Omicron outbreak had lower mortality rates compared to previous strains of COVID-19, finds study

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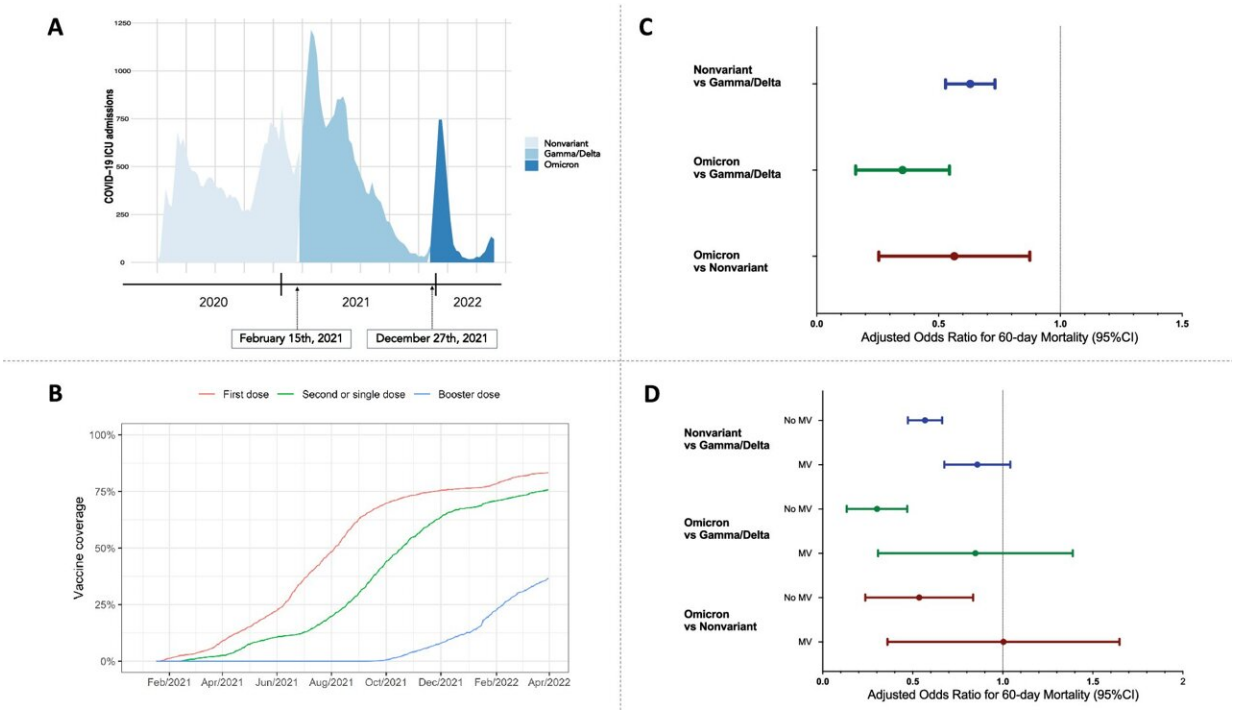

A Density plot of COVID-19 ICU admissions according to period of variant dominance in Brazil in 231 study ICUs. B Vaccination coverage rates for COVID-19 in the Brazilian population (https://coronavirusbra1.github.io/sobre). C, D Multivariable mixed logistic regression model with 60-day in-hospital mortality as the binary outcome variable. Adjusted for age, sex, frailty, performance status, COVID-19 as the primary diagnosis, source of admission to ICU, pandemic period, and clinical profile at admission, including organ dysfunction and support. C Adjusted odds ratios obtained through marginal means in multivariable model with no interaction terms. D Adjusted odds ratios

obtained through marginal means in multivariable model that included the interaction between variants of concern periods (Nonvariant, gamma/delta, and omicron) and the requirement of invasive mechanical ventilation at the first ICU day (Yes/No). Credit: *Intensive Care Medicine* (2023). DOI: 10.1007/s00134-023-07039-2

During the peak of the COVID-19 pandemic, a constant public fear was the rise of a new variant of the disease. Among the SARS-CoV-2 viral mutations, some were alarming, such as omicron, delta, and gamma. The strains with greater virulence and ability to invade the immune system are defined as variants of concern, as they also have the potential to overwhelm the health system, increasing the number of admissions to intensive care units.

A new study led by the D'Or Institute for Research and Education (IDOR) recently published in the journal *Intensive Care Medicine* used big data analysis techniques to compare the profile of patients admitted to Brazilian ICUs during the dominance of different VOCs.

As a research object, the authors evaluated a multicenter cohort of patients with COVID-19 confirmed by RT-PCR diagnosis. These patients were admitted to one of the 231 Brazilian ICUs evaluated in the study, totaling 47,465 admissions between February 27, 2020, and March 29, 2022. The admission data were all provided by Rede D'Or, the largest private hospital network in Latin America.

The scientists divided the information into three time periods: epoch 1 (when there was no dominant VOC; total: 21,996 admissions), epoch 2 (gamma/delta dominance; total: 21,183 admissions), and epoch 3 (omicron dominance; total: 4,286 admissions). After that, they studied the hospital mortality within 60 days after admission, also considering

the need for mechanical ventilation (intubation) in the three periods. These complex calculations were executed by a biostatistics software, which employed mathematical models that considered the multiple variables able to interfere with the patient's chance of mortality, such as age, sex, comorbidities, among others, resulting in what the authors described as the adjusted mortality rate.

The researchers noted that during epoch 3 (omicron dominance), patients were older, averaging 68 years old, whereas this number was 52 years old at epoch 2 and 55 years old at epoch 1. Omicron patients also had a larger number of dysfunctional strokes caused by COVID-19 and required less mechanical ventilation. In the same group, adjusted mortality was lower compared to the previous two epochs. However, for patients who required mechanical ventilation, mortality rates were very similar between all VOCs dominances.

"Patients who need mechanical ventilation at omicron are the most fragile, such as the elderly and immunosuppressed patients, and they are at greater risk of developing severe forms of the disease. One of the things our study reveals is that, for these patients, there is still a need to be cautious about the risk of hospitalization and death. Even in epoch 3, the most recent in the study, when there was already vaccination coverage, [there was no] relevant downturn in mortality rates for patients with COVID-19 who needed mechanical ventilation," says the first author and researcher at IDOR, Dr. Pedro Kurtz.

The researcher says that according to vaccination data for the Brazilian population, by the end of 2021, more than 60% of adults received the first dose of vaccination, 30% a second dose, and more than 90% of those aged over 60 years old had a full vaccination. Vaccination coverage, therefore, must have contributed to the lower mortality observed in the omicron period. However, the authors show that even with complete vaccination, the dissemination of variants with high

infectivity puts vulnerable patients at risk, especially those who are older, with comorbidities, and who may need hospitalization in more severe cases.

More information: Variants of concern and clinical outcomes in critically ill COVID-19 patients, *Intensive Care Medicine* (2023). DOI: 10.1007/s00134-023-07039-2

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