

## ANALYSIS OF THE HOSPITALIZATION PROFILE FOR COVID-19 IN THE CITY OF RIO DE JANEIRO

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### Introduction

On December 31<sup>st</sup>, 2019, the World Health Organization (WHO) was informed about a pneumonia outbreak in Wuhan city, at Hubei province (China). But only on January 30<sup>th</sup>, 2020, the WHO declared the novel coronavirus disease (COVID-19) a Public Health Emergency of International Concern (PHEIC) (1,2). On February 9<sup>th</sup>, 2020, the first infection case by the novel coronavirus responsible for the Severe Acute Respiratory Syndrome (SARS-CoV-2) occurred in Brazil (3). By August 24<sup>th</sup>, 2020, the lethality rate, which varies according to the place, was 3.2% in Brazil (114,744 deaths), 7.3% (15,292 deaths) in state of Rio de Janeiro (RJ), and 10.6% (9,231 deaths) in the city of Rio de Janeiro (4). Unfortunately, there are no vaccines or medicines approved for the novel coronavirus infection, but several clinical trials were launched to test coronavirus treatment (3,5). So, on March 17<sup>th</sup>, 2020, the governor of RJ determined measures to prevent people from the contamination by SARS-CoV-2, including the closure of shopping centers, tourist attractions, schools, gyms, and many other commercial activities. All these measures also aimed to enhance the State's Health System capability to properly hospitalize patients (6). By June 1<sup>st</sup>, 2020, those measures were gradually revoked in the State and the City of Rio de Janeiro (7). So far, the present work aims to analyze the impact of this commercial opening in the percentage of hospitalization, infection, and death rates in the municipal and in the integrated health system (SUS – Sistema Único de Saúde) in the city of Rio de Janeiro.

### Method

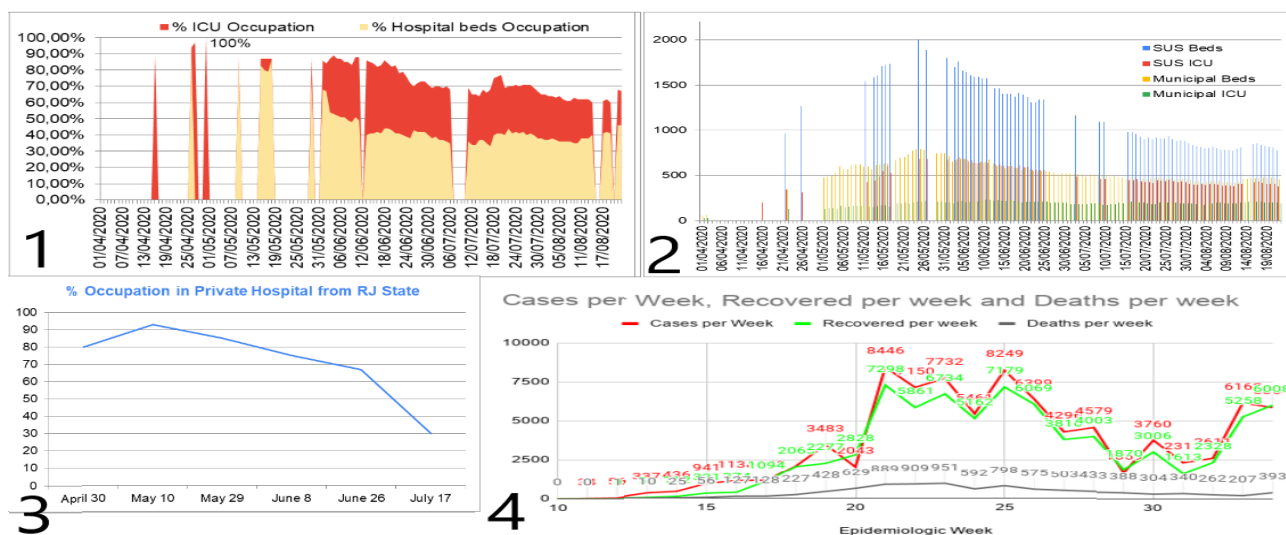
We searched the website <https://riocontraocorona.rio/> (7), the “*Painel Rio COVID-19*” virtual platform (8), and used the GOOGLE SEARCH® engine since June 1<sup>st</sup>, 2020, to retrieve information on the number of specific COVID-19 Hospital Beds and Intense Care Units (ICU) occupied, the percentage of specific COVID-19 Beds/ICU occupied in total in the municipal, state, and federal hospitals of Rio de Janeiro city. Also, we counted the of SARS-CoV-2 number of cases, recoveries, and deaths on the “*Painel Rio COVID-19*” platform.

### Results / Discussion

All the data retrieved were analyzed and used to prepare four graphics. **Graphic 1** brings the percentage of occupation of SARS-CoV-2 beds/ICU and **Graphic 2** represents the number of SARS-CoV-2 beds/ICU occupied. This information was taken from the website <https://riocontraocorona.rio/> (7) and from the “*Painel Rio COVID-19*” platform (8). **Graphic 3** is the occupation rate for the private hospitals from Rio de Janeiro city, retrieved by the GOOGLE SEARCH engine at the Association of Hospitals in the State of Rio de Janeiro (AHERJ). **Graphic 4** is the SARS-CoV-2 total cases, recoveries, and deaths per epidemiological week retrieved from “*Painel Rio COVID-19*”. As can be seen in Graphics 1 and 2, the peak of occupation in the whole public health (SUS) system in the city of Rio de Janeiro was on April 30<sup>th</sup>, 2020, with 100% of the ICUs occupied, almost 2000 of the total hospital beds occupied. It can also be seen that there is some lack of information on these two websites (7,8) concerning these data, especially in April and May of 2020. Graphic 3 shows that the private hospitals from the state of RJ had a

maximum rate of 93% occupation in May of 2020. Also, the maximum number of cases and deaths occurred during the epidemiological weeks 21 – 25 (May 17<sup>th</sup> – June 20<sup>th</sup>, 2020), with approximately 8000 cases per week and 900 deaths per week diagnosed in the same period. The epidemiological weeks with more recoveries than cases were weeks 20 (May 10<sup>th</sup>-16<sup>th</sup>), 29 (July 12<sup>th</sup>-18<sup>th</sup>), and 34 (August 16<sup>th</sup>-22<sup>nd</sup>), showing that an epidemic state remains in the city.

The reopening of businesses in the city of Rio de Janeiro started on June 1<sup>st</sup> with the bars (7), some commercial centers, bank agencies, restaurants, tourism, sports events, all with restrictions (Phase 1). Fifteen days later, the opening of shopping and aesthetic centers started (2<sup>o</sup> phase). In Phases 3A and 3B, gym centers opened and the time of the opening of authorized sectors was increased. Phase 4 was programmed to be the opening of educational centers, but it was suspended due to judicial processes, until today (7). Phase 5 (August) was the opening of sauna centers, and a major opening period authorized sector. In phase 5 (weeks 33 and 34), the number of cases jumped 3 times and the number of deaths almost doubled, but the death rate of these 2 weeks was lower than the previous ones, and this must be due to improved diagnostic tests done in the whole country (9), including previous samples collected but not yet analyzed. In phase 5, the ratio of occupation of ICU raised to 70% units and 45% for regular beds.



## Conclusion

The present work concluded that hospital regular beds from the city of Rio de Janeiro health system reached 100% at the end of April 2020 but no more saturation of these ICUs or regular beds occurred during the whole reopening until now. In phase 5 of the reopening, the number of cases almost tripled and the number of deaths almost doubled, but an enhancement of diagnosing capability also must have occurred in the city. The private health system never reached its maximum capacity.

## Acknowledgments

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## Bibliographic References

- 1 - <https://www.who.int/news-room/detail/27-04-2020-who-timeline---covid-19>. Accessed on 23 August 2020.
- 2- Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. N Engl J Med. 2020;1-7. DOI: 10.1056/NEJMoa2001017
- 3 - <https://agenciabrasil.ebc.com.br/en/saude/noticia/2020-02/brazil-confirms-first-case-coronavirus>. Accessed on 23 August 2020.
- 4 - [https://susanalitico.saude.gov.br/extensions/covid-19\\_html/covid-19\\_html.html](https://susanalitico.saude.gov.br/extensions/covid-19_html/covid-19_html.html). Accessed on 23 August 2020.
- 5 - Rosa SGVR and Santos WC. Rev Panam Salud Publica. 2020;44:e40. <https://doi.org/10.26633/RPSP.2020.40>
- 6 - . Accessed on 23 August 2020.
- 7 - <https://riocontraocorona.rio/>. Accessed on 23 August 2020.
- 8 - <https://experience.arcgis.com/experience/38efc69787a346959c931568bd9e2cc4>. Accessed on 23 August 2020.
- 9 - <https://covid19br.wcota.me/>. Accessed on 24 August 2020.