Vaccine protects most cancer patients from COVID, but risk remains higher for patients with blood cancers

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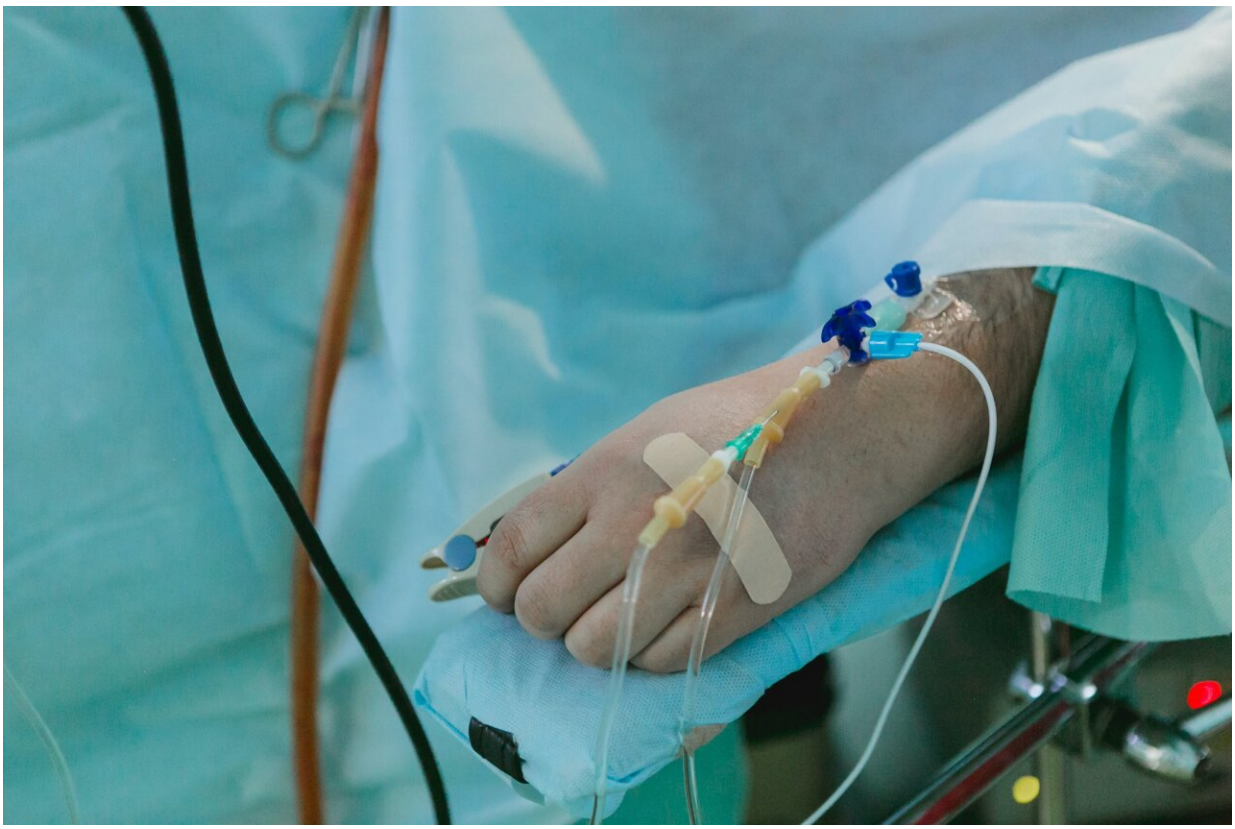

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Using the nation's largest COVID-19 data resource, a researcher at the Indiana University Melvin and Bren Simon Comprehensive Cancer

Center found the COVID-19 vaccine protected most cancer patients from getting COVID. However, patients with certain types of cancer have a higher and widely varied risk of breakthrough COVID infections after receiving the COVID vaccine.

Jing Su, Ph.D., assistant professor in the Indiana University School of Medicine Department of Biostatistics, was the lead investigator for the study published in the *Journal of Clinical Oncology*. He is also the core associate director of real-world data for the cancer center's Biostatistics and Data Management Core.

Su led a team of 13 investigators from 10 research institutes across the country to analyze data from the National COVID Cohort Collaborative (N3C) at the National Institutes of Health. The team included another researcher at IU School of Medicine, Xiaochun Li, Ph.D., a professor of biostatistics and health data sciences.

"This is one of the largest COVID real-world data resources in the world and the largest in the United States," Su said. It includes more than 12.5 million patients and 4.5 million COVID patients. Researchers examined more than 64,000 cancer patients who were vaccinated against COVID-19.

"We systematically screened major cancer types and major treatment types, as well as other risk factors such as age, comorbidities, sex, race, geographic locations and others to qualitatively know the contribution of each risk factor and the specific rates of each cancer subgroup as well as the contribution of treatment categories for cancer patients," Su said. "This type of analysis is only possible because we have a huge COVID cohort and control cohort."

Among key findings were:

- The risk of breakthrough infection was reduced after the second vaccine dose for all cancers.
- Patients with hematologic cancers, or blood cancers, including leukemia, multiple myeloma and lymphoma, were at a higher risk of breakthrough COVID; those with blood cancers had a greater risk than solid cancers.
- The Moderna vaccine was more effective than the Pfizer vaccine for protecting patients with hematologic cancers, especially patients with multiple myeloma.

These findings could help guide clinical care and treatment for cancer patients with COVID, Su said. Beyond the pandemic, this research could also help when developing immune-based cancer treatments. Some immunotherapies rely on a patient's immune capacities, and these findings could help researchers predict which patient populations may respond best to specific treatments.

"In fact, the COVID pandemic provides a unique opportunity for us to screen the immune competence among all cancer patients at a national level," Su said. "We could use this to imitate the differential immune capacities among cancer patients. This could guide us to better understand whether cancer patients will have good responses to cancer vaccines and if they are at a higher risk of infection of other viruses, such as the flu."

"Risk and Outcome of Breakthrough COVID-19 Infections in Vaccinated Patients With Cancer: Real-World Evidence From the National COVID Cohort Collaborative" is the second *Journal of Clinical Oncology* paper published by Su and colleagues using the N3C data. The group is now working to answer additional questions about waning immunity and the effectiveness of booster shots.

"With the surging of new variants, especially the BA.2, we don't know

whether there will be another wave down the road," Su said. "We are monitoring the situation to see what new variants will mean for cancer patients and how to best protect them through vaccination."

More information: Qianqian Song et al, Risk and Outcome of Breakthrough COVID-19 Infections in Vaccinated Patients With Cancer: Real-World Evidence From the National COVID Cohort Collaborative, *Journal of Clinical Oncology* (2022). DOI: 10.1200/JCO.21.02419

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