




Artigo Original

## Epidemiology of Severe Acute Respiratory Syndrome (SARS) resulting from COVID-19 in the State of Rio Grande do Norte

Epidemiologia da Síndrome Respiratória Aguda Severa (SARS) decorrente da COVID-19, no Estado do Rio Grande do Norte

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### ABSTRACT

This study aimed to elucidate the epidemiological profile of patients with Severe Acute Respiratory Syndrome (SARS) triggered by COVID-19, in the state of Rio Grande do Norte (RN), between March 12 and September 10, 2020. of an epidemiological, retrospective, ecological and documentary study, in which data were collected from Fiocruz's "Monitora Covid-19". The variables analyzed were: number of notifications, gender, age and number of deaths. Absolute and relative frequencies were evaluated, followed by the application of the chi-square test of independence, in which  $p \leq 0.05$  was considered statistically significant. There were registered 65,099 cases of COVID-19 in the state of RN, in which 4,393 affected developed SARS. Male individuals were the most affected (57%) and the age group from 60 years old (57%) was the most prevalent. There was a statistically significant association between men aged 20 to 59 years and women aged 60 years and over ( $p < 0.001$ ). Of the 1,696 deaths, there was higher mortality in males (55.6%) and higher mortality in females (40%). Furthermore, there was a positive association for deaths in those aged 60 years or more and no deaths in people aged 0-19 years and 20-59 years ( $p < 0.001$ ). Thus, it is expected that these data can contribute to the development of strategies aimed at the control and prevention of COVID-19 at the municipal and state level.

**Keywords:** Coronavirus infections; COVID-19; SARS-CoV-2; Epidemiology; Coronavirus

### RESUMO

Este estudo teve como objetivo elucidar o perfil epidemiológico de acometidos pela Síndrome Aguda Respiratória Severa (SARS) desencadeada pela COVID-19, no estado do Rio Grande do Norte (RN), entre 12 de março e 10 de setembro de 2020. Trata-se de um estudo epidemiológico, retrospectivo, ecológico e documental, na qual foram realizadas coletas de dados do "Monitora Covid-19" da Fiocruz. As variáveis analisadas foram: número de notificações, gênero, idade e o quantidade de óbitos. Avaliou-se as frequências absolutas e relativas seguido da aplicação do teste Qui-Quadrado de independência, na qual  $p \leq 0,05$  foi considerado estatisticamente significativo. Foram registrados 65.099 casos da COVID-19

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no estado do RN, em que 4.393 acometidos desenvolveram a SARS. Os indivíduos do sexo masculino foram os mais acometidos (57%) e a faixa etária a partir de 60 anos (57%) foi a mais prevalente. Observou-se associação estatisticamente significativa entre homens 20 a 59 anos e mulheres a partir dos 60 anos ( $p < 0,001$ ). Dos 1.696 óbitos, notou-se maior mortalidade no sexo masculino (55,6%) e maior letalidade no sexo feminino (40%). Ademais, evidenciou-se associação positiva para óbitos naqueles que apresentavam 60 anos ou mais e ausência de óbitos em pessoas com 0 a 19 anos e 20 a 59 anos ( $p < 0,001$ ). Dessa forma, espera-se que estes dados possam contribuir para o desenvolvimento de estratégias direcionadas ao controle e prevenção da COVID-19 a nível municipal e estadual.

**Palavras-chave:** Infecções por coronavírus; COVID-19; SARS-CoV-2; Epidemiologia; Coronavírus

## INTRODUCTION

On December 1, 2019, China reported to the World Health Organization (WHO) the appearance of unusual cases of pneumonia in the city of Wuhan. Then, in January 2020, China confirmed that these cases were due to a new etiological agent, from the Coronaviridae family, called Sars-CoV-2, responsible for causing the disease called COVID-19 (Coronavirus Disease 2019)<sup>1</sup>. Its high transmissibility alarmed health authorities around the world, followed by the declaration of a pandemic character by the WHO<sup>2</sup>.

Sars-CoV-2 is a single-stranded RNA (ribonucleic acid) virus that belongs to the genus Betacoronavirus, family Coronaviridae, and order Nidovirales. This one receives this name due to the points present on its surface that are similar to real crowns<sup>3</sup>. This microorganism affects the airways (main), kidneys and smooth muscle due to the presence of the angiotensin-2 converting enzyme (ACE-2), which acts as a receptor and allows the pathogen to adhere to the surface of human eukaryotic cells. The incubation period is 3 to 14 days<sup>2</sup>.

The mode of transmission occurs from person to person through droplets of saliva released from coughing, sneezing and speaking of infected individuals<sup>3</sup>. Furthermore, contamination is also caused by contact with fomites<sup>4</sup>.

Individuals affected by COVID-19 may be asymptomatic or symptomatic, in which case they present flu-like symptoms. However, in severe cases, those affected may develop pneumonia, SARS, sepsis and septic shock, which may lead to death<sup>5</sup>. More specifically, SARS causes difficulty in breathing, sore throat, myalgia, dyspnea and blood oxygen saturation below 95%<sup>6</sup>.

It is seen that the elderly with diabetes mellitus, hypertension, cancer, heart and respiratory problems and other diseases are the public with the highest risk of presenting the severe form of the disease and, consequently, of dying<sup>7</sup>.

Standard diagnosis is based on analyzes of nasopharyngeal samples or respiratory secretions using the reverse transcription test followed by polymerase chain reaction (RT-PCR)<sup>8</sup>.



To prevent the spread of the virus, it is necessary to maintain social distance, use a mask when leaving the house, and always sanitize hands with detergent or 70% alcohol gel<sup>9</sup>. There is still no pharmacological treatment for the disease, however there are vaccines capable of preventing the infection<sup>10</sup>.

The National Plan for the Operationalization of Vaccination against COVID-19 is a measure to combat the disease carried out by the Ministry of Health of Brazil. This plan is being conducted by the National Immunization Program (PNI), which uses four vaccines in the public health network: CoronaVac, produced by Farmacêutica Sinovac in conjunction with Instituto Butantan and AstraZeneca, made by the University of Oxford in partnership with Oswaldo Cruz Foundation (Fiocruz) and the Instituto Serum da Índia, formed by inactivated virus and recombinant adenovirus, respectively. In addition to the Pfizer vaccine, which uses mRNA (messenger RNA) technology, and Janssen's, using the non-replicating viral vector<sup>7</sup>.

In Brazil, until May 23, 2021, approximately 16,083,258 cases and 449,068 deaths were confirmed by the disease<sup>11</sup>. Thus, epidemiological studies can help in monitoring and surveillance of cases, providing data for the planning, execution and evaluation of actions for the prevention, control and treatment of diseases, especially in a pandemic such as that of COVID-19<sup>12</sup>.

Thus, the objective was to elucidate the epidemiological profile of patients affected by SARS by COVID-19 in the state of RN, Brazil, between March 12, 2020 and September 10, 2020.

## **METHODOLOGY**

### **Kind of Study**

This is an epidemiological, retrospective and documentary study, in which secondary data made available in the "Monitora Covid-19" is used, created by the Institute of Scientific and Technological Communication and Information in Health of the Oswaldo Cruz Foundation (Icict/Fiocruz), in which infections occurred in the State of Rio Grande do Norte, collected from March 12 to September 10, 2020 were evaluated.

### **Place of Study**

The State of RN, located in the Northeast region, has an estimated population of 3,534,165 people and a territorial area of 52,809,601 km<sup>2</sup>, in which it has a demographic density of 59.99 inhab/km<sup>2</sup>. The Human Development Index (HDI) in the Region is 0.684, with a per capita monthly household income of R\$ 1077,00<sup>13</sup>.



## Analyzed Variables

The week of notification, gender, age and number of deaths were analyzed.

## Statistical analysis

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) software, version 13.0. The chi-square test of independence was applied and the associations were considered statistically significant, for rejection of null hypotheses, when  $p \leq 0.05$ . In addition, adjusted residuals and lethality and mortality rates were calculated.

## Lethality and mortality rates

The lethality (LR) and mortality (MR) rates for the period analyzed were calculated using the formulas expressed as:  $LR = \text{N}^\circ \text{ of deaths from the disease} / \text{N}^\circ \text{ of disease cases} \times 100$ , and  $MR = \text{N}^\circ \text{ of deaths} / \text{Population estimated total} \times 100$  thousand.

The number of the population estimated from data from the IBGE (Brazilian Institute of Geography and Statistics) was used.

## Ethical aspects

As established by the National Commission for Research Ethics (CONEP), as well as supported by Law No. 12527, of November 18, 2011, data of public access and public domain information, such as the case of Monitor COVID-19, when used for scientific research purposes, they are exempt from passing by CEP (Research Ethics Committee) /CONEP. Thus, the present study, through all legal support, becomes ethical before the scientific community<sup>14</sup>.

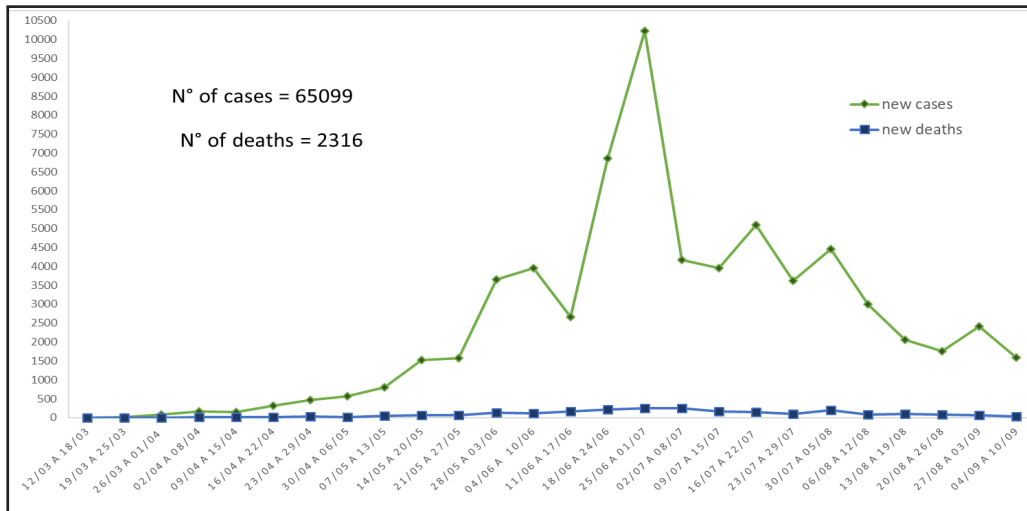
## RESULTS AND DISCUSSION

Between March 12, 2020 and September 10, 2020, 65099 cases of COVID-19 were evidenced in the state of RN (Figure 1), in which 4393 affected developed SARS, representing 6.7% of those infected with SARS-CoV- 2, 2316 patients died.

An increase in cases can be observed from 06/11, reaching a peak in the week from 06/25 to 07/01, having from then on a scenario of new cases registered in the system.



Figure 1 – Number of COVID-19 cases in the State of RN, counted according to the weeks



Source: Research data, 2021

In a study carried out in Rio de Janeiro, between March 2020 and April 2020, 1,808 cases of covid-19 were observed, with 92 deaths, and an incidence rate of 26.8/100,000 inhab. Furthermore, a considerable increase in new cases from the day of 23/03 was evidenced, and a doubling of new cases from the day of 07/04, jumping from 49 cases to approximately 100<sup>15</sup>.

Figure 2 – Overall mortality and lethality rates for SARS

$$LR = \frac{2316}{65099} = 0.036 \times 100 = 3.6\% \quad MR = \frac{2316}{3534165} \times 100000 = 65.5$$

LR - Lethality Rate; MR - Mortality Rate

Source: Research data, 2021

Below, it is possible to observe an association between sex and age group (Table 1).

Table 1 – Association between sex and age group of individuals affected by SARS-Cov-2

Age range	Male		Women		P
	N	%	N	%	
0 to 19 years	58	2	52	3	p<0.001
20 to 59 years	1121±	45	659	35	
From 60 years	1322	53	1181±	62	
Total	2501	100	1892	100	

P – Chi-Square Test of Independence; ± adjusted waste ≥ 1,96

Source: Research data, 2021



The overall lethality rate for the time period analyzed was 3.6%. In addition, there was a mortality rate of 65.5/100 thousand inhabitants in the 7-month period evaluated, as seen in figure 2, with the resolution of the formulas.

Regarding gender, the most affected were men, with 57%. In addition, in relation to the most affected age group, there are individuals aged 60 years or more (57%), followed by 50 to 59 years (18%), 40 to 49 years (11%), 30 to 39 years ( 8.4%), 20 to 29 years (3%), <2 years (0.8%), 10 to 19 years (0.8%), 5 to 9 years and 2 to 4 years (0.4% ). There was a statistically significant association between males aged between 20 and 59 years and females aged 60 years and over ( $p < 0.001$ ).

The higher prevalence of males developing SARS can be explained by the fact that men produce less type I interferon (IFN), inflammatory cytokines and circulating T cells. In addition, women have higher concentrations of estrogen, which gives them better immunity against SARS-CoV-2, as this hormone enhances the release of cytokines and the cellular response, allowing for more effective elimination of viral infections<sup>16</sup>.

A study carried out in the State of Bahia showed similar results with a predominance of men affected by SARS, with 1085 (54.9%) elderly people affected by the disease, but there were no statistically significant associations ( $p = 0.372$ )<sup>6</sup>, diverging from the study carried out in the RN.

Table 2 shows the SARS fatality rate caused by SARS-CoV-2, according to sex and age group.

Table 2 – Case fatality rate, by sex and age group, of SARS caused by SARS-Cov-2

Age range	Male			Women		
	Cases	Deaths	LR(%)	Cases	Deaths	LR(%)
< 2 years	27	1	3.70	9	2	22.22
2-4 years	9	2	22.22	9	2	22.22
5-9 years	9	1	11.11	9	0	0.00
10-19 years	13	1	7.69	25	4	16.00
20-29 years	72	14	19.44	61	7	11.48
30-39 years	227	34	14.98	144	31	21.53
40-49 years	326	67	20.55	161	41	25.47
50-59 years	496	168	33.87	293	99	33.79
60± years	1322	655	49.55	1181	567	48.01
Total	2501	943	37.70	1892	753	39.80

LR - Lethality Rate

Source: Research data, 2021



Regarding age group, it is seen in the world scenario that those most affected by the syndrome are individuals over 60 years old, similar to the data in this research. With senescence, the appearance of non-communicable chronic diseases such as hypertension, diabetes, heart disease and respiratory diseases are common, making the elderly present as a risk group for COVID-19 and its possible complications such as SARS<sup>17,5</sup>. In addition, metabolic changes make them more susceptible, thanks to deregulation of the immune response, decreased production of sex hormones and considerable imbalance in the coagulation/fibrinolytic system and endothelial dysfunction<sup>18</sup>.

Some factors corroborate the increase in mortality rates due to COVID-19 and its complications such as SARS, such as gender, age greater than or equal to 60 years, comorbidities, among other factors<sup>19</sup>. Apparently, the age group is the most prevalent factor for the good or bad prognosis of the disease<sup>20</sup>. Elderly people are mostly more affected by comorbidities, making SARS-Cov-2 infection more severe in this group<sup>21</sup>. Thus, data from the state of the RN that are present in the Mortality Information System (SIM) indicate that, in 2019, there were 2,359 deaths from hypertensive diseases, *diabetes mellitus* and asthma, in which 84.1% occurred in people aged 60 or over<sup>22</sup>.

Table 3 shows the association between sex, age group with deaths and absence of deaths in individuals who developed SARS in the state of RN.

Table 3 – Association between sex, age group and deaths from SARS caused by SARS-Cov-2 in the State of RN

	Death		Absence of death		P
	N	%	N	%	
Male	943	56	1558	58	0.158
Women	753	44	1139	42	
Total	1696	100	2697	100	
0 a 19 years	13	1	97±	4	<0.001
20 a 59 years	461	27	1319±	49	
From 60 years	1222±	72	1281	47	
Total	1696	100	2697	100	

P – Chi-Square Test of Independence; ± adjusted waste  $\geq 1,96$

Source: Research data, 2021

The number of deaths is majority in males with 56%, however there was no statistically significant association between the variables ( $p=0.158$ ).

On the other hand, cases of death related to age group occurred more frequently among individuals aged 60 years or more and less frequently between 0 and 19 years old. In addition, there is a positive association for deaths in individuals aged 60 years or more and no deaths among individuals aged 0-19 years and 20-59 years ( $p < 0.001$ ).

In a study carried out in Bahia, there was data that corroborate the present study, bringing a greater number of deaths of people aged 60 years and over (69.1%), predominantly males among those infected (56.7%), as well as an absence of deaths of individuals from 0 to 19 years old and from 20 to 59 years old<sup>6</sup>.

Survey conducted in Maranhão, from February 28th to March 19th, 2020, of 100 people who died from COVID-19, 62% were male and 66% were 60 years old or more<sup>23</sup>.

Analysis carried out with more than 50 countries discuss the relationship between age group and deaths by COVID-19, in which the total number of cases is equivalent to 2,017,444 and that of deaths to 137,166. The authors reported a significant association ( $p = 0.04$ ) between individuals aged 65 years or older and higher mortality<sup>24</sup>. On the other hand, in the present study, there was no significant association between deaths and gender.

It is not possible to clarify precisely the reasons responsible for the higher male mortality among those who presented SARS at the expense of COVID-19, however, it is seen that women, for having the duplicated X chromosome (which holds most of the genes related to immunity) seem to present greater defense against infectious-contagious diseases<sup>25</sup>.

With regard to age group, the higher mortality observed in the elderly may be related not only to immunosenescence, but also to the capacity that these individuals have to produce higher concentrations of pro-inflammatory mediators such as interleukin 6 (IL-6). This, in turn, is involved with inflammation and persistent damage to the lung parenchyma, and promotion of viral replication, which leads to a worsening of the clinical picture and poor prognosis in patients over 60 years old<sup>26</sup>.

## FINAL CONSIDERATIONS

Thus, it appears that there was an increase in the number of individuals affected by COVID-19 in the state of RN during the seven months analyzed. With regard to those affected who developed SARS, it was noted that those belonging to the male sex and who were over 60 years old had a higher record of cases and deaths, as well as a high mortality rate.

In the statistical analysis, there was a positive association between the outcome "death" and patients aged 60 years or older, while there was no significant difference between sex and the clinical outcome.



Therefore, the importance of the above results is highlighted, given the lack of studies that address the epidemiological aspects of SARS in patients affected with COVID-19. However, it is noteworthy that this information can be used for the development of new research, as well as indicating actions to be taken for the control and prevention of SARS.

## REFERENCES

1. Turci MA; Holliday JB; Oliveira NCV. A Vigilância Epidemiológica diante do Sars-Cov-2: desafios para o SUS e a Atenção Primária à Saúde. *APS em Revista*. 2020; 2(1):44-55.
2. Santos PSA, Mateus SRM, Silva MFO, Figueiredo PTS, Campolino RG. Perfil epidemiológico da mortalidade de pacientes internados por Covid-19 na unidade de terapia intensiva de um hospital universitário. *Brazilian Journal of Development*. 2021;7(5): 45981-45992.
3. Muralidar S, Ambi SV, Sekaran S, Krishnan UM. The emergence of COVID-19 as a global pandemic: Understanding the epidemiology, immune response and potential therapeutic targets of SARS-CoV-2. *Biochimie*. 2020;179:85-100
4. Gomes GGC, Bisco NCB, Paulo MF, Fabrin SCV, Fioco EM, Verri ED, Regalo SCH. Perfil epidemiológico da Nova Doença Infecciosa do Coronavírus-COVID-19 (Sars-Cov-2) no mundo: Estudo descritivo, janeiro-junho de 2020. *Brazilian Journal of Health Review*. 2020; 3(4):7993-8007.
5. Abreu MRP; Tejada JJG; Guach RAD. Características clínico-epidemiológicas de la COVID-19. *Revista Habanera de Ciencias Médicas*. 2020; 19(2).
6. Ferreira DA, Silva WB, Silva AP, Eloy MA, Cordeiro LV, Andrade-Júnior FP. Epidemiology of severe acute respiratory syndrome (sars) caused by covid-19 in the state of Bahia. *HOLOS*. 2020; 5:1-11. DOI: <https://doi.org/10.15628/holos.2020.10979>
7. Pereira EM, Santos BSP, Sousa Falcão DS, Mendes JR, Almeida MG, Teles DM, Costa MAO. Perfil Epidemiológico dos óbitos acumulados por COVID-19 em 2020, Piauí, Brasil. *Brazilian Journal of Development*. 2021;7(4):9526-39535.
8. Chamorro EM, Tascón AD, Sanz LI, Vélez SO, Nacenta SB. Diagnóstico radiológico del paciente con COVID-19. *Radiologia*. 2021;63(1):56-73.
9. Bilal U, Gullón P, Padilla-Bernáldez J. Evidencia epidemiológica acerca del rol de la hostelería en la transmisión de la COVID-19: una revisión rápida de la literatura. *Gaceta Sanitaria*. 2021.
10. Hermes FS, Alexandre JCM, Lucena JMB, Sousa TP, Cardoza YA, Guimarães MCM. Análise de tratamentos profilático para a COVID-19: uma revisão integrativa. *Revista Eletrônica Acervo Saúde*. 2021; 13(5), e 7167-e 7167.
11. Brasil. Ministério da Saúde. Coronavírus. Disponível em: Coronavírus Brasil ([saude.gov.br](http://saude.gov.br)). Acesso em: 24 de Mai. 2021.



12. Silva DFD, Oliveira, MLCD. Epidemiologia da COVID-19: comparação entre boletins epidemiológicos. *Comun. ciênc. saúde*.2020;31 Suppl 1:61-74.
13. IBGE. Indicadores sociodemográficos do Rio Grande do Norte: IBGE, 2020. <https://www.ibge.gov.br/cidades-e-estados/rn.html> . Acesso em: Abril,2021.
14. Brasil. Lei N° 12527 de novembro de 2011. Dados de informações de acesso público. Brasília. DF. 2011.
15. Cavalcante JR, Abreu AJL. COVID-19 no município do Rio de Janeiro: análise espacial da ocorrência dos primeiros casos e óbitos confirmados. *Epidemiol. Serv. Saude*. 2020; 29(3): 1-10.
16. Brandão SCS, Godoi ETAM, Ramos JOX, Melo LMMP, Sarinho ESC. COVID-19 grave: entenda o papel da imunidade, do endotélio e da coagulação na prática clínica. *Jorn. Vasc. Bras*. 2020; 19(16): 1-11.
17. Bastos LS, Niquini RP, Lana RM, Villela DAM, Cruz OG, Coelho FC, et al. COVID-19 y las hospitalizaciones por el SRAG en Brasil: una comparación hasta la 12ª semana epidemiológica de 2020. *Cader. Saúde Pub*. 2020; 36(4); 1-8.
18. Silva AWC, Cunha AA, Alves GC, Corona RA, Dias CAGM, Nassiri R, et al. Caracterização clínica e epidemiologia de 1560 casos de COVID-19 em Macapá/AP, extremo norte do Brasil. *Research, Soc. and Devel*. 2020; 9(8); 1-21.
19. Xie M, Chen Q. Insight into 2019 novel coronavirus — An updated interim review and lessons from SARS-CoV and MERS-CoV. *Intern. Journ. of Infect. Dis*. 2020; 94: 119-124.
20. Yi Y, Lagniton PNP, Ye S, Li E, Xu RH. COVID-19: what has been learned and to be learned about the novel coronavirus disease. *Intern. Journ. of Biol. Scie*. 2020; 16(10): 1753-1766.
21. Shahid Z, Kalayanamitra R, McClafferty B, Kepko D, Ramgobin D, Patel R, et al. COVID-19 and Older Adults: What We Know. *Journ. of the Americ. Geriat. Soc*. 2020; 68(5): 926-929.
22. BRASIL, Ministério da Saúde. Departamento de informática do Sistema Único de Saúde (DATASUS). Sistema de Informações sobre Mortalidade – SIM. Rio Grande do Norte. Óbitos por residência. 2019. Disponível em: <http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sim/cnv/obt10RN.def>. Acesso em: 01 maio 2021.
23. Almeida JS, Cardoso JA, Cordeiro EC, Lemos M, Araújo TME, Sardinha AHL. Caracterização Epidemiológica dos casos de COVID-19 no Maranhão: Uma Breve Análise. *Rev. Prev. de Infec. e Saúde*. 2020; 6: 1-11.
24. Goh HP, Mahari WI, Ahad NI, Chaw LL, Kifli N, Goh BH, et al. Risk factors affecting COVID-19 case fatality rate: A quantitative analysis of top 50 affected countries. *MedRxiv*. 2020.
25. Silva JPB, Costa LN, Monteiro TAL, Pinto T, Portela NLC. Epidemiological analysis of confirmed COVID-19 cases in Caxias, Maranhão-Brazil. *Rev. Prev. de Infec. e Saúde*. 2020;6



26. Pacheco ES, Silva VR, Soares LS. A Brief Epidemiological Analysis of Covid-19 in Piauí, BRAZIL. Rev. Prev. de Infec. e Saúde. 2020;6.

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### Conflito de Interesse

Os autores declararam não haver conflito de interesses.



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