

Pfizer-BioNTech COVID vaccine remains effective in preventing hospitalizations, find studies

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Adult hospitalizations from omicron-related SARS-CoV-2 (COVID-19) were less severe than delta and the Pfizer-BioNTech vaccine (also known as Comirnaty and BNT162b2) remains effective in preventing not only hospitalization, but severe patient outcomes associated with

COVID-19, two new research studies have found.

The University of Bristol-led research, funded and conducted in collaboration with Pfizer Inc., as part of AvonCAP, is published in *The Lancet Regional Health—Europe*.

AvonCAP records adults who are admitted to Bristol's two hospital Trusts—North Bristol NHS Trust (NBT) and University Hospitals Bristol and Weston NHS Foundation Trust (UHBW) with possible respiratory [infection](#).

In the first paper "Severity of Omicron (B.1.1.529) and Delta (B.1.617.2) SARS-CoV-2 infection among hospitalized adults: a [prospective cohort study](#) in Bristol, United Kingdom," researchers assessed whether delta SARS-CoV-2 infection resulted in worse patient outcomes than omicron SARS-CoV-2 infection in hospitalized patients

The study aimed to provide more detailed data on patient outcomes, such as the need for respiratory support.

The research demonstrated that omicron infection resulted in less serious outcomes than delta in hospitalized patients. Compared to delta, omicron-related SARS-CoV-2 hospitalizations were 58% less likely to need a high level of oxygen support, 67% less likely to need ventilatory support (such as a ventilator) or more critical care, and 16% less likely to have a hospital admission which lasted for more than three days.

Dr. Catherine Hyams, Post-Doctoral Clinical Research Fellow, Principal Investigator for the AvonCAP study and one of the study's lead authors at the University of Bristol, said, "By finding out the reduced requirement of increased oxygen support and total positive pressure support, including non-invasive ventilation, our analysis should contribute to future hospital care and service planning assessments.

"However, the impact of lower severity omicron-related hospitalization must be balanced with increased transmissibility and overall higher numbers of infections with this variant."

The research team suggest there should be ongoing evaluation of the severity of new variants of SARS-CoV-2, along with careful planning of health care resource to avoid health care systems being overwhelmed.

Dr. Leon Danon, Associate Professor in Infectious Disease Modeling and Data Analytics, in the Department of Engineering Mathematics and one of the study's lead authors, added, "These results have been published at a time when China is experiencing a resurgence of COVID-19 and may be useful in helping to understand what is happening there."

The second paper, "Effectiveness of BNT162b2 COVID-19 vaccination in prevention of hospitalizations and [severe disease](#) in adults with SARS-CoV-2 Delta (B.1.617.2) and Omicron (B.1.1.529) variant between June 2021 and July 2022: a prospective test negative case-control study," provides the first estimates of two- or three-dose Pfizer-BioNTech COVID vaccine effectiveness against hospital admission for more than three days and against respiratory difficulty requiring oxygen or ventilatory support.

Many studies have reported the effectiveness of the COVID-19 mRNA vaccines against hospitalization, but few have assessed the effectiveness against clinically relevant measures of COVID-19 severity. Using detailed clinical data from Bristol's two hospital Trusts—North Bristol NHS Trust (NBT) and University Hospitals Bristol and Weston NHS Foundation Trust (UHBW)—researchers estimate the effectiveness of two- or three-doses of the (original/monovalent) Pfizer-BioNTech vaccine against hospitalization for infection with either delta or omicron SARS-CoV-2 variants.

The study showed that receipt of two-doses of Pfizer-BioNTech vaccine may result in an 83% reduction in the rate of hospitalization due to delta SARS-CoV-2 infection, compared to the unvaccinated. Two doses also prevented severe in-hospital outcomes due to delta SARS-CoV-2 infection, reducing the likelihood of a hospital admission lasting more than three days by 63%. The researchers also found that two doses of this vaccine reduced the risk of a patient needing increased oxygen or ventilatory support by 52% and 59%, respectively.

Receipt of three-doses of Pfizer-BioNTech vaccine was also found to be effective in reducing omicron infection severity, compared to the unvaccinated, including in older adults, reducing the risk of hospitalization for more than three days with omicron SARS-CoV-2 by 56%, and decreasing the risk of needing high-level oxygen or ventilatory support by 42% and 59%, respectively. This is additional evidence that Pfizer-BioNTech vaccine is effective in reducing hospital admissions due to delta and omicron SARS-CoV-2 infection.

Dr. Anastasia Chatzilena, Postdoctoral Research Associate in the Department of Engineering Mathematics, and a lead author of the study, said, "Our research has shown the Pfizer-BioNTech vaccine provides effective protection against hospitalization from [delta](#) and omicron infection and has significant benefits in terms of preventing severe disease, including critical care admission and respiratory failure.

"However, the benefit provided by vaccination decreases over time which appears to be more pronounced in [older adults](#), so careful ongoing monitoring of vaccine effectiveness and SARS-CoV-2 disease severity for emerging variants remain important."

This research is part of AvonCAP, an ongoing collaborative surveillance project funded by Pfizer Inc., which records detailed information on every adult patient admitted to Bristol's two large NHS hospital Trusts,

NBT and UHBW, with symptoms, signs and/or X-ray evidence of acute disease in the lungs.

More information: Catherine Hyams et al, Severity of Omicron (B.1.1.529) and Delta (B.1.617.2) SARS-CoV-2 infection among hospitalised adults: A prospective cohort study in Bristol, United Kingdom, *The Lancet Regional Health—Europe* (2022). [DOI: 10.1016/j.lanepe.2022.100556](https://doi.org/10.1016/j.lanepe.2022.100556)

Anastasia Chatzilena et al, Effectiveness of BNT162b2 COVID-19 vaccination in prevention of hospitalisations and severe disease in adults with SARS-CoV-2 Delta (B.1.617.2) and Omicron (B.1.1.529) variant between June 2021 and July 2022: A prospective test negative case–control study, *The Lancet Regional Health—Europe* (2022). [DOI: 10.1016/j.lanepe.2022.100552](https://doi.org/10.1016/j.lanepe.2022.100552)

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