Informática em Saúde*. Brasília: MS; 2016.
24. Mello MM, Adler-Milstein J, Ding KL, Savage L. Legal barriers to the growth of Health Information Exchange-Boulders or Pebbles? *Milbank Q* 2018; 96(1):110-143.

Article submitted 24/10/2020

Approved 30/01/2021

Final version submitted 02/02/2021

Chief editors: Maria Cecília de Souza Minayo, Romeu Gomes, Antônio Augusto Moura da Silva

