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Analysis of epidemiological indicators of children and adolescents affected by Covid-19 in Northeastern Brazil

Análise de indicadores epidemiológicos de crianças e adolescentes acometidos pela Covid-19 no Nordeste do Brasil

Análisis de indicadores epidemiológicos de niños y adolescentes afectados por Covid-19 en el Noreste de Brasil

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Abstract: Objective: to analyze the epidemiological indicators of children and adolescents affected by Covid-19 in the Northeast region of Brazil. **Method:** ecological study with cases of Covid-19, in the northeastern states. Lethality, prevalence, daily accumulated index and ICU bed ratio were calculated. Consolidated data were analyzed until August 21, 2020. **Results:** there were 74,705 cases of Covid-19, with female prevalence and age group between 10 and 19 years. Lethality was 8%, prevalence of 321/100,000 inhabitants and bed ratio lower than two. There was significance for the relationship between the highest number of deaths and the lowest number of ICU beds (p=0.001), higher prevalence of cases due to the lower number of ICU beds (p=0.007). **Conclusion:** the indicators reveal insufficiency regarding beds for the disease, high lethality and prevalence, as well as a reasonable amount of ICU beds.
Descriptors: Coronavirus Infections; Health Status Indicators; Child Health; Adolescent Health; Epidemiology

Resumo: Objetivo: analisar os indicadores epidemiológicos de crianças e adolescentes acometidos pela Covid-19 na região Nordeste do Brasil. **Método:** estudo ecológico com casos de Covid-19, nos estados do Nordeste. Calculou-se taxas de letalidade, prevalência, índice acumulado diário e razão de leitos de UTI. Analisou-se dados consolidados até 21 de agosto de 2020. **Resultados:** houve 74.705 casos de Covid-19, com prevalência do sexo

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feminino e quanto a faixa etária àqueles entre 10 a 19 anos. Letalidade foi de 8%, prevalência de 321/100.000 habitantes e razão de leitos menor que dois. Houve significância para relação entre o maior número de óbitos e o menor número de leitos de UTI (p=0.001), maior prevalência de casos em razão da menor quantidade de leitos de UTI (p=0.007). **Conclusão:** os indicadores revelam insuficiência quanto aos leitos para a doença, alta letalidade e prevalência, bem como quantidade razoável dos leitos de UTI.
Descritores: Infecções por coronavírus; Indicadores básicos de saúde; Saúde da criança; Saúde do adolescente; Epidemiologia

Resumen: **Objetivo:** analizar los indicadores epidemiológicos de los niños y adolescentes afectados por Covid-19 en la región noreste de Brasil. **Método:** estudio ecológico con casos de Covid-19, en los estados del noreste. Se calcularon la letalidad, la prevalencia, el índice acumulado diario y la proporción de lechos de la UCI. Los datos consolidados se analizaron hasta el 21 de agosto de 2020. **Resultados:** hubo 74.705 casos de Covid-19, con prevalencia femenina y grupo de edad entre 10 y 19 años. La letalidad fue del 8%, la prevalencia de 321/100.000 habitantes y la proporción de camas inferior a dos. Hubo importancia para la relación entre el mayor número de muertes y el menor número de camas de UCI (p=0,001), mayor prevalencia de casos debido al menor número de camas de UCI (p=0,07). **Conclusión:** los indicadores revelan insuficiencia con respecto a las camas para la enfermedad, alta letalidad y prevalencia, así como una cantidad razonable de camas de UCI.
Descriptores: Infecciones por Coronavirus; Indicadores de salud; Salud del niño; Salud del adolescente; Epidemiología

Introduction

The coronavirus infectious disease pandemic (Covid-19) is a major global threat and, according to World Health Organization data, there are already 61,299,371 confirmed cases, including 1,439,784 deaths as of November 28, 2020. In Brazil, 6,238 cases have been confirmed, with 171,974 deaths.[1]

Given the importance to the context of the Covid-19 pandemic, several aspects related to health need to be considered. The implications of severe acute respiratory syndrome coronavirus [2] (SARS-CoV-2) are broad and several age groups have been affected, including children and adolescents, as they are periods of age vulnerable to various health problems.[2] According to a projection made in Italy in children and adolescents, two out of ten tested positive for Sars-Cov-2 or have severe acute respiratory syndrome.[3]

In Wuhan, Hubei Province, China, of the 1,391 children who were tested by March 2020, 171 (12.3%) were positive for Sars-Cov-2, with an average of up to seven years, being one of the

main means of dissemination of the virus, mainly due to asymptomatic characteristics. Of them, 27 (15.8%) had alterations with bilateral opacity on radiological examination, indicating persistent pneumonia and lymphopenia.[4]

A study conducted in the United States of America with 192 children and adolescents, which aimed to warn about the plan to resume classes and the possible mass spread of the virus, observed that 26% of children were infected with Sars-Cov-2 and another 8% with precise criteria of multisystemic inflammatory syndrome. Of them, only 25 presented fever as a non-specific symptom, in addition to cough, congestion, rhinorrhea and headache, which can increase contamination and hospitalization of adults.[5]

The cases of Covid-19 in children are still mild, mostly asymptomatic and with unknown factors, when associated with adjacent comorbidities, such as respiratory diseases, causing a higher rate of morbidity and mortality.[6] In pediatric patients, there is a rapid infection and dissemination of the disease with gradual increase in the contaminated curve.[7]

There are relatively few reported cases of Covid-19 infection in children compared to the total number of cases in the general population. Data from the Portuguese General Health Directorate, from March 29, 2020, showed that 1% of children under 10 years of age and 2.3% of adolescents aged 11 to 19 years were presenting Covid-19.[8] Despite the underreporting, by June 16, 2020, more than 8 million cases were reported worldwide in children and adolescents confirmed for Covid-19, and severe cases require long-term ventilatory support.[1,9]

The clinical spectrum of Sars-Cov-2 infection is very broad, but can basically present in three main conditions: asymptomatic carriers, individuals with acute respiratory disease (ARD) or patients with pneumonia in different degrees of severity. These last two conditions are considered as health problems related to Sars-Cov-2 infection.[10-11]

Although the immediate risk of Covid-19 in children is low, it is important to monitor the situation and its evolution. Despite non-severe news in children, a study with 171 children

revealed that, during hospitalization, only three required intensive support and invasive mechanical ventilation, all of them with coexisting conditions such as hydronephrosis, leukemia, intussusception and lymphopenia. In these cases, there was death due to multiple organ failure.[4,8]

The number of reported cases of Covid-19 certainly underestimates the true burden of the disease, due to the unavailability of tests in several sites and due to the proportion of people who develop unidentified asymptomatic or mild forms of the disease, despite being infected.[12] The lethality of Sars-Cov-2 varies mainly according to the age group and clinical conditions of affected individuals.[13]

In Northeastern Brazil, the cases of children and adolescents with Covid-19 stand out in relation to the national reality, especially for the existing vulnerabilities. There are marked inequalities such as access to piped water, sewage and electricity with almost 10% of households below the poverty line with weaknesses especially in health.[14] In this sense, the present study aimed to analyze the epidemiological indicators of children and adolescents affected by Covid-19 in Northeastern Brazil.

Method

This is a descriptive ecological study, whose research sites were the nine states of the Northeast region of Brazil: Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe and Bahia.

According to the projection of the Brazilian Institute of Geography and Statistics (IBGE) the northeast region has about 57,071,654 million inhabitants and a territorial area of 1,554,257 km^2. Among the states with the highest number of children and adolescents are Bahia (9,917,375), Ceará (3,035,091) and Pernambuco (2,664,267).[15] The study population consisted of 23,835,722 children and adolescents. The study included children from 0 to 9 years and

adolescents aged 10 to 19 years notified with Covid-19 by epidemiological bulletins of the states studied, excluding all those outside this age group.

In the Northeast region, hospitals that had 99 beds suffered a reduction of up to 6% in the occupancy rate. Thus, neonatal intensive care units (ICU) reduced their occupancy capacity by 5%. As for the legal sphere, there was an increase in public institutions administered by the unified health system (UHS) and a decrease in business and non-profit entities of up to 11%.[16]

Data collection was performed by two different researchers with subsequent double verification of the sample under study, allowing the comparison of the findings and minimization of losses. The research selected the consolidated data up to the 34th epidemiological week through the data provided by the state health departments in their official electronic addresses (websites), according to Chart 1:

Chart 1- Electronic addresses of the analyzed states, Brazil, 2020.

State	Website
Maranhão	https://www.saude.ma.gov.br/
Ceará	https://integrasus.saude.ce.gov.br/
Rio Grande do Norte	https://portalcovid19.saude.rn.gov.br/
Piauí	http://www.saude.pi.gov.br/
Paraíba	https://paraiba.pb.gov.br/diretas/saude/coronavirus
Pernambuco	https://www.cievspe.com/novo-coronavirus-2019-ncov
Alagoas	http://www.alagoascontraocoronavirus.al.gov.br/
Sergipe	https://todoscontraocorona.net.br/
Bahia	http://www.saude.ba.gov.br/temasdesaude/coronavirus/

Data on the capacity of hospital beds, including neonatal and pediatric ICUs, were obtained from the national registry of health facilities (CNES). Data on the general population were obtained from the IBGE website and the UHS Technologies Department (DATASUS) with the population characteristics of the 2010 national census and its estimates for the year 2020.

The variables analyzed were number of confirmed cases, number of deaths, number of hospital beds and number of ICU beds. Patients with positive laboratory results for Covid-19

virus were considered, regardless of signs or symptoms. Moreover, data on sex, age and age group (0 to 19 years) were obtained.

From the absolute number of cases and deaths by Covid-19, extracted by the method of analysis of the Health Information System from which the data are sourced, the following rates were calculated: prevalence (number of confirmed cases/resident population x 100,000inhab), lethality (number of deaths from Covid-19/total confirmed cases x 100) and the daily cumulative index (DCI) (number of confirmed cases/number of days between the first reported case and August 21, 2020).

The analysis was performed using calculations for hospital bed capacity, absolute and relative frequency and minimum and maximum values for the number of cases with the aid of the Microsoft Excel for Windows 2016®. The data were submitted to the Shapiro-Wilk normality test, with subsequent parametric statistical analysis with the Student's t-test, by Software R version 4.0.2 for Windows®. All cases used the significance criteria of 5%. The independent variables used were sex (male, female), age (0 to 9 and 10 to 19 years), the confirmed cases were the independent variables for the covariates (death, DCI and ICU bed ratio), the main outcome analyzed was death for the calculations with prevalence, ratio of ICU beds and DCI. In addition to these, the ratio of ICU beds was independent for DCI and prevalence.

The research complies with Resolution no. 510 of April 7, 2016, of the National Health Council for using public access information under shared domain and did not require the approval of the Research Ethics Committee.

Results

As of August 21, 2020, 74,705 cases of Covid-19 were confirmed in children and adolescents in northeastern Brazil. The first case was recorded in the state of Bahia on March 6,

2020. Table 1 shows the following data on sex, age group, number of confirmed cases and deaths in children and adolescents.

Table 1 - Absolute and relative frequency of confirmed cases and deaths from Covid-19, Brazil, 2020.

Variables	Cases		Deaths	
	n	%	n	%
Sex				
Male	34,554	46.3	160	54.8
Female	40,061	53.7	132	45.2
Age group				
0-9 years	27,395	36.7	175	60
10-19 years	47,310	63.3	117	40

Of the total number of cases, there is a prevalence of females in confirmed cases of the disease, while in relation to the number of deaths, males had more expressive rates. Regarding the age group, a greater number of cases were concentrated in adolescents, of whom 117 died, as well as a considerable part of the pediatric population died from Sars-Cov-2 infection.

States such as Bahia and Ceará obtained the highest rates of notification of the child and adolescent population, totaling 60.6% of the cases in the Northeast region. On the other hand, the state of Alagoas was the one that least reported it during the study period. Table 2 shows the health indicators of Covid-19.

Table 2 - Covid-19 indicators in children and adolescents in the northeast region, Brazil, 2020.

State	Population	Confirmed cases*	Deaths*	Lethality (%)	Prevalence (100,000inhab.)	DCI	Days after the 1st case
Bahia	9,917,375	23,531 (33.3)	34 (11.7)	0.1	257	140	168
Pernambuco	2,664,267	831 (1)	66 (22.6)	0.8	31	5.1	162
Ceará	3,035,091	19,497 (25.4)	59 (20.2)	0.3	642	119.6	162
Maranhão	2,716,327	12,920 (17)	34 (11.6)	0.2	475	82.2	156
Paraíba	1,305,858	3,709 (4.8)	18 (6.2)	0.4	284	23.4	158
Rio Grande	1,083,280	404 (0.5)	12 (4.1)	2.9	37	2.4	163

do Norte							
Alagoas	1,223,353	133 (0.2)	20 (6.8)	1.1	10	0.8	166
Piauí	1,131,904	8,493 (11)	11 (3.8)	0.1	750	53.7	158
Sergipe	758,267	5,187 (6.8)	38 (13)	2.1	684	32.4	160
Total	23,835,722	76,705	292	8	321	459.6	-

Notes: *n (%); †Daily cumulative index.

Regarding the number of deaths, Pernambuco and Ceará presented the highest rates, totaling 42.8% of northeastern mortality. The total prevalence was 321/100,000 inhabitants, standing out in the states of Piauí, Sergipe and Ceará. As for lethality, a higher mortality rate is highlighted in Rio Grande do Norte, Sergipe and Alagoas. Regarding the daily cumulative index, the state with the most daily notifications was Bahia, followed by Ceará and Maranhão.

Neonatal and pediatric beds are distributed in the northeast region according to Table 3. The pediatric and neonatal beds were detailed according to the CNES data, which identify the hospitalized population according to age group, not computing adolescents hospitalized in the adult ICU. The states of Bahia, Pernambuco and Ceará are the units with the highest number of neonatal and pediatric beds. Furthermore, the state of Bahia is the one with the highest capacity of neonatal beds, while Pernambuco has most of the pediatric beds in the region. The beds destined to the UHS for the population from 0 to 19 years are concentrated in Bahia; the state of Sergipe has the smallest number of beds available by the UHS (93) in the Northeast region.

Table 3 - Distribution of neonatal and pediatric ICU beds in the Northeast region, Brazil, 2020.

State	Population	ICU Beds					
		Neonatal beds*	Pediatric beds*	Number of the UHS	Enabled Covid-19†	Enabled Covid-19†	Total ratio of ICU beds/10,000inhab
Bahia	9,917,375	324 (21.8)	133 (17.7)	411	655	17	0.46
Pernambuco	2,664,267	243 (16.3)	168 (22.3)	353	602	15	1.54
Ceará	3,035,091	228 (15.3)	127 (16.9)	305	625	21	1.17
Maranhão	2,716,327	180 (12.1)	60 (8)	223	238	-	0.88
Paraíba	1,305,858	90 (6.1)	77 (10.2)	148	196	-	1.28

Rio Grande do Norte	1,083,280	130 (8.7)	53 (7)	155	242	15	1.69
Alagoas	1,223,353	144 (9.7)	62 (8.2)	181	202	-	1.68
Piauí	1,131,904	61 (4.1)	51 (6.8)	101	311	10	0.99
Sergipe	758,267	87 (5.9)	22 (2.9)	93	74	-	1.44
Total	23,835,722	1,487	753	1,970	3,145	78	11.13

Notes: *n (%); †Total number of Covid-19 beds; ‡Total number of neonatal and pediatric Covid-19 beds.

Regarding ICU beds enabled for Covid-19, the states of Bahia, Ceará and Pernambuco stand out for the availability of hospitalization units for the general population. Regarding beds for newborn and pediatric patients, a better distribution was observed in Ceará, Bahia and Pernambuco, with unavailability of beds in the states of Maranhão, Paraíba, Alagoas and Sergipe. The ratio of ICU beds per inhabitant was below two in all states. In this case, only Rio Grande do Norte presented better organization.

Concerning the crossings of confirmed neonatal and pediatric cases and the variables death ($p = 0.213$), prevalence ($p = 0.172$), daily cumulative index ($p = 0.286$) and ICU bed ratio ($p = 0.130$), there was no statistical significance. The ratio of deaths and daily cumulative index was ($p = 0.338$).

However, there was significance for the relationship between death and prevalence ($p = 0.011$), for deaths and the ratio of ICU beds ($p = 0.001$), prevalence and daily cumulative index ($p = 0.014$), prevalence and ratio of ICU beds ($p = 0.007$) and for the DCI and the ratio of ICU beds ($p = 0.020$).

Discussion

Ecological studies permeate the detection of clusters in space-time that indicate the best form of resource planning and management, whether they are focused on real or potential health problems or the eminence/duration of outbreaks and epidemics, which denotes an important way of supporting disease control when implementing effective assessment

measures. Moreover, the creation of an emergency contingency and mitigation plan permeates the sociocultural and geographic realities of the territory that achieve effectiveness through those studies.[17-18]

When considering the rapid dispersion of Covid-19 throughout the national territory, epidemiological monitoring in the Northeast shows a need to plan the health of the population enabling socioeconomic, environmental, geographical and social realities. This may favor the monitoring of the pandemic and health capacity in the Northeast, enabling information that can support the choice of better strategies to face the disease.[19] The low levels of DCI linked to the vulnerability of the population denote the difficulty between diagnosis and treatment of diseases, including Covid-19, in addition to the fragility of public services in Brazil and Latin America.[20]

A study confirmed that the state of Ceará has a positive relationship regarding the association between Covid-19 and human development, which denotes an association between the inequality in the incidence of cases in the state, in addition to the closer to the metropolitan region, the higher the incidence coefficient of that place.[21] Since May 2020, when the Northeast region had 31.2% of the cases, there was an exponential growth in the number of infected people, reaching the second region with the most confirmed cases in the national territory,[19,22] which remained until the period of this research, corroborating the data found.

Children are more sensitive to the Covid-19 and there is no significant difference between the sexes, thus they can be human-human transmitters causing adult patients to become infected with the virus.[7] A study conducted in Rio de Janeiro showed an association by sex that revealed a percentage of male involvement of 47.7% and 51.4% in females, which, even in general numbers, are consistent with the data of this study.[17] This study found a prevalence of females (53.7%) between 10 and 19 years of a total of 47,310 (63.3%). A study revealed that, in

adolescents of both sexes, there is a percentage of 46.1% (336) of Covid-19 infection, which corroborates the data from this study.[7]

This study revealed that Ceará and Bahia have the highest number of notifications and confirmed cases for Covid-19 in children and adolescents, however, in relation to deaths, the states of Pernambuco and Ceará prevail. These findings reaffirm what was found in a similar study, showing an exponential growth in the number of cases also in these states.[19]

Regarding the prevalence of Covid-19 cases in children and adolescents, the study found 321/100,000 inhabitants. This may be related to the accumulated number of cases of neonates, children and adolescents who are infected by Covid-19, but asymptomatic. Even with the international dissemination of Sars-Cov-2 infection and the emerging need to contain the disease, there is a gap in knowledge regarding the clinical implications in children, with reports of only symptomatic cases.[23]

Lethality, estimated at 8%, was concentrated in the states of Rio Grande do Norte, Sergipe and Alagoas. A study that characterized multisystemic inflammatory syndrome in children identified that there are negative repercussions for infants with unfavorable outcomes if associated with Covid-19.[5,7] The lethality found is above that estimated by the World Health Organization (WHO) of 3.4%. However, in Brazilian states, a national study identified a failure to prevent this disease where none of the states achieved this goal.[24]

In this sense, despite the early case definition in pediatric clinic, the recommendations indicate addressing children aged under 19 years without predilection for other purulent diseases, without clinical problems regarding volume and hypertensive diseases. For the pediatric population, specific imaging tests and monitoring of vital parameters should be included by electrocardiogram and troponin elevation (an important biomarker), as well as markers of inflammatory response and evidence of gastrointestinal symptoms. The main test, however, is positive RT-PCR for Covid-19.[3,24]

A study that revealed a high prevalence of the number of cases of Covid-19 in adolescents up to 19 years of age showed an important susceptibility of this public compared to the older age group because they were in contact with school assignments, whether in primary education or high school and even college.[25] The reasons for this event were not well justified in the research, but the data corroborate the present investigation, since it identified prevalence in the adolescent public.

Therefore, when considering the high percentage of asymptomatic, especially children and adolescents, it is important to maintain the surveillance system through laboratory investigations and confirmations in order to observe omitted and heterogeneous cases.[23] The highest cumulative index by states was in Bahia, with 140 cases per day, including children, adolescents, adults and the elderly. This highlights the increased proportion of community transmission of the virus, which may partly be explained by the country's continental proportions, climate differences and different seasonal patterns among Brazilian regions.[26]

The Brazilian Ministry of Health has encouraged efforts to meet the WHO's recommendation to test suspected cases for the detection of positive scans and guide the isolation of cases of the disease and their home contacts, in order to reduce the spread of the virus and reduce the peculiarities that make it different especially in younger age groups.[27]

Nine newborns were identified with Covid-19 infection in Wuhan (China) in 2020, and asphyxia was considered the main complication related to the infection. In preterm infants, there was alteration of myocardial enzymes without other clinical symptoms, considering the manifestation of the disease as mild or moderate. Thus, characteristics of a possible vertical transmission should be investigated.[28]

A study on the clinical characteristics of a cohort of 36 children with Covid-19 in China found that approximately half of the cases were asymptomatic or represented only mild upper acute respiratory symptoms and the other half with mild pneumonia, thus revealing that the

manifestations of Covid-19 in children are much lighter than in adults.[12] Another study with a series of cases in Bergamo, Italy, also affecting exclusively the pediatric age group, showed a 30-fold increase in the incidence of clinical manifestations and laboratory alterations resembling a syndrome known as Kawasaki syndrome.[29]

As of August 21, 2020, there were 3,145 ICU beds enabled for Covid-19 in the Northeast region and, of these, only 78 were in neonatal/pediatric unit. Until 2017, there was a reduction in the number of facilities (3.7%) and hospital admission beds (8.4%) per 100,000 inhabitants. ICUs grew with availability of 6.8/100,000 inhabitants.[16] When comparing national data, the Northeast region has a ratio of 11.13, a number higher than the nationally estimated common hospitalization beds.

The ratio of ICU beds estimated in the Northeast region for the hospitalization of the general population was 1.04/10,000 inhabitants, with the opening of a national bid to allocate 1,000 more beds throughout the territory, in addition to personal protective equipment.[19] However, the present study reveals that, for newborns and pediatrics, this estimate reaches three times this value.

The pediatric beds with the highest ratio are in the state of Rio Grande do Norte with 1.69% for every 10,000 patients, which is necessarily due to contingency plans. The states developed contingency plans capable of classifying responses between alert, imminent danger and public health emergency levels based on risk and impact on public health with surveillance work, laboratory support, infection control, care, risk and health management.[30]

The heterogeneities of northeastern states show the insufficiency of beds, point to the need for supplies and focus on the precariousness of timely diagnoses for the designated treatment.[19] Furthermore, there is a need for differential diagnosis and search for children and adolescents in order to reduce contamination by promoting early detection and targeted treatment.

For a differential diagnosis, prolonged fever, rash, red eyes, hands and feet in anasarca, sore lips or tongue or with numbness should be observed, and the presence of a grown lymph node in the neck, mainly because interleukin 6 hinders distinguishing between the systemic inflammatory responses of Covid-19 and Kawasaki disease.[6] Nevertheless, hand washing, social distancing and the reduction of the risk of nosocomial infections are reinforced as the main means of prevention in the care of infants.

The main limitation is the underreporting of the states due to the delay in the process of collection and result of the material, as well as the unavailability of human resources for the management of health systems and updating of bulletins. The analysis of the number of ICU beds and the aspects inherent to ecological studies such as the difficulty in the analysis process and the identification of sample cases are also deficiencies.

Conclusion

The indicators analyzed here demonstrate the diversity regarding the characterization of the data and the evolution of cases by state, due to structural and management divergences. The lethality rate was 8% with a prevalence of 321/100,000 inhabitants. The states of Piauí and Rio Grande do Norte with high prevalence and lethality, respectively, stand out. There was a significant ratio between the number of deaths, prevalence and the ratio of ICU beds.

DCI was associated with the proportion of cases accumulated since the first one in the states, including cases of adolescents and children. The indicators that were associated with the beds showed the deficiency of beds enabled for Covid-19 destined to the population up to 19 years.

The insufficiency of hospital beds enabled for Covid-19 in the states is associated with the precariousness of public services before and during the pandemic and there are factors that correspond directly to the mortality rates observed. The ratio of ICU beds above national levels

denotes a positive response regarding the availability of these units also in the children's sector. In this sense, efforts are needed to expand epidemiological surveillance in the identification, diagnosis and treatment of this population.

The contingency plans adopted by state governments since the beginning of the pandemic until now reveal the need for government strategies aimed at the child-adolescent public. However, the study contributes to the knowledge about the epidemic process of Covid-19 in children and adolescents, as well as opens paths to constant analyses that may indicate the real behavior of the disease, in addition to planning effective, coherent and problem-solving actions.

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