



# The specialty of Allergy and Clinical Immunology in Brazil: how do we start the second decade of the 21st century?

*A especialidade de Alergia e Imunologia Clínica no Brasil: como começamos a segunda década do século XXI?*

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## ABSTRACT

**Introduction:** It is necessary to know the situation of allergists/immunologists in different scenarios of action, identifying profiles and possible difficulties. The knowledge of these data can serve as a subsidy to promote the implementation of policies that ensure comprehensive health care for patients with allergic diseases and inborn errors of immunity (IEI). **Objective:** To verify the profile of specialists in Allergy and Immunology in Brazil, concerning the place of work, access to tests, therapies, and the impact of the pandemic on their professional practice. **Methods:** Descriptive-exploratory study, with data collected through an online survey, using the Google Forms tool. All compliant Associação Brasileira

## RESUMO

**Introdução:** É necessário conhecer a situação de alergistas/imunologistas nos diferentes cenários de atuação, identificando perfis e eventuais dificuldades. O conhecimento destes dados poderá servir de subsídio para fomentar a implementação de políticas que garantam a integralidade na atenção à saúde do paciente com doenças alérgicas e erros inatos da imunidade (EII). **Objetivo:** Verificar o perfil dos especialistas em Alergia e Imunologia no Brasil, em relação ao local de atuação, acesso a exames, terapias e o impacto da pandemia COVID-19 sobre o seu exercício profissional. **Métodos:** Estudo descritivo-exploratório, com dados coletados por inquérito *on-line*, utilizando-se a ferramenta Google

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de Alergia e Imunologia – ASBAI members were invited to participate. The questionnaire addressed sociodemographic and professional aspects. The information was analyzed using SPSS version 20.0. **Results:** Four hundred and sixty associates answered the questionnaire. Women were predominant (73%), and the median age was 47 years. Most participants work in the private sector (95%) and 47% in the public sector. Approximately 80% of those who work in the public sector reported having access to some diagnostic tests for allergic diseases and IEI. Only 35% of specialists in the public system have access to specific allergen immunotherapy, against 96% of those working in the private sector. As for immunobiological drugs, 53% and 72% of specialists working in the public and private service, respectively, reported access. More than 60% of the members participating in the survey had a reduction in the number of consultations by at least 50% and 56% have been assisted by teleconsultation during the Covid19 pandemic. **Conclusion:** ASBAI associates have incorporated advances in the therapy of immune allergic diseases into their clinical practice, but several diagnostic methods are still inaccessible. The presence of specialists in Allergy and Immunology in the Unified Health System (Sistema Único de Saúde - SUS) also needs to be expanded. The coronavirus pandemic brought the discussion of telemedicine as a method of clinical care practice in our specialty.

**Keywords:** Allergy and Immunology, comprehensive health care, telemedicine.

Forms. Todos os associados adimplentes da Associação Brasileira de Alergia e Imunologia - ASBAI foram convidados a participar. O questionário abordou aspectos sociodemográficos e profissionais. As informações foram analisadas no programa SPSS versão 20.0. **Resultados:** Quatrocentos e sessenta associados responderam ao questionário. Observou-se predomínio de mulheres (73%), com mediana de idade de 47 anos. A maioria dos participantes atua no setor privado (95%), e 47% no setor público. Aproximadamente 80% dos que atendem no setor público referiram ter acesso a algum exame diagnóstico para doenças alérgicas e EII. Apenas 35% dos especialistas do sistema público têm acesso a imunoterapia alérgica específica, contra 96% dos que atuam no setor privado. Já aos medicamentos imunobiológicos, 53% e 72% dos especialistas que atuam no serviço público e privado, respectivamente, referiram acesso. Mais de 60% dos associados participantes da pesquisa tiveram redução no número de consultas em pelo menos 50%, e 56% tem realizado atendimento por teleconsulta durante a pandemia de COVID-19. **Conclusão:** Os associados da ASBAI têm incorporado na sua prática clínica os avanços na terapia das doenças imunoalérgicas, mas vários métodos diagnósticos ainda são pouco acessíveis. A presença do especialista em Alergia e Imunologia no SUS, também precisa ser ampliada. A pandemia do coronavírus trouxe a discussão da telemedicina como um método de atendimento clínico em nossa especialidade.

**Descritores:** Alergia e Imunologia, assistência integral à saúde, telemedicina.

## Introduction

The increase in the prevalence of immune allergic diseases observed in recent decades has generated a growing demand by qualified specialist physicians, who work in both the private and public sectors, at different levels of health care, to meet the needs of the population suffering from allergic and immunological conditions.<sup>1</sup> In parallel to this, the advances that have taken place in diagnostic procedures and the development of targeted therapies have created the need for continuous training for specialists. Thus, the importance of the specialty society working with different spheres of the health scenario in Brazil is very clear, to improve access to diagnosis and treatment of these conditions, which affect about 30% of the population.

In this context, the Associação Brasileira de Alergia e Imunologia – ASBAI's mission is to promote permanent and continuing medical education, in addition to spreading knowledge in the area of Allergy and Immunology, to strengthen the professional practice of the specialty with excellence, both in the public and private spheres.<sup>2</sup> The challenges to

achieving a balance in the distribution of professionals and access to diagnostic tests and therapies, in a country with a continental dimension, are countless. Therefore, it is of fundamental importance to know the situation of specialists in the different action scenarios, so that the ASBAI can identify barriers and promote policies that ensure comprehensive healthcare for patients with allergic diseases and inborn errors of immunity (IEI).

To learn about the situation of experts at the national level, in 2017, ASBAI surveyed the performance of its specialists, which provided an overview of the place of work and the availability of diagnostic tests and immunotherapy. At that time, most allergists/immunologists were young and concentrated in large centers. The access to Specialized care in Allergy and Clinical Immunology was restricted to a few services, usually university services, making it difficult to provide comprehensive care to patients affected by these diseases, especially those over 70% who depend on the SUS. Shortcomings were identified in the access to various diagnostic tests and

specific immunotherapy with allergens, a therapeutic procedure exclusive to the specialty.<sup>3</sup>

COVID-19, declared a pandemic in March 2020,<sup>4,5</sup> has been imposing many challenges for the specialist, who has needed to adopt the sanitary recommendations to contain the dissemination of the coronavirus in health units, including the reduction of consultations and elective procedures, without being absent from their responsibility to provide quality care to their patients, within the ethical precepts on which medicine is based.

Five years after such study<sup>3</sup> it is necessary to update the information about the performance of the specialist in Brazil. Therefore, the objective of this research was to verify the current situation of specialists in Allergy and Immunology in Brazil concerning their workplace, access to exams, therapies, and the impact caused by the COVID-19 pandemic on specialized care.

## Material and methods

The study consisted of an online survey of a descriptive-exploratory nature, carried out from March to May of 2021. All ASBAI non-compliant members were invited to participate. E-mails informing about the survey and containing links to Google Forms® and access to the questionnaire (questionnairesbai@gmail.com) were sent to all members.

The questionnaire addressed sociodemographic and professional aspects in 34 multiple-choice questions and an open answer (Figure 1). Once answered, the information was electronically and automatically transferred from Google Forms to a Microsoft Excel® spreadsheet. At the end of the collection period, a database containing information on all research participants, in Excel format, was transferred to the SPSS version 20.0 program. Data were checked for duplicity and consistency, ensuring data and results reliability. Data were cataloged as numerical (age in years) and categorical (all others) variables. Data were analyzed and results are presented as simple frequencies in the form of tables and graphs.

## Results

From March to May 2021, 460 members responded to the structured online questionnaire, which corresponds to 25% of the total non-compliant

members of ASBAI (N = 1,848). The analysis of the responses showed a 100% completion rate for the questionnaire. The distribution was proportionally similar to the number of members per region (Table 1, Figure 2). The comparative analysis showed a heterogeneous distribution of specialists considering the Brazilian regions, however it was similar to that of all non-compliant members of the ASBAI in 2021 (Table 1).

Regarding the demographic profile, there was a predominance of women among the survey participants (336/460; 73%). Age ranged from 27 to 82 years (mean = 47.9; median = 47) and 56.4% of specialists reported being under 50 years of age. The distribution of participants by gender and age group is shown in Figure 3.

Regarding the main area of activity, we found that more than 90% of the participating associates have Allergy and Immunology as their main specialty, followed by 36.3% who add up to Pediatrics (Table 2). Despite this, only 14.6% restrict their care to pediatric patients (Table 2). 47.2% of those who participated in the survey work in the public sector, as specialists, and 95% in the private sector (Table 2). The distribution of the place of work, by age group, is seen in Figure 4.

Among specialists working in the public service (256/460), we found that the main workplace is in the outpatient clinic of a University Hospital (49.6%). Among those who work in the private sector (437/460), 89.7% do it in a private clinic and 27.2% in an outpatient clinic of a private hospital (Table 3).

**Table 1**

Distribution of experts who responded to the questionnaire and ASBAI members by Brazilian geographic regions.

	Sample* (n=460) n (%)	ASBAI associates (n=1,848) %
North	17 (3.7)	4.4
North East	73 (15.9)	15.0
Midwest	44 (9.5)	7.7
Southeast	280 (60.9)	63.1
South	46 (10.0)	9.7

\*Chi-square – p <0.001.

1. Gender:	Masculine Feminine
2. Age (full years):	<input type="text"/>
3. City of residence:	<input type="text"/>
4. State of residence:	<input type="text"/>
5. Main acting specialty (you can check more than one option):	Allergy/Immunology Pediatrics Medical clinic Family Health Other:
6. What is the age group of your patients considering the area of expertise?	Children and teenagers All age groups Teenagers and adults Adults
7. Do you work as an allergist in public service?	Not Yes
8. Where do you work as an allergist in the public service? (check as many as needed)	Basic Health Unit General Hospital Outpatient Clinic University Hospital Outpatient Clinic (teaching) Other
9. Do you work with patients with allergic diseases in the public service?	Not Yes
10. Do you work with patients with immunodeficiency or with suspicion in the public service?	Not Yes
11. In which place do you work with patients with immunodeficiencies (innate error of immunity - IEI) or suspected in the public service?	Basic Health Unit General Hospital Outpatient Clinic University Hospital Outpatient Clinic (teaching) Other
12. Do you work with patients hospitalized for allergic diseases in the public service?	Not Yes
13. Do you work with hospitalized patients with allergic diseases in the private service?	Not Yes
14. Do you work with hospitalized patients with innate error of immunity (IEI) in the public service?	Not Yes
15. Do you work with hospitalized patients with innate error of immunity (IEI) in the private service?	Not Yes
16. Do you have access to diagnostic tests for allergy in the public service where you work?	Not Yes I don't work in the public service
17. What diagnostic allergy tests do you have access to in the public service? (check as many as needed)	Immediate-read skin tests Contact tests Total IgE dosage Specific serum IgE dosage Oral food provocation test Oral drug challenge test None I don't work in the public service
18. Do you have access to diagnostic tests for immunodeficiencies (IEI) in the public service in which you work?	Not Yes I don't work in the public service
19. What diagnostic tests for immunodeficiency (IEI) are available in the public service? (check as many as needed)	Dosage of serum immunoglobulins (G, A, M, and E) IgG subclass dosage Antibodies to vaccine antigens (rubella, polio, among others) Antibodies to polysaccharide antigens (pneumococcus) Late Reading Skin Tests Immunophenotyping and quantification of T lymphocytes (CD4, CD8) Immunophenotyping and quantification of B lymphocytes (CD19, CD20) NK lymphocyte immunophenotyping (CD56) Evaluation of phagocytes (Rhodamine) Complement and fractions Quantitative and qualitative C1 inhibitor Newborn Screening - TRESs/KRECs Others I don't work in the public service

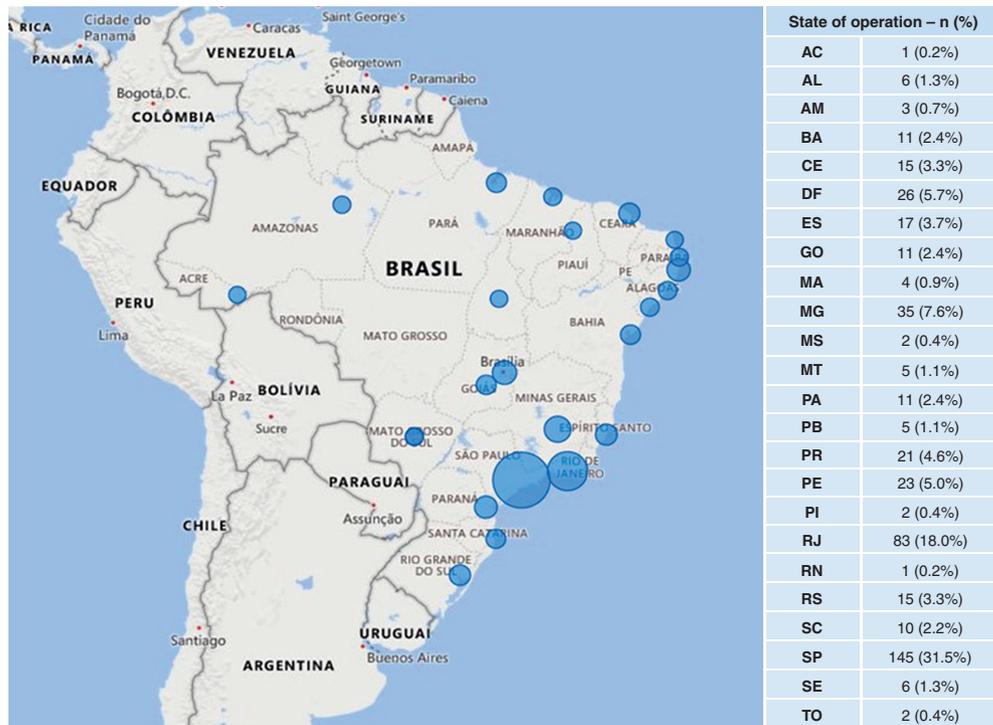
**Figure 1**

Questionnaire on the specialty of Allergy and Immunology at different levels of health care.

20. Do you have access to immunotherapy in the public service?	Not Yes I don't work in the public service
21. Do you have access to immunobiologicals for the treatment of immune allergic diseases for public service patients?	Not Yes I don't work in the public service
22. Have you ever prescribed immunobiologicals for the treatment of immune allergic diseases for public service patients?	Not Yes I don't work in the public service
23. For which disease have you already prescribed immunobiologicals in the public service?	Asthma Urticaria atopic dermatitis chronic rhinosinusitis Primary Immunodeficiency (IEI) None
24. Which immunobiological do you have access to for the patients you work within the public service? (check as many as needed)	Omalizumab Dupilumab Mepolizumab Benralizumab Human immunoglobulin Others I don't attend the public service None
25. Do you work in the private sector? *	Not Yes
26. Where do you work in the private sector? (check as many as needed)	Clinic Multispecialty clinic private hospital Supplementary health service clinic I don't work in the private sector
27. Do you prescribe immunotherapy in the private sector? *	Not Yes I don't work in the private sector
28. Do you have access to immunobiologicals for private sector patients?	Not Yes I don't work in the private service I don't have patients in use
29. For which disease have you already prescribed immunobiologicals in the private service? (check as many as needed)	Asthma Atopic dermatitis Urticaria Chronic rhinosinusitis Primary Immunodeficiency (IEI) Other indications
30. How does the patient attending the private service have access to treatment with immunobiologicals? (check as many as needed)	Via health operator Own resource Via the Unified Health System Judicialization I don't have patients in use
31. Which immunobiological do you have access to by health care providers? (check as many as needed)	Omalizumab Dupilumab Mepolizumab Benralizumab Human immunoglobulin Others None
32. What percentage did the pandemic reduce the number of consultations in the private practice?	Not Reduced Reduced below 25% Reduced between 25 and 50% Reduced between 50 and 75% Reduced above 75% I don't answer in private
33. Are you taking Telemedicine?	Yes Not
34. If you had the opportunity, would you like to work in the Unified Health System (Sistema Único de Saúde - SUS)? *	Not Yes I don't have an opinion I already work at SUS
35. Leave your comment here:	<input type="text"/>

**Figure 1** (continuation)

Questionnaire on the specialty of Allergy and Immunology at different levels of health care.



**Figure 2**  
Distribution of survey participants, according to housing status.

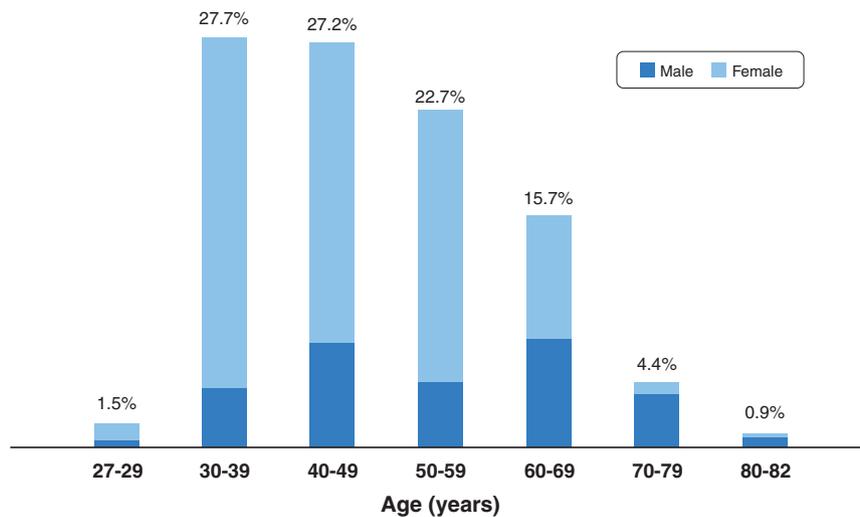
**Table 2**  
Distribution of specialists according to sociodemographic characteristics, the main specialty of activity, age group of patients, and place of work.

Feature	Total n=460 (%)
<b>Main specialty in which he works</b>	
Allergy and Immunology	449 (97.6)
Allergy, Immunology, and Pediatrics	169 (36.7)
Allergy, Immunology and Clinical Medicine	23 (5.0)
Allergy, Immunology and Family Health	10 (2.2)
Others	14 (3.0)
<b>The age range of your patients in Allergy and Immunology</b>	
All tracks	373 (81.1)
Children and teenagers	67 (14.6)
Teenagers and adults	21 (4.6)
Others	32 (6.6)
<b>Do you attend to allergic diseases in public service?</b>	
Yes	256 (55.7)
<b>Do you work in private service?</b>	
Yes	437 (95.0)

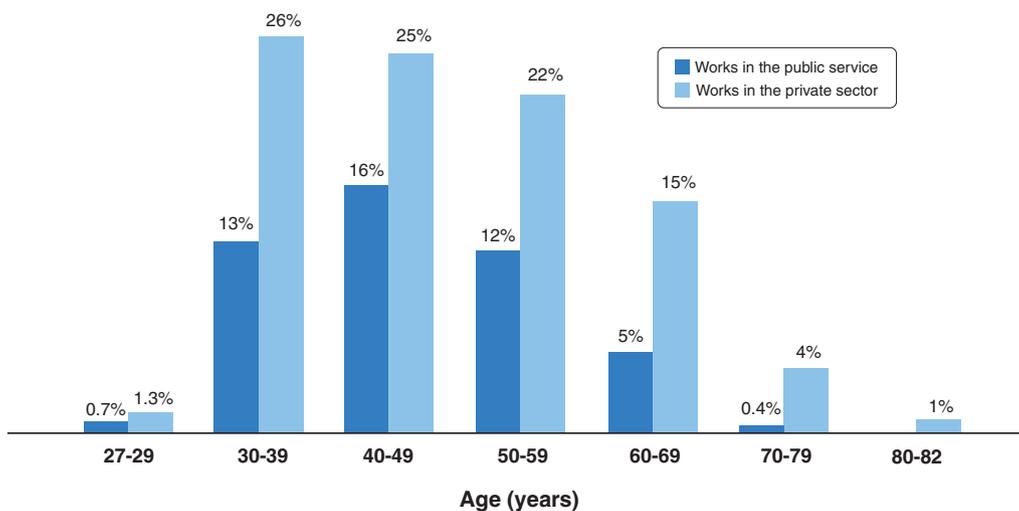
In the public sector, 78.5% (201/259) of specialists work with patients with a diagnosis or suspicion of IEI, 54.3% (139/256) work with patients hospitalized for allergic diseases, and 46.9% (139/256) work with patients hospitalized for IEI. In the private sector, 53.1% (232/437) of the specialists treat patients

hospitalized for allergic diseases, and 61.6% (269/437) treat patients hospitalized for IEI (Table 3).

Approximately 82% of specialists who work in the public sector have access to diagnostic tests for allergic diseases (Table 4). Among the tests, we highlight the measurement of total serum Immunoglobulin E



**Figure 3**  
Distribution of research participants, according to gender and age group.



**Figure 4**  
Distribution of participants, according to the place of professional activity, according to age group.

(IgE) (226/256; 88.3%), specific serum IgE (163/256; 63.7%), and immediate hypersensitivity skin tests (135/256; 52.7%) (Table 4). The provocation tests with food or drugs were mentioned by less than 50% of the experts. Regarding tests to assess possible IEI, we observed that 80.1% (205/256) of specialists have access to diagnostic tests, with special emphasis on serum immunoglobulin dosage (225/256; 87.9%), antigen antibodies vaccines (166/256; 64.8%), immunophenotyping and quantification of T lymphocytes (155/256; 60.5%), the dosage of complement and fractions (165/256; 64.4%), among others (Table 4).

Regarding allergen-specific immunotherapy (ASIT), in the public system, only 35.5% (91/256) of specialists report having access to it, against 95.9% (419/437) of those working in the private sector. As for immunobiological agents, 52.7% (135/256) and 71.9% (314/437) of specialists working in public and

private services, respectively, reported having access to it. Among specialists working in the public service, 61.3% (157/256) reported having already prescribed at least one of these agents (Table 5).

As for the diseases for which immunobiological drugs have been prescribed by professionals working in the public service, hives, IEI, asthma, and atopic dermatitis stand out, in descending order. In the private sector, the main prescriptions were for urticaria (hives), atopic dermatitis, asthma, and IEI (Table 5).

Omalizumab and dupilumab were the most used immunobiologicals both in the public system [142/256 (55.5%)] and [66/256 (25.8%)], and in the private sector [265/437 (60.6%) and [122/437 (27.9%)], respectively (Table 5). About human immunoglobulin, 47.3% (121/256) of specialists from the public service and 38.9% from the private sector (170/437) reported its use (Table 5). As for patient access to immunobiologicals in the private sector, health

**Table 3**

Distribution of specialists according to where they work: public or private.

Specialist	Public n=256 (%)	Private n=437 (%)
<b>The location where you work</b>		
Basic Health Unit	27 (10.5)	–
General Hospital Outpatient Clinic	46 (18.0)	–
University Hospital Outpatient Clinic	127 (49.6)	–
Clinic	–	392 (89.7)
Multispecialty clinic	–	96 (22.0)
Private Hospital Outpatient Clinic	–	119 (27.2)
Supplementary Health Clinic	–	30 (6.9)
Other	96 (37.5)	–
<b>Do you treat patients with Inborn Errors of Immunity or suspicion?</b>		
	201 (78.5)	–
<b>Do you work with hospitalized patients with allergic diseases?</b>		
	139 (54.3)	232 (53.1)
<b>Do you work with hospitalized patients with Inborn Errors of Immunity?</b>		
	120 (46.9)	269 (61.6)

**Table 4**

Distribution of specialists, according to the availability of subsidiary tests used in the assessment of patients with immune allergic diseases in the public sector (n=256).

Laboratory investigation	n=256 (%)
<b>Access to allergy diagnostic tests?</b>	
Yes	210 (82.0)
<b>Which exams do you have access to?</b>	
Immediate reading skin tests	135 (52.7)
Contact tests	92 (35.9)
Total serum IgE dosage	226 (88.3)
Specific serum IgE dosage	163 (63.7)
Oral food provocation test	116 (45.3)
Oral drug challenge test	103 (40.2)
None	23 (9.0)
<b>Access to diagnostic tests for Inborn Errors of Immunity?</b>	
Yes	205 (80.1)
<b>Which exams do you have access to?</b>	
Serum immunoglobulins (G, A, M and E)	225 (87.9)
IgG Subclasses	94 (36.7)
Vaccine antigen antibodies (rubella, polio, others)	166 (64.8)
Antibodies to polysaccharides (pneumococci)	55 (21.5)
Late Reading Skin Tests	68 (26.3)
T lymphocyte immunophenotyping (CD4, CD8)	155 (60.5)
B lymphocyte immunophenotyping (CD16, CD20)	111 (43.4)
NK lymphocyte immunophenotyping (CD56)	87 (34.0)
Evaluation of phagocytes (dihydro-rhodamine)	23 (9.0)
Complement and fractions	165 (64.4)
Qualitative and quantitative C1 inhibitor	73 (28.5)
Newborn Screening - TRECs/KRECs	23 (9.0)
Others	20 (7.8)

care providers (245/316; 77.5%) and judicialization (253/316; 80.1%) have been the most frequently used access routes (Table 5).

We found, among specialists participating in the survey, that when asked about the disorders caused by the pandemic in private care, more than 60% of them had a reduction in the number of consultations by at least 50%, and 56% have been attended by teleconsultation. Another relevant fact was that

approximately half of the specialists who answered the questionnaire work in the public service and that 29.5% of those who do not work would like to do so (Figure 5).

## Discussion

The trajectory of the specialty of Allergy and Clinical Immunology in Brazil is intertwined with the history of the Associação Brasileira de Alergia e

Imunologia.<sup>2</sup> The entity emerged from the successful union of two pre-existing scientific societies intending to join efforts to strengthen the specialty in the country. Due to their common scientific objectives, on November 18, 1971, the merger of Sociedade Brasileira de Alergia (RJ/1946) and the Sociedade Brasileira de Investigação em Alergia e Imunologia (SP/1960), which took place in the following year, in 1972, giving rise to the Sociedade Brasileira de Alergia e Imunopatologia (SBAI). In 2005, SBAI became an association and came to be called the Associação

Brasileira de Alergia e Imunopatologia (ASBAI). Years later, another change took place, and the entity was renamed Associação Brasileira de Alergia e Imunologia in 2013.<sup>6</sup>

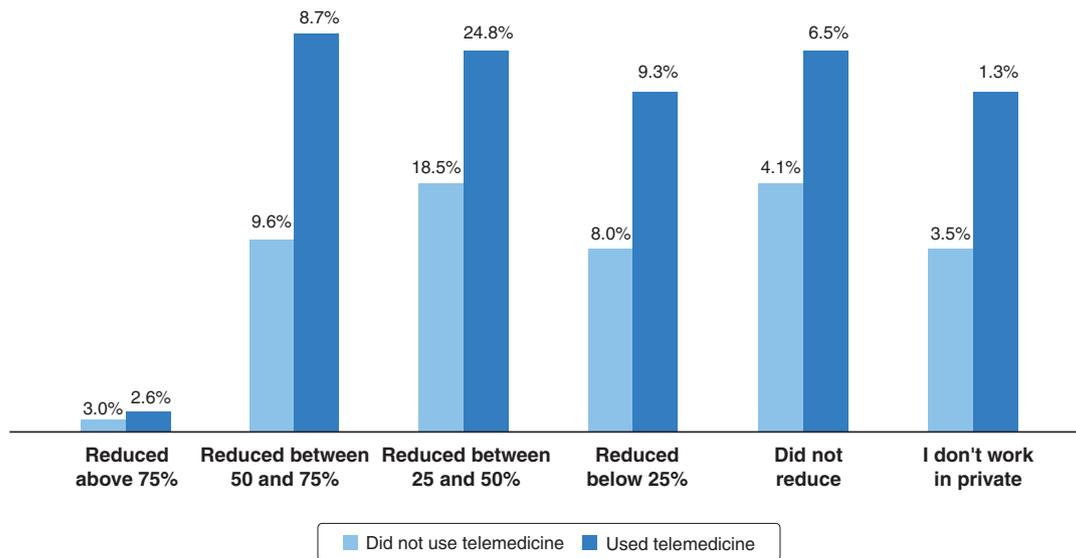
In the early 1970s, the creation of the Pediatric Allergy subspecialty represented another important milestone in the history of the specialty in Brazil, definitively changing the lives of countless children with allergic and immunological diseases, by improving the quality of care and professional training.<sup>7</sup>

**Tabela 5**

Access to allergen-specific immunotherapy and biological agents for patients in the public and private sectors, according to expert responses.

Variable	Public n=256 (%)	Private n=437 (%)
<b>Access to Immunotherapy?</b>		
Yes	91 (35.5)	419 (95.9)
<b>Access to immunobiologicals?</b>		
Yes	135 (52.7)	314 (71.9)
<b>Have you ever prescribed immunobiologicals?</b>		
Yes	157 (61.3)	–
<b>For which diseases did you prescribe immunobiologicals?</b>		
Asthma	88 (34.4)	188 (40.9%)
Urticaria	119 (46.5)	259 (56.3%)
Atopic dermatitis	74 (28.9)	195 (42.4%)
EII	97 (37.9)	52 (11.3%)
<b>What immunobiologicals do you have access to?</b>		
Omalizumab	142 (55.5)	265 (60.6)
Dupilumab	66 (25.8)	122 (27.9)
Mepolizumab	14 (5.5)	24 (5.5)
Benralizumab	–	23 (5.3)
Human immunoglobulin	121 (47.3)	170 (38.9)
Others	31 (12.1)	13 (3.0)
None	43 (16.8)	128 (29.3)
<b>In the private sector, how do you have access to immunobiologicals? *</b>		
Health Unic System	–	82 (25.9)
Via Health Operator	–	245 (77.5)
Judicialization	–	253 (80.1)
Own resource	–	58 (18.4)
I don't have a patient in use	–	121 (38.3)

\* Considering only those who prescribed (n=316).



**Figure 5**

Distribution of participants (n=460) according to the reduction in consultations in private clinics and the option for telemedicine care.

Since then, ASBAI has been developing and expanding, through actions aimed at the permanent and continuing education of the associate, valuing the specialist and professional defense. Today, at the door of the celebration of its 50 years of existence, the specialty of Allergy and Immunology is in its most prominent and representative position on the national and international scene, most notably, in Latin America. However, despite the many achievements already accomplished, there is still much to be done.

In the international context, the specialty has been facing challenges, such as the unavailability of specialists to meet the demands in different locations, the limitations imposed by its recognition only as a subspecialty in some countries, and the reduction in the training time of new specialists, paving the way for the weakening of the specialty.<sup>8</sup>

The results of the present study provided relevant information regarding the profile of the Brazilian specialist in Allergy and Immunology today. The completion rate of the structured questionnaire was 100%, meaning that all participants who started the survey completed it properly. Regarding the response rate, although it reached 25%, this percentage is within the expected range for the research strategy

adopted. Furthermore, the studied sample adequately represents the target population, which minimizes the risk of non-response bias, ensuring the reliability of the results.<sup>9</sup> When verifying the response rates, we observed an increase of 5% in this study when compared to the study previously carried out.<sup>3</sup>

The results showed that Brazilian allergists/immunologists are young, mostly women, and more concentrated in the Southeastern region of the country, with São Paulo, Rio de Janeiro, and Minas Gerais being the three states with the highest number of specialists. This data is in agreement with those of the previous study and shows that there has been no change in the demographic profile of the population of specialists in recent years.<sup>3</sup>

The specialty continues to attract more young people every year, professionals starting their careers, which may explain the maintenance of the mean age in relation to the previous study.<sup>3</sup> The distribution of professionals in the territory is still heterogeneous, being absent in several cities in the country, which results in an unequal specialist/patient relationship between regions. As a result, the access of patients with allergic and immunological diseases to adequate care can be quite compromised and

limited to some locations in the country, generating higher costs.

The dissemination of information about allergic diseases and the importance of specialized care in treating patients; professional qualification through matrix support programs for medical professionals from other specialties, especially those in Primary Care; specialized support via telemedicine for non-specialist professionals from distant locations; in addition to encouraging the creation of new ASBAI Regional Offices, these are strategies that have been discussed and implemented to promote and expand the specialty throughout Brazil.

Allergic diseases and IBS, formerly known as primary immunodeficiencies, often negatively impact the lives of patients and their families, whether due to the high prevalence of some of them or the high burden resulting from the morbidity and mortality associated with this group of diseases. This generates a demand for specialized care to meet the health needs of children and adults affected by immune allergic conditions, which, in turn, makes it imperative not only to train specialist professionals in Allergy and Immunology with appropriate skills and competences but also to facilitate access to this type of specialized care.<sup>7</sup> This can be achieved through programs to encourage migration and allocate professionals in places lacking specialists.

Another important issue is the need for the presence of specialists at all levels of the health care network, which could be achieved through public tenders aimed at the area of Allergy and Immunology. Greater insertion of specialists is also much awaited in undergraduate courses in Medicine, where they would contribute to the formation of a profile of graduates who are more prepared to recognize and manage the most frequent allergic diseases. The insertion and strengthening of syllabi related to allergic diseases and immunodeficiencies in the medical curriculum are essential for the dissemination of the specialty among undergraduates, awakening vocations, alongside the implementation of postgraduate courses and scientific research in the area of Allergy and Immunology.

The present study showed that the vast majority of research participants work as an allergist/immunologist, preferably in the private sector, and care for patients of all age groups. Although the place of work of the allergist/immunologist is predominantly in private offices, more than half of them reported working in the public service, which means a trend towards greater equity in access to specialized care.

However, when verifying the main place of action in the public service, almost all reported being in outpatient clinics of University Hospitals, which means that the specialist is concentrated in highly complex SUS services. As these are regulated access services, that is, they are not of the “open gate” type, the flow depends on the loco-regional regulation system. Thus, the patient's journey to reach the specialist depends on a well-organized health care network, where all service points (primary care units, specialized care units, high-complexity hospitals, and service providers, such as units of diagnostic services) act in a coordinated manner and where the regulatory system works properly, aspects that directly depend on the local management of the SUS. The difficulties encountered in the journey of patients with severe allergic diseases and IBS can result in delayed diagnosis, irreversible damage to health, and death. Thus, it is necessary to encourage this discussion with local managers, which can result in improved flows to access our specialty.

When evaluating the type of care, both those working in the private sector and those working in the SUS provide care to patients hospitalized for allergic diseases and IEI, revealing the level of complexity that specialists have to deal with in any sector in which they are linked. In this sense, permanent and continuing education strategies are essential to guarantee the updating of specialist professionals.

However, the quality of the care provided does not only depend on the specialist's skills and competences. It also depends on the diagnostic and therapeutic resources made available by the different sectors, whether public or private. The present study identified that about 80% of specialists have access to complementary tests, especially laboratory tests, for the diagnosis of both allergic diseases and IBS in both sectors. Regarding the *in vivo* tests, the Immediate Reading Skin Test was cited as the most available to specialists in the SUS, while the Contact Test was the least available, compromising the proper approach to cases suspected of contact dermatitis, unlike the previous study, where 45.6% of the participants reported having access to this patch test.<sup>3</sup>

Likewise, the tests to assess the response mediated by antibodies and the complement system were the most frequently mentioned as tests available for the investigation of suspected cases of IEI in the current study, in agreement with the data from the previous study.<sup>3</sup> Regarding the (ASIT), its availability in the SUS is referred to as being three times smaller

than in private services, indicating the inequality of access to this important therapeutic resource, exclusive to the allergy specialty.

As for immunobiologicals, even though they are recent and costlier options, the data from the present study reveal that more than 60% of specialists report having already prescribed them for patients with allergic diseases and IBS, both in the public and private service. This suggests that Brazilian professionals are aware of the rapid changes in clinical protocols and new therapeutic options for their patients. Omalizumab, which was approved by ANVISA more than 10 years ago for severe asthma and later for chronic spontaneous urticaria (CSU); dupilumab, more recently approved for atopic dermatitis, asthma, and chronic rhinosinusitis (CRS) with nasal polyps; and intravenous human immunoglobulin for IIE were the most prescribed. Hives, asthma, atopic dermatitis, and IIE were the indications most frequently cited by specialists for the group of biologicals. These drugs came to fill a gap and solve a demand generated by the CSU unresponsive to antihistamines and by severe asthma, atopic dermatitis, and CRS with nasal polyps, consolidating this new era of personalized medicine and individualized therapeutic regimens. As they are, in general, of high cost, few patients, for whom immunobiologicals are indicated, manage to use them. Thus, the use of these products by most patients depends on subsidized availability. Judicialization and funding via health care providers are the forms of access most frequently reported by research participants.

Recently, the Clinical Protocol and Therapeutic Guideline (CPTG) for asthma were updated and now includes two immunobiologicals for the treatment of severe asthma. In addition, a new resolution from the Agência Nacional de Saúde Suplementar (ANS) was published, updating the List of Procedures and Events in Health, making mandatory the coverage of private health care plans for a series of procedures, including immunobiological therapy intravenous, intramuscular, or subcutaneous, as long as properly guided by the Guidelines.<sup>10</sup> These measures represent a great achievement, guaranteeing the patient a better quality of life, through the opportunity to access effective and safe medications for the treatment of severe forms of some allergic and immunological diseases.<sup>10</sup>

Differently, despite being a well-known therapeutic resource indicated in the treatment of antibody replacement in IIE in which there are humoral immunity problems and in the control of several inflammatory

and immunological diseases, human immunoglobulin (Humlg) has been less used, according to data from research participants. It is second in frequency. A possible explanation for this difference is the lower prevalence of IIE in the population compared to allergic diseases, and the smaller number of specialists and services dedicated to the treatment of these conditions compared to the prevalence of allergic diseases, for which immunobiologicals are indicated and locations that make them available. Encouraging young specialists to also work with IIE can contribute to changing this scenario.

Perhaps the lower use of IgHum is due to compromised production. IgHum is an IgG concentrate extracted from human plasma, dependent on blood donation, which suffered a large reduction in the number of blood donations due to the COVID-19 pandemic. In Brazil, this scenario is even more worrying because there is no national production of the product, which makes us dependent on imported products to meet local demand. The concern with the possibility of a shortage of the product at a level that interferes with the treatment of patients with IIE worries specialists and has stimulated discussions on the subject.

The COVID-19 pandemic has also significantly affected the routine of allergists/immunologists. Approximately 60% of specialists reported a reduction in attendance by more than 50%, reaching in some cases a reduction of more than 75%. However, more than half of the affected professionals reported using, in a very timely manner, the resource of telemedicine as a way to reduce both the negative financial impact and to maintain the continuity of specialized care for the patient who was complying with the recommendations of the national and international health authorities of social isolation.<sup>11</sup> The pandemic seems to have consolidated the essential role of connectivity in several sectors, such as medicine, and it seems that telemedicine consultations will become an important option for people's health care.

At present, ASBAI has had as its motto to support the member and offer alternatives that guarantee their continued education, offering information with updated and relevant content. The online model has allowed specialists greater access to information and should have an impact on the specialist's daily practice.

In conclusion, ASBAI members have followed the growth of the specialty of Allergy and Immunology, seeking to incorporate the new therapies proposed in clinical practice. Access to exams has been

expanding, but the investigation of food and drug allergies, which depend on oral provocation tests, and several exams for investigation of IIE need health policies that enable their incorporation into services, which in health supplementary, includes forms of remuneration appropriate to the complexity and risk of these procedures. ASBAI has been engaged and actively participating in the processes of incorporation of new health technologies in public and private health, through the available channels; including the updating of the ANS Procedures List and public consultations by Comissão Nacional de Incorporação de Tecnologias no SUS (CONITEC) – Ministry of Health. It is still necessary to sensitize government authorities to expand health care for patients with allergic diseases and immunodeficiencies in the SUS. Public tenders specifically created for specialists in Allergy and Immunology are the definitive way to guarantee access and quality care aimed at this public. Greater access to area-specific diagnostic and therapeutic resources would help to improve patient care more immediately.

The COVID-19 pandemic impacted the entire health sector, affecting the practice of the specialty, especially during the period when elective face-to-face care was restricted, but it brought up the discussion and accelerated the process of incorporating telemedicine into the specialists' routine.

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