

# Clinical Characteristics and Booster Vaccine Effectiveness of the Omicron Variant

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## Abstract

**Background** Although many people received the COVID-19 vaccine, shortly after the Chinese government announced that the three-year COVID-19 restrictions were being eased, the first large number of Omicron infections appeared in Beijing. In this study, we describe the epidemiological characteristics, clinical severity, and time-to-event distribution of patients infected with SARS-CoV-2 in Beijing Omicron outbreak, comparing those who received the booster vaccine with cases of full/partial vaccines. **Methods** In this epidemiological study, we collected epidemiological, clinical, laboratory, and clinical management data from the hospital information system (HIS) for 1495 cases using standardized forms. We also collected the illness onset time, diagnosis time, hospital admission time, and start and end times of each treatment. In addition, we collected the time of vaccination, inoculation times, and type of COVID-19 vaccination thorough the vaccination system. We described the epidemiological characteristics across vaccine inoculation doses, and estimated the risk of death, mechanical ventilation, and admission to the intensive care unit for patients admitted to hospital. We used the Kaplan–Meier method to estimate the survival rate and plot the survival curve, and the Cox proportional hazards model to assess the effect of covariates on survival time. **Results** Of the 1495 cases, 58.1% were male and 41.9% were female. The median ages in the non-vaccinated and vaccinated groups were 80 and 47 years, respectively. The elderly, people with underlying medical condition, and those with a lower BMI were less willing to be vaccinated (  $p < 0.05$ ). Both the inactivated vaccine and adenovirus vaccine could reduce clinical severity and prolong survival time, and the protective effect of booster vaccination was the best. The clinical severity increased linearly from the booster vaccinated group to the full vaccinated group and non-vaccinated groups, and the death risk of COVID-19 cases without vaccination was the highest. **Conclusion** Booster vaccines of COVID-19 can provide greater protection against severe illness and death, and continuous monitoring and regular assessment are needed to minimize the risk of a recurrence of the pandemic.

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