Large study finds COVID-19 vaccine reduces long COVID in children

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A medical assistant prepares a dose of a COVID-19 vaccine to be administered to a patient. Credit: Public domain image courtesy of Lisa Ferdinando, U.S. Department of Defense

Vaccination against SARS-CoV-2, the virus that causes COVID-19, reduces the risk of serious acute illness in children and adolescents. However, its role in protecting against persistent health problems in the months after COVID-19, or "long COVID," was less clear.

Now, researchers from 17 health systems in the U.S., in work led by investigators at the Children's Hospital of Philadelphia (CHOP), have found that vaccination provides moderate protection against long COVID. Vaccination also has a stronger effect in adolescents, who have a higher risk of developing long COVID than young children.

The findings of the large retrospective study, based on electronic health records analyzed as part of the National Institutes of Health's Researching COVID to Enhance Recovery (RECOVER) initiative, were published in the journal *Pediatrics*. The paper is titled "Vaccine effectiveness against long COVID in children."

While overall severity of COVID-19 has been lower in children than adults, the burden of long COVID has been difficult to accurately describe since the symptoms can vary widely and the exact ways the virus causes them are unknown. Some symptoms include brain fog, dyspnea, gastrointestinal dysfunction, generalized pain and fatigue, while others are more acute, like inflammatory reaction or heart problems.

"To date, no studies have assessed clinical data for large, diverse groups of children to address this important question," said lead study author Hanieh Razzaghi, Ph.D., MPH, Director of Analytics in the PEDSnet and RECOVER/PCORnet EHR Coordinating Centers in the Applied Clinical Research Center at Children's Hospital of Philadelphia.

"Using clinical data from across health care networks allowed us to have a large enough sample of patients to identify rare effects of the virus and its impact on children."

The researchers analyzed results from a large-scale collaboration of health systems from PCORnet as part of the National Institutes of Health's Researching COVID to Enhance Recovery (RECOVER) initiative, which was created to learn about the long-term effects of

COVID-19.

Data from 17 health systems were used to assess vaccine effectiveness against long COVID in two groups of patients between five and 11 years old and 12 and 17 years old, respectively, as well as the time period in which patients were impacted. 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, though only 0.7% of patients were clinically diagnosed with long COVID. The study estimated effectiveness of the vaccine within 12 months of administration as 35.4% against probable long COVID and 41.7% against diagnosed long COVID. The estimate was higher in adolescents compared with younger children (50.3% vs. 23.8%), and higher at six months (61.4%) but decreased to 10.6% at 18 months.

Children who were vaccinated after recovering from COVID-19 also appeared to benefit, with vaccine effectiveness of 46% against probable long COVID after a subsequent episode of COVID-19.

"This study provides us with important data showing the protective effects of the vaccine against long-haul COVID and suggests that this protection is mostly from preventing visible infections. We hope this means that as vaccines are improved to be more effective against current strains of SARS-CoV-2, their protection against long COVID will get better, too," said senior study author Charles Bailey, MD, Ph.D., Associate Professor of Pediatrics and co-principal investigator for the PEDSnet and RECOVER/PCORnet EHR Coordinating Centers in the Applied Clinical Research Center at CHOP.

"These retrospective data provide guidance for additional research into the ways long COVID develops, and how we can better protect children and adolescents."

More information: Razzaghi et al, Vaccine Effectiveness Against Long COVID in Children, *Pediatrics* (2024). DOI: 10.1542/peds.2023-064446