

# Telemedicine knowledge and practices among Brazilian allergists and immunologists

*Conhecimentos e práticas sobre telemedicina entre alergistas e imunologistas brasileiros*

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## ABSTRACT

**Introduction:** The aim of this study was to evaluate the characteristics of telemedicine (TM) practices among Brazilian allergists/immunologists (A/I) and to assess their knowledge of regulatory recommendations. **Methods:** A self-report electronic survey was sent by email once a week between August and October 2021 to 2,600 Brazilian A/I physicians. **Results:** A total of 205 (7.9%) participants completed the survey. TM was used in clinical practice by 143 (70.2%) physicians, and 184 (89.9%) had never used it before the COVID-19 pandemic. Among participants, 192 (93.8%) used TM for follow-up consultations, 186 (91%) for checking complementary exams, and 136 (66.7%) for first consultations. The number of A/I physicians (70.2%) that felt confident in their diagnosis using TM was 143, and 7 (3.5%) reported that they could not reach the correct diagnosis using TM. Participants reported that the main benefits of TM were greater accessibility, especially in more distant areas (159, 77.6%), reduced travel costs (158, 77.1%), and safety regarding the transmission of COVID-19 (145, 71.2%). Conversely, the lack of physical examination (183, 89.7%), poor doctor-patient relationship (59, 28.8%), and internet connection problems (45, 22%) were mentioned as disadvantages. Regarding legal/ethical aspects, 105 (51.4%) physicians reported applying a consent form and 34 (16.7%) reported making a record of the teleconsultation, both of which are required for TM consultations, according to

## RESUMO

**Introdução:** O objetivo deste estudo foi avaliar as características das práticas de telemedicina (TM) entre médicos alergistas/imunologistas (A/I) brasileiros e avaliar seu conhecimento sobre as recomendações regulatórias. **Métodos:** Uma pesquisa eletrônica autorreferida foi enviada por e-mail uma vez por semana entre agosto e outubro/2021 a 2.600 médicos A/I brasileiros. **Resultados:** 205 (7,9%) participantes preencheram os formulários. 143 (70,2%) médicos usaram TM em sua prática clínica, e 184 (89,9%) nunca o usaram antes da pandemia de COVID-19. Dentre os médicos, 192 (93,8%) utilizaram a TM para consultas de acompanhamento, 186 (91%) para verificação de exames complementares e 136 (66,7%) nas primeiras consultas. Cento e quarenta e três médicos A/I (70,2%) sentiram-se seguros em seu diagnóstico por meio da TM, e 7 (3,5%) responderam que não conseguiram encontrar um diagnóstico correto usando a TM. Os principais benefícios da TM relatados foram: maior acessibilidade, principalmente em áreas mais distantes 159 (77,6%), redução dos custos de deslocamento 158 (77,1%) e segurança quanto à transmissão do COVID-19 145 (71,2%). Por outro lado, algumas desvantagens da TM foram listadas pelos participantes: ausência de exame físico 183 (89,7%), relação médico-paciente fragilizada 59 (28,8%) e problemas de Internet 45 (22%). Em relação ao campo jurídico/ético, 105 (51,4%) dos especialistas aplicaram o termo de consentimento e 34 (16,7%) registraram a teleconsulta,

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Submitted: 02/18/2022, accepted: 03/04/2022.

Arq Asma Alerg Imunol. 2022;6(2):262-70.

local regulatory recommendations. The use of inappropriate online platforms for TM, such as social media applications and nonspecific online meeting programs, was reported by 131 (64.1%) participants. Eighty (40%) participants did not read the official statements and recommendations that regulate the practice of TM in Brazil. **Conclusions:** An increasing use of TM was observed in Brazil, mainly influenced by the COVID-19 pandemic. Despite being a useful tool in the pandemic, with advantages and disadvantages, physicians should have knowledge of regulatory recommendations.

**Keywords:** Telemedicine, remote consultation, allergy and immunology.

ambas as etapas exigidas em uma consulta de TM, conforme recomendações regulatórias locais. Além disso, plataformas *online* inadequadas para TM, como aplicativos de mídia social e programas de reuniões online não específicos, foram relatadas como sendo usadas por 131 (64,1%) dos participantes. Oitenta (40%) não leram as declarações e recomendações oficiais que regulamentam a prática da TM no Brasil. **Conclusões:** Observou-se um uso crescente de TM no Brasil, influenciado principalmente pela pandemia de COVID-19. Apesar de ser ferramenta útil na pandemia, com vantagens e desvantagens, há necessidade de conhecer as recomendações regulatórias.

**Descritores:** Telemedicina, consulta remota, alergia e imunologia.

## Introduction

Medicine has always been, within the fields of science and human knowledge, one of the most present areas at the forefront of research and innovation. The history of telemedicine (TM) in the world is a good example, with reports of consultations carried out remotely since the 1950s.<sup>1</sup> In Brazil, in 2022, we completed 20 years of the first resolution of the Conselho Federal de Medicina (CFM) who dealt with the subject,<sup>2</sup> defining TM as “(...) the exercise of Medicine through the use of interactive methodologies of audiovisual and data communication, with the objective of assistance, education and research in Health”.

According to the Office of the National Coordinator for Health Information Technology, TM can be defined as “the use of electronic information and telecommunications technologies to support and promote clinical health care, patient and professional health-related education, public health and health administration”.<sup>3</sup>

However, despite its two decades of history, TM in Brazil has continued to make punctual advances only in some specific areas, such as cardiology, intensive care medicine and radiology. The lack of broad discussions, associated with the difficulty of reaching a consensus among the entities, led to the publication and revocation of several resolutions by the CFM.

Even before the COVID-19 pandemic, there were already several studies, protocols and consensus demonstrating the use of telehealth services in allergy and immunology in a complementary or even substitutive way to traditional face-to-face monitoring. We can cite, as examples, the use of TM tools for daily control and assessment of allergic rhinitis activity<sup>4</sup>

and the use of applications to control asthma and dermatitis performed by the patient.<sup>5,6</sup> Therefore, the potential viability of telemedicine as a viable alternative to traditional in-person medical care for the treatment and management of allergic and immunological diseases was already known.

The advent of COVID-19 in early 2020 brought with it the need for social distancing and a high demand for health services in this period. In a few months, this situation led to changes in legislation and in the understanding of the need to implement the TM practice. Physicians of all specialties saw their practices being quickly converted to telemedicine in a few days, without preparation or advance planning by professional bodies.<sup>7</sup> The practice of TM performed in an unregulated way can lead to several implications, not only regarding the patient's health, but also in the ethical-legal scope.<sup>8</sup>

The Ministry of Health published, on March 20, 2020, Ordinance No. 467, authorizing and regulating the practice more comprehensively.<sup>9</sup> The National Congress, in turn, drafted law No. 13,989 on April 15, 2020, which authorizes the practice of TM while the pandemic lasts.<sup>10</sup> These changes, in such a short time, were not accompanied by a deeper understanding of how TM could be performed in practice by health professionals in a safe and responsible way.

Observing this global trend and understanding that, regardless of the pandemic, this new model of care has definitively transformed medical practice, the board of the Brazilian Association of Allergy and Immunology (ASBAI) created, in March 2021, the Digital Health Commission. In this way, ASBAI seeks to: 1) be up to date with society's digital revolution,

2) contribute at the national level to the debate and implementation of this method, and 3) provide allergists and immunologists with knowledge and regulations that ensure an ethical and effective practice. within the peculiarities of the specialty. Knowing the situation of professionals and the way they see and practice TM is essential for improvements in the regulation of telehealth practices.

In order to more assertively understand the specialist's current situation regarding their level of knowledge and the difficulties faced in the practice of TM, the ASBAI Digital Health Commission carried out a national survey on the subject in 2021. This article presents the results of this research.

## Method

A cross-sectional study was carried out, through the application of an electronic questionnaire on the use of TM, applied to experts, through the GoogleForms platform® (Appendix 1).

A total of 2600 physicians associated with the Brazilian Association of Allergy and Immunology (ASBAI) were invited, by sending the questionnaire and the Free and Informed Consent Term (ICF) by emailing the months of August to October 2021, and on social networks like Instagram®, Facebook®, LinkedIn®, Whatsapp®. In the networks, the survey

was disseminated with an explanation of its objective, its importance and the time taken to respond to the instrument.

The project was approved by the Human Research Ethics Committee of the Hospital de Clínicas Complex of the Federal University of Paraná. Participants who signed the informed consent form were included in the study. Participants who did not complete the questionnaire in full or duplicate questionnaires answered by the same participant were excluded from the study.

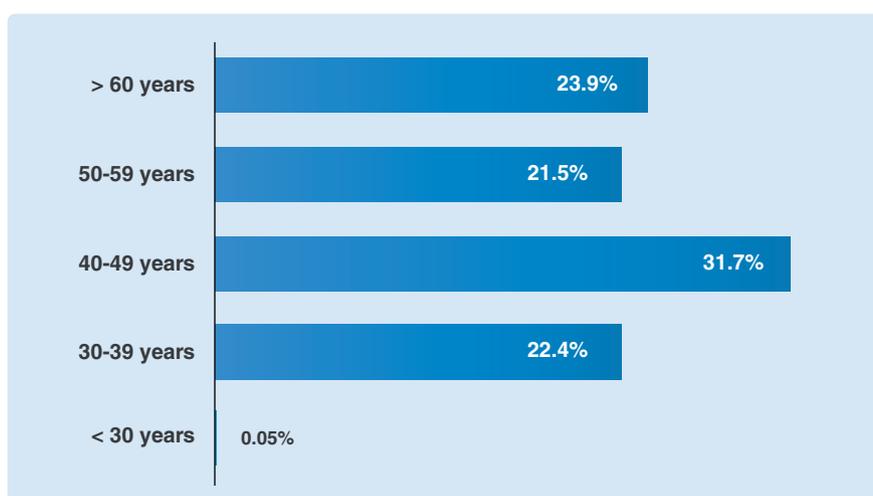
Categorical variables were presented by frequency distribution and proportion.

## Results

A total of 206 questionnaires were answered, one form being excluded due to data duplication, resulting in 205 participants. This amount represents about 7.9% of the total number of specialist professionals registered by ASBAI.

The distribution by age group is summarized in Figure 1.

Most of the participants who answered the questionnaire work in the Southeast region (59%); 12% work in the Northeast region, 10% in the South region, 11% in the Midwest region and 6% in the North region of Brazil.



**Figure 1**  
Age distribution of research participants

One hundred and forty-three (70.2%) answered that they attended TM. One hundred and eighty-nine (89.9%) did not use it before the COVID-19 pandemic, but 188 (91.7%) believe in the continuation of telemedicine care after the pandemic. Among those who used TM, 166 (81%) responded that only 25% or less of their patients used telemedicine.

Regarding ethical/legal issues, 105 (51.4%) of the participants who used TM used the informed consent, and 34 (16.7%) recorded the teleconsultation. It was evidenced that 122 (59.5%) of the participants read Resolution No. 1,643/2002 of the Federal Council of Medicine on telemedicine, while 119 (58%) of the interviewed specialists read the official position of ASBAI.

Most participants use the platform Whatsapp® for consultations via TM - 92 (45.1%). Other frequently used apps are Zoom® - 70 (34%), Own Electronic Medical Record - 65 (31.9%), Own Applications of the Agreement - 38 (18.8%), Google Meet® - 34 (16.7%) and Facetime® - 14 (6.9%). In total, 131 (64.1%) of the experts use at least one inappropriate platform for the use of TM.

As for consultation fees, almost three quarters of specialists charged the same amount as a face-to-face consultation - 147 (71.5%). Of these, 17 (28.5%) charged a different amount than the face-to-face consultation, all of them charged a lower amount for the TM consultation than for the face-to-face consultation. Among the participants, 120 (58.3%) answered that they did not have medical appointments for TM. Of the 41.7% who carry out consultations through the agreement, 67 (79.2%) receive the same amount as a face-to-face consultation.

When asked about the purposes they use telemedicine, 137 (66.7%) use it for the first consultation, 187 (91%) for return with exams and 192 (93.8%) for clinical follow-up. The most common diagnoses were: rhinitis (80.6%), urticaria and/or angioedema (74.3%), asthma (56.3%), food allergy (48.6%), atopic dermatitis (47.2%), drug allergy (38.9%), allergic conjunctivitis (30.6%), immunodeficiency (16%), COVID-19 (7%), need for immunobiologicals (1.4%) and chronic pruritus (0.7%). About 180 (88%) of physicians are able, most of the time or always, to determine the diagnosis with teleconsultation. Only 7 (3.5%) stated that they could not determine the diagnosis with this modality alone. Half of the specialists 104 (50.7%) request in vivo tests after the teleconsultation and 182 (88.9%) feel safe to handle the medications in use by the patient

by telemedicine. Of the total, 144 (70.2%) feel safe to perform medical care by TM.

Physicians also pointed out the advantages and disadvantages of using telemedicine (Table 1).

As for the face-to-face consultation, the doctors considered the advantages pointed out in relation to TM, mainly, the performance of the physical examination - 198 (96.6%), the reception - 161 (79%) and adherence to treatment - 103 (50.3%). Also listed were: doctor-patient relationship - 6 (3%), performing diagnostic tests (3.1%) and privacy, accessibility and security, with 1 (0.5%) each.

## Discussion

In our study, most allergy and immunology specialists reported that they used TM in their clinical practice, demonstrating the spread of the modality among Brazilian professionals. This is in line with the global panorama: the digital world is increasingly present with the use of the internet on smartphones, social networks and health informatics. These advances have facilitated the dissemination of the use of TM globally.<sup>7</sup>

The COVID-19 pandemic played an important role in the process of TM<sup>11</sup> implementation. In fact, in our study, the vast majority of professionals did not use the modality before the COVID-19 pandemic, and believed in the continuation of telemedicine care after the pandemic. This was also corroborated in other studies, such as a recent work carried out in a Spanish allergy unit, which showed that half of the patients who had a telephone consultation during the first peak of the pandemic would like to continue with this practice after the epidemic.<sup>7</sup>

Several advantages of telemedicine in relation to face-to-face consultation are already consolidated. Some studies, even before the pandemic, already demonstrated an equivalence between TM and traditional consultations - as in the study conducted by Nguyen et al.,<sup>3</sup> which found similar control values for the asthma activity in children between the two treatment modalities. It is also worth mentioning a Brazilian study conducted by Giavina-Bianchi et al.,<sup>12</sup> which showed that teletriage in pediatric dermatology addressed 63% of the lesions without the need for a face-to-face visit. This is in line with the result of our research, where specialists reported being able to determine the patient's diagnosis most of the time, demonstrating that the potential viability of

**Table 1**  
Attributes of telemedicine in the opinion of physicians

Benefits	n (%)
Accessibility in remote locations	159 (77.5%)
Avoid transportation	158 (77.1%)
Prevent the transmission of COVID-19	146 (71.2%)
Transfer of knowledge and experience between services	71 (34.6%)
Better quality of healthcare	52 (25.4%)
Integration of the assistance network	42 (20.5%)
Disadvantages	
Absence of physical examination	184 (89.8%)
Weakening of the doctor-patient bond	59 (28.8%)
Difficulty connecting to the Internet	45 (22%)
Lack of data security	45 (22%)
Little familiarity with the digital medium	29 (14.2%)
Inability to perform diagnostic tests	25 (12.2%)

telemedicine as an alternative to traditional face-to-face physicians for the treatment and management of allergic and immunological diseases.

Telemedicine has improved the frequency of consultations due to less use of transport, attendance at more flexible hours, which contributed to a better doctor-patient relationship.<sup>13</sup> In addition, several studies have shown that TM can be a reason for savings because the patient avoids commuting, lost working hours while waiting for the appointment, and absence from work.<sup>3,7</sup>

Despite numerous advantages, patient acceptance still seems to be low in Brazil: in our questionnaire, most experts reported that less than a quarter of their patients use telemedicine for consultations. This can be explained by the inherent disadvantages of the model, such as the absence of a physical examination and the loss of quality of care.<sup>14,15</sup> Second the European Society of Family Doctors, can negatively

affect the quality of the physical examination and the quality of care.<sup>11</sup> As in the works cited, these were the two main disadvantages of TM highlighted by Brazilian allergists and immunologists in our questionnaire. There are still reports in the literature of a certain “fear” among physicians that telemedicine may harm their professional autonomy, increase their workload, cause a lack of organization, integrity, remuneration and flexibility, among other damages.<sup>13</sup>

Difficulty in accessing the Internet was also raised as a disadvantage by a quarter of respondents. In fact, telemedicine facilitates access where there are geographical barriers where there is no qualified professional.<sup>11</sup> However, despite data showing that 82.7% of Brazilian households have access to the Internet,<sup>16</sup> the quality of the connection in situations of high data volume, such as video calls, can be a limiting factor in our country, especially in these more remote areas.

Regarding the values attributed to the teleconsultation, one third of the participants reported charging a lower value for the teleconsultation, when compared to the face-to-face consultation. Also, it was noted that about half of the professionals carried out consultations through medical insurance, and a fifth of these received different values from a face-to-face consultation. In a document prepared by the Ethics and Professional Defense Commission of ASBAI, in May 2020,<sup>17</sup> it is concluded that the values must be maintained in relation to those that were already being practiced by the conventional method.

Regarding ethical/legal issues, there are some observations to be considered. In our questionnaire, half of the participants who used the TM used informed consent and the minority recorded the teleconsultation. According to Resolution No. 1,643/2002 of the Federal Council of Medicine on telemedicine<sup>2</sup> and the position of ASBAI,<sup>17</sup> these are two mandatory requirements. In addition, more than half of the participants used

digital platforms not considered suitable for the use of telemedicine, such as the Whatsapp®. It is mandatory to use platforms or applications with digital certification that are exclusively appropriate for medical appointments by TM.<sup>10,17</sup> The data obtained show a lack of knowledge on the part of specialists about the TM regulation, and highlights the result that half of the allergists and immunologists interviewed did not read the documents that guide the practice in Brazil for the specialty.

In conclusion, our study shows the panorama of knowledge about the use of telemedicine in a portion of Brazilian allergists and immunologists. As electronic health innovations will be increasingly present in specialist practice, it is necessary that the protocols and guidelines formulated for the responsible use of TM are followed by professionals, in order to further optimize its advantages and minimize possible deleterious consequences, both for doctors and patients.

1. Email address: \_\_\_\_\_
2. I have read and understood the consent form, I voluntarily agree to participate in this study, and I understand that my identity will not be revealed.  
 Yes, I agree with my participation  
 No, I do not agree with my participation
3. What's your age?  
 < 30 years  
 30 to 39 years  
 40 to 49 years  
 50 to 59 years  
 > 60 years
4. In which City/State do you work? \_\_\_\_\_
5. Do you provide telemedicine services?  
 Yes  
 No
6. Were you using it before the COVID-19 pandemic?  
 Yes  
 No

## Appendix 1

Form used in the research

7. What percentage of your patients currently use teleconsultation?  
 Less than 25%  
 25 to 50%  
 50 to 75%  
 Greater than 75%
8. Do you use the electronic medical record?  
 Yes  
 No
9. Do you use the Free and Informed Consent Form?  
 Yes  
 No
10. Do you record the Teleconsultation?  
 Yes  
 No
11. Which platform(s) do you use?\*
- Google Meet®
- Zoom®
- Facetime®
- Whatsapp®
- Skype®
- Microsoft Teams®
- Own agreement application
- Electronic medical record (example: Doctoralia®, iclinic®, others)
- Other: \_\_\_\_\_
12. Do you charge the same amount as the face-to-face consultation?  
 Yes  
 No
13. If you answered no, what is the average percentage in relation to the value of the face-to-face consultation?  
 25%  
 50%  
 75%  
 100%  
 Greater than 100%
14. Do you do Telemedicine through medical insurance?  
 Yes  
 No
15. For what purpose(s) do you use teleservice?\*
- First consultation
- Return with exams
- Clinical follow-up
16. Can you determine the diagnosis with teleconsultation alone?  
 Yes  
 Mostly  
 Few times  
 No
17. What is the most sought after diagnosis?\*
- Rhinitis
- Asthma
- Urticaria and/or Angioedema
- Drug allergy
- Food allergy
- Immunodeficiency
- Atopic dermatitis
- Contact dermatitis
- Allergic conjunctivitis
- Other

**Appendix 1** (continuation)

Form used in the research

18. Do you feel safe to modify the medications used by the patient through teleconsultation?  
 Yes  
 No
19. Do you request in vivo tests (example: skin test) in the teleconsultation?  
 Yes  
 No
20. Do you feel safe to carry out the teleconsultation?  
 Yes  
 No
21. Have you read Resolution No. 1,643/2002 of the Federal Council of Medicine on telemedicine?  
 Yes  
 No
22. Have you read the official ASBAI position on telemedicine?  
 Yes  
 No
23. In your opinion, what are the biggest difficulties in this type of service?\*
- Little familiarity with the digital medium
  - Difficulty connecting to the internet
  - Lack of data security
  - Specialty exercise
  - Absence of physical examination
  - Inability to perform diagnostic tests at this time
  - Weakening of the doctor-patient bond
  - Other: \_\_\_\_\_
24. What is the advantage(s) of telemedicine in relation to face-to-face care?\*
- No need to transportation
  - Making the specialty more accessible (remote places)
  - Safety regarding the transmission of COVID-19
  - Integration of the assistance network
  - Transfer of knowledge and experience between services
  - Improving the quality of health care
  - Other: \_\_\_\_\_
25. Do you think telemedicine care should continue after a pandemic?  
 Yes  
 No
26. What do you consider to be the advantage(s) of a face-to-face consultation?\*
- Reception
  - Physical exam
  - Treatment adherence
  - Other: \_\_\_\_\_
27. If you want to receive the result of the research, as well as the CFM Resolution and the ASBAI position, leave your e-mail address here: \_\_\_\_\_

Note: Questions marked with \* could have multiple answers.

**Appendix 1** (continuation)

Form used in the research

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No conflicts of interest declared concerning the publication of this article.

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