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Clinical-epidemiological characteristics and surveillance in monitoring SARS-CoV-2 in the municipality of Teresopolis, RJ, Brazil

Caracteristicas clínico-epidemiologico e vigilância no monitoramento do SARS-CoV-2 no municipio de Teresópolis, RJ, Brasil

Características clínico-epidemiológicas y vigilancia en el monitoreo del SARS-CoV-2 en el municipio de Teresópolis, RJ, Brasil

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Abstract

The high transmissibility of SARS-CoV-2 can be attributed to the unique virological characteristics of SARS-CoV-2. Early diagnosis is crucial to controlling the spread of SARS-CoV-2. The most common cardiovascular problems in patients with SARS-CoV-2 is acute myocardial injury. However, SARS-CoV-2 can cause direct and indirect cardiovascular sequelae, including acute coronary syndromes, cardiomyopathy, acute cor pulmonale, arrhythmias, and cardiogenic shock. Thus, as the disease progresses, there is a need for new clinical evidence based on epidemiological data and laboratory findings, and it is prudent to identify risk factors for the development of systemic complications associated with disease severity and may predict worse clinical outcomes. and increased mortality. The objective of the research is to evaluate and describe the clinical and epidemiological profile of SARS-CoV-2 cases, in order to

assess the sociodemographic, clinical and epidemiological characteristics of individuals, seeking to subsidize the panorama of the spread of the disease, protection of the population through vaccination. , as well as the prevalence of diagnoses resulting from the virus in the city of Teresópolis - RJ, to assist in the understanding of the disease and its effects, so that solutions can be sought.
Keywords: SARS-CoV-2; Health surveillance; Clinical-epidemiological profile.

Resumo

A alta transmissibilidade do SARS-CoV-2 pode ser atribuída às características virológicas únicas do SARS-CoV-2. O diagnóstico precoce é crucial para controlar a propagação do SARS-CoV-2. As condições crônicas e outras tardias, como exemplos problemas cardiovasculares mais comuns em pacientes com SARS-CoV-2 é a lesão miocárdica aguda. No entanto, o SARS-CoV-2 pode causar sequelas cardiovasculares diretas e indiretas, incluindo síndromes coronarianas agudas, cardiomiopatia, cor pulmonale agudo, arritmias e choque cardiogênico. Dessa forma, a medida que acontece o curso da doença existe a necessidade de novas evidências clinica baseadas nos dados epidemiológicos e achados laboratoriais, sendo prudente identificar os fatores de risco para o desenvolvimento de complicações sistêmicas associado à gravidade da doença e pode predizer piores desfechos clínicos e aumento da mortalidade. O objetivo da pesquisa é avaliar e descrever o perfil clínico e epidemiológico dos casos de SARS-CoV-2, a fim de avaliar as características sociodemográfica, clínicas e epidemiológicas dos indivíduos buscando subsidiar o panorama da disseminação da doença, proteção da população através da vacinação, bem como a prevalência de diagnósticos decorrente do vírus no município de Teresópolis – RJ, para auxiliar na compreensão da doença e de seus efeitos, para que se possa buscar soluções.
Palavras-chave: SARS-CoV-2; Vigilância em saúde; Perfil clínico-epidemiológico.

Resumen

La alta transmisibilidad del SARS-CoV-2 se puede atribuir a las características virológicas únicas del SARS-CoV-2. El diagnóstico temprano es crucial para controlar la propagación de SARS-CoV-2. El problema cardiovascular más común en pacientes con SARS-CoV-2 es la lesión miocárdica aguda. Sin embargo, la SARS-CoV-2 puede causar secuelas cardiovasculares directas e indirectas, incluidos síndromes coronarios agudos, miocardiopatía, cor pulmonale agudo, arritmias y shock cardiogénico. Por lo tanto, a medida que la enfermedad avanza, existe la necesidad de nueva evidencia clínica basada en datos epidemiológicos y hallazgos de laboratorio, y es prudente identificar los factores de riesgo para el desarrollo de complicaciones sistémicas asociadas con la gravedad de la enfermedad y que pueden predecir peores resultados clínicos y mayores. mortalidad. La investigación tiene como objetivo evaluar y describir el perfil clínico y epidemiológico de los casos de SARS-CoV-2, con el fin de valorar las características sociodemográficas, clínicas y epidemiológicas de los individuos, buscando subvencionar el panorama de propagación de la enfermedad, protección de la población a través de la vacunación. , así como la prevalencia de diagnósticos resultantes del virus en la ciudad de Teresopolis - RJ, para ayudar en la comprensión de la enfermedad y sus efectos, para que se puedan buscar soluciones.
Palabras clave: SARS-CoV-2; Vigilancia de la salud; Perfil clínico-epidemiológico.

1. Introduction

Coronaviruses are a diverse group of viruses that infect many different animals and can cause mild to severe respiratory infections in humans. In late 2019, a novel coronavirus designated as SARS-CoV-2 emerged in the city of Wuhan, China, and caused an outbreak of unusual viral pneumonia. Due to its highly transmissible nature, this new infection caused by the new coronavirus, also known as SARS-CoV-2, has a high transmissibility on a global scale (Wu et al., 2020; Hui, et al., 2020). The ongoing outbreak of SARS-CoV-2 poses a threat to global public health (Deng & Peng, 2020; Han, 2020).

Clinical manifestations differ with age. In general, men (>60 years) with comorbidities are more likely to develop severe respiratory illness that requires hospitalization, while most youth and children have mild symptoms (not pneumonia or mild pneumonia) or are asymptomatic (Lu et al., 2020; Chen et al., 2020).

In infection, the most common symptoms are fever, fatigue, dry cough, headache, diarrhea, sore throat, anosmia, ageusia, chest pain, hemoptysis, sputum production, rhinorrhea, nausea, vomiting, rash, impaired consciousness, and seizures were also reported. observed. According to the severity of symptoms, patients can be classified as mild, severe or critical. Most people showed signs of illness after an incubation period of 1 to 14 days (most commonly around 5 days), and dyspnea and pneumonia developed an average of 8 days after illness onset (Wu & Mcgoogan, 2020).

Common comorbidities in patients with SARS-CoV-2 are hypertension (HT), diabetes, obesity, respiratory disease,

and cardiovascular disease. In addition, patients who required intensive care unit (ICU) admission were more likely to have these comorbidities than non-ICU patients. Chronic inflammatory diseases are closely correlated with an increase in circulating pro-inflammatory cytokines, which can worsen SARS-CoV-2 outcomes (WHO, 2020).

The most common cardiovascular complication in patients with SARS-CoV-2 is acute myocardial injury. However, SARS-CoV-2 can cause direct and indirect cardiovascular sequelae, including acute coronary syndromes, cardiomyopathy, acute cor pulmonale, arrhythmias, and cardiogenic shock. The incidence of thromboembolism has been high, with approximately 8-12% of positive cases developing a significant elevation of cardiac troponin I, a highly specific marker for cardiac injury that necessitates careful care in the course of infection (Li et al., 2020).

The high transmissibility of SARS-CoV-2 can be attributed to the unique virological characteristics of SARS-CoV-2. Early diagnosis is crucial to controlling the spread of SARS-COV-2. Molecular detection of SARS-CoV-2 nucleic acid is the gold standard, yet rapid immunochromatographic tests are essential diagnostic tools. Despite the increasing number of confirmed cases, clinical data on patients with SARS-CoV-2 in Brazil are insufficient.

Thus, as the disease progresses, there is a need for new clinical evidence based on epidemiological data and laboratory findings, and it is prudent to identify risk factors for the development of systemic complications associated with disease severity and may predict worse clinical outcomes and increased mortality. In patients of a certain population. Therefore, taking into account the elucidated evidence provided by any preliminary information regarding its characteristics, and which will have significant impacts on society, the importance of carrying out this research is justified, which aims to describe the clinical-epidemiological profile of cases of SARS-CoV-2 in the city of Teresópolis - RJ, seeking to help in the understanding of the disease and its effects, so that solutions can be sought.

The prevention of SARS-CoV-2 and SARS involves identifying the amenities and their causes to avoid their aggravation. It will be a great advance to carry out the mapping of the risk of the incidence of heart and respiratory diseases in the population. In this way, it seeks to define the clinical and epidemiological characteristics of individuals with SARS-CoV-2 in the municipality of Teresopolis - RJ, in order to subsidize the panorama of the spread of the disease, protection of the population through vaccination, as well as the prevalence of diagnoses resulting from the virus. These data will be crucial for the epidemiological and health sectors in the strategies and metrics of viral control, it is expected that these data will provide technical information to managers, health agencies and publications of national and international scientific works. Objectively, the execution of this project will promote operational and strategic advances in the fight against SARS-CoV-2 of rapid implementation.

Added to all this, the fact that the prevention of SARS-CoV-2 and SARS involves the identification of comorbidities and their causes to avoid their aggravation. It will be a great advance to map the risk of the incidence of heart and respiratory diseases, as well as the vaccine profile and other guiding factors.

Contextualizing the world situation, Brazil jumped from 11th to 3rd position in number of cases comparing data from April 2020 to June 2021. Cases are, in general, considered confirmed by a positive RT-PCR test of a sample of the respiratory system, which may be associated with an individual's symptomatic or asymptomatic state (Kumar et al., 2021). Individuals carrying the virus are often asymptomatic: a systematic review showed a variation in the proportion of asymptomatic individuals with positive RT-PCR from 6.3 to 96%, depending on the analyzed cohort, including several strategic designs from different countries such as the United States, Germany, Argentina, England, France, Chile, Japan, India, among others.

With regard to Brazil, the seroprevalence analysis of 25,025 and 31,165 individuals from 27 units of the federation during May and June 2020, respectively, showed results as low as 1% and up to 25% depending on the region, showing that the pandemic is very heterogeneous across the country (Hallal et al., 2020).

Brazil is the largest country in Latin America, and the first case of SARS-CoV-2 was recorded on February 26, 2020.

The first case of SARS-CoV-2 was reported in a man a week after he returned from Italy. Less than a month later, on March 20, 2020, the Ministry of Health declared the state of community transmission of the coronavirus in the national territory. Additionally, on March 22, 2020, social distancing and quarantine interventions were implemented.

The detection of reinfection in a patient from Brazil underscores the ongoing threat of SARS-CoV-2 in a country suffering from a runaway epidemic about to be exacerbated by a second wave of the disease. While the clinical significance of SARS-CoV-2 reinfection has not yet been fully elucidated, the concerns clearly arise from the possibility that, at least in some individuals, the immune response may not be sufficient to prevent a second infection.

The case of reinfection presented here is corroborated by the fact that clinical samples were collected more than 90 days apart from the same symptomatic patient presenting positive results with low TC values for SARS-CoV-2. In addition, the first episodes were caused by a common strain circulating in Brazil, B.1.1.33, which is highly disseminated in the country, according to the GISAID database (Rambaut et al., 2020).

SARS-CoV-2 continues to evolve, showing greater efficiency of infectivity and faster transmission, leading to a greater risk to global public health. To better assess the consequences of different variants and facilitate preventive measures or medical countermeasures, WHO divides them into variants of interest (VOI) and variants of concern (VOC) (Ramesh et al., 2021).

SARS-CoV-2 is a type of enveloped virus ranging in diameter from 80 to 220 nm with a positive single-stranded RNA inside its shell, belonging to the β-CoV class of human coronaviruses. The entire SARS-CoV-2 particle is mainly composed of 4 structural proteins, a fragile lipid envelope and genomic RNA. The four structural proteins are membrane (M), nucleocapsid (N), envelope (E), and spike protein (S).

SARS-CoV-2 can bind to angiotensin-converting enzyme 2 (ACE2), a functional SARS-CoV receptor (LI et al., 2003), on the cell surface with its S protein to enter the cell via membrane fusion and endocytosis (Belouzard et al., 2012). Host cell proteins such as the serine protease TMPRSS2 and the high-density lipoprotein (HDL) scavenging receptor type B (SR-B1) facilitate the invasion processes of SARS-CoV-2. Transmembrane serine protease 4 (TMPRSS4) is most significantly related to ACE2. SARS-CoV-2 has its unique feature The furin cleavage site, never found before in other coronaviruses, is necessary for the virus to enter cells lacking cathepsin protease. Furin can cleave the SARS-CoV-2 spike protein at the S1/S2 site, resulting in active S1 and S2 subunits. The cutting process occurs during the virus packaging process (Shang et al., 2020).

Inflammation is an early response triggered by noxious stimuli and conditions to restore homeostasis. SARS-CoV-2 can evoke the immune system and induce pro-inflammatory factors such as IL-6, IL-1, TNF-α and IFN (Lee et al., 2020), overproduction called cytokine storm, which brings catastrophic damage. cells and then causes tissue and organ dysfunction and failure (Wang et al., 2010). Cytokine levels in critically ill patients with SARS-COV-2 are significantly higher than those in mild conditions (Tang et al., 2020). SARS-CoV-2 infection can cause cytokine release syndrome (CRS) (Pasrija & Naime, 2021), which then produces a series of consequences such as multiple organ dysfunction syndrome (MODS), acute respiratory distress syndrome (ARDS) and even death (Ragab et al., 2020; Huang et al., 2019). Intervention and treatment of cytokine storm are necessary means to reduce mortality from SARS-COV-2.

2. Methodology

2.1 Study design

This is a single-center, retrospective observational study that included all patients with a confirmed diagnosis of SARS-CoV-2, in the city of Teresópolis, between January 1, 2022 and July 14, 2022. The study was supported by the Center Serra dos Órgãos University (PICPq Notice 2022/2023) and prepared by the researchers involved. The study was approved by the Institution's Research Ethics Committee, CAAE: 56355722.4.0000.5247.

2.2 Study location

The study was conducted with data generated through electronic medical records, data from the Epidemiological Surveillance Division (DVE), e-SUS Notifica (Platform used by the Unified Health System for notification and monitoring of suspected cases of SARS-CoV-2) and other care units. to SARS-CoV-2 in the city of Teresopolis, State of Rio de Janeiro. These are reference units for the fight against SARS-COV-2, financed by the Unified Health System (SUS). The Central Laboratory of Public Health of Rio de Janeiro (LACEN-RJ) is an integral part of the National System of Public Health Laboratories (SISLAB), being the reference laboratory unit of the State of Rio de Janeiro.

2.3 Study population

Patients diagnosed with SARS-CoV-2 infection of both sexes and any age and treated at the Reference Unit of the municipality were selected.

2.4 Definition of study groups

The diagnosis of SARS-CoV-2 was performed according to guidelines established by the World Health Organization. Thus, a confirmed case of SARS-CoV-2 was defined as a positive result through testing (RT-PCR, antibodies, serological, IgA and antigen) of nasal swab samples, or blood collection (fingertip or venipuncture). All cases included in the current analysis had laboratory confirmation.

2.5 Data sources

Data were obtained from the electronic patient record, including inpatients and outpatients with SARS-CoV-2 confirmed by laboratory tests. The data collected included demographic, clinical, laboratory and radiological information and was anonymized so that patients could not be identified.

Demographic characteristics included age, sex. Clinical information included testing strategy, symptomatology, health conditions, regimen, and clinical-epidemiological outcome. Regarding the analysis of estimates, we considered estimated population, estimated population served, incidence, prevalence, general mortality rate, lethality, mean positivity rate and hospitalization.

2.6 Inclusion criteria

Inclusion criteria for this study were patients diagnosed with SARS-CoV-2, who tested positive for SARS-CoV-2 (by laboratory criteria), through one of the tests, such as Reverse Transcription followed by Polymerase Chain Reaction (RT-PCR), or serology (positive presence of immunoglobulin IgM); patient who underwent available tests, as well as serological and molecular tests for the detection of SARS-CoV-2, the virus that causes SARS-CoV-2, vaccination (doses); with hospital medical history, defining hospitalization in an intensive care unit (ICU) or not, but remaining in a hospital environment, as well as whether or not the patient has comorbidities.

2.7 Exclusion criteria

While for exclusion criteria, patients with a negative diagnosis for SARS-CoV-2 were considered; non-residents of Teresopolis – RJ and who did not have sufficient clinical, laboratory and radiological data will be excluded from the study.

2.8 Statistical analysis

Continuous variables were expressed as mean with standard deviation, median, minimum and maximum values.

Categorical variables were summarized in counts and percentages. No imputation was made for missing data. All statistics are considered descriptive only, as the cohort of patients in our study was not derived from random selection. All analyzes were performed using Microsoft Excel 2013. Data were performed with a significance level of 5% ($p<0.05$).

3. Results and Discussion

Data related to the clinical and demographic profile are presented in Table 1. The period from January 1 to July 14, 2022 was evaluated, a total of 5,688 cases. Of these patients, 59% were female, 41% were male with a mean age of 41 years of diagnostic cases with SARS-CoV-2. Regarding the profession, the correlation of infected safety and health professionals was evaluated, however, low consistency was observed in filling out the data, making it not possible to define the real value of these professionals who had the diagnosis. While the relationship for race, there is a higher prevalence in whites, however, also the lack of filling in the data resulting in 26%.

Regarding the places where the testing was performed, the main data with a lack of completion, reaching 73%, followed by 21%, the diagnosis is performed in a health unit. As a testing strategy, about 96% of cases are relevant as symptomatic and only 2% are tested for asymptomatic cases. However, due to the natural history of the SARS-CoV-2 virus, most transmission events result from asymptomatic infections, requiring intensified testing to better elucidate the spread of the virus (Ferretti et al., 2020, Hellewell et al., 2020).

Table 1 - Description of the demographic aspects and clinical characteristics of the SARS-CoV-2 datas in the city of Teresopolis – RJ.

Data	Quantity	Frequency (%)
absolute number	5.688	100,00%
Feminine	3340	59,00%
Male	2.348	41,00%
Average total age	41 years ± 19,6	
Profession		
Not filled	5522	97,00%
Others	167	2,90%
Security professionals	5	0,08%
Health professionals	59	1,00%
Breed		
Yellow	62	1,00%
Black	301	5,29%
Brown	719	12,60%
Ignored	1489	26,17%
White	3117	54,70%
Testing location		
Workplace	26	0,45%
Airport	27	0,47%
Pharmacy or drugstore	72	1,26%
Others	128	2,25%
Health unit	1235	21,71%
Not filled	4200	73,83%
Testing Strategy		
Specific Population	39	0,68%
Asymptomatic	149	2,61%
Symptomatic	5498	96,65%
Vaccination		
Not filled	2	0,03%
Ignored	300	5,27%
No	1070	18,81%
Yes	4316	75,87%
Symptomatology		
Others	132	2,32%
Dyspnea	387	6,80%
Olfactory disorders	431	7,57%

Taste disorders	519	9,12%
Sore throat	2234	39,27%
Coryza	2250	39,55%
Fever	2312	40,64%
Headache	2506	44,05%
Cough	3172	55,76%
Health conditions		
Pregnant	20	0,35%
Chronic kidney diseases	22	0,38%
Chromosomal disorders or immune fragility	22	0,38%
Immunosuppression	30	0,52%
Obesity	36	0,63%
Others	132	2,32%
Decompensated chronic respiratory diseases	166	2,91%
Diabetes	188	3,30%
Chronic heart disease	497	8,73%
Vaccination Schedule		
1ª dose	4001	70,34%
2ª dose	2712	47,67%
Exam		
IgA	1	0,01%
Antibody IgM	2	0,35%
Antibody IgG	77	1,35%
RT-PCR	336	5,90%
Antigen	4204	73,90%
Case Outcome		
Intensive care admission	4	0,07%
Ward admission	57	1,00%
Death	57	1,00%
Ignored	181	3,18%
Under home treatment	4324	76,01%
Final Classification		
Clinical-epidemiological	13	0,22%
Clinical-image	11	0,19%
Flu syndrome unspecified	90	1,58%
Clinical criteria	363	6,38%
Laboratory	4118	72,39%

Period evaluated from January 1 to July 14 (2022). Source: Authors.

Regarding the vaccination schedule of the cases, 70% registered the first dose and 47% the second dose, which demonstrates a comprehensive vaccination coverage, another factor that mentions this data is the low hospitalization in intensive care, reaching only 0.07% and 1% in infirmary beds; and 1% progressed to death, and a good vaccine effectiveness in the population can be stated.

About 70% of the Brazilian population, approximately 150 million people, use the Unified Health System (SUS), which has the National Immunization Program (PNI). The SUS is the federally funded system, founded in 1988 under the precepts of universality, integrality and equity (Brasil, 2021). The SUS has already advanced a lot towards Universal Health Coverage, and the PNI has been considered a global standard in the provision of vaccination coverage in the last 30 years. It is estimated that 90-95% of all vaccines administered in Brazil are offered by the PNI. This success has led to the control of a number of communicable diseases across Brazil and serves as a model for vaccine delivery in a large, socially and geographically diverse middle-income country (Brasil, 2003; Massuda et al., 2018).

Another fact is that vaccination campaigns have been associated with reductions in hospital admissions and mortality among target population groups in several of the early-onset countries. This is corroborated by the results of mass vaccination with Coronavac in the city of Serrana (27,000 inhabitants) carried out by the Butantan Institute. Following high coverage with Coronavac in early 2021, reductions of 86% in hospitalizations and 95% in deaths were observed (Vasileiou et al., 2021; Butantã 2021).

Recent studies have highlighted that vaccination campaigns have been instrumental in reducing the incidence of SARS-CoV-2 among Brazilian health professionals, hospital admissions and deaths among the elderly. Overall, vaccines have proven their effectiveness in preventing fatalities from SARS-CoV-2 (Victora et al., 2021; Toniasso et al., 2021).

While the testing performed, different types of tests used for diagnostic purposes were evaluated, currently the main test of choice is the antigen method representing 73%, with a median of 17% for positivity rate, followed by the polymerase chain reaction with real-time reverse transcriptase (RT-PCR) with 5% utilization, with a median of 38% overall of tests performed. Thus, screening tests such as the rapid antigen test help to identify the high-risk population. However, antigen tests have lower sensitivity, are comparatively cost-effective, rapidly deployable and deliver faster results. The antigen test also reduces the dependence on RT-PCR, which has a high cost and longer time for results. The antigen test is most sensitive in the early stage of infection, where the viral load is high. Enabling these individuals, if isolated more quickly, can limit the spread of the disease. However, antigen levels may fall below the detection limit in samples collected beyond 7 days of symptom onset.

In order to evaluate the clinical outcome, 76% had their recovery in home treatment, thus demonstrating the reduction in the severity of the cases. Patients who had exposure to vaccination, regardless of type, had milder illness, lower odds of severe illness and Intensive Care Unit admission compared with unvaccinated patients. Among the total hospitalizations with SARS-CoV-2 during the delta period, death occurred in 1% of vaccinated patients. Table 2 reports that there were 258 cases of hospitalization during the data collection period. The data suggest that vaccination can attenuate disease progression and prevent the worst outcome in cases of vaccine rupture, in addition to its role in preventing hospitalization, as demonstrated by post-marketing trials of several vaccines. Thus, the benefits of the vaccine are underestimated in terms of its role in preventing hospitalization per se. This study shows that exposure to vaccination clearly decreases the chances of disease progression, need for ICU care and death outcome, regardless of the type of vaccination (Puranik et al., 2021; Vasileiou et al., 2021).

Regarding the main classification of cases, 72% were performed through laboratory tests, followed by clinical criteria 6%. In parallel, the main related symptoms are cough 55%, headache 44%, fever 40%, while for health conditions the main reported are chronic heart disease 8% and diabetes 3%. It is important to characterize the symptoms of severe SARS-COV-2 and identify clinical subgroups. This will speed up diagnosis, allow more accurate prediction of outcomes, and direct treatment. Symptoms for SARS-CoV-2 positive patients varied based on chronic illness. The top ten most frequently reported signs and symptoms were fever, cough, shortness of breath, sore throat, muscle pain, diarrhea, headache, fatigue, sputum production, and loss of smell or taste, as evidenced in the Struyf study. et al., 2021. If worldwide population testing is triggered by inaccurate symptom criteria, this could bias any prevalence estimate, leading to an underrepresentation of positive SARS-CoV-2 cases, which will undermine measures to control and manage the pandemic.

Estimation analyzes are necessary to understand the determinants of variation in the infection-fatality ratio, incidence, prevalence, hospitalization and positivity rate among populations and is a direct input into predicting the pandemic and investigating alternative policy options such data. are shown in Table 2.

Table 2 - Description of the analysis of estimates of the SARS-CoV-2 data in the municipality of Teresopolis – RJ.

Estimate analysis	
Estimated population	185.820
Estimated population served	28.213
Incidence	20,719/100.000 population
Prevalence	1,23/100 population
Overall mortality rate	558/100 population
Lethality	2,69%
Average positivity rate	20,16%
Internment	258
Overall (median) positivity rate of tests	38%
Positivity rate (median) for antigen	17%

Source: Authors.

This study makes several important contributions to understanding the full impact of the SARS-CoV-2 pandemic on population estimates. The municipality of Teresopolis - RJ has a population estimate of 185,820 inhabitants for the year 2021. This study reported an epidemiological overview of a cohort of 5,688 cases, there was an increase in the incidence of 20,719/100,000 inhabitants, the prevalence 1.23/ 100 inhabitants, for the general mortality rate is 558/100 inhabitants, with a lethality rate of 2.69% observed during the study period. In addition, an increase in the population served at the municipality's Testing Center was observed, reaching 28,213 individuals, with 60% females with the largest group seeking care, the races with the highest demand are self-declared as white 50% and 44% for browns. observed in Table 3.

In terms of risk related to care, 90% are characterized as non-urgent and only 0.24% urgent and 0.02% very urgent, thus observing a reduction in the number of pregnant patients. The consultations performed 11% required medical attention, and only 28% were tested. In terms of exams performed, 88% were for evaluation of radiographic aspects, in a general context, only 0.06% were indicated and exams were carried out to support the diagnosis. In this same vein, the performance of screening tests is a concern, given the current international situation of SARS-CoV-2 and the increased demand for the health system.

Inadequate contact tracing and inability to detect new variants in a timely manner due to higher costs and time to detection must be intensified. Detection of these variants is necessary as several recent studies have shown that the new variants have the ability to reinfect and therefore may reduce the effectiveness of vaccines (Wibmer, et al. 2021; Cheng, et al. 2021).

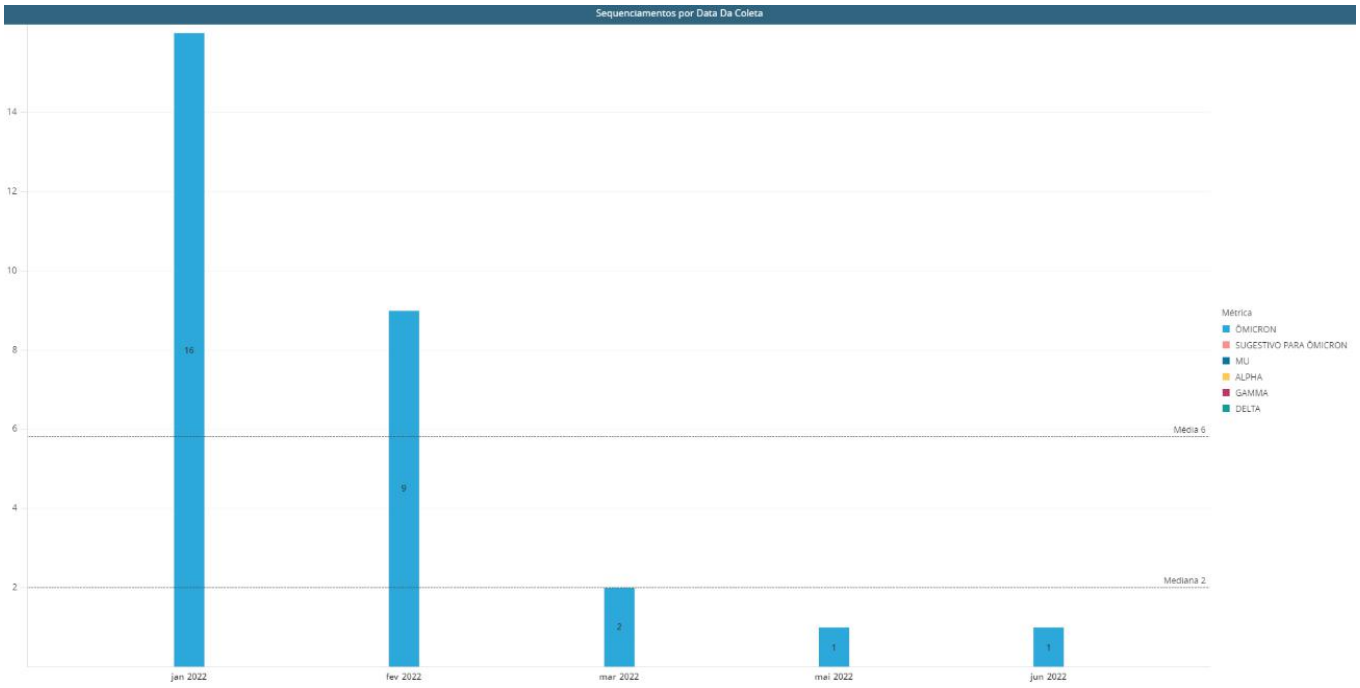
Table 3 - Testing Center Service Profile.

Data	Quantity	Frequency (%)
Gender		
Absolute Number	28.213	100,00%
Feminine	16.968	60,14%
Male	11.245	39,86%
Breed		
Yellow	145	0,51%
White	14375	50,95%
Brown	12511	44,34%
Black	1181	4,19%
Related Risk		
Not Urgent	25628	90,84%
Little Urgent	2325	8,24%
Without Classification	183	0,65%
Urgent	69	0,24%
Very Urgent	7	0,02%
Types Of Care		
Reception	28215	31,39%
Testing	25765	28,66%
Medical Care	10226	11,38%
Exams Performed		
Chest Computed Tomography	17	78,95%
Chest X-Ray	2	10,00%
Percentage Of Imaging Tests Performed	0,06%	

Period evaluated from January 1 to July 14, 2022. Souce: Authors.

Our study suggests that age, comorbidities and laboratory alterations are risk factors for mortality in patients with SARS-CoV-2. Therefore, there is a need for strategic plans and determined efforts for patients with SARS-CoV-2, especially those with older age and comorbidities. There is also a need to intensify the testing program and increase testing capabilities as well as daily variant screenings of symptomatic and asymptomatic patients, especially with the discovery of new variants as shown in Figure 1 representing genomic surveillance in the State of Rio de Janeiro. until 05/06/2022, a total of 11,023 samples from residents were sequenced in 2021. The sequencing is carried out on samples at Lacen and UNADIG, randomly selected, and also sent by the municipalities for the genomics study, as guided by Technical Note 33/2021 of the SUBVAPS-SES/RJ.

Figure 1 - Genomic surveillance - sequentially by collection date.



Source: Data organized daily by the Center for Strategic Information and Response for Health Surveillance (CIEVS-RJ) of the Secretary of Health of the State of Rio de Janeiro, based on the esus-VE and SIVEP-Gripe system, in conjunction with the surveillance of the state municipal health departments. Includes all confirmed cases and deaths up to July 14, 2022.

Surveillance of SARS-CoV-2 genomes has been slow. Currently 29 have been sequenced, only the Omicron variant, WHO has classified it as a variant of concern, the communication rate and reproduction time of Omicron are unknown. The variant's ability to spread, origin, and immune-avoidance ability remain unknown. It is also unclear whether other Omicron-based variants may emerge in the future. Omicron, however, will undoubtedly not be the last variant of SARS-CoV-2, with the need for constant genomic surveillance to be implemented on a large scale in Brazil to identify new variants and establish policies and countermeasures to control the spread of SARS. -CoV-2.

4. Conclusion

SARS-CoV-2 continues to spread in Brazil causing unprecedented challenges to the country's healthcare system. The information reported here assists as a basis for a clinical setting as an additional screening tool and for targeted testing, especially to better inform decisions in groups of patients with pre-conditions, comorbidities and multimorbidities, but also in countries where no profiles have been reported. of published symptoms. Symptom checkers are being widely used in response to the global SARS-COV-2 pandemic.

The results have broader public health implications beyond direct clinical care. The study highlights the importance of information on the demographics, clinic and epidemiology of SARS-COV-2 in the Serrana Region of Rio de Janeiro and will help strategic measures in the current pandemic coping and better prepare to combat future incursions of highly communicable respiratory pathogens in the population. human.

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Declaration of Competing Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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