

Vaccine Victory: Hospitalization for COVID-19 After Receiving a Vaccine Very Rare

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Several studies have found that a small percentage of fully vaccinated patients develop SARS-CoV-2 infections.¹ In our study, we found that of patients who received the COVID-19 vaccine, fewer than 0.049% had a breakthrough positive PCR-based SARS-CoV-2 test and fewer than 0.018% had a breakthrough admission with a COVID-19 diagnosis more than 14 days after completing the vaccine series.

Our study population consists of more than 8.6 million patients who completed the vaccine series for an FDA-authorized COVID-19 vaccine before May 9, 2021. Of those patients, 4,260 had a positive COVID test, and 1,594 were hospitalized for COVID-19 14 or more days after completion of their vaccine series.

COVID Vaccinated Individuals with Breakthrough Positive Test or Hospital Admission

| Vaccinated Individuals | Breakthrough Positive Tests | Breakthrough Admissions |
|------------------------|-----------------------------|-------------------------|
| 8,662,367 | 4,260 (0.049%) | 1,594 (0.018%) |

“COVID Vaccinated Individuals with Breakthrough Positive Test or Hospital Admission,”
2021. Epic Health Research Network (EHRN.org)

Figure 1. COVID vaccine breakthroughs determined by positive tests and hospital admissions.

These preliminary data indicate that testing positive or being hospitalized for COVID-19 after COVID-19 vaccination is exceedingly rare in the immediate post-vaccination timeframe we studied. We plan to repeat this analysis again in 6 and 12 months to determine whether these findings hold true as more time passes from initial vaccination.

These data come from Cosmos, a HIPAA Limited Data Set of more than 110 million patients from Epic customers. This study was completed by two teams, comprised of clinicians and data scientists, that independently acquired and analyzed data. Both teams were involved in the interpretation of results and drafting of this brief. Overall, the two teams came to similar conclusions. Data are pooled from 110 healthcare organizations representing 579 hospitals that span 49 states and more than 8 million patients with vaccine series administrations that meet manufacturer guidelines.

References

- 1) CDC. COVID-19 Vaccine Breakthrough Infections Reported to the CDC – United States, January 1-April 30, 2021. CDC.gov. 25 May 2021.
<https://www.cdc.gov/mmwr/volumes/70/wr/mm7021e3.htm>.

Data Definitions

| Term | Definition |
|--|---|
| PCR-based SARS-CoV-2 test | <p>A final result for one of the lab tests for SARS-CoV-2, with a lab value that could be interpreted definitively as Positive or Negative. LOINC codes include:</p> <p>943068, 943076, 943084, 943092, 943100, 943118, 943126, 943134, 943142, 943159, 943167, 945006, 945022, 945097, 945105, 945113, 945311, 945329, 945337, 945345, 945584, 945592, 945659, 946392, 946400, 946418, 946426, 946434, 946442, 946459, 946467, 946475, 946608, 947457, 947465, 947564, 947572, 947580, 947598, 947606, 947630, 947648, 947655, 947663, 947671, 948190, 948224, 948455, 952093, 954065, 954099, 954248, 954255, 955211, 955229, 956086, 956094, 958231, 958249, 958264, 959700, 959718, 959726, 959734, 959742, 960914, 960948, 961193, 961201, 961219, 961227, 961235, 964486, 967414, 967513, 967521</p> <p>Test Date: Date when the sample was collected; the date the test was resulted is used when the collection date is not available.</p> |
| Hospital admission | <p>A hospital admission during which the patient had a COVID-19 diagnosis OR a hospital admission with any respiratory diagnosis which happened within 14 days following the patient's COVID-19 start date.</p> <p>Respiratory Diagnosis Codes: J00-J99 (ICD-10-CM)</p> |
| Manufacturer recommendations for timing | <p>Moderna: Two doses, at least 28 days apart Pfizer: Two doses, at least 21 days apart Johnson & Johnson: 1 dose</p> |
| Emergency Use Authorization dates | <p>Moderna: December 18, 2020 Pfizer: December 11, 2020 Johnson & Johnson: February 27, 2021</p> |