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Pediatric clinical and epidemiological profile during the 2025 respiratory virus seasonality in Recife, Brazil

Perfil clínico e epidemiológico pediátrico durante a sazonalidade de vírus respiratórios de 2025 em Recife, Brasil

Perfil clínico y epidemiológico pediátrico durante la estacionalidad de virus respiratorios de 2025 en Recife, Brasil

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ABSTRACT

Objective: To analyze the clinical and epidemiological profile of children and adolescents admitted with respiratory illness at a teaching hospital during the seasonality of respiratory viruses in Pernambuco (Brazil). **Methods:** Retrospective cross-sectional study, conducted with children under 14 years of age hospitalized for respiratory illnesses between March and July 2025, in a tertiary pediatric referral hospital. Sociodemographic, clinical and laboratory variables were collected, including signs and symptoms at admission, length of stay, antibiotic use, need for intensive care unit (ICU) and results of tests for respiratory viruses. **Results:** Most patients (70.4%) were under one year of age, and the median length of hospital stay was five days. The most frequent cause of hospitalization was acute viral bronchiolitis (61.7%), especially among infants. The main symptoms at admission were respiratory distress (83.0%), cough (77.0%), dyspnea (60.9%), and rhinorrhea (48.3%). Among the 89 patients tested for respiratory viruses using RT-PCR, 67 (75.3%) were positive, with respiratory syncytial virus (RSV) predominating in 57 (64.2%). Vaccination status was available in 43.9% of medical records, and only 71.3% were up to date with age-appropriate vaccinations. At admission, 60.9% met the criteria for severe acute respiratory syndrome. **Conclusion:** A predominance of infants and acute viral bronchiolitis, mainly due to respiratory syncytial virus, was observed as the main cause of hospitalization, with a high proportion of cases classified as severe acute respiratory syndrome, with no differences in severity between age groups.

Keywords: Respiratory infections, Severe acute respiratory syndrome, Hospitalization, Pediatrics.

RESUMO

Objetivo: Analisar o perfil clínico e epidemiológico de crianças e adolescentes internados por doença respiratória em um hospital de ensino durante a sazonalidade de vírus respiratórios em Pernambuco (Brasil). **Métodos:** Estudo transversal retrospectivo, realizado com crianças menores de 14 anos internadas por doenças respiratórias entre março e julho de 2025, em hospital terciário de referência pediátrica. Foram coletadas variáveis sociodemográficas, clínicas e laboratoriais, incluindo sinais e sintomas na admissão,

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tempo de internação, uso de antibióticos, necessidade de unidade de terapia intensiva (UTI)e resultados de testes para vírus respiratórios. **Resultados:** A maioria dos pacientes tinha menos de um ano (70,4%), com mediana de internação de cinco dias. A principal causa de internação foi bronquiolite viral aguda (61,7%), sobretudo em lactentes. Os sintomas mais frequentes foram desconforto respiratório (83,0%), tosse (77,0%), dispneia (60,9%) e coriza (48,3%). Entre 89 pacientes testados por RT-PCR, 75,3% foram positivos, com predomínio do vírus sincicial respiratório (64,2%). O estado vacinal estava disponível em 43,9% dos prontuários médicos, e apenas 71,3% estavam com a vacinação em dia, de acordo com a faixa etária. Na admissão, 60,9% preencheram critérios para síndrome respiratória aguda grave. **Conclusão:** Observou-se predominância de lactentes e de bronquiolite viral aguda, principalmente por vírus sincicial respiratório, como principal causa de internação, com elevada proporção de casos classificados como síndrome respiratória aguda grave, sem diferenças de gravidade entre faixas etárias.

Palavras-chave: Infecções respiratórias, Síndrome respiratória aguda grave, Hospitalização, Crianças.

RESUMEN

Objetivo: Analizar el perfil clínico y epidemiológico de niños y adolescentes hospitalizados por enfermedad respiratoria en un hospital docente durante la estacionalidad de virus respiratorios en Pernambuco (Brasil). **Métodos:** Estudio transversal retrospectivo realizado con niños menores de 14 años hospitalizados por enfermedades respiratorias entre marzo y julio de 2025, en un hospital terciario de referencia pediátrica. Se recolectaron variables sociodemográficas, clínicas y de laboratorio, incluyendo signos y síntomas al ingreso, duración de la hospitalización, uso de antibióticos, necesidad de ingresso en la unidad de cuidados intensivos (UCI) y resultados de pruebas para virus respiratorios. **Resultados:** La mayoría de los pacientes tenía menos de un año (70,4%), y la mediana de estancia hospitalaria fue de cinco días. La causa más frecuente de hospitalización fue la bronquiolitis viral aguda (61,7%), especialmente en lactantes. Los síntomas más comunes al ingreso fueron dificultad respiratoria (83,0%), tos (77,0%), disnea (60,9%) y rinorrea (48,3%). Entre 89 pacientes evaluados mediante RT-PCR, 75,3% fueron positivos, con predominio del virus sincicial respiratorio (64,2%). El estado de vacunación estaba disponible en el 43,9% de las historias clínicas, y solo el 71,3% estaba al día con las vacunaciones, según el grupo de edad. Al ingreso, el 60,9% cumplía los criterios de síndrome respiratorio agudo severo. **Conclusión:** El perfil clínico y epidemiológico mostró predominio de lactantes y de bronquiolitis viral aguda, principalmente por virus sincicial respiratorio, como causa de hospitalización, con alta proporción de casos clasificados como síndrome respiratorio agudo grave, sin diferencias de gravedad entre grupos etarios.

Palabras clave: Infecciones respiratorias, Síndrome respiratorio agudo grave, Hospitalización, Niños.

INTRODUCTION

Acute respiratory infections constitute a clinical syndrome whose most common infectious agents are bacteria and respiratory viruses. *Streptococcus pneumoniae* and *Haemophilus influenzae* are among the leading causes of hospitalization in pediatric age groups (CARDOSO AM, 2010), and several risk factors contribute to the incidence of acute respiratory infections in childhood, including socioenvironmental conditions (e.g., household crowding, age, nutritional state, maternal education, exposure to tobacco smoke, and air pollution) (PRATO MIC, et al., 2014). Studies indicate that low family income, limited access to healthcare, and inadequate clinical management also worsen respiratory conditions in children, increasing the likelihood of hospitalization (PRATO MIC, et al., 2014).

Severe acute respiratory syndrome (SARS) is a complication of influenza-like illness (ILI), most often caused by respiratory viruses (MAZON LM, et al., 2016). Besides the typical symptoms of ILI (i.e., fever, cough, sore throat, rhinorrhea, myalgia, fatigue, and headache), patients with SARS present marked dyspnea or other signs of clinical deterioration, including oxygen saturation ≤ 94% on room air, tachypnea,

exacerbation of underlying disease, and hypotension, requiring hospitalization to control symptoms (MINISTÉRIO DA SAÚDE, 2023).

The seasonality of respiratory viruses directly affects ILI incidence and the number of SARS notifications, especially in tropical regions where climatic variables strongly influence viral circulation (ALMEIDA ARM, 2018; GRANGER CW, 1979; BARNETT AG, et al., 2010). In the state of Pernambuco (Brazil), the viral activity typically increases between March and July, coinciding with lower average temperatures and increased rainfall. Understanding this seasonality is paramount for improving healthcare services and developing effective prevention and control strategies (ALMEIDA ARM, 2018).

Beyond seasonality, studies have demonstrated that the COVID-19 pandemic altered the viral circulation dynamics and negatively impacted vaccination coverage, which in 2021 reached the lowest levels in 30 years (KURSKAYA O, et al., 2023; HANSEN C, et al., 2022; UNITED NATIONS CHILDREN'S FUND, 2023). This scenario contributed to the resurgence of previously controlled diseases and to an increase in the number of SARS cases (KURSKAYA O, et al., 2023; HANSEN C, et al., 2022). Brazil ranks among the 10 countries with the highest rates of delayed childhood vaccination, with three in every ten children missing the recommended vaccines for their age (UNITED NATIONS CHILDREN'S FUND, 2023).

The Respiratory Syndrome Surveillance System, established in 2000, was expanded in 2009 to include all SARS cases, increasing the monitoring of influenza and other respiratory pathogens (MINISTÉRIO DA SAÚDE, 2019; MINISTÉRIO DA SAÚDE, 2022). Since the onset of the COVID-19 pandemic in 2020, SARS case notification has become mandatory through the Influenza Surveillance Information System (MINISTÉRIO DA SAÚDE, 2020).

By the epidemiological week (EW) 34/2025, a total of 163,956 SARS cases were reported in Brazil, representing a 37.1% increase compared to the same period in 2024. Among these, 53.5% tested positive for at least one respiratory virus (45.1% respiratory syncytial virus [RSV], 25.2% rhinovirus, 24.6% influenza A, and 7% SARS-CoV-2), reflecting a significant drop in COVID-19 cases compared to the previous year (FUNDAÇÃO OSWALDO CRUZ, 2025; FUNDAÇÃO OSWALDO CRUZ, 2024).

Nationally, the number of SARS cases continued to rise among children and adolescents aged 2 to 14 years until the EW 34/2025, with rhinovirus being the most detected pathogen. The state of Pernambuco followed this pattern, showing an increase in SARS cases only in the 2- to 14-year-old age group. Conversely, RSV-related SARS, which affects especially infants, continued to decrease nationally while presenting a peak incidence during the EW 22 in Pernambuco (FUNDAÇÃO OSWALDO CRUZ, 2025).

Since 2023, the State Health Department of Pernambuco has declared a public health emergency during the respiratory virus season (FUNDAÇÃO OSWALDO CRUZ, 2024; ESTADO DE PERNAMBUCO. 2023; ESTADO DE PERNAMBUCO, 2024; ESTADO DE PERNAMBUCO, 2025). This measure was taken due to the growing demand for neonatal and pediatric intensive care unit (ICU) beds, which exceeded the capacity of the healthcare system despite recent contingency planning and bed expansion efforts (SECRETARIA DE ESTADUAL DE SAÚDE DE PERNAMBUCO, 2024). From the 5,420 SARS cases reported in the state by the EW 34/2025, 4,200 were children and adolescents (from 0 to 14 years), of which 71.0% were infants (SECRETARIA DE ESTADUAL DE SAÚDE DE PERNAMBUCO, 2025). Given this new scenario, this study aimed to analyze the clinical and epidemiological profile of children hospitalized for respiratory illnesses at a tertiary hospital in Recife (Pernambuco, Brazil) and identify the main etiological agents and factors associated with SARS cases. This knowledge is essential for improving prevention and care strategies during the respiratory virus season.

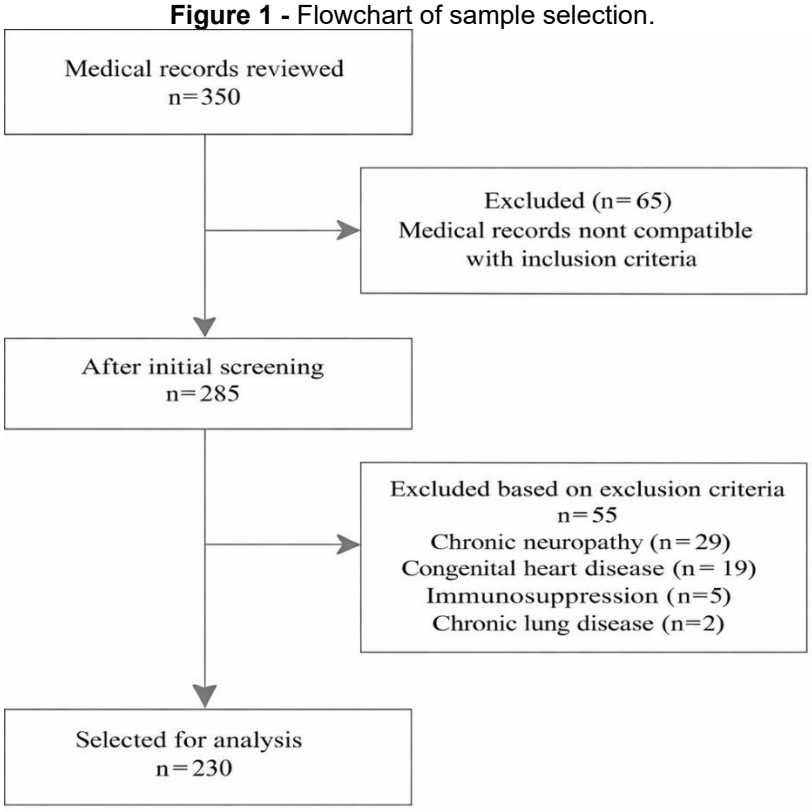
METHODS

A retrospective cross-sectional study was conducted from March to July 2025 at the Instituto de Medicina Integral Prof. Fernando Figueira, a philanthropic institution affiliated exclusively with the Unified Health System and recognized as a referral center for maternal and child healthcare.

Eligible participants were children and adolescents under 14 years of age hospitalized with respiratory illness during the study period. All cases of respiratory disorders were identified from the admission lists of the hospital using the International Classification of Diseases – 10th edition. Exclusion criteria were congenital or acquired immunodeficiencies, chronic lung diseases (except asthma), congenital heart diseases, and chronic neurological conditions. Newborns were excluded if admitted due to neonatal respiratory disorders, such as neonatal respiratory distress syndrome or meconium aspiration syndrome.

The sample size was calculated using the formula for estimating proportions in a finite population n=(Z^2×P×(1-P))/e^2 , where Z corresponds to the normal distribution value for the confidence level (1.96 for a 95% confidence interval [CI]), P is the expected proportion (0.5 to maximize sample size), and e is the desired precision (0.05). The finite correction n_adj=(N×n)/(N+n) for small sample sizes was also applied. For a total population of N = 895, the adjusted sample size was approximately 269 individuals. To account for potential data losses, 30% were added, resulting in a sample of 350 individuals. Medical records were selected using the sample function from the Pandas data analysis library (Python), with a fixed random seed to ensure reproducibility. Last, 230 medical records met the eligibility criteria and composed the final sample. The sample selection process is shown in **Figure 1**.

Figure 1 - Flowchart of sample selection.



Source: Vasconcelos RMC, et al., 2026.

The collected variables included demographic characteristics (age, sex, race, and place of residence) and clinical and laboratory data (vaccination status, respiratory rate and oxygen saturation at hospitalization, length of hospital stay, antibiotic use, and need for ICU admission). For cases with suspected viral etiology, results of rapid and molecular diagnostic tests were obtained from medical records and the Epidemiology Center of Instituto de Medicina Integral Prof. Fernando Figueira.

Each medical record was reviewed for signs and symptoms reported at admission, and cases were classified as ILI or SARS according to the definitions established by the Brazilian Ministry of Health. ILI was defined as acute respiratory illness with at least two of the following symptoms: fever (reported or measured),

chills, sore throat, headache, cough, rhinorrhea, or olfactory/gustatory disturbances; in younger children, nasal congestion was also considered. SARS was defined as meeting ILI criteria plus dyspnea or signs of clinical severity, including oxygen saturation ≤ 94% on room air, respiratory distress with age-adjusted tachypnea (documented as intercostal retraction or nasal flaring), worsening of underlying condition, or hypotension. In infants, nasal flaring, cyanosis, dehydration, or poor feeding were also considered markers of severity (MINISTÉRIO DA SAÚDE, 2023).

Data were analyzed using the Pandas library (Python) and SPSS software (v. 31.0.0.0, IBM, Armonk, NY, USA). Only valid responses (i.e., completely and legibly filled out) were included. Continuous variables were presented as mean and standard deviation or median and 25th – 75th interquartile range ($IQR_{25\%-75\%}$), whereas categorical variables were presented as absolute and relative frequencies. The variables age and length of hospital stay were categorized into intervals to facilitate visualization. Associations between categorical variables were examined using Pearson's chi-square test or Fisher's exact test, with a 95%CI. Analysis of variance (ANOVA) and Pearson's linear correlation were performed when applicable.

The study was conducted in accordance with resolution no. 466/2012 of the Brazilian National Health Council and the Declaration of Helsinki. The project was approved by the research ethics committee of Instituto de Medicina Integral Prof. Fernando Figueira (no. 7.508.058/2025 and CAAE: 87411025.0.0000.5201).

RESULTS

The mean age of the analyzed sample (n = 230) was 0.82 ± 2.00 years: 162 (70.4%) were under one year of age (24 newborns [10.4%]), 34 (14.8%) were between one and two years old, and only 10 (4.3%) were aged six years or older. A mild predominance of male patients (n = 124, 53.9%) was observed, with a balanced sex distribution. Most children were classified as mixed-race (n = 192; 83.5%), while 32 (13.9%) were classified as white, and only 6 (2.6%) as black. Most patients also resided in the metropolitan region of Recife, specifically the city of Recife (n = 126; 54.8%), followed by Jaboatão dos Guararapes (n = 33; 14.3%), Paulista (n = 20; 8.7%), and Olinda (n = 15; 6.5%), totaling 21 cities of origin. All patients were residents of the state of Pernambuco (**Table 1**).

Table 1 - Sociodemographic characteristics of patients (0 to 14 years) admitted with respiratory illness between March and July 2025 in a tertiary referral hospital. Recife, Brazil, 2025.

Variables		n	%
Sex	Male	124	53.9
	Female	106	46.1
Age	< 1	162	70.4
(in full years)	≥ 1 and < 2	34	14.8
	≥ 2 and< 3	13	5.7
	≥ 3 and < 4	6	2.6
	≥ 4 and< 5	2	0.9
	≥ 5 and< 6	3	1.3
	≥ 6	10	4.3
Race/skin color	Mixed-race	192	83.5
	White	32	13.9
	Black	6	2.6
City of residence	Recife	126	54.8
	Jaboatão dos Guararapes	33	14.3
	Paulista	20	8.7
	Olinda	15	6.5
	Igarassu	6	2.6
	São Lourenço da Mata	5	2.2
	Camaragibe	3	1.3
	Moreno	3	1.3
	Ipojuca	3	1.3
	Carpina	3	1.3
	Other	13	5.7

Data presented as absolute and relative frequency. n = number of patients. **Source:** Vasconcelos RMC, et al., 2026.

Regarding the conditions for hospitalization recorded in medical charts, acute viral bronchiolitis accounted for 142 (61.7%) cases, especially among infants (n = 135; 95.1%). Other causes of hospitalization included respiratory illnesses of other specified etiologies (n = 35; 15.2%), pneumonias (n = 28; 12.2%), unspecified respiratory failure (n = 19; 8.3%), and SARS (n = 6; 2.6%), which primarily affected infants. Among patients aged two years or older, the main causes of hospitalization were respiratory illnesses specified by other etiologies and pneumonia (22 out of 34, 64.7%) (**Table 2**).

Table 2 - Causes of hospitalization in patients (0 to 14 years) admitted with respiratory illness between March and July 2025 in a tertiary referral hospital. Recife, Brazil, 2025.

Cause	< 2 years n (%)	≥ 2 years n (%)	Total n (%)
Acute viral bronchiolitis	135 (95.1)	7 (4.9)	142 (61.7)
Respiratory illnesses specified by other etiology	24 (68.6)	11 (31.4)	35 (15.2)
Pneumonia	17 (60.7)	11 (39.3)	28 (12.2)
Unspecified respiratory failure	14 (73.7)	5 (26.3)	19 (8.3)
Severe acute respiratory syndrome	6 (100.0)	0 (0.0)	6 (2.6)

Data presented as absolute and relative frequency. n = number of patients.
Source: Vasconcelos RMC, et al., 2026.

Table 3 presents the clinical signs and symptoms most reported at hospital admission.

Table 3 - Signs and symptoms recorded in patients (0 to 14 years) admitted with respiratory illness between March and July 2025 in a tertiary referral hospital. Recife, Brazil, 2025.

Sign/symptom	n	%
Respiratory distress (retraction, intercostal retraction, nasal flaring)	191	83.0
Cough	177	77.0
Dyspnea	140	60.9
Rhinorrhea	111	48.3
Fever	107	46.5
Tachypnea	93	40.4
Fatigue	46	20.0
Nasal congestion	45	19.6
Vomit	27	11.7
Diarrhea	17	7.4
Moaning	14	6.1
Sneezing	13	5.7

Data presented as absolute and relative frequency. n = number of participants.
Source: Vasconcelos RMC, et al., 2026.

When categorizing medical record data according to the criteria of the Brazilian Ministry of Health, we observed that 140 (60.9%) patients presented clinical criteria for SARS, and 13 (5.7%) for ILI at admission.

Among all infants (n = 196), there were 119 (60.7%) cases of SARS and 7 (3.6%) of ILI, whereas 21 (61.8%) cases of SARS and 6 (17.6%) of ILI were reported among children aged ≥ 2 years (n = 34). The association between age group and SARS occurrence revealed similar proportions between children younger and older than two years (60.7% *vs.* 61.8%, p = 1.00), with a risk ratio (RR) of 0.98 (95%CI 0.74 to 1.31), indicating no statistically significant association between age and severity in this population.

The mean length of hospital stay was 7.0 ± 6.5 days, and half of the patients were discharged within five days of admission (median = 5.0, $IQR_{25\%-75\%}$ = 3.0 to 9.0). Hospitalizations lasting between 2 and 5 days accounted for 49.6% of cases, between 6 and 10 days for 27.0%, > 10 days for 17.0%, and < 2 days for 6.5%.

Among the 230 patients, 45 (19.6%) needed intensive care, with a mean ICU stay of 6.2 days. Of these patients, 25 (55.6%) remained in the ICU for up to five days, while 9 (20.0%) remained for 11 or more days. Comparative analyses between age groups showed no significant differences (p = 0.25). Furthermore, the

RR was 1.78 (95%CI 0.68 to 4.64), suggesting a numerically higher risk among infants, although this was not statistically significant. Similarly, the use of antibiotics did not differ among age groups: 79 (40.3%) infants and 17 (50.0%) children aged ≥ 2 years received antibiotics (p = 0.35, RR = 0.81, 95%CI 0.55 to 1.18).

Molecular tests for respiratory viruses were performed on samples from 89 patients (all under two years of age), of whom 67 (75.3%) were positive and 22 (24.7%) were negative. Among viral infections, RSV accounted for 43 (64.2%) cases (**Table 4**). In addition, 17 (19.1%) samples were positive for rhinovirus, 6 (6.6%) for metapneumovirus, 5 (5.6%) for adenovirus, and 2 (2.2%) for influenza A. The co-detection of two or more viruses occurred in 7 (7.9%) samples, most frequently the association of RSV and rhinovirus. No records of viral panel testing were found for patients aged ≥ 2 years.

Table 4 - Distribution of clinical and etiological variables by age group (older or younger than two years of age) in patients admitted with respiratory illness between March and July 2025 in a tertiary referral hospital. Recife, Brazil, 2025.

Variable	Category	< 2 years (n = 196)	≥ 2 years (n = 34)	*p*-value[3]
SARS (occurrence)[1]	**Yes**	119 (60.7%)	21 (61.8%)	1.00
	No	77 (39.3%)	13 (38.2%)	
ICU admission	**Yes**	41 (21.0%)	4 (11.8%)	0.25
	No	155 (79.1%)	30 (88.2%)	
Antibiotic use[1]	**Yes**	79 (40.3%)	17 (50.0%)	0.35
	No	117 (59.7%)	17 (50.0%)	
Positive viral panel[1,2]	**Yes**	67 (75.3%)	0 (0.0%)	N/A
	No	22 (24.7%)	0 (0.0%)	
RSV-positive[1,2]	**Yes**	43 (64.2%)	0 (0.0%)	N/A
	No	24 (35.8%)	0 (0.0%)	

[1] "SARS (ococurrence)" compares the proportion of cases classified as SARS at admission, according to the criteria of the Ministry of Health, among age groups; "Antibiotics use" considers any treatment scheme employed during hospitalization; "Positive viral panel" considers the presence or absence of any virus in collected samples, whereas "RSV-positive" considers the presence of RSV alone or in co-infection. [2] For "Positive viral panel" and "RSV-positive" variables, only cases with molecular testing were included (n = 89). In both variables, the total for the age group ≥ 2 years was zero; Fisher's exact test was not performed (N/A). [3] p-*values* defined by Fisher's exact test.
Source: Vasconcelos RMC, et al., 2026.

Regarding breastfeeding among infants (n = 196), 168 (85.7%) medical records presented this information. Of these records, 106 (63.1%) infants were being exclusively or partially breastfed at the time of hospitalization, while 62 (36.9%) were not being breastfed.

Vaccination status of children and adolescents was described in only 101 (43.9%) medical records. Among these, 72 (71.3%) reported up-to-date vaccination for age, whereas 29 (28.7%) indicated delayed vaccination. The discharge summaries provided vaccination guidance in 165 (71.7%) cases; of these, 147 (89.1%) emphasized the importance of keeping the vaccinations current, and 18 (10.9%) recommended updating the vaccination schedule.

Among the 140 cases meeting SARS criteria at admission, the final diagnoses recorded in the medical charts were acute viral bronchiolitis (81 cases), community-acquired pneumonia (20 cases), and RSV-related SARS (8 cases); the latter cases were confirmed before hospital discharge. In addition, 16 (11.4%) cases were classified as recurrent wheezing episodes or viral upper tract infection, while 15 (10.7%) were classified as miscellaneous diagnoses, including asthma and exacerbations with signs of severity.

Among patients (n = 90) who did not meet SARS criteria at admission, 6 (6.7%) were later classified as SARS of viral or unspecified origin. Another 6 (6.7%) cases were diagnosed as pertussis-like syndrome or pertussis, and the majority (n = 40; 44.4%) were classified as acute viral bronchiolitis.

DISCUSSION

Our results emphasize the strong viral nature of pediatric respiratory infections during the seasonal peak, consistent with the known epidemiology of the illnesses, which predominantly affect this age group (DEL TORO RODRÍGUEZ LB, et al., 2021). The results indicated that most hospitalized children were under one year of age, and acute viral bronchiolitis was the leading cause of hospitalization. The most common symptoms were respiratory distress, cough, and dyspnea. Approximately 61.0% of patients met the criteria for SARS diagnosis, with no significant differences in disease severity or need for intensive care across age groups. RSV was the main pathogen identified in children under two years of age.

The descriptive analysis of the data demonstrated that the age distribution aligned with the trends observed in state and national epidemiological profiles. In Pernambuco, as of EW 34/2025, 77.5% of reported SARS cases occurred in children under 14 years of age, of whom 71.0% were infants (FUNDAÇÃO OSWALDO CRUZ, 2025). Moreover, considering the urgency of hospitalization, more than 90.0% of the included patients resided in the metropolitan region of Recife; however, cases from other cities likely reflect the limited availability of high-complexity hospitals in their respective regions.

At admission, most patients from our study presented with signs and symptoms indicative of greater clinical severity, as expected in an inpatient population. However, because this study did not include children treated at the emergency department and discharged for outpatient management, it was not possible to determine the overall hospitalization rate by age group. Future studies should include these outpatient data to provide a more accurate estimate of disease burden and hospitalization frequency across different age groups.

The subset of patients who progressed to SARS after admission suggests an initial underestimation of risk or rapid clinical deterioration, a pattern consistent with the natural course of SARS as a complication of influenza-like syndromes caused by multiple viruses (e.g., influenza, RSV, and SARS-CoV-2). These findings emphasize the importance of serially monitoring of respiratory rate, ventilatory effort, and oxygen saturation during the first 24 to 48 hours, since these parameters define SARS in pediatric cases and inform clinical management (MINISTÉRIO DA SAÚDE, 2023).

Among the cases attributed to other etiologies, six patients were diagnosed with pertussis-like syndrome. In 2024, Brazil recorded the highest increase in pertussis cases of the decade (more than 7,000 confirmed cases). This resurgence was likely due to the cyclic nature of the disease, the resumption of social interactions after the COVID-19 pandemic, and the decline in vaccination coverage observed between 2016 and 2021 (UNITED NATIONS CHILDREN'S FUND, 2023; MINISTÉRIO DA SAÚDE, 2025; OPAS/OMS, 2025). In Pernambuco, 74 confirmed pertussis cases were reported by EW 34/2025 in children under 14 years of age, whereas there were 2,219 confirmed cases in Brazil across all age groups (1,493 of which occurred in children under 14 years of age). These data reinforce the urgent need to enhance vaccination coverage in the coming years (UNITED NATIONS CHILDREN'S FUND, 2023; MINISTÉRIO DA SAÚDE, 2025).

Vaccination status was documented in only 43.9% of medical records, indicating a need for greater rigor in reviewing and documenting vaccination records at the time of hospital admission. Among the available data, only 71.3% of children and adolescents were up to date with their vaccines. Vaccination recommendations must be clearly stated in the discharge summary since they guide families in post-hospital care and reflect the instructions provided by healthcare professionals. In this study, 70.9% of discharge summaries included such guidance, highlighting the importance of continuing education and professional accountability in reinforcing vaccination practices. The length of hospital stay ranged from 0 to 40 days (median of 5 days). Although most hospitalizations were relatively brief, a significant proportion (44.0%) lasted longer than five days. Prolonged hospitalizations may increase the risk of nosocomial infections, interruption of school and play activities, psychosocial distress for patients and their families, missed workdays, and complications from invasive procedures or iatrogenic events (OLIVEIRA GR, et al., 2004; SILVEIRA KA, et al., 2019).

The predominance of RSV observed reinforces its role as the primary etiological agent of acute respiratory infections in children under two years, particularly in bronchiolitis and pneumonia, which were responsible for approximately 80.0% and 60.0% of these cases, respectively (MINISTÉRIO DA SAÚDE, 2025). Outpatient care may be required by one in five infected children, while one in fifty children is hospitalized during the first year of life (ROSAS-SALAZAR C, et al., 2023). These findings emphasize the clinical and economic burden of RSV and the need for targeted preventive strategies.

In our cohort, the proportion of RSV-positive samples confirms its important contribution to severe respiratory infections in infants. However, the lack of testing records in children aged ≥ 2 years limits comparisons between age groups and restricts the extrapolation of findings to older populations.

During data collection, multiple pediatric emergency visits and hospitalizations were observed for the same child, including cases related to previous hospitalization sequelae. Although not addressed in this study, a North American prospective cohort of term infants followed to the age of five years demonstrated a significant association between RSV infection during the first year of life and subsequent respiratory outcomes, such as asthma and recurrent wheezing, until two years of age (ROSAS-SALAZAR C, et al., 2023). From an economic perspective, the average cost of a five-day RSV hospitalization exceeded R$2,000. In contrast, the Brazilian National Technology Incorporation Committee estimated the cost of the RSV recombinant (A and B types) vaccine dose at R$277.20, with a projected 15 hospitalizations prevented per 1,000 vaccinated pregnant women compared to no vaccination (MINISTÉRIO DA SAÚDE, 2023).

The high number of RSV-related hospitalizations also helps confirm the predictable seasonal pattern of viral circulation, highlighting the need for targeted prevention strategies, such as vaccination of vulnerable groups and enhanced surveillance during peak months. This seasonal awareness supports better resource planning, reduces hospital burden, and informs specific protective measures for infants and young children.

CONCLUSION

The findings demonstrated that acute viral bronchiolitispredominantly caused by RSVremains the leading cause of hospitalization for respiratory illness among children under one year of age in the metropolitan region of Recife. The high proportion of severe cases classified as SARS underscores the need for consistent and appropriate clinical management across all pediatric age groups, regardless of baseline disease severity. With the anticipated incorporation of the recombinant RSV A and B vaccine into the Brazilian Unified Health System for pregnant women (32–36 weeks of gestation), resulting in passive immunization of newborns, future studies should evaluate its impact on the incidence and severity of lower respiratory tract disease in infants under six months to verify the expected epidemiological shift. Further research should also inform the development of more effective prevention and surveillance policies, including targeted vaccination approaches, environmental interventions, and risk-based monitoring, with the aim of reducing morbidity and the economic burden of pediatric respiratory infections.

REFERENCES

1. CARDOSO AM. A persistência das infecções respiratórias agudas como problema de Saúde Pública. Cad Saude Publica, 2010; 26 (7): 1270-1.
2. PRATO MIC, et al. Doenças respiratórias na infância: uma revisão integrativa. Rev Soc Bras Enferm Ped. 2014; 14 (1): 33-9.
3. MAZON LM, et al. Perfil epidemiológico de pacientes com síndrome gripal e síndrome respiratória aguda grave. Saúde em Revista, 2016; 16 (43): 37-44.
4. MINISTÉRIO DA SAÚDE (BR). Secretaria de Vigilância em Saúde e Ambiente. Guia de manejo e tratamento de influenza 2023. Brasília (DF): Ministério da Saúde (BR), julho 2023. Disponível em: http://bvsms.saude.gov.br/bvs/publicacoes/guia_manejo_tratamento_influenza_2023.pdf. Acesso em: 12 abr. 2024.

5. ALMEIDA ARM. Dinâmica sazonal da influenza no Brasil: a importância da latitude e do clima. Tese (Doutorado em Saúde Pública)- Fundação Oswaldo Cruz, Escola Nacional de Saúde Pública Sergio Arouca; Rio de Janeiro (RJ)2018; p98.
6. GRANGER CW. Seasonality: causation, interpretation, and implications. In: Zellner A. Seasonal analysis of economic time series. 1st ed. Cambridge (MA): NBER; 1979. p. 33-56.
7. BARNETT AG, DOBSON AJ. Analysing seasonal health data. Statistics in the health sciences. 1st ed. London: Springer Nature; 2010.
8. KURSKAYA O, et al. Changes in the etiology of acute respiratory infections among children in Novosibirsk, Russia, between 2019 and 2022: the impact of the SARS-CoV-2 virus. Viruses. 2023; 15(4): 934.
9. HANSEN C, et al. Trends in risk factors and symptoms associated with SARS-CoV-2 and rhinovirus test positivity in King County, Washington, June 2020 to July 2022. JAMA Netw Open, 2022 ; 5 (11): e2245861.
10. UNITED NATIONS CHILDREN'S FUND. The state of the world's children 2023: for every child, vaccination. Florence: UNICEF Innocenti – Global Office of Research and Foresight, 2023. Disponível em: https://www.unicef.org/media/108161/file/SOWC-2023-full-report-English.pdf. Acesso em: 20 set. 2025.
11. MINISTÉRIO DA SAÚDE (BR). Secretaria de Vigilância em Saúde. Guia de vigilância epidemiológica: emergência de saúde pública de importância nacional pela doença pelo coronavírus 2019 – covid-19. Brasília (DF): Ministério da Saúde, janeiro 2022. Disponível em: https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/svsa/covid-19/guia-de-vigilancia-epidemiologica-covid-19_2021.pdf/@@download/file. Acesso em: 20 set. 2025.
12. MINISTÉRIO DA SAÚDE (BR). Nota Técnica Nº 20/2020: Notificação Imediata de Casos de Síndrome Gripal via plataforma do e-SUS VE e Síndrome Respiratória Aguda Grave (SRAG) hospitalizado no SIVEP-Gripe. Brasília (DF): Ministério da Saúde, 17 abr. 2020. Disponível em: https://egestorab.saude.gov.br/image/?file=20200429_N_NotaTecnica20NotificacaoImediatadeCasosdeSindromeGripalviaplataformadoeSUSVEeSindromeRespiratoriaAgudaGrave(..._8233595274282640358.pdf. Acesso em: 22 set. 2025
13. FUNDAÇÃO OSWALDO CRUZ (FIOCRUZ). Boletim epidemiológico: Boletim Infogripe Semana Epidemiológica (SE) 34, 2025. Rio de Janeiro (RJ): Fiocruz, agosto 2025. Disponível em: https://agencia.fiocruz.br/sites/agencia.fiocruz.br/files/Resumo_InfoGripe_2025_34.pdf. Acesso em: 20 set. 2025.
14. FUNDAÇÃO OSWALDO CRUZ (FIOCRUZ). Boletim epidemiológico: Boletim Infogripe Semana Epidemiológica (SE) 34, 2024. Rio de Janeiro (RJ): Fiocruz, agosto 2024. Disponível em: https://agencia.fiocruz.br/sites/agencia.fiocruz.br/files/u91/resumo_infogripe_atual_2.pdf. Acesso em: 20 set. 2025
15. ESTADO DE PERNAMBUCO. Decreto nº 54.878, de 20 de junho de 2023. Declara situação de emergência no âmbito da saúde pública no Estado de Pernambuco, em razão das elevadas taxas de ocupação de leitos de UTIs neonatal e pediátrica em decorrência do aumento de casos de SRAG de etiologia viral. Recife (PE): DOEPE, 20 jun. 2023. Disponível em: https://legis.alepe.pe.gov.br/texto.aspx?id=73235. Acesso em: 22 set. 2025
16. ESTADO DE PERNAMBUCO. Decreto nº 56.512, de 25 de abril de 2024. Declara situação de emergência no âmbito da saúde pública no Estado de Pernambuco, em razão das elevadas taxas de ocupação de leitos de UTIs neonatal e pediátrica em decorrência do aumento de casos de SRAG de etiologia viral. Recife (PE): DOEPE, 26 abr. 2024. Disponível em: https://legis.alepe.pe.gov.br/texto.aspx?id=77333. Acesso em: 22 set. 2025.
17. ESTADO DE PERNAMBUCO. Decreto nº 58.686, de 27 de maio de 2025. Declara situação de emergência no âmbito da saúde pública no Estado de Pernambuco, em razão das elevadas taxas de ocupação de leitos de UTIs neonatal e pediátrica em decorrência do aumento de casos de SRAG de etiologia viral. Recife (PE): DOEPE, 27 maio 2025. Disponível em: https://legis.alepe.pe.gov.br/texto.aspx?id=83335. Acesso em: 22 set. 2025.

18. SECRETARIA ESTADUAL DE SAÚDE DE PERNAMBUCO. Pernambuco lança o Plano de Contingência das Doenças Respiratórias Sazonais na Infância. [Internet]. Recife (PE); 2024. Disponível em: https://portal.saude.pe.gov.br/noticias/secretaria-executiva-de-atencao-saude/pernambuco-lanca-plano-de-contingencia-das-doencas. Acesso em: 26 abr. 2024.
19. SECRETARIA ESTADUAL DE SAÚDE DE PERNAMBUCO. Pernambuco decreta situação de emergência em saúde pública devido ao aumento de casos de SRAG em crianças. [Internet]. Recife (PE); 2025. Disponível em: https://portal.saude.pe.gov.br/pernambuco-decreta-situacao-de-emergencia-em-saude-publica-devido-ao-aumento-de-casos-de-srag-em-criancas. Acesso em: 18 ago. 2025.
20. SECRETARIA ESTADUAL DE SAÚDE DE PERNAMBUCO. Informe Vigilância dos Vírus Respiratórios Período: SE 34 de 2025. [Internet]. Recife (PE); 2025. Disponível em: https://portalcievs.saude.pe.gov.br/docs/Informe_VR%20SE%2034.pdf. Acesso em: 20 set. 2025.
21. DEL TORO RODRÍGUEZ LB, et al.. Caracterização clínico-epidemiológica da bronquiolite em pacientes pediátricos. Multimed. 2021 Mar; 25 (2): e1448.
22. MINISTÉRIO DA SAÚDE (BR). Coqueluche: situação epidemiológica. [Internet]. Brasília (DF); 2025. Disponívelem: https://www.gov.br/saude/pt-br/assuntos/saude-de-a-a-z/c/coqueluche/situacao-epidemiologica. Acesso em: 20 set. 2025.
23. ORGANIZAÇÃO PAN-AMERICANA DA SAÚDE (OPAS). Alerta epidemiológico: aumento da coqueluche (tosse convulsa) na Região das Américas. Washington (DC): OPAS/OMS, junho 2025. Disponível em: https://www.paho.org/pt/documentos/alerta-epidemiologico-aumento-casos-coqueluche-tosse-convulsa-na-regiao-das-americas-31. Acesso em: 22 set. 2025.
24. OLIVEIRA GF, et al., O impacto da hospitalização em crianças de 1 a 5 anos de idade. Rev SBPH. 2004; 7(2): 37-54.
25. SILVEIRA KA, et al.,. Stress related to pediatric hospitalization and possible interventions: an analysis of the Brazilian literature. Temas Psicol. 2019 Jun; 27 (2): 443-58.
26. MINISTÉRIO DA SAÚDE (BR). Vigilância da Síndrome Respiratória Aguda Grave (SRAG). [Internet]. Brasília (DF); 2025. Disponível em: https://opendatasus.saude.gov.br/dataset/srag. Acesso em: 20 set. 2025.
27. MINISTÉRIO DA SAÚDE (BR). Relatório de Recomendação nº 975: Vacina vírus sincicial respiratório (VSR) A e B (recombinante). [Internet]. Brasília (DF); fevereiro 2025. Disponível em: https://www.gov.br/conitec/pt-br/midias/relatorios/2025/relatorio-de-recomendacao-no-975-vacina-vsr. Acesso em: 20 set. 2025.
28. ROSAS-SALAZAR C, et al. Respiratory syncytial virus infection during infancy and asthma during childhood in the USA (INSPIRE): a population-based, prospective birth cohort study. Lancet, 2023; 401 (10389): 1669-80.