

Long COVID After COVID-19 Vaccination

Articles showing a beneficial effect of COVID-19 vaccination on Long COVID

- **2025, Sept. Association of COVID vaccinations and treatments with long COVID beyond 6 months: a case-control study on the adult population in a large integrated healthcare system in the United States from 2020 to 2023**
This study showed that with each vaccination the risks of long COVID decreases. Long COVID was defined as having symptoms for more than 6 months. One vaccination gave a 23% protection, two provided a 27% protection, three 46% protection and four provided 71% protection. Paxlovid provided a 95% protection.
<https://www.sciencedirect.com/science/article/pii/S221133552500227X>
- **2025, Mar. 12. The Effect of COVID-19 Vaccination on the Risk of Persistent Post-COVID-19 Condition: Cohort Study**
"We conducted a population-based cohort study in Stockholm, Sweden, to investigate the effect of COVID-19 vaccination on the risk of developing persistent post-COVID-19 condition (PCC) in individuals surviving the first year after a SARS-CoV-2 infection. In total, 331 042 individuals were included, of which 852 had persistent PCC. The adjusted risk ratio for developing persistent PCC compared with unvaccinated individuals was 0.81 (95% confidence interval [CI], .59–1.10) for 1 dose, 0.42 (95% CI, .35–.52) for 2 doses, and 0.37 (95% CI, .27–.52) for 3 doses. Reduced risks for vaccinated individuals were also observed when restricting the analyses to pre-Omicron and Omicron, as well as all subgroups including sex, age, and previous infection." Mar. 12, 2025.
<https://academic.oup.com/jid/article/231/5/e941/8071565>
- **2025 Feb. SARS-COV-2 re-infection and incidence of post-acute sequelae of COVID-19 (PASC) among essential workers in New York: a retrospective cohort study:** Babalola TK, Clouston SAP, Sekendiz Z, et al. SARS-COV-2 re-infection and incidence of post-acute sequelae of COVID-19 (PASC) among essential workers in New York: a retrospective cohort study. *Lancet Reg Health Am.* 2025 Jan 8;42:100984. doi: 10.1016/j.lana.2024.100984. PMID: 39866362; PMCID: PMC11764319.
Interpretation: Although the pathogenetic mechanism for PASC remains unclear, identifying risk factors such as lack of vaccination or re-infection can assist in better understanding and managing the condition." [https://www.thelancet.com/journals/lanam/article/PIIS2667-193X\(24\)00311-9/fulltext](https://www.thelancet.com/journals/lanam/article/PIIS2667-193X(24)00311-9/fulltext)
- **2025, Feb. 26: Persistence in risk and effect of COVID-19 vaccination on long-term health consequences after SARS-CoV-2 infection**
Nature Communications: "Completely vaccinated and patients with booster dose of vaccines did not incur significant higher risk of health consequences from 271 and 91 days of infection onwards, respectively, whilst un-vaccinated and incompletely vaccinated patients continued to incur a greater risk of clinical sequelae for up to a year following SARS-CoV-2 infection. This study provided real-world evidence supporting the effectiveness of COVID-19 vaccines in reducing the risk of long-term health consequences of SARS-CoV-2 infection and its persistence following infection." <https://www.nature.com/articles/s41467-024-45953-1>

- **2025, Jan. Real-world effectiveness and causal mediation study of BNT162b2 on long COVID risks in children and adolescents**
[https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370\(24\)00541-8/fulltext](https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(24)00541-8/fulltext)
COVID vaccine protected kids from long COVID
 Instead of special protection against long COVID, vaccines kept children and adolescents from developing the condition by blocking COVID-19 infections in the first place.
 "Unvaccinated children and adolescents were up to 20 times more likely to develop long COVID than their vaccinated peers, according to new research led by a team from the Perelman School of Medicine at the University of Pennsylvania. "
<https://www.pennmedicine.org/news/covid-vaccine-protected-kids-from-long-covid>
- **2025, Jan. 16: COVID-19 vaccine gaps linked to higher hospitalization and death rates in the UK**
 "Mathematical modelling indicated that 7,180 hospitalizations and deaths out of around 40,400 severe COVID-19 outcomes during four months in summer 2022 might have been averted, if the UK population was fully vaccinated."
<https://www.news-medical.net/news/20250116/COVID-19-vaccine-gaps-linked-to-higher-hospitalization-and-death-rates-in-the-UK.aspx>
- **2024, Oct. 15. Long COVID facts and findings: a large-scale online survey in 74,075 Chinese participants** "Vaccination, particularly multiple boosters, significantly reduced long-term symptoms by 30%–70% (OR < 1, FDR < 0.05)."
[https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065\(24\)00212-8/fulltext](https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065(24)00212-8/fulltext)
- **2024, Mar. 8: Vaccine Effectiveness Against Long COVID in Children**
 "Adjusted vaccine effectiveness within 12 months was 35.4% (95 CI 24.5–44.7) against probable long COVID and 41.7% (15.0–60.0) against diagnosed long COVID."
<https://publications.aap.org/pediatrics/article/153/4/e2023064446/196419/Vaccine-Effectiveness-Against-Long-COVID-in?autologincheck=redirected>
- **2024, Feb 8: Persistence in risk and effect of COVID-19 vaccination on long-term health consequences after SARS-CoV-2 infection.**
 Lam, I.C.H., Zhang, R., Man, K.K.C. *et al.* *Nat Commun* **15**, 1716 (2024).
<https://doi.org/10.1038/s41467-024-45953-1>
 "Completely vaccinated and patients with booster dose of vaccines did not incur significant higher risk of health consequences from 271 and 91 days of infection onwards, respectively, whilst un-vaccinated and incompletely vaccinated patients continued to incur a greater risk of clinical sequelae for up to a year following SARS-CoV-2 infection. "
- **2024, Jan. 16. Vaccine Effectiveness Against Long COVID in Children** The vaccination rate was 56% in the cohort of 1,037,936 children. The incidence of probable long COVID was 4.5% among patients with COVID-19, while diagnosed long COVID was 0.7%. Adjusted vaccine effectiveness within 12 months was 35.4% (95 CI 24.5 – 44.5) against probable long COVID and 41.7% (15.0 – 60.0) against diagnosed long COVID. VE was higher for adolescents 50.3% [36.3 – 61.0]) than children aged 5-11 (23.8% [4.9 – 39.0]). VE was higher at 6 months (61.4% [51.0 – 69.6]) but decreased to 10.6% (-26.8 – 37.0%) at 18-months. *Pediatrics*:
<https://publications.aap.org/pediatrics/article/doi/10.1542/peds.2023-064446/196419/Vaccine-Effectiveness-Against-Long-COVID-in>

- **2023, Nov. 22. Covid-19 vaccine effectiveness against post-covid-19 condition among 589 722 individuals in Sweden: population based cohort study**

Results Of 299 692 vaccinated individuals with covid-19, 1201 (0.4%) had a diagnosis of PCC during follow-up, compared with 4118 (1.4%) of 290 030 unvaccinated individuals. Covid-19 vaccination with any number of doses before infection was associated with a reduced risk of PCC (adjusted hazard ratio 0.42, 95% confidence interval 0.38 to 0.46), with a vaccine effectiveness of 58%. Of the vaccinated individuals, 21 111 received one dose only, 205 650 received two doses, and 72 931 received three or more doses. Vaccine effectiveness against PCC for one dose, two doses, and three or more doses was 21%, 59%, and 73%, respectively.

Conclusions The results of this study suggest a strong association between covid-19 vaccination before infection and reduced risk of receiving a diagnosis of PCC. The findings highlight the importance of primary vaccination against covid-19 to reduce the population burden of PCC.

BMJ: <https://www.bmj.com/content/383/bmj-2023-076990>

2023, Nov. 22. Does timely vaccination help prevent post-viral conditions?

Further analysis showed a dose-response relation: the first dose reduced the risk of post-covid-19 condition (Long COVID) by 21% (adjusted hazard ratio 0.79, 0.68 to 0.91), two doses by 59% (0.41, 0.37 to 0.45), and three or more doses by 73% (0.27, 0.23 to 0.32). These are impressive findings, and they are similar to the cumulative protective effect of vaccines against outcomes of acute infection, such as severity of illness and death. BMJ

<https://www.bmj.com/content/383/bmj.p2633>

- **2023, Oct. 13: The effectiveness of COVID-19 vaccine in the prevention of post-COVID conditions: a systematic literature review and meta-analysis of the latest research.**

Marra AR, Kobayashi T, Callado GY, Pardo I, Gutfreund MC, Hsieh MK, Lin V, Alsuhaibani M, Hasegawa S, Tholany J, Perencevich EN, Salinas JL, Edmond MB, Rizzo LV. Antimicrob Steward Healthc Epidemiol. 2023 Oct 13;3(1):e168. doi: 10.1017/ash.2023.447. PMID: 38028898; PMCID: PMC10644173. <https://pubmed.ncbi.nlm.nih.gov/38028898/>

“Thirty-two studies with 775,931 individuals evaluated the effect of vaccination on post-COVID conditions, of which, twenty-four studies were included in the meta-analysis. The pooled DOR for post-COVID conditions among fully vaccinated individuals was 0.680 (95% CI: 0.523-0.885) with an estimated VE of 32.0% (11.5%-47.7%). Vaccine effectiveness was 36.9% (23.1%-48.2%) among those who received two doses of COVID-19 vaccine before COVID-19 infection and 68.7% (64.7%-72.2%) among those who received three doses before COVID-19 infection. The stratified analysis demonstrated no protection against post-COVID conditions among those who received COVID-19 vaccination after COVID-19 infection.”

- **2023, Sept. 15: Vaccination after developing long COVID: impact on clinical presentation, viral persistence and immune responses.**

Another article showing the benefits of vaccination in the prevention of Long COVID. This article demonstrated benefits after one develops Long COVID. Symptoms were observed to improve.

- COVID-19 vaccination post-PCC (post-COVID-19 conditions) reduced number of symptoms and increased well-being
- COVID-19 vaccination post-PCC down-regulated systemic markers of inflammation
- COVID-19 vaccination post-PCC did not abrogate the persistence of viral products
- A viral reservoir not cleared by one or two vaccine doses may persist

- International Journal of Infectious Diseases
[https://www.ijidonline.com/article/S1201-9712\(23\)00720-8/fulltext](https://www.ijidonline.com/article/S1201-9712(23)00720-8/fulltext)
- **2023: June 5: Risk factors for long coronavirus disease 2019 (long COVID) among healthcare personnel, Brazil, 2020–2022**
"Of 7,051 HCP diagnosed with COVID-19, 1,933 (27.4%) who developed long COVID were compared to 5,118 (72.6%) who did not. The majority of those with long COVID (51.8%) had 3 or more symptoms. Those receiving 4 COVID-19 vaccine doses prior to infection (OR, 0.05; 95% CI, 0.01–0.19) were significantly less likely to develop long COVID." "Long COVID can be prevalent among HCP. Acquiring >1 SARS-CoV-2 infection was a major risk factor for long COVID, while maintenance of immunity via vaccination was highly protective."
<https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/abs/risk-factors-for-long-coronavirus-disease-2019-long-covid-among-healthcare-personnel-brazil-20202022/AA01F17E1C8A33C07457914E63AB3EEE>
- **2023, May 31: More than 1 in 6 unvaccinated people report health effects of COVID two years after confirmed infection**
The findings show that 17% of participants did not return to normal health and 18% reported COVID-19 related symptoms 24 months after initial infection.
<https://medicalxpress.com/news/2023-05-unvaccinated-people-health-effects-covid.html>
Recovery and symptom trajectories up to two years after SARS-CoV-2 infection: population based, longitudinal cohort study "Excess risk (adjusted risk difference) for individual symptoms among those infected ranged from 2% to 10%, with the highest excess risks observed for altered taste or smell (9.8% (7.7% to 11.8%)), post-exertional malaise (9.4% (6.1% to 12.7%)), fatigue (5.4% (1.2% to 9.5%)), dyspnoea (7.8% (5.2% to 10.4%)), and reduced concentration (8.3% (6.0% to 10.7%)) and memory (5.7% (3.5% to 7.9%))." <https://www.bmj.com/content/381/bmj-2022-074425>
- **2023, May 22: Long COVID risk and pre-COVID vaccination in an EHR-based cohort study from the RECOVER program.** " We found that vaccination was consistently associated with lower odds and rates of long COVID clinical diagnosis and high-confidence computationally derived diagnosis after adjusting for sex, demographics, and medical history."
Table 14 shows how older adults are both more likely to be vaccinated and more likely to contract long COVID in comparison to younger adults. Failing to account for the substantial differences between individuals who were and were not vaccinated prior to COVID-19 could lead one to inaccurately conclude that vaccination is harmful.
Nature Communications. May 22, 2023. <https://www.nature.com/articles/s41467-023-38388-7>
- **2023, Mar. 23: Meta analysis finds being vaccinated cuts your risk of Long COVID by almost half (43%).**
Risk Factors Associated With Post–COVID-19 Condition: A Systematic Review and Meta-analysis
Patients who had been vaccinated against COVID-19 with 2 doses had a significantly lower risk of developing PCC (long COVID) compared with patients who were not vaccinated (OR, 0.57; 95% CI, 0.43-0.76). Mar. 23, 2023

<https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2802877>

- **2023, Jan. 18: Persistent COVID-19 Symptoms at 6 Months After Onset and the Role of Vaccination Before or After SARS-CoV-2 Infection**
"In this cohort study of 1832 US adults, the risk of reporting symptoms for 28 or more days after COVID-19 onset was significantly higher in participants who were unvaccinated at the time of infection and those who reported moderate or severe acute illness symptoms. At 6 months after onset, participants had significantly higher risk of pulmonary, diabetes, neurological, and mental health encounters vs preinfection baseline." "Among unvaccinated participants, postinfection vaccination was associated with a 41% lower risk of reporting symptoms at 6 months (RR, 0.59; 95% CI, 0.40-0.89). Participants had higher risk of pulmonary (RR, 2.00; 95% CI, 1.40-2.84), diabetes (RR, 1.46; 95% CI, 1.00-2.13), neurological (RR, 1.29; 95% CI, 1.02-1.64), and mental health-related medical encounters (RR, 1.28; 95% CI, 1.01-1.62) at 6 months after symptom onset than at baseline (before SARS-CoV-2 infection)."
<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2800554>
- **2022, Oct 12: Outcomes among confirmed cases and a matched comparison group in the Long-COVID in Scotland study**
Compared to unvaccinated people, people vaccinated prior to symptomatic infection were less likely to report persistent change in smell (OR 0.58, 0.45–0.76), change in taste (OR 0.61, 95% CI 0.46–0.79), problems hearing (OR 0.60, 95% CI 0.44–0.83), poor appetite (OR 0.72, 95% CI 0.53–0.99), balance problems (OR 0.71, 95% CI 0.53–0.95), confusion/difficulty concentrating (OR 0.72, 95% CI 0.58–0.89), and anxiety/depression (OR 0.76, 95% CI 0.64–0.92) at their latest follow-up after adjustment for potential confounders.
<https://www.nature.com/articles/s41467-022-33415-5>
- **2022, Oct. 7: Long COVID Risk and Pre-COVID Vaccination: An EHR-Based Cohort Study from the RECOVER Program**
NIH Researching COVID to Enhance Recovery (RECOVER) The study population was drawn from 5,434,528 COVID-19-positive patients available
The most significant is age: eTable 7 shows how older adults are both more likely to be vaccinated and more likely to contract long COVID in comparison to younger adults. Failing to account for the substantial differences between individuals who were and were not vaccinated prior to COVID-19 could lead one to conclude that vaccination is harmful. Retrospective cohort study of adults with evidence of COVID-19 between August 1, 2021 and January 31, 2022 based on electronic health records from eleven healthcare institutions taking part in the NIH Researching COVID to Enhance Recovery (RECOVER) Initiative. In both cohorts, when adjusting for demographics and medical history, pre-COVID vaccination was associated with a reduced risk of long COVID (clinic-based cohort: HR, 0.66; 95% CI, 0.55-0.80; OR, 0.69; 95% CI, 0.59-0.82; model-based cohort: HR, 0.62; 95% CI, 0.56-0.69; OR, 0.70; 95% CI, 0.65-0.75).
<https://www.medrxiv.org/content/10.1101/2022.10.06.22280795v1>
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9558440/>
- **2022, July 1: Association Between BNT162b2 Vaccination and Long COVID After Infections Not Requiring Hospitalization in Health Care Workers** Of 2,560 participants, 739 (29%) had COVID-19 (89 asymptomatic), of whom 229 (31.0%; 95% confidence interval [CI], 27.7%-34.5%) had long COVID. The prevalence of long COVID varied across the pandemic waves, from 48.1% (95% CI, 39.9%-56.2%) in wave 1 to 35.9% (95% CI, 30.5%-41.6%) in wave 2 to 16.5% (95% CI, 12.4%-

21.4%) in wave 3.

“The number of vaccine doses was associated with lower long COVID prevalence: 41.8% (95% CI, 37.0%-46.7%) in unvaccinated patients, 30.0% (95% CI, 6.7%-65.2%) with 1 dose, 17.4% (95% CI, 7.8%-31.4%) with 2 doses, and 16.0% (95% CI, 11.8%-21.0%) with 3 doses,” Among vaccinated individuals (n = 265), time between the second vaccination dose and infection was not associated with long COVID (OR, 0.66; 95% CI, 0.34-1.29). On the other hand, no statistically significant association with infection waves was found.

Summary of Findings: 739 individuals with COVID-19, 31% had Long COVID.

-- 41.8% of unvaccinated patients had Long COVID.

-- 30.0% (95% CI, 6.7%-65.2%) with 1 dose.

-- 17.4% (95% CI, 7.8%-31.4%) with 2 doses and

-- 16.0% (95% CI, 11.8%-21.0%) with 3 doses.

Older age, higher body mass index, allergies, and obstructive lung disease were associated with long COVID. <https://jamanetwork.com/journals/jama/fullarticle/2794072>

- **2022, May 25: Long COVID after breakthrough SARS-CoV-2 infection.**

“Compared to people with SARS-CoV-2 infection who were not previously vaccinated (n = 113,474), people with BTI (Vaccinated and then had an infection) exhibited lower risks of death (HR = 0.66, 95% CI: 0.58, 0.74) and incident post-acute sequelae” Nature Medicine. May 25, 2022. <https://www.nature.com/articles/s41591-022-01840-0>

2022, May 7: The Protective Effect of Coronavirus Disease 2019 (COVID-19) Vaccination on Postacute Sequelae of COVID-19: A Multicenter Study From a Large National Health Research Network

At baseline, 1 578 719 patients with confirmed COVID-19 were identified and 1.6% (n = 25 225) completed vaccination. At 90 days:

--- hypertension RR 0.22 About one fifth as likely to have this as unvaccinated.

--- diabetes 0.28 About one quarter as likely to have this as unvaccinated.

--- heart disease 0.35 About a third as likely.

--- death 0.21 About a fifth as likely.

<https://academic.oup.com/ofid/article/9/7/ofac228/6582238>

<https://dgalerts.docguide.com/ncov-home/article/study-suggests-covid-19-vaccine-protective-against-post-acute-sequelae-covid-19-symptoms-new-onset-of-health-conditions-and-mortality>

- **2022, Jan 26: Coronavirus vaccines may reduce risk of long Covid, ONS study finds**

Vaccination could reduce the risk of long Covid, research by the Office for National Statistics suggests.

The study, of more than 6,000 adults, found those who were double-vaccinated had a 41% lower likelihood of self-reporting Covid symptoms 12 weeks after first testing positive. Overall, 9.5% of the double-vaccinated group reported experiencing long Covid, defined as symptoms lasting more than four weeks, compared with 14.6% of a socio-demographically matched group who were unvaccinated.

<https://www.theguardian.com/society/2022/jan/26/coronavirus-vaccines-may-reduce-risk-of-long-covid-ons-study-finds>

<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/selfreportedlongcovidaftertwodosesofacoronaviruscovid19vaccineintheuk/26january2022>

Additional Articles Showing a Preventive Effect of Vaccination and Long COVID

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