



Incidence of COVID-19 in the states of the northern region of Brazil

Incidência da COVID-19 nos estados da região norte do Brasil

Incidencia de COVID-19 en los estados del norte de Brasil

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ABSTRACT

Introduction: The clinical disease named COVID-19 is caused by a novel coronavirus named SARS-CoV-2. In this sense, in order to provide information for a better planning of the educational and preventive measures for vulnerable groups, with a view to reducing transmission chain, this study aimed to analyze COVID-19 epidemiological aspects in the states of the North Region of Brazil. **Outline:** Cross-sectional, retrospective study, with quantitative and descriptive approach, conducted through access to samples dated from March 28 to April 24, 2020, belonging to Center for Strategic Information in Health Surveillance (CIEVS) database. **Results:** 3,635 cases reported in the North Region were analyzed, and Amazonas and Pará have the highest rates of confirmed cases, while Tocantins has the lowest ones. **Implications:** As observed, the number of new cases and its possible evolution to serious manifestations still justify prophylaxis measures to decrease the high transmissibility of the disease. Thus, the guidelines for preventive measures need to be followed in order to reduce the impact of the disease in Brazil.

DESCRIPTORS

Epidemiological Monitoring; Transmission; Coronavirus Infections.

INTRODUCTION

The clinical disease named COVID-19 is caused by a novel coronavirus named SARS-CoV-2. Coronaviruses are RNA viruses, belonging to the family *Coronaviridae*, and they are widely spread among humans and the other mammals. The first set of identified cases of the novel coronavirus caused a Severe Acute Respiratory Syndrome (SARS) outbreak and was associated with the seafood market of southern China, where great variety of live and freshly slaughtered animals are sold. From this, it was inferred that those could be the virus reservoir.¹⁻²

The novel coronavirus can be transmitted among humans via airborne droplets, and the respiratory tract, probably, is not the only route of transmission, since SARS-CoV-2 can also be transmitted by direct and indirect contact with mucous membranes of the eyes, mouth, or nose; in addition, it has already been associated with gastrointestinal symptoms, which may suggest that the digestive tract is also a route of infection.³

The disease began to be disseminated in Wuhan and spread throughout China, beginning to receive worldwide attention. In view of this, World Health Organization (WHO), on January 30, 2020, officially declared the COVID-19 epidemics as public health emergency of international concern.⁴

The epidemiological studies on the occurrence of infections, such as this one caused by the novel coronavirus, are of utmost importance for the detection of outbreaks and epidemics, aiming to contribute to generate greater knowledge and timely control of the disease in different regions of Brazil, as the high transmission chain of the virus and the absence of an available vaccine and of prior immunity of the population make the growth of the number of the cases exponential.⁵⁻⁶

It is known that each Brazilian region has specific characteristics. For this reason, there are distinct ways of expanding the number of cases, which are dependent on social distancing measures adopted. In this way, this study aimed to analyze COVID-19

confirmed cases and epidemiological aspects, in the states of the North Region of Brazil, between March 18 and April 24, 2020, in order to provide information for a better planning of the preventive measures for the most vulnerable groups and a better evaluation of the actions to reduce the transmission chain.

METHOD

It is an epidemiological, cross-sectional retrospective, descriptive study, with quantitative presentation and made from the access to information available in CIEVS on April 26, 2020.

It is based on a comparative study that involve all the North Region states. Inclusion criteria for the study were SARS admissions, lethality, number of confirmed cases and deaths related to COVID-19, in the sample from March 18 to April 24, 2020. Moreover, data from April 25 of the same year were excluded, as well as the number of deaths from other causes that did not have a previous COVID-19 diagnosis.

Variables analyzed in the data from the state of Tocantins were gender, age group, patients in home isolation, number of patients admitted, daily evolution, recovered cases, and number of deaths. These variables, according to the researchers' experience of this study, are the most appropriate questions to understand the characteristics of the patients affected by the disease in the state. Data were collected by two independent researchers from spreadsheets created by Tabwin32 application in the version 3.6b and sent to Microsoft Excel® 2013 software that allowed the analysis.

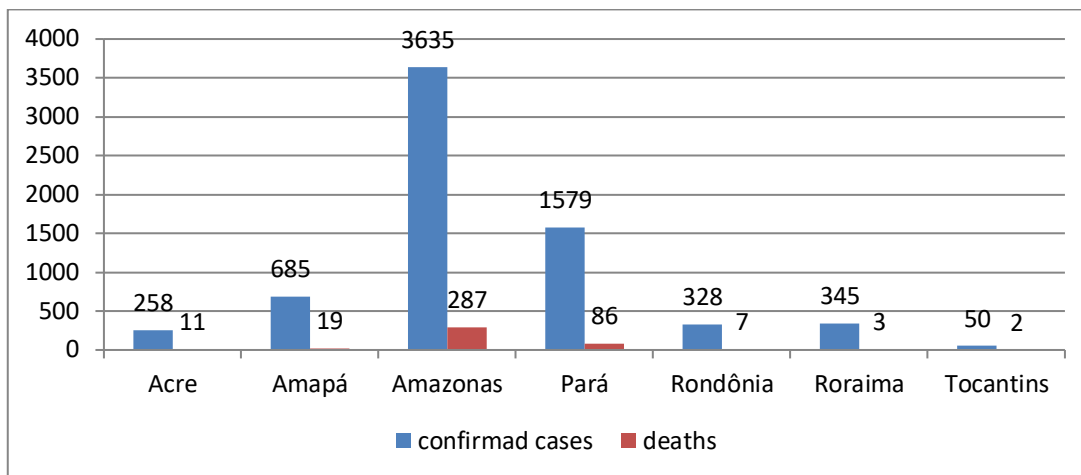
RESULTS

The results found showed that, in the North Region, the states that had the greatest number of COVID-19 confirmed cases were Amazonas, with a total of 3,635 cases, and Pará, with 1,579 cases. In relation to states with the fewest cases, Acre and Tocantins have, respectively, 258 and 50 cases in each state. Data were presented in Figure 1.

Concerning the total number of deaths, Amazonas and Pará remain with the greatest number of confirmed cases, with 287 and 86 cases in each

state, respectively. As for the states with the fewest deaths, Roraima has three cases, and Tocantins has two cases. Data were presented in Figure 1.

Figure 1 – Reports of COVID-19 confirmed cases and number of deaths in the states of the North Region of Brazil.

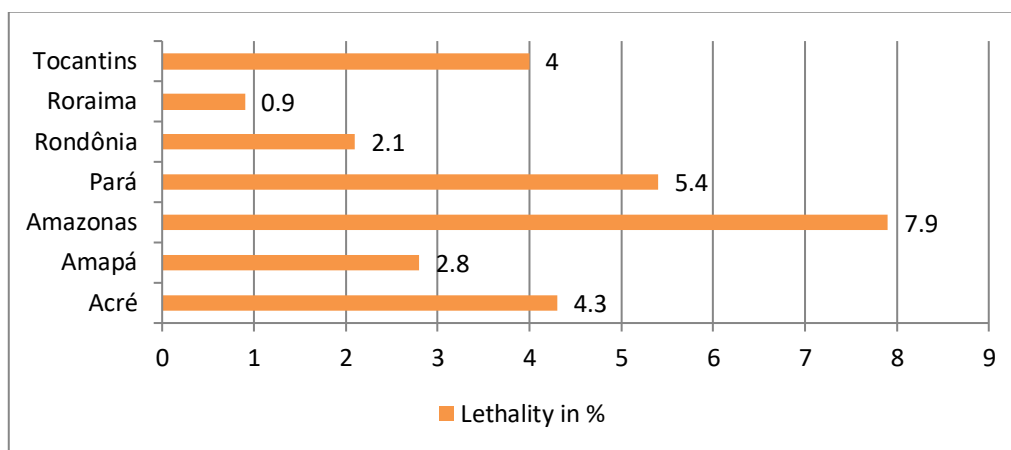


Source: Epidemiological Bulletin of the state of Tocantins / SES-TO.

Regarding lethality, Amazonas e Pará remain with the highest values, with 7.9% and 5.4%,

respectively, in each state. Data were presented in Figure 2.

Figure 2 – COVID-19 lethality in the states of the North Region of Brazil.

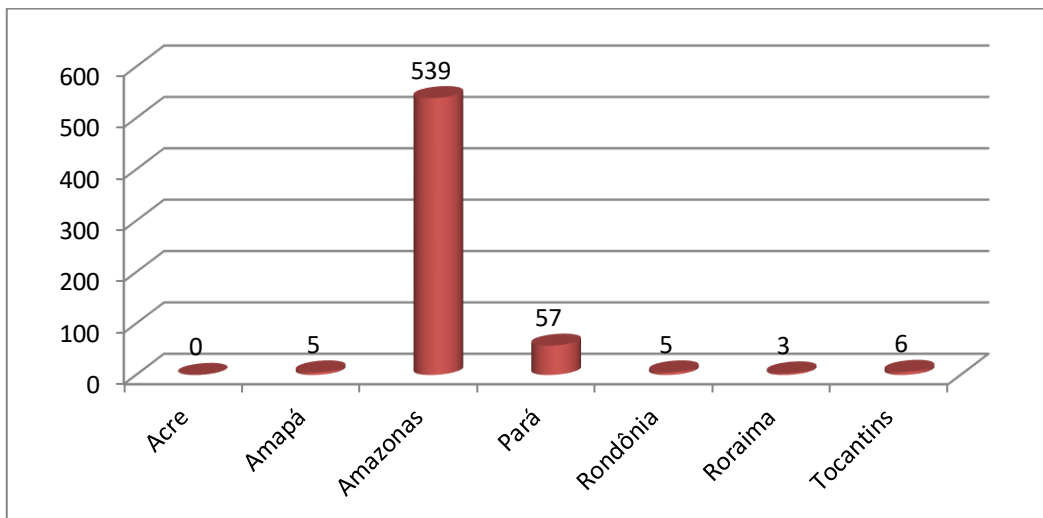


Source: Epidemiological Bulletin of the state of Tocantins / SES-TO.

Analyzing SARS admissions, the state of Amazonas led the list of the number of hospitalizations, with a total of 539 cases, followed by

the state of Pará, with 57 hospitalizations. Data were presented in Figure 3.

Figure 3 – Number of SARS admissions by COVID-19 etiology in the states of the North Region.

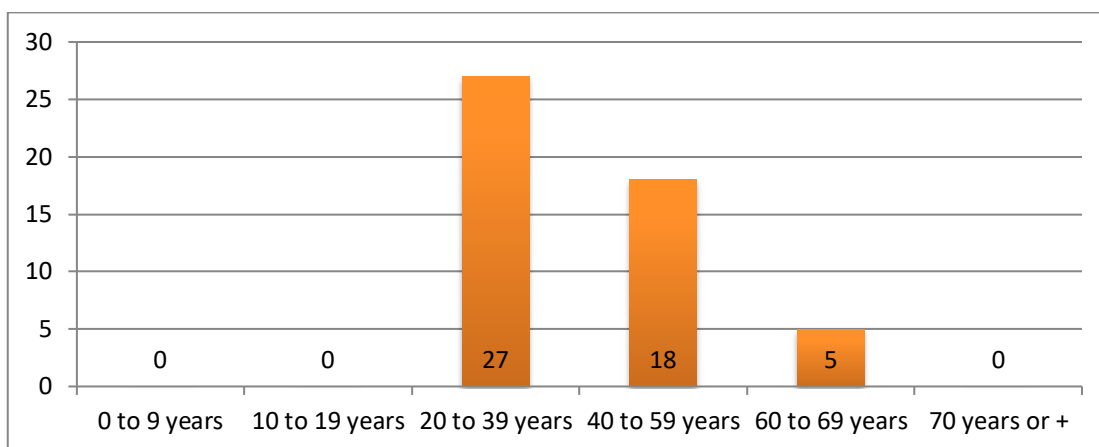


Source: Epidemiological Bulletin of the state of Tocantins / SES-TO.

Observing the number of confirmed cases in the state of Tocantins in relation to age group, the greatest number of cases is found in adult/young

population, from 20 to 39 years, with a total of 27 cases, and from 40 to 59 years, with 18 cases. Data were presented in Figure 4.

Figure 4 – Distribution of number of COVID-19 cases per age group in the state of Tocantins.



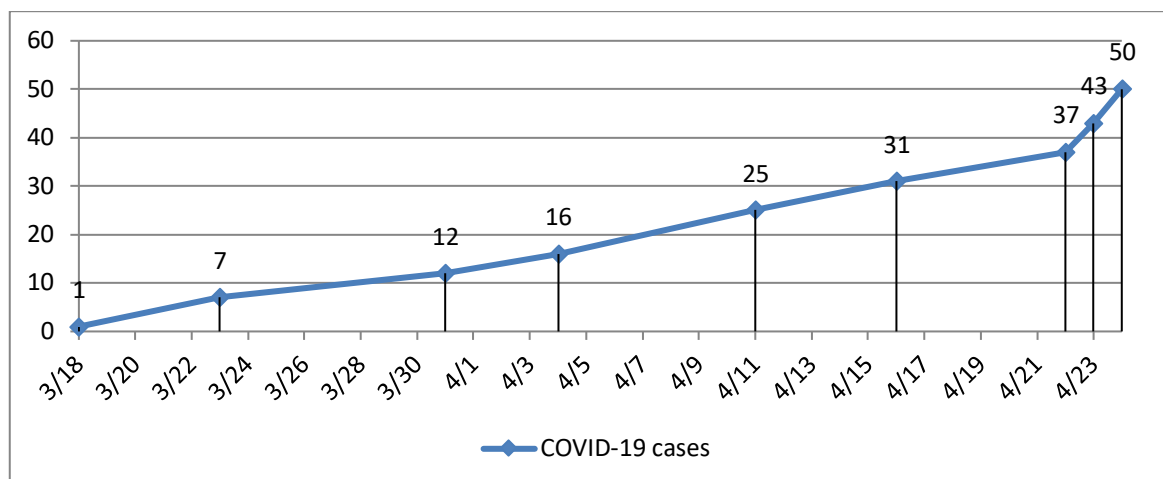
Source: Epidemiological Bulletin of the state of Tocantins / SES-TO.

In Tocantins, there was a slight predominance in the number of cases in female patients, with a total of 27 cases. Meanwhile, the incidence in male patients occurred in 23 cases. In this Brazilian state, the current situation in which the individuals of the study sample was also analyzed, given that 28 patients were isolated

in home environment, 16 were cured, four were admitted in serious condition, and two died.

The first confirmed case in the state of Tocantins was on March 18. In relation to the last day approached in the study sample, the state has already had 50 COVID-19 confirmed cases. Data were presented in Figure 5.

Figure 5 – Reports of COVID-19 cases in the state of Tocantins distributed per number of cases according to the data collected from March 18 to April 24, 2020.



Source: Epidemiological Bulletin of the state of Tocantins / SES-TO.

DISCUSSION

In Figures 1, 2, and 3, it is observed that Amazonas and Pará had the greatest number of confirmed cases, deaths, lethality, and SARS admissions caused by COVID-19. These results may be related to the fact that these states have the largest populations estimated in the North Region. According to the Brazilian Institute of Geography and Statistics (IBGE), Amazonas has 4,144,597 inhabitants, and Pará, 8,602,865 inhabitants.⁷⁻⁹

Furthermore, these states have capitals that exceed one million inhabitants and have infrastructure, such as international airports and bus stations, which make possible the access to other regions and countries. Thus, the possibility arises that there is a greater intensification in the spread of the virus in different environments.⁷⁻⁹

According to Ministry of Health, up to March 28, 2020, Brazil had 3,904 cases and 114 deaths. The Southeast Region concentrated 57% of the cases (2,222); the Northeast, 16% (624); the South, 13% (514); the Central-West, 9% (360); and the North, 5% (184).¹⁰

According to the bulletin published on April 25, 2020, the North Region has already had a total of 6,880 cases. However, it is known that current guidelines of Ministry of Health in relation to virus testing include only the cases of patients with serious symptoms of the

disease, and this situation may promote underreporting of cases. Studies indicate that, in various Brazilian regions, the number of available tests is not enough for the population. In relation to the North Region, its territorial extension and the various economic levels of the population may also hinder the tracking of the disease.⁸⁻¹¹

In order to contain the spread of the virus, countries took measures referred to the implementation of the social isolation, that is, the restriction of movement of individuals potentially exposed to a certain infectious agent. In Brazil, state of quarantine was declared on February 6, 2020, through Law 13,979/2020. However, knowing the great territorial extension of the North Region, with a large share of the population without education, internet, and, often, isolated in riverside communities, it is pointed out that the lack of information available may also be one of the reasons that caused the increased number of cases in the Region, especially, in the states of Amazonas and Pará.^{8,10,12}

Among the states of the North Region, Tocantins had the fewest confirmed cases and deaths, despite the large road network that links it to other regions. It is noted that quarantine measures implemented in the state may have been efficient for a less disease transmission; in addition, the state does not have international airports, thus flow of people from other

countries or regions is less when compared with the flow from other states.^{8,10}

In relation to the age group of confirmed patients in the state of Tocantins, it was observed that most are in the age group from 20 to 59 years. These data are equivalent to studies on COVID-19 in other Brazilian states, such as Mato Grosso, that had most cases in patients in age group from 40 to 59 years.⁹

Another study indicated that there is an average age of 43 years among the COVID-19 confirmed patients. This datum is equivalent to data obtained from Tocantins, as the average age of the patient was 44.5 years.¹³

It is noted that, in Figure 5, the state still shows growth in the number of confirmed cases. In view of this, the need for continuity of extensive measures to reduce the high transmission chain of the disease, they are: the use of masks, hand hygiene, ban of gatherings

in public or private places, the implementation of early detection of cases, the tracking of contacts and the stimulation of social isolation for risk groups.⁷

The limitation of this study is the fact that results presented are still modifying daily, since the COVID-19 transmission chain is not, up to this point, controlled. Moreover, the data are directed to the particularities of the states of the North Region of Brazil.

CONCLUSION

As it was observed, the number of new cases and its possible evolution to serious manifestations still justify prophylaxis measures to decrease the high transmissibility of the disease. Thus, the guidelines for preventive measures need to be followed in order to reduce the impact of the disease in Brazil.

RESUMO

Introdução: A doença clínica denominada COVID-19 é causada por um novo coronavírus denominado SARS-CoV-2. Neste sentido, no intuito de fornecer informações para um melhor planejamento das medidas de educação e prevenção para os grupos vulneráveis, com vistas à redução da cadeia de transmissão, esta pesquisa teve por objetivo analisar aspectos epidemiológicos da COVID-19 nos estados da Região Norte do Brasil. **Delineamento:** Estudo transversal, retrospectivo, com abordagem quantitativa e descritiva, feito por meio de consulta às amostras datadas de 28 de março a 24 de abril do ano de 2020, pertencentes à base de dados do Centro de Informações Estratégicas de Vigilância em Saúde (CIEVS). **Resultados:** Foram verificados 3.635 casos notificados na Região Norte, sendo que o Amazonas e o Pará apresentam as maiores taxas de casos confirmados, ao passo que o Tocantins apresenta as menores. **Implicações:** Conforme observado, o número de novos casos e a sua possível evolução para manifestações graves ainda justificam medidas de profilaxia para diminuição da elevada transmissibilidade da doença. Desta forma, as orientações de medidas preventivas precisam ser seguidas a fim de que o impacto da doença diminua no Brasil.

DESCRITORES

Monitoramento Epidemiológico; Transmissão; Infecções por Coronavírus.

RESUMEN

Introducción: La enfermedad clínica llamada COVID-19 es causada por un nuevo coronavirus llamado SARS-CoV-2. En este sentido, con el fin de proporcionar información para una mejor planificación de las medidas educativas y prevención para grupos vulnerables, con miras a reducir la cadena de transmisión, esta investigación tuvo como objetivo analizar los aspectos epidemiológicos de COVID-19 en los estados de la Región Norte de Brasil. **Delineación:** Estudio transversal, retrospectivo, con enfoque cuantitativo y descriptivo, realizado mediante consulta de las muestras del 28 de marzo al 24 de abril de 2020, pertenecientes a la base de datos del Centro de Información Estratégica de Vigilancia de la salud. (CIEVS). **Resultados:** Fueron verificados 3.635 casos reportados en la Región Norte, siendo que el Amazonas y Pará tener las tasas más altas de casos confirmados, mientras que Tocantins tiene el más pequeño. **Implicaciones:** Como observado, El número de casos nuevos y su posible evolución a manifestaciones graves aún justifican las medidas de profilaxis para disminuir la alta transmisibilidad de la enfermedad. Por lo tanto, Es necesario seguir las pautas de medidas preventivas para reducir el impacto de la enfermedad en Brasil.

DESCRIPTORES

Monitoreo Epidemiológico; Transmisión; Infecciones por Coronavírus.

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COLLABORATIONS

CWBG: Contributed to data collection, analysis and interpretation, and article writing. ABPN and DLF: Contributed to data collection and article writing. GSL: Contributed to article writing and to critical review of the article. KHJFR: Contributed to article writing. JMS: Contributed to critical review of the article. All the authors agree and take responsibility for the content of this manuscript version to be published.

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CONFLICTS OF INTEREST

There are no conflicts of interest to declare.