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Epidemiological scenario of COVID-19 in northeast Brazil

Escenario epidemiológico del COVID-19 en el noreste de Brasil

Cenário epidemiológico da COVID-19 no nordeste do Brasil

ABSTRACT
The objective is to describe the epidemiological scenario of COVID-19 in northeastern Brazil. Method: This is a descriptive, cross-sectional, retrospective epidemiological study, carried out based on data collected from the COVID-19 epidemiological bulletins in Northeast Brazil, from March to July 2020. Results: In the Northeast, 585,831 cases were confirmed of COVID-19, in seven states the percentage of cases in females is higher than in males, the number of deaths in the period was 22,187, of these 56% (12,187) occurred in males, the highest mortality rate was observed in Ceará (73.8). The number of cases recovered in the region exceeds 400 thousand. Conclusion: The northeast region has a high number of cases of COVID-19, and Ceará stands out for presenting a higher mortality and incidence rate. The spread of the pathology was more intense in females, however the number of deaths was higher in males in the nine northeastern states.
ESCRIPTORS: COVID-19; Epidemiology, Mortality.

RESUMEN
El objetivo es describir el escenario epidemiológico del COVID-19 en el noreste de Brasil. Método: Se trata de un estudio epidemiológico descriptivo, transversal, retrospectivo, realizado con base en los datos recolectados de los boletines epidemiológicos COVID-19 en el Nordeste de Brasil, de marzo a julio de 2020. Resultados: En el Nordeste se confirmaron 585.831 casos. de COVID-19, en siete estados el porcentaje de casos en mujeres es mayor que en hombres, el número de muertes en el período fue de 22,187, de estos 56% (12,187) ocurrieron en hombres, la mayor tasa de mortalidad se observó en Ceará (73,8). El número de casos recuperados en la región supera los 400 mil. Conclusión: La región noreste tiene un alto número de casos de COVID-19, y Ceará se destaca por presentar una mayor tasa de mortalidad e incidencia. La extensión de la patología fue más intensa en las mujeres, sin embargo, el número de muertes fue mayor en los hombres en los nueve estados del noreste.
DESCRIPTORES: COVID-19; Epidemiología; Mortalidad.

RESUMO
Objetiva-se descrever o cenário epidemiológico da covid-19 no nordeste brasileiro. Método: Trata-se de um estudo epidemiológico descritivo, transversal, retrospectivo, realizado a partir de dados coletados dos boletins epidemiológicos da COVID-19 no Nordeste do Brasil, no período de março a julho de 2020. Resultados: No Nordeste foram confirmados 585.831 casos da COVID-19, em sete estados o percentual de casos no sexo feminino é superior ao masculino, o número de óbitos no período foi de 22.187, destes 56% (12.187) ocorreram no sexo masculino, a maior taxa de mortalidade foi observada no Ceará (73,8). O número de casos recuperados na região ultrapassa 400 mil. Conclusão: A região nordeste apresenta elevado quantitativo de casos da COVID-19, sendo que o Ceará se destaca por apresentar maior índice de mortalidade e incidência. A disseminação da patologia foi mais intensa no sexo feminino, contudo o quantitativo de óbitos foi maior no sexo masculino nos nove estados nordestinos.
DESCRITORES: COVID-19; Epidemiologia; Mortalidade.

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INTRODUCTION

Sars-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2), Sars-CoV-2 is an enveloped RNA virus and causative agent of COVID-19 disease, an emerging disease characterized by infections of the respiratory system. [1] Coronavirus infection can present asymptomatic, mild or severe, most infected individuals exhibit symptoms. [2]

In December 2019, the first cases of COVID-19 emerged in Wuhan, China, the virus quickly spread across the continents and in March 2020, 110.000 cases were reported in 114 countries. Observing the epidemiological worsening, the World Health Organization (WHO) declared the disease pandemic on March 11th, 2020. [3]

In Brazil, the first case was confirmed in São Paulo in February 2020. [4] In the Northeast, the first confirmed case occurred in Epidemiological Week (SE) 10 and the first death was registered in Pernambuco in the 13th SE. [5]

Globally, at the beginning of October 2020 there were an additional 36 million confirmed cases of COVID-19, including about 1 million deaths. American women have a higher rate of contamination with 17,3 million more cases. [6]

According to the national epidemiological survey of July 2020, the number of COVID-19 cases in Brazil was 2 million, with 76 thousand deaths, more than 1,2 million recovered, the southeastern region has the largest number of confirmed cases, with 690 more thousand, then comes the northeast region with more than 670 thousand registered cases. In Brazil in March 2020 the incidence rate was 2,76/100 thousand inhabitants, with the massive increase in the number of confirmed cases the incidence rate increased to 2379,6/100 thousand inhabitants in October. [7]

Considerando a ampla e rápida disseminação do novo coronavírus no Nordeste brasileiro e por se tratar de uma nova doença é pertinente compreender o impacto que a COVID-19 causa na população e no sistema de saúde pública, para que assim sejam traçadas estratégias eficazes para o controle.

Updated data from October 2020 show that Brazil has more than 5 million confirmed cases, with 148.228 deaths and a mortality rate of 70,5/100 thousand inhabitants. The Northeast has about 1,3 million cases, with 39.985 deaths, with a mortality rate of 70,1/100 thousand inhabitants and an incidence of 2397,3/100 thousand inhabitants. [7] Emphasize that the Northeast region is composed of nine states with an estimated population of more than 53 million. [8]

Considering the wide and rapid spread of the new coronavirus in Northeastern Brazil and because it is a new disease, it is pertinent to understand the impact that COVID-19 causes on the population and on the public health system, so that effective strategies for control can be drawn up. Thus, this study aims to describe the epidemiological scenario of COVID-19 in Northeast Brazil..

METHOD

This is a descriptive, cross-sectional,

retrospective epidemiological study, built from the analysis of secondary data collected from the epidemiological bulletins of COVID-19 from the state health departments of the Northeast region of Brazil. (Ceará[9], Bahia[10], Maranhão[11], Pernambuco[12], Paraíba[13], Alagoas[14], Rio Grande do Norte[15], Sergipe[16] e Piauí[17]). The data refer to the epidemiological bulletins of July 9th, 2020, which included data from the period from March 6th to July 8th, 2020.

Data collection was performed using a form built by the authors themselves. The variables analyzed were: number of confirmed cases, number of deaths, number of recovered cases, mortality rate and incidence. The mortality and incidence rates were expressed per 100 thousand inhabitants. The inclusion of these variables is due to the expression monitoring that they allow from COVID-19, identifying the direct and immediate impact on epidemiological indicators.

The results were tabulated to make the comparison between the states by structuring a table with absolute values and percentage calculations, performed by the Microsoft Excel version 2016 program. As it is a study with secondary data, it is not necessary the authorization of the ethics committee in research.

RESULTS

In the Northeast between March 6th and July 8th, 585.831 cases of COVID-19 were recorded. The state of Ceará has the highest number of cases in the Northeast region with 120.872 cases, among the nine states Piauí has the lowest number of confirmed cases with 31.269 cases. Regarding the percentage of cases by sex, in seven states the percentage in females is higher than in males, representing more than 52% of confirmed cases in these states (Table 1).

The total number of deaths accumulated in the Northeast was 22.187, this number should increase as the results of the exams are confirmed. Deaths in males are higher than deaths in females, reaching the percentage of 56,3% (12.187). The highest and lowest mortality rates were observed in the states of Ceará

Table 1. Number of confirmed cases and number of cases by gender of COVID-19 in Northeastern Brazil, 2020.

Estado	Total de casos confirmados	Casos no sexo masculino	%	Casos no sexo feminino	%
Ceará	120.872	66.033	54,6	54.839	45,4
Bahia	98.319	46.209	47	52.110	53
Maranhão	95.323	43.022	45	52.301	55
Pernambuco	68.767	31.030	45,1	37.737	54,9
Paraíba	57.614	*	*	*	*
Alagoas	43.191	20.257	46,9	22.934	53,1
Rio grande do Norte	37.060	17.603	47,5	19.457	52,5
Sergipe	33.416	15.035	45	18.381	55
Piauí	31.269	14.540	46,5	16.729	53,5

Source: Bulletins and epidemiological reports from the municipal health departments of the Northeast, Brazil, 2020.
* There was no division of cases by gender in the epidemiological report of Paraíba

Table 2. Distribution of data according to deaths and mortality rates of COVID-19 in the Northeast, Brazil, 2020.

Estado	Óbitos	Óbitos no sexo masculino	%	Óbitos no sexo feminino	%	Taxa de mortalidade
Ceará	6.525	3.745	57,4	2.780	42,6	73,8
Bahia	2.328	1.272	54,6	1.056	45,4	15,7
Maranhão	2.357	1.461	62	896	38	33,3
Pernambuco	5.409	2.914	54,7	2.409	45,3	56,6
Paraíba	1.196	705	59	491	41	29,8
Alagoas	1.230	706	56,6	540	43,3	36,9
Rio Grande do Norte	1.345	750	55,7	595	44,3	38,4
Sergipe	901	518	57,5	383	42,5	39,2
Piauí	896	485	54,1	411	45,9	27,0

Source: Bulletins and epidemiological reports from the municipal health departments of the Northeast, Brazil, 2020.

and Bahia, respectively, corresponding to 73,8/100 thousand inhabitants and 15.7/100 thousand inhabitants (Table 2). A relevant aspect is the number of recovered cases, which in total corresponds to 408.903 (Table 3).

DISCUSSION

The results showed that the COVID-19 epidemic occurs differently in the nine northeastern states, assuming a specific configuration in each state. The first confirmed case occurred in the state of Bahia, with the first death recorded in Pernambuco. In the analyzed period, more than 500 thousand cases of COVID-19 in the region were confirmed.

When comparing the number of cases in the Northeast with the other regions of Brazil, it can be seen that this region occupies the second place in the number of confirmed cases of COVID-19, behind the Southeast that has the largest number of confirmed cases in Brazil. [7]

The state of Ceará, Bahia and Maranhão occupy a prominent place for presenting a greater number of confirmed cases. It is noteworthy that Ceará has about 20 thousand more cases than Bahia, a state that ranks second in the number of COVID-19 cases.

When comparing the number of deaths between the states, it appears that Ceará and Pernambuco have a much higher number of deaths than the other states. It is observed that Bahia has a high number of cases, but has a much lower number of deaths than the state of Pernambuco, which has fewer cases of COVID-19. Thus, the distinct behavior that COVID-19 assumes in different populations is verified, with different characteristics and different health care resources.

It is observed that Ceará has a higher mortality and incidence rate than the other northeastern states, corresponding to 73,8 and 1.434,5, respectively, per 100 thousand inhabitants.

Regarding the distribution of deaths by gender, it was found that in all northeastern states, male people have a higher percentage of deaths than women. The state of Maranhão has the highest rate, with 62% (1.461) of deaths in males. The highest number of deaths in males due to diseases of the respiratory system was also found in a study carried out in the Northeast, in which magnitudes were satisfactorily higher than those of females for almost all states in the Northeast. [18]

The data presented corroborate the data of deaths by COVID-19 in China, in which two thirds of deaths occur in men, causing 2,4 times more deaths in men. 19 Therefore, it is asked about the possibility of greater susceptibility and mortality in males by covid-19, thus requiring further studies to elucidate this fact.

It is observed that Ceará has a higher mortality and incidence rate than the other northeastern states, corresponding to 73,8 and 1.434,5, respectively, per 100 thousand inhabitants. This fact may be related to the situation in the state of Ceará, presenting more cases of covid-19 in the Northeast and being the only state in the Northeast where the number of confirmed cases in males is higher than in females. It is known that the elderly population over 60 years old has a higher risk of infection by covid-19, and the greater possibility of developing severe forms of the disease [20], so this high mortality rate can be explained in part because in the state of Ceará the elderly population represents more than 800 thousand people in the group at risk for covid-19. [21]

In the Northeast region, approximately 400 thousand patients recovered from COVID-19, with the states of Ceará, Maranhão and Bahia presenting more recovered cases. The number of cases recovered from COVID-19 directly related to the severity of the cases and the health care provided.

Table 3. Number of recovered cases and incidence rate of COVID-19 in the Northeast, Brazil, 2020.

Estado	Número de casos recuperados	Incidência
Ceará	106.512	1.434,5
Bahia	69.098	661,1
Maranhão	73.847	1.347,5
Pernambuco	47.996	719,5
Paraíba	20.604	1.433,9
Alagoas	35.431	1.294,2
Rio grande do Norte	3.258	1.056,8
Sergipe	22.686	1.453,7
Piauí	29.471	908,7

Source: Bulletins and epidemiological reports from the municipal health departments of the Northeast, Brazil, 2020.

In this sense, there is a relationship between the number of confirmed cases and the number of recovered cases.

It is important to note that the Northeast region is vulnerable, due to a combination of ICU bed infrastructure below the minimum required and mortality due to conditions similar to COVID-19 above the Brazilian median. [22]

CONCLUSION

The analysis of the epidemiological data of COVID-19 in the Northeast showed that the nine northeastern states have a high number of cases of the disease, with Ceará occupying a prominent place for presenting high rates of mortality and incidence. It is noticeable that COVID-19 spread more intensely in females in seven of the nine states, however the number of deaths was higher in males in all states. Due to the nature of the study and the variables analyzed, it is not possible to establish a correlation to justify this fact, requiring further studies to elucidate this issue. ■

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