v. 4, n. 18, 2024

International Journal of Health Science

EPIDEMIOLOGICAL PROFILE OF PATIENTS DIAGNOSED WITH COVID-19 IN A REFERENCE HOSPITAL IN CAMPINA GRANDE-PB

Matheus Leitão França
Universidade Federal de Campina Grande (UFCG)
Campina Grande - PB
http://lattes.cnpq.br/2249466302980968

Deborah Rose Galvão Dantas
Universidade Federal de Campina Grande (UFCG)
Campina Grande - PB
http://lattes.cnpq.br/8835093220021812

Cynthia Beatriz de Araújo Machado
Universidade Federal de Campina Grande (UFCG)
Campina Grande - PB
https://lattes.cnpq.br/0033105467140851

Jackson Matheus Pinheiro Oliveira
Universidade Federal de Campina Grande (UFCG)
Campina Grande - PB
http://lattes.cnpq.br/9172791016520871

Fábio Augusto da Silva Rezende
Universidade Federal de Campina Grande (UFCG)
Campina Grande
http://lattes.cnpq.br/6419500379189406

Daniel Azevedo Duarte
Universidade Federal de Campina Grande (UFCG)
Campina Grande - PB
https://lattes.cnpq.br/6559312217664849

Tuanny Loriato Demuner
Universidade Federal de Campina Grande (UFCG)
Campina Grande - PB
http://lattes.cnpq.br/3559373514941384

Pedro Arthur Gonçalves de Medeiros Dela Bianca
Universidade Federal de Campina Grande (UFCG)
Campina Grande - PB
http://lattes.cnpq.br/4663693497849002

Alana Emile Pinto Carvalho
Universidade Federal de Campina Grande (UFCG)
Campina Grande - PB
http://lattes.cnpq.br/1465566234998075

Helano Maciel Brilhante
Universidade Federal de Campina Grande (UFCG)
Campina Grande - PB
https://lattes.cnpq.br/1721140081828698

Lucas Queiroga Melo
Universidade Federal de Campina Grande (UFCG)
Campina Grande - PB
http://lattes.cnpq.br/9104678186617428

Alisson Bandeira de Aragão
Universidade Federal de Campina Grande (UFCG)
Campina Grande - PB
http://lattes.cnpq.br/7907306471391023

Abstract: GOAL: To observe the epidemiological profile of patients diagnosed with COVID-19 at Hospital Pedro I, a reference for treatment in Campina Grande-PB. **METHODS:** A total of 133 medical records of patients over 18 years of age, of both sexes, diagnosed with COVID-19 between 2020 and 2021 were analyzed, through a draw of 15 boxes of medical records. The data was tabulated and analyzed through the Unit's Statistical Analysis Laboratory of Statistics at UFCG (LANEST), through the Microsoft Excel 365 2021 and "R" computing environments. **RESULTS:** The sample consisted of 72 (54.1%) women and 61 (45.9%) men. The largest proportion of patients (65.41%) were in the age group over 60 years old. The length of stay. The average was approximately 10 days and the median were 7 days. Regarding the outcome, Death was associated with the IOT procedure in 90.20% of cases, with allocation to the Red Wing in 81.40% of cases and with Obesity in 51 70% of cases, using the chi-square test. When the relative risk and odds ratio were calculated, the IOT procedure, allocation to the Red Wing, length of stay above 7 days and the presence of Systemic Arterial Hypertension (SAH). **CONCLUSION:** The epidemiological profile was represented by the female sex and the age between 60 and 89 years. There was an association between Death with Systemic Arterial Hypertension, but the association with Obesity or Diabetes mellitus was not confirmed, which contradicts what is mentioned in the literature. Factors associated with death, such as the IOT procedure, allocation to the Red Wing and length of stay above 7 days, may be associated as a consequence of the worsening of the disease and not the other way around.

Keywords: Coronavirus; Epidemiological Profile

INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is an acute respiratory infection caused by the new coronavirus or SARS-CoV-2. Potentially serious and highly transmissible, it has been the cause of a major global crisis whose devastating effects have fueled debate, research and reflection. It is important to know that, among the coronaviruses already identified, SARS-CoV-2 is the seventh to cause disease in humans (WANG et al., 2020), and the third to cause an epidemic.

Since its emergence at the end of December 2019, COVID-19 has been responsible for major challenges to Health Systems around the world, becoming a Public Health Emergency of International Importance (ESPII). To date, more than 140 million cases have been confirmed, and cumulative deaths exceed 3 million (WHO, 2021).

In the world, there are now more than 162.2 million cases and the number of deaths exceeds the 3.3 million mark (The New York Times, 2021). The devastating effects of the SARS-CoV-2 pandemic also resulted in more than 15.5 million cases in Brazil with an incidence of 7,417/100,000, totaling the number of deaths at almost 435 thousand to date.

In the Northeast, despite being the region with the lowest incidence when compared to other locations in the country, the numbers are also worrying: more than 3.6 million confirmed cases and around 90 thousand deaths.

Finally, the state of Paraíba has recorded approximately 310 thousand cases and more than 7 thousand deaths due to the new coronavirus to date (BRASIL, 2021)

This pandemic scenario mobilized researchers around the world to develop vaccines against SARS-CoV-2 infection. In Brazil, vaccination began in January 2021, with the country reaching a record number of deaths in one day, in April 2021 (BRASIL, 2021). As vaccination progresses, a change in the epidemiological profile of the affected population is expected. As of June 10, 2021, around 11.1% of the Brazilian population has been completely vaccinated, a large proportion of them elderly and people with comorbidities (BRASIL, 2021).

Data from the China Center for Disease Control and Prevention (CCDC) shows that more than 80% of cases are mild, and that risk groups involve people with comorbidities and the elderly. However, as vaccination progresses, this profile may undergo changes, emphasizing the importance of studying it, so that the best prevention and treatment alternatives can be found.

According to the Brazilian Ministry of Health, the first death from COVID 19 occurred in São Paulo, on March 17, 20 days after the first confirmed case (Ministry of Health, 2020). From then on, the pandemic evolved and there was the first wave, whose peak occurred on July 29, 2020, with a total of 1590 deaths in 24 hours (BRASIL, 2020). After this, there was the second wave, with a peak of 2286 deaths in 24 hours (BRASIL, 2020). Furthermore, there is speculation about the beginning of a third wave, due to the emergence of new variants (ADRIANA DE LUCA, May 28, 2021).

As of June 12, 2021, there were 481,146 deaths from COVID 19, 55.95% men and 44.05% women (TRANSPARENCY PORTAL., June 12, 2021). Furthermore, around 80.37% of deaths are related to the age group between 50 and 89 years old (TRANSPARENCY PORTAL., June 12, 2021).

However, among the age group over 80 years old, there has already been a 50% reduction in the number of deaths since the start of vaccination, with at least 13,800 deaths being avoided (CESAR VICTORA, et al., 2021).

Along these lines, a study with the Brazilian

population (Pedro HALLAL, et al., 2020) demonstrated that there are a significant number of cases of COVID-19 in the economically active population aged 15 to 59, while in a study carried out in China (WEI-JIE GUAN, et al., 2020), the average age of the affected population was 47 years old.

Furthermore, there is a discrete prevalence of females in China, around 53% of cases (WEI-JIE GUAN, et al., 2020), while in other places, such as the state of Paraná, Brazil, there is a prevalence of males. (61.1%) (HEALTH SECRETARIAT OF THE STATE OF PARANÁ, 2020).

There are studies that demonstrate a significantly higher prevalence in serological tests in healthcare workers compared to other professions (KASPER IVERSEN et al., 2020). In a study carried out in New York, in 2020, around 50% of patients with COVID had some type of comorbidity (MATTHEW CUMMINGS et al., 2020),

Several studies show that the presence of comorbidities increases the severity of the disease, especially Diabetes mellitus (DM) and Systemic arterial hypertension (SAH), which can triple the chance of hospitalization in patients with COVID-19 (MATTHEW CUMMINGS et al., 2020; BAUD D et al., 2020; KASPER IVERSEN et al., 2020; PALLET SJC et al., 2020; CENTERS OF DISEASE CONTROL(US), 2020).

There are few studies in Paraíba and the Northeast region that focus on the topic addressed in this study, and in Brazil and around the world, due to the recent emergence of the disease, many questions still need to be answered;

Therefore, the importance of studying the epidemiological profile of patients diagnosed with COVID-19 becomes evident, in order to better understand and thus be able to collaborate in combating the pandemic in Brazil.

GOALS

GENERAL GOAL

Observe the epidemiological profile of patients diagnosed with COVID-19 in a reference hospital for the treatment of this disease. in the city of Campina Grande-PB.

SPECIFIC GOALS

- Observe the evolution of patients diagnosed with COVID-19 towards a favorable outcome (hospital discharge) or unfavorable outcome (death);
- Check the main comorbidities related to an unfavorable outcome;
- Check the prevalence of Orotracheal Intubation (OTI) and its association with unfavorable outcomes.

METHODOLOGY

The present study was related to a Double-Blind Clinical Trial called OXYGEN THERAPY AS EARLY TREATMENT IN PATIENTS DIAGNOSED WITH COVID 19: A CLINICAL TRIAL. It turns out that, despite being carefully prepared, the Clinical Trial was submitted for analysis by the Research Ethics Committee of the Hospital Universitário Alcides Carneiro (CEP-HUAC), but the time taken to carry out this analysis was so long, around 6 months, that made the project unfeasible.

Therefore, there was no alternative but to modify the initial project of this study, without compromising its importance and feasibility.

This is a pilot study, which will support a larger sample later.

SAMPLING

133 medical records from Hospital Pedro I, located in the city of Campina Grande, were analyzed, chosen through a simple draw, as follows: the medical records were stored in

boxes, which were organized by month. This way, 15 boxes were drawn that fell within the 2020-2021 period.

VARIABLES

Dependent: COVID-19 diagnosis

Independent: sex, age, presence of comorbidities, type of comorbidity, length of stay, OTI, favorable outcome (hospital discharge) or unfavorable outcome (death).

THE INCLUSION FACTORS WERE

Patients of both sexes, over 18 years of age, whose medical records were legible and contained most of the variables mentioned above.

The exclusion factors were: those who did not fit the inclusion factors.

STATISTICAL ANALYSIS

The data were tabulated and analyzed through the Statistical Analysis Laboratory of the UFCG-LANEST Statistics Unit), by Prof. Dr. João Batista de Carvalho and the Statistics course student Fábio Silva Bastos, both belonging to the UFCG Academic Statistics Unit (UAEST/UFCG). The Microsoft Excel 365 2021 computing environment was used to fill in the data tables, with statistical analysis carried out using the "R" computing environment (Available for download at www.r-project.org).

RESULTS AND DISCUSSION

The selected patient sample consisted of 61 (45.9%) men and 72 (54.1%) women.

In Table 1, the absolute frequencies and percentages of patients by age groups are presented. It was observed that the largest proportion of patients (65.41%) were concentrated in the age group over 60 years old. It was also found that, of these patients, the majority were between 70 and 79 years old, with 21.80% of observations. Furthermore, there are participants whose ages ranged from 60 to 69 years old, with 21.05% of the observations. Finally, the third class with the highest concentration of observations was that of individuals aged between 80 and 89 years old, with 18.80%.

Age (years)	Number of patients	%	% Accumulated
20 to 29	6	4,51	4,51
30 to 39	6	4,51	9,02
40 to 49	20	15,04	24,06
50 to 59	14	10,53	34,59
60 to 69	28	21,05	55,64
70 to 79	29	21,80	77,44
80 to 89	25	18,80	96,24
90 to 99	5	3,76	100,00
Total	133	100,00	-

Table 1: Number and percentage of patients by age groups.

Source: survey data

Furthermore, there was a mean and median age of 64.1 years and 66.0 years, respectively, indicating that the majority of patients admitted to the hospital were elderly. The standard deviation presented a value of approximately 17.6 years and, analyzing the coefficient of variation (CV), a measure of dispersion used to estimate the precision of data around the average, being represented by the quotient between the standard deviation and the average, in relative terms, presented a value corresponding to 27.5%, which, according to Amaral et al., (1997), can be considered as a moderate value in terms of age variability (Table 2).

Statistics	Age	Length of stay
Minimum	23,0	0,0
Maximum	97,0	53,0
Median	66,0	7,0
Average	64,1	10,4
Standard deviation	17,6	9,4
CV	27,5%	90,4%

Table 2: Descriptive statistics on the ages and length of stay (in days) of patients

Source: survey data

The table 2 shows the descriptive statistics of the length of stay, in days, of the individuals participating in the research, where the average was approximately 10 days, indicating that the period of hospitalization was relatively short. The median was 7 days, suggesting that 50% of participants stayed for a period equal to or less than this value. The standard deviation, in turn, presented a value of approximately 9 days with a coefficient of variation of 90.4%, demonstrating relatively large variability in length of stay around the average of 10 days.

Factor	Category	Outcome		Death (%)
		Discharge	Death	
Gender	F	46	26	36,1
	M	38	23	37,7
Age (years)	Up to 65	46	19	29,2
	Over 65	38	30	44,1
H.A.S.	No	37	10	21,3
	Yes	47	39	45,3
Diabetes	No	59	29	33,0
	Yes	25	20	44,4
Obesity	No	70	34	32,7
	Yes	14	15	51,7
Sector	Green/Yellow	73	1	1,4
	Red	11	48	81,4
Procedure	Nenhum	79	3	3,7
	IOT	5	46	90,2
Time (days)	Até 7	54	18	25,0
	Acima de 7	30	31	50,8

Table 3: Number of patients discharged and dying by variable categories

Source: survey data

The table 3 presents the relationship between clinical factors and the outcome of individuals participating in the research, where it can be seen that the highest percentage is related to the IOT procedure performed on individuals admitted to the aforementioned hospital, where approximately 90.20% were to death, therefore there are the individuals who were allocated to the red ward, with 81.40% of deaths and finally, among the factors that stand out most, are the individuals who were obese, with 51.70% of deaths.

The table 4, in turn, first presents the result of the chi-square statistical test of independence, which checks whether there is a statistically significant association between the variables addressed. It can be seen that, at a 5% level of significance, there is a significant association between the outcome of death and the factors HAS, Ward, Procedure and time, that is, the majority of individuals who died had some type of pathology of a cardiac nature, were allocated to the red ward, required auxiliary respiratory intervention or remained hospitalized for more than 7 days.

The test showed that there was no significant association between the outcome of death of individuals and their sex, age and pathologies such as Diabetes and obesity. It is worth noting that p-values close to 10% could indicate a degree of association if the studied sample had more observations.

The aforementioned table also presents the association measures Relative Risk (RR) and Odds Ratio (OR), where the "HAS" factor presented a value of 2.13 for the RR, that is, the risk of death of hypertensive patients is the double that of non-hypertensive patients and the CR, in turn, showed a value of 3.07, therefore, the chance of death for patients with hypertension is triple that of patients without this pathology.

For individuals who were transferred to the red ward, the risk of death was 58.8 times

Factor	x^2	Valor - *p*	RR	ICrr	RC	ICrc
Gender	0,036	0,849	1,04	(0,67;1,63)	1,07	(0,53;2,17)
Age (years)	3,165	0,075	1,51	(0,95;2,40)	1,91	(0,93;3,92)
H.A.S.	7,568	0,006	2,13	(1,17;3,88)	3,07	(1,36;6,95)
Diabetes	1,689	0,194	1,35	(0,87;2,10)	1,63	(0,78;3,40)
Obesity	0,53	0,060	1,58	(1,01;2,48)	2,21	(0,96;5,09)
Sector	90,3	<0,001	58,82	(8,6;500,0)	318,6	(39;2547)
Procedure	101,197	<0,001	24,39	(8,1;76,9)	242,3	(25;1061)
Time (days)	9,461	0,002	2,03	(1,27;3,26)	3,1	(1,49;6,45)

Table 4: Association between factor and outcome of death from COVID-19

Source: survey data

the risk of those admitted to the green/yellow wards and the chance of death was 318 times that of patients who were allocated to the green/yellow wards.

For the "procedure" factor, patients who received this treatment had a risk of death of 24.39 times the risk of those who did not receive this type of intervention, while the chance of death for these individuals was 242.3 times compared to those who did not. assisted by the aforementioned procedure. Finally, among the factors that presented a significant association with the outcome of death is the "time" of hospitalization of individuals, which presented a value of 2.03 for RR and 3.10 for RC, thus, the risk and chance of death rate for patients who spent more than 7 days in hospital was double and triple that of those who did not stay for more than that period, respectively.

At a 5% significance level, a significant association was found between the outcome of death and the SAH factors, allocation to the Red Wing, IOT Procedure and length of stay. There was no significant association between the outcome of death of individuals and their sex, age and pathologies such as Diabetes and obesity. However, some p values, especially those related to obesity, were very close to the significance limit, which suggests that a larger sample could find a significant association. Therefore, a larger study is needed to draw more precise conclusions.

CONCLUSION

The epidemiological profile was represented by females and ages between 60 and 89 years. There was an association between the worst outcome (death) and the comorbidity Systemic Arterial Hypertension, but the association with the comorbidities Obesity or Diabetes mellitus was not confirmed, which is in line with what is reported in the literature. Factors associated with death, such as the IOT procedure, allocation to the Red Wing and length of stay above 7 days, may be associated as a consequence of the worsening of the disease and not the other way around.

REFERENCES

Adriana De Luca. **Especialistas preveem que terceira onda da Covid-19 pode atingir Brasil em junho** CNN. 28 mai 2021. Disponível em: <https://www.cnnbrasil.com.br/saude/2021/05/28/terceira-onda-da-covid-19-pode-chegar-ao-brasil-em-junho. Acesso em 12 de Junho de 2021.

Alagoas é o primeiro Estado do Brasil a concluir vacinação de grupos prioritários contra a Covid-19. CONASS (Conselho Nacional de Secretarias de Saúde) 20 mai 2021. Disponível em: < https://www.conass.org.br/alagoas-e-o-primeiro-estado-do-brasil-a-concluir-vacinacao-de-grupos-prioritarios-contra-a-covid-19/>. Acesso em 12 de Junho de 2021.

Baqui P, Bica I, Marra V, Ercole A, van der Schaar M. **Ethnic and regional variations in hospital mortality from COVID-19 in Brazil: a cross-sectional observational study.** Londres: Lancet Glob Heal; 2020. 0(0). Disponível em: https://doi:10.1016/S2214-109X(20)30285-0

BRASIL, Ministério da saúde. **Doença pulmonar obstrutiva crônica**. Portaria SAS/MS no 609, de 06 de junho de 2013, retificada em 14 de junho de 2013. Disponível em: http://portalarquivos2.saude.gov.br/images/pdf/2014/abril/02/pcdt-doenca-pulmonar-obscronica-livro-2013.pdf.

Brasil. Ministério da Saúde. 2020. **Situação epidemiológica da COVID-19 [Internet].** 2020 [acessado em 2 mar. 2021]. Disponível em: https://portalarquivos.saude.gov.br/images/pdf/2020/April/12/2020-04-11-BE9-Boletim-do-COE.pdf. Acesso em 12 de Junho de 2021.

BRASIL. Ministério da Saúde. **Coronavírus Brasil: painel coronavírus. Painel coronavírus. 2021.** Disponível em: https://covid.saude.gov.br. Acesso em: 24 abr. 2021.

Brasil. **Painel COVID-19 no Brasil. [internet].**2020 [acessado em 2 mar. 2021]. Disponível em: https://susanalitico.saude.gov.br/extensions/covid-19_html/covid-19_html.html. Acesso em 12 de Junho de 2021.

Ceará tem queda de 46% na taxa de internação de idosos após vacinação contra a Covid-19, diz Sesa. Diário do Nordeste (Fortaleza, CE). 11 mar 2021. Disponível em: <https://diariodonordeste.verdesmares.com.br/metro/ceara-tem-queda-de-46-na-taxa-de-internacao-de-idosos-apos-vacinacao-contra-a-covid-19-diz-sesa-1.3058867>. Acesso em 12 de Junho de 2021.

Centers for Disease Control (US). **COVID-19 Associated Hospitalization Related to Underlying Medical Conditions [Internet]**. [local desconhecido: Centers for Disease Control and Prevention; 2020. [citado em 2020 Out 05]. Disponível em: https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-underlying-medical-

Cesar Victora, Marcia C Castro , Susie Gurzenda , Aluisio JD Barros. **Estimating the early impact of immunization against COVID19 on deaths among elderly people in Brazil: analyses of secondary data on vaccine coverage and mortality**. Medrxiv. 2021. doi: https://doi.org/10.1101/2021.04.27.21256187conditions.html.

Cummings MJ, Baldwin MR, Abrams D, Jacobson SD, Meyer BJ, Balough EM, et al. **Epidemiology, clinical course, and outcomes of critically ill adults with COVID-19 in New York City: a prospective cohort study**. medRxiv; 2020. Disponível em: https://doi:10.1101/2020.04.15.20067157.

Cummings MJ, Baldwin MR, Abrams D, Jacobson SD, Meyer BJ, Balough EM, et al. **Epidemiology, clinical course, and outcomes of critically ill adults with COVID-19 in New York City: a prospective cohort study**. medRxiv; 2020. Disponível em: https://doi:10.1101/2020.04.15.20067157.

Guan W, Ni Z, Hu Y, Liang W, Ou C, He J, et al. **Clinical characteristics of coronavirus disease 2019 in China**. N Engl J Med; 2020. 382(18):1708-1720. Disponível em: https://doi:10.1056/NEJMoa2002032.

Hallal PC, Hartwig FP, Horta BL, Silveira MF, Struchiner CJ, Vidaletti LP, et al**. SARS-CoV-2 antibody prevalence in Brazil: results from two successive nationwide erological household surveys [Internet]**. Londres: Lancet Glob Heal; 2020. 0(0):1-9. Disponível em: https://doi:10.1016/S2214-109X(20)30387-9

Harch PG. **Hyperbaric oxygen treatment of novel coronavirus (COVID-19) respiratory failure.** Med Gas Res. 2020;10(2):61-62. doi:10.4103/2045-9912.282177

Iversen K, Bundgaard H, Hasselbalch RB, Kristensen JH, Nielsen PB, Pries-Heje M, et al. **Risk of COVID-19 in health-care workers in Denmark: an observational cohort study.** Lancet Infect Dis.; 2020. 0(0). Disponível em: https://doi:10.1016/S1473-3099(20)30589-2.

Lai CKC, Lam W. **Laboratory testing for the diagnosis of COVID-19.** Biochem Biophys Res Commun. 2021 Jan 29;538:226-230. doi: 10.1016/j.bbrc.2020.10.069. Epub 2020 Oct 28. PMID: 33139015; PMCID: PMC7598306.

Nóbrega F. **Casos de Covid-19 em idosos com 85 anos e mais em Pernambuco caem 25% após início da vacinação. Folha de Pernambuco (Recife, PE). 5 mar 2021.** Disponível em: < https://www.folhape.com.br/noticias/casos-de-covid-19-em-idosos-com-85-anos-e-mais-em-pernambuco-caem/175123/>. Acesso em 12 de Junho de 2021.

Pallett SJC, Rayment M, Patel A, Fitzgerald-Smith SAM, Denny SJ, Charani E, et al. **Point-of-care serological assays for delayed SARS-CoV-2 case identification among health-care workers in the UK: a prospective multicentre cohort study.** Lancet Respir Med.; 2020. 2600(20):1-10. Disponível em: https://doi:10.1016/S2213-2600(20)30315-5.

Reis V. **Após vacinação, mortes de idosos entre 85 e 89 anos por Covid-19 caem 51% na cidade de SP em fevereiro e atingem menor nº desde outubro. G1 Globo (São Paulo). 17 mar 2021.** Disponível em: < https://g1.globo.com/sp/sao-paulo/noticia/2021/03/17/apos-vacinacao-mortes-de-idosos-entre-85-e-89-anos-por-covid-19-caem-51percent-na-cidade-de-sp-em-fevereiro-e-atingem-menor-no-desde-outubro.ghtml>. Acesso em 12 de Junho de 2021.

Secretaria de Saúde do Estado do Paraná (**BR Informe epidemiológico Coronavírus (COVID-19)** [Internet]. Curitiba: SESA; 2020. [citado em 2020 Out 5]. Disponível em: https://www.saude.pr.gov.br/sites/default/arquivos_restritos/files/documento/2020-09/informe_epidemiologico_28_09_2020_.pdf.

Secretarias Estaduais de Saúde. Brasil, 2021. **Painel Coronavírus**. Disponível em: https://covid.saude.gov.br/. Acesso em: 16 maio 2021.

Taleghani N, Taghipour F. **Diagnosis of COVID-19 for controlling the pandemic: A review of the state-of-the-art.** Biosens Bioelectron. 2021 Feb 15;174:112830. doi: 10.1016/j.bios.2020.112830. Epub 2020 Nov 27. PMID: 33339696; PMCID: PMC7694563.

The New York Times. Coronavirus World Map: **Tracking the Global Outbreak.** Disponível em: https://www.nytimes.com/interactive/2020/world/coronavirus-maps.html. Acesso em: 16 maio 2021.

Wang, Lisheng et al. "**Review of the 2019 novel coronavirus (SARS-CoV-2) based on current evidence.**" International journal of antimicrobial agents vol. 55,6 (2020): 105948. doi:10.1016/j.ijantimicag.2020.105948

WORLD HEALTH ORGANIZATION. **COVID-19 Clinical management: living guidance.** 2021. Disponível em: https://www.who.int/publications/i/item/WHO-2019-nCoV-clinical-2021-1. Acesso em: 25 abr. 2021.

WORLD HEALTH ORGANIZATION. COVID-19 **Weekly Epidemiological Update.** Genebra, 2021. Disponível em: https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19---20-april-2021. Acesso em: 24 abr 2021.