EPIDEMIOLOGY

Long COVID in Children Appears Less Common Than Early Fears Suggested

Although the risk of long COVID is not insignificant, it is much lower than previously thought

By Shannon Hall on August 25, 2022

Credit: Pablo Rodrigo Sanchez Remorini/EyeEm/Getty Images

Long COVID—the constellation of symptoms that can persist long after an initial coronavirus infection—has been a source of fear among parents throughout the pandemic. But just how often are children affected? Conflicting and evolving messages can leave a parent both terrified and wildly confused. Now a consensus is emerging that long COVID in children is a real risk but a significantly smaller one than some earlier research indicated.

Early fears were justified. Studies at the beginning of the pandemic reported alarming numbers: one review suggested long COVID could impact as many as 66 percent of children. But some experts say that the early reports included several biases. “I never

took the original studies at their face value," says Stephen Freedman, a professor of pediatrics at the University of Calgary in Alberta. "The methodological limitations of those studies were significant and not fitting with what we were seeing clinically."

One major challenge is that long COVID is poorly defined. Currently the World Health Organization (WHO) describes it as persistent or fluctuating symptoms following an infection with SARS-CoV-2, the virus that causes COVID, that last for at least two months. In contrast, the U.S. Centers for Disease Control and Prevention defines long COVID as symptoms that begin merely four weeks after infection. Complicating matters, long COVID is a catchall phrase that includes several common symptoms—from fatigue to depression to headaches—that many people experience on a regular basis, regardless of whether they have ever had a COVID infection. To account for this confounding factor, recent studies have included control groups. This has allowed experts to compare children who have had COVID with those who have never been diagnosed with it—and assess whether those infected with SARS-CoV-2 experience symptoms that go beyond what uninfected people experience. In short, do COVID sufferers actually endure more nagging symptoms than COVID evaders?

One of the first studies to include a control group was a large U.K. study published in August 2021 in the *Lancet Child & Adolescent Health*. The team looked at 1,734 children who had tested positive for COVID at any point and the same number of children who tested negative between September 2020 and February 2021. It found that the kids who tested positive typically felt better after six days. Additionally, 98.2 percent of symptomatic children recovered by eight weeks—providing reassurance that the rate of prolonged symptoms from COVID in kids is low.

When the team compared children who felt unwell at the four-week mark (chosen because numbers were still high enough to make robust statistical comparisons), they found that those who had tested negative for COVID actually felt *worse* and reported more symptoms than those who had tested positive. The authors speculated that the children in the negative cohort were suffering from other respiratory viruses for which they had not been tested. But it is also possible that the prolonged symptoms could have been caused by the pandemic's societal effects. "There's been an impact of the pandemic on all children—irrespective of infection," says Emma Duncan, a professor of clinical endocrinology at King's College London, who worked on the study.

In another study published in the *Lancet Child & Adolescent Health* in June, researchers in Denmark sent a nationwide survey to parents of children from birth to 14 years old who had tested either positive or negative for SARS-CoV-2 between January 2020 and July 2021. The children who had tested positive were consistently more likely than the children who had tested negative to report at least one long COVID symptom two months later—but not by much. Selina Kikkenborg Berg, a senior researcher at the University of Copenhagen and lead author of the study, was surprised to find that so many children in the control group had been suffering even though they had not been infected with COVID.

One possibility is that the uninfected children were struggling emotionally—which could bubble up as physical ailments. Physical and mental health are often intertwined: for example, depression can manifest as fatigue, and both are common symptoms of long COVID. The team also assessed the older children's psychological and social symptoms, only to find that those in the control group felt more scared, had more difficulty sleeping and felt more worried than those in the COVID group. Berg

suspects that the children in the control group were still living restricted lives, which was causing emotional turmoil.

"At that time, some papers were starting to report on pandemic symptoms—children suffering from the 'new normal': the new everyday life with lockdowns and social isolation and a world that was afraid of disease," Berg says. A study published in February in the *Lancet Child & Adolescent Health* offered crucial information about the pandemic's mental health toll on children, regardless of whether they had personally been infected with SARS-CoV-2. An alarming 40 percent of children surveyed—both those who had COVID three months prior and those who had not had it—reported feeling worried, sad or unhappy.

Taken together, many recent studies have found the odds of children developing long COVID are low, and other factors—including different respiratory viruses and the pandemic itself—could be to blame for many long-COVID-like symptoms. Although many researchers note that false negatives are possible (in that children who tested negative could have still been infected), they do not think that the numbers would have been high enough to skew their results. In addition, all of these studies took place in Europe, where testing was commonplace. For example, in Denmark, where Berg's team sent out a nationwide survey, children were encouraged to get tested twice a week in school.

The welcome news, however, does not negate the fact that debilitating COVID symptoms can persist for months in a small percentage of children, likely because of lingering effects of infection and the body's immune response to it. Even if only a small percentage of children develop long COVID, the sheer number of those who are being infected with SARS-CoV-2 means a significant amount of children are suffering.

Alexandra Yonts, director of the Post-COVID Program at Children's National Hospital in Washington, D.C., has seen close to 90 patients already and has a schedule that is booked until November. "Every patient is one life that has been affected," she says. And if your son or daughter is such a patient, then the number is certainly not insignificant. Monika Varma, a mother whose nine-year-old son tested positive in late December 2021, told *Scientific American* that, for most of this year, he has suffered from deep coughs, multiple headaches a day and extreme fatigue—making him unable to keep up with schoolwork, let alone continue playing soccer. He has only just started to feel better.

To help patients such as Varma's son, scientists are racing to better understand the long-term risks of COVID infection. A recent large CDC study, published in the agency's *Morbidity and Mortality Weekly Report*, found that after a COVID infection, children were twice as likely to have an acute pulmonary embolism (a blood clot in the lungs), myocarditis (inflammation of the heart muscle) and cardiomyopathy (a disease of the heart muscle that can cause it to become enlarged or rigid) than kids who were uninfected. Venous blood clots, kidney failure and type 1 diabetes were also more likely among COVID sufferers.

But whether these risks qualify as long COVID is up for debate. Freedman points out that it is unclear if the complications seen in children who had COVID are associated with acute infection or long COVID—in part because the research was based on a medical claims database, where codes and even dates can be misleading. In addition, the study used the CDC's definition of long COVID—complications that arise four weeks following infection—whereas the WHO and most of the aforementioned studies have looked at symptoms two or more months following infection. The shorter time line could have dramatically influenced the CDC study because many symptoms do

retreat with time, Freedman notes. Myocarditis, for example, occurs when someone is acutely ill but abates within a few months. Finally, the researchers did not quantify the overall incidence of long COVID, but their paper noted that many symptoms are "rare or uncommon"—in alignment with other recent studies.

"COVID infection can have some long-term impacts on some children," Freedman says, but "I think for the vast majority of children, it is not something to worry about." A recent study he and his colleagues conducted corroborates that. The research, published in July in *JAMA Network Open*, found that long COVID rates after 90 days could be as high as 9.8 percent in children who spent a significant chunk of time—two days or more—in the hospital. The experts found that experiencing a lengthy hospital visit, being age 14 or older and having seven or more symptoms were all associated with a greater risk of developing long COVID three months after the initial infection. But for children who were discharged from the emergency room, the rate was 4.6 percent. That said, when the team subtracted the rates of long COVID symptoms in COVID-negative controls from those in COVID-positive children, it found that the resulting rates were 5.2 and 1.6 percent among hospitalized and discharged children, respectively.

For those reasons, Freedman argues that vaccination likely helps prevent long COVID in children by lowering the risk of hospitalization. Yonts agrees that the jab is crucial. "Every time you get COVID, it's a gamble," she says. "So anything to do to maximize your protection from that, including vaccination, is kind of no-brainer. At least tip the odds a little bit more in your favor."

ABOUT THE AUTHOR(S)

Shannon Hall is an award-winning freelance science journalist based in the Rocky Mountains. She specializes in writing about astronomy, geology and the environment. *Credit: Nick Higgins*

Recent Articles by Shannon Hall

Webb Telescope Finds Carbon Dioxide on a Distant Exoplanet

NASA Will Map Every Living Thing on the International Space Station

Model Suggests Toxic Transformation on Venus
