

# Though risk is minuscule, infection after COVID-19 vaccination is possible

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In a letter to *The New England Journal of Medicine*, published online March 23, 2021, a group of investigators from University of California San Diego School of Medicine and the David Geffen School of

Medicine at UCLA report COVID-19 infection rates for a cohort of health care workers previously vaccinated for the novel coronavirus.

"Because of the compulsory daily symptom screening of health care personnel, patients, and visitors, and the high testing capacity at both UC San Diego Health and UCLA Health, we were able to identify symptomatic and asymptomatic infections among [health care workers](#) at our institutions," said co-author Jocelyn Keehner MD, an infectious disease fellow at UC San Diego School of Medicine.

"Moreover, we were able to describe the infection rates in a real-world scenario, where vaccine roll-out coincided with a surge of infections. We observed a low overall positivity rate among fully immunized health care workers, supporting the high protection rates of these vaccines."

The authors looked at pooled data from UC San Diego and UCLA health care workers who received either the Pfizer or Moderna vaccines between December 16, 2020 and February 9, 2021 (36,659 first doses, 28,184 second doses), a time period that coincided with a significant surge in COVID-19 infections in the region.

Within this group, 379 individuals tested positive for SARS-CoV-2 at least one day following vaccination, with the majority (71 percent) testing positive within the first two weeks after the first dose. Thirty-seven health care workers tested positive after receiving two doses, which is when maximum immune protection is expected to be achieved with both vaccines.

The authors estimated that absolute risk of testing positive for SARS-CoV-2 following vaccination was 1.19 percent for health care workers at UC San Diego Health and 0.97 percent at UCLA Health, both higher than the risk identified in the Moderna and Pfizer clinical trials, which were not limited to health care workers.

"There are several possible explanations for this elevated risk," said co-author Lucy E. Horton, MD, MPH, associate professor in the Division of Infectious Diseases and Global Public Health at UC San Diego School of Medicine and medical director of the UC San Diego Health Contact Tracing Unit.

"First, the health care workers surveyed have access to regular asymptomatic and symptomatic testing. Second, there was a regional surge in infections overlapping with vaccination campaigns during this time period. And third, there are differences in the demographics of health care workers compared to participants in the vaccine clinical trials. Health care workers tend to be younger and have a greater overall risk of exposure to SARS-CoV-2 in the community."

Increased rates of infection have been strongly linked to behaviors that heighten risk of exposure, such as attending social gatherings in restaurants and bars without adequate masking and physical distancing. This connection is more strongly associated with younger age demographics.

Additionally, noted co-author Michael A. Pfeffer, MD, assistant vice chancellor and [chief information officer](#) at UCLA Health, the Moderna and Pfizer [clinical trials](#) stopped collecting data before the December-February surge and there was little to no asymptomatic testing conducted.

The authors found that risk of [infection](#) 14 days after second dose, when maximum immunity is expected to be reached, was rare. "It suggests the efficacy of these vaccines is maintained outside of the trial setting," they wrote.

Nonetheless, they also noted that risk is not zero. While both Pfizer and Moderna report efficacy levels in the mid-90s, neither is 100 percent.

"It underscores the critical importance of continued public [health](#) mitigation measures (masking, physical distancing, daily symptom screening and regular testing), even in highly vaccinated environments, until herd immunity is reached at large," said corresponding author Francesca Torriani, MD, professor of clinical medicine in the Division of Infectious Diseases and Global Public Health in the UC San Diego School of Medicine and program director of Infection Prevention and Clinical Epidemiology at UC San Diego Health.

**More information:** Jocelyn Keehner et al, SARS-CoV-2 Infection after Vaccination in Health Care Workers in California, *New England Journal of Medicine* (2021). [DOI: 10.1056/NEJMc2101927](https://doi.org/10.1056/NEJMc2101927)

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