Milder COVID cases, lower viral loads in vaccinated frontline workers, study finds

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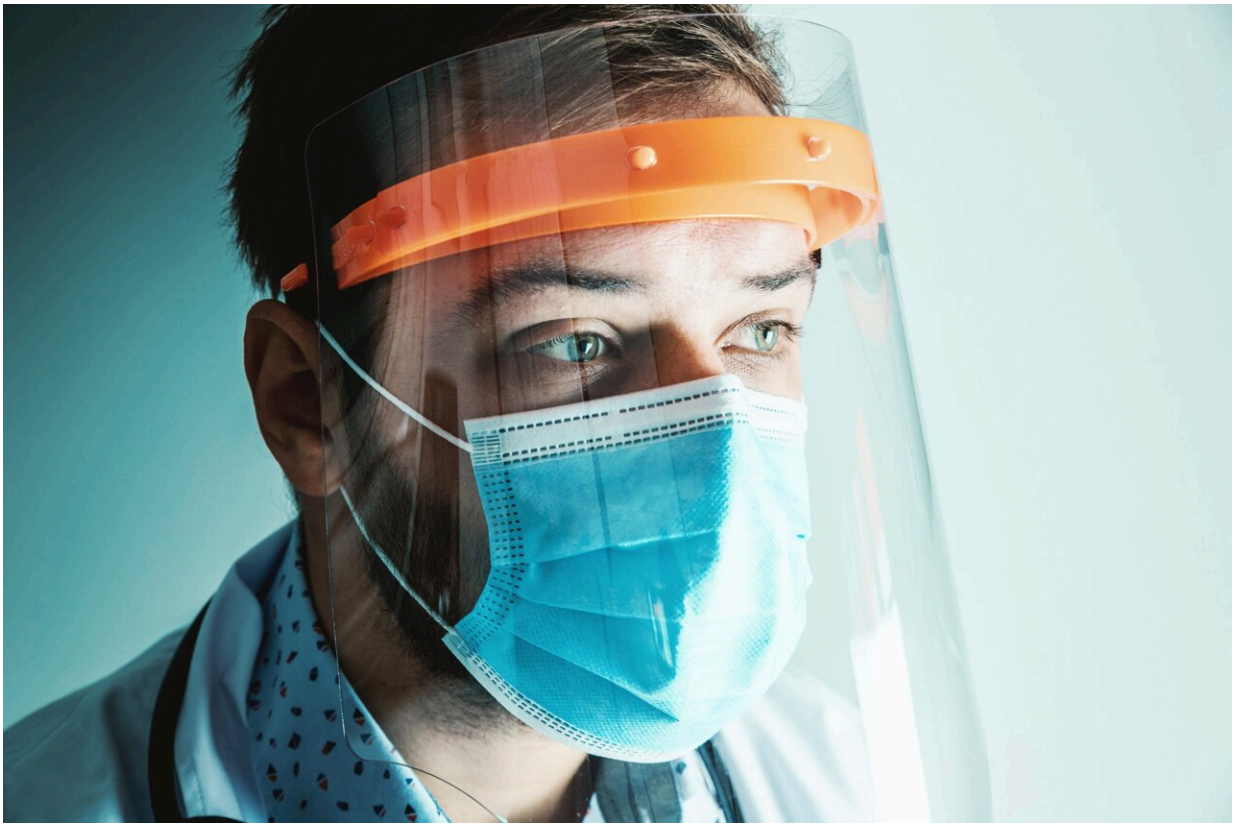

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A study of essential and frontline workers in six U.S. states who tested positive for COVID-19 and received two or three mRNA vaccine doses before delta infections and three doses before omicron infections

suggests that they had significantly milder infections and lower viral loads than their unvaccinated peers.

In the study, published today in *JAMA*, HEROES-RECOVER Network researchers analyzed the weekly self-collected nasal swabs and whole-genome sequencing results from 1,199 frontline workers infected with COVID-19 from Dec 14, 2020, to Apr 19, 2022, with follow-up until May 9.

The workers, primarily health care professionals and first responders, were located in Arizona, Florida, Minnesota, Oregon, Texas, and Utah. Median age was 41 years, 59.5% were women, 72.6% were White, 19.3% were Hispanic, 14% were infected with the wild-type strain, 24.0% had a delta variant case, and 62.0% had omicron.

More symptom-free days

Of the 352 COVID-19 infections among the unvaccinated, 12.5% were asymptomatic, and 6.8% had uncharacteristic symptoms. Asymptomatic cases were more often linked to omicron than delta infections (odds ratio [OR], 5.6).

Among participants with symptoms, those with omicron infections had symptoms for, on average, 12.3 days, compared with 15.6 days with wild-type infections and 16.4 days with delta. Omicron-infected participants reported an average of 2.6 days sick in bed, 1.2 days fewer than those with wild-type infections and 2.0 days fewer than those with delta. Vaccinated patients had milder delta illnesses, but the precision of the estimates varied.

Workers who received their second vaccine dose 14 to 149 days before delta infection were significantly less likely than their unvaccinated participants to have symptoms (77.8% vs 96.1%; OR, 0.13). When they

were symptomatic, third-dose recipients were significantly less likely to have fever or chills (38.5% vs 84.9%; OR, 0.07), had symptoms for fewer days (10.2 vs 16.4; difference, -6.1), and reported fewer hours of work missed (47.1 vs 62.8; difference, -15.2).

Among omicron-infected workers, the risk of symptoms didn't differ significantly between two-dose compared with unvaccinated participants but was significantly higher for three-dose recipients (88.4% vs 79.4%; OR, 2.0). Workers with symptomatic omicron infections who received a third vaccine dose 7 to 149 days earlier were significantly less likely to have fever or chills than the unvaccinated (51.5% vs 79.0%; OR, 0.25) and were less likely to seek medical attention (14.6% vs 24.7%; OR, 0.45).

Symptoms tied to higher viral loads

"In a cohort of US essential and frontline workers with SARS-CoV-2 infections, recent vaccination with two or three mRNA vaccine doses less than 150 days before infection with delta or omicron variants, compared with being unvaccinated, was associated with attenuated symptoms, duration of illness, medical care seeking, or viral load for some comparisons, although the precision and statistical significance of specific estimates varied," the researchers wrote.

Symptomatic participants had significantly higher average viral loads than those with no symptoms. delta- and omicron-infected workers who received a second vaccine dose 14 to 149 days earlier had a significantly lower average viral load than their unvaccinated counterparts.

"Although viral RNA shedding cannot be directly attributable to transmission, the relatively high viral load of omicron infections together with the higher frequency of asymptomatic infection supports previous studies suggesting an association with increased transmission,

particularly during the first three to five days when viral load peaked," the authors concluded.

More information: Association of mRNA Vaccination With Clinical and Virologic Features of COVID-19 Among US Essential and Frontline Workers, *JAMA* (2022). DOI: 10.1001/jama.2022.18550

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