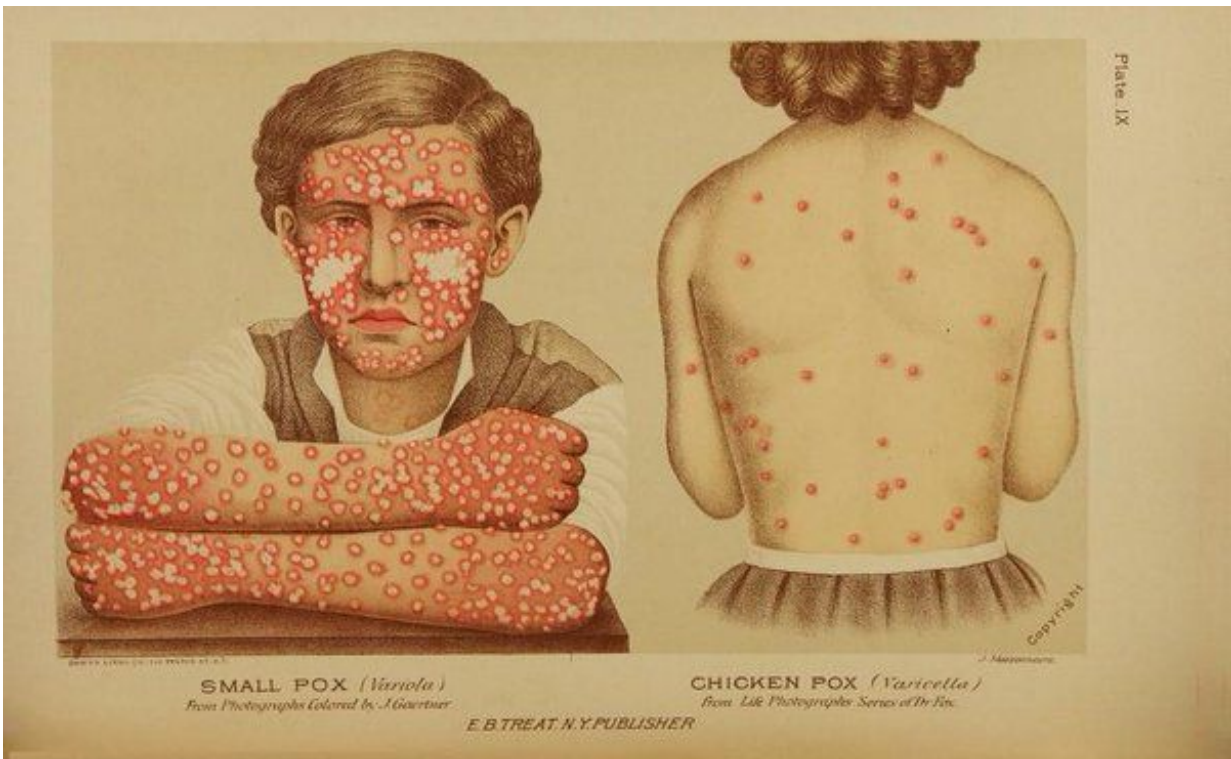


# A necessary retelling of the smallpox vaccine story

January 13 2017, by Sara Kassabian



A curious confluence of events unfolded Tuesday night. Just hours before President Obama uttered the powerful "science and reason matter" in his farewell address, Robert F. Kennedy Jr. announced that the incoming president had tapped him to head a committee on vaccine

safety.

RFK Jr. is not a pediatric immunologist nor an epidemiologist, but a vocal "[vaccine skeptic](#)." Although the PEOTUS dialed back on the purported appointment shortly after social media erupted, a [tweet](#) from March 28, 2014 makes his analysis of the history and science of vaccines clear: Healthy young child goes to doctor, gets pumped with massive shot of many vaccines, doesn't feel good and changes – AUTISM. Many such cases!

As a child I devoured books on the history of medicine. One of my favorite stories was how Edward Jenner developed the first vaccine, testing an approach that had been used for centuries. Knowing his story made me understand why my little sister had to shriek her way through shots for the "childhood diseases," while I'd suffered through chickenpox, mumps, and both types of measles. My pediatrician predicted I'd end up deaf and brain damaged after a month with measles.

Now I think the tale of Edward Jenner needs retelling, for those who may not have heard it.

## **Vaccines 101**

A vaccine is a pathogen, or part of one, whose presence in a human body is sufficient to evoke an immune response, yet not complete or active enough to transmit the illness. When the vaccinated person encounters the wild pathogen, the protective antibody response is immediate, thanks to immune memory. Conquering polio provides a dramatic vaccine, which DNA Science covered [here](#).

Vaccines aren't just biomedicine, but bioethics too. The herd immunity that arises at the population level protects us all, illustrating the principle of beneficence: action that is done for the benefit of others. Vaccinate

enough people against a particular pathogen, and it can't find enough sensitive people to rampage through a population. In practical terms, when parents refuse to vaccinate their children, other children can die. Yet vaccines are not entirely risk-free; no medical treatment or procedure is. Most reactions are due to allergy or the necessary revving up of the immune response—[here's a list](#) from a reliable source, the CDC.

## The discredited Dr. Wakefield

The vaccine-autism link arose from a paper published in *The Lancet* in 1998, in which English physician Andrew Wakefield described "a pervasive developmental disorder" in 12 children. The large, red word "[RETRACTED](#)" appears on the first page. The study had no controls and a tiny sample size, but case reports are ok in the medical literature given appropriate caveats. What wasn't ok (among many other problems) was that Dr. Wakefield was being paid by attorneys representing allegedly harmed children. When this news surfaced, *The Lancet*, in February 2010, again fully retracted the paper—in case anyone missed the earlier discrediting.

Apparently the president-elect did not get that memo.



A physician inspects the growth of cowpox lesions on a milkmaid.

But he's certainly old enough to remember how polio vanished after kids started lining up at school to receive vaccines. Maybe they didn't do that at the military school his parents sent him to (see "Confident. Incorrigible. Bully: Little Donny was a lot like candidate Donald Trump" from the [Washington Post](#).)

And so in the interest of educating the new administration on the history of vaccines, here is the story of Edward Jenner and his testing of the [smallpox vaccine](#) that has rid the world of this terrible disease. (It's from my first textbook, with apologies to McGraw-Hill. I plagiarize myself for the greater good.)

## Jenner's story

"Vaccine technology dates back to the eleventh century in China. Based on the observation that those who recovered from smallpox never got it again, people would collect the scabs of infected individuals and crush them into a powder, which they inhaled or rubbed into pricked skin.

In 1796, the wife of a British ambassador to Turkey witnessed the Chinese method of vaccination, and mentioned it to an English country physician, Edward Jenner. Intrigued, Jenner had himself vaccinated the Chinese way, and then thought of a different approach.

It was widely known that people who milked cows contracted a mild illness called cowpox, but did not get smallpox. The cows became ill from infected horses. Since the virus seemed to jump species, Jenner wondered, would exposing a healthy person to cowpox lesions protect

against smallpox?

Wrote Jenner of the horse ailment that farmers transferred to cows: 'It is an inflammation and swelling in the heel, from which issues matter possessing properties of very peculiar kind, which seems capable of generating a disease in the [human body](#) ... which bears so strong a resemblance to the smallpox that I think it highly probably it may be the source of the disease.'

A slightly different virus causes cowpox than smallpox, but Jenner's approach would prove successful, leading to development of the first vaccine (from the Latin *vaca* for "cow"). Unable to experiment on himself because he'd already taken the Chinese vaccine, Jenner instead tried his first vaccine on 8-year-old James Phipps. On May 14, 1796, he dipped a needle in pus oozing from a small sore on a milkmaid named Sarah Nelmes, then scratched the boy's arm with it.

Young James survived, and the smallpox vaccine was born. Eventually, the vaccine would completely eradicate the disease, although several nations maintain the virus in storage for research purposes."

Smallpox lesions had a characteristic central dimple, and if a person survived for awhile, the lesions grew together, covering the body. Instead of that horrific and painful disfigurement, I have a scar from my smallpox vaccine on my upper left arm. My kids didn't even need smallpox vaccines, for the last case in the US was in 1949, and the last in the world, in Somalia, in 1977, according to the [CDC](#).

The success of vaccine campaigns is a vivid reminder that, as President Obama said, science and reason matter. Can someone please invent a [vaccine](#) against willful ignorance? Stat.

*This story is republished courtesy of PLOS Blogs: [blogs.plos.org](https://blogs.plos.org).*

Provided by Public Library of Science

Citation: A necessary retelling of the smallpox vaccine story (2017, January 13) retrieved 2 May 2024 from <https://medicalxpress.com/news/2017-01-retelling-smallpox-vaccine-story.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.