

Four vaccine myths and where they came from

By [Lindzi Wessel](#) | Apr. 27, 2017 , 1:15 PM

False: Vaccination can cause autism

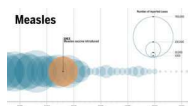
In 1998, U.K. doctor Andrew Wakefield published a study in *The Lancet* suggesting that the measles, mumps, and rubella (MMR) vaccine could trigger autism. In the years after, MMR vaccination rates among 2-year-olds in England dropped below 80%. But the claim began to unravel in 2004 after journalist Brian Deer reported undisclosed conflicts of interest: Wakefield had applied for a patent on his own measles vaccine and had received money from a lawyer trying to sue companies making the MMR vaccine. Citing further concerns about ethics and misrepresentation, *The Lancet* retracted the paper in 2010. Shortly after, the United Kingdom's General Medical Council permanently pulled Wakefield's medical license.

The vaccine wars

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But the MMR-autism falsehood made headlines again in 2016 with the release of *Vaxxed*, a movie Wakefield directed that alleges a cover-up by the Centers for Disease Control and Prevention (CDC). The story features bioengineer Brian Hooker, who took issue with a 2004 CDC study that found no overall difference in vaccination rates between kids with and without autism. Hooker reanalyzed the data in 2014 and claimed CDC had hidden evidence that the vaccine could increase autism risk in black boys. In fact, CDC noted in the paper that rates of vaccination in the oldest age group were slightly higher in kids with autism. But CDC says that this effect was "most likely a result of immunization requirements for preschool special education program attendance in children with autism."

Such claims prompted a slew of studies finding no evidence that MMR causes autism. For example, a 2014 meta-analysis in *Vaccine* examined studies involving a total of almost 1.3 million people. That same year, a paper in the *Journal of the American Medical Association* reported that no difference existed in autism rates between thousands of vaccinated and unvaccinated children.

False: Mercury in vaccines acts as a neurotoxin

In 2005 the magazines *Rolling Stone* and *Salon* copublished a story by environmental lawyer Robert F. Kennedy Jr. (nephew of former President John F. Kennedy) alleging a government conspiracy to cover up evidence that thimerosal, a mercury-containing preservative once used in vaccines, can cause brain problems, including autism. Multiple corrections soon appeared, including one noting that Kennedy had incorrectly stated the mercury levels. In 2011 *Salon* retracted and removed the story, noting "continued revelations of the flaws and even fraud tainting the science behind the connection."

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Kennedy has continued to use his name to promote the idea, and in recent months vaccine skeptics have called for a new "vaccine safety" commission with Kennedy at its head. Yet according to the Centers for Disease Control and Prevention (CDC) in Atlanta and the World Health Organization, no evidence exists that thimerosal from vaccines causes health problems in kids.

In 2001, well before Kennedy's article or his related book, thimerosal was removed from all childhood vaccines in the United States except multidose vials of flu vaccine. "If it did cause autism, the prediction would be that once thimerosal was taken out of vaccines that then the numbers of cases of autism should have leveled off or gone down. But that did not happen," says Frank DeStefano, director of CDC's Immunization Safety Office. A rumor that autism incidence dropped in Denmark after it removed thimerosal in 1992 also is not true. The rumor apparently arose from a misinterpretation of epidemiological data.

False: Countering mercury from vaccines can make children better

In the mid-2000s, riding the wave of concerns about thimerosal, a mercury-containing preservative, Maryland doctor Mark Geier and his son, David, began to promote a theory that a pathological interaction between mercury and testosterone explained many symptoms of autism. That claim came after the Geiers published a few studies suggesting a link between thimerosal and autism—studies that the Institute of Medicine characterized as having "serious methodological flaws." Despite that review, the Geiers proceeded with their controversial work. They established an unapproved treatment that involved daily injections of leuprolide (Lupron), a drug used to treat prostate cancer and to chemically castrate sex offenders. In children, the drug is approved only to treat precocious puberty, a rare condition in which puberty begins before the age of 8 years. Side effects in kids can include bone and heart damage. Leuprolide also carries a risk of exacerbating seizure disorders, a condition commonly associated with autism. The Geiers sometimes paired those injections with chemical chelation, a risky treatment for patients with heavy metal poisoning. To peddle their treatments to parents and insurance companies at a cost upward of \$5000 a month, the Geiers improperly diagnosed children with precocious puberty—without performing the necessary diagnostic tests. They also misled parents into believing that the regimen was approved to treat autism, according to a 2011 investigation by the Maryland Board of Physicians. The board revoked Mark Geier's state medical license, saying his practice "far exceeds his qualifications and expertise," and other states followed suit. His son, who holds only a Bachelor of Arts degree, was charged with practicing medicine without a license.

False: Spreading out vaccines can be safer for kids

Some vaccine skeptics contend that the Centers for Disease Control and Prevention's (CDC's) current vaccination schedule, which protects children from 14 diseases before age 2, requires too many vaccines in too short a time—overloading children's immune systems early in life. That overload, the skeptics argue, leaves children prone to a host of disorders, including neurodevelopmental delays and diabetes. Experts roundly dismiss those claims. A child's immune system must cope with thousands of foreign antigens each day, whereas the 2014 recommended vaccine schedule exposes a child to only about 300 antigens by the age of 2, according to CDC. One estimate, by vaccine expert Paul Offit of the Children's Hospital of Philadelphia in Pennsylvania, suggests 11 vaccines given to an infant at one time would temporarily "use up" only 0.1% of the child's immune system. And although the number of recommended vaccines has risen over the years, advances in vaccine development mean that the number of antigens contained in those vaccines has decreased—yet rates of autism and diabetes have not.

In a 2015 survey of 534 pediatricians and family doctors published in the journal *Pediatrics*, only about 1% agreed that vaccines should be spread out. But almost all of them had sometimes given in to parent requests to do so, and some doctors have published "alternative" vaccination schedules. But alternative schedules pose many problems, Offit says. The most obvious is

that extending the schedule leaves children vulnerable to dangerous diseases for longer. Spacing out vaccinations also makes it more likely that kids will not get all their shots. One proposed alternative schedule would require 19 doctor visits over 6 years—12 of those by age 2. Requiring more visits increases the burden on parents and could expose children to more illnesses from sick patients in waiting rooms, Offit says.

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