

Study tries to see if child vaccines and asthma are linked

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An infant receives a routine vaccination in Fayetteville, Ga., Tuesday, Aug. 17, 2021. Years ago, the government set out to determine if aluminum in vaccines could be driving growing rates of allergies and asthma in children. A federally funded study released Friday, Sept. 23, 2022, has found a possible link between aluminum and persistent asthma. But experts say the study has several shortcomings and is not a reason to change current vaccine recommendations. Credit: AP Photo/Angie Wang

A number of scientists have wondered if aluminum, a vaccine additive that has been used for decades, had a role in allergies and asthma in children.

A new federally funded study has found a possible link, but experts say the research has important shortcomings and is not a reason to change current [vaccine](#) recommendations. The study doesn't claim aluminum causes the breathing condition, and officials say more work is needed to try to confirm any connection, which hadn't been seen in earlier research.

Even if a link were ever found, the life-saving benefits of the vaccines are still likely to outweigh the [asthma](#) risk, said Dr. Matthew Daley, the

study's lead author. But it's possible that if the results are confirmed, it could prompt new work to redesign vaccines, he added.

Dr. Paul Offit, of Children's Hospital of Philadelphia, worried that the flawed study will needlessly scare some families away from proven vaccines.

"Making an extraordinary claim requires extraordinary evidence," Offit said. This study does not offer that kind of evidence, he said.

He and other outside experts noted that Daley and his colleagues were unable to account for the effects of some potentially important ways children are exposed to aluminum—such as in the air or through their diet.

They also noted the findings include hard-to-explain inconsistencies, like why, in one subset of thousands of fully vaccinated kids, more aluminum exposure didn't seem to result in a higher [asthma risk](#).

CDC officials, in a statement, said it appears that aluminum-containing vaccines "do not account for the overall trends that we see."

The study, [released Tuesday](#), suggests that [young children](#) who were vaccinated with most or all of the recommended aluminum-containing vaccines had at least a 36% higher risk of being diagnosed with [persistent asthma](#) than kids who got fewer vaccines.

Aluminum has been used in some vaccines since the 1930s, as an ingredient—called an adjuvant—that provokes stronger immune protection.

By age 2, children should be vaccinated against 15 diseases, according to U.S. recommendations. Aluminum adjuvants are in vaccines for seven of them.

Aluminum adjuvants have long been considered safe and effective. Still, scientists noted a period of increased rates in allergies and asthma among U.S. children during a 30-year period starting in about 1980, and some wondered if there was a connection. (Those rates leveled off starting about a decade ago and have declined somewhat in recent years, for reasons not fully understood.)

Several previous studies didn't find a link between aluminum-containing childhood vaccines and allergies and asthma. But other research has linked aluminum in industrial workplaces to asthma. And mice injected with aluminum suffer an immune system reaction that causes the kind of airway inflammation seen in childhood asthma.

"Based on what I consider limited animal data, there is a theoretical risk that the aluminum in vaccines could influence allergy risk," said Daley, an associate professor of pediatrics at the University of Colorado School of Medicine.

In 2013, the Institute of Medicine—now known as the National Academy of Medicine—called for more federal research into the safety of childhood vaccines, including their use of aluminum.

The new study is part of the government response to that call, Daley said. It was funded by the CDC, and included current and former CDC staffers among its authors. It was published by the medical journal *Academic Pediatrics*.

The researchers focused on about 327,000 U.S. children born from 2008 to 2014, looking at whether they got vaccines containing aluminum before age 2 and whether they developed persistent asthma between ages 2 and 5.

Asthma, a condition that can cause spasms in the lungs, usually results from an allergic reaction. About 4% of U.S. children under 5 have persistent asthma.

The researchers took steps to try to account for different factors that might influence the results, including race and ethnicity, whether kids were born premature or whether children had food allergies or certain other conditions.

But there were many other factors they were unable to address. For example, aluminum can routinely be found in breastmilk, infant formula and food, but the researchers were unable to get data on how much aluminum the kids got from eating. They also had no information on aluminum exposures from the air and environment where the children lived.

The researchers split the study group into two. One was about 14,000 kids who developed eczema, a skin condition that is seen as an early indicator for the development of asthma or other allergic diseases. They wanted to see if kids with eczema were more or less sensitive to aluminum in vaccines, compared with [children](#) who did not have early eczema. The other 312,000 or so kids in the study did not have early eczema.

Both groups got roughly the same amount of vaccine-related aluminum. The researchers found that for each milligram of aluminum received through vaccines, the risk of persistent asthma rose 26% in the eczema kids and 19% in kids who did not have eczema.

Overall, kids who got 3 milligrams or more of vaccine-related [aluminum](#) had at least a 36% higher risk of developing persistent asthma than kids who got less than 3, Daley said.

Offit said the study's limitations meant that the work has "added nothing to our understanding of vaccines and asthma."

But other experts said the researchers drew from a respected set of patient data and worked carefully with the best information that was available.

"This is public health at its best. They are making every effort to find any possible signal that may be a concern," said Michael Osterholm, director of the University of Minnesota's Center for Infectious Disease Research and Policy. "It's our job to exhaustively examine that to see if that's true."

He acknowledged anti-vaccine activists will likely jump to conclusions that the evidence doesn't support. But if CDC had the information and didn't publish it, the agency might be seen as misleading

the public, further eroding trust, he said.

Dr. Sarah Long, professor of pediatrics at the Drexel University College of Medicine, echoed that.

"I believe in complete transparency," she said. "If you've asked a question and here spent our (taxpayer) money to (investigate) that question, I think the results should be aired in all of its warts and glory."

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