

PREVALENCE OF HOSPITALIZATIONS FOR SEVERE ACUTE RESPIRATORY SYNDROME IN RIO GRANDE DO SUL FROM 2023 TO 2024

PREVALÊNCIA DAS INTERNAÇÕES POR SÍNDROME RESPIRATÓRIA AGUDA GRAVE NO RIO GRANDE DO SUL NO PERÍODO DE 2023 A 2024

PREVALENCIA DE HOSPITALIZACIONES POR SÍNDROME RESPIRATORIO AGUDO GRAVE EN RIO GRANDE DO SUL EN EL PERÍODO DE 2023 A 2024



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ABSTRACT

Severe Acute Respiratory Syndrome (SARS) represents a significant public health problem, responsible for high morbidity and mortality rates in Brazil. This study aims to outline the profile of hospitalizations due to SARS in the state of Rio Grande do Sul from 2023 to 2024. This is an exploratory, descriptive, analytical, and retrospective epidemiological study with a quantitative approach. The data were collected from SIVEP-gripe (Influenza Epidemiological Surveillance System) from 2023 to 2025. The data showed an absolute number of 17,644 hospitalizations, presenting an incidence of 29.99, of which an incidence of 25.11%, in addition to a hospital fatality rate of 17.06. By analyzing the data, one can observe the importance of prevention and early intervention in order to reduce severe and lethal cases of the disease. The present study identified that despite the advances, hospitalizations for SARS represent a high rate, suggesting intensification of prevention and disease control campaigns.

Keywords: Incidence. Hospitalizations. Prevalence. Severe Acute Respiratory Syndrome. Notification.

RESUMO

A Síndrome Respiratória Aguda Grave (SRAG), representa um importante problema de Saúde Pública, uma vez que é responsável por altos índices de morbimortalidade no Brasil.

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O presente estudo tem como objetivo delinear o perfil das internações por SRAG no estado do Rio Grande do Sul no período de 2023 a 2024. Trata-se de um estudo exploratório epidemiológico descritivo, descritivo, analítico, retrospectivo numa abordagem quantitativa. Os dados foram colhidos a partir do SIVEP-gripe (Sistema de Vigilância Epidemiológica da Gripe) no período de 2023 a 2025. Os dados imprimiram um número absoluto de 17644 internações apresentando uma incidência de 29,99, destes uma incidência de 25,11%, além de um coeficiente de letalidade hospitalar de 17,06. Ao analisar os dados, pode-se observar a importância de prevenção e intervenção precoce a fim de reduzir os casos graves e letais da doença. O presente estudo identificou que apesar dos avanços as internações por SRAG representam um alto índice, sugerindo intensificação nas campanhas de prevenção e enfrentamento da doença.

Palavras-chave: Incidência. Internações. Prevalência. Síndrome Respiratória Aguda Grave. Notificação.

RESUMEN

El síndrome respiratorio agudo grave (SRAG) representa un importante problema de salud pública, ya que es responsable de altos índices de morbilidad y mortalidad en Brasil. El presente estudio tiene como objetivo delinear el perfil de las hospitalizaciones por SRAG en el estado de Rio Grande do Sul en el período de 2023 a 2024. Se trata de un estudio exploratorio epidemiológico descriptivo, analítico y retrospectivo con un enfoque cuantitativo. Los datos se recopilaron a partir del SIVEP-gripe (Sistema de Vigilancia Epidemiológica de la Gripe) en el período comprendido entre 2023 y 2025. Los datos arrojaron un número absoluto de 17 644 hospitalizaciones, con una incidencia del 29,99 %, de las cuales un 25,11 % tuvo una incidencia hospitalaria del 17,06 %. Al analizar los datos, se observa la importancia de la prevención y la intervención temprana para reducir los casos graves y mortales de la enfermedad. El presente estudio identificó que, a pesar de los avances, las hospitalizaciones por SRAG representan un índice elevado, lo que sugiere la necesidad de intensificar las campañas de prevención y lucha contra la enfermedad.

Palabras clave: Incidencia. Hospitalizaciones. Prevalencia. Síndrome Respiratorio Agudo Grave. Notificación.

1 INTRODUCTION

Severe Acute Respiratory Syndrome (SARS) is a relevant public health problem, due to its high potential for clinical severity and the high rate of associated morbidity and mortality. This condition is characterized by an acute respiratory condition that can quickly progress to respiratory failure, requiring hospitalization and ventilatory support in many cases. In the Brazilian context, the state of Rio Grande do Sul has stood out for the significant number of cases and the persistence of high mortality rates, which reinforces the need for continuous epidemiological surveillance and effective strategies for prevention, early diagnosis, and appropriate clinical management.

This study is justified by the need to analyze and describe the incidence of hospitalizations for Severe Acute Respiratory Syndrome (SARS) in the state of Rio Grande do Sul (RS), in the period from 2023 to 2025, considering its epidemiological relevance and impact on health services. Understanding the behavior of this syndrome over time is essential to identify patterns of occurrence, more vulnerable population groups, and possible factors associated with the worsening of cases.

In this context, the question arises about the profile of hospitalizations for Severe Acute Respiratory Syndrome (SARS) in the state of Rio Grande do Sul, in the period from 2023 to 2025. Based on this question, the main objective of this study is to outline the epidemiological profile of these hospitalizations, identifying sociodemographic, clinical and temporal characteristics of the registered cases. The proposed analysis seeks to provide scientific evidence that supports the decision-making process of health managers, contributing to the planning of more targeted and effective actions. In addition, the results may favor the improvement of SARS prevention, surveillance, and coping strategies, strengthening the health system's response capacity to acute respiratory diseases and reducing their impacts on the population of Rio Grande do Sul.

The methodological approach of this study adopts a retrospective epidemiological approach, focused on the analysis of the behavior of hospitalizations for Severe Acute Respiratory Syndrome (SARS) in the state of Rio Grande do Sul. Data collection was carried out through consultations with the Influenza Epidemiological Surveillance Information System (SIVEP-Gripe), covering the period from 2023 to 2025 and using a secondary database in the public domain. The data obtained were properly organized in tables and spreadsheets, in order to enable a systematized visualization of the information. Subsequently, they were submitted to treatment and descriptive statistical analysis, with the purpose of identifying the distribution of cases according to demographic, temporal and clinical variables, as well as facilitating the interpretation of the results and the discussion of the observed trends. In

addition, a critical evaluation of the findings was carried out, seeking to recognize epidemiological patterns, seasonal variations, and possible factors associated with the increase in hospitalizations. This analysis aims to support the improvement of surveillance, alert, and response actions, strengthening SARS prevention, control, and clinical management strategies in the context of public health in the state.

The study is structured in multiple sections, in order to cover the proposed theme in a broad and systematized way. The introduction presents an in-depth contextualization of the problem, highlighting the scientific and social relevance of the research, as well as its general and specific objectives, the methodological approaches adopted and the theoretical bases that support the investigation. Next, the theoretical foundation includes an analysis of the main concepts and theoretical frameworks related to Severe Acute Respiratory Syndrome (SARS), with emphasis on the epidemiological and clinical aspects that characterize the profile of hospitalizations in the state of Rio Grande do Sul, in addition to discussing previous studies and trends observed in the national context. The methodological procedures section describes in detail the study design, the data sources, the inclusion and exclusion criteria, and the statistical analysis techniques used, ensuring the transparency and reproducibility of the research. Subsequently, the results and discussions are presented, with a critical interpretation of the findings in the light of the scientific literature and public health policies. Finally, the work concludes with the final considerations, which summarize the main contributions of the research, point out its limitations and suggest perspectives for future investigations, aiming to strengthen knowledge about SARS and support more effective actions for surveillance, prevention and control of this syndrome.

This article aims to improve strategies for preventing and reducing SARS morbidity and mortality, promoting the strengthening of surveillance, alert, and response related to influenza syndromes.

2 CONCEPTUAL THEORETICAL FRAMEWORK

Severe Acute Respiratory Syndrome (SARS) is characterized by a highly severe flu-like clinical picture, usually associated with significant respiratory impairment, manifested by dyspnea, tachypnea, and hypoxemia, with peripheral oxygen saturation (SpO_2) below 95% on room air. It is a potentially serious condition, which can quickly progress to acute respiratory failure, requiring hospitalization and ventilatory support. During the period of the COVID-19 pandemic, there was a significant increase in the incidence of SARS cases, mainly driven by the spread of SARS-CoV-2, although other etiological agents such as the Influenza

A and B viruses and the respiratory syncytial virus (RSV) also contributed to the worsening of the epidemiological scenario (Antonelli et al, 2022).

The population most vulnerable to the severe evolution of the syndrome includes the elderly, pregnant women, children under five years of age, and people with chronic comorbidities, such as cardiovascular diseases, diabetes mellitus, pre-existing respiratory diseases, obesity, and immunosuppression. These factors are strongly associated with increased risk of hospitalization, clinical complications, and mortality. In view of this, SARS represents an important challenge for Public Health, requiring continuous epidemiological surveillance, timely diagnosis, and rapid response from health services, in order to reduce unfavorable outcomes and minimize impacts on the hospital care system (CDC, 2024).

Severe Acute Respiratory Syndrome (SARS) represents an important challenge in the public health scenario, especially due to its high lethality coefficient and the significant impact it has on health systems. It is a rapidly evolving clinical condition, often associated with highly transmissible infectious agents, such as respiratory viruses, which contributes to the significant increase in hospitalizations, especially in intensive care units. In addition, SARS affects vulnerable groups more severely, such as the elderly, young children, pregnant women, and individuals with comorbidities, increasing the risk of unfavorable outcomes, including death. In this context, coping with SARS requires integrated strategies for epidemiological surveillance, timely diagnosis, appropriate clinical management, and strengthening prevention actions, in order to reduce mortality and minimize its impacts on public health (Antonelli et al, 2022).

Several viruses are associated with the etiology of Severe Acute Respiratory Syndrome (SARS), especially those with high transmission capacity and potential for unfavorable clinical evolution. Recently, the World Health Organization (WHO) announced the identification of a new viral serotype, related to the so-called influenza K, classified as a subtype of the influenza A (H3N2) virus. It is an agent imported into the country, whose circulation has attracted the attention of health authorities due to its clinical similarity with seasonal influenza (Espinoza-Gonzalez et al, 2022).

Infected individuals may present symptoms such as fever, general malaise, myalgia, headache, cough, odynophagia, and fatigue, typical manifestations of viral respiratory infections. Although, in most cases, the clinical picture is self-limiting, there is concern about the possibility of worsening in more vulnerable populations, such as the elderly, children, pregnant women, and people with comorbidities. In this context, early identification, epidemiological monitoring, and strengthening of health surveillance actions become

essential to prevent progression to severe forms of the disease and reduce the impact of SARS on public health (WHO, 2025).

In this scenario, the Hospital Epidemiological Surveillance Center (NVEH) plays an essential role in the systematic monitoring of cases, constituting a strategic axis for the early identification of events of interest in public health. Its role is fundamental not only in the registration and analysis of SARS cases, but also in the processes of timely detection, issuance of alerts, and rapid response to the circulation of respiratory viruses of epidemiological importance (Brasil, 2024).

Through the collection, consolidation, and continuous analysis of clinical and laboratory data, the NVEH contributes to the identification of patterns of illness, outbreaks, and possible changes in the epidemiological profile, supporting decision-making by managers and care teams. In addition, the center strengthens the articulation between hospital services and health surveillance systems, ensuring adequate notification, compliance with current protocols, and the implementation of control and prevention measures. Thus, the NVEH becomes essential for reducing morbidity and mortality, qualifying care, and timely coping with respiratory problems in the hospital context (Brasil, 2024).

Another strategy of great relevance for the prevention and control of Severe Acute Respiratory Syndrome (SARS) is mass immunization, recognized as one of the most effective interventions to reduce the incidence of severe forms of the disease, hospitalizations, and deaths. In Brazil, vaccination is organized and offered universally by the National Immunization Program (PNI), which historically has high vaccination coverage rates and important achievements in the control of vaccine-preventable diseases (Espinoza-Gonzalez et al, 2022).

In the context of flu-like syndromes, Severe Acute Respiratory Syndrome (SARS) stands out as the condition of greatest severity and concern in public health, due to its high lethality coefficient. It is a clinical condition that can evolve rapidly, characterized by acute respiratory failure and the need for hospitalization, especially in intensive care units. SARS affects more severely populations considered vulnerable, such as the elderly, individuals living with chronic comorbidities such as cardiovascular diseases, diabetes mellitus, obesity and respiratory diseases, as well as children in the age group of zero to five years. These groups are more susceptible to complications and fatal outcome, which reinforces the importance of continuous epidemiological surveillance, expansion of vaccination coverage, and the implementation of prevention strategies and early management of cases, with a view to reducing morbidity and mortality associated with SARS (Souza et al, 2023).

SARS can be triggered by several etiological agents, including respiratory viruses such as influenza, respiratory syncytial virus, and SARS-CoV-2, the latter being responsible for a significant increase in cases during the COVID-19 pandemic. The severity of the condition and the rapid clinical evolution observed in certain population groups, especially among the elderly and people with chronic diseases, require early identification by health managers as well as immunization campaigns in order to reduce such rates (Espinoza-Gonzalez et al, 2022).

In 2019, most cases of Severe Acute Respiratory Syndrome (SARS) were associated with infection by the influenza virus, which has historically been one of the main etiological agents of this disease. With the advent of the COVID-19 pandemic, a significant change in this etiological profile was observed, with the coronavirus (SARS-CoV-2) becoming the main responsible for SARS-related cases and deaths in the country. Currently, with the advance of vaccination against COVID-19 and the reduction of the predominant circulation of SARS-CoV-2, there has been a significant increase in cases associated with different viral agents. Among them, respiratory syncytial virus (RSV), rhinovirus, parainfluenza, and human metapneumovirus stand out, which have contributed to the reemergence and diversification of the causes of SARS (Farias et al, 2023).

Severe Acute Respiratory Syndrome (SARS) represents an important challenge for public health, due to its high clinical severity and the diversity of etiological agents involved. It is a condition that can be caused by different microorganisms, especially respiratory viruses that affect the lower respiratory tract. Among the most frequently associated agents are the Influenza A and B viruses, the Respiratory Syncytial Virus (RSV), the Coronavirus and the Rhinovirus (Franco et al, 2025).

In addition to these, other pathogens, such as Metapneumoviruses, Parainfluenza and Adenovirus, can also be related to the development of the syndrome, especially in more vulnerable populations, such as children, the elderly and people with chronic comorbidities. This etiological diversity makes clinical and laboratory diagnosis difficult, requiring epidemiological surveillance strategies and expanded testing of viral panels for a more accurate identification of the causative agent (Hippisly-Cox et al, 2023).

Health surveillance actions play a fundamental role in the fight against Severe Acute Respiratory Syndrome (SARS), since they allow for continuous monitoring of cases, early identification of outbreaks, and the adoption of timely prevention and control measures. In this context, the identification of the etiological agent is extremely relevant, as it enables not only diagnostic confirmation, but also the definition of more appropriate and specific therapeutic conducts for each clinical situation (IDS, 2024).

Accurate recognition of the etiological agent responsible for the infection contributes to the rational choice of treatment, avoiding the inappropriate use of antibiotics and favoring evidence-based clinical management. In addition, laboratory surveillance integrated with epidemiological surveillance provides essential subsidies for the formulation of public policies, planning vaccination campaigns, improving care protocols, and strengthening biosafety actions in health services (Lira et al, 2024).

In order to reduce the number of hospitalizations and morbidity and mortality associated with Severe Acute Respiratory Syndrome (SARS), especially those resulting from viral agents, the Ministry of Health has implemented strategies aimed at expanding and strengthening laboratory surveillance. Among these actions, the expansion of the use of the RT-PCR test for viral panel (respiratory viruses), a molecular test of high sensitivity and specificity aimed at detecting viruses other than SARS-cov (Menni et al, 2022), stands out.

The expanded viral panel, which enables the differential diagnosis and serotyping of various respiratory viruses, such as respiratory syncytial virus (RSV), influenza A and B, adenovirus, rhinovirus and metapneumovirus. This integrated approach allows for the more precise identification of the causative agents of respiratory infections, contributing to the improvement of prevention, control, and clinical management measures for cases (Capdeirla et al, 2022).

The expansion of testing also favors continuous epidemiological monitoring, allowing the early detection of outbreaks and the adoption of timely measures to prevent viral spread, especially among more vulnerable populations, such as the elderly, children, and individuals with comorbidities. Thus, strengthening diagnostic capacity represents an essential pillar for reducing the impacts of SARS on the health system and on Brazilian public health (Brasil, 2022).

Despite the inclusion of influenza and COVID-19 vaccines in the national immunization calendar, the number of hospitalizations and deaths from Severe Acute Respiratory Syndrome (SARS) still represents a significant portion among the respiratory diseases reported in the country. This persistence shows that, although vaccines are widely available, the population's vaccine adherence is still insufficient to ensure collective protection and the effective reduction of morbidity and mortality associated with viral respiratory infections (Capdeirla et al, 2022).

Given this scenario, it is essential to reinforce education and social mobilization actions, with the aim of raising awareness among the population about the importance of vaccination as a primary prevention measure. Regular immunization not only reduces the individual risk of illness and serious complications, but also contributes to the indirect

protection of vulnerable groups, such as the elderly, children, pregnant women, and people with comorbidities (Neberg et al, 2022).

In addition, maintaining high vaccination coverage is essential to prevent the reemergence of respiratory viruses and minimize the seasonal impact of epidemics. Therefore, the strengthening of vaccination campaigns, combined with the expansion of access to health services and the dissemination of information based on scientific evidence, is a strategic component for the continuous confrontation of SARS and the promotion of respiratory health in the Brazilian population (Nyberg et al, 2022).

The adequate approach to suspected cases and the strict adoption of the clinical and surveillance protocols recommended by the Ministry of Health, especially those aimed at vulnerable populations, are fundamental strategies for reducing hospitalizations for flu-like syndromes and Severe Acute Respiratory Syndrome (SARS). These protocols guide the work of health professionals from the early recognition of symptoms to the implementation of medication and isolation measures, contributing to the interruption of transmission chains and the mitigation of severe outcomes (WHO, 2023).

The early insertion of specific protocols for the management of influenza and COVID-19 represents a significant advance in the field of secondary prevention of SARS, since it enables timely diagnosis, immediate initiation of treatment, and adequate clinical monitoring of patients. Such measures reduce the progression of mild cases to severe forms of the disease, minimize complications, and reduce the burden on health services (Wang et al, 2023).

With the arrival of the COVID-19 pandemic, there was a significant increase in the number of cases of Severe Acute Respiratory Syndrome (SARS) throughout the national territory. This growth was strongly associated with the spread of SARS-CoV-2, the etiological agent of COVID-19, which became, during the pandemic period, the main cause of hospitalizations and deaths due to SARS (Wynants et al, 2022).

However, it is important to note that SARS is not limited to coronavirus infection. Several other respiratory viruses are also related to the manifestation of the condition, including respiratory syncytial virus (RSV), influenza A and B viruses, adenovirus, rhinovirus, and metapneumovirus, among others. This etiological diversity reinforces the need for a broader and more accurate diagnostic approach, which goes beyond testing for COVID-19. In this context, the performance of the respiratory viral panel emerges as an essential tool for differential diagnosis and epidemiological surveillance. The use of this test allows the specific identification of the causative agent, guides appropriate clinical management, optimizes the

use of therapeutic resources, and contributes to the prevention of outbreaks and control of viral dissemination (Arroyo-Sanchez et al, 2024).

When identifying suspected or confirmed cases of Severe Acute Respiratory Syndrome (SARS), the health professional must immediately notify the Influenza Epidemiological Surveillance Information System (SIVEP-Gripe), an official platform of the Ministry of Health intended for monitoring these diseases. This mandatory notification has been established in Brazil since the end of the influenza A (H1N1) pandemic in 2009, when the importance of systematic monitoring of severe cases of respiratory infections was recognized to support surveillance and control actions (Antonelli et al, 2022).

Notification in SIVEP-Gripe allows the standardized registration of clinical, laboratory and epidemiological information, enabling the analysis of the profile of cases, the detection of outbreaks and the identification of new viral agents in circulation. In addition, this process is essential to guide rapid response strategies, the allocation of resources, and the updating of public policies aimed at preventing morbidity and mortality associated with SARS (Franco et al, 2024).

3 MATERIAL AND METHOD

This is a retrospective, exploratory and cross-sectional analysis, with a quantitative-qualitative approach. The objective is to evaluate the profile of hospitalizations due to SARS in the state of Rio Grande do Sul in the period from 2023 to 2025, which was selected because it is an important public health problem responsible for a high morbidity and mortality coefficient in the respective state (SIVEP-2025).

The data used in this study were extracted from SIVEP-gripe, which records information on hospitalizations for SARS, including the outcome of the case. SIVEP-influenza is essential in the surveillance of cases of hospitalizations due to flu-like syndromes (Brasil, 2022).

The system was chosen because it is a source of data on the monitoring of SARS cases in real time, justified by its comprehensiveness and reliability, and is widely recognized in epidemiological investigations. The system offers a detailed set of information on cases such syndromes, including patient demographics, medical diagnoses, treatments performed, and clinical outcomes (Brazil, 2022).

Therefore, the data obtained from SIVEP provide a solid and comprehensive basis for the analysis of the profile of hospitalizations due to SARS during the period in question. They allow a detailed understanding of the morbidity patterns and epidemiological trends of these diseases in the context of the etiologic agents in question (CDC, 2024).

After data collection, they were organized and used to calculate the prevalence of hospitalizations due to SARS. Prevalence was determined based on these data, providing a solid basis for presenting subsequent results. This method allowed a detailed analysis of the frequency and distribution of hospitalizations for SARS and their respective outcomes, it is worth noting that hospitalization for this cause is considered a negative outcome for flu-like syndrome (Roquayrol, 2018).

The data below were obtained from the prevalence equation:

3.1 PREVALENCE = NUMBER OF EXISTING CASES OF THE DISEASE/TOTAL POPULATION AT RISK X 1000.

Prevalence calculation is a statistical method used to measure the proportion of individuals in a population who have a particular condition or characteristic at a specific point in time. Prevalence is a static measure that provides a snapshot of public health in a population and is crucial for health policymaking, service planning, and evaluation of interventions (Roquayrol, 2018).

4 RESULTS

Data collection was carried out based on information available in the Influenza Epidemiological Surveillance Information System (SIVEP-Gripe), considering hospitalizations for Acute Respiratory Syndrome (SARS) recorded in the state of Rio Grande do Sul between 2023 and 2025. Variables related to social class or other sociodemographic aspects were not included. It was observed that, in the period analyzed, influenza cases exceeded COVID-19 cases, evidencing the progressive control of the pandemic. The data were carefully extracted, organized, and tabulated in spreadsheets to facilitate subsequent analysis. Next, the previously described equation was applied to calculate the prevalence of hospitalizations and identify the main etiological agents involved (Farias et al, 2024).

It is noteworthy that, as this is a secondary data source, the study has limitations, such as the possible imprecision in the absolute number of reported cases. Even so, SIVEP-Gripe is an essential tool for understanding the epidemiological profile of hospitalizations and care related to Notifiable Respiratory Diseases (NCD), offering relevant subsidies for public health planning and surveillance (Espinosa-Gonzales et al, 2022).

The statistical analysis process made it possible to obtain detailed information on the distribution of hospitalizations for Severe Acute Respiratory Syndrome (SARS) and the main etiological agents identified. From the tabulated data, three Figures were prepared that clearly and objectively illustrate the trends and patterns observed. These visual aids are key

to understanding variations in the prevalence of respiratory infections, allowing for a more accurate assessment of the areas and periods of greatest impact, as well as the identification of possible associated risk factors (Menni et al, 2022).

In the field of public health, these results play a fundamental role in the development of intervention and control strategies, especially aimed at the regions and populations most impacted. The Figureical representation of the data, in addition to facilitating the interpretation of the findings, is a valuable tool for communicating information to health professionals, managers, and public policy makers 9Capdeirla et al, 2022).

The following tables present the detailed results of the prevalence equations, allowing an accurate analysis of the prevalence of hospitalizations due to SARS. It is worth mentioning that these data support the decision-making process by managers based on the decision-action premise (Nyberg et al, 2022).

The different serotypes of viruses responsible for flu-like syndromes present variations in their virulence, which may increase the probability of progression to more severe clinical conditions. Patients infected with certain serotypes are subject to intense respiratory manifestations, systemic complications and, in severe cases, high risk of death. These factors reinforce the importance of accurate identification of etiological agents, continuous epidemiological surveillance, and the adoption of appropriate preventive and therapeutic measures, especially in vulnerable populations, such as the elderly, pregnant women, and individuals with chronic comorbidities (Brasil, 2022).

The mortality associated with flu-like syndromes is significant, representing a constant challenge for global public health. Severe or persistent infections by respiratory viruses, especially in vulnerable populations such as the elderly, children, pregnant women, and individuals with chronic comorbidities, constitute one of the main causes of death related to these syndromes. In addition, the evolution to severe clinical conditions can be aggravated by factors such as delay in diagnosis, lack of access to adequate medical care, and the circulation of more virulent serotypes. These aspects highlight the importance of effective surveillance, prevention, and clinical management strategies, including vaccination, early detection, and appropriate therapeutic intervention, to reduce the morbidity and mortality associated with flu-like syndromes (Farias et al, 2024).

The results obtained corroborate the high morbidity and mortality coefficient associated with Severe Acute Respiratory Syndrome (SARS), reinforcing the severity of this condition for public health. These findings highlight not only the significant frequency of hospitalizations, but also the intensity of clinical complications, which can rapidly progress to adverse outcomes, including death. In addition, the data highlight the need for continuous

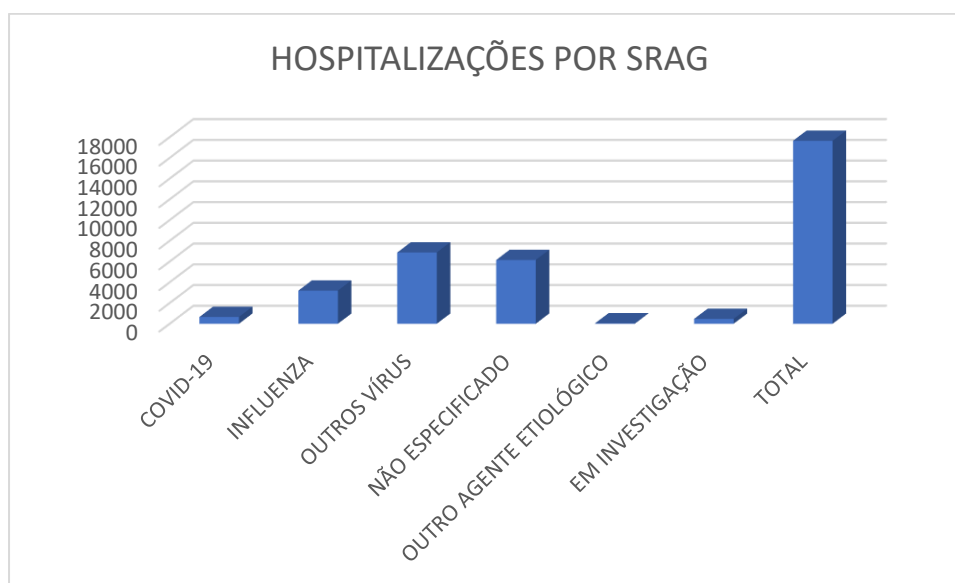
monitoring, effective prevention strategies, early detection, and appropriate clinical management, especially among vulnerable populations, such as the elderly, individuals with comorbidities, and young children, who are at higher risk of progressing to severe forms of the disease (Souza et al, 2023).

The different virus serotypes responsible for flu-like syndromes play a crucial role in determining the epidemiological profile in the country, due to their ability to generate adverse clinical outcomes. Some serotypes have higher virulence, increasing the risk of severe complications, prolonged hospitalizations, and deaths, especially in vulnerable populations, such as the elderly, children, pregnant women, and individuals with chronic comorbidities (Hippisry-Cox et al, 2023).

Figure 1 shows the distribution of hospitalizations for Severe Acute Respiratory Syndrome (SARS) in the state of Rio Grande do Sul, covering the period from 2023 to 2025. Through this visual representation, it is possible to identify temporal patterns, trends of increase or decrease in hospitalizations, and possible seasonal variations associated with viral circulation. In addition, the Figure allows comparing the frequency of cases between different periods, offering important subsidies for epidemiological analysis, health resource planning, and implementation of prevention and control strategies aimed at the most vulnerable populations. The results describe the high rates of hospitalizations due to SARS.

Figure 1

Distribution of hospitalizations due to SARS in the state of Rio Grande do Sul



Source: Ministry of Health

When analyzing Figure 2, the prevalence is observed through a linear model showing that the higher the cases of SARS by etiological agents, there is a higher prevalence of cases

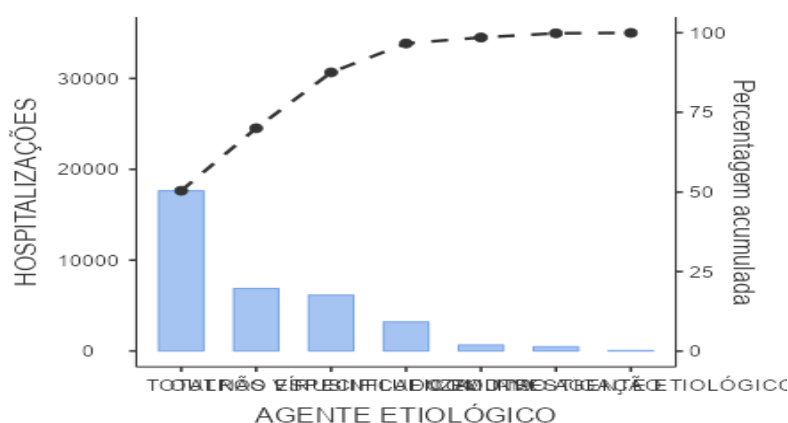
of COVID-19, respiratory syncytial virus (RSV) in addition to influenza A and B viruses, on the other hand there is a lower prevalence in the identification of cases, representing an important concern in Public Health.

The prevalence calculation, based on the tabulated data, reveals that most cases of hospitalization are related to the transmission of flu-like syndromes occur mainly in unvaccinated patients or those who had an incomplete vaccine schedule, as well as in those patients living with comorbidities. This mode of transmission includes factors such as the presence of comorbidities, low immunity and extremes of age, that is, children and the elderly, it is necessary to monitor these syndromes and early testing in order to avoid progression to negative outcomes such as death and ICU admissions. Flu-like syndromes are caused by several types of viruses, especially influenza A and B viruses, arenaviruses, respiratory respiratory virus (VSF), coronaviruses, among others (Wang et al, 2023).

In addition, the predominance of flu-like syndromes as one of the main causes of ICU admission by various etiological agents underlines the importance of an integrated public health approach, which includes not only the appropriate treatment of cases, but also primary and secondary prevention. In this context, adherence to vaccination is essential as primary prevention.

Figure 2

Prevalence of hospitalizations due to SARS considering the etiological agent



Source: Ministry of Health

When looking at the Pareto chart, we can see Left vertical axis (hospitalizations): indicates the absolute number of hospitalizations for each etiological agent; Right vertical axis (Accumulated percentage): shows the accumulated percentage of hospitalizations, allowing you to see which agents are responsible for most cases; Blue bars: represent the number of hospitalizations associated with each etiologic agent. It is observed that one or two agents dominate most hospitalizations and Dashed line: represents the accumulated percentage,

showing that a limited fraction of etiological agents (the "vital few") concentrate the largest proportion of hospitalizations (Wyants et al, 2022).

The influenza virus is responsible for approximately 50% of flu-like syndromes, and is the main etiological agent of these acute respiratory infections. Next, a significant portion of cases are attributed to viruses that have not yet been identified or of unknown etiology, while a smaller proportion is caused by other pathogens. These data highlight the relevance of flu-like syndromes of viral origin, highlighting the need for continuous epidemiological surveillance, prevention strategies, rapid diagnosis, and appropriate clinical approach, since such infections represent an important impact on public health, especially in vulnerable populations such as the elderly, pregnant women, and individuals with comorbidities (Arroyo-Sanchez & Aguirre-Merja, 2024).

It is noteworthy that, despite the advances achieved with the implementation of prevention campaigns and the insertion of protocols aimed at the early identification and adequate management of severe cases, the high morbidity and mortality coefficient associated with this disease still persists in several regions. This reality highlights the need to strengthen epidemiological surveillance actions, expand access to timely diagnosis, and ensure continuity of care in health care networks. In addition, factors such as socioeconomic inequalities, adverse environmental conditions, and limitations in adherence to preventive measures contribute to the maintenance of this scenario, reinforcing the importance of integrated and intersectoral strategies aimed at reducing diseases and promoting the health of the population (Lira et al, 2024).

It was observed that hospital admissions are directly associated with increased chances of progression to severe and lethal forms of the disease. As shown in Figure 3, the mortality coefficient for Severe Acute Respiratory Syndrome (SARS) presents significantly high values among hospitalized patients, especially those who required intensive care in Intensive Care Units (ICU).

This finding shows that the clinical severity of hospitalized cases reflects both the complexity of the disease and possible delays in diagnosis and initiation of treatment, factors that can negatively impact prognosis. In addition, the presence of pre-existing comorbidities, advancing age, and limited respiratory support in certain care contexts are also elements that increase the risk of death among patients hospitalized for SARS. Note Figure 3:

Figure 3*Prevalence of deaths due to flu-like syndromes*

Source: Ministry of Health

5 DISCUSSION

When analyzing the profile of hospitalizations for Severe Acute Respiratory Syndrome (SARS), it was observed that the morbidity and mortality pattern recorded in the state of Rio Grande do Sul follows the trend observed at the national level, representing approximately 19% of all hospital admissions. This data demonstrates that SARS remains one of the main causes of hospitalization for respiratory diseases in the country, reflecting its relevance as a public health problem (Capdeirla et al, 2022).

Another worrying aspect identified is the growing trend of clinical worsening and deaths resulting from this syndrome, which suggests the persistence of challenges in early detection, in the appropriate management of severe cases, and in the effectiveness of prevention and control strategies. Factors such as the simultaneous circulation of different respiratory viruses, population aging, the presence of chronic comorbidities, and inequalities in access to health services contribute to the increase in the vulnerability of the population (Antonelli et al, 2022).

In another study on SARS carried out in Rio Grande do Sul, it was observed that 1,268 notifications of Severe Acute Respiratory Syndrome (SARS) were registered in elderly individuals, corresponding to a population group of high clinical vulnerability. Among these cases, 72% had COVID-19 as the etiological agent, evidencing the predominance of SARS-CoV-2 as the main responsible for severe episodes in this age group (Espinosa-Gonzalez et al, 2022).

The case fatality rate observed was significantly high, reaching 40.9%, with a higher concentration of deaths among men and people with low education. These data suggest the influence of social determinants and inequalities in access to health services, which can delay diagnosis and compromise the effectiveness of treatment. In addition, the presence of comorbidities proved to be a decisive factor for the worsening of cases and the occurrence of deaths, with chronic kidney disease standing out as one of the main associated risk factors. This condition, in itself, compromises the immune system and increases susceptibility to severe respiratory complications.

Another relevant risk factor identified is pregnancy, since the physiological and immunological changes typical of this period increase the woman's vulnerability to severe respiratory infections, such as Severe Acute Respiratory Syndrome (SARS). During pregnancy, changes occur in the immune system, cardiovascular system, and lung function, which can reduce immune response capacity and compromise tissue oxygenation, favoring progression to more severe forms of the disease (CDC, 2024).

In a study carried out between 2020 and 2022, it was observed that the SARS mortality rate among pregnant women in Brazil reached around 7%, a value considered significant given the expectation of a favorable evolution in this age group when compared to the general population. This data reinforces the need for increased attention to pregnant women during outbreaks and epidemics of respiratory viruses, with priority given to access to testing, vaccination, and qualified prenatal care (Brasil, 2025).

In Figures 1 and 2, the presence of a high coefficient of cases of Severe Acute Respiratory Syndrome (SARS) caused by unidentified viruses was observed, which shows an important gap in the etiological diagnosis processes. This situation suggests the need to intensify the performance of specific laboratory tests, such as the respiratory viral panel, which allows the simultaneous detection of multiple viral agents, including respiratory syncytial virus, rhinovirus, metapneumovirus, influenza, and seasonal coronavirus. Expanding the use of the viral panel is essential not only to improve epidemiological surveillance and identify circulating agents more accurately, but also to guide more assertive clinical conduct and direct public policies for prevention and control (Souza et al, 2023).

Expanding vaccination coverage is one of the main public health strategies for reducing morbidity and mortality associated with Severe Acute Respiratory Syndrome (SARS), since immunization contributes to reducing the incidence of severe cases, hospitalizations, and deaths, especially among vulnerable groups, such as the elderly, pregnant women, children, and those with comorbidities (Franco et al, 2025).

However, insufficient adherence to vaccination campaigns still represents a major challenge, both in the state of Rio Grande do Sul and in other regions of the country. Factors such as misinformation, the spread of fake news, fear of possible adverse effects, and lack of access to reliable information have contributed to vaccine hesitancy and the consequent reduction in coverage rates (Nyberg et al, 2022).

This reality favors the persistence of outbreaks and the increase in severe cases of SARS, compromising the advances achieved in immunization policies and overloading the health system. In view of this, it is essential to strengthen health education, social communication, and combating misinformation, using strategies to get closer to the community and intersectoral partnerships to rebuild the population's confidence in vaccines (Wang et al, 2023).

People with low immunity are more vulnerable to the development of Severe Acute Respiratory Syndromes (SARS), due to their reduced immune response capacity to infectious agents, especially respiratory viruses. A comprehensive study conducted with 1,380 immunocompetent (IC) and immunosuppressed (IS) patients with acute respiratory tract infections showed marked differences in clinical and virological behavior between these groups. The immunocompetent (IC) group included patients with chronic heart disease (HD), primary health care (PC) beneficiaries, and a subgroup with suspected severe acute respiratory syndrome caused by influenza A (H1N1)pdm09 virus (SARS H1N1). The immunosuppressed group (IS) was composed of transplant patients and individuals with HIV infection (Menni et al, 2022).

Respiratory samples were collected between February 2005 and October 2013, and RT-qPCR analyses were performed for the detection of respiratory syncytial virus (RSV) and quantification of viral load (Log_{10} RNA copies/mL). The overall rate of RSV infection was 17.3%, being higher in children (23.9%) than in adults (12.9%), especially in children under two years of age (28.2%), an age group known to be more susceptible. Among the pediatric subgroups, children with suspected SARS H1N1 and those seen in primary care (PC) had even higher infection rates (16.4% and 34.9%, respectively), reaching 45.45% in children aged 1 to < 2 years in the PC group. Among adults, those with chronic heart disease (HD) had a significantly higher frequency of infection (27.83%), compared to the SARS H1N1 (2.65%) and immunosuppressed (15.16%) subgroups, in addition to having a higher hospitalization rate among individuals under 65 years of age. The RSV viral load ranged from 2.43 to 10.15 Log_{10} RNA copies/mL (mean $\pm$ SD = 5.82 ± 2.19), being significantly higher in hospitalized patients (7.34 ± 1.9) than in outpatients (4.38 ± 1.89). These findings reinforce

the relationship between high viral load and clinical severity, especially in risk groups (Farias et al, 2024).

It is also noteworthy that elderly patients undergoing bone marrow transplantation had higher viral loads (7.57 ± 2.41) compared to younger adults (5.12 ± 1.87), indicating that immunosuppression associated with advanced age and post-transplant treatment potentiates viral replication and the risk of severe outcomes. vulnerability to SARS is strongly associated with immune status and the presence of comorbidities, reinforcing the importance of specific prevention, surveillance, and clinical management strategies for immunosuppressed patients, the elderly, and those with chronic diseases, in order to reduce complications and mortality from acute respiratory infections (IDS, 2024).

Despite the high coefficients of cases of Severe Acute Respiratory Syndrome (SARS) caused by unidentified viruses observed in the present study, other studies corroborate the relevance of viral infections, especially COVID-19, as the main causes of this syndrome in recent years. In a study conducted in the interior of the state of Rio Grande do Sul, from 2020 to 2021, 4,710 cases of SARS were reported, of which 53.4% were related to COVID-19 in 2020, a proportion that increased significantly to 87.5% in 2021 ($p < 0.001$). These data show the growing predominance of SARS-CoV-2 as the main etiological agent, following the evolution of the pandemic in the country (Capdeirla et al, 2022).

When comparing the two years analyzed, a significant change was observed in the sociodemographic profile of the affected patients, with variations in terms of age, skin color, and level of education ($p < 0.001$). Such changes suggest a broadening of the affected population spectrum, reflecting both the dynamics of community transmission of the virus and social and regional inequalities in access to prevention and health care. Regarding the clinical aspects, there was a reduction in the prevalence of preexisting health conditions among the reported cases, with the exception of obesity, which remained an important risk factor for worsening the disease. In addition, there were changes in the pattern of reported signs and symptoms, possibly associated with the emergence of new viral variants and improved diagnostic capacity over the course of the pandemic (Souza et al, 2023).

A relevant finding was the decrease in hospital admission rates and bed occupancy in Intensive Care Units (ICU), which may be related to the expansion of vaccination coverage, the improvement of clinical protocols for the management of COVID-19, and the strengthening of the health care network. although SARS cases persist without etiological identification, COVID-19 remains the main agent responsible for severe conditions, and demographic, social, and clinical changes have directly influenced the profile of cases in the state of Rio Grande do Sul (Lira et al, 2024).

By analyzing the results obtained in the present study, in line with the recommendations of the Ministry of Health (MS) and the World Health Organization (WHO), the need to adopt early and effective measures aimed at identifying and managing the groups most vulnerable to Severe Acute Respiratory Syndrome (SARS) is evident. Early intervention is essential to reduce the number of hospitalizations, clinical complications, and deaths resulting from this condition, both in the state of Rio Grande do Sul and nationwide. Such protocols include expanding access to laboratory testing (such as RT-PCR and viral panel), constant monitoring of patients with risk factors such as the elderly, pregnant women, immunosuppressed and those with chronic diseases, and articulation between the different levels of health care to ensure comprehensiveness and continuity of care (Franco et al, 2025).

In addition, it is essential to promote permanent health education actions, training professionals for early recognition of signs of worsening, and encouraging adherence to preventive measures, such as vaccination against influenza and COVID-19. These strategies, when integrated with the guidelines of the Ministry of Health and the WHO, enhance the effectiveness of public policies, favoring the reduction of morbidity and mortality due to SARS and the strengthening of the health system's response to future respiratory emergencies (Capdeirla et al, 2022).

The prevention and coping with Severe Acute Respiratory Syndrome (SARS) is a shared responsibility of all professionals who work in the Health Care Network (RAS), including doctors, nurses, physiotherapists, community health agents, managers and other members of the multiprofessional team. Each link in this network plays an essential role, from early detection of cases, adequate notification in surveillance systems, to the implementation of effective therapeutic and preventive measures (Wynants et al, 2022).

However, individual effort combined with integration and coordination between the different levels of primary, secondary, and tertiary care is essential for actions to produce concrete results in reducing morbidity and mortality associated with SARS. Collaboration between teams makes it possible to optimize the flow of information, ensure continuity of care, speed up the referral of severe cases, and improve the management of hospital beds and Intensive Care Units (ICU) (Antonelli et al, 2022).

6 FINAL CONSIDERATIONS

The study shows high rates of Severe Acute Respiratory Syndrome (SARS) attributed to multiple etiological agents, highlighting that these diseases are of great relevance in the context of the hospital network, where they have a high frequency of hospitalizations. The

significant presence of these conditions in hospitals reflects the potential clinical severity of SARS, which can quickly progress to severe complications and, in many cases, result in death, especially among more vulnerable population groups, such as the elderly, immunosuppressed, and people with chronic comorbidities.

The study has some important methodological limitations that should be considered in the interpretation of the results. First, it was not possible to delineate in detail the sociodemographic profile of cases of Severe Acute Respiratory Syndrome (SARS), which restricts the analysis of how factors such as age, gender, skin color, education, and socioeconomic status influence the incidence, severity, and outcomes of the disease.

In addition, the study was based on secondary data, which may imply gaps in the completeness and consistency of information, as well as the possibility of underreporting or incomplete recording of relevant clinical and epidemiological variables. Another point is that some cases were still under investigation at the time of data collection, which may have affected the accuracy of etiological classification and the determination of clinical outcomes, such as hospitalization and death.

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