

Fewer breakthrough infections, lower hospitalization risk in Moderna vaccine recipients compared to Pfizer–BioNTech

January 20 2022



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A new study by researchers at the Case Western Reserve University School of Medicine finds those who received the Moderna COVID-19

mRNA vaccine are less likely to experience "breakthrough" COVID-19 cases, compared to recipients of the Pfizer-BioNTech mRNA vaccine.

A vaccine breakthrough infection occurs when a person becomes infected after being fully vaccinated (receiving two doses of the mRNA vaccine), according to the Centers for Disease Control and Prevention.

The research—which also found those who received the Moderna vaccine were less likely to be hospitalized, compared to recipients of the Pfizer-BioNTech vaccine—was published today in the *Journal of the American Medical Association*. The study examines breakthrough SARS-CoV-2 infections, hospitalizations and [death rates](#) when the Delta variant was predominant.

Rong Xu, professor of bioinformatics and director of the Center for AI in Drug Discovery at the Case Western Reserve School of Medicine and study author, said the study analyzed [electronic health records](#) of more than 637,000 fully vaccinated patients from 63 healthcare organizations across the United States, covering diverse geographic, age, races and ethnicities, income levels and insurance groups.

"Breakthrough COVID infections, hospitalization and mortality associated with the Delta variant were compared between recipients of Moderna mRNA vaccine and recipient[s] of Pfizer mRNA vaccine while considering patient characteristics and the varying time since vaccination," Xu said.

Data included COVID-19 [breakthrough infections](#) that occurred between July and November 2021, when Delta accounted for almost all cases. Incidents of breakthrough infections were included if the person had not been previously infected with COVID-19 or had received a booster vaccination. The team considered demographics, social determinants of health, transplants and comorbidities. Hospitalization rates of patients

within 60 days after COVID-19 infection were also compared.

The findings show that the monthly incidence rate of breakthrough cases was higher in those who received the Pfizer–BioNTech vaccine, compared to the Moderna vaccine. For example, the data showed 2.8 breakthrough cases in those vaccinated with Pfizer–BioNTech, compared to 1.6 cases per 1,000 people in November 2021. The 60-day hospitalization rate was 12.7% for Moderna recipients and 13.3% for Pfizer–BioNTech recipients.

No significant difference was observed in mortality rates between those who received the Moderna vaccine and Pfizer- BioNTech [vaccine](#).

"Although there is a difference in breakthrough infections, both vaccines are highly protective against SARS-COV2 infection and especially against the most severe consequences of [infection](#)," said Pamela B. Davis, the Arline and Curtis Garvin Research Professor in the Center for Community Health Integration and a coauthor of the study. "Further studies are required to assess the results of booster doses and also the protection afforded especially vulnerable populations by vaccines."

More information: Lindsey Wang et al, Comparison of mRNA-1273 and BNT162b2 Vaccines on Breakthrough SARS-CoV-2 Infections, Hospitalizations, and Death During the Delta-Predominant Period, *JAMA* (2022). [DOI: 10.1001/jama.2022.0210](https://doi.org/10.1001/jama.2022.0210)

Provided by Case Western Reserve University

Citation: Fewer breakthrough infections, lower hospitalization risk in Moderna vaccine recipients compared to Pfizer–BioNTech (2022, January 20) retrieved 15 January 2023 from <https://medicalxpress.com/news/2022-01-breakthrough-infections-hospitalization-moderna->

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