Getting COVID-19 Twice: Reinfections 44% More Likely Among the Unvaccinated

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Abstract: Unvaccinated patients are more likely than vaccinated patients to get COVID-19 twice.

To examine how vaccines affect immunity for people who have already had COVID-19, we compared reinfection rates of COVID-19 in vaccinated and unvaccinated patients and found that unvaccinated patients were significantly more likely to be reinfected. To best determine whether a patient was vaccinated or unvaccinated, our study population included those with a face-to-face encounter where vaccination status could be verified.

While the primary benefit of vaccination is to decrease the severity of infection[1], it also appears to have a modest benefit in preventing reinfection. This finding was based on an average weekly reinfection rate of 1.6 out of 10,000 for partially or fully vaccinated patients and 2.3 out of 10,000 for unvaccinated patients. This equates to one prevented reinfection for every 275 patients vaccinated over a period of 12 months.

Reinfection Rates Between Vaccinated and Unvaccinated Patients

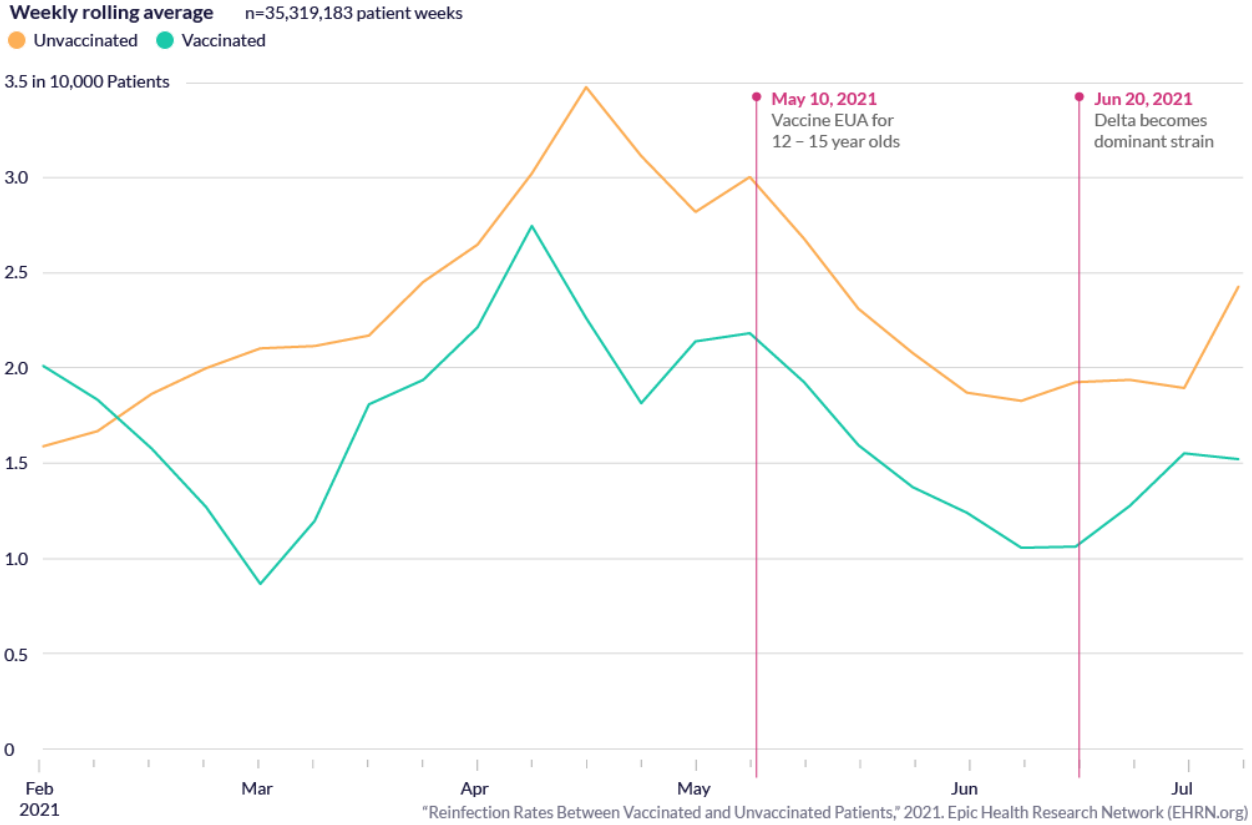

Figure 1. The lines above show the average weekly reinfection rates per 10,000 by vaccination status: unvaccinated (orange) and fully vaccinated (green). Unvaccinated patients had consistently higher rates of reinfection.

Among patients who were reinfected, hospitalization rates were similar for both vaccinated and unvaccinated patients, with about one in five reinfected patients admitted to the hospital. These findings are consistent with other research demonstrating a decreased risk of COVID reinfection in vaccinated patients[2].

These data come from Cosmos, a HIPAA-defined Limited Data Set of more than 120 million patients from 141 Epic organizations including 832 hospitals and 13,421 clinics, serving patients in all 50 states. This study was completed by two teams, each comprised of a clinician and research scientists who worked independently. The two teams came to similar conclusions.

References

1. Centers for Disease Control and Prevention. COVID-19 Vaccines Work. https://www.cdc.gov/coronavirus/2019-ncov/vaccines/effectiveness/work.html. Accessed on: December 3, 2021.
2. Cavanaugh AM, Spicer KB, Thoroughman D, Glick C, Winter K. Reduced Risk of Reinfection with SARS-CoV-2 After COVID-19 Vaccination — Kentucky, May–June 2021. MMWR Morb Mortal Wkly Rep 2021;70:1081-1083. DOI: http://dx.doi.org/10.15585/mmwr.mm7032e1external icon

Data Definitions

Term	Definition
COVID-19 Reinfection	A patient is considered to be reinfected with COVID-19 if they have a second COVID-19 infection at least 90 days after their first COVID-19 infection.
Face-to-face Encounters	Encounters of the following types: Allied health, Ancillary procedure, Anticoagulation visit, Appointment, Audiology, Case management, Clinical support, Confidential, Diagnostic services, Education, Emergency, Fetal care consult, Fetal procedure, Follow-up, Genetics, Home care visit, Hospice F2F visit, Hospital, Hospital encounter, Immunization, Induction, Infusion, Initial prenatal, Injection, Lactation consult, Lactation encounter, Multidisciplinary visit, NST, Nurse only, Nursing home, Nutrition, Office visit, Oncology survivorship, Ophth exam, Occupational/Physical Therapy, Postpartum visit, Procedural consult, Procedure visit, Radiology appointment, REI, Research encounter, Routine prenatal, Sleep study, Social work, Speech therapy, Surgery, Surgical consult, Telemedicine, Transplant evaluation, Transplant follow up, Treatment, Urgent care, Walk-in, Well child

Unvaccinated	This status in any given week means that a patient had a Covid infection 90 or more days in the past, has not received any COVID-19 vaccination on or before that week, and the patient has a face-to-face encounter on or after that week.
Partially Vaccinated	This status in any given week means that a patient had a COVID infection 90 or more days in the past, has received at least one dose of COVID-19 vaccine and has not been fully vaccinated (i.e., has not reached 14 days after the second dose in a 2-dose series or after a single-dose vaccine) on or before that week, and the patient has a face-to-face encounter on or after that week. Partially vaccinated patients were excluded from this brief.
Fully Vaccinated	This status in any given week means that a patient had a COVID infection 90 or more days in the past, has been fully vaccinated against COVID-19 (i.e., has reached 14 days after the second dose in a 2-dose series or after a single-dose vaccine) on or before that week, and the patient has a face-to-face encounter on or after that week.