



# Effect of vaccination on COVID-19 hospitalizations and mortality

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COVID-19, caused by SARS-CoV-2, has spread worldwide since December of 2019, causing significant morbidity and mortality. As of July 26, 2023, a total of 768,560,727 cases of COVID-19 had been confirmed worldwide, including 6,952,522 deaths. In Brazil, from January 3, 2020 to July 26, 2023, there were 37,704,598 confirmed COVID-19 cases and 704,488 COVID-19 deaths reported to the WHO.<sup>(1)</sup>

Medical conditions associated with increased COVID-19 severity and, consequently, increased likelihood of COVID-19 hospitalization include diabetes mellitus, obesity, hypertension, and heart failure. Early in the COVID-19 pandemic, it was shown that patients who were hospitalized for the disease and those who died from it were older and had more comorbidities.<sup>(2)</sup> Recent studies, published after the initiation of COVID-19 vaccination, have shown that being male, being over 60 years of age, not having been vaccinated for COVID-19, and having comorbidities are risk factors for complications resulting in hospitalization, including ICU admission.<sup>(3-5)</sup>

Vaccination has proven to be the most effective strategy to control the spread of SARS-CoV-2 infection and reduce the risk of severe COVID-19. Studies have shown that vaccination reduces COVID-19 mortality, COVID-19 severity, and the length of hospital stay.<sup>(4,6,7)</sup> Individuals with complete vaccination schedules had higher survival rates in a retrospective study evaluating 854 patients with COVID-19.<sup>(6)</sup> In addition, full vaccination reduced the need for ICU admission by 49.7% and mortality by 56.5%.<sup>(6)</sup> In a retrospective study evaluating 486 hospitalized COVID-19 patients,<sup>(4)</sup> not having been vaccinated or not having been fully vaccinated were factors associated with increased mortality. In individuals who require hospitalization despite COVID-19 vaccination, the length of hospital stay, the need for ICU admission, and mortality are lower than in unvaccinated individuals.<sup>(7)</sup>

Despite the recognized benefits of vaccination, the efficacy of vaccination in preventing moderate-to-severe COVID-19 decreases over time; this supports the recommendation for additional booster doses.<sup>(1)</sup> However, the role that the number of doses plays in the risk of severe disease and mortality has yet to be fully studied. In the current issue of the JBP, Costa et al.<sup>(8)</sup> report the results

of a retrospective cohort study comparing vaccinated and unvaccinated hospitalized COVID-19 patients in terms of the risk factors for death and disease severity. The study included 1,921 patients, of whom 996 (50.8%) had been vaccinated. The risk of mortality in vaccinated patients was higher in those undergoing invasive mechanical ventilation, those over 80 years of age, and those requiring vasopressors. Symptoms were more common in unvaccinated patients than in vaccinated patients. In addition, in-hospital mortality was higher in unvaccinated patients than in vaccinated patients (60.8% vs. 48.7%). The authors also showed the benefits of multiple doses of vaccine even in hospitalized COVID-19 patients.<sup>(8)</sup> The 28-day survival rate was 38.2% in unvaccinated patients and 62.9% in patients who had received only one dose of vaccine. The 28-day survival rate increased to 74.6% in patients who had received two doses of vaccine and to 91.8% in those who had received three.

In conclusion, vaccination mitigates the severity of COVID-19, and efforts must be made to ensure adequate vaccination coverage and booster doses, especially in at-risk individuals such as the elderly and those with comorbidities. With regard to the Omicron variant, the efficacy of COVID-19 vaccines in preventing SARS-CoV-2 infection is low and short-lived after full primary immunization, although it can be enhanced by booster vaccination. For severe COVID-19, vaccine efficacy has been reported to be high and long-lasting, especially after booster vaccination.<sup>(9)</sup> Vaccine hesitancy deserves special attention from governments. Vaccine acceptance depends on individual sociocultural factors. Complacency, inconvenience in accessing vaccines, and lack of confidence are key reasons underlying vaccine hesitancy.<sup>(10)</sup> Strategies in the fight against COVID-19 include combating vaccine hesitancy by investing in public health campaigns.

## AUTHOR CONTRIBUTIONS

All authors contributed equally to this work.

## CONFLICTS OF INTEREST

None declared.

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