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Comparative analysis of the distribution of serious cases by covid-19 in the state of Paraíba

Análise comparativa da distribuição dos casos graves por covid-19 no estado da Paraíba

Análisis comparativo de la distribución de casos graves por covid-19 en el estado de Paraíba

RESUMO

Objetivo: Realizar uma análise comparativa da distribuição dos casos graves por Covid-19 na Paraíba. Método: Estudo ecológico, descritivo, de série temporal, com base nas informações epidemiológicas de Covid-19 na Paraíba. Os dados foram todos os casos graves de Covid-19, no período entre a 7ª semana epidemiológica de 2020, que registrou o primeiro caso, até a 21ª semana de 2021. Os dados foram tratados e transformados em gráficos para uma melhor análise. Resultados: Observou-se uma rápida evolução de casos graves a partir da 21ª semana epidemiológica de 2020, porém o ano encerrou-se com tendência de queda para estes casos. Após elevação em 2021, percebe-se tendência de queda ao término do primeiro semestre. Conclusão: Compreender padrões de transmissão do Covid-19, adotar medidas preventivas de controle não garantem a interrupção da disseminação da doença. A imunização contra o Covid-19, já começa revelar resultados que indicam uma possível saída da atual pandemia.

DESCRIPTORIOS: Pandemias; Infecção por Coronavírus; Epidemiologia Descritiva.

ABSTRACT

Objective: To carry out a comparative analysis of the distribution of severe cases by Covid-19 in Paraíba. Method: Ecological, descriptive, time series study, based on epidemiological information from Covid-19 in Paraíba. Data were all severe cases of Covid-19, in the period between the 7th epidemiological week of 2020, which registered the first case, until the 21st week of 2021. Data were processed and graphed for further analysis. Results: There was a rapid evolution of severe cases from the 21st epidemiological week of 2020, but the year ended with a downward trend for these cases. After an increase in 2021, a downward trend can be seen at the end of the first semester. Conclusion: Understanding Covid-19 transmission patterns, adopting preventive control measures do not guarantee the interruption of the disease's spread. Immunization against Covid-19 is already beginning to reveal results that indicate a possible exit from the current pandemic.

DESCRIPTORS: Pandemics; Coronavirus Infections; Population Density; Epidemiology Descriptive.

RESUMEN

Objetivo: Realizar un análisis comparativo de la distribución de casos graves por Covid-19 en Paraíba. Método: Estudio ecológico, descriptivo, de series de tiempo, basado en información epidemiológica del Covid-19 en Paraíba. Los datos fueron todos casos graves de Covid-19, en el período comprendido entre la séptima semana epidemiológica de 2020, que registró el primer caso, hasta la semana 21 de 2021. Los datos fueron procesados y graficados para su posterior análisis. Resultados: Hubo una rápida evolución de los casos graves a partir de la 21 semana epidemiológica de 2020, pero el año terminó con una tendencia a la baja para estos casos. Después de un aumento en 2021, se puede ver una tendencia a la baja al final del primer semestre. Conclusión: Comprender los patrones de transmisión de Covid-19, adoptar medidas de control preventivo no garantiza la interrupción de la propagación de la enfermedad. La inmunización contra Covid-19 ya está comenzando a revelar resultados que indican una posible salida de la pandemia actual.

DESCRIPTORIOS: Pandemias; Infecciones por Coronavirus; Densidad de Población; Epidemiología descriptiva.

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INTRODUCTION

SARS-CoV-2, the etiologic agent of the coronavirus, which causes a severe acute respiratory infection, had its first confirmed case in Wuhan, China, in late 2019. The outbreak of this disease led to the World Health Organization – WHO to declare an emergency in public health internationally, causing high mortality rates, accounting until the time of preparation of this study, more than 7.9 million cases in the world, resulting in more than 434.000 deaths, evolving into a state of pandemic by the new coronavirus. 1

The then new coronavirus is a virus, which belongs to the subgenus Sarbecovirus of the Coronaviridae family and can be transmitted by touch, droplets of saliva eliminated from coughing or sneezing, contaminated objects and surfaces. Symptoms can range from asymptomatic to mild, moderate, severe and critical cases. 2

Patients contaminated by the new coronavirus may be asymptomatic, or even present mild symptoms that manifest themselves in a non-specific way, such as cough, sore throat or runny nose, abdominal pain, diarrhea, fever, chills and headache. Mild symptoms may include mild signs accompanied by fever and persistent cough. In severe cases, symptoms are dyspnea, respiratory distress or persistent pressure on the chest, oxygen saturation lower than 95% in room air, or cyanosis of the lips and extremities. 3

In Brazil, the first confirmed case occurred on February 25, 2020. The growth of infected people was exponential, and on March 23, 2020, the country already had 1.891 confirmed cases. 4 The year 2020 marked Brazil by facing a rapidly evolving pandemic, reaching the mark of 1.864.681 cases and 72.100 deaths, affecting around 55% of the population of Latin America. 1

With the number of alarming cases, government and public health authorities have adopted a series of preventive measures, such as social distancing, the use of masks in public environments, use of 70% alcohol for hand hygiene, when it is not

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possible to use soap and water. 5

Thus, a reduction in the number and evolution of cases was expected, however the contamination only increased and health services began to show signs of overcrowding and lack of resolvability, requiring the Brazilian health system to expand hospital beds, ventilators and oxygen for ventilatory support, health education for the population, rapid tests, Personal Protective Equipment - PPE for health professionals, among many other medical support needs. 6

Thus, health in Brazil entered a veritable collapse, the health system started to face, in addition to the pandemic, another serious public health problem, the insufficiency of beds in the Intensive Care Units – ICU. Studies reveal that the COVID-19 transmission rate, always on the rise, occurs due to asymptomatic infected people, cyclically favoring an excessive increase in the number of confirmed cases and increasing the occupation of ICU beds in the country. 7

Thus, it can be considered that the situation in Brazil is extremely worrying, considering that the increased need for the number of ICU beds is directly linked to the rise of the epidemic curve, which presents an increasing and exponential behavior of severe cases of coronavirus. 8

In the State of Paraíba, the pandemic caused by the new coronavirus has also spread rapidly. The first confirmed case for COVID-19 occurred on March 16th, 2020, in the city of João Pessoa, capital of the state. Confirmed cases quickly increased significantly, making the scenario in the state follow the evolution in other states of Brazil. 9 Still in the State of Paraíba, what calls attention today is the growing number of severe cases, which reaches an average of 436 cases in 2021 alone, almost double the average of severe cases in 2020. 10

In this scenario, we can observe that although preventive measures are known and strictly adopted, severe cases continue to grow every day in the State of Paraíba, and thus the following question emerged, which guided the study: How are severe cases of COVID-19 distributed in the State of Paraíba? Therefore, the aim of this stu-

dy was to carry out a comparative analysis of the distribution of severe cases by COVID-19 in the State of Paraíba.

METHOD

An ecological, descriptive, time series study was carried out, based on epidemiological information from COVID-19 in the State of Paraíba/PB. Confirmed serious data from COVID-19 open access from the dashboard of the State Health Department were used. The State of Paraíba has an estimated population of 4.039.277 people, distributed in 223 municipalities. 11

The selected data were all confirmed serious cases for COVID-19, in the State of Paraíba, in the period between the 7th epidemiological week of the year 2020, which recorded the first case until the 21st epidemiological week of the year 2021, according to the national epidemiological calendar. 12

Data were processed using the Excel for Windows® program. After processing the data, graphs were made for a better comparative analysis of severe cases. It was not necessary to submit the study for consideration by the Research Ethics Committee, as the data are publicly accessible and without identification of participants.

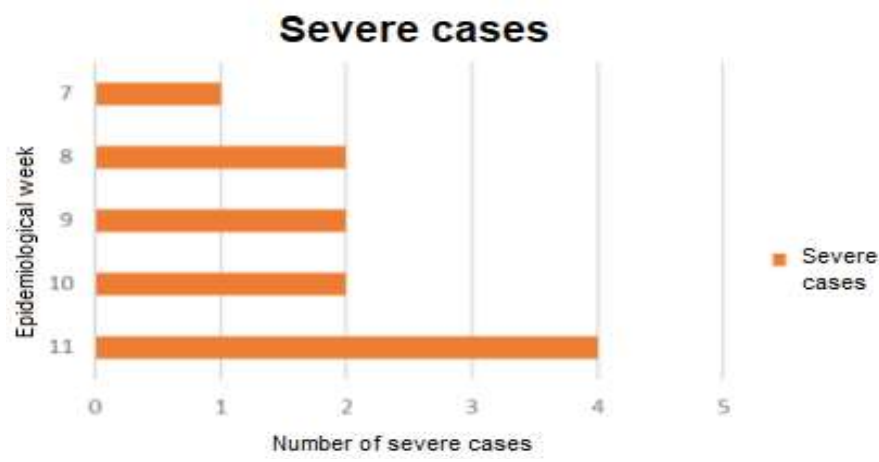
RESULTS

It is possible to observe the evolution of severe cases of Covid-19 in the State of Paraíba, from the 7th epidemiological week of 2020, considering the date of the first confirmed case of the disease. Figure 1 shows an evolutionary plot between that week and the 11th epidemiological week of the same year.

Figure 2 shows an exorbitant leap in severe cases, it is possible to observe between the 11th and 20th epidemiological week of 2020, that severe cases accounted for a total of 518 cases.

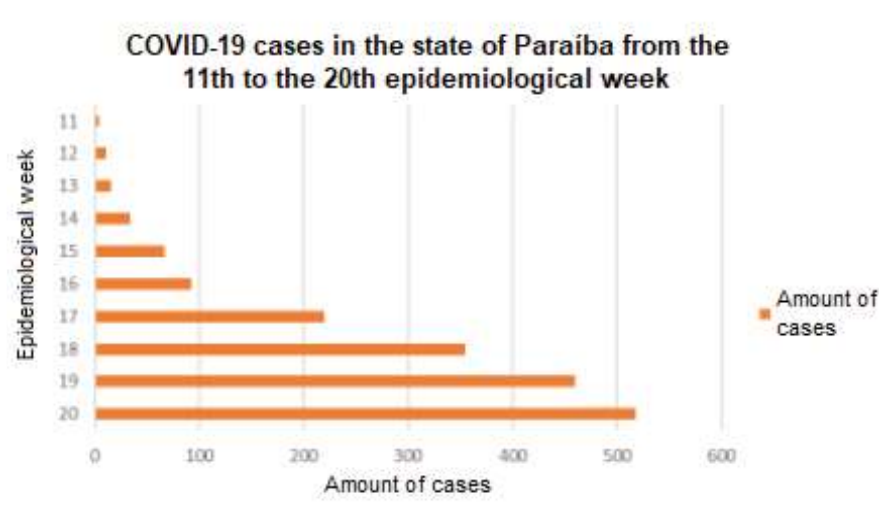
It is clear that severe cases evolved rapidly, but in Figure 3, it is possible to observe fluctuations in the number of cases, with a tendency for cases to fall. In the 21st epidemiological week of 2020, the cases re-

Figure 1: Evolution of Severe Cases – From the 7th to the 11th Epidemiological Week, 2020.



Fonte: SES/PB, 2021.

Figure 2: Evolution of Severe Cases – From the 11th to the 20th Epidemiological Week, 2020.



Fonte: SES/PB, 2021.

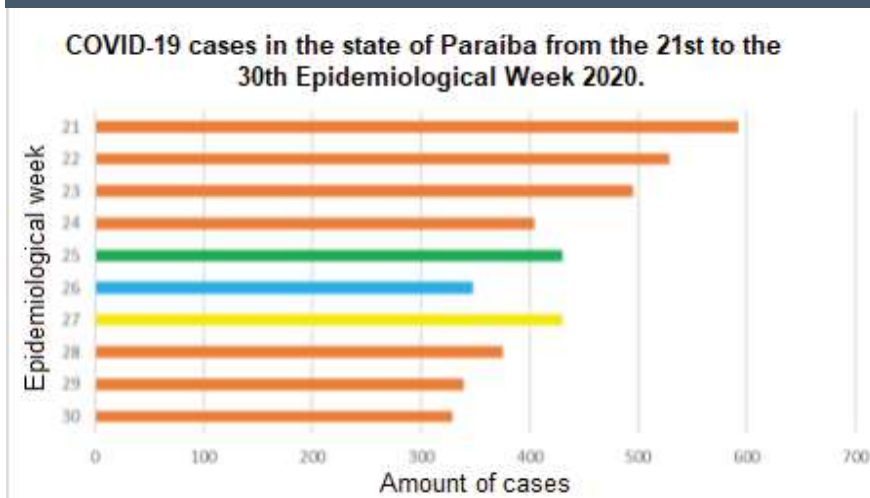
ched the mark of 592 severe cases. In the 25th epidemiological week of the same year (green bar) there were 430 cases. The downward trend is also observed in the 26th epidemiological week of 2020 (blue bar) totaling 348 severe cases. However, the downward trend is interrupted in the 27th epidemiological week of the year 2020 (yellow bar) and once again the State of Paraíba, once again, shows an increasing trend in the number of severe cases.

Also in Figure 3, there is evidence of some instability in the evolution or involution in the number of severe cases, which is

clear when looking at the 30th epidemiological week of 2020.

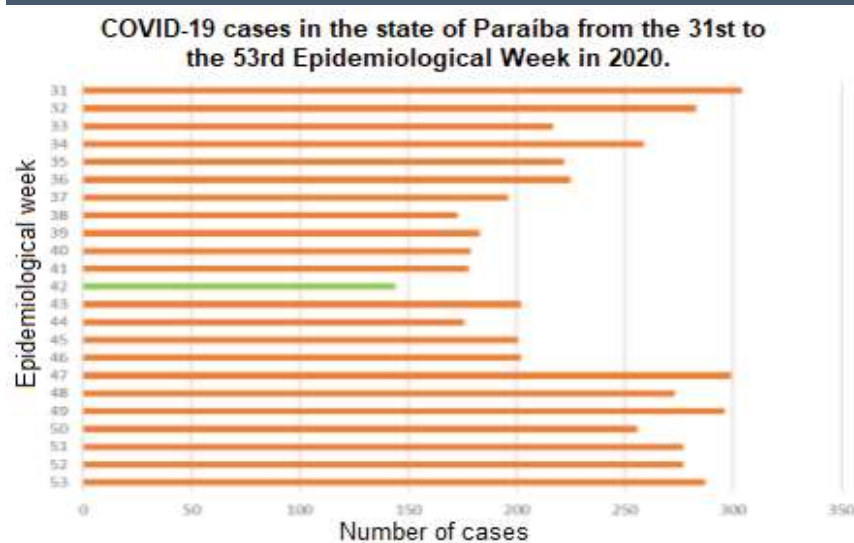
In Figure 4 below, it is possible to observe a considerable decrease in severe cases, in which the 42nd epidemiological week of 2020 stands out, with only 144 cases. This result allowed a transition in the epidemiological tracing in the State of Paraíba, which was shown to be stable, to a downward trend in severe cases. In the following epidemiological weeks, it is possible to observe an increase in severe cases, reaching 250 cases, and showing a new upward trend, accounting for 287 cases in the last epi-

Figure 3: Evolution of Severe Cases – From the 21st to the 30th Epidemiological Week, 2020.



Fonte: SES/PB, 2021.

Figure 4: Evolution of Severe Cases – From the 31st to the 53rd Epidemiological Week, 2020.



Fonte: SES/PB, 2021.

miological week of the year 2020.

The year 2021, as shown in Figure 5, starts with a downward trend in severe cases of Covid-19, totaling 263 cases in the 1st epidemiological week of the year, between the 3rd and 9th of January. The 6th epidemiological week of the year 2021 reveals an increase in the number of severe cases, reaching 438 cases. It is also possible to observe in the 9th epidemiological week (red bar) an exorbitant leap in the number

of serious cases of Covid-19, compared to the first epidemiological weeks of the year, reaching 829 cases. The 10th epidemiological week of 2021 shows stability (yellow bar) in the number of severe cases of the disease, maintaining 832 cases, which are the highest rates of severe cases in the initial period of that year.

Still as shown in Figure 5, in the 15th epidemiological week of 2021, it indicates a downward trend in the number of severe

cases, with 391 cases, however, in the 18th epidemiological week, there were 522 cases. Almost like an accordion effect, from the 20th epidemiological week of 2021 onwards, a new downward trend can be seen, in which 262 serious cases of Covid-19 were recorded. By the end of data collection, which make up this study, in the 21st epidemiological week of 2021, between 23 and 29 May, only 50 new cases of severe disease were registered.

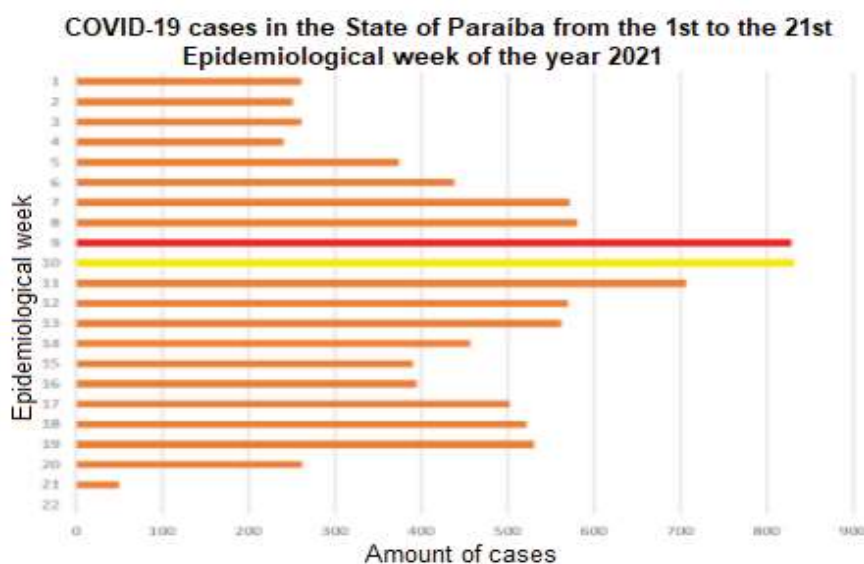
DISCUSSION

According to the data presented in the previous chapter, it is possible to observe the epidemiological trace of Covid-19 in the State of Paraíba between the 7th epidemiological week of 2020 and the 21st epidemiological week of 2021. It was possible to observe in Figure 1 a distribution of only 04 serious cases in the State of Paraíba, in the year 2020. These cases were concentrated in the largest urban centers in the State, with 02 cases in João Pessoa, capital of Paraíba and 02 cases in Campina Grande, the second largest city in Paraíba, that is, the severe cases, shown in Figure 1, were concentrated in the two largest cities in the state, both with high-density demographic data. 11

The sudden increase in serious cases of Covid-19 between the 14th and 20th epidemiological week of 2020, resulted in state and municipal recommendations and determinations, issued by the health authorities regarding Covid-19, in order to contain this advance, through more severe measures, such as mandatory use of masks, lockdown, social distancing and rapid testing for the control of new cases. 13

Despite the various state and municipal decrees, with measures that are often quite restrictive, the number of severe cases continued to increase, as illustrated in Figure 3, which presented the 21st epidemiological week of the year 2021, which accounted for more than 500 severe cases. The restrictive decrees in the State of Paraíba presented their results in the following epidemiological weeks. Cases tended to increase when less restrictive decrees were then published,

Figure 5: Evolution of Severe Cases - From 1st to 21st Epidemiological Week, 2021



Fonte: SES/PB, 2021.

this result can be observed throughout the 25th to 30th epidemiological week of the year 2020.

It is evident that the Brazilian government and public health authorities were not sufficiently prepared to act in the fight against the Covid-19 pandemic. There seems to have been a lack of a more efficient attempt to curb the rapid increase in the number of cases and consequently of serious cases, given that the preventive measures proposed were not being effective to stop the cases. In addition, there was a delay in paying attention to overloading hospital

networks and a lack of supplies for health care in combating the pandemic. 14,15

The year 2020 ended with a downward trend until the 7th epidemiological week, but the hope of better days with the number of severe cases for COVID-19 controlled, lasted only until the 8th epidemiological week, and reached its peak between the 9th and the 10th epidemiological week, with over 800 severe cases of the disease, characterizing the peak of the disease in the state.

The first half of 2021 is ending on a

downward trend. Immunization against Covid-19 in the State of Paraíba began in January, the vaccination plan was divided into priority groups, according to the time of exposure and people at higher risk of developing complications and death from the disease. Until the date of data collection for this study, Paraíba had received 368.898 doses of Coronavac and Oxford/Astrazeneca vaccines, of which 262.629 were applied, referring to the first dose. Today there are 106.269 fully immunized inhabitants of Paraíba. 16

CONCLUSION

The study aimed to carry out a comparative analysis of the distribution of severe cases by Covid-19 in the State of Paraíba, between the years 2020 and 2021, until the period proposed for data collection. With the analysis, it was possible to observe that the Covid-19 pandemic in the state is not yet under control, despite having shown a downward trend in the number of severe cases at different times.

Understanding the transmission patterns of COVID-19, adopting preventive measures to control the disease do not seem to guarantee the interruption of the spread of the disease or improve the scenario in which we are living, however, the immunization against COVID-19 has already started to reveal results that indicate a possible exit from the current pandemic.

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