A PLAIN-ENGLISH FACT CHECK

THE SHOT

How Vaccines Are Made, Approved and Watched



HISTORY · APPROVAL · SAFETY · CLAIMS

How Vaccines Are Tested and Monitored, and What the Records Show

ANDREW DOMINGUEZ

TRINFINITY Enterprises

The Shot

How Vaccines Are Made, Approved and Watched

A Fact Check Series Book

Andrew Dominguez

The Shot: How Vaccines Are Made, Approved and Watched

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Contact: andrew@trinfinityenterprises.com

Information cutoff: November 12, 2026. Facts, figures, laws, court cases and agency positions in this book are current as of that date. Many of them are changing. Check the sources in the notes for newer information.

This book is not medical advice. It explains how vaccines are made, approved, monitored and paid for, and what the records show about common claims. Decisions about your own vaccines or your child's vaccines should be made with your doctor or pharmacist.

Dollar amounts are nominal (not adjusted for inflation) unless the text says otherwise.

Every fact in this book has a footnote naming its source. Web addresses were checked on November 12, 2026. If a link has moved, the title and date in the note should help you find it.

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Introduction: How to Read This Book

The information in this book stops at November 12, 2026. Anything that happened after that date is not in here. Vaccine policy in the United States has changed many times since 2025, and it may change again soon after you read this. When a chapter talks about the present, it says so at the top and gives the date again.

I wrote this book for one reason. Most of us hear about vaccines in pieces: a headline, a post from a friend, a doctor's advice, a politician's speech. The pieces often disagree. I wanted one place where an everyday reader could see how vaccines are made, how they are approved, how their safety is watched, what has gone wrong, what has gone right, and what each side of today's debate actually says. Every fact in this book comes with a footnote that tells you where it came from, so you can check it yourself.

What this book is not

This book is not medical advice. It explains how the system works and what the records show. It does not tell you whether you or your child should get a particular shot. Your own doctor, nurse or pharmacist knows your health history. Please talk with them about your situation.

Where the facts come from

Not all sources are equal. I sorted every source into one of five tiers and leaned on the higher tiers first.

Tier	What it includes	How I use it
1. Primary and official	Food and Drug Administration (FDA) approval documents and labels; Centers for Disease Control and Prevention (CDC) data and reports; records of the Advisory Committee on Immunization Practices (ACIP); the Vaccine Adverse Event Reporting System (VAERS); compensation program data; laws; court rulings; announcements from the Department of Health and Human Services (HHS)	The main record of what happened and what the government said and did
2. Nonpartisan analysis	Congressional Research Service (CRS), Congressional	To explain laws and policy changes

Tier	What it includes	How I use it
	Budget Office (CBO), Government Accountability Office (GAO), inspectors general	
3. Scholarly	Peer-reviewed medical journals; National Academies reviews; the Cochrane Library; World Health Organization (WHO) reviews	For what studies found
4. Fact-checks and journalism	Associated Press, Reuters, PolitiFact, FactCheck.org and major newspapers	Only to point back to primary sources, or to show when something was reported
5. Advocacy groups	Groups that argue for a side, such as Children's Health Defense or the American Academy of Pediatrics	Only to show what a side argues, always labeled, and always balanced with the other side

One more word on Tier 1. Since 2025, some of the people running HHS and CDC hold views that were once found mostly outside government. So an official statement is not automatically the same as settled science anymore, if it ever was. In this book, an HHS or CDC statement is cited as the record of what the government said and did. The evidence behind it is shown separately, so you can judge both.

Three kinds of statements

You might ask, "How do I know what is fact and what is opinion?" I try to keep three things apart:

- **Confirmed facts.** Something a primary source shows, such as a case count or the text of a law.
- **Interpretations.** What someone concludes from the facts. I say whose interpretation it is and give the source.
- **Unknowns.** Things the evidence cannot yet answer. I say so plainly.

When I could not find a source for something, I wrote **[Not verified]** and said what I searched. I would rather leave a gap than fill it with a guess.

The four verdicts

Part Six tests common claims about vaccines, from every side. Each claim gets one of four verdicts:

Verdict	Meaning
True	Primary sources confirm it as usually stated
Partly true	There is a real fact underneath, but the usual version leaves out or twists something important
False (debunked)	Primary sources contradict it
Inconclusive	The evidence is not enough to say either way, or an investigation is still open

Numbers and money

Numbers in this book come with their dates. Disease counts change every week during an outbreak, so I give the "as of" date for each one. Dollar amounts are nominal, meaning the actual dollars paid at the time, unless I say they were adjusted for inflation and to which year.

A word on tone

People on every side of this debate love their children and want them safe. Parents who skip a vaccine and parents who get every one are usually trying to do the same thing. I have tried to treat every person, party, agency and group by the same standard: what they actually said and did, with a source, whether it makes them look good or not. Where the evidence clearly points one way, I say so. Where it does not, I say that too.

Let's start at the beginning, with a disease that killed three out of every ten people who caught it.

Part One: The History

Chapter 1: Smallpox and the First Vaccine

Before there were vaccines, there was smallpox. CDC says the disease goes back at least 3,000 years, based on smallpox-like rashes found on Egyptian mummies.[1] On average, 3 out of every 10 people who caught it died. Many who lived were left with scars, some of them severe.[2]

Variolation: the risky first step

People found a way to fight back long before anyone knew what a virus was. The method was called variolation. A person who had never had smallpox was exposed on purpose to material from a smallpox sore, either scratched into the arm or breathed in through the nose. They usually got sick, but fewer of them died than when people caught smallpox the natural way.[3]

Variolation came to colonial Boston during an epidemic in 1721. The minister Cotton Mather learned about it from Onesimus, an enslaved West African man in his household, who described the "Operation" and showed Mather his scar.[4] Mather persuaded a Boston doctor, Zabdiel Boylston, to try it.[5] Harvard's Houghton Library reports that of the 242 people Boylston inoculated, six died, about one in 40. Across the city, close to 850 people died, about one in seven of everyone who was infected.[6] The National Park Service gives the rates as about 14 percent for natural smallpox and about 2 percent for the inoculated.[7] The two sources round slightly differently (six of 242 is about 2.5 percent), but they agree on the big picture: the planned infection was far less deadly than the natural one.

Variolation also shows up in the founding of the country. The National Park Service says George Washington mandated inoculation for all Continental soldiers in 1777, and calls it "the first medical mandate in American history."[8]

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[1] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[2] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[3] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[4] Peter X. Accardo, Houghton Library, Harvard University, *Three Bostonians and the Smallpox Epidemic of 1721*, June 4, 2020, https://sites.harvard.edu/houghton-library/2020/06/04/three-bostonians-and-the-smallpox-epidemic-of-1721 (accessed November 12, 2026).

[5] National Park Service, *Smallpox, Inoculation, and the Revolutionary War*, updated January 16, 2025, https://www.nps.gov/articles/000/smallpox-inoculation-revolutionary-war.htm (accessed November 12, 2026).

[6] Peter X. Accardo, Houghton Library, Harvard University, *Three Bostonians and the Smallpox Epidemic of 1721*, June 4, 2020, https://sites.harvard.edu/houghton-library/2020/06/04/three-bostonians-and-the-smallpox-epidemic-of-1721 (accessed November 12, 2026).

[7] National Park Service, *Smallpox, Inoculation, and the Revolutionary War*, updated January 16, 2025, https://www.nps.gov/articles/000/smallpox-inoculation-revolutionary-war.htm (accessed November 12, 2026).

[8] National Park Service, *Smallpox, Inoculation, and the Revolutionary War*, updated January 16, 2025, https://www.nps.gov/articles/000/smallpox-inoculation-revolutionary-war.htm (accessed November 12, 2026).

You might ask, "If variolation worked, why did we need anything else?" Because it was still a real smallpox infection. Some people died from it, and they could spread smallpox to others while they were sick.

Jenner and the cowpox idea

In 1796 an English doctor named Edward Jenner noticed that milkmaids who had caught cowpox, a mild disease from cows, seemed to be protected from smallpox. He took material from a cowpox sore on the hand of a milkmaid, Sarah Nelmes, and put it into the arm of James Phipps, the 8-year-old son of his gardener. Months later Jenner exposed the boy to smallpox several times. Phipps never got sick.[9]

That was the start of vaccination. The word itself comes from the Latin *vacca*, meaning cow. Jenner published his findings, and in an 1801 work he wrote that "the annihilation of the smallpox, the most dreadful scourge of the human species, must be the final result of this practice."[10] Vaccination slowly replaced variolation. Sometime in the 1800s, the virus used in the vaccine changed from cowpox to a related virus called vaccinia.[11]

Wiping smallpox off the earth

It took almost 200 years for Jenner's hope to come true. Smallpox was eliminated in North America in 1952 and in Europe in 1953.[12] The World Health Organization (WHO) started a worldwide eradication plan in 1959, but it ran short of money, staff and vaccine. In 1967 an Intensified Eradication Program began. It used better freeze-dried vaccine, a simple two-pronged (bifurcated) needle, case tracking, and mass vaccination.[13]

The last person to catch the severe form of smallpox naturally was a 3-year-old girl in Bangladesh, Rahima Banu, in 1975. The last natural case of any kind was Ali Maow Maalin, a hospital cook in Somalia, in 1977. He recovered.[14] The last person to die of smallpox was Janet Parker, a medical photographer in Birmingham, England, who was infected in 1978, likely from a laboratory in the building where she worked.[15]

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[9] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[10] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[11] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[12] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[13] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[14] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[15] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

On May 8, 1980, the World Health Assembly declared the world free of smallpox.[16] It is still the only human disease ever eradicated. Today only two labs officially keep the virus under WHO supervision: CDC in Atlanta and the VECTOR Institute in Russia.[17]

What this chapter shows: The idea of training the body to fight a disease is older than the United States. From the start, it came with both real benefits and real risks, and people weighed one against the other.

[16] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[17] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

Chapter 2: Polio and the Cutter Incident

If you were a parent in the early 1950s, summer was the season you feared. Polio came in waves each summer and fall, and it could paralyze a healthy child in days.[18]

Why polio got worse as cities got cleaner

Here is a strange fact. Polio became a bigger problem as sanitation improved. CDC explains that before the 1700s, polioviruses probably circulated so widely that babies caught them early, while they were still protected by antibodies from their mothers. Cleaner water and better sanitation in the 1900s meant children caught the virus later, without that protection. The result was large epidemics with many deaths.[19]

In 1952, more than 21,000 cases of paralytic polio were reported in the United States.[20]

The biggest medical trial of its time

Jonas Salk developed a vaccine made from polio virus that had been killed (inactivated) with formaldehyde.[21] In 1954 it was tested in a national field trial of about 1.8 million children, who came to be called "Polio Pioneers."[22,23] Some children got the vaccine and some got a placebo (a look-alike shot with no vaccine in it), and in other areas children were simply observed for comparison.[24,25]

On April 12, 1955, Dr. Thomas Francis Jr. of the University of Michigan announced the results in Ann Arbor. The press release from that day said the vaccine was "up to 80-90 percent effective

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[18] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[19] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[20] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[21] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[22] Peter Salk, Smithsonian magazine, *When the Fear of Polio Gripped the World, Jonas Salk's Determination Led to a Liberating Medical Breakthrough*, Summer 2026, https://www.smithsonianmag.com/innovation/when-fear-polio-gripped-world-jonas-salk-determination-led-liberating-medical-breakthrough-180988798/ (accessed November 12, 2026).

[23] University of Michigan School of Public Health, *1955 Polio Vaccine Trial Announcement (reproduces the April 12, 1955 press release)*, April 12, 1955 (release), https://sph.umich.edu/polio/ (accessed November 12, 2026).

[24] Peter Salk, Smithsonian magazine, *When the Fear of Polio Gripped the World, Jonas Salk's Determination Led to a Liberating Medical Breakthrough*, Summer 2026, https://www.smithsonianmag.com/innovation/when-fear-polio-gripped-world-jonas-salk-determination-led-liberating-medical-breakthrough-180988798/ (accessed November 12, 2026).

[25] University of Michigan School of Public Health, *1955 Polio Vaccine Trial Announcement (reproduces the April 12, 1955 press release)*, April 12, 1955 (release), https://sph.umich.edu/polio/ (accessed November 12, 2026).

in preventing paralytic polio."[26] In the placebo areas, 428 of 749,236 children got polio. The release also reported that only 0.4 percent of vaccinated children had minor reactions.[27]

The Cutter Incident

Almost right away, something went wrong. In 1955, some batches of polio vaccine made by one company, Cutter Laboratories, contained live polio virus even though they had passed the required safety tests. CDC says more than 250 cases of polio were linked to Cutter's vaccine, many with paralysis. The vaccine was recalled as soon as the cases were found.[28]

Other histories give more detailed counts of how many children got the bad lots, how many were paralyzed and how many died. I could not open those sources directly to check their numbers, so I am only reporting CDC's figure here. **[Not verified: detailed Cutter counts. I searched PubMed and PubMed Central for Paul Offit's 2005 New England Journal of Medicine article "The Cutter Incident, 50 Years Later," the FDA history pages, and the History of Vaccines site, but could not load them.]**

What matters most is what came next. CDC calls the Cutter Incident "a defining moment in the history of vaccine manufacturing and government oversight of vaccines." The government tightened its oversight, and polio vaccination started again in the fall of 1955.[29] CDC also notes that at the time there was no system to pay people who were harmed by a vaccine.[30] That gap comes back in Part Four.

A second problem surfaced later. From 1955 to 1963, an estimated 10 to 30 percent of polio vaccine doses given in the United States were contaminated with a monkey virus called simian virus 40 (SV40), which came from the monkey kidney cells used to grow the vaccine. CDC says most studies have found no causal link between those doses and cancer, and no vaccine used today contains SV40.[31] This is still raised today, so it is worth knowing that the contamination itself was real.

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[26] University of Michigan School of Public Health, *1955 Polio Vaccine Trial Announcement (reproduces the April 12, 1955 press release)*, April 12, 1955 (release), https://sph.umich.edu/polio/ (accessed November 12, 2026).

[27] University of Michigan School of Public Health, *1955 Polio Vaccine Trial Announcement (reproduces the April 12, 1955 press release)*, April 12, 1955 (release), https://sph.umich.edu/polio/ (accessed November 12, 2026).

[28] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[29] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[30] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[31] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

The oral vaccine and the end of wild polio here

Albert Sabin developed a second kind of polio vaccine, given by mouth, made with live but weakened virus. Oral polio vaccine (OPV) was licensed in stages in 1961, 1962 and 1963.[32]

The numbers fell fast. From more than 21,000 paralytic cases in 1952, there were 2,525 in 1960 and 61 in 1965.[33] The last cases of polio spread by wild virus inside the United States happened in 1979, in Amish communities in several Midwestern states, after the virus was brought in from the Netherlands.[34]

But the oral vaccine had a rare, serious side effect. Because it used live virus, in rare cases it caused paralysis itself. From 1980 to 1999, 162 cases of paralytic polio were confirmed in the United States, and 154 of them (95 percent) were vaccine-associated paralytic polio caused by the oral vaccine's virus.[35] To end that risk, ACIP recommended in 2000 that the United States use only the injected, inactivated vaccine. The last case of vaccine-associated polio acquired in the United States was reported in 1999.[36]

You might ask, "So the vaccine caused polio?" Yes, in rare cases the oral vaccine did, and CDC says so plainly. Once wild polio was gone from the country, the small risk from the oral vaccine was larger than the risk from the disease, so the country switched. That is an example of a vaccine policy changing because of a confirmed side effect.

Polio in the world

Worldwide, CDC reports that polio paralyzed an estimated 350,000 people a year in more than 125 countries in 1988, when the World Health Assembly set the goal of global eradication. By 2019 there were 125 cases caused by wild poliovirus, a drop of more than 99 percent, and wild polio was endemic in only two countries.[37] Two of the three types of wild poliovirus were declared eradicated, type 2 in 2015 and type 3 in 2019.[38]

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[32] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[33] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[34] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[35] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[36] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[37] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[38] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

There is a twist that critics and supporters of vaccines both point to. The oral polio vaccine uses live, weakened virus, and on rare occasions that virus can change back into a form that spreads and paralyzes like wild polio. These are called vaccine-derived polioviruses (VDPVs). The Pink Book says weak routine vaccination and poor campaigns led to a re-emergence of type 2 VDPV in 2019, in places still using the oral vaccine.[39] The United States stopped using the oral vaccine in 2000, but that does not make Americans who skip the shot safe. In 2005, a circulating VDPV was found in several unvaccinated children in Minnesota, without causing paralysis.[40]

Then, in June 2022, an unvaccinated young adult in Rockland County, New York, was hospitalized with weakness in both legs. Tests found vaccine-derived poliovirus type 2. The patient had not traveled abroad, and the virus's genetic changes suggested it had been spreading somewhere for up to a year. Related virus turned up in 21 of 260 wastewater samples from Rockland and neighboring Orange County, including samples collected weeks before the patient got sick. CDC called it only the second community spread of poliovirus found in the United States since 1979. Polio vaccine coverage among children under 2 in Rockland County had fallen from 67.0 percent in July 2020 to 60.3 percent by August 2022, and was as low as 37.3 percent in some zip codes.[41]

That case cuts both ways. CDC said the exact origin was unknown, but that the finding pointed to a chain of spread inside the United States that began with "a person who received a type 2-containing oral polio vaccine (OPV) abroad."[42] It paralyzed a person who had not received the inactivated shot that would have protected them. CDC's conclusion was that unvaccinated people in the United States "remain at risk for paralytic poliomyelitis if they are exposed to either wild or vaccine-derived poliovirus."[43]

The Pink Book also notes a long shadow for survivors of the old epidemics: 15 to 40 years after paralytic polio in childhood, 25 to 40 percent of survivors develop new muscle pain and worsening weakness, known as post-polio syndrome.[44]

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[39] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[40] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[41] Link-Gelles R, Lutterloh E, Schnabel Ruppert P, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(33):1065-1068, *Public Health Response to a Case of Paralytic Poliomyelitis in an Unvaccinated Person and Detection of Poliovirus in Wastewater, New York, June-August 2022*, August 19, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7133e2.htm (accessed November 12, 2026).

[42] Link-Gelles R, Lutterloh E, Schnabel Ruppert P, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(33):1065-1068, *Public Health Response to a Case of Paralytic Poliomyelitis in an Unvaccinated Person and Detection of Poliovirus in Wastewater, New York, June-August 2022*, August 19, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7133e2.htm (accessed November 12, 2026).

[43] Link-Gelles R, Lutterloh E, Schnabel Ruppert P, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(33):1065-1068, *Public Health Response to a Case of Paralytic Poliomyelitis in an Unvaccinated Person and Detection of Poliovirus in Wastewater, New York, June-August 2022*, August 19, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7133e2.htm (accessed November 12, 2026).

[44] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

Chapter 3: Measles, Whooping Cough and the Rest

Smallpox and polio get the headlines, but most of the vaccines on a child's schedule target diseases that were once so common almost everyone caught them.

Measles

Before a vaccine, measles was nearly universal. CDC says more than half of people had measles by age 6 and more than 90 percent by age 15.[45] Before 1963, about 500,000 cases and 500 deaths were reported each year, but CDC estimates the true number of cases was 3 to 4 million a year, since many were never reported.[46]

Is measles just a rash? No. About 30 percent of reported measles cases in the United States from 1987 to 2000 had one or more complications, including diarrhea, ear infections, pneumonia, brain swelling (encephalitis), a rare fatal brain disease years later called subacute sclerosing panencephalitis, and death.[47] Complications were most common in children under 5 and in adults.[48]

The first measles vaccines were licensed in 1963. In the following years, measles cases dropped by more than 95 percent.[49] The combined measles, mumps and rubella (MMR) vaccine was licensed in 1971.[50]

The vaccine was not perfect. From 1985 through 1988, 68 percent of measles cases in school-age children were in children who had gotten one dose as recommended. That led to a

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[45] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[46] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[47] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[48] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[49] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[50] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

recommendation for a second dose in 1989.[51] Measles was declared eliminated from the United States in 2000, meaning it no longer spread here year-round.[52] CDC also notes that among reported cases each year before the vaccine, an estimated 400 to 500 people died, 48,000 were hospitalized and 1,000 had encephalitis.[53] Chapter 16 covers what has happened since 2000.

Whooping cough (pertussis)

From 1940 through 1945, more than 1 million cases of whooping cough were reported, an average of 175,000 a year.[54] A whole-cell pertussis vaccine came into use in the 1940s, and by 1980 to 1990 the average was about 2,900 reported cases a year.[55]

Whooping cough has come back partway. In 2012, 48,277 cases were reported, the most since the mid-1950s.[56] CDC says several things likely contributed, including better testing and reporting, but that waning protection from the newer acellular vaccines, which replaced the whole-cell vaccine in the 1990s, is thought to play a key role.[57] That is a real weakness of the current vaccine, and CDC states it openly.

Diphtheria

In the 1920s, 100,000 to 200,000 cases of diphtheria and 13,000 to 15,000 deaths were reported each year in the United States.[58] Vaccines arrived in the 1940s. From 1996 through 2018, only 14 cases were reported in the whole country.[59]

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[51] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[52] Centers for Disease Control and Prevention, *History of Measles*, April 29, 2026, https://www.cdc.gov/measles/about/history.html (accessed November 12, 2026).

[53] Centers for Disease Control and Prevention, *History of Measles*, April 29, 2026, https://www.cdc.gov/measles/about/history.html (accessed November 12, 2026).

[54] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[55] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[56] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[57] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[58] Centers for Disease Control and Prevention, *Pink Book, Chapter 7: Diphtheria*, updated April 8, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-7-diphtheria.html (accessed November 12, 2026).

[59] Centers for Disease Control and Prevention, *Pink Book, Chapter 7: Diphtheria*, updated April 8, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-7-diphtheria.html (accessed November 12, 2026).

Rubella (German measles)

Rubella is usually mild for children, but it is dangerous for unborn babies. In 1941 an Australian eye doctor, Norman Gregg, reported cataracts in babies born to mothers who had rubella while pregnant.[60] This is now called congenital rubella syndrome. A rubella vaccine was introduced in 1969, and endemic rubella was declared eliminated in the United States in 2004.[61]

Hib

Before a vaccine, *Haemophilus influenzae* type b (Hib), a bacterium that can cause meningitis in young children, caused an estimated 20,000 cases a year in the early 1980s, mostly in children under 5.[62] The first effective (conjugate) Hib vaccine was licensed in 1987. CDC says Hib disease has declined 99 percent since the pre-vaccine era.[63]

Tetanus and mumps

Tetanus is different from every other disease in this chapter. It does not spread from person to person. The germ lives in soil and enters through wounds. That means no one is protected by other people's vaccines; the only protection is your own. Before the vaccine, the United States reported 500 to 600 cases a year. Since the mid-1970s it has been about 50 to 100 a year, and in recent years about 11 percent of reported cases have been fatal.[64]

Mumps vaccine was licensed in 1971 as part of MMR.[65] About 152,000 cases were reported in 1968. After the two-dose MMR schedule began in 1989, cases fell from about 5,700 that year to fewer than 300 in 2004, a drop of more than 99 percent overall from before the vaccine.[66] Mumps is usually mild, but in the years before the vaccine, inflammation of the ovaries or

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[60] Centers for Disease Control and Prevention, *Pink Book, Chapter 20: Rubella*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-20-rubella.html (accessed November 12, 2026).

[61] Centers for Disease Control and Prevention, *Pink Book, Chapter 20: Rubella*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-20-rubella.html (accessed November 12, 2026).

[62] Centers for Disease Control and Prevention, *Pink Book, Chapter 8: Haemophilus influenzae*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-8-haemophilus-influenzae.html (accessed November 12, 2026).

[63] Centers for Disease Control and Prevention, *Pink Book, Chapter 8: Haemophilus influenzae*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-8-haemophilus-influenzae.html (accessed November 12, 2026).

[64] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 21: Tetanus*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-21-tetanus.html (accessed November 12, 2026).

[65] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

[66] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

breasts was reported in 7 percent and 30 percent of women past puberty who got it.[67] Since 2006, mumps outbreaks have come back in close-contact settings such as schools, universities and sports teams, many of them among fully vaccinated people.[68] That is one of the clearer examples of a vaccine that works well but not perfectly.

The newer vaccines

Many of the vaccines on today's childhood schedule came after 1980. Each was added after its own trials and its own ACIP vote. Here is a short history of each, with what the disease did before the vaccine. These are also the vaccines at the center of the 2025 and 2026 changes you will read about in Chapter 14, so it helps to know what each one protects against.

Hepatitis B (licensed 1981). Hepatitis B is a virus that attacks the liver. It spreads through blood and body fluids, and a mother can pass it to her baby at birth. Age matters a great deal: as many as 90 percent of infants infected at birth or in infancy develop lifelong (chronic) infection, compared with about 5 percent of adults. About 25 percent of people infected as children will die early from cirrhosis or liver cancer.[69] The first vaccine, made from blood plasma, was licensed in 1981. It was replaced in 1986 by a vaccine made with recombinant DNA technology, which uses yeast cells to produce the virus's surface protein.[70] Reported acute infections fell about 90 percent, from 9.6 per 100,000 people in 1982 to 1.0 in 2018.[71]

You might ask, "Why give it to newborns at all, if the mother tests negative?" The answer given for decades was that tests can miss infections, records can be wrong, and babies can be exposed by others in the household. Infection at that age is the most likely to become lifelong. Critics answer that a newborn of a mother who tests negative has a very low risk, and that the decision should be up to the family. That disagreement is exactly what the December 2025 ACIP vote was about (Chapter 14).

Hepatitis A (licensed 1995). Hepatitis A spreads mainly through contaminated food, water or close contact. Before the vaccine, it came in large nationwide waves every 10 to 15 years, and children 2 to 18 had the highest rates. From 1987 to 1997, 11 mostly western states, including

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[67] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

[68] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

[69] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 10: Hepatitis B*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-10-hepatitis-b.html (accessed November 12, 2026).

[70] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 10: Hepatitis B*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-10-hepatitis-b.html (accessed November 12, 2026).

[71] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 10: Hepatitis B*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-10-hepatitis-b.html (accessed November 12, 2026).

Nevada, had half of all reported cases while holding only 22 percent of the population.[72] Cases fell more than 95 percent from 1996 to 2011, but the disease came back after 2016 in large outbreaks among people who use drugs or are homeless, with more than 37,000 outbreak cases from 2016 to 2021.[73]

Chickenpox, or varicella (licensed 1995). Before the vaccine, nearly everyone caught chickenpox, about 4 million people a year, and about 10,500 needed a hospital each year.[74] Since the vaccine program began in 1995, hospitalizations and deaths from chickenpox have fallen 93 percent and 94 percent.[75] Cases also dropped in infants too young for the vaccine, a sign that vaccinating others protected them.[76]

Pneumococcal disease (first vaccine 1977; first for infants 2000). This bacterium causes ear infections, pneumonia, blood infections and meningitis. The first conjugate vaccine, which works well in babies, came in 2000. Since the 13-type version arrived in 2010, invasive disease from the types it covers has fallen 90 percent in children, and antibiotic-resistant infections have fallen as well.[77]

Rotavirus (2006 and 2008, after a failed first try). Rotavirus causes severe diarrhea and vomiting in babies. Before the vaccine, nearly every child caught it by age 5, with an estimated 2.7 million cases a year in the United States. The first vaccine, licensed in 1998, was withdrawn in 1999 because it caused intussusception, a dangerous folding of the bowel (Chapter 8). Newer vaccines were licensed in 2006 and 2008. CDC estimates they prevent about 280,000 clinic visits, 62,000 emergency room visits and 45,000 hospitalizations a year.[78]

Meningococcal disease. This bacterial infection can kill a healthy teenager within a day. Even with antibiotics, 10 to 15 percent of people who get it die, and up to 20 percent of survivors

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[72] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 9: Hepatitis A*, updated May 21, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-9-hepatitis-a.html (accessed November 12, 2026).

[73] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 9: Hepatitis A*, updated May 21, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-9-hepatitis-a.html (accessed November 12, 2026).

[74] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 22: Varicella*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-22-varicella.html (accessed November 12, 2026).

[75] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 22: Varicella*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-22-varicella.html (accessed November 12, 2026).

[76] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 22: Varicella*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-22-varicella.html (accessed November 12, 2026).

[77] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 17: Pneumococcal Disease*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-17-pneumococcal-disease.html (accessed November 12, 2026).

[78] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 19: Rotavirus*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-19-rotavirus.html (accessed November 12, 2026).

are left with hearing loss, brain damage or a lost limb.[79] It is also rare: 329 cases were reported in the whole country in 2018.[80] That combination, rare but devastating, is why reasonable people argue about whether every teenager needs the vaccine.

HPV (licensed 2006). Human papillomavirus is the most common sexually transmitted infection in the United States. Before the vaccine, about 79 million Americans were infected, with about 14 million new infections a year. It causes about 44,000 cancers a year, including cervical, anal and genital cancers and cancers of the back of the throat, in both women and men.[81] Within 10 years of the vaccine, infection with the main cancer-causing types fell 86 percent among girls aged 14 to 19.[82] The usual schedule has been two doses if started before age 15. The 2026 federal schedule cut that to one dose (Chapter 14).

Influenza. Flu is not one vaccine but a new one every year, because the virus changes. CDC says flu causes more hospitalizations among young children than any other vaccine-preventable disease, between 7,000 and 26,000 a year in children under 5 since 2010. The 2019-2020 season set a record for a regular season with 189 reported child deaths.[83]

The before-and-after table

CDC keeps a table that compares how common each disease was in the 1900s with how common it is now. The 1900s figures come from a 2007 study in the *Journal of the American Medical Association* (JAMA) by Sandra Roush and Trudy Murphy.[84,85]

Table 3.1. Reported cases per year, 20th century compared with 2025 (CDC figures, slide dated February 25, 2026)

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[79] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 14: Meningococcal Disease*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-14-meningococcal-disease.html (accessed November 12, 2026).

[80] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 14: Meningococcal Disease*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-14-meningococcal-disease.html (accessed November 12, 2026).

[81] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 11: Human Papillomavirus*, updated April 23, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-11-human-papillomavirus.html (accessed November 12, 2026).

[82] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 11: Human Papillomavirus*, updated April 23, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-11-human-papillomavirus.html (accessed November 12, 2026).

[83] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 12: Influenza*, updated April 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-12-influenza.html (accessed November 12, 2026).

[84] Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, *Comparison of 20th Century Annual Morbidity and Current Morbidity: Vaccine-Preventable Diseases (slide)*, February 25, 2026, https://www.cdc.gov/ncird-surveillance/media/VPD-morbidity-slide1-mmwr-508.pdf (accessed November 12, 2026).

[85] Roush SW, Murphy TV, and the Vaccine-Preventable Disease Table Working Group, *Historical Comparisons of Morbidity and Mortality for Vaccine-Preventable Diseases in the United States, JAMA 298(18):2155-2163*, 2007, https://pubmed.ncbi.nlm.nih.gov/18000199/ (accessed November 12, 2026).

Disease	20th century annual cases	2025 reported cases	Decrease
Smallpox	29,005	0	100%
Diphtheria	21,053	0	100%
Measles	530,217	1,975	more than 99%
Mumps	162,344	336	more than 99%
Pertussis	200,752	28,132	86%
Polio (paralytic)	16,316	0	100%
Rubella	47,745	0	100%
Congenital rubella syndrome	152	1	99%
Tetanus	580	37	94%
Hib (children under 5)	20,000	21	more than 99%

Source: CDC, National Center for Immunization and Respiratory Diseases.[86] The 2025 column uses provisional weekly data through December 27, 2025.

A note on that measles number. This table shows 1,975 measles cases for 2025, but CDC's measles page, updated later, reports 2,289 confirmed cases for the full year 2025.[87] The difference comes from timing: the table used early weekly reports, and more cases were confirmed afterward. I use the later, higher figure everywhere else in this book.

CDC keeps a second table for diseases where it compares estimates rather than reported cases.

Table 3.2. Estimated cases per year, pre-vaccine era compared with a recent estimate (CDC figures, slide dated March 20, 2024)

Disease	Pre-vaccine era estimate	Recent estimate (2022 unless noted)	Decrease
Hepatitis A	117,333	11,500	90%
Hepatitis B (acute)	66,232	13,300	80%

[86] Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, *Comparison of 20th Century Annual Morbidity and Current Morbidity: Vaccine-Preventable Diseases (slide)*, February 25, 2026, https://www.cdc.gov/ncird-surveillance/media/VPD-morbidity-slide1-mmwr-508.pdf (accessed November 12, 2026).

[87] Centers for Disease Control and Prevention, *Measles Cases and Outbreaks*, data as of November 5, 2026, https://www.cdc.gov/measles/data-research/index.html (accessed November 12, 2026).

Disease	Pre-vaccine era estimate	Recent estimate (2022 unless noted)	Decrease
Invasive pneumococcal disease, all ages	63,067	17,400	72%
Invasive pneumococcal disease, under age 5	16,069	900	94%
Rotavirus hospitalizations, under age 3	62,500	18,400	71%
Chickenpox (varicella)	4,085,120	34,238	99%

Source: CDC, National Center for Immunization and Respiratory Diseases.[88]

You might ask, "Couldn't better sanitation and nutrition explain these drops?" It is a fair question, and better living conditions did help with many diseases. But notice the timing. Each big drop in Table 3.1 follows the year its vaccine came in: measles after 1963, Hib after 1987, rubella after 1969. And polio got *worse* as sanitation improved, until the vaccine arrived.[89] The pattern points to the vaccines, not just cleaner living.

The other reasons people stopped dying of infections

That answer about timing is true, but it is not the whole story, and I would be giving you only one side if I stopped there. CDC itself, looking back at the 20th century in 1999, gave credit to three things together: "improvements in sanitation and hygiene, the discovery of antibiotics, and the implementation of universal childhood vaccination programs."[90]

The scale of the change was enormous. In 1900, 30.4 percent of all deaths in the United States were children under 5. By 1997 that share was 1.4 percent.[91] In 1900 the three leading causes of

[88] Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, *Comparison of Pre-Vaccine Era Estimated Annual Morbidity with Current Estimate (slide)*, March 20, 2024, https://www.cdc.gov/ncird-surveillance/media/VPD-morbidity-slide2-mmwr-508.pdf (accessed November 12, 2026).

[89] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[90] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(29):621-629, *Achievements in Public Health, 1900-1999: Control of Infectious Diseases*, July 30, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm (accessed November 12, 2026).

[91] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(29):621-629, *Achievements in Public Health, 1900-1999: Control of Infectious Diseases*, July 30, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm (accessed November 12, 2026).

death were pneumonia, tuberculosis (TB), and diarrhea and enteritis, which together with diphtheria caused one third of all deaths.[92] Life expectancy rose by 29.2 years over the century.[93]

Much of that early progress came before most of today's vaccines existed:

- **Clean water and sewers.** Chlorination and other treatment of drinking water began in the early 1900s and became widespread, cutting waterborne diseases. By 1900, 40 of the 45 states had health departments.[94]
- **Better housing.** TB deaths fell from 194 per 100,000 people in 1900 to 46 per 100,000 by 1940, before antibiotics, as crowding eased and TB control programs began.[95]
- **Antibiotics.** Penicillin became widely available in the 1940s. Streptomycin, isolated in 1943, was the first antibiotic that worked against TB, and TB deaths fell from 39.9 to 9.1 per 100,000 between 1945 and 1955.[96]
- **Pest and animal control.** Malaria, once common in the Southeast, was brought to very low levels by the late 1940s, with mosquito control playing an important role.[97]

Where did vaccines fit? The same CDC report says vaccination campaigns "have virtually eliminated" diphtheria, tetanus, polio, smallpox, measles, mumps, rubella and Hib meningitis in the United States.[98] It also traces how the government's role grew. After the combined diphtheria, tetanus and pertussis vaccine was licensed in 1949, state and local health departments began programs aimed mainly at poor children. (CDC's pertussis page dates the start of wide DTP use to 1948.[99]) The Salk polio vaccine in 1955 led to federal funding for state

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[92] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(29):621-629, *Achievements in Public Health, 1900-1999: Control of Infectious Diseases*, July 30, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm (accessed November 12, 2026).

[93] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(29):621-629, *Achievements in Public Health, 1900-1999: Control of Infectious Diseases*, July 30, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm (accessed November 12, 2026).

[94] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(29):621-629, *Achievements in Public Health, 1900-1999: Control of Infectious Diseases*, July 30, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm (accessed November 12, 2026).

[95] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(29):621-629, *Achievements in Public Health, 1900-1999: Control of Infectious Diseases*, July 30, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm (accessed November 12, 2026).

[96] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(29):621-629, *Achievements in Public Health, 1900-1999: Control of Infectious Diseases*, July 30, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm (accessed November 12, 2026).

[97] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(29):621-629, *Achievements in Public Health, 1900-1999: Control of Infectious Diseases*, July 30, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm (accessed November 12, 2026).

[98] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(29):621-629, *Achievements in Public Health, 1900-1999: Control of Infectious Diseases*, July 30, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm (accessed November 12, 2026).

[99] Centers for Disease Control and Prevention, *Pertussis Surveillance and Trends*, October 27, 2026, https://www.cdc.gov/pertussis/php/surveillance/index.html (accessed November 12, 2026).

and local childhood vaccination. And the Vaccination Assistance Act of 1962 set up a federally coordinated program that, CDC wrote in 1999, "has been renewed continuously."[100]

So the fair way to say it is this. Cleaner water, better housing and antibiotics did most of the work against TB, cholera, typhoid and diarrheal disease, for which we had no routine childhood vaccines. For the specific diseases in Table 3.1, the sharp drops line up with the arrival of each vaccine, and polio actually got worse as sanitation improved. Both things are true at once. People on each side of the vaccine debate tend to quote only half of that sentence.

What the vaccines prevented: one estimate

How many illnesses and deaths did the childhood vaccines prevent? No one can count events that did not happen, so the answer has to come from a model. The best-known one is from CDC. In August 2024, CDC researchers estimated that for about 117 million children born from 1994 through 2023, nine routine childhood vaccines will have prevented about 508 million cases of illness, 32 million hospitalizations and 1,129,000 deaths over those children's lifetimes.[101] The largest numbers came from measles (about 13.2 million hospitalizations prevented) and diphtheria (about 752,800 deaths prevented).[102] The study also estimated net savings of $540 billion in direct costs (nominal dollars).[103]

You should know how that number was built. The model starts from how common each disease was before its vaccine and compares that with what surveillance shows now.[104] The authors list limits that cut both ways. Leaving out flu, COVID-19 and RSV shots may make the benefit look smaller than it is. But they also write that for some diseases, things other than vaccines, such as hygiene, "might have contributed to lower disease risks," and "if such reductions were

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[100] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(29):621-629, *Achievements in Public Health, 1900-1999: Control of Infectious Diseases*, July 30, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm (accessed November 12, 2026).

[101] Fangjun Zhou, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 73(31):682-685, *Health and Economic Benefits of Routine Childhood Immunizations in the Era of the Vaccines for Children Program, United States, 1994-2023*, August 8, 2024, https://www.cdc.gov/mmwr/volumes/73/wr/mm7331a2.htm (accessed November 12, 2026).

[102] Fangjun Zhou, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 73(31):682-685, *Health and Economic Benefits of Routine Childhood Immunizations in the Era of the Vaccines for Children Program, United States, 1994-2023*, August 8, 2024, https://www.cdc.gov/mmwr/volumes/73/wr/mm7331a2.htm (accessed November 12, 2026).

[103] Fangjun Zhou, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 73(31):682-685, *Health and Economic Benefits of Routine Childhood Immunizations in the Era of the Vaccines for Children Program, United States, 1994-2023*, August 8, 2024, https://www.cdc.gov/mmwr/volumes/73/wr/mm7331a2.htm (accessed November 12, 2026).

[104] Fangjun Zhou, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 73(31):682-685, *Health and Economic Benefits of Routine Childhood Immunizations in the Era of the Vaccines for Children Program, United States, 1994-2023*, August 8, 2024, https://www.cdc.gov/mmwr/volumes/73/wr/mm7331a2.htm (accessed November 12, 2026).

substantial, the model would overestimate" what the vaccines prevented.[105] So treat 1.1 million deaths as an informed estimate from the agency that runs the program, not a head count.

CDC has run this kind of model before, and the earlier results point the same way. A 2014 CDC report looked at the 78.6 million children born from 1994 through 2013. It estimated that routine childhood vaccination would prevent 322 million illnesses, 21 million hospitalizations and 732,000 early deaths over those children's lifetimes, with net savings of $295 billion in direct costs and $1.38 trillion in total costs to society (2013 dollars).[106] Illnesses prevented ranged from 3,000 for tetanus to more than 70 million for measles.[107] That model left out flu and hepatitis A vaccines.[108] A 2011 CDC review gave a per-year view: vaccinating one year's worth of U.S. babies on the schedule of that time prevented about 42,000 deaths and 20 million cases of disease, with net savings of nearly $14 billion in direct costs.[109]

The same 2011 review named the vaccines added in the 2000s: rotavirus, a four-strain meningococcal vaccine, shingles, pneumococcal conjugate, HPV, and a Tdap booster for teens and adults. That brought the number of diseases targeted by U.S. vaccine policy to 17.[110] CDC credited the pneumococcal conjugate vaccine with preventing an estimated 211,000 serious infections and 13,000 deaths from 2000 to 2008, and said rotavirus vaccination, begun in 2006, was preventing an estimated 40,000 to 60,000 hospitalizations a year.[111] Deaths from

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[105] Fangjun Zhou, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 73(31):682-685, *Health and Economic Benefits of Routine Childhood Immunizations in the Era of the Vaccines for Children Program, United States, 1994-2023*, August 8, 2024, https://www.cdc.gov/mmwr/volumes/73/wr/mm7331a2.htm (accessed November 12, 2026).

[106] Whitney CG, Zhou F, Singleton J, Schuchat A, Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 63(16):352-355, *Benefits from Immunization During the Vaccines for Children Program Era, United States, 1994-2013*, April 25, 2014, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6316a4.htm (accessed November 12, 2026).

[107] Whitney CG, Zhou F, Singleton J, Schuchat A, Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 63(16):352-355, *Benefits from Immunization During the Vaccines for Children Program Era, United States, 1994-2013*, April 25, 2014, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6316a4.htm (accessed November 12, 2026).

[108] Whitney CG, Zhou F, Singleton J, Schuchat A, Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 63(16):352-355, *Benefits from Immunization During the Vaccines for Children Program Era, United States, 1994-2013*, April 25, 2014, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6316a4.htm (accessed November 12, 2026).

[109] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 60(19):619-623, *Ten Great Public Health Achievements, United States, 2001-2010*, May 20, 2011, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6019a5.htm (accessed November 12, 2026).

[110] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 60(19):619-623, *Ten Great Public Health Achievements, United States, 2001-2010*, May 20, 2011, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6019a5.htm (accessed November 12, 2026).

[111] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 60(19):619-623, *Ten Great Public Health Achievements, United States, 2001-2010*, May 20, 2011, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6019a5.htm (accessed November 12, 2026).

chickenpox among people under 20 fell 97 percent, from 0.65 per million in 1990-1994 to 0.02 per million in 2005-2007.[112]

These are all CDC estimates. They depend on CDC's own assumptions about how much disease there would have been without vaccines. I am not aware of an independent model that reached a very different answer, but I did not find one that rebuilt these numbers from scratch either.

What Part One shows: Vaccines brought several of the deadliest childhood diseases close to zero in the United States. Along the way there were real failures: the Cutter batches, contaminated polio vaccine, paralysis from the oral polio vaccine, and whooping cough vaccines whose protection fades. Each one changed how vaccines are made and watched. Part Two explains how a vaccine gets from a lab to your arm today.

[112] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 60(19):619-623, *Ten Great Public Health Achievements, United States, 2001-2010*, May 20, 2011, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6019a5.htm (accessed November 12, 2026).

Part Two: How Vaccines Are Made, Tested and Approved

Chapter 4: From the Lab to the Clinical Trial

You might ask, "How long does it take to make a vaccine?" Usually a long time. CDC says vaccine development often takes 10 to 15 years of laboratory research, usually at a private company, often working with university researchers.[113] COVID-19 was the big exception, and Chapter 13 explains how that was done faster.

What a vaccine is

Every vaccine has an active ingredient called an antigen. An antigen is anything that gets the immune system to start making antibodies. CDC lists three kinds of antigens: weakened or killed bacteria or viruses; bits of their outer surface or genetic material; or a bacterial poison (toxin) treated so it is no longer harmful.[114]

CDC sorts vaccines into two basic groups.[115]

- **Live, weakened (attenuated) vaccines** use a germ that can still grow but has been weakened so it does not cause serious disease in healthy people. MMR is an example. The response is close to what natural infection produces.
- **Inactivated vaccines** cannot grow. This group includes whole killed germs (polio shots, hepatitis A, rabies), pieces of germs (flu and pneumococcal vaccines), toxoids (diphtheria and tetanus), and recombinant vaccines made by having cells produce one protein of the germ (hepatitis B, human papillomavirus or HPV).[116] CDC notes that protection from inactivated vaccines usually does not last as long as from live vaccines, which is why some need boosters.[117]

Newer vaccines work a different way. A messenger RNA (mRNA) vaccine gives your cells a set of instructions to make one harmless piece of a germ. For COVID-19, that piece is the "spike protein" on the surface of the virus. The cells make the protein piece, then break down the

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[113] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

[114] Centers for Disease Control and Prevention, *Explaining How Vaccines Work*, August 10, 2024, https://www.cdc.gov/vaccines/basics/explaining-how-vaccines-work.html (accessed November 12, 2026).

[115] Centers for Disease Control and Prevention, *Pink Book, Chapter 1: Principles of Vaccination*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-1-principles-of-vaccination.html (accessed November 12, 2026).

[116] Centers for Disease Control and Prevention, *Pink Book, Chapter 1: Principles of Vaccination*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-1-principles-of-vaccination.html (accessed November 12, 2026).

[117] Centers for Disease Control and Prevention, *Pink Book, Chapter 1: Principles of Vaccination*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-1-principles-of-vaccination.html (accessed November 12, 2026).

mRNA and get rid of it. The immune system learns to recognize the spike.[118] CDC says these vaccines do not enter the nucleus of the cell, where DNA is kept, and so cannot change your genes.[119] Part Six tests the claim that they do.

How the body learns: two kinds of immunity

To make sense of later chapters, especially the arguments about "natural immunity," it helps to know the basics the Pink Book teaches doctors.[120]

Passive immunity is borrowed. It means getting antibodies that someone or something else made. It protects right away, but only for weeks to months, because the borrowed antibodies break down. The most common example is a newborn: antibodies cross the placenta, mostly in the last one to two months of pregnancy, and protect the baby for the first few months of life. The Pink Book notes that a mother's antibodies protect better against some diseases, such as measles, rubella and tetanus, than others, such as polio and whooping cough.[121] Antibody shots, such as the RSV antibody for babies in Chapter 8, are also passive immunity.

Active immunity is home-grown. The body's own immune system makes antibodies and special cells, and it usually lasts for many years, often for life. The body keeps "memory" cells that can quickly make antibodies again if the germ returns.[122] There are two ways to get it: survive the disease, or get a vaccine. The Pink Book puts the difference simply: with vaccination, "the recipient is not subjected to the disease and its potential complications."[123]

The two main types of vaccines produce active immunity in different ways:

- **Live, weakened vaccines** produce a response the Pink Book calls "virtually identical" to natural infection, usually from one dose. A small share of people do not respond to the first shot, which is why MMR has a second dose. Live vaccines can rarely cause serious infection, but the Pink Book says this happens only in people with badly weakened

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[118] Centers for Disease Control and Prevention, *COVID-19 Vaccine Basics (How COVID-19 Vaccines Work)*, September 3, 2024, https://www.cdc.gov/covid/vaccines/how-they-work.html (accessed November 12, 2026).

[119] Centers for Disease Control and Prevention, *COVID-19 Vaccine Basics (How COVID-19 Vaccines Work)*, September 3, 2024, https://www.cdc.gov/covid/vaccines/how-they-work.html (accessed November 12, 2026).

[120] Centers for Disease Control and Prevention, *Pink Book, Chapter 1: Principles of Vaccination*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-1-principles-of-vaccination.html (accessed November 12, 2026).

[121] Centers for Disease Control and Prevention, *Pink Book, Chapter 1: Principles of Vaccination*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-1-principles-of-vaccination.html (accessed November 12, 2026).

[122] Centers for Disease Control and Prevention, *Pink Book, Chapter 1: Principles of Vaccination*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-1-principles-of-vaccination.html (accessed November 12, 2026).

[123] Centers for Disease Control and Prevention, *Pink Book, Chapter 1: Principles of Vaccination*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-1-principles-of-vaccination.html (accessed November 12, 2026).

immune systems. The only live vaccine known to turn back into a disease-causing form is the oral polio vaccine, no longer used in the United States.[124]

- **Inactivated vaccines** cannot cause the disease, even in people with weak immune systems. But their protection usually does not last as long, the first dose mostly "primes" the immune system, and protection comes after the second or third dose. Some need boosters later.[125]

This is why the "natural versus vaccine" debate (Claim 6) is not a simple contest. Natural infection often gives strong immunity, but the price of admission is the disease itself. Live vaccines aim to copy that immunity without the disease. Inactivated vaccines are safer for more people but may need more doses. Each trade-off is real.

Before people: lab and animal work

Before a vaccine is tried in people, researchers test whether it causes an immune response in small animals such as mice, and adjust it if needed.[126] If the results look promising, the company files an Investigational New Drug (IND) application with the Food and Drug Administration (FDA). The application includes the animal data and information on how the vaccine is made and how good its quality is.[127]

The three phases of human trials

Federal rules divide human testing into phases.[128] CDC gives typical sizes for vaccine trials:[129]

Table 4.1. Clinical trial phases for vaccines

Phase	Typical size (CDC)	Main question
Phase 1	20 to 100 people	Is it safe in people? What side effects show up? Does it cause an immune response?

[124] Centers for Disease Control and Prevention, *Pink Book, Chapter 1: Principles of Vaccination*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-1-principles-of-vaccination.html (accessed November 12, 2026).

[125] Centers for Disease Control and Prevention, *Pink Book, Chapter 1: Principles of Vaccination*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-1-principles-of-vaccination.html (accessed November 12, 2026).

[126] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

[127] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

[128] Code of Federal Regulations (Legal Information Institute, Cornell Law School), *21 CFR 312.21, Phases of an investigation*, current text, https://www.law.cornell.edu/cfr/text/21/312.21 (accessed November 12, 2026).

[129] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

Phase	Typical size (CDC)	Main question
Phase 2	Hundreds (100 to 300)	More safety data, and how well it causes an immune response, in people like those who will get it
Phase 3	Thousands (1,000 to 3,000)	Does it protect against the disease? What are the common and less common side effects?
Phase 4	Thousands, after approval	Longer-term safety and effectiveness in the general public

Sources: CDC;[130] phase definitions in 21 CFR 312.21.[131]

The federal rule describes Phase 3 trials as including "from several hundred to several thousand subjects."[132] In practice, many recent vaccine trials have been much larger. The main COVID-19 trials enrolled more than 43,000 people (Pfizer-BioNTech) and about 30,000 people (Moderna).[133,134]

What is a placebo, and why does it matter?

A placebo is a look-alike treatment with no active ingredient, often a salt-water (saline) shot. In a placebo-controlled trial, one group gets the vaccine and one gets the placebo, and usually neither the participants nor the researchers know who got which (that is called "double-blind"). The 1954 polio trial and the COVID-19 trials were placebo-controlled.[135,136]

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[130] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

[131] Code of Federal Regulations (Legal Information Institute, Cornell Law School), *21 CFR 312.21, Phases of an investigation*, current text, https://www.law.cornell.edu/cfr/text/21/312.21 (accessed November 12, 2026).

[132] Code of Federal Regulations (Legal Information Institute, Cornell Law School), *21 CFR 312.21, Phases of an investigation*, current text, https://www.law.cornell.edu/cfr/text/21/312.21 (accessed November 12, 2026).

[133] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 69(50), *The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-BioNTech COVID-19 Vaccine, United States, December 2020*, December 18, 2020, https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e2.htm (accessed November 12, 2026).

[134] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 69(5152), *The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Moderna COVID-19 Vaccine, United States, December 2020*, January 1, 2021, https://www.cdc.gov/mmwr/volumes/69/wr/mm695152e1.htm (accessed November 12, 2026).

[135] University of Michigan School of Public Health, *1955 Polio Vaccine Trial Announcement (reproduces the April 12, 1955 press release)*, April 12, 1955 (release), https://sph.umich.edu/polio/ (accessed November 12, 2026).

Not every vaccine trial uses an inert placebo. Some compare a new vaccine with an existing vaccine, or use a control shot that contains some of the vaccine's other ingredients but not the antigen. Researchers and ethicists have argued over when that is acceptable. This is at the heart of a claim tested in Part Six, "Childhood vaccines were never tested against a placebo," and of a 2025 federal policy change covered in Chapter 14.

You might ask, "Why not always use saltwater?" The usual answer is that once a vaccine is known to prevent a serious disease, giving a child a fake shot instead means leaving that child unprotected on purpose. Critics answer that without an inert placebo, you cannot see the full rate of side effects. Both arguments come back in Part Six with sources.

Two kinds of evidence: trials and observational studies

Most arguments about vaccine safety come down to which kind of study you trust, so it is worth slowing down here. CRS gives a clear plain-language summary of the two main kinds.[137]

Clinical trials are experiments. Researchers assign some people to get the vaccine and others to get a control, which can be a placebo, an existing vaccine, or another comparison. When people are assigned by chance, it is a randomized controlled trial. When people do not know which group they are in, it is "blinded," and when the researchers do not know either, it is "double-blinded." Those features, CRS explains, help rule out other reasons one group might do better or worse than the other.[138] FDA requires clinical trial data before it licenses a new vaccine.[139]

Observational studies watch what happens to people who chose, or happened to get, a vaccine as part of normal care, and compare them with people who did not. They can follow far more people for far longer than a trial can, which makes them the main tool for spotting rare or delayed effects after a vaccine is on the market. Their weakness is built in. CRS puts it plainly: "vaccinated populations often have different health and demographic characteristics than unvaccinated populations," so a difference in health between the groups might come from

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[136] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 69(50), *The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-BioNTech COVID-19 Vaccine, United States, December 2020*, December 18, 2020, https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e2.htm (accessed November 12, 2026).

[137] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), pp. 12-13.

[138] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), p. 12.

[139] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), p. 12.

something other than the vaccine.[140] Researchers use study design and statistics to adjust for that, but they cannot erase it completely.

Table 4.2. The two main kinds of vaccine studies

	Clinical trial	Observational study
Who decides who gets the vaccine?	The researchers, often by chance	The person, parent or doctor, as part of normal care
Typical size	Hundreds to tens of thousands	Can be millions of people
Typical length	Months to a few years	Can run for many years
Main strength	Best at showing cause and effect	Can find rare and delayed effects
Main weakness	Too small and short to catch very rare effects	The groups may differ in ways that affect the result
When it is used	Before licensing, and for some later questions	Mostly after licensing

Source: summarized from CRS.[141]

How much trial evidence stands behind a typical vaccine? CRS cites one published analysis of vaccines FDA licensed from January 2010 to June 2020. Each vaccine was supported by a median of seven clinical trials, including two large "pivotal" efficacy trials, and 95 percent of those pivotal trials used either a placebo or an active control such as another vaccine.[142] Note the "or." That figure does not say how many used an inert saltwater placebo, and that distinction is exactly what the argument in Part Six is about. CRS adds that it is often considered unethical to give only a placebo when an effective vaccine already exists, and that many new vaccines are updates of older ones, so they are tested against the older vaccine.[143]

You might ask, "So which kind of study wins?" Neither, on its own. A trial can show that a vaccine prevents disease and does not cause common side effects. Only large observational

[140] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), p. 12.

[141] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), pp. 12-13.

[142] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), p. 13.

[143] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), p. 13.

studies can find a problem that strikes one child in 100,000. That is why Chapter 7 is about the systems that keep watching after approval.

Chapter 5: What FDA Reviews and How Fast It Can Move

Where the federal rules began

Federal vaccine rules are older than most people think. The first was the Biologics Control Act of 1902. CRS calls it "the first federal law to require premarket review of pharmaceutical products." Congress passed it after deaths, many of them children, from tetanus contamination of smallpox vaccine and diphtheria antitoxin. The law set rules for how these products were made and labeled, and required the factory to be inspected before a federal license was issued.[144]

The law was rewritten into the Public Health Service Act in 1944. Until 1972, the National Institutes of Health (NIH) and the agencies before it regulated vaccines. In 1972 that job moved to FDA.[145] The 1986 law in Chapter 9 added more: it required reports of vaccine side effects to FDA and CDC, created the National Vaccine Program Office in HHS, gave FDA power to order recalls of biological products, and set up VICP.[146]

The license

A vaccine is a "biological product," so it is licensed under the Public Health Service Act. The law says FDA shall approve a biologics license application on the basis of a showing that the product "is safe, pure, and potent" and that the factory where it is made meets standards to keep it that way.[147]

The company files a Biologics License Application (BLA). CDC explains that it includes the lab and clinical trial data, details of the manufacturing process, and information on the factory. FDA reviews the trial data to see whether the vaccine is safe and effective, and reviews the label, called the prescribing information or package insert, which covers how the vaccine is used, the dose, and how it is given.[148] FDA also inspects the factory during Phase 3.[149]

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[144] Kavya Sekar and Agata Bodie, Congressional Research Service, *Vaccine Safety in the United States: Overview and Considerations for COVID-19 Vaccines (R46593)*, updated January 29, 2021, https://www.congress.gov/crs_external_products/R/PDF/R46593/R46593.5.pdf (accessed November 12, 2026), p. 4.

[145] Kavya Sekar and Agata Bodie, Congressional Research Service, *Vaccine Safety in the United States: Overview and Considerations for COVID-19 Vaccines (R46593)*, updated January 29, 2021, https://www.congress.gov/crs_external_products/R/PDF/R46593/R46593.5.pdf (accessed November 12, 2026), pp. 4-5.

[146] Kavya Sekar and Agata Bodie, Congressional Research Service, *Vaccine Safety in the United States: Overview and Considerations for COVID-19 Vaccines (R46593)*, updated January 29, 2021, https://www.congress.gov/crs_external_products/R/PDF/R46593/R46593.5.pdf (accessed November 12, 2026), p. 5.

[147] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 262, Regulation of biological products*, current text, https://www.law.cornell.edu/uscode/text/42/262 (accessed November 12, 2026).

[148] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

The outside advisers: VRBPAC

In some cases FDA asks its Vaccines and Related Biological Products Advisory Committee (VRBPAC), a panel of independent scientific and public health experts, to discuss the data in a public meeting.[150] VRBPAC gives advice. FDA makes the decision.

Do not confuse VRBPAC with ACIP. VRBPAC advises FDA on whether a vaccine should be **approved**. ACIP advises CDC on **who should get** an approved vaccine and when. Chapter 12 covers ACIP.

The fast lanes

The law gives FDA several ways to speed up review for products that treat or prevent serious diseases.[151]

Table 5.1. FDA's expedited programs (simplified)

Program	What qualifies	What it does
Fast track	A product for a serious or life-threatening condition that may meet an unmet medical need	More frequent meetings with FDA and faster review steps
Breakthrough therapy	Early evidence of substantial improvement over existing treatments for a serious condition	More intensive FDA guidance during development
Accelerated approval	A serious condition, where the product shows an effect on a "surrogate endpoint," such as a blood test, that is reasonably likely to predict real benefit	Approval earlier, with follow-up studies required to confirm the benefit

Source: 21 U.S.C. 356.[152]

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[149] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

[150] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

[151] United States Code (Legal Information Institute, Cornell Law School), *21 U.S.C. 356, Expedited approval of drugs for serious or life-threatening diseases or conditions*, current text, https://www.law.cornell.edu/uscode/text/21/356 (accessed November 12, 2026).

[152] United States Code (Legal Information Institute, Cornell Law School), *21 U.S.C. 356, Expedited approval of drugs for serious or life-threatening diseases or conditions*, current text, https://www.law.cornell.edu/uscode/text/21/356 (accessed November 12, 2026).

These programs speed up the process. They do not change the legal standard for full approval.

Emergency Use Authorization

An Emergency Use Authorization (EUA) is different from approval. It lets the HHS Secretary allow an unapproved product to be used during a declared emergency. The law sets a lower bar than a full license. The Secretary must conclude, based on "the totality of scientific evidence available," that it is "reasonable to believe" the product "may be effective," and that "the known and potential benefits of the product … outweigh the known and potential risks."[153]

The law also says people who are offered an EUA product must be told that it was authorized for emergency use, told its known and potential benefits and risks "and of the extent to which such benefits and risks are unknown," and told "of the option to accept or refuse administration of the product."[154] That last phrase became a point of argument during the COVID-19 mandate fights in Chapter 13.

You might ask, "Is an EUA vaccine an experimental vaccine?" It is not a fully licensed vaccine, and the law itself says some risks may be unknown. But EUA vaccines still went through clinical trials. The first COVID-19 vaccines were authorized based on Phase 3 trials with tens of thousands of people and about two months of median follow-up.[155] Full licenses came later, as Chapter 13 explains.

After approval: recalls and reporting duties

A license is not the end of FDA's oversight. The law lets HHS staff "during all reasonable hours enter and inspect" any vaccine factory. If FDA finds that a lot "presents an imminent or substantial hazard to the public health," it must order that lot recalled right away.[156]

Makers also have reporting duties. They must keep records on how each lot was made and tested, including any serious problems, and report any test that shows a possible hazard. They must send FDA a "15-day alert report" for each serious and unexpected side effect they learn of, "promptly investigate" it, and send periodic safety reports every three months for the first three

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[153] United States Code (Legal Information Institute, Cornell Law School), *21 U.S.C. 360bbb-3, Authorization for medical products for use in emergencies*, current text, https://www.law.cornell.edu/uscode/text/21/360bbb-3 (accessed November 12, 2026).

[154] United States Code (Legal Information Institute, Cornell Law School), *21 U.S.C. 360bbb-3, Authorization for medical products for use in emergencies*, current text, https://www.law.cornell.edu/uscode/text/21/360bbb-3 (accessed November 12, 2026).

[155] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 69(50), *The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-BioNTech COVID-19 Vaccine, United States, December 2020*, December 18, 2020, https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e2.htm (accessed November 12, 2026).

[156] Kavya Sekar and Agata Bodie, Congressional Research Service, *Vaccine Safety in the United States: Overview and Considerations for COVID-19 Vaccines (R46593)*, updated January 29, 2021, https://www.congress.gov/crs_external_products/R/PDF/R46593/R46593.5.pdf (accessed November 12, 2026), p. 19.

years and once a year after that. If a maker fails to keep records or report, FDA can revoke the license.[157]

[157] Kavya Sekar and Agata Bodie, Congressional Research Service, *Vaccine Safety in the United States: Overview and Considerations for COVID-19 Vaccines (R46593)*, updated January 29, 2021, https://www.congress.gov/crs_external_products/R/PDF/R46593/R46593.5.pdf (accessed November 12, 2026), pp. 19-20.

Chapter 6: Making Vaccines: Ingredients, Adjuvants and Lot Release

Lots and lot release

Vaccines are made in batches called lots. Each lot is tested to make sure it is consistent with the others, and the company must send FDA the results.[158] Under federal rules, FDA can require samples of any lot along with the test records, and can tell a maker not to ship a lot until FDA releases it.[159] CDC says FDA usually checks each lot for safety, purity and potency.[160] FDA also keeps inspecting factories for as long as the company holds the license.[161]

This system grew out of failures like the Cutter Incident in Chapter 2, where live virus got into a batch that had passed the tests then in use.[162]

What else is in the vial

Besides the part that teaches the immune system (the antigen), a vaccine can contain small amounts of other ingredients. CDC's "Vaccine Basics" page, dated August 10, 2024, groups them by purpose and, for each, names everyday places the same substances turn up:[163]

- **Stabilizers**, such as sugars and gelatin, keep the vaccine working after it is made.
- **Adjuvants**, such as aluminum salts, boost the body's response (more on these in the next section).
- **Leftover inactivating ingredients**, such as formaldehyde, which is used to kill viruses or inactivate toxins during manufacturing. CDC says it is diluted during manufacturing, that leftover amounts may be found in some vaccines, and that the amount is "so small compared to the concentration that occurs naturally in the body that it does not pose a safety concern."

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[158] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

[159] Code of Federal Regulations (Legal Information Institute, Cornell Law School), *21 CFR 610.2, Requests for samples and protocols; official release*, current text, https://www.law.cornell.edu/cfr/text/21/610.2 (accessed November 12, 2026).

[160] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

[161] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

[162] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[163] Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, *Vaccine Basics (ingredients page)*, August 10, 2024, https://www.cdc.gov/vaccines/basics/ (accessed November 12, 2026).

- **Leftover cell culture materials**, such as egg protein, because some flu and yellow fever vaccines are grown in eggs. CDC says people with severe egg allergies should be vaccinated in a medical setting, and that egg-free flu vaccines exist.
- **Leftover antibiotics**, such as neomycin, used to prevent bacterial contamination. CDC says the antibiotics people are most often allergic to, like penicillin, are not used in vaccines.
- **Preservatives**, such as thimerosal, used only in multi-dose vials (see "Thimerosal" below).

You might ask, "Why should I take CDC's word that these amounts are too small to matter?" That is a fair question in a book like this one. The honest answer is that "the dose makes the poison" is a basic rule of toxicology, but it only reassures you if you trust the measurements. CDC's page sends readers to FDA, which posts information on each approved vaccine, including its ingredients.[164] FDA's list of licensed vaccines also links to each vaccine's package insert, the official label that describes its contents and the trials behind it.[165] If you want to check a specific vaccine, the package insert is the place to start (Chapter 19).

Cells from fetal tissue

Some readers object to certain vaccines for moral or religious reasons, because of how they are made, not because of safety. This is one of the few vaccine questions where the basic facts are not really in dispute, so it is worth stating them plainly.

Some vaccines are made by growing the virus in human cells kept alive in labs for decades. CDC's Pink Book says the rubella part of MMR is grown in "WI-38 human diploid lung fibroblasts," and that the chickenpox vaccine strain was passed through WI-38 cells and then MRC-5 human diploid cells during its development.[166,167]

Where did those cells come from? The Vaccine Education Center at Children's Hospital of Philadelphia, which strongly supports vaccination, says the fibroblast cells "were first obtained from elective termination of two pregnancies in the early 1960s."[168] It lists the vaccines made

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[164] Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, *Vaccine Basics (ingredients page)*, August 10, 2024, https://www.cdc.gov/vaccines/basics/ (accessed November 12, 2026).

[165] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), p. 13.

[166] Centers for Disease Control and Prevention, *Pink Book, Chapter 20: Rubella*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-20-rubella.html (accessed November 12, 2026).

[167] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 22: Varicella*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-22-varicella.html (accessed November 12, 2026).

[168] Children's Hospital of Philadelphia, Vaccine Education Center (reviewed by Paul A. Offit, MD), *Vaccine Ingredients: Fetal Cells*, reviewed September 9, 2026, https://www.chop.edu/centers-programs/vaccine-education-center/vaccine-ingredients/fetal-tissues (accessed November 12, 2026).

using fetal cells as chickenpox, rubella, hepatitis A, one version of the rabies vaccine and a chikungunya vaccine, and says the Johnson and Johnson COVID-19 vaccine also used fetal cells (from a 1985 pregnancy) but is no longer used in the United States.[169]

The same source makes two further points. It says the vaccines "do not contain these cells or pieces of DNA that are recognizable as human DNA," though they may contain "minimal quantities of highly fragmented DNA or proteins from fetal cells."[170] And it says no new abortions are needed: "No further sources of fetal cells are needed to make these vaccines."[171]

How have religious authorities answered the moral question? The Catholic Church's Congregation for the Doctrine of the Faith addressed it for the COVID-19 vaccines in December 2020. Its note said "it is morally acceptable to receive Covid-19 vaccines that have used cell lines from aborted fetuses" when ethically uncontroversial vaccines are not available, describing the cooperation of the person receiving the vaccine as "remote" and "passive material cooperation."[172] The same note also said "vaccination is not, as a rule, a moral obligation and that, therefore, it must be voluntary," and urged companies and governments to offer vaccines "that do not create problems of conscience."[173] Other faith traditions and individual believers have reached their own conclusions, and I have not tried to summarize them all.

Verdict on the claim "Some vaccines were made using cells from aborted fetuses": True, for the vaccines listed above, based on CDC's own reference book and a pro-vaccine source. Whether that should affect your choice is a moral question this book does not answer. A claim that vaccines "contain aborted baby parts" goes further than the record I found: the sources describe cell lines started in the 1960s and fragments of DNA or protein, not tissue in the vial. [Not verified: I did not find a government source giving the measured amount of leftover cell DNA in each vaccine.]

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[169] Children's Hospital of Philadelphia, Vaccine Education Center (reviewed by Paul A. Offit, MD), *Vaccine Ingredients: Fetal Cells*, reviewed September 9, 2026, https://www.chop.edu/centers-programs/vaccine-education-center/vaccine-ingredients/fetal-tissues (accessed November 12, 2026).

[170] Children's Hospital of Philadelphia, Vaccine Education Center (reviewed by Paul A. Offit, MD), *Vaccine Ingredients: Fetal Cells*, reviewed September 9, 2026, https://www.chop.edu/centers-programs/vaccine-education-center/vaccine-ingredients/fetal-tissues (accessed November 12, 2026).

[171] Children's Hospital of Philadelphia, Vaccine Education Center (reviewed by Paul A. Offit, MD), *Vaccine Ingredients: Fetal Cells*, reviewed September 9, 2026, https://www.chop.edu/centers-programs/vaccine-education-center/vaccine-ingredients/fetal-tissues (accessed November 12, 2026).

[172] Congregation for the Doctrine of the Faith (Luis F. Card. Ladaria, Prefect; Giacomo Morandi, Secretary), *Note on the morality of using some anti-Covid-19 vaccines*, December 21, 2020, https://www.vatican.va/roman_curia/congregations/cfaith/documents/rc_con_cfaith_doc_20201221_nota-vaccini-anticovid_en.html (accessed November 12, 2026).

[173] Congregation for the Doctrine of the Faith (Luis F. Card. Ladaria, Prefect; Giacomo Morandi, Secretary), *Note on the morality of using some anti-Covid-19 vaccines*, December 21, 2020, https://www.vatican.va/roman_curia/congregations/cfaith/documents/rc_con_cfaith_doc_20201221_nota-vaccini-anticovid_en.html (accessed November 12, 2026).

Adjuvants

An adjuvant is an ingredient in some vaccines that helps create a stronger immune response.[174] The most common adjuvants are aluminum salts. CDC says they were first used in the 1930s, 1940s and 1950s with diphtheria and tetanus vaccines and have been used for more than 70 years.[175] Aluminum is in many childhood vaccines, including DTaP, hepatitis A, hepatitis B, HPV and pneumococcal vaccines.[176]

CDC says research has shown that the amount of aluminum from the recommended schedule is low and is not readily absorbed by the body, and points out that aluminum is also in air, food and water.[177] CDC's same page also reports that a 2022 study from the Vaccine Safety Datalink found a possible association between aluminum from vaccines and later persistent asthma. CDC wrote that it was not changing recommendations based on that single study but that "further investigation is needed into this potential safety signal."[178] That is an open question, and Part Six returns to it.

Newer adjuvants are also in use. For example, AS01B, used in the shingles vaccine, is made from a substance from bacteria and a compound from the Chilean soapbark tree. CDC says it caused local and whole-body reactions in trials, but its overall safety profile was reassuring.[179]

Thimerosal

Thimerosal is a mercury-based preservative. It has been used for decades in multi-dose vials, which hold more than one dose, to keep bacteria and fungi from growing after the vial is opened.[180]

There are two kinds of mercury people talk about. Methylmercury builds up in the body and is the kind found in some fish. Thimerosal contains ethylmercury, which CDC says is "very different."[181]

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[174] Centers for Disease Control and Prevention, *Adjuvants and Vaccines*, December 20, 2024, https://www.cdc.gov/vaccine-safety/about/adjuvants.html (accessed November 12, 2026).

[175] Centers for Disease Control and Prevention, *Adjuvants and Vaccines*, December 20, 2024, https://www.cdc.gov/vaccine-safety/about/adjuvants.html (accessed November 12, 2026).

[176] Centers for Disease Control and Prevention, *Adjuvants and Vaccines*, December 20, 2024, https://www.cdc.gov/vaccine-safety/about/adjuvants.html (accessed November 12, 2026).

[177] Centers for Disease Control and Prevention, *Adjuvants and Vaccines*, December 20, 2024, https://www.cdc.gov/vaccine-safety/about/adjuvants.html (accessed November 12, 2026).

[178] Centers for Disease Control and Prevention, *Adjuvants and Vaccines*, December 20, 2024, https://www.cdc.gov/vaccine-safety/about/adjuvants.html (accessed November 12, 2026).

[179] Centers for Disease Control and Prevention, *Adjuvants and Vaccines*, December 20, 2024, https://www.cdc.gov/vaccine-safety/about/adjuvants.html (accessed November 12, 2026).

[180] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

[181] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

In July 1999, the Public Health Service agencies, the American Academy of Pediatrics and vaccine makers agreed that thimerosal should be reduced or removed from vaccines "as a precautionary measure."[182] It was taken out of childhood vaccines in the United States in 2001.[183] As of CDC's October 2025 page, flu vaccines still came in both thimerosal-free single-dose form and thimerosal-containing multi-dose vials.[184] In June 2025, the newly appointed ACIP voted to recommend stopping the use of flu vaccines that contain thimerosal.[185] Chapter 14 explains what happened to that vote.

What about autism? CDC's thimerosal page, as last updated October 28, 2025, says research does not show any link between thimerosal and autism, and notes that autism rates kept rising after thimerosal was removed from almost all childhood vaccines, which is the opposite of what you would expect if it were the cause.[186] But a separate CDC page on autism and vaccines was rewritten in 2025 and 2026 to say that the statement "vaccines do not cause autism" is "not an evidence-based claim."[187] So, as of this book's cutoff, two CDC pages take different positions. Part Six looks at the evidence behind both.

Keeping vaccines cold

A good vaccine can be ruined between the factory and your arm. CRS notes that vaccine supply needs "temperature control, safety controls, and regular monitoring of expiry dates," and that how vaccines are stored affects how well they work. Public money, federal and state, pays for more than half of the vaccines given in the United States by volume. Doctors who want free VFC vaccines must show their state program that they can store and handle them properly.[188]

The flu shot: a new recipe every year

Most vaccines keep the same recipe for years. The flu shot changes almost every year, because flu viruses keep changing. It is a good example of how a vaccine can be made carefully and still work only part of the time.

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[182] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

[183] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

[184] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

[185] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[186] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

[187] Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

[188] Kavya Sekar and Agata Bodie, Congressional Research Service, *Vaccine Safety in the United States: Overview and Considerations for COVID-19 Vaccines (R46593)*, updated January 29, 2021, https://www.congress.gov/crs_external_products/R/PDF/R46593/R46593.5.pdf (accessed November 12, 2026), pp. 28-29.

All current U.S. flu vaccines protect against three groups of flu viruses: an influenza A(H1N1) virus, an influenza A(H3N2) virus and an influenza B/Victoria virus.[189] Picking the exact strains is a worldwide job. CDC says there are 152 national influenza centers in more than 129 countries that test flu samples all year for the World Health Organization (WHO). Twice a year, WHO meets with the directors of its flu research centers and other labs to recommend which viruses should go into the vaccine. The February meeting picks viruses for the Northern Hemisphere and the September meeting picks them for the Southern Hemisphere.[190] Each country then makes its own decision. In the United States, FDA's VRBPAC "makes the final decision about which vaccine viruses to include," usually in February or March.[191]

That means the strains are chosen months before flu season, based on what is spreading at the time. If the virus changes after the choice is made, the vaccine is a poorer match. CDC publishes how well the vaccine worked each season. Its studies measure how much the vaccine lowered the chance of a doctor visit for lab-confirmed flu.

Table 6.1. Flu vaccine effectiveness by season, selected years (CDC)

Flu season	Effectiveness (percent)	95% confidence range
2004-05	10	-36 to 40
2010-11	60	53 to 66
2014-15	19	10 to 27
2017-18	38	31 to 43
2019-20	39	32 to 44
2020-21	Not estimated (too little flu)	
2022-23	30	-9 to 54
2023-24	44	36 to 51
2024-25 (preliminary)	56	54 to 58
2025-26 (preliminary)	36	33 to 39

[189] Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, *Selecting Viruses for the Seasonal Influenza Vaccine*, September 1, 2026, https://www.cdc.gov/flu/vaccine-process/vaccine-selection.html (accessed November 12, 2026).

[190] Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, *Selecting Viruses for the Seasonal Influenza Vaccine*, September 1, 2026, https://www.cdc.gov/flu/vaccine-process/vaccine-selection.html (accessed November 12, 2026).

[191] Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, *Selecting Viruses for the Seasonal Influenza Vaccine*, September 1, 2026, https://www.cdc.gov/flu/vaccine-process/vaccine-selection.html (accessed November 12, 2026).

Source: CDC, Past Seasons' Vaccine Effectiveness Estimates, March 16, 2026.[192] CDC notes that a range that crosses zero is not statistically significant.

You might ask, "Thirty-six percent? Why bother?" That is a fair question, and the answer depends on what you are comparing. A flu shot is far less protective than, for example, two doses of MMR against measles. CDC's Pink Book says more than 99 percent of people who get two doses of measles vaccine develop measurable immunity.[193] (That measures an immune response in the blood, which is not exactly the same thing as the flu numbers above, but the gap is still large.) It does not keep most people from ever catching flu. Supporters say even partial protection, given to tens of millions of people, prevents many doctor visits and hospital stays. Skeptics say numbers like these are a reason to be honest that the flu shot is a different kind of product from the childhood vaccines. Both points are true. What the table shows for certain is that flu vaccine protection varies a lot from year to year.

What Part Two shows: A vaccine must show it is "safe, pure, and potent" before it is licensed, and every lot can be held back until FDA releases it. Emergency authorization uses a lower legal bar during a declared emergency. The ingredients that worry many parents, aluminum and thimerosal, are real ingredients with real histories, and federal agencies themselves now disagree about how to describe some of the evidence.

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[192] Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, *Past Seasons' Vaccine Effectiveness Estimates*, March 16, 2026, https://www.cdc.gov/flu-vaccines-work/php/effectiveness-studies/past-seasons-estimates.html (accessed November 12, 2026).

[193] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

Part Three: How Safety Is Watched, and the Side Effects That Are Real

Chapter 7: The Safety Systems and What They Can Prove

A clinical trial with 30,000 people is large, but it cannot catch a side effect that happens once in a million doses. That is why the government keeps watching after a vaccine is licensed. CDC and FDA use several systems that work together.[194]

Table 7.1. The main U.S. vaccine safety systems

System	Run by	Started	How it works	What it is good for
Vaccine Adverse Event Reporting System (VAERS)	CDC and FDA together	1990	Anyone can file a report of a health problem after a vaccine	An early warning system. Spots unusual patterns
Vaccine Safety Datalink (VSD)	CDC with health care organizations	1990	Uses electronic health records from member health systems, compared with unvaccinated or differently timed groups	Testing whether a side effect really happens more often after a vaccine
Post-licensure Rapid Immunization Safety Monitoring (PRISM)	FDA, part of its Sentinel Initiative	not stated	Uses health insurance claims data	Checking signals in large populations
Clinical Immunization Safety Assessment (CISA) Project	CDC with medical research centers	2001	Experts review individual complex cases for doctors	Helping doctors decide about a specific patient; clinical research
V-safe	CDC	December 2020	Smartphone check-ins after vaccination, first	Fast reports from vaccinated people

[194] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

System	Run by	Started	How it works	What it is good for
			for COVID-19 vaccines	

Sources: CDC Pink Book;[195] CDC pages on VAERS,[196] VSD,[197] CISA[198] and V-safe.[199]

VAERS: the early warning system

The 1986 vaccine injury law required doctors and vaccine makers to report certain problems after vaccination, which led to VAERS in 1990.[200] CDC and FDA run it together.[201]

The most important thing to know about VAERS is this: **anyone can file a report, and a report does not mean the vaccine caused the problem.** CDC says plainly, "A report to VAERS does not mean that a vaccine caused an adverse event."[202] VAERS takes reports "regardless of seriousness or how likely the vaccine may have caused the adverse event."[203] The public search tool on CDC WONDER warns that reports "may contain information that is incomplete, inaccurate, coincidental, or unverifiable" and that they "can also be biased."[204]

You might ask, "If a side effect is reported, does that mean the vaccine caused it?" Not by itself. Here is why. Millions of people get vaccines every year. Some of them will have a heart attack, a seizure or a stroke in the days after a shot, just by chance, the same way some people have those things the day after a haircut. VAERS collects all of those reports, coincidental or not. Its job is to notice when a pattern looks unusual, like more reports of one problem than you would expect.

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[195] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[196] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

[197] Centers for Disease Control and Prevention, *About the Vaccine Safety Datalink (VSD)*, https://www.cdc.gov/vaccine-safety-systems/vsd/index.html (accessed November 12, 2026).

[198] Centers for Disease Control and Prevention, *About the Clinical Immunization Safety Assessment (CISA) Project*, May 12, 2025, https://www.cdc.gov/vaccine-safety-systems/hcp/cisa/index.html (accessed November 12, 2026).

[199] Centers for Disease Control and Prevention, *About V-safe*, https://www.cdc.gov/vaccine-safety-systems/v-safe/index.html (accessed November 12, 2026).

[200] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[201] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

[202] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

[203] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

[204] Centers for Disease Control and Prevention, CDC WONDER, *The Vaccine Adverse Event Reporting System (VAERS) Request: About VAERS and Disclaimer*, https://wonder.cdc.gov/vaers.html (accessed November 12, 2026).

Then other systems, like VSD, check whether vaccinated people really get that problem more often than unvaccinated people.

That works in both directions. VAERS is a passive system, meaning it only knows about problems someone chooses to report.[205] So some real side effects are never reported, and some reports are about things the vaccine did not cause. Both are true at once.

VAERS has caught real problems. In 1999 it picked up reports of a rare bowel blockage in infants after the first rotavirus vaccine, which led to that vaccine being pulled (Chapter 8).[206] In 2021 it picked up reports of rare blood clots after the Johnson and Johnson COVID-19 vaccine.[207]

How many reports come in? The Pink Book says VAERS gets about 30,000 reports a year, which sounds like a lot until you set it against the millions of doses given every year.[208] Doctors are required by law to report certain events, and vaccine makers must report every adverse event they learn about. For reports classed as serious, such as a hospital stay, a life-threatening illness, a permanent disability or a death, staff try to get the medical records and later ask how the patient recovered.[209]

One change happened in 2025. On May 8, 2025, CDC and FDA expanded the public VAERS data to include "secondary reports," meaning the first report from an additional person about the same patient, vaccine and dose. CDC says this made it look as if reports had been added, but these are reports about events already in the system, not new events.[210] If you compare VAERS totals from before and after May 2025, keep that in mind.

The Vaccine Safety Datalink

The VSD started in 1990 and is made up of 13 member sites. Eleven are health care organizations, mostly Kaiser Permanente regions plus others such as HealthPartners, Denver

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[205] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

[206] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(43), *Withdrawal of Rotavirus Vaccine Recommendation*, November 5, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4843a5.htm (accessed November 12, 2026).

[207] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(3):90-95, *Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine: Updated Interim Recommendations from the Advisory Committee on Immunization Practices, United States, December 2021*, January 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7103a4.htm (accessed November 12, 2026).

[208] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[209] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[210] Centers for Disease Control and Prevention, CDC WONDER, *The Vaccine Adverse Event Reporting System (VAERS) Request: About VAERS and Disclaimer*, https://wonder.cdc.gov/vaers.html (accessed November 12, 2026).

Health and Marshfield Clinic, that share electronic health records using a common format.[211] Researchers check the data every week to see whether certain serious events happen more often after a vaccine than in a comparison group.[212]

The big advantage of VSD over VAERS is that it has a denominator. It knows how many people got the vaccine and how many did not, so it can compare rates.

CISA and V-safe

CDC's Clinical Immunization Safety Assessment Project, started in 2001, is a network of vaccine safety experts from CDC, eight medical research centers and other partners. Doctors can ask it for free help with complex vaccine safety questions about a specific patient.[213]

V-safe was launched in December 2020 to follow the safety of COVID-19 vaccines through check-ins on people's phones.[214]

FDA's own system: Sentinel and PRISM

CDC is not the only agency watching. FDA set up the Sentinel Initiative in 2008. Its vaccine part, the Post-Licensure Rapid Immunization Safety Monitoring program (PRISM), began in 2009 during the H1N1 flu pandemic. PRISM uses health insurance records and state vaccine registries to watch for side effects. CRS called it the largest linked database for vaccine safety in the country, with data on more than 100 million people. Because it covers so many people, it can catch rarer problems than the Vaccine Safety Datalink, although the Datalink has been faster.[215] FDA also runs a second system called Biologics Effectiveness and Safety (BEST).[216]

The Datalink has limits that CRS spells out. Its members are private health plans, which tend to have more people with higher incomes and fewer people from minority groups than the country as a whole, and it may be too small to catch extremely rare events.[217]

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[211] Centers for Disease Control and Prevention, *About the Vaccine Safety Datalink (VSD)*, https://www.cdc.gov/vaccine-safety-systems/vsd/index.html (accessed November 12, 2026).

[212] Centers for Disease Control and Prevention, *About the Vaccine Safety Datalink (VSD)*, https://www.cdc.gov/vaccine-safety-systems/vsd/index.html (accessed November 12, 2026).

[213] Centers for Disease Control and Prevention, *About the Clinical Immunization Safety Assessment (CISA) Project*, May 12, 2025, https://www.cdc.gov/vaccine-safety-systems/hcp/cisa/index.html (accessed November 12, 2026).

[214] Centers for Disease Control and Prevention, *About V-safe*, https://www.cdc.gov/vaccine-safety-systems/v-safe/index.html (accessed November 12, 2026).

[215] Kavya Sekar and Agata Bodie, Congressional Research Service, *Vaccine Safety in the United States: Overview and Considerations for COVID-19 Vaccines (R46593)*, updated January 29, 2021, https://www.congress.gov/crs_external_products/R/PDF/R46593/R46593.5.pdf (accessed November 12, 2026), p. 22.

[216] Kavya Sekar and Agata Bodie, Congressional Research Service, *Vaccine Safety in the United States: Overview and Considerations for COVID-19 Vaccines (R46593)*, updated January 29, 2021, https://www.congress.gov/crs_external_products/R/PDF/R46593/R46593.5.pdf (accessed November 12, 2026), p. 22.

[217] Kavya Sekar and Agata Bodie, Congressional Research Service, *Vaccine Safety in the United States: Overview and Considerations for COVID-19 Vaccines (R46593)*, updated January 29, 2021, https://www.congress.gov/crs_external_products/R/PDF/R46593/R46593.5.pdf (accessed November 12, 2026), p. 22.

Why after-market studies are hard

Once a vaccine is in wide use, studying it gets harder, not easier. CRS explains why. Vaccinated people usually far outnumber unvaccinated people, and the two groups differ in other ways, so comparing them is tricky. Researchers often compare how often a problem happens in a set window after a shot with how often it happens at other times. That works well for problems that show up quickly. It works less well "for hypothesized long-term effects of vaccines or adverse health events that are otherwise common in the population."[218] CRS adds that a statistical link "is often necessary but not sufficient to establish causality."[219]

That point cuts both ways in the debate. It is why one study showing a link does not prove a vaccine caused something. It is also why critics are right that some long-term questions are hard to settle with the systems we have.

A real example shows the scale problem. When the current five-strain rotavirus vaccine was tested, about 70,000 infants took part, getting either the vaccine or a placebo. The trial was that big for one reason: the bowel blockage that sank RotaShield is so rare that, in the Pink Book's words, "large trials would be needed to detect even a single occurrence."[220] Most vaccine trials are much smaller than that, which is why the watching has to continue after approval.

How do scientists decide a vaccine caused something?

Doctors separate two ideas that people often blur. An "adverse event" is any health problem that happens after a vaccine, whether or not the vaccine had anything to do with it. A "side effect" or "adverse reaction" is a problem the vaccine actually caused. CDC's Pink Book, the standard reference for doctors who give vaccines, says that many adverse events after vaccination are coincidental: they happen close in time but by chance.[221]

So how do you tell the two apart? The Pink Book lists the signs that make a link more believable:[222]

1. The problem shows up in a plausible time window after the shot.
2. It matches problems already tied to that vaccine.

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[218] Kavya Sekar and Agata Bodie, Congressional Research Service, *Vaccine Safety in the United States: Overview and Considerations for COVID-19 Vaccines (R46593)*, updated January 29, 2021, https://www.congress.gov/crs_external_products/R/PDF/R46593/R46593.5.pdf (accessed November 12, 2026), p. 27.

[219] Kavya Sekar and Agata Bodie, Congressional Research Service, *Vaccine Safety in the United States: Overview and Considerations for COVID-19 Vaccines (R46593)*, updated January 29, 2021, https://www.congress.gov/crs_external_products/R/PDF/R46593/R46593.5.pdf (accessed November 12, 2026), p. 27.

[220] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[221] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[222] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

3. It fits a known pattern with strong biological sense, such as a severe allergic reaction minutes after a shot, or a syndrome the disease itself is known to cause.
4. A lab test confirms it, for example finding the vaccine strain of chickenpox virus in a rash.
5. It happens again when the same person gets the same vaccine again.
6. A controlled trial or population study shows more of it in vaccinated people than unvaccinated people.
7. Other studies confirm the finding.

No single item settles the question. A rash two days after a shot fits item 1 but could be a dozen other things. A finding that meets items 6 and 7 is much stronger than a single report. When you read a claim in Part Six, it can help to ask which of these seven the evidence actually meets.

Why vaccines are held to a higher bar

The Pink Book makes a point that I think both sides of the debate should agree with. Most medicines are given to sick people. Vaccines are given to healthy people, often healthy babies, to prevent a disease they may never meet. For that reason, it says, "A higher standard of safety is generally expected of vaccines than of other medical interventions," and the public's tolerance for side effects in healthy children "is substantially less."[223]

That higher bar has a strange side effect of its own. Because vaccines work, most parents today have never seen a child with diphtheria or polio. The Pink Book notes that parents may be more likely to know someone who had a problem after a vaccine than someone who had one of the diseases.[224] The risk you can see starts to feel bigger than the risk you cannot.

When the safer choice is to stop

The safety systems are not only there to defend vaccines. Sometimes they show that a vaccine should no longer be used. The Pink Book gives two U.S. examples. As smallpox and polio neared the end, monitoring found that complications from the smallpox vaccine and from the oral polio vaccine were greater than the risk from the diseases themselves. That led to ending routine smallpox vaccination in the United States before the disease was wiped out worldwide, and to switching from the oral polio vaccine to the safer shot form.[225] RotaShield, covered in Chapter 8, is a third example. A system that only ever said "safe" would not deserve your trust. The record shows these systems have said "stop" more than once.

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[223] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[224] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[225] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

Chapter 8: Side Effects That Are Real

This chapter lists side effects that the evidence shows vaccines can cause. These are not rumors. Most are rare, and most were found by the safety systems in Chapter 7. Every vaccine can cause sore arms, mild fever or fussiness. CDC also says, "As with any medicine, there is a very remote chance of a vaccine causing a severe allergic reaction, other serious injury, or death."[226]

Numbers matter here. "Rare" can mean one in a thousand or one in a million. So each entry gives a number, the source, and how it was found.

Table 8.1. Confirmed vaccine side effects, with how often they happen

Side effect	Vaccine	How often	How it was found	Source
Fainting, with risk of injury from falls	Any shot, especially in teens	Not given as a rate	Reports and studies; FDA added fall-prevention guidance to the HPV vaccine label	CDC[227,228]
Febrile seizure (a seizure caused by fever)	First MMR plus chickenpox vaccine, ages 12 to 23 months	About 4 per 10,000 children given separate MMR and chickenpox shots; about twice as many with the combined MMRV shot	Large studies	CDC[229]
Low platelet	MMR	One study	Studies	CDC[230]

[226] Centers for Disease Control and Prevention, *Possible Side Effects from Vaccines*, https://www.cdc.gov/vaccines/basics/possible-side-effects.html (accessed November 12, 2026).

[227] Centers for Disease Control and Prevention, *Possible Side Effects from Vaccines*, https://www.cdc.gov/vaccines/basics/possible-side-effects.html (accessed November 12, 2026).

[228] Centers for Disease Control and Prevention, *HPV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/hpv.html (accessed November 12, 2026).

[229] Centers for Disease Control and Prevention, *MMR Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/mmr.html (accessed November 12, 2026).

[230] Centers for Disease Control and Prevention, *MMR Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/mmr.html (accessed November 12, 2026).

Side effect	Vaccine	How often	How it was found	Source
count (immune thrombocytopenic purpura, ITP)		estimated 1 case per 40,000 vaccinated children, in the six weeks after		
Joint pain or stiffness	MMR (rubella part)	Up to 1 in 4 women past puberty who were not already immune	Studies	CDC[231]
Severe allergic reaction (anaphylaxis)	Pfizer-BioNTech COVID-19 vaccine (first dose)	11.1 per million doses in the first weeks	VAERS reports confirmed by case review	CDC MMWR[232]
Severe allergic reaction (anaphylaxis)	Moderna COVID-19 vaccine (first dose)	2.5 per million doses in the first weeks	VAERS reports confirmed by case review	CDC MMWR[233]
Intussusception (bowel blockage)	RotaShield (withdrawn 1999)	Significantly higher in the 1 to 2 weeks after vaccination	VAERS reports, then investigations	CDC MMWR[234]
Intussusception	Current rotavirus vaccines	About 1 in 20,000 to 1 in 100,000 infants,	Post-licensure studies	CDC[235]

[231] Centers for Disease Control and Prevention, *MMR Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/mmr.html (accessed November 12, 2026).

[232] CDC COVID-19 Response Team and FDA, Morbidity and Mortality Weekly Report 70(2), *Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine, United States, December 14-23, 2020*, January 15, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7002e1.htm (accessed November 12, 2026).

[233] CDC COVID-19 Response Team and FDA, Morbidity and Mortality Weekly Report 70(4), *Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Moderna COVID-19 Vaccine, United States, December 21, 2020-January 10, 2021*, January 29, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7004e1.htm (accessed November 12, 2026).

[234] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(43), *Withdrawal of Rotavirus Vaccine Recommendation*, November 5, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4843a5.htm (accessed November 12, 2026).

[235] Centers for Disease Control and Prevention, *Rotavirus Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/rotavirus.html (accessed November 12, 2026).

Side effect	Vaccine	How often	How it was found	Source
		within a week		
Guillain-Barre syndrome (GBS), a nerve disorder	1976 swine flu vaccine	About 1 extra case per 100,000 people vaccinated	Surveillance during the 1976 program	CDC[236]
Guillain-Barre syndrome	Seasonal flu vaccine	If there is any increase, about 1 to 2 extra cases per million doses	Studies	CDC[237]
Guillain-Barre syndrome and other serious nerve conditions	RSV vaccines for older adults (Arexvy and Abrysvo)	"A small number of people," within 42 days	Monitoring after approval	CDC[238]
Myocarditis (heart muscle inflammation)	mRNA COVID-19 vaccines	VAERS reporting rate of 62.8 per million second doses in males 12 to 17 and 50.5 in males 18 to 24 (data through June 2021)	VAERS, then VSD and other studies	CDC MMWR[239]
Thrombosis with thrombocytopenia syndrome (TTS), blood	Johnson and Johnson (Janssen) COVID-19	3.83 per million doses overall; 10.6 per million in women 30 to	VAERS reports confirmed by medical record review	CDC MMWR[240]

[236] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[237] Centers for Disease Control and Prevention, *Guillain-Barre Syndrome and Flu Vaccine*, https://www.cdc.gov/flu/vaccine-safety/guillainbarre.html (accessed November 12, 2026).

[238] Centers for Disease Control and Prevention, *RSV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/rsv.html (accessed November 12, 2026).

[239] Gargano JW, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(27), *Use of mRNA COVID-19 Vaccine After Reports of Myocarditis Among Vaccine Recipients: Update from the Advisory Committee on Immunization Practices, United States, June 2021*, July 9, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7027e2.htm (accessed November 12, 2026).

[240] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(3):90-95, *Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine: Updated Interim Recommendations from the Advisory Committee on Immunization Practices, United States, December 2021*, January 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7103a4.htm (accessed November 12, 2026).

Side effect	Vaccine	How often	How it was found	Source
clots with low platelets	vaccine	39; 8 deaths through August 2021		
Paralysis from vaccine virus (vaccine-associated paralytic polio)	Oral polio vaccine (no longer used in the U.S.)	154 cases from 1980 to 1999	Surveillance	CDC[241]

What the vaccine information sheets say

Before each dose of most routine vaccines, the 1986 law requires every provider, public or private, to give the patient or parent the federal Vaccine Information Statement (VIS) for that vaccine, whatever the patient's age.[242] CDC collects the side effects listed on those sheets on one page. Table 8.2 is a plain summary of what that page says for the most common childhood shots. It is useful because it shows the government's own list of expected reactions, both the common mild ones and the rare serious ones.

Table 8.2. Side effects listed in the federal vaccine information sheets (summary)

Vaccine	Common or mild	Rare or serious, as listed
DTaP	Soreness or swelling, fever, fussiness, tiredness, poor appetite, vomiting	Seizures, non-stop crying for 3 hours or more, fever over 105 F; rarely, swelling of the whole arm or leg after the 4th or 5th dose
Hepatitis B	Soreness, fever, headache, tiredness	None specific beyond the general allergy warning
Hib	Redness, warmth, swelling, fever	None specific beyond the general allergy warning
Flu shot (inactivated)	Soreness, fever, muscle aches, headache	"A very small increased risk" of Guillain-Barre syndrome; slightly higher chance of fever seizures in young children if

[241] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[242] Centers for Disease Control and Prevention, *Facts About Vaccine Information Statements*, August 2, 2024, https://www.cdc.gov/vaccines/hcp/vis/about/facts-vis.html (accessed November 12, 2026).

Vaccine	Common or mild	Rare or serious, as listed
		given with pneumococcal or DTaP vaccine at the same visit
MMR	Sore arm, fever, mild rash; swollen glands or temporary joint pain, mostly in teenage or adult women	Seizures, often with fever; temporary low platelet count; a possibly life-threatening infection in people with serious immune problems, who should not get it
MMRV	Same as MMR	Higher seizure risk than separate MMR and chickenpox shots when given as the first dose to young children
Chickenpox (varicella)	Sore arm, rash, fever	Very rarely pneumonia, brain or spinal cord covering infection, or seizures; the vaccine virus can spread from a rash
Pneumococcal conjugate (PCV)	Redness, swelling, fever, fussiness, tiredness	Higher chance of fever seizures if given with the flu shot
Rotavirus	Irritability, mild diarrhea or vomiting	A small risk of intussusception, a bowel blockage that may need surgery
HPV	Soreness, fever, headache	Fainting (true of many shots, especially in teens)
Meningococcal B	Soreness, tiredness, headache, muscle or joint pain, fever, chills; "some of these reactions occur in more than half" of people	None specific beyond the general allergy warning

Source: CDC, Possible Side Effects from Vaccines, July 31, 2024, which is based on the federal Vaccine Information Statements.[243] Every entry also carries the same line: "As with any

[243] Centers for Disease Control and Prevention, *Possible Side Effects from Vaccines*, https://www.cdc.gov/vaccines/basics/possible-side-effects.html (accessed November 12, 2026).

medicine, there is a very remote chance of a vaccine causing a severe allergic reaction, other serious injury, or death."[244]

Two things stand out. First, the government's own sheets do list serious reactions. Anyone who says officials claim vaccines have no risks has not read these sheets. Second, most of the serious items are rare, and several are tied to fever, which is why the timing of combined shots gets attention.

A closer look at four of them

RotaShield. The first rotavirus vaccine was approved by FDA in 1998.[245] By July 1999, VAERS had reports of intussusception, a dangerous folding of the bowel, in 15 infants who had gotten it. Use was suspended. On October 22, 1999, ACIP concluded that intussusception happened "with significantly increased frequency" in the first one to two weeks after vaccination and withdrew its recommendation.[246] The maker pulled the vaccine from the market that October.[247] Newer rotavirus vaccines carry a much smaller risk, which CDC states openly: about 1 in 20,000 to 1 in 100,000 infants.[248]

The 1976 swine flu program. In early 1976, a swine flu virus sickened recruits at Fort Dix, New Jersey, and spread person to person among more than 200 of them. Fearing a pandemic like 1918, the government launched a national program to vaccinate "every man, woman, and child."[249] It immunized 45 million people in 10 weeks.[250] Then cases of Guillain-Barre syndrome showed up among the vaccinated. On December 16, 1976, with more than 40 million people immunized and no sign the virus was spreading, officials stopped the program.[251] CDC later put the extra risk at about 1 case per 100,000 people vaccinated, and the Institute of Medicine

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[244] Centers for Disease Control and Prevention, *Possible Side Effects from Vaccines*, https://www.cdc.gov/vaccines/basics/possible-side-effects.html (accessed November 12, 2026).

[245] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[246] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(43), *Withdrawal of Rotavirus Vaccine Recommendation*, November 5, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4843a5.htm (accessed November 12, 2026).

[247] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[248] Centers for Disease Control and Prevention, *Rotavirus Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/rotavirus.html (accessed November 12, 2026).

[249] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

[250] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

[251] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

concluded in 2003 that the vaccine did raise the risk. The exact reason is still unknown.[252] The pandemic never came. Two people who ran the program, former CDC director David Sencer and J. Donald Millar, wrote about its lessons in 2006, including that "effective communication from scientifically qualified persons was lacking."[253]

Myocarditis after mRNA COVID-19 vaccines. By June 11, 2021, VAERS had received 1,226 reports of myocarditis after mRNA vaccination. Reports were highest in young males after the second dose: 62.8 per million second doses in males 12 to 17 and 50.5 per million in males 18 to 24. In males 30 and older it was 2.4 per million.[254] CDC says most patients responded well to medicine and rest, and in surveys taken at least three months later, about 80 percent were considered by their doctors to have fully or probably fully recovered.[255] A CDC study of health records from 40 health systems found that, even in males 12 to 17 after the second dose, the risk of heart complications was 1.8 to 5.6 times higher after COVID-19 infection than after vaccination.[256] Chapter 13 covers how this finding shaped the policy fights, and Part Six tests the claim about young men.

Blood clots after the Johnson and Johnson vaccine. On April 13, 2021, CDC and FDA paused the Janssen vaccine after reports of a rare clotting condition with low platelets. Use resumed with a warning 10 days later. Through August 31, 2021, 54 cases were confirmed among about 14.1 million doses, and 8 people died.[257] CDC concluded the evidence "supports a causal relationship."[258] In December 2021, ACIP recommended that people choose the mRNA

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[252] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[253] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

[254] Gargano JW, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(27), *Use of mRNA COVID-19 Vaccine After Reports of Myocarditis Among Vaccine Recipients: Update from the Advisory Committee on Immunization Practices, United States, June 2021*, July 9, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7027e2.htm (accessed November 12, 2026).

[255] Centers for Disease Control and Prevention, *Safety of COVID-19 Vaccines*, January 31, 2025, https://www.cdc.gov/vaccine-safety/vaccines/covid-19.html (accessed November 12, 2026).

[256] Block JP, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(14), *Cardiac Complications After SARS-CoV-2 Infection and mRNA COVID-19 Vaccination, PCORnet, United States, January 2021-January 2022*, April 8, 2022, https://stacks.cdc.gov/view/cdc/116620/cdc_116620_DS1.pdf (accessed November 12, 2026).

[257] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(3):90-95, *Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine: Updated Interim Recommendations from the Advisory Committee on Immunization Practices, United States, December 2021*, January 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7103a4.htm (accessed November 12, 2026).

[258] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(3):90-95, *Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine: Updated Interim Recommendations from the Advisory Committee on Immunization Practices, United States, December 2021*, January 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7103a4.htm (accessed November 12, 2026).

vaccines instead.[259] CDC says the Janssen vaccine has not been available in the United States since May 2023.[260]

A smaller real effect: fever seizures after MMRV

Not every confirmed side effect is dramatic. A good example is the combined measles, mumps, rubella and chickenpox shot, called MMRV.

A febrile seizure is a seizure brought on by a high fever in a young child. It is frightening to watch, but CDC says these seizures "have not been associated with any long-term effects."[261] After MMRV was licensed, studies found that fever and rash were more common in the 42 days after a first dose of MMRV than after separate MMR and chickenpox shots given at the same visit.[262] Safety monitoring through the Vaccine Safety Datalink then found the size of the risk: among children 12 to 23 months old, about 1 additional febrile seizure per 2,300 to 2,600 children given MMRV as a first dose, compared with separate shots.[263] There is no extra risk when MMRV is given at ages 4 to 6.[264]

What happened next is a good picture of how the system is supposed to work. In February 2008, ACIP dropped its preference for MMRV and set up a work group, the first ACIP work group ever formed just to study the safety of one vaccine.[265] From 2010 on, CDC advised separate MMR and chickenpox shots for the first dose unless parents preferred the combined shot.[266] In September

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[259] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(3):90-95, *Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine: Updated Interim Recommendations from the Advisory Committee on Immunization Practices, United States, December 2021*, January 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7103a4.htm (accessed November 12, 2026).

[260] Centers for Disease Control and Prevention, *Safety of COVID-19 Vaccines*, January 31, 2025, https://www.cdc.gov/vaccine-safety/vaccines/covid-19.html (accessed November 12, 2026).

[261] Centers for Disease Control and Prevention, *Measles, Mumps, Rubella, Varicella (MMRV) Vaccine Safety*, September 4, 2025, https://www.cdc.gov/vaccine-safety/vaccines/mmrv.html (accessed November 12, 2026).

[262] Centers for Disease Control and Prevention, *Measles, Mumps, Rubella, Varicella (MMRV) Vaccine Safety*, September 4, 2025, https://www.cdc.gov/vaccine-safety/vaccines/mmrv.html (accessed November 12, 2026).

[263] Centers for Disease Control and Prevention, Advisory Committee on Immunization Practices, *Briefing Document: Policy Recommendations for Use of Measles, Mumps, Rubella, and Varicella (MMRV) Vaccine in the United States (meeting of September 18-19, 2025)*, September 2025, https://www.cdc.gov/acip/downloads/slides-2025-09-18-19/policy-recs-mmrv-briefing-508.pdf (accessed November 12, 2026).

[264] Centers for Disease Control and Prevention, *Measles, Mumps, Rubella, Varicella (MMRV) Vaccine Safety*, September 4, 2025, https://www.cdc.gov/vaccine-safety/vaccines/mmrv.html (accessed November 12, 2026).

[265] Centers for Disease Control and Prevention, Advisory Committee on Immunization Practices, *Briefing Document: Policy Recommendations for Use of Measles, Mumps, Rubella, and Varicella (MMRV) Vaccine in the United States (meeting of September 18-19, 2025)*, September 2025, https://www.cdc.gov/acip/downloads/slides-2025-09-18-19/policy-recs-mmrv-briefing-508.pdf (accessed November 12, 2026).

[266] Centers for Disease Control and Prevention, Advisory Committee on Immunization Practices, *Briefing Document: Policy Recommendations for Use of Measles, Mumps, Rubella, and Varicella (MMRV) Vaccine in the United States (meeting of September 18-19, 2025)*, September 2025, https://www.cdc.gov/acip/downloads/slides-2025-09-18-19/policy-recs-mmrv-briefing-508.pdf (accessed November 12, 2026).

2025, the newly appointed ACIP went further and recommended against MMRV for young children (Chapter 14).[267]

A case study in the newest products: RSV

Respiratory syncytial virus (RSV) shows how the safety system handles brand-new products, and how officials weigh a small risk against a benefit. RSV usually causes a cold, but it can be severe in babies and older adults.[268]

Between 2023 and 2025, FDA approved three RSV vaccines for adults (from Pfizer, GSK and Moderna), one vaccine for pregnant women (Pfizer's Abrysvo, given at 32 to 36 weeks), and a monoclonal antibody for babies, nirsevimab (Beyfortus). An antibody shot is not a vaccine. It gives the baby ready-made antibodies instead of teaching the immune system to make its own. CDC recommends either the maternal vaccine or the infant antibody, and says most babies do not need both.[269]

Here is what the safety data showed, according to CDC's July 2025 page:[270]

- **Older adults and GBS.** In trials of the GSK and Pfizer vaccines, a small number of people developed serious nerve conditions such as Guillain-Barre syndrome within 42 days, too few to tell if the vaccine was the cause. After approval, an FDA study using Medicare data found an increased risk. FDA estimated it at "on the order of 10 excess cases per 1 million vaccinated adults 60 or older." The link was statistically significant for GSK and similar but not significant for Pfizer. CDC and ACIP concluded the benefits still outweigh the risk for adults 75 and older and for adults 50 to 74 at higher risk.
- **Pregnancy and preterm birth.** The Pfizer trials in pregnant women found more preterm births among women who got the vaccine. The increase was not statistically significant, but FDA approved the vaccine only for 32 to 36 weeks of pregnancy "to avoid the potential risk for preterm birth" earlier than 32 weeks. The trials also saw a small, not statistically significant increase in high blood pressure problems of pregnancy. Early Vaccine Safety Datalink results from the first season found no increased risk of preterm birth at 32 to 36 weeks. More studies are under way.
- **Babies.** Trials of nirsevimab found no safety concerns. After approval, FDA added serious allergic reactions to the label in February 2024 after reports came in.

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[267] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[268] Centers for Disease Control and Prevention, *RSV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/rsv.html (accessed November 12, 2026).

[269] Centers for Disease Control and Prevention, *RSV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/rsv.html (accessed November 12, 2026).

[270] Centers for Disease Control and Prevention, *RSV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/rsv.html (accessed November 12, 2026).

You might ask, "If the preterm birth result was not statistically significant, why change anything?" This is a good example of regulators acting on a possible signal before it is proven, by narrowing the window when the vaccine can be given. Critics on one side say that is proof the safety system works. Critics on the other side say it shows that risks can show up only after millions of doses, and that new products deserve more caution. Both readings are drawn from the same facts.

In June 2025, the reconstituted ACIP recommended a second infant RSV antibody, clesrovimab. The March 2026 court order stayed that vote, which CRS says may leave it without a recommendation (Chapter 14).[271]

A case study in public worry: the HPV vaccine

The HPV vaccine draws more safety questions than most teen vaccines, partly because it is given to preteens and protects against a sexually transmitted infection. CDC's March 2025 safety page says the agency "is aware of public concern" and lays out what has been studied.[272]

What was found. Fainting after the shot is real. FDA changed the label to include advice on preventing falls, and providers are told to give the shot while the patient is seated or lying down and to watch the patient for 15 minutes afterward. Severe allergic reactions can happen, as with any vaccine. Shot-site pain, swelling and redness were more common with Gardasil 9 than with the older Gardasil, and rose with each dose.[273]

What was reported to VAERS. More than 80 million doses of the original Gardasil were distributed from June 2006 through December 2017. VAERS received 36,142 U.S. reports for it in that time; 93 percent were classified as non-serious and 7 percent as serious. For Gardasil 9, researchers reviewed 7,244 reports from December 2014 through December 2017; about 97 percent were non-serious. Remember from earlier in this chapter that a VAERS report does not prove the vaccine caused the problem.[274]

What was checked and not found. CDC lists specific concerns and its findings:[275]

Concern	CDC's finding (March 2025)
Early menopause (primary ovarian	"CDC and FDA have not found any proof" of

[271] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[272] Centers for Disease Control and Prevention, *HPV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/hpv.html (accessed November 12, 2026).

[273] Centers for Disease Control and Prevention, *HPV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/hpv.html (accessed November 12, 2026).

[274] Centers for Disease Control and Prevention, *HPV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/hpv.html (accessed November 12, 2026).

[275] Centers for Disease Control and Prevention, *HPV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/hpv.html (accessed November 12, 2026).

Concern	CDC's finding (March 2025)
insufficiency) and fertility	reproductive problems
Postural orthostatic tachycardia syndrome (POTS)	Monitoring "has not detected any safety concerns"; a VSD study is under way
Complex regional pain syndrome	"Evidence does not support a causal link"
Chronic fatigue syndrome	Studies show no increased risk; a VSD study is under way
Guillain-Barre syndrome	Risk "extremely rare"
Death	"Evidence does not suggest a causal link"
Shots given by mistake during pregnancy	Pregnancy registries "have not found any health concerns"

A fair reader will notice two things. CDC states its conclusions firmly. And for two of the conditions people worry about most, POTS and chronic fatigue, CDC also says studies are still in progress. Both are true at the same time.

There was also one manufacturing recall. In December 2013, Merck recalled one lot of Gardasil because a small number of vials might contain glass particles from breakage during manufacturing. CDC said no reactions beyond mild redness and swelling had been reported from that lot.[276] It is a small example of the lot-tracking system in Chapter 6 working as designed.

Alarms that turned out to be false, or that never applied here

CDC keeps a list of past safety concerns.[277] Some were real problems, like RotaShield and the 1976 swine flu vaccine above. Others were investigated and not confirmed. I include both kinds, because a fair account has to show the system catching real problems and also clearing false ones.

Table 8.3. Selected past vaccine safety concerns and what investigators found

Years	Concern	What was found
1955-1963	An estimated 10 to 30 percent of polio vaccine given in the U.S. contained simian virus 40 (SV40), a monkey virus	The contamination was real. Testing was required for all new lots. CDC says most studies found no causal link to

[276] Centers for Disease Control and Prevention, *HPV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/hpv.html (accessed November 12, 2026).

[277] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

Years	Concern	What was found
	from the kidney cells used to grow it	cancer, and no vaccine used today contains SV40.[278]
1998	Hepatitis B vaccine and multiple sclerosis	A 2002 Institute of Medicine review found no link.[279]
2005-2008	Guillain-Barre syndrome after the Menactra meningococcal vaccine	Two studies of more than 2 million vaccinated teenagers found no link.[280]
2007	Merck recalled 1.2 million doses of Hib vaccine over possible bacterial contamination	A precaution. No infections were found in children who got recalled doses.[281]
2009-2010	Narcolepsy after Pandemrix, an H1N1 flu vaccine used in Europe	A real increased risk was found in some European countries. Pandemrix was never licensed in the U.S., and CDC studies did not find the link with U.S. vaccines.[282]
2010	Both U.S. rotavirus vaccines found to contain pieces of a pig virus (porcine circovirus)	The virus is not known to cause disease in animals or people. Monitoring found no reason for concern.[283]
2013	Merck recalled one batch of Gardasil over possible glass particles	A precaution. No health problems beyond normal side effects were reported.[284]

[278] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[279] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[280] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[281] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[282] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[283] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[284] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

Two things stand out. First, contamination problems were real more than once: SV40, Cutter (Chapter 2), and the recalls. Each led to new testing rules. Second, the narcolepsy case shows that a side effect can be tied to one specific product made one specific way. That is why safety findings are reported product by product and not for "vaccines" as a whole.

Weighing one vaccine: rotavirus

Every vaccine decision comes down to setting the harm of the disease beside the harm of the vaccine. That sounds obvious, but you rarely see both sides laid out on one page. CRS did it in 2026 for the rotavirus vaccine, as an example of how the weighing works.[285] I have put its points in Table 8.4.

Table 8.4. Rotavirus: harms of the disease and of the vaccine, side by side

	What CRS reports
The disease, before the vaccine (2006)	Each year among U.S. children under 5: about 410,000 doctor visits, 205,000 to 272,000 emergency room visits, 55,000 to 70,000 hospital stays, and 20 to 60 deaths
How well the vaccines work in trials	RotaTeq: 98 percent protection against severe rotavirus disease and 74 percent against disease of any severity. Rotarix: 85 to 96 percent effective against severe disease
What happened after they came in	By 2017, a median 80 percent drop in rotavirus hospital stays and a 57 percent drop in emergency room visits, with about 70 percent of toddlers vaccinated
Common side effects of the vaccine	Mild ones such as fussiness, mild diarrhea and vomiting
The serious side effect	Intussusception, a bowel blockage. Estimated at about 1 in 20,000 to 1 in 100,000 U.S. infants who get the vaccine. Usually treated in the hospital without surgery, but sometimes surgery is needed, and in rare cases it can be fatal or cause lasting harm, especially if untreated
The weighing	Studies estimate that for every hospital stay for intussusception caused by the vaccine,

[285] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), p. 17.

	What CRS reports
	hundreds of rotavirus hospital stays are prevented (128 to 1,142, depending on the study). CRS reports that risk-benefit analyses have concluded the benefit outweighs the risk

Source: CRS, which notes the table is an illustration and "not a result of a comprehensive and systematic literature review."[286]

Two things stand out to me. First, the side effect is real, rare and serious, and the official sources say so. Second, the decision still depends on the setting. Chapter 12 explains that Denmark chose not to use this vaccine, because children there very rarely died of rotavirus. A country with more severe disease would weigh the same numbers differently. That is a fair reason for countries to differ, and it is a different thing from saying the vaccine is unsafe.

What about deaths?

Deaths after vaccination get reported to VAERS, and those reports are often quoted as proof that vaccines kill. Part Six tests that claim. The confirmed cases above, such as the TTS deaths, show that vaccines can rarely cause death. The difficult work is separating those from deaths that happened after a vaccine but were not caused by it. CDC says serious adverse events after vaccination "are rarely caused by the vaccine."[287] Readers who distrust CDC will want to know that the same agency confirmed and published the TTS deaths and the myocarditis rates in its own journal.

What Part Three shows: Real side effects exist, and the U.S. system has found several of them, sometimes fast. Most are rare, and their rates are known. The biggest confusion comes from VAERS, which collects reports of anything that happens after a shot and cannot by itself show what caused it.

[286] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), p. 17.

[287] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

Part Four: Injury Compensation and Liability

Chapter 9: The Lawsuits and the 1986 Law

Chapter 2 ended with a gap. When the Cutter vaccine paralyzed children in 1955, there was no system to pay the families. CDC says so directly.[288] For the next 30 years, people hurt by a vaccine had one main option: sue the company in state court.

The 1976 warning sign

The first big crack showed during the 1976 swine flu program. The best inside account comes from two men who ran it: Dr. David Sencer, CDC director from 1966 to 1977, and Dr. J. Donald Millar, who directed the program. Keep in mind that they were defending their own decisions when they wrote it in 2006.[289]

In February 1976, CDC identified a new flu strain in two sick Army recruits at Fort Dix, New Jersey. It was similar to the virus believed to have caused the 1918 pandemic. Blood tests suggested more than 200 recruits had been infected, passed from person to person.[290] On March 10, ACIP concluded a pandemic was possible. One member said, "If we believe in prevention, we have no alternative but to offer and urge the immunization of the population." Another member thought the vaccine should be stockpiled, not given.[291] President Gerald Ford accepted CDC's plan to make enough vaccine for the whole country. The program's budget was $137 million, though newspapers reported "$1.9 billion" because the money was part of a larger spending bill.[292]

Then the vaccine makers delivered an ultimatum: the federal government had to protect them against claims over side effects, or they would not release the vaccine. Sencer and Millar wrote that "the government quickly capitulated to industry's demand for indemnification." They also wrote that the demand sent a message that "blared 'There's something wrong with this vaccine,'" so that every health problem after a shot was blamed on it.[293] Earlier that year, before Fort Dix,

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[288] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[289] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

[290] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

[291] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

[292] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

[293] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

CDC had proposed a law to pay people hurt by properly given vaccines. The proposal came back from the Surgeon General's office with a handwritten note: "This is not a problem."[294]

The program gave shots to about 45 million people in 10 weeks.[295] Three elderly people died after shots at the same clinic. Investigators found no evidence the vaccine caused those deaths, but the press coverage was intense. The blow the program could not survive was Guillain-Barre syndrome (GBS), a rare nerve disorder that can cause paralysis. Experts debated whether more GBS cases were being found only because people were looking harder, but the consensus was that the number of cases "appeared to be an excess." With more than 40 million people vaccinated and no sign that the new flu was spreading, officials stopped the program on December 16, 1976. The next February, the new head of the health department fired the CDC director.[296] The swine flu pandemic never came.

You might ask, "Was 1976 a failure?" People still argue about it. Sencer and Millar argued that when lives are at stake, "it is better to err on the side of overreaction than underreaction." They also admitted that the President's press conference and his televised shot made the program look political, and that health officials should explain what they do not know as clearly as what they do.[297] Critics then and now point to it as a case where a vaccine was rushed and then caused real harm for a threat that did not arrive. Both sides use it. What is not in dispute is that the liability deal of 1976 was a one-time arrangement. The bigger fight came a few years later, over whooping cough.

The DTP lawsuits

In the 1970s and 1980s, lawsuits against makers of the diphtheria, tetanus and pertussis (DTP) vaccine multiplied. The Supreme Court later summed up what happened. Between 1978 and 1981, only nine product liability suits were filed against DTP makers. By the mid-1980s there were more than 200 a year. Two of the three U.S. makers of the vaccine left the market. The one that remained, Lederle Laboratories, estimated that its possible liability was 200 times its yearly sales. When Lederle had production problems in 1984, there were vaccine shortages.[298]

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[294] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

[295] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

[296] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

[297] David J. Sencer and J. Donald Millar, Emerging Infectious Diseases 12(1) (CDC journal), *Reflections on the 1976 Swine Flu Vaccination Program*, January 2006, https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article (accessed November 12, 2026).

[298] Supreme Court of the United States, *Bruesewitz v. Wyeth LLC, 562 U.S. 223 (2011) (opinion of the Court by Justice Scalia; dissent by Justice Sotomayor)*, February 22, 2011, https://tile.loc.gov/storage-services/service/ll/usrep/usrep562/usrep562223/usrep562223.pdf (accessed November 12, 2026).

You might ask, "Were the lawsuits right or wrong?" Some of each, and that is why Congress tried to build something new. The Supreme Court described the 1986 law as meant to do two things at once: keep vaccine makers in the market, and make it easier for people with real vaccine injuries to get paid, since they "found pursuing legitimate vaccine-inflicted injuries too costly and difficult."[299]

The National Childhood Vaccine Injury Act of 1986

Congress passed the National Childhood Vaccine Injury Act in 1986. The Congressional Research Service (CRS) describes it as creating a "no-fault compensation program," the National Vaccine Injury Compensation Program (VICP), where people file a claim against the HHS Secretary instead of suing the company first.[300] "No-fault" means a person does not have to prove the company did anything wrong, only that the vaccine likely caused the injury.

The law also did three other things that still matter today:

- **It limited lawsuits.** No one can sue a covered vaccine maker or the person who gave the shot for more than $1,000 without first going through VICP.[301]
- **It protected makers from some kinds of claims.** The key sentence says that no vaccine maker "shall be liable in a civil action for damages arising from a vaccine-related injury or death … if the injury or death resulted from side effects that were unavoidable even though the vaccine was properly prepared and was accompanied by proper directions and warnings."[302]
- **It set up safety reporting.** The same law required doctors and makers to report certain problems after vaccination, which led to VAERS in 1990 (Chapter 7).[303]

How it is paid for

VICP is paid for by a tax on vaccines, not by general tax dollars. The tax is 75 cents per dose of each covered vaccine.[304] The money goes into the Vaccine Injury Compensation Trust Fund.

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[299] Supreme Court of the United States, *Bruesewitz v. Wyeth LLC, 562 U.S. 223 (2011) (opinion of the Court by Justice Scalia; dissent by Justice Sotomayor)*, February 22, 2011, https://tile.loc.gov/storage-services/service/ll/usrep/usrep562/usrep562223/usrep562223.pdf (accessed November 12, 2026).

[300] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[301] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 300aa-11, Petitions for compensation*, current text, https://www.law.cornell.edu/uscode/text/42/300aa-11 (accessed November 12, 2026).

[302] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 300aa-22, Standards of responsibility*, current text, https://www.law.cornell.edu/uscode/text/42/300aa-22 (accessed November 12, 2026).

[303] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[304] United States Code (Legal Information Institute, Cornell Law School), *26 U.S.C. 4131, Imposition of tax (vaccines)*, current text, https://www.law.cornell.edu/uscode/text/26/4131 (accessed November 12, 2026).

Congress separately pays for the court's special masters, the Department of Justice lawyers who represent HHS, and the medical reviewers at the Health Resources and Services Administration (HRSA).[305] CRS points out a quirk: a vaccine cannot be covered by VICP until Congress applies the excise tax to it.[306]

[305] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[306] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

Chapter 10: How the Vaccine Court Works

People often call VICP the "vaccine court." Here is how a claim moves through it.

Who decides

Claims are decided by special masters at the U.S. Court of Federal Claims. CRS explains that special masters are court officers appointed by the court's judges for four-year terms, and that the law caps their number at eight.[307] They work much like judges: they hold conferences, gather records and hold hearings. HRSA doctors review the medical records, and Department of Justice lawyers represent the government.[308]

The Vaccine Injury Table

The table is the heart of the program. It lists vaccines, specific injuries, and the time window in which the first symptom must appear.[309] If your injury is on the table and started inside the window, the law presumes the vaccine caused it, unless the government shows another cause. If it is not on the table, you can still win, but you have to prove the vaccine actually caused it.[310]

Table 10.1. Examples from the Vaccine Injury Table

Vaccine	Injury	First symptom must start within
Tetanus-containing (DTaP, Tdap, Td and others)	Anaphylaxis	4 hours
Tetanus-containing	Brachial neuritis (nerve inflammation in the shoulder and arm)	2 to 28 days
Pertussis-containing (DTaP, DTP)	Encephalopathy or encephalitis (brain injury or swelling)	72 hours

[307] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[308] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[309] Code of Federal Regulations (Legal Information Institute, Cornell Law School), *42 CFR 100.3, Vaccine injury table*, current text, https://www.law.cornell.edu/cfr/text/42/100.3 (accessed November 12, 2026).

[310] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

Vaccine	Injury	First symptom must start within
Measles, mumps, rubella (MMR, MMRV)	Encephalopathy or encephalitis	5 to 15 days
Rubella-containing	Chronic arthritis	7 to 42 days
Measles-containing	Thrombocytopenic purpura (low platelets)	7 to 30 days
Oral polio (OPV)	Paralytic polio	30 days (6 months if immunodeficient)
Rotavirus	Intussusception	1 to 21 days
Many injected vaccines	Shoulder injury related to vaccine administration (SIRVA)	48 hours
Many injected vaccines	Fainting (vasovagal syncope)	1 hour

Source: 42 CFR 100.3.[311] The table has more entries than shown here.

Notice how many entries match the confirmed side effects in Chapter 8. The table is supposed to follow the science. The HHS Secretary can change it by regulation.[312] For example, CRS reports that shoulder injuries (SIRVA) were added in 2017, removed by a final rule in January 2021, and then that removal was rescinded, so SIRVA is still on the table.[313]

Proving cause when the injury is not on the table

For an injury that is not on the table, the courts use a three-part test, called the Althen factors after a federal appeals case. The person must show a medical theory linking the vaccine and the

[311] Code of Federal Regulations (Legal Information Institute, Cornell Law School), *42 CFR 100.3, Vaccine injury table*, current text, https://www.law.cornell.edu/cfr/text/42/100.3 (accessed November 12, 2026).

[312] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[313] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

injury, a logical sequence of cause and effect, and a close enough timing between the two.[314] The standard is "more likely than not."[315]

Deadlines

Deadlines are short. For an injury, a claim must be filed within 36 months of the first symptom. For a death, within 24 months of the death and no more than 48 months after the first symptom of the injury that caused it.[316]

What people can receive

Winners can get paid for past and future medical care, lost earnings, and pain and suffering. Pain and suffering is capped at $250,000, and a vaccine-related death brings a set award of $250,000 to the estate.[317] Those caps are set in the law and are nominal dollars, not adjusted for inflation since 1986. Punitive damages are not allowed.[318]

Lawyers' fees are paid by the program, even when a claim loses, as long as it was brought in good faith with a reasonable basis. Lawyers paid by the program cannot charge their clients more.[319] Supporters say this helps families find lawyers. Critics say it encourages weak claims. Both are interpretations, not facts I can settle here.

Settlements

Most claims are settled. CRS reports that, according to HRSA, 60 percent of all compensation paid through VICP comes from negotiated settlements in which HHS has not concluded, based on the evidence, that the vaccine caused the injury.[320] So a payment does not always mean the government agreed the vaccine was the cause. Some groups count every payment as a proven

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[314] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[315] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[316] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 300aa-16, Limitations of actions*, current text, https://www.law.cornell.edu/uscode/text/42/300aa-16 (accessed November 12, 2026).

[317] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 300aa-15, Compensation*, current text, https://www.law.cornell.edu/uscode/text/42/300aa-15 (accessed November 12, 2026).

[318] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[319] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[320] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

vaccine injury. That goes further than the records support. Others dismiss all settlements as meaningless. That also goes too far, since a settlement means HHS judged the case worth paying.

Accepting or rejecting the result

After a decision, the person chooses. If they accept, they take the award and give up the right to sue the maker over the same injury. If they reject it, they get nothing from VICP but can then sue the maker or provider in regular court, within the limits of the law.[321] Either side can appeal a special master's decision to a judge of the Court of Federal Claims and then to the U.S. Court of Appeals for the Federal Circuit.[322]

What VICP has paid

Table 10.2. VICP totals, October 1, 1988, through November 1, 2026 (nominal dollars)

Measure	Amount
Petitions filed	30,424 (28,960 injury, 1,464 death)
Found compensable	13,557
Dismissed	13,425
Paid to petitioners	$5,045,810,644.84
Attorneys' fees and costs, compensated cases	$448,166,552.40
Attorneys' fees and costs, dismissed cases	$140,178,043.57
Interim attorneys' fees and costs	$81,523,147.29
Total outlays	$5,715,678,388.10 (about $5.7 billion)
Fiscal year 2026 (Oct. 2025 to Sept. 2026)	1,063 awards; $207,435,907.37 total outlays

Source: HRSA, VICP Data and Statistics, updated November 1, 2026.[323] Note: one table in the same HRSA report shows 13,602 compensated petitions while another shows 13,557. HRSA's

[321] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[322] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[323] Health Resources and Services Administration (HRSA), *National Vaccine Injury Compensation Program Data and Statistics*, updated November 1, 2026, https://www.hrsa.gov/sites/default/files/hrsa/vicp/vicp-stats-11-01-26.pdf (accessed November 12, 2026).

own summary text uses 13,557, so I do too. The report also says some earlier fiscal year figures have been updated.

How does that compare with the number of shots? CRS reports that from 2006 to 2024, VICP decided 14,501 petitions and 10,732 received compensation, while more than 5 billion doses of covered vaccines were distributed. HRSA's summary of that is that "for every 1 million doses of vaccine that were distributed, approximately 1 individual was compensated."[324] That figure counts compensated people, not every injury. Some injured people never file a claim, so the true number of injuries is likely higher. How much higher is unknown.

Autism cases in vaccine court

The biggest test the vaccine court ever faced was autism. In July 2002, facing thousands of petitions that said vaccines caused autism, the Office of Special Masters set up the Omnibus Autism Proceedings. More than 5,000 petitions went into it.[325] Instead of hearing every case one at a time, lawyers for the families picked "test cases" for each main theory: that the MMR vaccine combined with thimerosal-containing vaccines caused autism, that thimerosal-containing vaccines alone did, and that MMR alone did.[326]

The court later called the evidence "easily . . . the largest of all cases presented to the [c]ourt in the history of the Vaccine Act." Three special masters heard the test cases. Each one separately found that the theories were not reliable and that the families had not proven their case. The families' lawyers dropped the MMR-alone theory because the first round of cases had already covered it. The appeals ended in 2010, when the Federal Circuit upheld the dismissals of the Hazlehurst and Cedillo cases.[327]

One case went the other way, and both sides still talk about it. Hannah Poling had a mitochondrial disorder and was diagnosed with regressive autism. In November 2007 the Justice Department agreed that her claim met the law's standard for compensation. Its reason was that she showed signs of brain injury (encephalopathy) within the time limits on the Vaccine Injury Table after DTaP and measles vaccines. The government did not concede that

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[324] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[325] U.S. Court of Federal Claims (Judge Edward H. Meyers), *Hazlehurst v. Secretary of Health and Human Services, No. 03-654V, Opinion and Order (Document 142)*, June 26, 2025 (reissued July 16, 2025), https://www.govinfo.gov/content/pkg/USCOURTS-cofc-1_03-vv-00654/pdf/USCOURTS-cofc-1_03-vv-00654-0.pdf (accessed November 12, 2026), pp. 4-5.

[326] U.S. Court of Federal Claims (Judge Edward H. Meyers), *Hazlehurst v. Secretary of Health and Human Services, No. 03-654V, Opinion and Order (Document 142)*, June 26, 2025 (reissued July 16, 2025), https://www.govinfo.gov/content/pkg/USCOURTS-cofc-1_03-vv-00654/pdf/USCOURTS-cofc-1_03-vv-00654-0.pdf (accessed November 12, 2026), p. 5.

[327] U.S. Court of Federal Claims (Judge Edward H. Meyers), *Hazlehurst v. Secretary of Health and Human Services, No. 03-654V, Opinion and Order (Document 142)*, June 26, 2025 (reissued July 16, 2025), https://www.govinfo.gov/content/pkg/USCOURTS-cofc-1_03-vv-00654/pdf/USCOURTS-cofc-1_03-vv-00654-0.pdf (accessed November 12, 2026), pp. 5, 12.

vaccines cause autism in general.[328] People who doubt vaccine safety point to the Poling case as proof that the government quietly admitted a link. The government's position was narrower: one child's injury met the table rules.

You might ask, "Is that settled now?" In 2025, the man whose childhood case had been one of the MMR test cases asked the court to throw out the 2009 judgment against him. He said the Justice Department hid that one of its own experts, Dr. Andrew Zimmerman, had come to believe that vaccines could, in some children with mitochondrial problems, lead to a brain injury with features of autism. Judge Edward Meyers denied the motion. He wrote, "The court has no doubt that his belief is sincere," and noted that "the Government won virtually all autism cases brought to the court." But he also said the only question in front of him was fraud: "The court today addresses only whether the United States Department of Justice committed a fraud on the court to prevail in this case. It did not."[329] In other words, the 2025 ruling was about how the government behaved in court, not a new ruling on the science.

A growing backlog

Filings are rising. CRS reports that in fiscal year 2025 there were 1,301 new petitions, almost 10 percent more than the year before and 62 percent more than in fiscal year 2015. As of September 30, 2025, more than 3,400 petitions were pending.[330] With only eight special masters allowed by law, CRS notes Congress may consider adding more.[331]

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[328] U.S. Court of Federal Claims (Judge Edward H. Meyers), *Hazlehurst v. Secretary of Health and Human Services, No. 03-654V, Opinion and Order (Document 142)*, June 26, 2025 (reissued July 16, 2025), https://www.govinfo.gov/content/pkg/USCOURTS-cofc-1_03-vv-00654/pdf/USCOURTS-cofc-1_03-vv-00654-0.pdf (accessed November 12, 2026), p. 13.

[329] U.S. Court of Federal Claims (Judge Edward H. Meyers), *Hazlehurst v. Secretary of Health and Human Services, No. 03-654V, Opinion and Order (Document 142)*, June 26, 2025 (reissued July 16, 2025), https://www.govinfo.gov/content/pkg/USCOURTS-cofc-1_03-vv-00654/pdf/USCOURTS-cofc-1_03-vv-00654-0.pdf (accessed November 12, 2026), pp. 1-2.

[330] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[331] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

Chapter 11: COVID-19 Claims and the Fight Over Liability

COVID-19 vaccines are not in VICP

COVID-19 vaccines are handled by a different, much smaller program. CRS explains that during a public health emergency declared under the Public Readiness and Emergency Preparedness Act (PREP Act), the Countermeasures Injury Compensation Program (CICP) covers injuries from "covered countermeasures," which include COVID-19 vaccines.[332] As of CRS's April 2025 report, COVID-19 vaccines remained covered "through the end of 2029."[333]

CICP is much harder on claimants than VICP. Here are the main differences, according to CRS:

Table 11.1. VICP compared with CICP

	VICP (most routine vaccines)	CICP (COVID-19 vaccines)
Who decides	Special masters at the Court of Federal Claims	HRSA, inside HHS
Deadline to file	36 months from first symptom (injury)	Generally 1 year from the date of the shot
What injuries count	Any vaccine injury, table or proven	Only death or "serious physical injuries"
Lawyers' fees paid	Yes	No
Pain and suffering	Up to $250,000	Not paid
Death benefit	$250,000 set by statute	Tied to the Public Safety Officers' Benefits program, $448,575 at the time of the CRS report
Lost income cap	No fixed yearly cap in this summary	$50,000 a year
Can you sue afterward?	Yes, if you reject the award, within limits	Generally no; only a narrow "willful misconduct" exception

[332] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026).

[333] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026).

Sources: CRS;[334,335] 42 U.S.C. 300aa-16.[336] Dollar figures are nominal.

The PREP Act says the only exception to the legal immunity it grants is for "willful misconduct."[337]

How many COVID-19 claims have been paid?

Very few, so far. CRS reported that as of April 2025, HRSA had decided 4,111 of 13,764 claims about COVID-19 countermeasures (vaccines and other products). It denied 4,044 of them (98.4 percent) and found 67 eligible for compensation (1.6 percent).[338] CRS's May 2026 update says almost 11,000 claims about COVID-19 vaccines alone had been filed with CICP as of March 2026.[339] **[Not verified: newer CICP payment totals. I tried to open HRSA's CICP data pages and could not load them.]**

Bringing COVID-19 vaccines into VICP would take an act of Congress as well as regulatory changes, according to CRS.[340]

Why CICP is so hard to win

CICP was built in 2005 for rare emergencies, and before COVID-19 it was barely used. CRS reports that fewer than 600 claims had been filed before 2020 and only a few dozen paid. From fiscal years 2010 through 2025, CICP paid just 30 claims not related to COVID-19, almost all for the 2009 H1N1 flu vaccine.[341] Then COVID-19 changed the scale. Almost 96 percent of all CICP

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[334] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026).

[335] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[336] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 300aa-16, Limitations of actions*, current text, https://www.law.cornell.edu/uscode/text/42/300aa-16 (accessed November 12, 2026).

[337] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 247d-6d, Targeted liability protections for pandemic and epidemic products and security countermeasures (PREP Act)*, current text, https://www.law.cornell.edu/uscode/text/42/247d-6d (accessed November 12, 2026).

[338] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026).

[339] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[340] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[341] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026), p. 6.

claims ever filed relate to COVID-19 products, and more than 77 percent of those claim harm from COVID-19 vaccines.[342]

Three features make those claims hard to win:

- **No injury table.** VICP has a table of injuries the program presumes were caused by a vaccine (Chapter 10). CICP can have one too, but CRS reports that "no such table has yet been promulgated for any COVID-19 countermeasure, including COVID-19 vaccines." So every COVID-19 vaccine claimant must prove the vaccine caused the injury.[343]
- **A high bar for proof.** Without a table, claimants must show the injury was the "direct result" of the shot, using "compelling, reliable, [and] valid" medical and scientific evidence, "beyond mere temporal association." In plain words, it is not enough to show the problem started soon after the shot.[344]
- **No court.** Decisions are made by HRSA staff for the Secretary. Claimants can ask HRSA to reconsider, but the PREP Act "precludes judicial review." No judge looks at the case.[345]

CRS also notes criticism that CICP lacks "transparency and accountability" and has high administrative costs compared with what it pays out.[346]

You might ask, "Why not just move COVID-19 vaccines into VICP?" The law sets a path, but it has a lock on it. When CDC recommended COVID-19 vaccines for routine use in children in its schedule published February 10, 2023, that triggered a legal duty for the Secretary to add them to the injury table. But any table change does not take effect until Congress passes an excise tax on the vaccine, and Congress had not done so. A 2025 lawsuit, *Brundage v. Becerra*, sought to force HHS to add the vaccine to the table anyway.[347] CRS lays out the choices for Congress: lower the barriers in CICP, move COVID-19 vaccine claims into VICP, create a new program just

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[342] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026), p. 6.

[343] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026), p. 5.

[344] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026), p. 5.

[345] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026), p. 5.

[346] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026), p. 14.

[347] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026), p. 13.

for COVID-19 vaccine injuries, or let the regular courts handle claims once the PREP Act protection ends.[348]

Do not confuse two different federal declarations. The June 29, 2026 notice in Chapter 14 ends the declaration that allowed emergency use authorizations, effective June 29, 2027.[349] The PREP Act declaration that shields makers and sends claims to CICP is a separate document, and CRS reported in 2025 that it covered COVID-19 vaccines through the end of 2029.[350] [Not verified: whether the PREP Act declaration was changed after April 2025.]

The debate over liability protection

This is one of the sharpest arguments in the whole vaccine debate. Here is what each side says, with the facts each side points to.

The case for the current system. Supporters say the 1986 law did what it was built to do: it kept vaccines on the market after makers were leaving and paid thousands of people without forcing them to prove anyone was at fault. In *Bruesewitz v. Wyeth* (2011), the Supreme Court described the law's bargain this way: "The vaccine manufacturers fund an informal, efficient compensation program for vaccine injuries in exchange for avoiding costly tort litigation and the occasional disproportionate jury verdict."[351] The CDC page on historical vaccine concerns, as last updated in July 2024, called VICP "a model method for ensuring that all persons harmed by vaccines are compensated quickly and fairly, while also protecting companies that make lifesaving products from financially unsustainable liability claims."[352]

The case against. Critics say the law took away the strongest pressure on companies to make safer vaccines. In *Bruesewitz*, the Supreme Court ruled 6 to 2 that the 1986 law blocks all lawsuits claiming a vaccine's *design* was defective.[353] Justice Sonia Sotomayor, joined by Justice Ruth Bader Ginsburg, dissented. She wrote that the decision "leaves a regulatory vacuum in which no one ensures that vaccine manufacturers adequately take account of scientific and

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[348] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026), p. 14.

[349] Office of the Secretary, U.S. Department of Health and Human Services, Federal Register (FR Doc. 2026-13374), *Termination of Declaration Authorizing Emergency Use of Drug and Biological Products During the COVID-19 Pandemic*, July 2, 2026, https://www.govinfo.gov/link/fr/2026-13374?link-type=html (accessed November 12, 2026).

[350] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026).

[351] Supreme Court of the United States, *Bruesewitz v. Wyeth LLC, 562 U.S. 223 (2011) (opinion of the Court by Justice Scalia; dissent by Justice Sotomayor)*, February 22, 2011, https://tile.loc.gov/storage-services/service/ll/usrep/usrep562/usrep562223/usrep562223.pdf (accessed November 12, 2026).

[352] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[353] Supreme Court of the United States, *Bruesewitz v. Wyeth LLC, 562 U.S. 223 (2011) (opinion of the Court by Justice Scalia; dissent by Justice Sotomayor)*, February 22, 2011, https://tile.loc.gov/storage-services/service/ll/usrep/usrep562/usrep562223/usrep562223.pdf (accessed November 12, 2026).

technological advancements when designing or distributing their products."[354] Critics also point to the backlog, the short deadlines, the fixed $250,000 caps, and the very low payment rate for COVID-19 claims in CICP.[355,356]

What is changing. HHS Secretary Robert F. Kennedy Jr. has said he wants to overhaul the program. CRS noted in May 2026 that "some news reports have speculated" that the Secretary may try to add autism, encephalopathy or other injuries to the table, and that such changes "may be challenged in court under the Administrative Procedure Act."[357] CRS also says it is legally unclear whether vaccines moved off the routine schedule in 2026 would still be covered by VICP, because the law ties coverage to vaccines recommended "for routine administration" to children or pregnant women.[358] CRS added three points in a May 2026 legal analysis. First, the Secretary has said that providers who stray from CDC recommendations "are not shielded from liability under the 1986 Vaccine Injury Act," but he did not explain that statement, and HHS had not changed the injury table to match the new schedule.[359] Second, the law does not say the Secretary can remove a vaccine from the table, and only Congress can end the excise tax that funds it.[360] Third, the line is already blurry: the meningococcal B vaccine is on the table even though CDC recommends it only through shared decision-making.[361] Pressure also comes from the other direction. A group of lawyers who represent VICP petitioners wrote to the Secretary asking him to add injuries they say are "associated with" certain vaccines, and threatened to sue if he does not.[362] CRS lists options for Congress, such as defining "recommended for routine

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[354] Supreme Court of the United States, *Bruesewitz v. Wyeth LLC, 562 U.S. 223 (2011) (opinion of the Court by Justice Scalia; dissent by Justice Sotomayor)*, February 22, 2011, https://tile.loc.gov/storage-services/service/ll/usrep/usrep562/usrep562223/usrep562223.pdf (accessed November 12, 2026).

[355] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[356] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026).

[357] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[358] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[359] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[360] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[361] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[362] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

administration" or spelling out which vaccines VICP covers. As of November 12, 2026, I found no final rule changing the injury table to add or remove a vaccine. [Not verified: whether a proposed rule is pending. I searched CRS and HRSA pages I could reach; the Federal Register site blocked my tools.]

You might ask, "So can vaccine makers be sued or not?" Part Six tests that claim directly. The short version: they can be sued in some situations, but the 1986 law and the PREP Act block or delay most lawsuits.

What Part Four shows: Congress made a trade in 1986: limits on lawsuits in exchange for a no-fault payment system funded by a tax on each shot. The system has paid about $5.7 billion. It pays roughly one person per million doses distributed, though not every injured person files. COVID-19 vaccines sit in a separate program that has paid very few claims. Whether the trade is still fair is a live political question.

Part Five: The Schedule and the COVID-19 Years

Chapter 12: How the Schedule Is Set

Who decides who gets a vaccine?

FDA decides whether a vaccine can be sold. A different group has long advised on who should get it: the Advisory Committee on Immunization Practices (ACIP). The Surgeon General set up ACIP in March 1964, and it became a formal federal advisory committee in 1972.[363]

Under its charter, ACIP can have up to 19 voting members with clinical, scientific and public health expertise, including one consumer representative. The HHS Secretary appoints them for overlapping terms of up to four years. Groups such as the American Academy of Pediatrics (AAP) have taken part as non-voting liaison members.[364]

The process, as it ran for decades, worked like this. ACIP formed a work group for a vaccine. The work group reviewed the evidence, usually meeting about once a month, and presented it to the full committee in a public meeting. The committee voted. The CDC Director then decided whether to adopt the recommendation. Once adopted, it became official CDC guidance and could be added to the schedule.[365,366] Since 2018, ACIP has used a structured "Evidence to Recommendation" framework to weigh benefits, harms and other factors.[367]

A few more rules shaped the process. Under the 21st Century Cures Act, ACIP must "consider the use of" any newly FDA-approved vaccine at its next regular meeting.[368] By committee policy, ACIP tried to revisit each recommendation at least once every seven years.[369] And the CDC Director almost always adopted ACIP's votes. CRS found only two times the Director went against a majority ACIP vote: in 2003, when Director Julie Gerberding continued a smallpox

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[363] Congressional Research Service, *The Advisory Committee on Immunization Practices (ACIP) (CRS In Focus IF12317)*, updated September 15, 2025, https://www.congress.gov/crs_external_products/IF/PDF/IF12317/IF12317.6.pdf (accessed November 12, 2026).

[364] Congressional Research Service, *The Advisory Committee on Immunization Practices (ACIP) (CRS In Focus IF12317)*, updated September 15, 2025, https://www.congress.gov/crs_external_products/IF/PDF/IF12317/IF12317.6.pdf (accessed November 12, 2026).

[365] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[366] Centers for Disease Control and Prevention, *How Vaccines are Developed and Approved for Use*, August 10, 2024, https://www.cdc.gov/vaccines/basics/test-approve.html (accessed November 12, 2026).

[367] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[368] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[369] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

vaccination campaign the committee had voted against, and in 2021, when Director Rochelle Walensky did not adopt part of ACIP's proposed criteria for COVID-19 boosters.[370]

You might ask, "If ACIP is only advisory, why does it matter who sits on it?" Because, as the next section shows, laws written by Congress and by the states treat its votes as the trigger for real money and real legal protection.

Why ACIP's vote matters in law

An ACIP recommendation is advice, but federal laws hang real money on it. CRS lists several:[371]

- **Vaccines for Children (VFC).** This program gives free vaccines to children who are on Medicaid, uninsured, underinsured at certain clinics, or American Indian or Alaska Native. The law tells the Secretary to use the list set by ACIP.
- **Private insurance.** Most private health plans must cover, with no cost to the patient, immunizations that have an ACIP recommendation in effect.
- **Vaccine injury compensation.** VICP covers vaccines recommended by CDC "for routine administration" to children or pregnant women (Chapter 10).

So when the recommendation changes, who pays for the shot and whether an injury can be compensated can change too.

Where Vaccines for Children came from

The VFC program is a good example of how a public health problem turned into a law. From 1989 to 1991, a measles epidemic in the United States caused tens of thousands of cases and hundreds of deaths. When CDC investigated, it found that more than half of the children who caught measles had not been vaccinated, even though many of them had seen a health care provider. CDC says the cost of the vaccine was "a primary reason" those children were not vaccinated, even in families that had a regular doctor.[372]

Congress answered in the Omnibus Budget Reconciliation Act of August 10, 1993, which created VFC. The program started on October 1, 1994. It is Section 1928 of the Social Security Act and is a mandatory entitlement, which means eligible children 18 and younger have a right to it by law.[373] The money flows from the Office of Management and Budget through the Centers for

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[370] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[371] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[372] Centers for Disease Control and Prevention, *About the Vaccines for Children (VFC) Program*, August 27, 2026, https://www.cdc.gov/vaccines-for-children/about/index.html (accessed November 12, 2026).

[373] Centers for Disease Control and Prevention, *About the Vaccines for Children (VFC) Program*, August 27, 2026, https://www.cdc.gov/vaccines-for-children/about/index.html (accessed November 12, 2026).

Medicare and Medicaid Services (CMS) to CDC, which buys vaccines at a discount and sends them to enrolled doctors and clinics through 63 state, local and territorial immunization programs.[374]

The key line for this book is that VFC "automatically covers vaccines recommended by the Advisory Committee on Immunization Practices (ACIP) and approved by the CDC." As of CDC's August 2026 page, VFC vaccines protected against 18 diseases.[375] That is why a change to ACIP's list can change which shots a low-income family can get free. Chapter 14 shows how that played out in 2026.

Types of recommendations

ACIP does not only say yes or no. Its recommendations come in types. A routine recommendation is for everyone in an age group. A risk-based recommendation is for people at higher risk. A "shared clinical decision-making" (SCDM) recommendation means a patient and a health care provider should talk about it and decide together.[376] These types matter a great deal in Chapter 14.

How the schedule grew

Since 1995, CDC has published a yearly schedule for children and teens, and from 1995 through 2024 that schedule was formally endorsed by the AAP and the American Academy of Family Physicians.[377]

The number of shots has grown. CDC's current autism page, rewritten in 2025 and 2026, describes the change this way: in 1986, the infant schedule had five doses (two of oral polio vaccine and three of DTP); by 2025, it included doses of rotavirus, hepatitis B, DTaP, Hib, pneumococcal and polio vaccines by six months, flu vaccine, and more shots at 12 months.[378] By the time of a March 2026 CDC report, routine recommendations for children by age 24 months covered vaccines and a monoclonal antibody protecting against 16 diseases.[379]

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[374] Centers for Disease Control and Prevention, *About the Vaccines for Children (VFC) Program*, August 27, 2026, https://www.cdc.gov/vaccines-for-children/about/index.html (accessed November 12, 2026).

[375] Centers for Disease Control and Prevention, *About the Vaccines for Children (VFC) Program*, August 27, 2026, https://www.cdc.gov/vaccines-for-children/about/index.html (accessed November 12, 2026).

[376] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[377] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[378] Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

[379] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child,*

People read the same growth in opposite ways. Some see the added vaccines as protection against more diseases, each one licensed and recommended after its own review. Others worry that the combined schedule has not been studied as a whole. That second concern is not new. A 2013 Institute of Medicine report recommended further HHS studies on the safety of the whole childhood schedule, and the 2026 HHS assessment cited the lack of follow-up research.[380] CRS notes that since a 2016 CDC white paper, researchers have published some whole-schedule studies using the Vaccine Safety Datalink, with mixed results: one found no link between the schedule and type 1 diabetes; another found a possible link between total aluminum exposure and asthma.[381]

How the U.S. compares with other countries

Other wealthy countries do not all use the same schedule. CRS gives the example of rotavirus. Denmark chose not to vaccinate against rotavirus, because children there very rarely died of it with their public health care system (about one death every five years). Finland, Norway and Sweden recommend it for every infant based on its effect on hospitalizations.[382] In the United States before 2006, rotavirus caused an estimated 55,000 to 70,000 hospitalizations and 20 to 60 deaths a year among children under 5. After the vaccine, one review found a median 80 percent drop in rotavirus hospitalizations by 2017.[383] Countries weigh the same facts differently. That comparison became the main argument for the 2026 schedule change in Chapter 14.

Not just for children: vaccines for adults

Most of the public fight is about children, but CDC also keeps an adult schedule. Its consumer page "What Vaccines are Recommended for You," dated June 12, 2024, lists three routine vaccines for every adult: COVID-19, flu, and Tdap or Td (tetanus, diphtheria and, for Tdap, whooping cough).[384] Other vaccines depend on age, job, travel, pregnancy or health conditions:

United States, 2022-2024, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

[380] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[381] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[382] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[383] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[384] Centers for Disease Control and Prevention, *What Vaccines are Recommended for You*, June 12, 2024, https://www.cdc.gov/vaccines-adults/recommended-vaccines/index.html (accessed November 12, 2026).

- **Pregnancy.** A Tdap shot between 27 and 36 weeks of each pregnancy to help protect the newborn from whooping cough, plus flu and other vaccines as needed.[385]
- **Health care workers.** Up to date on COVID-19, chickenpox, flu, hepatitis B, MMR and Tdap or Td, with meningococcal vaccine for certain lab workers.[386]
- **Travelers.** Vaccines depend on the destination; CDC advises getting them 4 to 6 weeks before a trip.[387]
- **Older adults.** Pneumococcal vaccine for all adults 50 and older (and younger adults with certain conditions), according to CDC's pneumococcal page dated February 25, 2026, which notes that older adults are at greatest risk of serious illness and death from pneumococcal disease.[388] RSV vaccine for adults 75 and older and for adults 50 to 74 at higher risk (Chapter 8).[389]

Notice one problem. The 2024 consumer page still calls the COVID-19 vaccine routine for all adults. As Chapter 14 explains, federal advice moved COVID-19 vaccination to individual decision-making in 2025. Agency pages do not always change at the same time, which is one more reason to check dates (Chapter 19).[390]

Shingles, a closer look. Shingles is a good example of an adult vaccine with a clear record. It is caused by the chickenpox virus waking up years after a person had chickenpox. CDC says about 1 in 3 Americans will get shingles in their lifetime, the risk rises with age, 1 to 4 percent of people with shingles are hospitalized, and fewer than 100 people die of it each year, almost all of them older adults or people with weakened immune systems. The most common complication is long-lasting nerve pain called postherpetic neuralgia (PHN), which affects about 10 to 18 percent of people with shingles.[391]

CDC recommends two doses of the shingles vaccine (Shingrix) for adults 50 and older, and for adults 19 and older with weakened immune systems.[392] Its page reports these results:[393]

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[385] Centers for Disease Control and Prevention, *What Vaccines are Recommended for You*, June 12, 2024, https://www.cdc.gov/vaccines-adults/recommended-vaccines/index.html (accessed November 12, 2026).

[386] Centers for Disease Control and Prevention, *What Vaccines are Recommended for You*, June 12, 2024, https://www.cdc.gov/vaccines-adults/recommended-vaccines/index.html (accessed November 12, 2026).

[387] Centers for Disease Control and Prevention, *What Vaccines are Recommended for You*, June 12, 2024, https://www.cdc.gov/vaccines-adults/recommended-vaccines/index.html (accessed November 12, 2026).

[388] Centers for Disease Control and Prevention, *Pneumococcal Vaccination*, February 25, 2026, https://www.cdc.gov/pneumococcal/vaccines/index.html (accessed November 12, 2026).

[389] Centers for Disease Control and Prevention, *RSV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/rsv.html (accessed November 12, 2026).

[390] Centers for Disease Control and Prevention, *What Vaccines are Recommended for You*, June 12, 2024, https://www.cdc.gov/vaccines-adults/recommended-vaccines/index.html (accessed November 12, 2026).

[391] Centers for Disease Control and Prevention, *Shingles Facts and Stats*, April 12, 2024, https://www.cdc.gov/shingles/data-research/index.html (accessed November 12, 2026).

[392] Centers for Disease Control and Prevention, *Shingles Vaccination*, August 19, 2025, https://www.cdc.gov/shingles/vaccines/index.html (accessed November 12, 2026).

Table 12.1. Shingrix effectiveness, as reported by CDC

Group	Prevented shingles	Prevented PHN
Adults 50 to 69 with healthy immune systems	97%	91% (all adults 50 and older)
Adults 70 and older with healthy immune systems	91%	89%
Adults with weakened immune systems	68% to 91%, depending on the condition	not stated

Source: CDC, Shingles Vaccination, August 19, 2025.[394] CDC adds that protection stayed high for at least 7 years in people 70 and older.

The same page is frank about side effects. Shingrix causes a strong immune response, and common side effects such as a sore arm, tiredness, muscle pain, headache, shivering, fever and nausea "may temporarily prevent a vaccinated person from doing regular activities," usually for 2 to 3 days. CDC also says Guillain-Barre syndrome "has been reported very rarely" after Shingrix, and that there is also a very small increased risk of Guillain-Barre syndrome after shingles itself.[395] More than 99 percent of Americans born in 1980 or earlier have had chickenpox, CDC says, even if they do not remember it, and adults can get Shingrix whether or not they remember having had chickenpox.[396]

From the schedule to the exam room

A schedule on a website does nothing until someone gives the shot. CDC's Pink Book has a chapter for doctors and nurses on how to get vaccines to patients, and a chapter on their safety duties.[397,398] Reading them tells you a lot about what happens on the other side of the conversation at your child's checkup.

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[393] Centers for Disease Control and Prevention, *Shingles Vaccination*, August 19, 2025, https://www.cdc.gov/shingles/vaccines/index.html (accessed November 12, 2026).

[394] Centers for Disease Control and Prevention, *Shingles Vaccination*, August 19, 2025, https://www.cdc.gov/shingles/vaccines/index.html (accessed November 12, 2026).

[395] Centers for Disease Control and Prevention, *Shingles Vaccination*, August 19, 2025, https://www.cdc.gov/shingles/vaccines/index.html (accessed November 12, 2026).

[396] Centers for Disease Control and Prevention, *Shingles Vaccination*, August 19, 2025, https://www.cdc.gov/shingles/vaccines/index.html (accessed November 12, 2026).

[397] Adam Bjork and Valerie Morelli, Centers for Disease Control and Prevention, *Pink Book, Chapter 3: Immunization Strategies for Healthcare Practices and Providers*, March 28, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-3-immunization-strategies.html (accessed November 12, 2026).

[398] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

What the provider is required to do. By law, the provider must give you the federal Vaccine Information Statement (VIS) before each dose of a covered vaccine and must record that it was given.[399] The Pink Book says patients and parents should get a chance to ask questions before each vaccination, and that discussing benefits and risks "is sound medical practice and is required by law."[400] Providers are also responsible for storing and handling vaccines correctly, timing doses, checking for reasons not to vaccinate, and reporting certain events to VAERS.[401]

Being ready for the rare bad reaction. Severe allergic reactions are rare, about one or two per million doses, but the Pink Book says every vaccine provider should have emergency procedures in place, be able to give epinephrine, and be trained in CPR (cardiopulmonary resuscitation), with airway equipment on hand.[402]

If you say no. The Pink Book tells providers to record a refusal in the chart, which it calls "informed refusal," and notes that doing so "might reduce any potential liability" if the unvaccinated patient later gets the disease.[403] It also advises that "identifying common ground and discussing measures for deferring vaccination are more effective public health strategies than excluding these patients from a practice."[404] In other words, the CDC guidance leans against turning those families away.

How the recommendation is worded. This part surprised me. CDC tells providers that a strong recommendation from a health care provider "remains the number one reason parents decide to vaccinate."[405] It describes research showing that a "presumptive" approach, such as "Your child needs DTaP, Hib, and hepatitis B shots today," led more parents to accept vaccines than a "participatory" approach, such as "Have you thought about the shots your child needs today?"[406] Supporters see that as clear medical advice. Some parents may hear it as being

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[399] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[400] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[401] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[402] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[403] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[404] Adam Bjork and Valerie Morelli, Centers for Disease Control and Prevention, *Pink Book, Chapter 3: Immunization Strategies for Healthcare Practices and Providers*, March 28, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-3-immunization-strategies.html (accessed November 12, 2026).

[405] Adam Bjork and Valerie Morelli, Centers for Disease Control and Prevention, *Pink Book, Chapter 3: Immunization Strategies for Healthcare Practices and Providers*, March 28, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-3-immunization-strategies.html (accessed November 12, 2026).

[406] Adam Bjork and Valerie Morelli, Centers for Disease Control and Prevention, *Pink Book, Chapter 3: Immunization Strategies for Healthcare Practices and Providers*, March 28, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-3-immunization-strategies.html (accessed November 12, 2026).

steered. Either way, it is useful to know that the wording is deliberate, and that you are free to ask questions however the recommendation is framed.

Missed chances. CDC counts it as a "missed opportunity" when a patient who is due for a vaccine leaves without it. The Pink Book says providers sometimes avoid giving several shots at one visit because of worries about weaker immune response or side effects, and states that "These concerns are not supported by scientific data." It cites studies finding that ending missed opportunities could raise coverage by up to 20 percent.[407]

Records that follow you. Most states run an immunization information system (IIS), a confidential electronic registry of the vaccine doses given by participating providers in that area. It lets a new doctor, a school or a health department see a child's full record even if the shots were given in different places.[408]

Standing orders. In many clinics, hospitals and nursing homes, nurses and other staff can give vaccines under a "standing order," a written protocol that does not need a doctor's sign-off for each patient. The protocol is supposed to include screening for reasons not to vaccinate, giving the benefit and risk information, and recording refusals and any reactions.[409]

None of this tells you whether to vaccinate. It tells you what you can expect and ask for: the information sheet, time for questions, a provider ready for an allergic reaction, and a record of whatever you decide.

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[407] Adam Bjork and Valerie Morelli, Centers for Disease Control and Prevention, *Pink Book, Chapter 3: Immunization Strategies for Healthcare Practices and Providers*, March 28, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-3-immunization-strategies.html (accessed November 12, 2026).

[408] Adam Bjork and Valerie Morelli, Centers for Disease Control and Prevention, *Pink Book, Chapter 3: Immunization Strategies for Healthcare Practices and Providers*, March 28, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-3-immunization-strategies.html (accessed November 12, 2026).

[409] Adam Bjork and Valerie Morelli, Centers for Disease Control and Prevention, *Pink Book, Chapter 3: Immunization Strategies for Healthcare Practices and Providers*, March 28, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-3-immunization-strategies.html (accessed November 12, 2026).

Chapter 13: COVID-19 Vaccines

This chapter covers events from 2020 through 2024. The information stops at November 12, 2026.

Operation Warp Speed

Operation Warp Speed (OWS) was a partnership between HHS and the Department of Defense to speed up COVID-19 vaccines, treatments and tests. CRS describes it as a Trump Administration initiative.[410] Most of the money went to vaccines. The government paid for some companies' development work and, for others, only bought doses ahead of time.[411]

Table 13.1. Selected Operation Warp Speed vaccine contracts (as of March 1, 2021; nominal dollars)

Company	Type	Purchase contract value	Doses
Pfizer/BioNTech	mRNA	$5.97 billion	300 million
Moderna	mRNA	$4.94 billion, plus $954 million for development	300 million
Johnson and Johnson (Janssen)	Viral vector	$1 billion, plus $456 million for development	100 million
AstraZeneca/Oxford	Viral vector	$1.2 billion	300 million
Novavax	Protein	$1.6 billion	100 million
Sanofi/GSK	Protein	$2.04 billion	100 million

Source: CRS.[412] Pfizer/BioNTech took part through purchase of doses only, not federal development funding.[413] Because the government bought the doses, they were free to the public.[414]

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[410] Congressional Research Service, *Operation Warp Speed Contracts for COVID-19 Vaccines and Ancillary Vaccination Materials (CRS Insight IN11560)*, updated March 1, 2021, https://www.congress.gov/crs_external_products/IN/PDF/IN11560/IN11560.7.pdf (accessed November 12, 2026).

[411] Congressional Research Service, *Operation Warp Speed Contracts for COVID-19 Vaccines and Ancillary Vaccination Materials (CRS Insight IN11560)*, updated March 1, 2021, https://www.congress.gov/crs_external_products/IN/PDF/IN11560/IN11560.7.pdf (accessed November 12, 2026).

[412] Congressional Research Service, *Operation Warp Speed Contracts for COVID-19 Vaccines and Ancillary Vaccination Materials (CRS Insight IN11560)*, updated March 1, 2021, https://www.congress.gov/crs_external_products/IN/PDF/IN11560/IN11560.7.pdf (accessed November 12, 2026).

How could vaccines be ready in under a year when Chapter 4 said it usually takes 10 to 15? Several things were done at the same time instead of one after another, and the government took the financial risk of making doses before knowing whether they would work. Research on mRNA vaccines had also been going on for decades before the pandemic.[415] The legal steps were not skipped: the vaccines still went through Phase 3 trials and FDA review, but under the emergency use standard first (Chapter 5).

What the COVID-19 vaccine effort cost

The contracts in Table 13.1 were only part of the bill. CRS tracked the wider spending in an October 2021 report. The money came mostly from emergency spending laws in 2020 and the American Rescue Plan Act (ARPA) of March 2021.[416] All amounts below are nominal dollars.

- **Research, manufacturing and purchase.** The 2020 and 2021 emergency spending laws set aside at least $23.2 billion for the Biomedical Advanced Research and Development Authority (BARDA), the HHS office that signed most of the big company agreements. ARPA added $6.05 billion for vaccines and other medical products, and $10 billion under the Defense Production Act for supplies including vaccines.[417]
- **Giving the shots.** CDC received $16.25 billion in fiscal year 2021 to plan, promote, distribute, give, monitor and track COVID-19 vaccines, including at least $4.5 billion in grants to state, local, tribal and territorial health departments. ARPA also gave CDC $1 billion for "vaccine confidence" activities.[418]
- **What was committed.** According to the Government Accountability Office, as reported by CRS, HHS had set aside $40.2 billion for vaccine work as of May 31, 2021,

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[413] Congressional Research Service, *Operation Warp Speed Contracts for COVID-19 Vaccines and Ancillary Vaccination Materials (CRS Insight IN11560)*, updated March 1, 2021, https://www.congress.gov/crs_external_products/IN/PDF/IN11560/IN11560.7.pdf (accessed November 12, 2026).

[414] Congressional Research Service, *Operation Warp Speed Contracts for COVID-19 Vaccines and Ancillary Vaccination Materials (CRS Insight IN11560)*, updated March 1, 2021, https://www.congress.gov/crs_external_products/IN/PDF/IN11560/IN11560.7.pdf (accessed November 12, 2026).

[415] Centers for Disease Control and Prevention, *COVID-19 Vaccine Basics (How COVID-19 Vaccines Work)*, September 3, 2024, https://www.cdc.gov/covid/vaccines/how-they-work.html (accessed November 12, 2026).

[416] Kavya Sekar, Congressional Research Service, *Domestic Funding for COVID-19 Vaccines: An Overview (In Focus IF11951)*, October 19, 2021, https://www.congress.gov/crs_external_products/IF/PDF/IF11951/IF11951.2.pdf (accessed November 12, 2026).

[417] Kavya Sekar, Congressional Research Service, *Domestic Funding for COVID-19 Vaccines: An Overview (In Focus IF11951)*, October 19, 2021, https://www.congress.gov/crs_external_products/IF/PDF/IF11951/IF11951.2.pdf (accessed November 12, 2026).

[418] Kavya Sekar, Congressional Research Service, *Domestic Funding for COVID-19 Vaccines: An Overview (In Focus IF11951)*, October 19, 2021, https://www.congress.gov/crs_external_products/IF/PDF/IF11951/IF11951.2.pdf (accessed November 12, 2026).

and had obligated $25.1 billion of it. The Federal Emergency Management Agency (FEMA) had obligated $5.9 billion for vaccination efforts as of September 20, 2021.[419]

CRS also notes that in 2021 the Defense Department was managing some of the purchase and manufacturing deals on HHS's behalf, and that Operation Warp Speed had become the "Countermeasures Acceleration Group" under the new administration.[420]

You might ask, "Was it worth it?" That is a judgment, not a fact, and the answer depends on what you think the vaccines prevented. The next sections give the real-world results that CDC measured. What I can say from the record is that the government paid for the doses and gave them free to the public, and that the bulk of the spending passed through emergency laws rather than the normal yearly budget.

The trials and the emergency authorizations

FDA issued an Emergency Use Authorization for the Pfizer-BioNTech vaccine on December 11, 2020, and for the Moderna vaccine on December 18, 2020.[421,422]

- **Pfizer-BioNTech:** one randomized, double-blind, placebo-controlled trial with more than 43,000 people aged 16 to 91. With a median of about two months of follow-up, the vaccine was 95.0 percent effective at preventing symptomatic, lab-confirmed COVID-19 in people without prior infection. CDC noted that "no data were available to assess the efficacy for prevention of asymptomatic SARS-CoV-2 infection."[423]
- **Moderna:** a similar trial with about 30,000 people aged 18 to 95. Efficacy was 94.1 percent after two doses.[424]

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[419] Kavya Sekar, Congressional Research Service, *Domestic Funding for COVID-19 Vaccines: An Overview (In Focus IF11951)*, October 19, 2021, https://www.congress.gov/crs_external_products/IF/PDF/IF11951/IF11951.2.pdf (accessed November 12, 2026).

[420] Kavya Sekar, Congressional Research Service, *Domestic Funding for COVID-19 Vaccines: An Overview (In Focus IF11951)*, October 19, 2021, https://www.congress.gov/crs_external_products/IF/PDF/IF11951/IF11951.2.pdf (accessed November 12, 2026).

[421] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 69(50), *The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-BioNTech COVID-19 Vaccine, United States, December 2020*, December 18, 2020, https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e2.htm (accessed November 12, 2026).

[422] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 69(5152), *The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Moderna COVID-19 Vaccine, United States, December 2020*, January 1, 2021, https://www.cdc.gov/mmwr/volumes/69/wr/mm695152e1.htm (accessed November 12, 2026).

[423] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 69(50), *The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-BioNTech COVID-19 Vaccine, United States, December 2020*, December 18, 2020, https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e2.htm (accessed November 12, 2026).

[424] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 69(5152), *The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Moderna COVID-19 Vaccine, United States, December 2020*, January 1, 2021, https://www.cdc.gov/mmwr/volumes/69/wr/mm695152e1.htm (accessed November 12, 2026).

Those trials measured protection against getting sick with symptoms over a short time. They were not designed to show how long protection would last or whether vaccinated people could still spread the virus. Both of those questions became central later.

FDA granted full approval (a Biologics License) to the Pfizer-BioNTech vaccine, sold as Comirnaty, for people 16 and older on August 23, 2021. By then about 211 million doses of it had been given in the United States.[425]

What the vaccines did in the real world

Against severe illness. In a CDC study of adults 65 and older from February to April 2021, full vaccination was 96 percent effective at preventing hospitalization for Pfizer-BioNTech and Moderna among people 65 to 74, and 84 percent for Janssen.[426]

Against infection, especially over time. Protection against infection faded and weakened against new variants. CDC data from 25 jurisdictions showed that unvaccinated people were 13.9 times as likely as fully vaccinated people to test positive before the Delta variant, 8.7 times as Delta emerged, and 5.1 times during Delta's peak.[427] Boosters raised protection again, especially for people 50 and older.[428]

Against spread. In July 2021, after large public events in a town in Barnstable County, Massachusetts, 469 COVID-19 cases were found among state residents who had visited. Of these, 346 (74 percent) were in fully vaccinated people. Lab tests found similar amounts of virus in vaccinated and unvaccinated patients.[429] That report helped change public guidance about masks, and it is part of the evidence for a claim tested in Part Six.

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[425] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(38):1344-1348, *Use of Pfizer-BioNTech COVID-19 Vaccine in Persons Aged 16 Years and Older: Recommendations of the Advisory Committee on Immunization Practices, United States, September 2021*, September 24, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7038e2.htm (accessed November 12, 2026).

[426] Moline HL, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(32):1088-1093, *Effectiveness of COVID-19 Vaccines in Preventing Hospitalization Among Adults Aged 65 Years and Older, COVID-NET, 13 States, February-April 2021*, August 13, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7032e3.htm (accessed November 12, 2026).

[427] Johnson AG, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(4):132-138, *COVID-19 Incidence and Death Rates Among Unvaccinated and Fully Vaccinated Adults with and Without Booster Doses During Periods of Delta and Omicron Variant Emergence, 25 U.S. Jurisdictions, April 4-December 25, 2021*, January 28, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7104e2.htm (accessed November 12, 2026).

[428] Johnson AG, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(4):132-138, *COVID-19 Incidence and Death Rates Among Unvaccinated and Fully Vaccinated Adults with and Without Booster Doses During Periods of Delta and Omicron Variant Emergence, 25 U.S. Jurisdictions, April 4-December 25, 2021*, January 28, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7104e2.htm (accessed November 12, 2026).

[429] Brown CM, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(31):1059-1062, *Outbreak of SARS-CoV-2 Infections, Including COVID-19 Vaccine Breakthrough Infections, Associated with Large Public Gatherings, Barnstable County, Massachusetts, July 2021*, August 6, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7031e2.htm (accessed November 12, 2026).

Boosters and the Omicron years. As protection faded and Omicron spread, CDC recommended boosters, and in September 2022 an updated "bivalent" booster aimed at both the original virus and Omicron.[430] A CDC study across 24 jurisdictions found that during the late part of 2022, death rates from COVID-19 among unvaccinated people were 14.1 times the rates among people who had the bivalent booster, and rates among people with only the older vaccines were 2.6 times higher.[431] Those are death rates per person, so they already account for the different sizes of each group. They do not by themselves prove the vaccine caused the whole difference, because people who choose boosters may differ in other ways, such as health habits and access to care. Studies like this try to adjust for age but cannot adjust for everything.

For people who already had COVID-19. Did vaccination add anything for someone who had already been infected? A CDC study from June 2021 to February 2022 found that it did, but less than it did for someone never infected: during Omicron, vaccine effectiveness against a reinfection serious enough to need a hospital was about 35 percent after two doses and 68 percent after a booster.[432] The same report noted that prior infection on its own had been estimated to give "up to 90% protection against reinfection," though less against Omicron.[433]

Pregnancy. Pregnant women with COVID-19 face higher risks of severe illness, and many were worried about the vaccine. A CDC study of 46,079 pregnant women in eight health systems found that 10,064 were vaccinated during pregnancy, nearly all in the second or third trimester, and that vaccination was "not associated with preterm birth or small-for-gestational-age at birth."[434] That study did not look at vaccination in the first trimester in any depth, because few women were vaccinated then. In May 2025, as you will see in Chapter 14, federal guidance for COVID-19 vaccines in pregnancy changed to "no guidance."[435]

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[430] Johnson AG, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 72(6), *COVID-19 Incidence and Mortality Among Unvaccinated and Vaccinated Persons Aged 12 Years and Older by Receipt of Bivalent Booster Doses and Time Since Vaccination, 24 U.S. Jurisdictions, October 3, 2021-December 24, 2022*, February 10, 2023, https://www.cdc.gov/mmwr/volumes/72/wr/mm7206a3.htm (accessed November 12, 2026).

[431] Johnson AG, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 72(6), *COVID-19 Incidence and Mortality Among Unvaccinated and Vaccinated Persons Aged 12 Years and Older by Receipt of Bivalent Booster Doses and Time Since Vaccination, 24 U.S. Jurisdictions, October 3, 2021-December 24, 2022*, February 10, 2023, https://www.cdc.gov/mmwr/volumes/72/wr/mm7206a3.htm (accessed November 12, 2026).

[432] Plumb ID, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(15):549-555, *Effectiveness of COVID-19 mRNA Vaccination in Preventing COVID-19-Associated Hospitalization Among Adults with Previous SARS-CoV-2 Infection, United States, June 2021-February 2022*, April 15, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7115e2.htm (accessed November 12, 2026).

[433] Plumb ID, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(15):549-555, *Effectiveness of COVID-19 mRNA Vaccination in Preventing COVID-19-Associated Hospitalization Among Adults with Previous SARS-CoV-2 Infection, United States, June 2021-February 2022*, April 15, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7115e2.htm (accessed November 12, 2026).

[434] Lipkind HS, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(1):26-30, *Receipt of COVID-19 Vaccine During Pregnancy and Preterm or Small-for-Gestational-Age at Birth, Eight Integrated Health Care Organizations, United States, December 15, 2020-July 22, 2021*, January 7, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7101e1.htm (accessed November 12, 2026).

[435] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

People with weakened immune systems. For people whose immune systems are weakened by disease or treatment, the vaccines worked less well, which is why ACIP recommended an extra third primary dose for them in August 2021.[436] A CDC study of adults with immune-weakening conditions who were hospitalized with COVID-like illness from December 2021 to August 2022, during Omicron, found vaccine effectiveness against COVID-19 hospitalization of 36 percent at least 14 days after a second dose, 69 percent 7 to 89 days after a third dose, and 44 percent 90 days or more after a third dose. In the later Omicron period, it was 43 percent after a fourth dose.[437] The authors called that protection "moderate." It is a useful reminder that "the vaccine works" is not one number. It depends on who got it, which variant was spreading, and how long ago the last dose was given.

The Johnson and Johnson pause, by the numbers. When ACIP decided in April 2021 to resume the Janssen vaccine, it had 15 confirmed clotting cases among about 7.98 million doses, all in women; three of those patients had died. ACIP's model estimated that resuming the vaccine for six months could prevent 586 to 1,435 deaths, compared with 26 expected clotting cases.[438] ACIP judged that benefits outweighed risks and added a warning for women 18 to 49.[439] By December 2021, with more cases confirmed and plenty of mRNA vaccine available, ACIP changed course and recommended people choose the mRNA vaccines instead (Chapter 8).[440] That sequence is a real-time example of weighing a known rare harm against a disease that was killing thousands of people a week, and then reweighing as the facts changed.

Side effects found

Chapter 8 lays out the confirmed side effects: anaphylaxis, myocarditis after mRNA vaccines (highest in young males after the second dose), and blood clots with low platelets (TTS) and

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[436] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(42):1335-1342, *Effectiveness of COVID-19 mRNA Vaccines Against COVID-19-Associated Hospitalizations Among Immunocompromised Adults During SARS-CoV-2 Omicron Predominance, VISION Network, 10 States, December 2021-August 2022*, October 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7142a4.htm (accessed November 12, 2026).

[437] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(42):1335-1342, *Effectiveness of COVID-19 mRNA Vaccines Against COVID-19-Associated Hospitalizations Among Immunocompromised Adults During SARS-CoV-2 Omicron Predominance, VISION Network, 10 States, December 2021-August 2022*, October 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7142a4.htm (accessed November 12, 2026).

[438] MacNeil JR, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(17):651-656, *Updated Recommendations from the Advisory Committee on Immunization Practices for Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine After Reports of Thrombosis with Thrombocytopenia Syndrome Among Vaccine Recipients, United States, April 2021*, April 30, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7017e4.htm (accessed November 12, 2026).

[439] MacNeil JR, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(17):651-656, *Updated Recommendations from the Advisory Committee on Immunization Practices for Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine After Reports of Thrombosis with Thrombocytopenia Syndrome Among Vaccine Recipients, United States, April 2021*, April 30, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7017e4.htm (accessed November 12, 2026).

[440] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(3):90-95, *Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine: Updated Interim Recommendations from the Advisory Committee on Immunization Practices, United States, December 2021*, January 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7103a4.htm (accessed November 12, 2026).

Guillain-Barre syndrome after the Janssen vaccine.[441,442,443] Each led to a change. Sites were told to watch people for 15 to 30 minutes after a shot for allergic reactions. The Janssen vaccine was paused, then given a warning, then placed behind the mRNA vaccines in ACIP's preference, and is no longer available in the United States.[444,445]

When ACIP reviewed myocarditis in June 2021, it compared benefits and risks for every million second doses given to males 12 to 29. Its estimate was that vaccination would prevent 11,000 COVID-19 cases, 560 hospitalizations, 138 intensive care admissions and six deaths, compared with 39 to 47 expected myocarditis cases.[446] ACIP concluded the benefits outweighed the risks. Critics later argued those estimates were made when COVID-19 was hitting harder than it did in later years, and that the math is different for a young, healthy, already-infected person. Both points shaped the 2025 changes in Chapter 14.

Mandates and the courts

In late 2021 the federal government issued two major vaccine requirements. On January 13, 2022, the Supreme Court ruled on both the same day, with different results:

- **Large employers (OSHA rule).** The Occupational Safety and Health Administration (OSHA) required employers with 100 or more workers to make employees get vaccinated or be tested weekly. It covered about 84 million workers. The Court blocked it, saying the challengers were likely to win their argument that the Labor Secretary "lacked authority to impose the mandate."[447]

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[441] CDC COVID-19 Response Team and FDA, Morbidity and Mortality Weekly Report 70(2), *Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine, United States, December 14-23, 2020*, January 15, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7002e1.htm (accessed November 12, 2026).

[442] Gargano JW, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(27), *Use of mRNA COVID-19 Vaccine After Reports of Myocarditis Among Vaccine Recipients: Update from the Advisory Committee on Immunization Practices, United States, June 2021*, July 9, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7027e2.htm (accessed November 12, 2026).

[443] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(3):90-95, *Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine: Updated Interim Recommendations from the Advisory Committee on Immunization Practices, United States, December 2021*, January 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7103a4.htm (accessed November 12, 2026).

[444] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(3):90-95, *Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine: Updated Interim Recommendations from the Advisory Committee on Immunization Practices, United States, December 2021*, January 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7103a4.htm (accessed November 12, 2026).

[445] Centers for Disease Control and Prevention, *Safety of COVID-19 Vaccines*, January 31, 2025, https://www.cdc.gov/vaccine-safety/vaccines/covid-19.html (accessed November 12, 2026).

[446] Gargano JW, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(27), *Use of mRNA COVID-19 Vaccine After Reports of Myocarditis Among Vaccine Recipients: Update from the Advisory Committee on Immunization Practices, United States, June 2021*, July 9, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7027e2.htm (accessed November 12, 2026).

[447] Supreme Court of the United States, *National Federation of Independent Business v. Department of Labor, OSHA, 595 U.S. ___ (2022) (per curiam)*, January 13, 2022, https://www.supremecourt.gov/opinions/21pdf/21a244_hgci.pdf (accessed November 12, 2026).

- **Health care workers (Medicare and Medicaid rule).** HHS required staff at facilities that take Medicare and Medicaid money to be vaccinated, with medical and religious exemptions. The Court let it take effect, saying the rule "fits neatly within the language of the statute" and noting the medical principle "first, do no harm." Four justices dissented.[448]

These rulings were about which agency had the power, not about whether the vaccines worked. The older foundation for vaccine requirements is *Jacobson v. Massachusetts* (1905), in which the Supreme Court upheld a city smallpox vaccination rule. The Court said it is "within the police power of a State to enact a compulsory vaccination law," and that the liberty protected by the Constitution "does not import an absolute right in each person to be at all times, and in all circumstances wholly freed from restraint."[449] State school vaccine requirements rest on that state power. Chapter 18 covers how states use it today.

The OSHA and health care rules were not the only federal requirements. CRS listed five civilian ones in place or attempted as of February 7, 2022: the health care facility rule, the OSHA large-employer rule, a requirement for federal executive branch employees (Executive Order 14043), a requirement for federal contractors (Executive Order 14042), and a requirement for staff of the Head Start early childhood program. Each allowed exemptions for a disability or medical condition or a sincerely held religious belief. At that date, courts had blocked the federal employee and federal contractor requirements, the Supreme Court had stayed the OSHA rule, and the health care rule was in effect.[450] On May 9, 2023, President Biden revoked the federal employee and contractor orders, effective May 12, 2023. The order said the government had reached "a 98 percent compliance rate" among federal employees by January 2022, counting people with at least one dose or a pending or approved exemption, and that COVID-19 deaths had fallen 93 percent since September 2021.[451]

"You can't be required to take an emergency-use vaccine." This argument was common in 2021. The emergency use law tells HHS to make sure people are informed "of the option to accept or refuse administration of the product." Some legal commentators argued that this meant mandates were not allowed.[452] CRS reports that courts "generally rejected this claim," holding that the provision is an informed consent duty on the medical providers who give the

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[448] Supreme Court of the United States, *Biden v. Missouri, 595 U.S. ___ (2022) (per curiam)*, January 13, 2022, https://www.supremecourt.gov/opinions/21pdf/21a240_d18e.pdf (accessed November 12, 2026).

[449] Supreme Court of the United States, *Jacobson v. Massachusetts, 197 U.S. 11 (1905)*, February 20, 1905, https://tile.loc.gov/storage-services/service/ll/usrep/usrep197/usrep197011/usrep197011.pdf (accessed November 12, 2026).

[450] Wen W. Shen, Congressional Research Service, *State and Federal Authority to Mandate COVID-19 Vaccination (Report R46745)*, February 7, 2022, https://www.congress.gov/crs_external_products/R/PDF/R46745/R46745.7.pdf (accessed November 12, 2026), pp. 34-37.

[451] President Joseph R. Biden, Jr., Federal Register Vol. 88, No. 93, pp. 30891-30892, *Executive Order 14099, Moving Beyond COVID-19 Vaccination Requirements for Federal Workers (FR Doc. 2023-10407)*, May 9, 2023 (published May 15, 2023), https://www.govinfo.gov/content/pkg/FR-2023-05-15/html/2023-10407.htm (accessed November 12, 2026).

[452] Wen W. Shen, Congressional Research Service, *State and Federal Authority to Mandate COVID-19 Vaccination (Report R46745)*, February 7, 2022, https://www.congress.gov/crs_external_products/R/PDF/R46745/R46745.7.pdf (accessed November 12, 2026), p. 41.

vaccine, not a limit on employers or governments that set requirements. The Justice Department's Office of Legal Counsel reached the same conclusion in July 2021. Once FDA fully licensed the first COVID-19 vaccine in August 2021, CRS wrote, challenges on this ground became "largely moot," though it noted the question might stay open for ages 12 to 15, for whom no licensed vaccine existed at that time.[453]

What this chapter shows: The COVID-19 vaccines were developed fast, tested in large trials, and strongly reduced severe illness and death, especially in older adults. Their protection against infection faded, they did not stop spread the way many people were told, and they had real, rare side effects. Each of those facts is used by one side or the other in the debate that followed.

[453] Wen W. Shen, Congressional Research Service, *State and Federal Authority to Mandate COVID-19 Vaccination (Report R46745)*, February 7, 2022, https://www.congress.gov/crs_external_products/R/PDF/R46745/R46745.7.pdf (accessed November 12, 2026), pp. 41-42.

Chapter 14: The Rules Change, 2025 and 2026

This chapter covers the present. The information stops at November 12, 2026. Some of these events are still moving, and some may have changed by the time you read this.

For more than 60 years, the way the United States set vaccine advice followed one pattern. ACIP reviewed the evidence, voted, and the CDC director decided whether to adopt the vote.[454] In 2025 and 2026 that pattern broke. This chapter lays out what changed, what the people who made the changes said, what their critics said, and where the courts left things.

I want to be careful here. This is the part of the book most likely to be read through a political lens, so I stick to dated events from official records and the Congressional Research Service (CRS), which serves both parties in Congress. Where I quote one side, I quote the other.

The timeline

Table 14.1 lists the main events. Robert F. Kennedy Jr. was sworn in as HHS Secretary on February 13, 2025.[455]

Table 14.1. Federal vaccine advice changes, 2025 to 2026

Date	What happened
April 15-16, 2025	ACIP, with its original members, makes routine recommendations (a combined meningitis vaccine; RSV vaccine for some adults 50 to 59).[456]
May 27, 2025	The Secretary posts on X that CDC will stop recommending COVID-19 vaccines for healthy children and pregnant women. CDC pages change: children move to shared decision-

[454] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[455] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[456] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

Date	What happened
	making, pregnant women to "no guidance."[457]
June 9, 2025	The Secretary removes all 17 ACIP members and later appoints new ones.[458]
June 25-26, 2025	New ACIP recommends a new infant RSV antibody (clesrovimab), reaffirms yearly flu shots, and votes to stop using flu vaccines that contain thimerosal.[459]
August 27, 2025	FDA revokes the emergency authorizations for the Pfizer, Moderna and Novavax COVID-19 vaccines. Approved COVID-19 vaccines remain for people 65 and older and for people 6 months to 64 years with at least one high-risk condition.[460]
September 18-19, 2025	ACIP moves COVID-19 vaccines for adults and children from routine to shared decision-making, and recommends against the combined MMRV shot for young children.[461]
December 4-5, 2025	ACIP moves the hepatitis B birth dose from routine to shared decision-making for babies whose mothers test negative or have unknown results.[462]

[457] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[458] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[459] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[460] Food and Drug Administration, Federal Register Vol. 90 (FR Doc. 2025-19272), *Revocation of Emergency Use of Three Biological Products; Availability*, October 2, 2025, https://www.govinfo.gov/link/fr/2025-19272?link-type=html (accessed November 12, 2026).

[461] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[462] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

Date	What happened
December 5, 2025	The President directs HHS and CDC to compare the U.S. schedule with "peer, developed countries."[463]
January 5, 2026	The Acting CDC Director adopts a new childhood schedule without an ACIP vote.[464]
February 2026	The American Academy of Pediatrics (AAP) and others add the new schedule to their lawsuit.[465]
March 16, 2026	A federal court in Massachusetts stays the new schedule, 13 ACIP appointments, and all ACIP votes after June 11, 2025.[466]
April 6, 2026	CDC publishes a notice renewing ACIP's charter. It is later withdrawn "due to an administrative error," and the charter lapses.[467]
April 29, 2026	The government appeals to the U.S. Court of Appeals for the First Circuit.[468]
May 19, 2026	CDC re-establishes ACIP under a revised charter for two years.[469]

[463] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[464] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[465] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[466] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[467] Centers for Disease Control and Prevention, Federal Register Vol. 91, No. 96, *Advisory Committee on Immunization Practices (ACIP); Notice of Charter Re-Establishment (FR Doc. 2026-10012)*, May 19, 2026, https://www.govinfo.gov/content/pkg/FR-2026-05-19/html/2026-10012.htm (accessed November 12, 2026).

[468] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[469] Centers for Disease Control and Prevention, Federal Register Vol. 91, No. 96, *Advisory Committee on Immunization Practices (ACIP); Notice of Charter Re-Establishment (FR Doc. 2026-10012)*, May 19, 2026, https://www.govinfo.gov/content/pkg/FR-2026-05-19/html/2026-10012.htm (accessed November 12, 2026).

Date	What happened
May 29, 2026	Executive Order 14407 calls the HHS assessment a "guiding resource" and directs CDC and ACIP to update the schedules as far as the law allows.[470]
June 29, 2026	The HHS Secretary determines that emergency use of drugs and biological products for COVID-19 is no longer justified, ending the 2020 declaration effective June 29, 2027.[471]
August 10, 2026	Executive Order 14420 declares "Gold Standard Childhood Vaccine Recommendations" and creates a 90-day deadline for HHS plans, including single-disease measles, mumps and rubella shots.[472]
2026	All three regular ACIP meetings (March, June, October) are cancelled "due to ongoing litigation." The next listed meeting is February 24-26, 2027.[473]

FDA's own actions matter too, because ACIP can only recommend vaccines that FDA has approved or authorized. On August 27, 2025, FDA revoked the emergency use authorizations for the Pfizer-BioNTech, Moderna and Novavax COVID-19 vaccines. Its notice said there were now "approved COVID-19 vaccines for use in individuals who are 65 years of age and older, or 6 months through 64 years of age with at least one underlying condition that puts them at high risk for severe outcomes," and that "widespread natural and vaccine-acquired immunity has reduced severe outcomes." FDA added that "safety concerns were not the basis" for the decision.[474] In plain terms, the vaccines stayed on the market under full approval, but the

[470] Executive Office of the President, Daily Compilation of Presidential Documents, *Executive Order 14407: Realigning United States Core Childhood Vaccine Recommendations With Best Practices From Peer, Developed Countries (DCPD-202600371)*, May 29, 2026, https://www.govinfo.gov/content/pkg/DCPD-202600371/html/DCPD-202600371.htm (accessed November 12, 2026).

[471] Office of the Secretary, U.S. Department of Health and Human Services, Federal Register (FR Doc. 2026-13374), *Termination of Declaration Authorizing Emergency Use of Drug and Biological Products During the COVID-19 Pandemic*, July 2, 2026, https://www.govinfo.gov/link/fr/2026-13374?link-type=html (accessed November 12, 2026).

[472] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

[473] Centers for Disease Control and Prevention, *ACIP Meeting Information*, October 9, 2026, https://www.cdc.gov/acip/meetings/index.html (accessed November 12, 2026).

[474] Food and Drug Administration, Federal Register Vol. 90 (FR Doc. 2025-19272), *Revocation of Emergency Use of Three Biological Products; Availability*, October 2, 2025, https://www.govinfo.gov/link/fr/2025-19272?link-type=html (accessed November 12, 2026).

approved labels covered fewer healthy younger people than the emergency authorizations had. **[Not verified: the text of the May 2025 FDA framework article that announced this approach, and whether FDA requires new placebo-controlled trials for healthy people under 65. The FDA and journal sites blocked my tools.]**

CDC's clinical guidance, dated November 4, 2025, recommended COVID-19 vaccination for adults 65 and older and for people 6 months to 64 years "based on individual-based decision-making," with the benefit "most favorable" for people at higher risk.[475] That guidance rests in part on the September 2025 ACIP vote, which the March 2026 court order stayed, so the official status of COVID-19 advice for some groups is uncertain. [Not verified: whether CDC has updated this page to match the court order.] Then, on June 29, 2026, the HHS Secretary ended the 2020 declaration that allowed emergency use of COVID-19 drugs and biological products, effective June 29, 2027.[476]

The January 2026 schedule

The new schedule did not remove any vaccine.[477] It changed how strongly six were recommended and changed the dose count for one. CRS summarized the differences from the January 2025 schedule this way:[478]

Table 14.2. What the January 2026 schedule changed

Vaccine	2025 schedule	January 2026 schedule
COVID-19	Routine (later changed in 2025)	Shared decision-making (ACIP vote, September 2025)
Hepatitis B birth dose	Routine for all newborns	Shared decision-making if the mother tests negative (ACIP vote, December 2025)
Hepatitis A	Routine for all children	High-risk groups; shared decision-making for others
Meningococcal ACWY	Routine for all adolescents	High-risk groups; shared

[475] Centers for Disease Control and Prevention, *Interim Clinical Considerations for Use of COVID-19 Vaccines in the United States*, November 4, 2025, https://www.cdc.gov/covid/downloads/hcp/interim-clinical-considerations.pdf (accessed November 12, 2026).

[476] Office of the Secretary, U.S. Department of Health and Human Services, Federal Register (FR Doc. 2026-13374), *Termination of Declaration Authorizing Emergency Use of Drug and Biological Products During the COVID-19 Pandemic*, July 2, 2026, https://www.govinfo.gov/link/fr/2026-13374?link-type=html (accessed November 12, 2026).

[477] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[478] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

Vaccine	2025 schedule	January 2026 schedule
		decision-making for others
RSV (infant antibody)	"All children" not protected by the mother's vaccine	Same infants, relabeled as a high-risk group (no change in who gets it)
Rotavirus	Routine for all infants	Shared decision-making
Influenza	Routine yearly from 6 months	Shared decision-making
HPV	2 or 3 doses	1 dose

Counted another way, the court found that the January 2026 memo cut the number of childhood vaccines recommended as "routine" from seventeen to eleven.[479]

"Shared decision-making" means the parent and the doctor talk through the benefits and risks and decide together. It was not new. ACIP had used it before, for example for the meningococcal B vaccine.[480]

Why HHS said it made the changes

The new schedule rested on a report written by Dr. Tracy Beth Høeg of FDA and Dr. Martin Kulldorff of HHS, dated January 2, 2026.[481] The report said the goal was to "restore public confidence, provide much-needed clarity for parents of young children, and preserve the benefits of immunization programs." It made three main arguments:[482]

- **Other countries.** The report compared the U.S. with 20 peer nations. It kept as "consensus" vaccines the ones all of those nations recommend, covering 11 diseases: measles, mumps, rubella, polio, whooping cough, tetanus, diphtheria, Hib, pneumococcal disease, chickenpox and HPV. The vaccines that not every peer nation recommends were moved to high-risk or shared decision-making.

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[479] U.S. District Court for the District of Massachusetts (Judge Brian E. Murphy), *American Academy of Pediatrics v. Kennedy, No. 1:25-cv-11916-BEM, Memorandum and Order on Plaintiffs' Motion for Preliminary Injunction (Document 291)*, March 16, 2026, https://www.govinfo.gov/content/pkg/USCOURTS-mad-1_25-cv-11916/pdf/USCOURTS-mad-1_25-cv-11916-0.pdf (accessed November 12, 2026).

[480] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[481] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[482] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

- **Trust.** The report pointed to falling trust in health care and falling vaccination rates. It argued that giving parents more choice could rebuild trust.
- **Safety.** The report said manufacturers have "inadequate incentives to study vaccine adverse effects," called U.S. safety monitoring "limited" and "underutilized," and called for more placebo-controlled trials. It cited the 2013 Institute of Medicine report from Chapter 12, which asked for more study of the whole schedule.

The case for change, in its author's own slides

Because this book tests claims from every side, I want you to see the argument for the new schedule as its supporters made it, not only as critics summarized it. One of the report's two authors, Dr. Høeg, presented it to ACIP at its December 4-5, 2025 meeting, in slides titled "Core Childhood Vaccination Schedules: An International Perspective with focus on the US & Denmark." The slides are posted on CDC's website.[483] What follows is her case, in her words where I quote, and it is labeled as her view.

- **What families are owed.** Under the heading "What do we owe to our children?" the slides call for "proper randomized, placebo-controlled studies," for vaccines to be "treated like all medical products; may not be right for all children," and for avoiding "overmedicalizing childhood."[484]
- **Why Denmark.** The slides describe Denmark as having a "Culture of Debate," "Transparent decision making," "Extensive documentation of decision making about vaccines," and a willingness to "Acknowledge Unknowns" and "Promptly reverse recommendations." They also list "Higher level of trust in Public Health Authorities."[485]
- **Disease rates.** One slide labels as a "Misconception" the idea that the two countries' schedules differ "Because of differences in disease prevalences," and compares hepatitis B and meningococcal disease rates in the two countries.[486]

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[483] Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark (meeting slides)*, December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

[484] Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark (meeting slides)*, December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

[485] Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark (meeting slides)*, December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

[486] Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark (meeting slides)*, December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

- **Reversals.** The slides give examples of Denmark changing course: it was described as the first high-income nation to remove the COVID-19 vaccine from its childhood schedule, and a flu vaccine program for ages 2 to 6 introduced in 2021 was reversed in 2023.[487]
- **Why fewer core vaccines might raise trust.** The slides quote a 2004 Danish health authority document on hepatitis B, translated as: "If one includes a vaccine which some consider less important, it could negatively affect the view of vaccines in general." A slide on meningococcal vaccine makes a similar point, that adding vaccines "may cause some parents to opt out of other vaccines."[488]
- **Trust.** A slide states that trust in U.S. health care fell "from 72% to 40%."[489] [Not verified: the slide text I could read does not name the survey behind that figure, so I could not check it.]
- **Benefits claimed for a smaller schedule.** The closing slides list more time at checkups for overall health, better targeting of high-risk groups, "Improve informed consent" and "Minimize coercion."[490]

The same slides also include points that cut the other way. They show rising measles cases in the U.S. and Europe, note that the minimum vaccination level to prevent measles outbreaks is "around 90%," and warn that some states with rubella vaccination rates below the 83 to 85 percent community immunity threshold, naming Idaho and Wisconsin, are at risk of rubella outbreaks.[491] They also pose open questions rather than answers, such as whether it would be appropriate to stop the chickenpox vaccine given "chance of increasing average age of chickenpox."[492]

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[487] Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark (meeting slides)*, December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

[488] Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark (meeting slides)*, December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

[489] Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark (meeting slides)*, December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

[490] Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark (meeting slides)*, December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

[491] Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark (meeting slides)*, December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

[492] Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark*

How should you weigh this? The slides are a presentation, not a peer-reviewed study, and several points rest on sources the slides only link to. CRS's critique in the next section is the main published response I found. Read both and judge.

What critics and CRS said

CRS, which does not take sides on policy, raised questions about each argument:[493]

- **Other countries.** Countries weigh different things. Denmark does not use the rotavirus vaccine partly because its health system rarely lets a child die of rotavirus. Finland, Norway and Sweden, with a similar disease burden, chose to vaccinate. In the U.S. before 2006, rotavirus caused an estimated 55,000 to 70,000 child hospitalizations and 20 to 60 deaths a year. By 2017, hospitalizations for rotavirus had dropped by a median of 80 percent. CRS also noted the report included "almost no information" about U.S. health care conditions.
- **Trust.** CRS found that the report "does not cite any studies or provide any evidence to directly support the claim" that changing recommendations would raise vaccination rates.
- **Process.** No ACIP vote, no outside medical groups, and no review of what happened to uptake in the past when advice changed.

The AAP called the move "unprecedented" and published its own 2026 schedule, which 12 other medical groups endorsed.[494] Some states have adopted the AAP schedule, and others have moved toward the federal one.[495] For families, that means the advice a child gets may now depend on the state and the doctor.

Supporters of the changes see that patchwork differently. HHS titled its June 9, 2025 announcement of the ACIP removals "HHS Takes Bold Step to Restore Public Trust in Vaccines by Reconstituting ACIP."[496] In that view, a single federal schedule left little room for family choice, and a fresh committee was needed to win back people who had stopped trusting the old one. The AAP, for its part, said in 2025 that the reconstituted ACIP had been "replaced with

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(meeting slides), December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

[493] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[494] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[495] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[496] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

individuals who have a history of spreading vaccine misinformation."[497] [Not verified: I could not reach the HHS press release itself, which is blocked to my tools, so I quote its title as CRS records it and do not paraphrase its reasons beyond that.]

What it would mean for families

Because the new schedule is stayed, none of this has taken full effect. But the questions it raised show how many everyday things hang on the schedule. CRS walked through them in June 2026.[498]

Will insurance still pay? Federal law requires most private health plans to cover, with no copay, vaccines that have an ACIP recommendation "in effect."[499] The HHS decision memo and assessment both said "broad-based insurance coverage of both consensus and non-consensus immunizations should remain in effect."[500] But because ACIP was not involved in six of the changes, CRS said it is unclear whether those six would still count as ACIP recommendations "in effect" if the schedule took effect as written. The HPV change raises its own question: cutting the doses from two to one "arguably rescinds" the recommendation for the second dose.[501]

Insurers moved to calm this. In September 2025, AHIP, a trade group for health insurers, said its member plans would keep covering all vaccines ACIP recommended as of September 1, 2025, through the end of 2026. In May 2026 it extended that to "all ACIP-recommended immunizations with no cost-sharing through the end of 2027."[502] One catch: more than 60 percent of people with private insurance are in employer self-insured plans, and insurer promises and state rules do not necessarily reach those plans.[503]

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[497] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[498] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[499] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[500] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[501] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[502] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[503] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

What about families on Medicaid or without insurance? The Vaccines for Children (VFC) program buys vaccines for children who are on Medicaid, uninsured, underinsured at certain clinics, or American Indian or Alaska Native. VFC follows its own list, set by separate ACIP votes, and the 2026 schedule did not change that list. CRS concluded the new schedule would not appear to change which vaccines VFC covers.[504]

Does "shared decision-making" mean "optional"? Not as the term has been defined. ACIP's definition says the decision is "individually based and informed by a decision process between the health care provider and the patient or parent/guardian."[505] But surveys suggest many people read it differently. CRS reports, citing the Annenberg Public Policy Center, that about one in four people thought it meant they should consult family, and nearly half thought it meant it was up to them whether to talk to a provider at all.[506] Some experts argue that shared decision-making fits only when medicine has no clear answer, and is the wrong tool for vaccines with proven protection against serious illness.[507] Supporters of the 2026 schedule see the same tool as a way to "restore trust" by putting parents back in the conversation.[508]

On the 2026 schedule, 9 of 17 vaccines are recommended only for high-risk groups or through shared decision-making, including 3 that are shared decision-making only. On the 2025 schedule, 4 of 19 were in those categories and none were shared decision-making only.[509]

What will my state do? States set school requirements and decide which providers, such as pharmacists, can give which vaccines, and many state laws point to ACIP.[510] As of January 20, 2026, 28 states (counting Washington, D.C.) and several multistate health alliances had said they would follow the AAP's schedule. Other states said they would adopt parts of the new CDC

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[504] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[505] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[506] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[507] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[508] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[509] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[510] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

schedule, and some proposed requiring providers to follow it.[511] By September 2025, at least 23 states had passed new rules on vaccine coverage, on which group's recommendations they would follow, or both.[512] The practical result is that the same child could be advised differently depending on which side of a state line the family lives on.

A closer look: the hepatitis B birth dose

No single change drew more argument than the hepatitis B shot given in the first hours of life, so it is worth setting both cases side by side.

What ACIP voted. On December 5, 2025, the reconstituted ACIP voted 8 to 3 for "individual-based decision-making" on the hepatitis B vaccine, including the birth dose, for babies born to women who test negative for the virus. For babies who skip the birth dose, it suggested the first dose come no earlier than two months of age. It told parents and providers to consider risks such as a household member with hepatitis B, and it said coverage would continue under Vaccines for Children, Medicaid and private plans.[513] Babies of mothers who test positive still get the vaccine at birth.[514] Earlier, on September 19, 2025, ACIP had voted to recommend that all pregnant women be tested for hepatitis B.[515] (CRS describes the December change as covering babies of mothers with "negative or unknown" results, while CDC's press release says "test negative." I report both.)[516,517]

The case made for the change. CDC's press release summarized the presentations the committee heard. One, by Cynthia Nevison, Ph.D., concluded that the universal birth dose's

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[511] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[512] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[513] Centers for Disease Control and Prevention, Office of Communications, *ACIP Recommends Individual-Based Decision-Making for Hepatitis B Vaccine for Infants Born to Women Who Test Negative for the Virus (press release)*, December 5, 2025, https://www.cdc.gov/media/releases/2025/2025-acip-recommends-individual-based-decision-making-for-hepatitis-b-vaccine-for-infants-born-to-women.html (accessed November 12, 2026).

[514] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[515] Centers for Disease Control and Prevention, Office of Communications, *ACIP Recommends Individual-Based Decision-Making for Hepatitis B Vaccine for Infants Born to Women Who Test Negative for the Virus (press release)*, December 5, 2025, https://www.cdc.gov/media/releases/2025/2025-acip-recommends-individual-based-decision-making-for-hepatitis-b-vaccine-for-infants-born-to-women.html (accessed November 12, 2026).

[516] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[517] Centers for Disease Control and Prevention, Office of Communications, *ACIP Recommends Individual-Based Decision-Making for Hepatitis B Vaccine for Infants Born to Women Who Test Negative for the Virus (press release)*, December 5, 2025, https://www.cdc.gov/media/releases/2025/2025-acip-recommends-individual-based-decision-making-for-hepatitis-b-vaccine-for-infants-born-to-women.html (accessed November 12, 2026).

contribution to the drop in acute hepatitis B "is likely small," and credited blood screening, better dialysis practices and needle exchange programs. It cited a 2019 study finding that 0.5 percent of U.S. pregnancies are to women who test positive, and that 57.9 percent of those births were to women born outside the United States, mainly in countries where the virus is common. The workgroup chair, Vicky Pebsworth, Ph.D., R.N., said the U.S. universal birth dose is "an outlier among developed countries with low hepatitis B prevalence."[518] Dr. Høeg's slides made a similar point about Denmark, which runs a targeted program for high-risk groups and, according to the slides, judged that vaccinating everyone "could not be justified from a health economics perspective."[519]

The case made for keeping it universal. CDC's March 2026 coverage report, written by CDC staff, called the birth dose "a universal safeguard against early hepatitis B virus (HBV) transmission." Its authors gave three reasons a negative test at the clinic does not settle the risk. Without protection, about 90 percent of babies infected by their mothers develop chronic infection and about 25 percent of those eventually die of liver disease. Some 12 to 16 percent of pregnant women in the United States who have insurance and prenatal care are not tested for hepatitis B during pregnancy. And babies can be infected by family or community members before they finish the three-dose series.[520] The Pink Book adds that the virus can survive at least seven days on surfaces (Appendix D).[521]

Where it stands. The March 2026 court order stayed the votes of the reconstituted ACIP, which CRS says reverts the schedule to the version in place as of May 2025, so the universal birth dose was again the federal recommendation at my cutoff.[522] The birth dose has also been slipping in practice: the same CDC report found it had declined for three birth groups in a row.[523]

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[518] Centers for Disease Control and Prevention, Office of Communications, *ACIP Recommends Individual-Based Decision-Making for Hepatitis B Vaccine for Infants Born to Women Who Test Negative for the Virus (press release)*, December 5, 2025, https://www.cdc.gov/media/releases/2025/2025-acip-recommends-individual-based-decision-making-for-hepatitis-b-vaccine-for-infants-born-to-women.html (accessed November 12, 2026).

[519] Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark (meeting slides)*, December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

[520] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

[521] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 10: Hepatitis B*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-10-hepatitis-b.html (accessed November 12, 2026).

[522] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), p. 24.

[523] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

You might ask, "So which side is right?" Both rely on true numbers. The disagreement is about how much a universal safety net is worth when most mothers test negative, and whether testing alone can be trusted to catch the rest. That is a judgment about risk, and it is exactly the kind of question Chapter 18 hands back to you.

The court case

The AAP and other groups first sued in July 2025 over the ACIP removals and the COVID-19 changes, then added the new schedule in February 2026.[524,525] On March 16, 2026, Judge Brian E. Murphy of the U.S. District Court for the District of Massachusetts granted part of their request.[526] He opened his ruling by quoting the astronomer Carl Sagan, that science "is far from a perfect instrument of knowledge" but is still "the best we have," and the Supreme Court, that "Procedure is to law what scientific method is to science."[527] The court held that:[528,529]

- The schedule was a "final agency action" that courts can review, because federal and state laws attach real consequences to it.
- Congress wrote ACIP into several laws, so the CDC director "lacked authority" to rewrite the schedule without at least consulting ACIP.
- The change abandoned a "decades-old practice" without enough explanation, and "Defendants cannot disregard the APA's requirements simply because they are following the President's orders."
- The new ACIP was likely not "fairly balanced" as the Federal Advisory Committee Act requires. The court pointed to ACIP's own membership plan, which calls for members with "expertise in the field of immunization practices" or "knowledge of vaccine

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[524] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[525] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[526] U.S. District Court for the District of Massachusetts (Judge Brian E. Murphy), *American Academy of Pediatrics v. Kennedy, No. 1:25-cv-11916-BEM, Memorandum and Order on Plaintiffs' Motion for Preliminary Injunction (Document 291)*, March 16, 2026, https://www.govinfo.gov/content/pkg/USCOURTS-mad-1_25-cv-11916/pdf/USCOURTS-mad-1_25-cv-11916-0.pdf (accessed November 12, 2026).

[527] U.S. District Court for the District of Massachusetts (Judge Brian E. Murphy), *American Academy of Pediatrics v. Kennedy, No. 1:25-cv-11916-BEM, Memorandum and Order on Plaintiffs' Motion for Preliminary Injunction (Document 291)*, March 16, 2026, https://www.govinfo.gov/content/pkg/USCOURTS-mad-1_25-cv-11916/pdf/USCOURTS-mad-1_25-cv-11916-0.pdf (accessed November 12, 2026).

[528] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[529] U.S. District Court for the District of Massachusetts (Judge Brian E. Murphy), *American Academy of Pediatrics v. Kennedy, No. 1:25-cv-11916-BEM, Memorandum and Order on Plaintiffs' Motion for Preliminary Injunction (Document 291)*, March 16, 2026, https://www.govinfo.gov/content/pkg/USCOURTS-mad-1_25-cv-11916/pdf/USCOURTS-mad-1_25-cv-11916-0.pdf (accessed November 12, 2026).

development, evaluation, safety and delivery," and found that, on the record before it, many new members lacked relevant experience. It also noted the appointment process "took a few months and involved some limited outreach," compared with a process that historically took about two years.[530] The judge added that there "may be evidence" showing more relevant experience than the government had put in the record.[531]

The government argued that the plaintiffs lacked standing, that the schedule was only a set of "non-binding" recommendations that courts cannot review, and that the CDC director could change the schedule on his own under the Secretary's general power to "assist" and "advise" states.[532] The court rejected those arguments at this early stage. It did not stop ACIP from meeting in the future or pick its members; it stayed the January 2026 memo, the appointments of 13 members named on June 11, 2025, September 11, 2025 and January 13, 2026, and "all votes taken by the now-stayed ACIP."[533] This was a preliminary ruling, not a final decision on the merits.

The stay put most of the schedules back to their January 2025 versions. It kept the April 2025 ACIP votes and the May 2025 COVID-19 change.[534] It also left an odd gap: the new infant RSV antibody approved by the stayed committee may no longer have a recommendation, which could affect insurance coverage for it.[535]

On April 29, 2026, the government appealed the ruling to the U.S. Court of Appeals for the First Circuit.[536] CRS reported on September 29, 2026, that the court order was still blocking the new

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[530] U.S. District Court for the District of Massachusetts (Judge Brian E. Murphy), *American Academy of Pediatrics v. Kennedy, No. 1:25-cv-11916-BEM, Memorandum and Order on Plaintiffs' Motion for Preliminary Injunction (Document 291)*, March 16, 2026, https://www.govinfo.gov/content/pkg/USCOURTS-mad-1_25-cv-11916/pdf/USCOURTS-mad-1_25-cv-11916-0.pdf (accessed November 12, 2026).

[531] U.S. District Court for the District of Massachusetts (Judge Brian E. Murphy), *American Academy of Pediatrics v. Kennedy, No. 1:25-cv-11916-BEM, Memorandum and Order on Plaintiffs' Motion for Preliminary Injunction (Document 291)*, March 16, 2026, https://www.govinfo.gov/content/pkg/USCOURTS-mad-1_25-cv-11916/pdf/USCOURTS-mad-1_25-cv-11916-0.pdf (accessed November 12, 2026).

[532] U.S. District Court for the District of Massachusetts (Judge Brian E. Murphy), *American Academy of Pediatrics v. Kennedy, No. 1:25-cv-11916-BEM, Memorandum and Order on Plaintiffs' Motion for Preliminary Injunction (Document 291)*, March 16, 2026, https://www.govinfo.gov/content/pkg/USCOURTS-mad-1_25-cv-11916/pdf/USCOURTS-mad-1_25-cv-11916-0.pdf (accessed November 12, 2026).

[533] U.S. District Court for the District of Massachusetts (Judge Brian E. Murphy), *American Academy of Pediatrics v. Kennedy, No. 1:25-cv-11916-BEM, Memorandum and Order on Plaintiffs' Motion for Preliminary Injunction (Document 291)*, March 16, 2026, https://www.govinfo.gov/content/pkg/USCOURTS-mad-1_25-cv-11916/pdf/USCOURTS-mad-1_25-cv-11916-0.pdf (accessed November 12, 2026).

[534] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[535] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[536] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

ACIP members and their votes.[537] **[Not verified: whether the First Circuit had heard argument or ruled by the cutoff. The court's website and the news sites that cover it blocked my tools.]**

As of my check on November 12, 2026, CDC's website still displays the 2025 childhood schedule with its July 2, 2025 addendum.[538] The ACIP roster page, dated June 24, 2026, lists new members.[539]

Two executive orders

With the new schedule paused in court, the President acted twice more.

Executive Order 14407 (May 29, 2026). This order called the HHS assessment, with its proposed changes, "a guiding resource for the Federal Government." It told CDC and ACIP to review the assessment and "the latest clinical data" and to update the schedule "to the extent permitted by law," and asked ACIP to consider "maximum flexibility to parents and doctors" on the timing and order of shots. It also said that every vaccine "in any category" on the ACIP schedule should stay covered without cost-sharing by private insurance, Medicaid, the Children's Health Insurance Program and VFC.[540] In other words, it tried to send the changes back through ACIP, the step the court said was missing, while promising that coverage would not be cut.

Executive Order 14420 (August 10, 2026). Two months later, the President said implementation had been "delayed due to litigation" and went further.[541] The order declared "Gold Standard Childhood Vaccine Recommendations" in three groups:[542]

- **For all children:** measles, mumps, rubella, diphtheria, tetanus, pertussis, polio, Hib, pneumococcal disease, HPV and chickenpox.

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[537] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[538] Centers for Disease Control and Prevention, *Child and Adolescent Immunization Schedule by Age, Recommendations for Ages 18 Years or Younger, United States, 2025 (Addendum updated July 2, 2025)*, July 2, 2025 (as displayed November 12, 2026), https://www.cdc.gov/vaccines/hcp/imz-schedules/child-adolescent-age.html (accessed November 12, 2026).

[539] Centers for Disease Control and Prevention, *ACIP Membership Roster*, June 24, 2026, https://www.cdc.gov/acip/membership/roster.html (accessed November 12, 2026).

[540] Executive Office of the President, Daily Compilation of Presidential Documents, *Executive Order 14407: Realigning United States Core Childhood Vaccine Recommendations With Best Practices From Peer, Developed Countries (DCPD-202600371)*, May 29, 2026, https://www.govinfo.gov/content/pkg/DCPD-202600371/html/DCPD-202600371.htm (accessed November 12, 2026).

[541] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

[542] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

- **For certain high-risk groups:** RSV antibodies, hepatitis A, hepatitis B, meningococcal B, meningococcal ACWY and dengue.
- **Through shared decision-making:** hepatitis A, hepatitis B, rotavirus, meningococcal disease, flu and COVID-19.

It also said MMR "should be administered in three separate single-disease shots once such products are domestically available," and that "to the maximum extent feasible, all childhood immunizations should be administered at separate medical visits."[543] It gave an HHS task force 90 days to present plans to offer single vaccines starting with MMR, study "the ideal timing and sequencing" of childhood vaccines, develop alternatives to aluminum adjuvants, and improve safety monitoring.[544] And it told the Attorney General to support lawsuits against state laws that conflict with federal obligations on "parental authority, religious freedom, disability accommodations, and equal protection," including religious and medical exemptions from school vaccine requirements.[545]

You might ask, "Can a president set the vaccine schedule by executive order?" The order itself says it must be "implemented consistent with applicable law" and does not create any legal right that can be enforced in court.[546] It directs agencies and advises states; it does not by itself change a state's school law or an insurer's legal duty. How far it reaches will likely be decided in the courts.

Two points are worth checking against earlier chapters. First, the order itself indicates that single-disease measles, mumps and rubella vaccines were not available in the United States when it was signed, since it says separate shots would follow "once such products are domestically available."[547] Second, the order's call for separate visits for every vaccine runs into a practical cost: more visits mean more chances for a child to miss a dose. The order does not address that trade-off. [Not verified: I could not confirm whether the HHS task force delivered its 90-day plans, due around November 8, 2026. I found only unofficial reports and no HHS document, so I treat it as unknown.]

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[543] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

[544] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

[545] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

[546] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

[547] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

Who leads the agencies

Leadership at the agencies in this book changed often in 2025 and 2026. As of the cutoff:

- **HHS Secretary:** Robert F. Kennedy Jr., sworn in February 13, 2025.[548]
- **CDC Director:** Dr. Erica Schwartz, a former Deputy Surgeon General, according to CDC's leadership page dated October 30, 2026.[549] Before her, the agency had acting directors. The January 2026 schedule memo was issued by the Acting CDC Director, whom the court calls "Director O'Neill," and in February 2026 NIH Director Jayanta Bhattacharya was named acting CDC director.[550] The Senate confirmed Schwartz as CDC director on August 5, 2026, by a vote of 51 to 44.[551]
- **FDA Commissioner:** Marty Makary, one of the three officials who sent the January 2026 schedule recommendation to CDC.[552]

I list these because the same few officials appear on many of the decisions in this chapter, which matters for readers weighing who made which call.

What this chapter shows: The 2025-2026 changes moved several vaccines from "every child" to "talk with your doctor." No vaccine was taken off the schedule. HHS said the changes would rebuild trust and match peer nations; CRS and medical groups said the evidence for that was thin and the process skipped the steps the law expects. A court has paused the new schedule, and an appeal is pending. Parents now face two sets of advice, federal and medical-society, that do not match.

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[548] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[549] Centers for Disease Control and Prevention, *Director and ATSDR Administrator (staff biography of Erica Schwartz)*, October 30, 2026, https://www.cdc.gov/about/leadership/director.html (accessed November 12, 2026).

[550] U.S. District Court for the District of Massachusetts (Judge Brian E. Murphy), *American Academy of Pediatrics v. Kennedy, No. 1:25-cv-11916-BEM, Memorandum and Order on Plaintiffs' Motion for Preliminary Injunction (Document 291)*, March 16, 2026, https://www.govinfo.gov/content/pkg/USCOURTS-mad-1_25-cv-11916/pdf/USCOURTS-mad-1_25-cv-11916-0.pdf (accessed November 12, 2026).

[551] U.S. Senate Daily Press Gallery, *Wednesday, August 5, 2026 (floor log)*, August 5, 2026, https://www.dailypress.senate.gov/wednesday-august-5-2026/ (accessed November 12, 2026).

[552] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

Part Six: Claims Tested

Chapter 15: Eighteen Claims, One Standard

This chapter tests 18 claims people make about vaccines. Some come from people who distrust vaccines. Some come from public health officials and their supporters. I hold them all to the same standard: what do the best available records show?

Each claim gets one of four verdicts, the same ones explained in the Introduction:

- **True:** the records support it.
- **Partly true:** part of it holds up, part does not, or it leaves out something that changes the meaning.
- **False (debunked):** the records show it is wrong.
- **Inconclusive:** the evidence is not strong enough either way.

A verdict is about the claim as people usually say it, not about the people who say it. Many people who repeat a false claim are worried parents asking a fair question. Many people who repeat an overstatement from the other side are trying to reassure. Neither deserves contempt. Both deserve accurate answers.

Table 15.1 at the end of the chapter lists every verdict in one place.

Claim 1: "Vaccines cause autism."

Where it came from. The modern form of this claim traces to a 1998 paper in *The Lancet* by Dr. Andrew Wakefield and 12 co-authors. It described 12 children and suggested a link between the MMR vaccine, bowel disease and autism. In early 2010 the story collapsed. Britain's General Medical Council ruled in January 2010 that the children in the study "were carefully selected," that Wakefield "had acted unethically," and that he had shown "callous disregard" for the children. On February 2, 2010, *The Lancet* retracted the paper, saying "several elements" of it were "incorrect, contrary to the findings of an earlier investigation."[553] In May 2010 the General Medical Council struck Wakefield off the UK medical register, so he can no longer practice medicine there.[554]

What the records show. This claim has to be split, because the evidence is different for different vaccines.

MMR. MMR is the vaccine studied most for autism. Even CDC's own autism page, which was rewritten in 2025 and 2026 to say that "vaccines do not cause autism" is "not an evidence-based

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[553] Laura Eggertson, CMAJ (Canadian Medical Association Journal) 182(4):E199-E200, *Lancet retracts 12-year-old article linking autism to MMR vaccines*, February 4, 2010, https://pmc.ncbi.nlm.nih.gov/articles/PMC2831678/ (accessed November 12, 2026).

[554] Zosia Kmietowicz, "Wakefield is struck off for the 'serious and wide-ranging findings against him'," BMJ (British Medical Journal) 340:c2803, May 24, 2010, PubMed record https://pubmed.ncbi.nlm.nih.gov/20498165/ (accessed November 12, 2026).

claim," states that reviews by the Institute of Medicine and the Agency for Healthcare Research and Quality "maintain with a high strength of evidence that there is no association" between MMR and autism.[555] The same page argues those studies are observational and have flaws.[556] That is a fair point about study design. But no reliable study has found that MMR causes autism, and the paper that started the claim was retracted.

Other infant vaccines. For vaccines such as DTaP and hepatitis B, the official reviews said something narrower. The 2012 Institute of Medicine review found "the evidence is inadequate to accept or reject a causal relationship" between DTaP and autism, and a 2021 federal review found no new studies to change that.[557] The CDC page also describes a large Danish study that found no increased risk of neurodevelopmental disorders from aluminum-containing vaccines, while pointing to one subgroup result it says needs follow-up.[558] In plain terms: no good study has shown these vaccines cause autism, and the official reviews say there are too few studies to formally rule it out. In vaccine court, three special masters heard more than 5,000 autism claims in test cases from 2007 to 2010 and found the theories unreliable. The one well-known paid case, Hannah Poling, was paid because her injury met the injury table rules, not because the government accepted that vaccines cause autism (Chapter 10).[559]

You might ask, "Isn't that the same as saying it might be true?" Science almost never proves a negative. What it can do is look hard for an effect and report whether it found one. For MMR, researchers looked very hard and did not find one. For some infant vaccines, fewer studies looked specifically at autism.

Verdict:

- "MMR causes autism": **False (debunked).**
- "Other infant vaccines cause autism": **Inconclusive.** No reliable evidence shows they do. Federal reviews have said the evidence is not enough to formally rule it out. HHS has said it is studying the question.[560]

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[555] Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

[556] Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

[557] Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

[558] Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

[559] U.S. Court of Federal Claims (Judge Edward H. Meyers), *Hazlehurst v. Secretary of Health and Human Services, No. 03-654V, Opinion and Order (Document 142)*, June 26, 2025 (reissued July 16, 2025), https://www.govinfo.gov/content/pkg/USCOURTS-cofc-1_03-vv-00654/pdf/USCOURTS-cofc-1_03-vv-00654-0.pdf (accessed November 12, 2026), pp. 5, 13.

[560] Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

Claim 2: "VAERS proves vaccines have killed thousands."

Where it came from. VAERS data are public. Anyone can download them and count the reports of deaths after vaccination, which ran into the thousands after COVID-19 vaccines, given to hundreds of millions of people.

What the records show. VAERS accepts reports from anyone about any health problem after a vaccine, "even if you are not sure if the vaccine caused the event."[561] CDC states plainly: "A report to VAERS does not mean that a vaccine caused an adverse event."[562] When millions of people are vaccinated, some will die in the following days and weeks from heart attacks, strokes, accidents and old age, whether or not they were vaccinated. VAERS is designed to catch possible signals, which are then checked in systems that have comparison groups (Chapter 7).

But the claim is not entirely empty. Vaccines have caused deaths. The Johnson and Johnson COVID-19 vaccine caused a rare clotting disorder, and CDC confirmed 8 deaths from it through August 2021.[563] Those deaths were found because VAERS reports were checked against medical records.

Verdict: False (debunked). VAERS death reports are real, but they do not show the vaccine caused the deaths. A small number of deaths have been confirmed as vaccine-caused, and they were found by checking reports, not by counting them.

Claim 3: "Vaccine makers can never be sued."

What the records show. Chapters 9 through 11 cover this in detail. For vaccines on the injury table, people must first file in the Vaccine Injury Compensation Program (VICP). After VICP decides, they can reject the award and sue the company in regular court.[564,565] But the 1986 law blocks lawsuits claiming a vaccine was badly *designed*, as the Supreme Court held in 2011,[566]

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[561] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

[562] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

[563] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(3):90-95, *Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine: Updated Interim Recommendations from the Advisory Committee on Immunization Practices, United States, December 2021*, January 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7103a4.htm (accessed November 12, 2026).

[564] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 300aa-11, Petitions for compensation*, current text, https://www.law.cornell.edu/uscode/text/42/300aa-11 (accessed November 12, 2026).

[565] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 300aa-15, Compensation*, current text, https://www.law.cornell.edu/uscode/text/42/300aa-15 (accessed November 12, 2026).

[566] Supreme Court of the United States, *Bruesewitz v. Wyeth LLC, 562 U.S. 223 (2011) (opinion of the Court by Justice Scalia; dissent by Justice Sotomayor)*, February 22, 2011, https://tile.loc.gov/storage-services/service/ll/usrep/usrep562/usrep562223/usrep562223.pdf (accessed November 12, 2026).

and limits other kinds of suits. For COVID-19 vaccines given under the PREP Act, lawsuits are blocked except for "willful misconduct," which has a high bar.[567]

Verdict: Partly true. Lawsuits are possible in limited situations, but the 1986 law and the PREP Act block or delay most of them. "Never" overstates it. "It is very hard" is accurate.

Claim 4: "COVID-19 vaccines change your DNA."

What the records show. The mRNA vaccines deliver a set of instructions that cells use to make a piece of the spike protein. CDC says the vaccines "do not enter the nucleus of the cell where our DNA (genetic material) is located, so they cannot change or influence our genes," and that cells "break down the mRNA and remove it."[568]

Verdict: False (debunked). No study has shown the vaccines alter human DNA.

Claim 5: "COVID-19 vaccines caused heart problems in young men."

What the records show. Yes. The mRNA vaccines caused myocarditis, inflammation of the heart muscle, mostly in young males after the second dose. CDC's own data showed reporting rates of 62.8 per million second doses in males 12 to 17 and 50.5 per million in males 18 to 24.[569] Most cases were mild and improved with treatment.[570] A CDC study also found that, even in teen boys, heart complications were more common after COVID-19 infection than after vaccination.[571]

Verdict: True. The side effect is real, rare, and mostly mild. It was confirmed by CDC itself. People still argue about whether the benefit outweighed the risk for healthy young men, especially later in the pandemic when most had already been infected. That debate is about weighing risks, not about whether the side effect happened.

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[567] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 247d-6d, Targeted liability protections for pandemic and epidemic products and security countermeasures (PREP Act)*, current text, https://www.law.cornell.edu/uscode/text/42/247d-6d (accessed November 12, 2026).

[568] Centers for Disease Control and Prevention, *COVID-19 Vaccine Basics (How COVID-19 Vaccines Work)*, September 3, 2024, https://www.cdc.gov/covid/vaccines/how-they-work.html (accessed November 12, 2026).

[569] Gargano JW, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(27), *Use of mRNA COVID-19 Vaccine After Reports of Myocarditis Among Vaccine Recipients: Update from the Advisory Committee on Immunization Practices, United States, June 2021*, July 9, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7027e2.htm (accessed November 12, 2026).

[570] Centers for Disease Control and Prevention, *Safety of COVID-19 Vaccines*, January 31, 2025, https://www.cdc.gov/vaccine-safety/vaccines/covid-19.html (accessed November 12, 2026).

[571] Block JP, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(14), *Cardiac Complications After SARS-CoV-2 Infection and mRNA COVID-19 Vaccination, PCORnet, United States, January 2021-January 2022*, April 8, 2022, https://stacks.cdc.gov/view/cdc/116620/cdc_116620_DS1.pdf (accessed November 12, 2026).

Claim 6: "Natural immunity is always better than vaccination."

What the records show. For COVID-19, a CDC study from California and New York looked at four groups in 2021. Early in the year, people who had only been vaccinated had lower case rates than people who had only been infected. By October 2021, during the Delta wave, the pattern flipped: people who had survived an infection had lower case rates than people who had only been vaccinated. For hospitalization in early October, rates were 19.8 times lower among vaccinated people with no prior infection, and about 55 times lower among unvaccinated people with a prior infection, compared with people who had neither.[572] The same study noted it was done before Omicron.[573] A later CDC study found that, during Omicron, vaccination still added protection for people who had already been infected: about 35 percent against a reinfection needing a hospital after two doses, and 68 percent after a booster.[574]

The catch is the price of admission. To get natural immunity you have to survive the disease. For measles, natural infection gives lifelong immunity, but it comes with the complications in Chapter 3, including brain swelling and death.[575] The CDC study above was a count of people who survived, and by November 2021 about 130,781 people had died of COVID-19 in those two states alone.[576]

Verdict: Partly true. Immunity after infection can be strong, and for COVID-19 in 2021 it was at least as protective as vaccination alone. But "always better" ignores the risk of getting sick to get it, and the strongest protection in the CDC data came from having both.

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[572] León TM, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(4):125-131, *COVID-19 Cases and Hospitalizations by COVID-19 Vaccination Status and Previous COVID-19 Diagnosis, California and New York, May-November 2021*, January 28, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7104e1.htm (accessed November 12, 2026).

[573] León TM, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(4):125-131, *COVID-19 Cases and Hospitalizations by COVID-19 Vaccination Status and Previous COVID-19 Diagnosis, California and New York, May-November 2021*, January 28, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7104e1.htm (accessed November 12, 2026).

[574] Plumb ID, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(15):549-555, *Effectiveness of COVID-19 mRNA Vaccination in Preventing COVID-19-Associated Hospitalization Among Adults with Previous SARS-CoV-2 Infection, United States, June 2021-February 2022*, April 15, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7115e2.htm (accessed November 12, 2026).

[575] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[576] León TM, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(4):125-131, *COVID-19 Cases and Hospitalizations by COVID-19 Vaccination Status and Previous COVID-19 Diagnosis, California and New York, May-November 2021*, January 28, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7104e1.htm (accessed November 12, 2026).

Claim 7: "Childhood vaccines were never tested against a placebo."

What the records show. Some were. The 1954 polio vaccine trial used a saline placebo in about 750,000 children in the placebo areas.[577] The rotavirus vaccine trials gave 70,000 infants either vaccine or placebo.[578] The adult COVID-19 vaccine trials also used a placebo.[579]

But many other trials compared a new vaccine against an existing vaccine, or used a control shot that contained the adjuvant (such as aluminum) but not the active ingredient. Supporters of that design say it is unethical to leave children in a trial unprotected against a disease when a working vaccine already exists. Critics say that without an inert placebo you cannot measure the true rate of side effects. The 2026 HHS assessment called for more "double-blind, placebo-controlled clinical trials."[580] The Institute of Medicine, in 2013, called a trial that leaves some children totally unvaccinated a design that would "needlessly endanger" them.[581]

Verdict: Partly true. "Never" is false. It is true that many childhood vaccines on today's schedule were licensed without a trial against an inert saline placebo, and that is a real point of debate.

Claim 8: "Vaccines contain microchips."

What the records show. Every licensed vaccine's ingredients are listed in its package insert and on CDC's pages. They include the active ingredient, plus things like adjuvants, stabilizers and preservatives (Chapter 6).[582,583] No ingredient list, laboratory test, or investigation has found a microchip or tracking device. A working tracker would need a power source and an antenna, which cannot pass through a standard vaccine needle and still work.

Verdict: False (debunked). No evidence has ever been produced for this claim.

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[577] University of Michigan School of Public Health, *1955 Polio Vaccine Trial Announcement (reproduces the April 12, 1955 press release)*, April 12, 1955 (release), https://sph.umich.edu/polio/ (accessed November 12, 2026).

[578] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[579] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 69(50), *The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-BioNTech COVID-19 Vaccine, United States, December 2020*, December 18, 2020, https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e2.htm (accessed November 12, 2026).

[580] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[581] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[582] Centers for Disease Control and Prevention, *Adjuvants and Vaccines*, December 20, 2024, https://www.cdc.gov/vaccine-safety/about/adjuvants.html (accessed November 12, 2026).

[583] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

Claim 9: "Measles is a harmless childhood illness."

Where it came from. Before 1963 nearly everyone caught measles, and most children recovered. Many older adults remember it as an ordinary part of childhood.

What the records show. About 30 percent of reported U.S. measles cases from 1987 to 2000 had at least one complication, including pneumonia, brain swelling and death.[584] Before the vaccine, an estimated 400 to 500 people died each year, 48,000 were hospitalized and 1,000 had encephalitis.[585] In 2026, through November 5, 11 percent of U.S. measles patients were hospitalized (562 of 5,182), and CDC had confirmed 7 deaths. In 2025, it confirmed 3.[586]

Verdict: False (debunked). Most children who catch measles recover, but about 1 in 10 recent patients needed a hospital, and some die.

Claim 10: "Vaccines are 100 percent safe" / "Serious side effects never happen."

Where it came from. This is an overstatement heard from the pro-vaccine side, usually in an effort to reassure.

What the records show. Chapter 8 lists real, confirmed side effects: severe allergic reactions, Guillain-Barre syndrome in some years, myocarditis, a clotting disorder with deaths, and the RotaShield bowel blockage that led to its withdrawal.[587,588,589,590] The federal government has

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[584] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[585] Centers for Disease Control and Prevention, *History of Measles*, April 29, 2026, https://www.cdc.gov/measles/about/history.html (accessed November 12, 2026).

[586] Centers for Disease Control and Prevention, *Measles cases, hospitalizations and deaths data file (measles_hosp.json), used by the Measles Cases and Outbreaks page*, last updated November 5, 2026, https://www.cdc.gov/wcms/vizdata/measles/measles_hosp.json (accessed November 12, 2026).

[587] CDC COVID-19 Response Team and FDA, Morbidity and Mortality Weekly Report 70(2), *Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine, United States, December 14-23, 2020*, January 15, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7002e1.htm (accessed November 12, 2026).

[588] Gargano JW, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(27), *Use of mRNA COVID-19 Vaccine After Reports of Myocarditis Among Vaccine Recipients: Update from the Advisory Committee on Immunization Practices, United States, June 2021*, July 9, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7027e2.htm (accessed November 12, 2026).

[589] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(3):90-95, *Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine: Updated Interim Recommendations from the Advisory Committee on Immunization Practices, United States, December 2021*, January 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7103a4.htm (accessed November 12, 2026).

[590] Centers for Disease Control and Prevention, *Rotavirus Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/rotavirus.html (accessed November 12, 2026).

paid more than $5.7 billion through VICP to people with vaccine injuries listed on its injury table, though most awards are settlements that do not prove the vaccine caused the injury.[591]

Verdict: False (debunked). No medical product is 100 percent safe. Serious side effects are rare, but they happen, and the government pays compensation for them.

Claim 11: "The COVID-19 vaccine stops you from catching or spreading the virus."

Where it came from. In 2021, public officials and many media reports said or implied that vaccinated people would not catch or spread COVID-19.

What the records show. The original trials measured protection against *symptomatic* illness, and CDC noted at the time that "no data were available to assess the efficacy for prevention of asymptomatic" infection.[592] Early real-world studies did show strong protection against infection. But by July 2021, an outbreak in Barnstable County, Massachusetts, found that 74 percent of the 469 cases were in fully vaccinated people, and that vaccinated and unvaccinated people with breakthrough infections had similar amounts of virus in their noses.[593] Protection against infection also faded over months, while protection against hospitalization held up better.[594]

Verdict: Partly true. The vaccines reduced infection and spread for a time, especially early on and before Delta and Omicron. They did not stop it, and the claim was stated more strongly than the trials supported.

Claim 12: "Too many shots too soon overload a baby's immune system."

What the records show. No study has shown that the number of vaccines on the schedule overloads or damages a baby's immune system. Each vaccine is tested with the others it will be given alongside before it is licensed. But the 2013 Institute of Medicine report found that the

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[591] Health Resources and Services Administration (HRSA), *National Vaccine Injury Compensation Program Data and Statistics*, updated November 1, 2026, https://www.hrsa.gov/sites/default/files/hrsa/vicp/vicp-stats-11-01-26.pdf (accessed November 12, 2026).

[592] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 69(50), *The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-BioNTech COVID-19 Vaccine, United States, December 2020*, December 18, 2020, https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e2.htm (accessed November 12, 2026).

[593] Brown CM, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(31):1059-1062, *Outbreak of SARS-CoV-2 Infections, Including COVID-19 Vaccine Breakthrough Infections, Associated with Large Public Gatherings, Barnstable County, Massachusetts, July 2021*, August 6, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7031e2.htm (accessed November 12, 2026).

[594] Moline HL, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(32):1088-1093, *Effectiveness of COVID-19 Vaccines in Preventing Hospitalization Among Adults Aged 65 Years and Older, COVID-NET, 13 States, February-April 2021*, August 13, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7032e3.htm (accessed November 12, 2026).

schedule as a whole is not regularly re-studied when a new vaccine is added, and it recommended more research.[595] Since then, some whole-schedule studies have been done with mixed results: one found no link to type 1 diabetes, another found a possible link between total aluminum exposure and asthma.[596] HHS and medical groups now disagree sharply on what this means (Chapter 14).

Verdict: Inconclusive. There is no evidence the schedule "overloads" the immune system. There is also less whole-schedule research than many parents assume, and the research that exists is mixed on some outcomes.

Claim 13: "Aluminum (or mercury) in vaccines is poisoning children."

What the records show. Both ingredients are real.

Mercury. Thimerosal contains ethylmercury. It was removed from U.S. childhood vaccines by 2001 as a precaution, and is now found mainly in multi-dose flu vials.[597] CDC's thimerosal page says research shows no link to autism.[598]

Aluminum. Aluminum salts have been used in vaccines for more than 70 years to strengthen the immune response.[599] CDC says the amount from following the schedule is low.[600] A 2022 Vaccine Safety Datalink study found a possible association between aluminum from vaccines and persistent asthma. CDC noted that study itself.[601] A large Danish study found no increased risk of neurodevelopmental disorders.[602]

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[595] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[596] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[597] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

[598] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

[599] Centers for Disease Control and Prevention, *Adjuvants and Vaccines*, December 20, 2024, https://www.cdc.gov/vaccine-safety/about/adjuvants.html (accessed November 12, 2026).

[600] Centers for Disease Control and Prevention, *Adjuvants and Vaccines*, December 20, 2024, https://www.cdc.gov/vaccine-safety/about/adjuvants.html (accessed November 12, 2026).

[601] Centers for Disease Control and Prevention, *Adjuvants and Vaccines*, December 20, 2024, https://www.cdc.gov/vaccine-safety/about/adjuvants.html (accessed November 12, 2026).

[602] Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

Verdict: Partly true. The ingredients are real and are fair to ask about. "Poisoning" is not supported: no study has shown poisoning at vaccine doses. One study found a possible link to asthma that has not been confirmed or ruled out.

Claim 14: "The CDC hid data showing vaccines cause autism" (the 2014 "CDC whistleblower" claim).

Where it came from. In 2004 CDC researchers published a study in *Pediatrics* on the age of first MMR vaccination in children with autism in metro Atlanta. One of the authors was CDC scientist William Thompson. In August 2014, Thompson released a statement that said: "I regret that my coauthors and I omitted statistically significant information in our 2004 article published in the Journal of Pediatrics." Rep. Bill Posey of Florida read it on the House floor in July 2015, along with more of Thompson's account. In it, Thompson said the authors decided in 2002 "not to report any race effects for the paper," that co-authors later met to throw out hard-copy study documents, that he kept copies because he believed discarding them would be illegal, and that "I believe we intentionally withheld controversial findings from the final draft."[603] Posey began his remarks by saying, "I am absolutely, resolutely provaccine."[604]

What the records show. CDC's statement on the study says the full sample did not have reliable race data, so race results were reported only for the subset with Georgia birth certificates. It says the study found MMR between 24 and 36 months was "slightly more common among children with autism," which the authors believed was due to school requirements for special education programs. CDC says the data remain public for others to analyze, and that later studies and an Institute of Medicine review found MMR does not raise autism risk.[605]

Verdict: Partly true. A CDC co-author did say, in his own words, that statistically significant results were left out of a 2004 paper. That part is true, and it is a serious charge about how one study was reported. CDC's statement gives a different reason for how race was handled: the full sample did not have reliable race data. The bigger claim, that the data proved MMR causes autism, is not supported: the omitted result was in one subgroup of one study, and later, larger studies and an Institute of Medicine review found no link.[606] [Not verified: the status of a 2014

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[603] Congressional Record, House, Vol. 161, No. 121, p. H5602 (Rep. Bill Posey), *Research and Scientific Integrity*, July 29, 2015, https://www.govinfo.gov/content/pkg/CREC-2015-07-29/html/CREC-2015-07-29-pt1-PgH5602.htm (accessed November 12, 2026).

[604] Congressional Record, House, Vol. 161, No. 121, p. H5602 (Rep. Bill Posey), *Research and Scientific Integrity*, July 29, 2015, https://www.govinfo.gov/content/pkg/CREC-2015-07-29/html/CREC-2015-07-29-pt1-PgH5602.htm (accessed November 12, 2026).

[605] Centers for Disease Control and Prevention, *CDC Statement: 2004 MMR and Autism Study (archived page)*, last reviewed August 24, 2020, https://archive.cdc.gov/www_cdc_gov/vaccinesafety/concerns/autism/cdc2004pediatrics.html (accessed November 12, 2026).

[606] Centers for Disease Control and Prevention, *CDC Statement: 2004 MMR and Autism Study (archived page)*, last reviewed August 24, 2020, https://archive.cdc.gov/www_cdc_gov/vaccinesafety/concerns/autism/cdc2004pediatrics.html (accessed November 12, 2026).

outside reanalysis of the same data by Brian Hooker, which is widely reported to have been retracted. I could not open the journal's site to confirm.]

Claim 15: "Vitamin A cures or prevents measles."

Where it came from. During the 2025 Texas outbreak, vitamin A got wide attention as a measles treatment.

What the records show. CDC says: "Vitamin A does not prevent measles and is not a substitute for vaccination." It also says vitamin A may be given to children with measles under a doctor's care, and that children with severe measles, such as those in the hospital, "should be managed with vitamin A." CDC warns that too much vitamin A can damage the liver, bones, nervous system and skin, and can cause birth defects.[607]

Verdict: Partly true. Vitamin A is a real part of treatment for children sick with measles. It does not prevent measles and does not cure it.

Claim 16: "The 1986 law was passed because vaccines were injuring so many children."

What the records show. Chapter 9 tells the story. In the 1970s and 1980s, lawsuits over the whole-cell pertussis (DTP) vaccine climbed, prices rose, and companies left the market. Congress passed the 1986 law to keep vaccines available while paying people who were injured.[608,609] The injuries were real, and some lawsuits were over injuries that later studies did not tie to the vaccine. The whole-cell pertussis vaccine was later replaced with the acellular version (the "a" in DTaP), which causes fewer reactions.[610]

Verdict: Partly true. Injury claims did drive the law. But the main threat Congress was reacting to was a collapse in vaccine supply caused by lawsuits, not proof of mass injury.

Claim 17: "Ivermectin or hydroxychloroquine made COVID-19 vaccines unnecessary."

What the records show. Both drugs were real hopes early in the pandemic, and both were tested.

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[607] Centers for Disease Control and Prevention, *Clinical Overview of Measles*, August 5, 2026, https://www.cdc.gov/measles/hcp/clinical-overview/index.html (accessed November 12, 2026).

[608] Supreme Court of the United States, *Bruesewitz v. Wyeth LLC, 562 U.S. 223 (2011) (opinion of the Court by Justice Scalia; dissent by Justice Sotomayor)*, February 22, 2011, https://tile.loc.gov/storage-services/service/ll/usrep/usrep562/usrep562223/usrep562223.pdf (accessed November 12, 2026).

[609] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[610] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

Hydroxychloroquine. FDA gave chloroquine and hydroxychloroquine an emergency use authorization for COVID-19 in 2020, then revoked it on June 15, 2020. FDA said that, after "a review of new information and a reevaluation of information available at the time," it was "no longer reasonable to believe" the drugs "may be effective in treating COVID-19" or that their benefits outweighed their risks.[611]

Ivermectin. Ivermectin is an FDA-approved human drug for certain parasite infections, and it is "generally safe and well tolerated" when used as prescribed.[612] In August 2021, CDC warned that prescriptions had jumped 24-fold from before the pandemic, to more than 88,000 in one week, and that poison control calls about ivermectin had risen sharply, many from people taking versions made for horses and cattle. CDC said ivermectin was "not authorized or approved by FDA for prevention or treatment of COVID-19" and that the NIH treatment panel had found "insufficient data to recommend" it.[613] **[Not verified: the final results of the large ivermectin trials that ended after 2021. The journal and NIH sites blocked my tools.]**

The government's messaging also drew a court rebuke. FDA posted on social media, "You are not a horse. You are not a cow. Seriously, y'all. Stop it." Three doctors who prescribed human ivermectin sued. In 2023 a federal appeals court let their case go forward, writing that "FDA is not a physician" and that posts giving consumers medical advice were "plausibly ultra vires," meaning beyond FDA's legal power. The court did not decide whether ivermectin works.[614]

Verdict: False (debunked). FDA withdrew hydroxychloroquine's emergency authorization because the evidence no longer showed it worked, and no federal agency ever found ivermectin effective against COVID-19. Neither drug was shown to do what the vaccines did: lower the risk of severe illness and death across large groups of people. The ivermectin story also shows how heavy-handed government messaging can backfire.

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[611] Food and Drug Administration, Federal Register Vol. 85, No. 177 (FR Doc. 2020-20041), *Authorizations and Revocation of Emergency Use of Drugs During the COVID-19 Pandemic; Availability*, September 11, 2020, https://www.govinfo.gov/content/pkg/FR-2020-09-11/html/2020-20041.htm (accessed November 12, 2026).

[612] Centers for Disease Control and Prevention, Health Alert Network (CDCHAN-00449), *Rapid Increase in Ivermectin Prescriptions and Reports of Severe Illness Associated with Use of Products Containing Ivermectin to Prevent or Treat COVID-19*, August 26, 2021, https://archive.cdc.gov/emergency_cdc_gov/han/2021/han00449.asp (accessed November 12, 2026).

[613] Centers for Disease Control and Prevention, Health Alert Network (CDCHAN-00449), *Rapid Increase in Ivermectin Prescriptions and Reports of Severe Illness Associated with Use of Products Containing Ivermectin to Prevent or Treat COVID-19*, August 26, 2021, https://archive.cdc.gov/emergency_cdc_gov/han/2021/han00449.asp (accessed November 12, 2026).

[614] U.S. Court of Appeals for the Fifth Circuit (Judge Don R. Willett), *Apter v. Department of Health and Human Services, No. 22-40802*, September 1, 2023, https://www.govinfo.gov/content/pkg/USCOURTS-ca5-22-40802/pdf/USCOURTS-ca5-22-40802-0.pdf (accessed November 12, 2026).

Claim 18: "Unvaccinated people caused the measles comeback" / "Vaccinated people spread it."

What the records show. Measles still circulates in other countries, so cases start with travel. Whether a case grows into an outbreak depends on how many people around it are immune. In 2026, through November 5, CDC reported that 96 percent of confirmed cases were in people who were unvaccinated or whose vaccination status was unknown; 2 percent had one MMR dose and 2 percent had two.[615] 96 percent of cases were part of outbreaks.[616]

Verdict:

- "Most measles cases are in unvaccinated people": **True.**
- "Vaccinated people are spreading the outbreaks": **False (debunked).** A small share of cases occur in vaccinated people, as expected with any vaccine that is not perfect, but the outbreaks have spread mainly among people without the vaccine.

Neither verdict says anything about *why* people were unvaccinated. That question, including falling school coverage and changing advice, is covered in Chapter 16.

Table 15.1. All verdicts

#	Claim	Verdict
1a	MMR causes autism	False (debunked)
1b	Other infant vaccines cause autism	Inconclusive
2	VAERS proves vaccines have killed thousands	False (debunked)
3	Vaccine makers can never be sued	Partly true
4	COVID-19 vaccines change your DNA	False (debunked)
5	COVID-19 vaccines caused heart problems in young men	True
6	Natural immunity is always better than vaccination	Partly true

[615] Centers for Disease Control and Prevention, *Measles cases, hospitalizations and deaths data file (measles_hosp.json), used by the Measles Cases and Outbreaks page*, last updated November 5, 2026, https://www.cdc.gov/wcms/vizdata/measles/measles_hosp.json (accessed November 12, 2026).

[616] Centers for Disease Control and Prevention, *Measles Cases and Outbreaks*, data as of November 5, 2026, https://www.cdc.gov/measles/data-research/index.html (accessed November 12, 2026).

#	Claim	Verdict
7	Childhood vaccines were never tested against a placebo	Partly true
8	Vaccines contain microchips	False (debunked)
9	Measles is a harmless childhood illness	False (debunked)
10	Vaccines are 100 percent safe	False (debunked)
11	The COVID-19 vaccine stops you from catching or spreading the virus	Partly true
12	Too many shots too soon overload a baby's immune system	Inconclusive
13	Aluminum or mercury in vaccines is poisoning children	Partly true
14	The CDC hid data showing vaccines cause autism	Partly true
15	Vitamin A cures or prevents measles	Partly true
16	The 1986 law was passed because vaccines were injuring so many children	Partly true
17	Ivermectin or hydroxychloroquine made vaccines unnecessary	False (debunked)
18a	Most measles cases are in unvaccinated people	True
18b	Vaccinated people are spreading the outbreaks	False (debunked)

What this chapter shows: Claims on both sides fail when they use words like "always," "never" and "100 percent." The claims that hold up best are the narrow ones that match the records: some side effects are real and rare, some questions have been studied far more than others, and diseases like measles still hurt people.

Part Seven: Where Things Stand

Chapter 16: The Numbers Right Now

This chapter covers the present. The information stops at November 12, 2026. Every number here is the latest I could confirm on that date. Check the sources for newer figures.

Measles

Measles is the clearest early-warning sign for vaccine coverage, because it is so contagious that small drops in immunity show up fast.

Table 16.1. U.S. measles cases, as of November 5, 2026

Year	Confirmed cases	Outbreaks (3 or more linked cases)	Share of cases in outbreaks	Hospitalized	Confirmed deaths
2024	285	16	69%	not shown here	not shown here
2025	2,289	48	90%	11% (244 of 2,289)	3
2026 (through November 5)	5,182	43 new	96%	11% (562 of 5,182)	7

Sources: CDC measles cases page and data file.[617,618] Numbers are confirmed cases only; CDC says states may also report probable cases.[619]

Who is getting sick? In 2026, 18 percent of cases were children under 5, 41 percent were ages 5 to 19, and 41 percent were adults. The youngest children were hospitalized most often: 17 percent of patients under 5 (154 of 908) went to the hospital. 96 percent of patients were unvaccinated or had unknown vaccination status.[620]

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[617] Centers for Disease Control and Prevention, *Measles Cases and Outbreaks*, data as of November 5, 2026, https://www.cdc.gov/measles/data-research/index.html (accessed November 12, 2026).

[618] Centers for Disease Control and Prevention, *Measles cases, hospitalizations and deaths data file (measles_hosp.json), used by the Measles Cases and Outbreaks page*, last updated November 5, 2026, https://www.cdc.gov/wcms/vizdata/measles/measles_hosp.json (accessed November 12, 2026).

[619] Centers for Disease Control and Prevention, *Measles Cases and Outbreaks*, data as of November 5, 2026, https://www.cdc.gov/measles/data-research/index.html (accessed November 12, 2026).

[620] Centers for Disease Control and Prevention, *Measles cases, hospitalizations and deaths data file (measles_hosp.json), used by the Measles Cases and Outbreaks page*, last updated November 5, 2026, https://www.cdc.gov/wcms/vizdata/measles/measles_hosp.json (accessed November 12, 2026).

Measles was declared eliminated from the United States in 2000, meaning it no longer spread year-round inside the country.[621] A country loses that status if a single chain of spread lasts 12 months or more. As of CRS's September 29, 2026 report, the United States "may lose its decades-long measles elimination status this year due to ongoing outbreaks."[622] **[Not verified: whether the Pan American Health Organization (PAHO) had formally ruled on U.S. elimination status by the cutoff. I read PAHO's news list for October 28 to November 11, 2026, and found no such announcement. Other news and journal sites blocked my tools.]**

CRS put the 2026 numbers in history. By September 24, 2026, the country had 3,659 confirmed cases, "the highest number of annual cases in 35 years," since 9,643 cases in 1991.[623] The CDC count has kept climbing since then (Table 16.1). CRS also notes a gap in the death count. As of late September, CDC's website listed one 2026 measles death while the Pennsylvania Department of Health had reported four, and CDC said it was working on a standard case definition for measles deaths.[624] CDC's November 5 data file lists seven.[625] Treat the death count as a number that may still change.

Where outbreaks happen, local coverage is usually low. CRS points to the 2025 West Texas outbreak, where some affected counties had kindergarten two-dose rates as low as 77.3 percent, and those numbers do not count homeschooled children, of whom there were reportedly many in the area. In a South Carolina outbreak from October 2025 to April 2026, schools exposed to the outbreak averaged 82.5 percent two-dose coverage, compared with 91 percent at schools that were not.[626] CDC gave $50 million in extra one-time money to state and local health departments for measles response as of September 2026.[627]

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[621] Centers for Disease Control and Prevention, *History of Measles*, April 29, 2026, https://www.cdc.gov/measles/about/history.html (accessed November 12, 2026).

[622] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[623] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[624] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[625] Centers for Disease Control and Prevention, *Measles cases, hospitalizations and deaths data file (measles_hosp.json), used by the Measles Cases and Outbreaks page*, last updated November 5, 2026, https://www.cdc.gov/wcms/vizdata/measles/measles_hosp.json (accessed November 12, 2026).

[626] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[627] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

The messages from the top have been mixed. CRS notes that a March 2026 CDC press release said, "The benefits of the MMR vaccine far outweigh the risks," while the President suggested the MMR vaccine could be "quite lethal."[628]

Whooping cough

Pertussis is the other disease worth watching, because its vaccine's protection fades (Chapter 3 and Appendix D). CDC's surveillance page, updated October 27, 2026, gives the long view:[629]

- Before a vaccine was available in the 1940s, more than 200,000 cases were reported each year.
- After the whole-cell DTP vaccine came into wide use from 1948, yearly cases fell by more than 90 percent.
- Reports started climbing again in the 1980s and peaked at 48,277 cases in 2012. CDC lists several likely reasons: doctors recognizing it more, better lab tests, better reporting, and "waning immunity from acellular pertussis vaccines," which fully replaced DTP for children in 1996.
- Cases dropped during the COVID-19 pandemic, likely because of masking and distancing.
- In 2024, cases came roaring back. Preliminary data showed more than six times as many cases as in 2023, and more than in 2019. The last peak came in November 2024.
- In 2025, cases stayed high compared with before the pandemic but trended down after that peak. CDC says preliminary data show fewer cases reported so far in 2026 than at the same point in 2025.

Babies under 1 year old have the highest rate of pertussis and face the greatest risk of serious illness and death.[630] CDC also says reports of antibiotic-resistant pertussis have been rare in the United States, but resistance to the usual class of antibiotics is being reported more often in Asia, Australia, Europe and South America, and CDC has it on its watch list.[631]

Pertussis is a good example of a story that does not fit either side's slogan. The vaccine cut cases by more than 90 percent. The newer, gentler acellular vaccine also wears off faster, and that is part of why cases rose again. Both facts come from the same CDC page.

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[628] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[629] Centers for Disease Control and Prevention, *Pertussis Surveillance and Trends*, October 27, 2026, https://www.cdc.gov/pertussis/php/surveillance/index.html (accessed November 12, 2026).

[630] Centers for Disease Control and Prevention, *Pertussis Surveillance and Trends*, October 27, 2026, https://www.cdc.gov/pertussis/php/surveillance/index.html (accessed November 12, 2026).

[631] Centers for Disease Control and Prevention, *Pertussis Surveillance and Trends*, October 27, 2026, https://www.cdc.gov/pertussis/php/surveillance/index.html (accessed November 12, 2026).

School and toddler coverage

Kindergarten. For the 2025-2026 school year, CDC reported that coverage among kindergartners fell for every reported vaccine compared with the year before. MMR coverage was 92.4 percent. About 280,000 kindergartners were in school without records showing they had completed the MMR series. Exemptions from one or more vaccines rose to 4.2 percent from 3.6 percent, rose in 41 states and the District of Columbia, and topped 5 percent in 24 states.[632]

States vary widely. Table 16.2 shows a few, including my home state of Nevada.

Table 16.2. Kindergarten MMR coverage in selected states (as reported to CDC)

State	2019-20	2024-25	2025-26
Nevada	95.4%	91.3%	90.8%
Idaho	89.1%	78.5%	75.2%
Texas	96.9%	93.2%	93.2%
Mississippi	99.1%	97.6%	97.0%
West Virginia	98.2%	not available	98.9%

Source: CDC state data file.[633] Some states measure coverage differently; CDC notes that a few states report only the share of children with all required vaccines.[634]

Toddlers. A March 2026 CDC report looked at children born in 2021 and 2022. By age 2, coverage was at or above 90 percent for polio (92.1 percent), hepatitis B (91.6 percent), at least one dose of MMR (90.8 percent) and chickenpox (90.0 percent). It fell for some vaccines, most of all for flu, where two-dose coverage dropped to 53.5 percent from 61.0 percent for children born in 2019 and 2020. The share of children with no vaccines at all was 1.2 percent.[635] That report has a known limit: only 23.4 percent of households reached for the survey completed it.[636]

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[632] Centers for Disease Control and Prevention, *Vaccination Coverage and Exemptions among Kindergartners (SchoolVaxView)*, August 17, 2026, https://www.cdc.gov/schoolvaxview/data/index.html (accessed November 12, 2026).

[633] Centers for Disease Control and Prevention, *MMR vaccine coverage for kindergartners by state and school year (data file MeaslesKindergartenVaxcovExemptions.json)*, https://www.cdc.gov/wcms/vizdata/measles/MeaslesKindergartenVaxcovExemptions.json (accessed November 12, 2026).

[634] Centers for Disease Control and Prevention, *MMR vaccine coverage for kindergartners by state and school year (data file MeaslesKindergartenVaxcovExemptions.json)*, https://www.cdc.gov/wcms/vizdata/measles/MeaslesKindergartenVaxcovExemptions.json (accessed November 12, 2026).

[635] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

[636] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

The same report shows who is being missed. Coverage was lower for children eligible for the Vaccines for Children program than for other children. Children living below the poverty line had lower coverage than other children, with gaps from 3.5 percentage points (hepatitis B) to 18.1 points (rotavirus). Children outside metropolitan areas had lower coverage for most vaccines.[637] States varied widely: two-dose flu coverage ranged from 25.2 percent in Mississippi to 78.3 percent in Massachusetts.[638] The national goal for at least one MMR dose (90.8 percent) was met exactly, but the goal for four doses of DTaP was not (80.7 percent against a 90 percent target).[639]

CDC's authors flagged two trends. First, the hepatitis B birth dose has declined for three birth groups in a row; they call it "a universal safeguard against early hepatitis B virus (HBV) transmission," and note that 12 to 16 percent of pregnant women with insurance and prenatal care are not tested for hepatitis B during pregnancy.[640] Second, flu vaccination in young children has not recovered from the pandemic. The authors point out that the 2024-25 flu season had the highest flu hospitalization rate since 2010-11 and 280 flu deaths in children, the most in any non-pandemic season since those deaths became reportable in 2004, and that 89 percent of those children were not fully vaccinated against flu.[641] Parents who skipped flu shots most often said they did not think their child would get very sick (48.2 percent), worried about safety and side effects (43.3 percent), or thought the vaccine did not work well (37.0 percent).[642]

One small inconsistency: the report's results give 53.5 percent for two-dose flu coverage among children born in 2021 and 2022, while its discussion section gives 51.8 percent as the lowest

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[637] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

[638] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

[639] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

[640] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

[641] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

[642] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

level in more than a decade. The second figure may refer to a single birth year, but the text does not say. I use 53.5 percent above, the figure in the report's table.

Federal policy at the cutoff

Here is where the policy fights from Chapter 14 stood on November 12, 2026:

- **The 2026 childhood schedule** is stayed by a federal court. CDC's website still shows the 2025 schedule.[643,644]
- **The appeal.** The government appealed to the First Circuit on April 29, 2026.[645] As of CRS's September 29, 2026 report, the stay was still in place.[646] [Not verified: any appeals court ruling by the cutoff.]
- **ACIP** has not met in 2026. CDC cancelled the March, June and October meetings "due to ongoing litigation." The next meeting listed is February 24-26, 2027.[647]
- **Executive Orders 14407 and 14420** (May 29 and August 10, 2026) direct agencies to follow the HHS assessment as far as the law allows, declare "Gold Standard" recommendations, call for single-disease MMR shots once available, and direct the Justice Department to support legal challenges to state laws on vaccine exemptions.[648,649]
- **The autism page.** CDC's autism and vaccines page, dated July 22, 2026, says the statement "vaccines do not cause autism" is "not an evidence-based claim," while its

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[643] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[644] Centers for Disease Control and Prevention, *Child and Adolescent Immunization Schedule by Age, Recommendations for Ages 18 Years or Younger, United States, 2025 (Addendum updated July 2, 2025)*, July 2, 2025 (as displayed November 12, 2026), https://www.cdc.gov/vaccines/hcp/imz-schedules/child-adolescent-age.html (accessed November 12, 2026).

[645] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[646] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[647] Centers for Disease Control and Prevention, *ACIP Meeting Information*, October 9, 2026, https://www.cdc.gov/acip/meetings/index.html (accessed November 12, 2026).

[648] Executive Office of the President, Daily Compilation of Presidential Documents, *Executive Order 14407: Realigning United States Core Childhood Vaccine Recommendations With Best Practices From Peer, Developed Countries (DCPD-202600371)*, May 29, 2026, https://www.govinfo.gov/content/pkg/DCPD-202600371/html/DCPD-202600371.htm (accessed November 12, 2026).

[649] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

thimerosal page says research shows no link. HHS says it is studying causes of autism.[650,651]

- **Vaccine injury compensation.** No final change to the injury table to add or remove a vaccine was in place, as far as I could confirm. CRS has flagged several open legal questions (Chapter 10).[652]
- **Single-disease measles shots.** Executive Order 14420 says MMR "should be administered in three separate single-disease shots" once such products are available in the United States. None was licensed here at the cutoff. CRS says makers would have to run new large trials and build new factories, and that makers have reportedly said it could take as long as 10 years. CDC's own page states that "no published scientific evidence shows any benefit in separating the combination MMR vaccine into three individual shots."[653]
- **Medical societies** publish their own schedules, and states are split on which advice to follow.[654]

What this chapter shows: Measles cases in 2026 are more than twice the 2025 count and far above 2024, almost all in unvaccinated people. Kindergarten coverage and exemptions moved the wrong way again in 2025-2026, a trend that started before the 2025 policy changes. Federal vaccine advice is on hold while a court case plays out.

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[650] Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

[651] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

[652] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[653] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[654] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

Chapter 17: What Americans Think

This chapter covers the present. The information stops at November 12, 2026. Polls are snapshots. Each one is dated so you can see how old it is.

You might ask, "Why does a fact-check book need a chapter on opinion?" Because opinion drives policy. School rules, state laws and federal advice all move when public trust moves. And polls themselves get misused. A single number gets quoted without the question that produced it, or one poll gets treated as the last word. So this chapter follows three rules: give the pollster, the dates and the sample; compare more than one poll; and keep what people believe separate from what the evidence shows.

How to read a poll

Three things matter most.

- **Who was asked.** A poll of all adults is not a poll of parents. The KFF poll below asked 1,328 adults, including 437 parents.[655]
- **The margin of error.** KFF reported a margin of error of plus or minus 3 points for all adults but about 6 points for parents and for Democrats, and 7 points for Republicans.[656] A small group always has a wider margin. A gap of a few points between two small groups may not be real.
- **The exact question.** "Is the MMR vaccine safe?" and "Do the benefits of MMR outweigh the risks?" are different questions and get different answers. Where I could not see the exact wording, I say so. **[Not verified: the exact question wording for the KFF and Pew results below. I read each organization's report but not its full questionnaire, so the figures are given as the reports summarized them.]**

The broad picture: most people still back the old vaccines

The strongest finding across polls is that the long-used childhood vaccines still have wide support across both parties.

Table 17.1. Views on the MMR vaccine in two national polls

Poll	Dates	Who	Finding
Pew Research Center	October 20-26, 2025	5,111 adults	84% say MMR

[655] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

[656] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

Poll	Dates	Who	Finding
			benefits outweigh the risks (Democrats 92%, Republicans 78%)
KFF	September 16-21, 2026	1,328 adults	82% of adults and 76% of parents say MMR benefits outweigh the risks; 17% of adults and 22% of parents say the risks outweigh the benefits

Sources: Pew;[657] KFF.[658]

KFF found that at least three-quarters of people in both parties were confident the childhood polio and MMR vaccines are safe for children. Even among people who called themselves supporters of the "Make America Healthy Again" movement, 76 percent were confident about MMR.[659]

That broad support has a soft edge, and the soft edge is among parents. In the KFF poll, 24 percent of Republican parents and 14 percent of Democratic parents said the risks of MMR outweigh the benefits.[660]

Where the parties split

The gap between the parties is small for the oldest vaccines and wide for COVID-19 and for the schedule as a whole.

Table 17.2. Partisan gaps on selected questions

[657] Eileen Yam, Emma Kikuchi and Isabelle Pula, Pew Research Center, *How Do Americans View Childhood Vaccines, Vaccine Research and Policy?*, November 18, 2025, https://www.pewresearch.org/science/2025/11/18/how-do-americans-view-childhood-vaccines-vaccine-research-and-policy/ (accessed November 12, 2026).

[658] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

[659] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

[660] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

Question (as summarized by the pollster)	Democrats	Republicans	Source
Extremely or very confident childhood vaccines are effective against serious illness	80%	48%	Pew, Oct. 2025
High confidence that the childhood schedule is safe	71%	32%	Pew, Oct. 2025
Low confidence that the childhood schedule is safe	7%	31%	Pew, Oct. 2025
Confident COVID-19 vaccines are safe for children (all adults)	77%	21%	KFF, Sept. 2026
Confident COVID-19 vaccines are safe in pregnancy	62%	17%	KFF, Sept. 2026

Sources: Pew;[661] KFF.[662]

Overall, Pew found 63 percent of adults were extremely or very confident childhood vaccines work against serious illness, 53 percent were confident in how vaccines are tested for safety, and 51 percent were confident the schedule is safe.[663] KFF found that only 39 percent of adults were confident COVID-19 vaccines are safe during pregnancy, down from 53 percent in May 2022.[664]

You might ask, "Did people change their minds because of the 2025 policy changes, or did the policy follow opinion?" The polls cannot answer that. Pew's trend on school rules (below) shows Republican support falling between 2019 and 2025, which covers both the pandemic and the

[661] Eileen Yam, Emma Kikuchi and Isabelle Pula, Pew Research Center, *How Do Americans View Childhood Vaccines, Vaccine Research and Policy?*, November 18, 2025, https://www.pewresearch.org/science/2025/11/18/how-do-americans-view-childhood-vaccines-vaccine-research-and-policy/ (accessed November 12, 2026).

[662] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

[663] Eileen Yam, Emma Kikuchi and Isabelle Pula, Pew Research Center, *How Do Americans View Childhood Vaccines, Vaccine Research and Policy?*, November 18, 2025, https://www.pewresearch.org/science/2025/11/18/how-do-americans-view-childhood-vaccines-vaccine-research-and-policy/ (accessed November 12, 2026).

[664] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

start of the new administration. The honest answer is that we cannot tell cause from these numbers alone.

School requirements

Support for school vaccine rules has dropped, and almost all of the drop is on one side.

- Pew found that support for requiring MMR for public school fell from 82 percent in 2019 to 69 percent in 2025. Among Republicans, it fell from 79 percent to 52 percent. Among Democrats, it stayed a solid majority.[665]
- CDC's own survey of 2,034 parents in June and July 2024 found that 76.6 percent agreed that school and daycare requirements are important and necessary, and 8.3 percent disagreed. A third (33.4 percent) agreed that unvaccinated children should be allowed to attend school, while 54.6 percent agreed they should stay home during an outbreak.[666]
- In that CDC survey, parents who had sought or planned to seek an exemption most often gave "philosophical or personal belief" objections (37.5 percent). More than a quarter (27.2 percent) said medical reasons. CDC noted that this is far higher than the 0.2 percent medical exemption rate states report, and suggested some parents "might consider concerns about vaccine safety or side effects as a 'medical' reason."[667]

Spacing out shots

One belief stands out because it is widely held and has little evidence behind it. KFF found that 48 percent of parents think spacing out childhood vaccines is healthier. That belief split by party: 69 percent of Republican parents said spacing is healthier, while 68 percent of Democratic parents said there is no strong evidence for it.[668] KFF itself described the spacing belief as incorrect.[669]

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[665] Eileen Yam, Emma Kikuchi and Isabelle Pula, Pew Research Center, *How Do Americans View Childhood Vaccines, Vaccine Research and Policy?*, November 18, 2025, https://www.pewresearch.org/science/2025/11/18/how-do-americans-view-childhood-vaccines-vaccine-research-and-policy/ (accessed November 12, 2026).

[666] Kayla Calhoun, Tianyi Zhou, Devon Dramann and Ranee Seither, Centers for Disease Control and Prevention, *Parental Attitudes and Behaviors Toward School and Daycare Vaccination Requirements*, October 16, 2024, https://www.cdc.gov/schoolvaxview/pubs-resources/parental-attitudes-toward-vaccination-requirements.html (accessed November 12, 2026).

[667] Kayla Calhoun, Tianyi Zhou, Devon Dramann and Ranee Seither, Centers for Disease Control and Prevention, *Parental Attitudes and Behaviors Toward School and Daycare Vaccination Requirements*, October 16, 2024, https://www.cdc.gov/schoolvaxview/pubs-resources/parental-attitudes-toward-vaccination-requirements.html (accessed November 12, 2026).

[668] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

[669] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

Here the evidence and the opinion part ways. As Part Six explains (Claim 12), each vaccine is tested along with the others given at the same visit, and there are fewer studies of the whole schedule than many parents assume.[670] But I found no study showing that a slower schedule is safer, and delaying shots leaves a child unprotected for longer. On separating MMR into three shots, which Executive Order 14420 calls for, CDC's page says "no published scientific evidence shows any benefit."[671]

What people know about the new rules

Many people have not followed the policy changes closely.

- KFF found that about 6 in 10 adults had heard "not much" or "nothing at all" about the recent executive order on the childhood schedule. Asked how it would affect children's health, about 4 in 10 said negatively, 12 percent positively, 9 percent no impact, and 38 percent were unsure. Republicans were more likely to expect a positive effect (27 percent) than a negative one (9 percent).[672]
- The Annenberg Public Policy Center at the University of Pennsylvania asked in two 2025 surveys (about 1,700 and 1,600 adults, margin of error plus or minus 3.5 points) what "shared decision-making" means. Most (68 percent) correctly said it means reviewing your medical history with a provider. But 42 percent also said it means the person decides whether to talk to a provider at all, and 23 percent said it means talking it over with family.[673] Neither of those matches CDC's definition, which says the decision is "informed by a decision process between the health care provider and the patient or parent/guardian."[674]
- Annenberg also asked who counts as a provider. People named physicians (86 percent), physician assistants or nurse practitioners (66 percent), registered nurses (50 percent) and pharmacists (33 percent).[675]

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[670] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[671] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[672] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

[673] Annenberg Public Policy Center, University of Pennsylvania, *CDC Urges "Shared Decision-Making" on Some Childhood Vaccines; Many Unclear About What That Means*, January 5, 2026, https://www.annenbergpublicpolicycenter.org/cdc-urges-shared-decision-making-on-some-childhood-vaccines-many-unclear-about-what-that-means/ (accessed November 12, 2026).

[674] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[675] Annenberg Public Policy Center, University of Pennsylvania, *CDC Urges "Shared Decision-Making" on Some Childhood Vaccines; Many Unclear About What That Means*, January 5, 2026, https://www.annenbergpublicpolicycenter.org/cdc-

Who should make vaccine policy?

Pew asked who should have a major role in childhood vaccine policy. Democrats were more likely to give scientists a major role (85 percent, versus 62 percent of Republicans). Republicans were more likely to give parents of young children a major role (71 percent, versus 46 percent of Democrats).[676] That split lines up with the policy fight in Chapter 18: one side wants decisions anchored in expert committees, the other wants more room for families to choose.

What this chapter shows: Most Americans in both parties still support the MMR and polio vaccines and see their benefits as larger than their risks. Trust in the COVID-19 vaccines, in the schedule as a whole and in school requirements has fallen, mostly among Republicans. Some popular beliefs, such as spacing out shots being safer, are not supported by evidence. Many people are unsure what the new rules mean.

urges-shared-decision-making-on-some-childhood-vaccines-many-unclear-about-what-that-means/ (accessed November 12, 2026).

[676] Eileen Yam, Emma Kikuchi and Isabelle Pula, Pew Research Center, *How Do Americans View Childhood Vaccines, Vaccine Research and Policy?*, November 18, 2025, https://www.pewresearch.org/science/2025/11/18/how-do-americans-view-childhood-vaccines-vaccine-research-and-policy/ (accessed November 12, 2026).

Chapter 18: The Choices Ahead

This chapter covers the present. The information stops at November 12, 2026.

This chapter lists the main policy choices on the table, who supports each one, and what the evidence in this book says about it. I do not recommend any of them. My job in this book is to give you the record. The choices belong to voters, lawmakers, doctors and parents.

For each option I have tried to name who supports it from their own documents or from the Congressional Research Service, not from what opponents say about them.

Who sets the schedule?

Option A: Return to the ACIP-led process, or write it into law. Before 2026, ACIP voted and CDC adopted. A federal court has said the law expects ACIP to be "a meaningful participant" in schedule changes.[677] CRS notes that Congress could create ACIP in statute and require members to have specific expertise, which would limit the Secretary's power over the committee.[678]

- *Supported by:* the American Academy of Pediatrics and the medical groups that sued, and that endorsed AAP's own schedule.[679]
- *Concerns raised:* HHS leaders argue the old committee was too narrow in its views and too close to the groups it advised. The revised 2026 charter widened the kinds of expertise allowed, including "recovery from serious vaccine injuries."[680]

Option B: Keep the January 2026 schedule and its approach. Fewer universal recommendations, more shared decision-making, aligned with what peer nations do.

- *Supported by:* the Administration, through the December 2025 memorandum, Executive Orders 14407 and 14420, and the HHS assessment.[681,682,683]

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[677] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[678] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[679] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[680] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[681] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

- *Concerns raised:* CRS found the assessment had little U.S.-specific evidence and no evidence that the change would raise trust or uptake. Medical groups oppose it.[684]

Option C: Let independent groups set their own advice. This is already happening. Medical societies publish their own schedules, and the AMA and the Vaccine Integrity Project announced an independent evidence review in February 2026.[685]

- *Supported by:* the medical and academic groups doing it.[686]
- *Concerns raised:* CRS notes that families and doctors now face "a patchwork of clinical guidance," and that many laws and insurance rules are tied to CDC's schedule, not to private groups.[687]

Option C2: Fewer combination shots and more spacing. Executive Order 14420 calls for single-disease measles, mumps and rubella shots and, "to the maximum extent feasible," separate visits for each childhood vaccine.[688]

- *Supported by:* the Administration.[689]
- *Concerns raised:* Single-disease MMR shots were not available in the United States when the order was signed.[690] More shots and more visits add cost and give more

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[682] Executive Office of the President, Daily Compilation of Presidential Documents, *Executive Order 14407: Realigning United States Core Childhood Vaccine Recommendations With Best Practices From Peer, Developed Countries (DCPD-202600371)*, May 29, 2026, https://www.govinfo.gov/content/pkg/DCPD-202600371/html/DCPD-202600371.htm (accessed November 12, 2026).

[683] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

[684] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[685] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[686] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[687] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[688] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

[689] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

[690] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

chances to miss a dose. The fever-seizure history of MMRV (Chapter 8) shows that combination choices can carry real trade-offs, which is one reason this debate is not one-sided.[691]

How should vaccines be tested?

Option D: Require more placebo-controlled trials. The HHS assessment called for more "double-blind, placebo-controlled clinical trials."[692]

- *Supported by:* HHS leadership.[693]
- *Concerns raised:* The Institute of Medicine said a trial that leaves some children entirely unvaccinated would "needlessly endanger" them. CRS also notes the cost and length of such trials.[694]

Option E: More whole-schedule safety studies using existing health records. Use systems such as the Vaccine Safety Datalink to compare children on different schedules.

- *Supported by:* both the 2013 Institute of Medicine report and the 2026 HHS assessment called for more of this research.[695] This is one of the few places where both sides of the debate point in the same direction.
- *Concerns raised:* Observational studies can show associations but have trouble proving cause, and results so far are mixed.[696]

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[691] Centers for Disease Control and Prevention, Advisory Committee on Immunization Practices, *Briefing Document: Policy Recommendations for Use of Measles, Mumps, Rubella, and Varicella (MMRV) Vaccine in the United States (meeting of September 18-19, 2025)*, September 2025, https://www.cdc.gov/acip/downloads/slides-2025-09-18-19/policy-recs-mmrv-briefing-508.pdf (accessed November 12, 2026).

[692] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[693] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[694] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[695] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[696] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

How should injured people be paid?

Option F: Clarify which vaccines VICP covers. The law covers vaccines CDC recommends "for routine administration" to children or pregnant women, but never defines that phrase. CRS suggests Congress could define it, or say what happens when a vaccine stops being routine.[697]

- *Supported by:* raised as an option by CRS for Congress; no clear camp has formed around one answer that I could confirm.

Option G: Add more injuries to the injury table. Lawyers who represent people filing VICP claims have asked the Secretary to add injuries they say are "associated with" certain vaccines, and have threatened to sue if he does not.[698]

- *Concerns raised:* Any change to the table can be challenged in court, and adding injuries without strong evidence would pay claims for harms the vaccine may not cause.[699,700]

Option H: Speed up VICP. Petitions have grown faster than the court can decide them. CRS notes Congress could add special masters, and could make new routine vaccines subject to the excise tax automatically so they join VICP faster.[701]

Option I: Move COVID-19 vaccine claims from CICP to VICP. CICP has paid very few COVID-19 claims, pays no attorney fees or pain-and-suffering damages, and has been criticized for a lack of transparency. Some observers argue the claims should go through VICP instead. To do that, Congress would have to tax the vaccine and HHS would have to add it to the injury table.[702]

- *Supported by:* "some observers," according to CRS.[703] [Not verified: I could not confirm by name which members of Congress or groups back a specific bill as of the cutoff.]

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[697] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[698] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[699] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[700] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[701] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[702] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026).

[703] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026).

Option J: Remove or narrow the liability shield. Some critics want to undo parts of the 1986 law so injured people can sue manufacturers directly, as Justice Sotomayor's dissent suggested the current law leaves gaps in accountability.[704]

- *Concerns raised:* The law was passed in the first place because lawsuits drove makers out of the market (Chapter 9).[705]

Who has the power to require a vaccine?

Before weighing options on school rules, it helps to know who holds which power. CRS laid this out in a 2019 legal summary, written during that year's measles outbreaks.[706] Some of the numbers in it are from 2019 and may have changed.

States. Under the Constitution, states hold a general "police power" to protect public health, and that includes requiring vaccination. The Supreme Court upheld this twice in the early 1900s: in *Jacobson v. Massachusetts* (1905), for an adult smallpox vaccination rule, and in *Zucht v. King* (1922), for a city rule that kept an unvaccinated child out of school. In *Zucht*, the Court said "it is within the police power of a State to provide for compulsory vaccination."[707] All 50 states and the District of Columbia require certain vaccines for students. As of 2019, every state allowed medical exemptions, most but not all allowed religious exemptions, and 16 states allowed broader philosophical or personal-belief exemptions.[708] CRS reported that courts have "consistently rejected" constitutional challenges to these laws, and several recent decisions held that a state does not have to offer a religious exemption at all.[709] The section on the courts below shows that this question is being tested again after the Supreme Court's 2025 *Mahmoud* decision. The trend among states has also moved. According to a 2022 CRS report, from 1979 to 2016 Mississippi and West Virginia were the only two states without any nonmedical exemption, and from 2016 four more states, California, New York, Maine and Connecticut, eliminated

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[704] Supreme Court of the United States, *Bruesewitz v. Wyeth LLC, 562 U.S. 223 (2011) (opinion of the Court by Justice Scalia; dissent by Justice Sotomayor)*, February 22, 2011, https://tile.loc.gov/storage-services/service/ll/usrep/usrep562/usrep562223/usrep562223.pdf (accessed November 12, 2026).

[705] Supreme Court of the United States, *Bruesewitz v. Wyeth LLC, 562 U.S. 223 (2011) (opinion of the Court by Justice Scalia; dissent by Justice Sotomayor)*, February 22, 2011, https://tile.loc.gov/storage-services/service/ll/usrep/usrep562/usrep562223/usrep562223.pdf (accessed November 12, 2026).

[706] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

[707] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

[708] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

[709] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

theirs.[710] The same report notes a 2021 Supreme Court ruling, *Tandon v. Newsom*, which held that a law is not neutral and generally applicable if it treats "any comparable secular activity more favorably than religious exercise." That standard has given challengers a new argument where a state allows medical but not religious exemptions.[711]

The federal government. Washington has only the powers the Constitution lists. CRS points to two that matter here. The Commerce Clause lets Congress regulate interstate commerce. The Spending Clause lets Congress attach conditions to federal money, as long as the conditions relate to the program being funded.[712] Under the Tenth Amendment, Congress cannot order states to pass vaccine laws, but it can offer grants that encourage them.[713]

Religious freedom limits. Under the Supreme Court's 1990 decision in *Employment Division v. Smith*, a neutral law that applies to everyone, such as a general vaccine requirement, generally does not violate the Free Exercise Clause. But the federal Religious Freedom Restoration Act of 1993 (RFRA) bars the federal government from substantially burdening a sincere religious practice unless it uses "the least restrictive means" to serve a compelling interest. RFRA does not bind states; as of 2019, 21 states had passed their own versions.[714]

What Washington has actually required. CRS wrote in 2019 that apart from certain groups, such as immigrants seeking permanent residence and military personnel, the federal government had not used its power to require vaccination of the general public.[715] Its role had been to promote, pay for, recommend and monitor vaccines. The COVID-19 years tested that line with employer and federal workforce rules (Chapter 13). Section 317 of the Public Health Service Act gives immunization grants to states and cities; CRS noted that a 2019 bill, the Vaccinate All Children Act, would have made those grants depend on states requiring

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[710] Wen W. Shen, Congressional Research Service, *State and Federal Authority to Mandate COVID-19 Vaccination (Report R46745)*, February 7, 2022, https://www.congress.gov/crs_external_products/R/PDF/R46745/R46745.7.pdf (accessed November 12, 2026), p. 6.

[711] Wen W. Shen, Congressional Research Service, *State and Federal Authority to Mandate COVID-19 Vaccination (Report R46745)*, February 7, 2022, https://www.congress.gov/crs_external_products/R/PDF/R46745/R46745.7.pdf (accessed November 12, 2026), p. 6.

[712] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

[713] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

[714] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

[715] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

recommended vaccines for public school students.[716] [Not verified: I did not find that the bill became law.]

The practical result is that the biggest decisions about school vaccine rules sit with state legislatures, not with Washington. Federal advice, money and now executive orders shape those choices, but they do not make them.

School requirements

Option K: Tighten or loosen state exemption rules. Every state requires vaccines for school, and states decide what exemptions to allow. The Supreme Court has upheld state power to require vaccination since 1905.[717] Exemptions reached 4.2 percent of kindergartners in 2025-2026 and topped 5 percent in 24 states.[718] CRS, drawing on a January 2026 KFF review, reports that some states have adopted the medical-society schedules, while some have announced plans to adopt parts of the new federal schedule.[719]

- *Federal role:* Executive Order 14420 advises states to "consider updating" school requirements based on the HHS assessment and directs the Attorney General to support lawsuits that challenge state laws on religious and medical exemptions.[720]
- *Concerns on each side:* Supporters of easier exemptions point to parental rights and conscience. Supporters of tighter rules point to outbreaks in places with low coverage, like those in Chapter 16.

The courts and religious exemptions

The legal ground under school rules is shifting, and a case from New York shows how. New York first let schools turn away unvaccinated students in 1860. In 1966 its school vaccine law exempted children with medical reasons or parents with religious objections. After the 2018-2019 measles outbreak, which the court described as the worst in more than 25 years with New

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[716] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

[717] Supreme Court of the United States, *Jacobson v. Massachusetts, 197 U.S. 11 (1905)*, February 20, 1905, https://tile.loc.gov/storage-services/service/ll/usrep/usrep197/usrep197011/usrep197011.pdf (accessed November 12, 2026).

[718] Centers for Disease Control and Prevention, *Vaccination Coverage and Exemptions among Kindergartners (SchoolVaxView)*, August 17, 2026, https://www.cdc.gov/schoolvaxview/data/index.html (accessed November 12, 2026).

[719] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[720] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

York at its center, the legislature repealed the religious exemption in 2019 and kept the medical one.[721]

Amish parents and three Amish schools that were fined for not requiring vaccines sued, saying the law violates their religious freedom. The trial court dismissed the case, and the U.S. Court of Appeals for the Second Circuit agreed in March 2025.[722] On December 8, 2025, the Supreme Court sent the case back for another look in light of *Mahmoud v. Taylor* (2025), a decision about parents' religious rights in public schools.[723] On June 30, 2026, the Second Circuit again ruled for New York, concluding that "Mahmoud does not change the result."[724]

The court relied on a 2026 ruling from the Fourth Circuit, *Perry v. Marteney*, which had thrown out a lower-court order that forced a religious exemption into West Virginia's school vaccine law. The Fourth Circuit wrote that the West Virginia law "is a public health measure, not an instrument of ideological indoctrination," and that "all the law requires is that, in the interest of protecting others, children get themselves vaccinated before attending school."[725]

The Amish families asked the Supreme Court to step in again on September 28, 2026. Their lawyers argue that New York "has effectively prohibited the practice of the Amish faith within its borders" and that it is "an outlier" because, they say, 45 other states and the District of Columbia allow religious exemptions.[726] As of early November 2026, New York's response was due December 2, 2026, and several groups, including the Heritage Foundation and Children's Health Defense, had filed briefs supporting the families.[727] Executive Order 14420 also directs

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[721] U.S. Court of Appeals for the Second Circuit (per curiam), as reprinted in Appendix A of the petition in Supreme Court No. 26-438, *Miller v. McDonald, No. 24-681 (on remand)*, June 30, 2026, https://www.supremecourt.gov/DocketPDF/26/26-438/425843/20260928152759674_26-%20Petition.pdf (accessed November 12, 2026), App. 2a-3a.

[722] U.S. Court of Appeals for the Second Circuit (per curiam), as reprinted in Appendix A of the petition in Supreme Court No. 26-438, *Miller v. McDonald, No. 24-681 (on remand)*, June 30, 2026, https://www.supremecourt.gov/DocketPDF/26/26-438/425843/20260928152759674_26-%20Petition.pdf (accessed November 12, 2026), App. 3a-4a.

[723] Supreme Court of the United States, *Docket No. 25-133, Miller v. McDonald (order of December 8, 2025)*, January 9, 2026 (judgment issued), https://www.supremecourt.gov/docket/docketfiles/html/public/25-133.html (accessed November 12, 2026).

[724] U.S. Court of Appeals for the Second Circuit (per curiam), as reprinted in Appendix A of the petition in Supreme Court No. 26-438, *Miller v. McDonald, No. 24-681 (on remand)*, June 30, 2026, https://www.supremecourt.gov/DocketPDF/26/26-438/425843/20260928152759674_26-%20Petition.pdf (accessed November 12, 2026), App. 4a.

[725] U.S. Court of Appeals for the Second Circuit (per curiam), as reprinted in Appendix A of the petition in Supreme Court No. 26-438, *Miller v. McDonald, No. 24-681 (on remand)*, June 30, 2026, https://www.supremecourt.gov/DocketPDF/26/26-438/425843/20260928152759674_26-%20Petition.pdf (accessed November 12, 2026), App. 24a-25a.

[726] Petitioners Joseph Miller, et al. (counsel First Liberty Institute; Siri and Glimstad LLP; others), *Petition for a Writ of Certiorari, Miller v. McDonald, Supreme Court No. 26-438*, September 28, 2026, https://www.supremecourt.gov/DocketPDF/26/26-438/425843/20260928152759674_26-%20Petition.pdf (accessed November 12, 2026).

[727] Supreme Court of the United States, *Docket No. 26-438, Miller v. McDonald*, docket as of November 2, 2026, https://www.supremecourt.gov/docket/docketfiles/html/public/26-438.html (accessed November 12, 2026).

the Justice Department to support challenges like this one.[728] **[Not verified: the count of states with religious exemptions. The 45-state figure comes from the families' lawyers, and I could not reach a neutral source to check it.]**

What it means: if the Supreme Court takes the case and sides with the families, states may find it much harder to require vaccines for school without a religious exemption. If it declines, the appeals courts' view that school vaccine rules are ordinary public health laws stands for now.

The strongest case each side makes

Arguments about vaccines usually pit one side's best point against the other side's worst. I think readers deserve the reverse: each side's strongest case, built only from facts this book has already checked. Here is my attempt. I have tried to write each one so that someone on that side would say, "Yes, that is our case."

The strongest case for keeping a broad, routine schedule:

- The diseases are real and they come back when coverage drops. The United States had more confirmed measles cases in 2026 than in any year in more than three decades, and almost all cases were in people who were unvaccinated or whose status was unknown.[729,730] Whooping cough returned to pre-pandemic levels in 2024, and babies carry the highest risk.[731]
- The benefits are large even by cautious estimates. CDC's 2024 model estimated more than a million deaths prevented among children born from 1994 through 2023, and its authors listed the limits of that model in plain view.[732]
- The safety system works in the direction critics say they want: it has pulled or changed vaccines when the risk was real, including RotaShield, the oral polio vaccine and routine smallpox vaccination.[733,734]

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[728] Executive Office of the President, Federal Register Vol. 91, No. 156, *Executive Order 14420 of August 10, 2026: Delivering Gold Standard Childhood Vaccine Recommendations for Americans (FR Doc. 2026-16730)*, August 14, 2026, https://www.govinfo.gov/content/pkg/FR-2026-08-14/html/2026-16730.htm (accessed November 12, 2026).

[729] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[730] Centers for Disease Control and Prevention, *Measles Cases and Outbreaks*, data as of November 5, 2026, https://www.cdc.gov/measles/data-research/index.html (accessed November 12, 2026).

[731] Centers for Disease Control and Prevention, *Pertussis Surveillance and Trends*, October 27, 2026, https://www.cdc.gov/pertussis/php/surveillance/index.html (accessed November 12, 2026).

[732] Fangjun Zhou, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 73(31):682-685, *Health and Economic Benefits of Routine Childhood Immunizations in the Era of the Vaccines for Children Program, United States, 1994-2023*, August 8, 2024, https://www.cdc.gov/mmwr/volumes/73/wr/mm7331a2.htm (accessed November 12, 2026).

[733] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(43), *Withdrawal of Rotavirus Vaccine Recommendation*, November 5, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4843a5.htm (accessed November 12, 2026).

- The most famous safety fear, that MMR causes autism, rests on a paper that was retracted, and many later studies found no link.[735,736]
- A predictable, shared schedule lets doctors, schools, insurers and the Vaccines for Children program work from the same list, which CRS notes many federal and state laws are built around.[737]

The strongest case for change, more choice or more caution:

- Real side effects have been found after approval, sometimes years after: the Cutter polio disaster, RotaShield, paralysis from the oral polio vaccine, myocarditis after mRNA COVID-19 vaccines, and clotting after the Johnson and Johnson vaccine.[738,739,740,741] A system that found these after the fact can miss others.
- The whole schedule, as given together, is not systematically re-studied each time a vaccine is added. The Institute of Medicine said so in 2013, and CRS confirms that gap remained a subject of calls for more research.[742]
- Many childhood vaccines on today's schedule were licensed without a trial against an inert saltwater placebo (Claim 7), and the most-cited figure on control groups lumps placebos together with other vaccines (Chapter 4).[743]

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[734] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[735] Laura Eggertson, CMAJ (Canadian Medical Association Journal) 182(4):E199-E200, *Lancet retracts 12-year-old article linking autism to MMR vaccines*, February 4, 2010, https://pmc.ncbi.nlm.nih.gov/articles/PMC2831678/ (accessed November 12, 2026).

[736] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[737] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[738] Centers for Disease Control and Prevention, *Historical Vaccine Concerns*, July 31, 2024, https://www.cdc.gov/vaccine-safety/historical-concerns/index.html (accessed November 12, 2026).

[739] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[740] Gargano JW, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(27), *Use of mRNA COVID-19 Vaccine After Reports of Myocarditis Among Vaccine Recipients: Update from the Advisory Committee on Immunization Practices, United States, June 2021*, July 9, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7027e2.htm (accessed November 12, 2026).

[741] MacNeil JR, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(17):651-656, *Updated Recommendations from the Advisory Committee on Immunization Practices for Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine After Reports of Thrombosis with Thrombocytopenia Syndrome Among Vaccine Recipients, United States, April 2021*, April 30, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7017e4.htm (accessed November 12, 2026).

[742] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

- People injured by vaccines can wait years. The vaccine court had more than 3,400 petitions pending in 2025, and the separate COVID-19 program has paid very few claims.[744,745]
- Trust has fallen, and supporters of the 2026 changes argue that a smaller core schedule, honest about unknowns and quick to reverse course, could win it back. That is the argument in Dr. Høeg's slides (Chapter 14).[746]
- Even CDC's own pages disagreed with each other at my cutoff on how to describe the autism evidence, which shows that official messages are not fixed.[747,748]

Where the two cases actually meet. Read the two lists side by side and some common ground shows up. Both sides say they want better long-term safety research. Both sides cite the RotaShield withdrawal, one as proof the system works, the other as proof it needs watching. Both sides say injured people should be paid fairly and faster. The real disagreement is narrower than it looks: how much unproven risk is acceptable for a known benefit, and who decides. Those are the value questions in the next section.

A note on what the evidence can and cannot settle

Evidence can tell you how often a vaccine causes a side effect, how much a disease costs in lives and hospital stays, and what happened when advice changed in the past. It cannot tell you how much risk a parent should accept, how much weight to give personal choice against community protection, or who should have the final say. Those are value questions. Reasonable people answer them differently, and this book does not answer them for you.

What this chapter shows: The choices fall into four groups: who sets the advice, how vaccines are tested, how injured people are paid, and how states handle school rules. A few options have support from people on different sides, especially more safety research using existing records. Most do not.

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743 Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026), p. 13.

744 Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

745 Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026).

746 Tracy Beth Hoeg, U.S. Food and Drug Administration (presentation to the Advisory Committee on Immunization Practices), *Core Childhood Vaccination Schedules: An International Perspective with focus on the US and Denmark (meeting slides)*, December 4-5, 2025, https://www.cdc.gov/acip/downloads/slides-2025-12-04-05/01-Hoeg-Danish-vax-schedule-508.pdf (accessed November 12, 2026).

747 Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

748 Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

Chapter 19: How to Check a Vaccine Claim Yourself

This chapter is about method. The tools and pages it names were checked on November 12, 2026. Web addresses change, so if a link breaks, search for the page title.

This book will go out of date. New studies will come out, courts will rule, and agencies will rewrite their pages. Some of that has already happened while I was writing. So the most useful thing I can leave you with is not another verdict. It is the method I used, so you can test the next claim yourself.

Step 1: Find the original

Most vaccine claims you see are third-hand. A post quotes an article that quotes a study that someone else summarized. Before you decide anything, try to find the first source. If a claim cites "a CDC study," look for the actual report. If it cites a court, look for the docket or the ruling. If it quotes a person, look for the speech, hearing record or document where they said it.

This matters because claims change as they travel. In Chapter 15, the "CDC whistleblower" story looked one way in videos and another way in the scientist's own written statement, which is preserved in the Congressional Record.[749] The ivermectin story looked one way in social posts and another way in the court ruling that actually decided the case.[750] In both, the original said something more careful than the version that spread.

Step 2: Know which kind of source you are holding

The introduction explained the five tiers of sources this book uses. Here is the short version you can carry with you:

- **Primary records** are the thing itself: a law, a regulation, a court ruling, an agency's own data, the text of a study. These are the strongest for "what happened" and "what does the rule say."
- **Nonpartisan analysis**, such as the Congressional Research Service (CRS), explains the records without taking a side.
- **Peer-reviewed research** reports what studies found, with methods you can check.

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[749] Congressional Record, House, Vol. 161, No. 121, p. H5602 (Rep. Bill Posey), *Research and Scientific Integrity*, July 29, 2015, https://www.govinfo.gov/content/pkg/CREC-2015-07-29/html/CREC-2015-07-29-pt1-PgH5602.htm (accessed November 12, 2026).

[750] U.S. Court of Appeals for the Fifth Circuit (Judge Don R. Willett), *Apter v. Department of Health and Human Services, No. 22-40802*, September 1, 2023, https://www.govinfo.gov/content/pkg/USCOURTS-ca5-22-40802/pdf/USCOURTS-ca5-22-40802-0.pdf (accessed November 12, 2026).

- **News reporting** is useful for what happened and when, but check it against records when you can.
- **Advocacy** from any side shows you what that side argues. Use it for that, and only for that.

None of these tiers is automatically right. Agencies make mistakes and change their pages. In this book I found an agency's own pages disagreeing with each other: CDC's autism page and its thimerosal page, both live at my cutoff, describe the evidence on vaccines and autism differently.[751,752] When sources disagree, the honest move is to say so, not to pick the one you like.

Step 3: Check the numbers with the people who keep them

Table 19.1. Where the records live

If the claim is about…	Look here	What you will find
Reports of problems after vaccines	VAERS data on CDC WONDER (wonder.cdc.gov/vaers.html)	Searchable reports, with CDC's warning that a report does not prove the vaccine caused the problem[753]
Disease cases now	CDC disease pages, such as the measles cases page	Current confirmed counts and outbreaks[754]
How many children are vaccinated	CDC coverage reports and data files	Kindergarten and toddler coverage by state[755,756]
What a vaccine does and its side effects	CDC's Pink Book and the federal Vaccine Information Statements	The standard doctor's reference, and the sheet you get at each shot[757,758]

[751] Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

[752] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

[753] Centers for Disease Control and Prevention, CDC WONDER, *The Vaccine Adverse Event Reporting System (VAERS) Request: About VAERS and Disclaimer*, https://wonder.cdc.gov/vaers.html (accessed November 12, 2026).

[754] Centers for Disease Control and Prevention, *Measles Cases and Outbreaks*, data as of November 5, 2026, https://www.cdc.gov/measles/data-research/index.html (accessed November 12, 2026).

[755] Centers for Disease Control and Prevention, *MMR vaccine coverage for kindergartners by state and school year (data file MeaslesKindergartenVaxcovExemptions.json)*, https://www.cdc.gov/wcms/vizdata/measles/MeaslesKindergartenVaxcovExemptions.json (accessed November 12, 2026).

[756] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

If the claim is about…	Look here	What you will find
Vaccine court payments	HRSA's monthly VICP data report	Claims filed, paid and dismissed, and total dollars paid[759]
What a federal rule says	The Federal Register on govinfo.gov, and the Code of Federal Regulations	The official text and date of rules, notices and executive orders[760,761]
What the law says	The U.S. Code	The statute itself, such as the 1986 vaccine injury law[762]
What Congress's own researchers say	CRS reports on congress.gov	Nonpartisan summaries with footnotes back to the records[763]
A Supreme Court case	The Court's online docket	Every filing and order, with dates[764]
What the public thinks	The pollster's own release, with dates, sample size and wording	KFF, Pew and others publish their methods[765]

[757] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[758] Centers for Disease Control and Prevention, *Facts About Vaccine Information Statements*, August 2, 2024, https://www.cdc.gov/vaccines/hcp/vis/about/facts-vis.html (accessed November 12, 2026).

[759] Health Resources and Services Administration (HRSA), *National Vaccine Injury Compensation Program Data and Statistics*, updated November 1, 2026, https://www.hrsa.gov/sites/default/files/hrsa/vicp/vicp-stats-11-01-26.pdf (accessed November 12, 2026).

[760] Centers for Disease Control and Prevention, Federal Register Vol. 91, No. 96, *Advisory Committee on Immunization Practices (ACIP); Notice of Charter Re-Establishment (FR Doc. 2026-10012)*, May 19, 2026, https://www.govinfo.gov/content/pkg/FR-2026-05-19/html/2026-10012.htm (accessed November 12, 2026).

[761] Code of Federal Regulations (Legal Information Institute, Cornell Law School), *21 CFR 312.21, Phases of an investigation*, current text, https://www.law.cornell.edu/cfr/text/21/312.21 (accessed November 12, 2026).

[762] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 300aa-11, Petitions for compensation*, current text, https://www.law.cornell.edu/uscode/text/42/300aa-11 (accessed November 12, 2026).

[763] Congressional Research Service, *The Advisory Committee on Immunization Practices (ACIP) (CRS In Focus IF12317)*, updated September 15, 2025, https://www.congress.gov/crs_external_products/IF/PDF/IF12317/IF12317.6.pdf (accessed November 12, 2026).

[764] Supreme Court of the United States, *Docket No. 26-438, Miller v. McDonald*, docket as of November 2, 2026, https://www.supremecourt.gov/docket/docketfiles/html/public/26-438.html (accessed November 12, 2026).

[765] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

Step 4: Ask the right question of each kind of claim

Different claims need different checks. Here are the four I ran into most.

"VAERS shows thousands of deaths." Go to the VAERS data yourself and read CDC's disclaimer first. Then ask: is this a count of reports, or a count of deaths the vaccine caused? Those are different things. Remember that VAERS accepts reports regardless of how likely the vaccine was to blame, and that in May 2025 the public data began including "secondary reports" about events already in the system, which can make totals look larger if you compare before and after.[766,767] Then look for the follow-up: did the Vaccine Safety Datalink or another study with a comparison group find more deaths in vaccinated people than expected? Appendix C walks through a VAERS report line by line.

"A study proves..." Find the study. Ask what kind it is (Chapter 4): a randomized trial, or an observational study comparing groups that chose differently? How many people? Was there a comparison group? Has anyone else repeated it? Was it later corrected or retracted? *The Lancet* retracted the 1998 Wakefield paper in 2010, but the paper still circulates.[768] And run the seven tests from Chapter 7: timing, consistency with known effects, biological sense, lab confirmation, recurrence, controlled comparison and confirmation by other studies.[769]

"The court ruled..." Check the date and the court. A district court ruling can be stayed, appealed or reversed. A Supreme Court order sending a case back for another look is not a ruling on the merits. In Chapter 18, the Supreme Court sent *Miller v. McDonald* back to the Second Circuit in December 2025, and the Second Circuit reached the same result again in June 2026.[770,771] Someone quoting only the first step would leave you with the wrong picture. The docket shows every step.

"The government now says..." Check the date on the page and look for later changes. Federal vaccine policy changed many times in 2025 and 2026 (Chapter 14), and some actions were stayed by a court. A recommendation that was voted on is not the same as one that is in

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[766] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

[767] Centers for Disease Control and Prevention, CDC WONDER, *The Vaccine Adverse Event Reporting System (VAERS) Request: About VAERS and Disclaimer*, https://wonder.cdc.gov/vaers.html (accessed November 12, 2026).

[768] Laura Eggertson, CMAJ (Canadian Medical Association Journal) 182(4):E199-E200, *Lancet retracts 12-year-old article linking autism to MMR vaccines*, February 4, 2010, https://pmc.ncbi.nlm.nih.gov/articles/PMC2831678/ (accessed November 12, 2026).

[769] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[770] Supreme Court of the United States, *Docket No. 25-133, Miller v. McDonald (order of December 8, 2025)*, January 9, 2026 (judgment issued), https://www.supremecourt.gov/docket/docketfiles/html/public/25-133.html (accessed November 12, 2026).

[771] U.S. Court of Appeals for the Second Circuit (per curiam), as reprinted in Appendix A of the petition in Supreme Court No. 26-438, *Miller v. McDonald, No. 24-681 (on remand)*, June 30, 2026, https://www.supremecourt.gov/DocketPDF/26/26-438/425843/20260928152759674_26-%20Petition.pdf (accessed November 12, 2026).

effect. The Federal Register shows when a notice or order was published and when it takes effect.[772]

Step 5: Watch for the warning signs

These are the patterns that made me slow down while writing this book. None of them proves a claim false. Each is a reason to check harder.

1. **No source, or a source you cannot open.** If a claim cannot be traced, treat it as unverified, the way this book marks gaps as [Not verified].
2. **A screenshot of a document instead of the document.** Screenshots crop out dates, footnotes and corrections.
3. **"Always" and "never."** Medicine rarely works in absolutes. "Vaccines are 100 percent safe" and "vaccines are poison" both failed in Chapter 15 for the same reason.
4. **Raw counts without a denominator.** "500 reports" means one thing out of 1,000 doses and another out of 100 million.
5. **Old numbers presented as new.** Check the year. Pertussis, measles and vaccination rates have all moved a lot in the past few years (Chapter 16).
6. **A quote with no date or setting.** Look for where and when the person said it. Quotes from hearings and court records are usually easy to confirm.
7. **Only one side's experts.** Ask what the strongest opposing source says. Chapter 14 sets HHS's case for the new schedule beside CRS's critique for this reason.
8. **A claim that flatters what you already believe.** This one is the hardest. It is also the easiest one to miss.

Step 6: Decide what you actually know

When you finish checking, sort what you found into three piles, the same way this book does:

- **Confirmed:** you saw it in a record you can point to.
- **Assumed:** you are going on it for now, but you know what would change your mind.
- **Unknown:** you looked, and the evidence is not there or not settled.

Then, if you want, give it one of the four verdicts from the introduction: True, Partly true, False (debunked) or Inconclusive. "Inconclusive" is an honest answer. Many of the hardest vaccine questions, especially about rare and long-term effects, still sit there, and Chapter 7 explains why they are hard to settle.

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[772] Office of the Secretary, U.S. Department of Health and Human Services, Federal Register (FR Doc. 2026-13374), *Termination of Declaration Authorizing Emergency Use of Drug and Biological Products During the COVID-19 Pandemic*, July 2, 2026, https://www.govinfo.gov/link/fr/2026-13374?link-type=html (accessed November 12, 2026).

A last word on talking about this

Most of us will not settle a vaccine argument by reading one more study. We will settle it, if at all, with a doctor we trust, a family member who disagrees, or a friend who has questions. The conversation usually goes better when both people can name their sources and admit what they do not know. If this chapter helps you do that, it has done its job.

Appendix A: Timeline

Each entry is covered, with its source, in the chapter shown.

Year	Event	Chapter
1721	Smallpox inoculation tried in Boston during an epidemic	1
1796	Edward Jenner tests cowpox as protection against smallpox[773]	1
1902	Biologics Control Act sets the first federal rules for vaccine makers	5
1905	*Jacobson v. Massachusetts* upholds a city vaccination requirement	13
1922	*Zucht v. King* upholds a school vaccination requirement[774]	18
1948	Combined DTP vaccine comes into wide use; whooping cough cases later fall more than 90 percent[775]	16
1954	National field trial of the Salk polio vaccine, about 1.8 million children	2
1955	Salk vaccine announced effective; Cutter incident follows	2

[773] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[774] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

[775] Centers for Disease Control and Prevention, *Pertussis Surveillance and Trends*, October 27, 2026, https://www.cdc.gov/pertussis/php/surveillance/index.html (accessed November 12, 2026).

Year	Event	Chapter
1962	Vaccination Assistance Act sets up a federally coordinated vaccination program[776]	3
1963	First measles vaccine licensed in the United States[777]	3
1964	ACIP created	12
1976	Swine flu vaccination campaign; Guillain-Barre cases lead to its end	8
1977	Last naturally occurring smallpox case in the world[778]	1
1979	Last U.S. cases of polio spread by wild virus	2
1986	National Childhood Vaccine Injury Act creates VICP	9
1988	VICP begins[779]	10
1989	Second dose of measles vaccine recommended	3
1990	VAERS and the Vaccine Safety Datalink begin	7
1994	Vaccines for Children program starts (October 1)	12
1998	RotaShield licensed; Wakefield paper published	8, 15
1999	RotaShield withdrawn after	8

[776] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 48(29):621-629, *Achievements in Public Health, 1900-1999: Control of Infectious Diseases*, July 30, 1999, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4829a1.htm (accessed November 12, 2026).

[777] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[778] Centers for Disease Control and Prevention, *History of Smallpox*, October 23, 2024, https://www.cdc.gov/smallpox/about/history.html (accessed November 12, 2026).

[779] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026).

Year	Event	Chapter
	bowel blockage cases	
2000	Measles declared eliminated in the United States	3
2001	Thimerosal removed from U.S. childhood vaccines	6
2005	PREP Act enacted[780]	11
2006	Current rotavirus vaccine recommended for infants	8
2009	FDA's PRISM vaccine monitoring begins during the H1N1 pandemic	7
2010	*The Lancet* retracts the Wakefield paper	15
2011	*Bruesewitz v. Wyeth* decided	10
2012	Whooping cough reports peak at 48,277 cases[781]	16
2013	Institute of Medicine report on the childhood schedule	12
2020	COVID-19 vaccines authorized in December	13
2021	Pfizer COVID-19 vaccine fully approved (August 23); myocarditis and clotting risks confirmed	8, 13
2022	Supreme Court rules on two federal vaccine mandates (January 13)	13
2023	Federal employee and contractor COVID-19 vaccine orders revoked (May 12)[782]	13

[780] Congressional Research Service, *Compensation for COVID-19 Vaccine Injuries (CRS Report R46982)*, updated April 16, 2025, https://www.congress.gov/crs_external_products/R/PDF/R46982/R46982.5.pdf (accessed November 12, 2026).

[781] Centers for Disease Control and Prevention, *Pertussis Surveillance and Trends*, October 27, 2026, https://www.cdc.gov/pertussis/php/surveillance/index.html (accessed November 12, 2026).

Year	Event	Chapter
2024	Whooping cough returns to pre-pandemic levels[783]	16
2025	FDA revokes the COVID-19 vaccine emergency authorizations (August 27); ACIP hears the Denmark comparison (December 4-5)	14
2025	All ACIP members removed (June 9); new ACIP changes several recommendations	14
2025	Measles: 2,289 cases and 3 deaths	16
2026	New childhood schedule (January 5); stayed by court (March 16); appealed (April 29); Executive Order 14407 (May 29); Executive Order 14420 (August 10)	14
2026	Measles: 5,182 cases and 7 deaths through November 5	16

[782] President Joseph R. Biden, Jr., Federal Register Vol. 88, No. 93, pp. 30891-30892, *Executive Order 14099, Moving Beyond COVID-19 Vaccination Requirements for Federal Workers (FR Doc. 2023-10407)*, May 9, 2023 (published May 15, 2023), https://www.govinfo.gov/content/pkg/FR-2023-05-15/html/2023-10407.htm (accessed November 12, 2026).

[783] Centers for Disease Control and Prevention, *Pertussis Surveillance and Trends*, October 27, 2026, https://www.cdc.gov/pertussis/php/surveillance/index.html (accessed November 12, 2026).

Appendix B: Glossary

Adjuvant. An ingredient added to some vaccines to produce a stronger immune response. Aluminum salts are the most common.

Adverse reaction (side effect). A health problem that a vaccine actually caused, as opposed to one that only happened after it.

Adverse event. Any health problem that happens after a vaccine, whether or not the vaccine caused it.

Anaphylaxis. A severe, fast allergic reaction that can affect breathing and blood pressure. After vaccines it happens about one or two times per million doses, and providers are expected to be ready to treat it.[784]

Antigen. The part of a germ, or a copy of it, that the immune system learns to recognize.

Attenuated. Weakened. A live, attenuated vaccine uses a germ that can still grow but has been weakened so it does not cause serious disease in healthy people.

Biologics License Application (BLA). The request a company files with FDA to have a vaccine licensed.

Booster. An extra dose given after the first series to restore or strengthen protection that has faded.

Breakthrough infection. An infection in someone who is fully vaccinated.

Emergency Use Authorization (EUA). FDA permission to use an unapproved product, or an approved product in a new way, during a declared emergency. It uses a lower legal bar than full approval.

Contraindication and precaution. A contraindication is a condition that means a person should not get a certain vaccine. A precaution is a condition that calls for weighing the risk before giving it.

Double-blind. A trial in which neither the participants nor the researchers know who got the vaccine and who got the control.

Efficacy and effectiveness. Efficacy is how well a vaccine works in a controlled trial. Effectiveness is how well it works in everyday use.

Elimination. No year-round spread of a disease inside a country for at least 12 months. Cases can still come in from other countries.

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[784] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

Eradication. A disease is gone worldwide. Smallpox is the only human disease eradicated so far.

Evidence to Recommendation (EtR). The structured framework ACIP has used since 2018 to weigh benefits, harms and other factors before voting.

Excise tax. The 75-cent tax on each dose of a covered vaccine that funds VICP.[785]

Herd immunity (community immunity). Protection for people who are not immune that comes from enough people around them being immune, so the germ cannot spread easily.

Immunization information system (IIS). A confidential electronic registry of vaccine doses given in a state or area.[786]

Informed refusal. A record in the chart that a patient or parent was told about a vaccine and declined it.[787]

Intussusception. A bowel blockage in which part of the intestine folds into itself. A rare side effect of rotavirus vaccines.

Injury table. The list of vaccines, injuries and time frames that VICP presumes are caused by the vaccine.

Live vaccine. See *attenuated*.

Lot release. FDA's review and release of each batch (lot) of a licensed vaccine before it is sold.

Monoclonal antibody. A lab-made antibody given as a shot. It gives ready-made protection instead of teaching the body to make its own, so it is not a vaccine.

mRNA. Messenger RNA, a set of instructions a cell uses to make a protein. mRNA vaccines deliver instructions for one viral protein.

Myocarditis. Inflammation of the heart muscle.

Observational study. A study that compares people who did and did not get a vaccine as part of normal life, without assigning them. Good for rare and long-term effects, but the groups may differ in other ways.

Package insert. The official FDA-approved label for a vaccine, describing its contents, uses, warnings and the trials behind it.

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[785] Hannah-Alise Rogers, Congressional Research Service, *The Vaccine Injury Compensation Program and the Office of Special Masters (CRS In Focus IF12213)*, updated May 4, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF12213/IF12213.3.pdf (accessed November 12, 2026).

[786] Adam Bjork and Valerie Morelli, Centers for Disease Control and Prevention, *Pink Book, Chapter 3: Immunization Strategies for Healthcare Practices and Providers*, March 28, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-3-immunization-strategies.html (accessed November 12, 2026).

[787] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

Placebo. A look-alike treatment with no active ingredient, used for comparison in a trial.

Police power. A state's general authority to pass laws for public health and safety, including vaccination requirements.[788]

Randomized controlled trial. A trial in which people are assigned by chance to get the vaccine or a control.

Shared clinical decision-making (SCDM). A recommendation that a patient or parent and the health care provider decide together whether to vaccinate.

Standing order. A written protocol that lets nurses and other staff give vaccines without a doctor's sign-off for each patient.[789]

Signal. A pattern in safety data that suggests a possible problem and needs more study.

Statistically significant. A result unlikely to be due to chance alone, by a set standard. A result can be real but not statistically significant if a study is too small to tell.

Special master. A judicial officer of the U.S. Court of Federal Claims who decides VICP cases.

Stay. A court order that pauses an action while a case continues.

Test-negative design. A way of measuring vaccine effectiveness that compares vaccination rates among sick people who test positive and those who test negative.

Thimerosal. A mercury-based preservative used in some multi-dose vaccine vials.

Vaccine Information Statement (VIS). The federal information sheet that providers must give before each dose of a covered vaccine.[790]

Waning immunity. Protection that fades over time after vaccination or infection.

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[788] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

[789] Adam Bjork and Valerie Morelli, Centers for Disease Control and Prevention, *Pink Book, Chapter 3: Immunization Strategies for Healthcare Practices and Providers*, March 28, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-3-immunization-strategies.html (accessed November 12, 2026).

[790] Centers for Disease Control and Prevention, *Facts About Vaccine Information Statements*, August 2, 2024, https://www.cdc.gov/vaccines/hcp/vis/about/facts-vis.html (accessed November 12, 2026).

Appendix C: How to Read a VAERS Report

VAERS data are public, and anyone can search them on CDC WONDER (wonder.cdc.gov) or download them from vaers.hhs.gov.[791] Here is how to read what you find without being misled.

1. Read the disclaimer first. CDC WONDER states that VAERS reports "alone cannot be used to determine if a vaccine caused or contributed to an adverse event or illness," and that reports "may contain information that is incomplete, inaccurate, coincidental, or unverifiable."[792]

2. Know who filed it. Anyone can file: patients, family members, doctors and companies.[793] Some reports are required, such as certain events reported by health care providers and manufacturers.[794]

3. Check for duplicates. Since May 8, 2025, the public data include "secondary reports," the first report from each additional person who reports the same patient, vaccine and dose. CDC says these "do not represent additional reports of adverse events."[795] If you compare counts from before and after May 2025, you may be counting the same event twice.

4. Look at the timing. A report gives the vaccination date and the date symptoms began. A close gap does not prove cause, but a long gap makes cause less likely.

5. Look for a denominator. A count of reports means little without knowing how many doses were given. Ten reports out of 100 doses and ten out of 100 million doses are very different. VAERS does not give you the number of doses.

6. Look for follow-up. For a serious report, the question is whether anyone checked medical records. The confirmed cases in Chapter 8, such as the clotting cases after the Johnson and Johnson vaccine, were confirmed that way.[796]

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[791] Centers for Disease Control and Prevention, CDC WONDER, *The Vaccine Adverse Event Reporting System (VAERS) Request: About VAERS and Disclaimer*, https://wonder.cdc.gov/vaers.html (accessed November 12, 2026).

[792] Centers for Disease Control and Prevention, CDC WONDER, *The Vaccine Adverse Event Reporting System (VAERS) Request: About VAERS and Disclaimer*, https://wonder.cdc.gov/vaers.html (accessed November 12, 2026).

[793] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

[794] Centers for Disease Control and Prevention, CDC WONDER, *The Vaccine Adverse Event Reporting System (VAERS) Request: About VAERS and Disclaimer*, https://wonder.cdc.gov/vaers.html (accessed November 12, 2026).

[795] Centers for Disease Control and Prevention, CDC WONDER, *The Vaccine Adverse Event Reporting System (VAERS) Request: About VAERS and Disclaimer*, https://wonder.cdc.gov/vaers.html (accessed November 12, 2026).

[796] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(3):90-95, *Use of the Janssen (Johnson and Johnson) COVID-19 Vaccine: Updated Interim Recommendations from the Advisory Committee on Immunization Practices, United States, December 2021*, January 21, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7103a4.htm (accessed November 12, 2026).

7. Look for confirmation in a system with a comparison group. VAERS raises questions. Systems such as the Vaccine Safety Datalink compare vaccinated and unvaccinated people (Chapter 7).[797]

You might ask, "If VAERS can't prove anything, why does it exist?" Because it is fast and national. It is the smoke detector, not the fire investigator. The RotaShield and clotting problems were both first spotted there.

[797] Centers for Disease Control and Prevention, *About the Vaccine Safety Datalink (VSD)*, https://www.cdc.gov/vaccine-safety-systems/vsd/index.html (accessed November 12, 2026).

Appendix D: The Diseases and Their Vaccines, One by One

This appendix is a quick reference. For each disease on the childhood schedule, it gives what the disease is, how it spreads, how serious it can be, and what the vaccine does. Almost all of it comes from CDC's *Epidemiology and Prevention of Vaccine-Preventable Diseases*, called the Pink Book, which doctors and nurses use as a training text. The online chapters were updated in 2024, but many of their U.S. case counts run only through about 2018, so newer numbers appear in Chapter 16 where I have them. Side effects of each vaccine are in Table 8.2.

A note on two words. *Efficacy* usually means how well a vaccine worked in a controlled trial. *Effectiveness* usually means how well it worked in real-world use. They are often different.

Diphtheria

What it is. A bacterial infection, usually of the throat and tonsils, caused by bacteria that make a toxin. The toxin damages tissue and can form a thick coating in the throat.[798]

How it spreads. From person to person through respiratory droplets, and less often from infected skin sores.[799]

How serious. Most complications come from the toxin, mainly heart inflammation (myocarditis) and nerve damage. CDC estimates that 5 to 10 percent of people who get diphtheria die.[800] In the 1920s the United States had 100,000 to 200,000 cases and 13,000 to 15,000 deaths a year. From 1996 through 2018 it had 14 cases in total.[801] Having diphtheria once does not always make a person immune.[802]

The vaccine. A toxoid, which is the toxin treated so it is harmless, given as part of DTaP for children and Tdap or Td for older children and adults. The childhood series is five doses: at 2, 4 and 6 months, at 15 to 18 months, and at 4 to 6 years.[803] Efficacy has been estimated at 97

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[798] Centers for Disease Control and Prevention, *Pink Book, Chapter 7: Diphtheria*, updated April 8, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-7-diphtheria.html (accessed November 12, 2026).

[799] Centers for Disease Control and Prevention, *Pink Book, Chapter 7: Diphtheria*, updated April 8, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-7-diphtheria.html (accessed November 12, 2026).

[800] Centers for Disease Control and Prevention, *Pink Book, Chapter 7: Diphtheria*, updated April 8, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-7-diphtheria.html (accessed November 12, 2026).

[801] Centers for Disease Control and Prevention, *Pink Book, Chapter 7: Diphtheria*, updated April 8, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-7-diphtheria.html (accessed November 12, 2026).

[802] Centers for Disease Control and Prevention, *Pink Book, Chapter 7: Diphtheria*, updated April 8, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-7-diphtheria.html (accessed November 12, 2026).

[803] Centers for Disease Control and Prevention, *Pink Book, Chapter 7: Diphtheria*, updated April 8, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-7-diphtheria.html (accessed November 12, 2026).

percent.[804] Treatment today still uses an antitoxin made in horses, which in the United States is available only from CDC.[805]

Tetanus (lockjaw)

What it is. A disease caused by a toxin from bacteria that live in soil and in animal and human intestines. The toxin causes rigid muscles and painful spasms, often starting with the jaw.[806]

How it spreads. It does not spread from person to person. The bacteria get in through wounds.[807] That makes tetanus unusual: other people's vaccines do not protect you.

How serious. In recent years about 11 percent of reported cases have been fatal, mostly in people 60 and older and in unvaccinated people. Spasms can last three to four weeks, and full recovery can take months.[808] The country had 500 to 600 cases a year before the vaccine. From 2009 to 2018 it averaged 29 cases a year.[809]

The vaccine. A toxoid, in DTaP, Tdap and Td. Adults are advised to get a booster every 10 years, and people with dirty wounds may need a dose and sometimes tetanus immune globulin.[810,811]

Whooping cough (pertussis)

What it is. A bacterial infection that causes long fits of coughing. Babies may not whoop at all; they may simply stop breathing.[812]

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[804] Centers for Disease Control and Prevention, *Pink Book, Chapter 7: Diphtheria*, updated April 8, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-7-diphtheria.html (accessed November 12, 2026).

[805] Centers for Disease Control and Prevention, *Pink Book, Chapter 7: Diphtheria*, updated April 8, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-7-diphtheria.html (accessed November 12, 2026).

[806] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 21: Tetanus*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-21-tetanus.html (accessed November 12, 2026).

[807] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 21: Tetanus*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-21-tetanus.html (accessed November 12, 2026).

[808] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 21: Tetanus*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-21-tetanus.html (accessed November 12, 2026).

[809] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 21: Tetanus*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-21-tetanus.html (accessed November 12, 2026).

[810] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 21: Tetanus*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-21-tetanus.html (accessed November 12, 2026).

[811] Centers for Disease Control and Prevention, *Explaining How Vaccines Work*, August 10, 2024, https://www.cdc.gov/vaccines/basics/explaining-how-vaccines-work.html (accessed November 12, 2026).

How it spreads. Through respiratory droplets. It is highly contagious.[813]

How serious. It is most dangerous for young babies. From 2000 to 2017, 307 people died of pertussis in the United States, and 84 percent of those deaths were in babies younger than 2 months, too young to be fully vaccinated.[814] Pneumonia is the most common complication and the usual cause of death.[815]

The vaccine. Whole-cell pertussis vaccine was first licensed in 1914 and combined into DTP in 1948. Four doses were 70 to 90 percent effective against serious disease, but they caused frequent reactions.[816] The United States switched to acellular vaccines (DTaP and Tdap) in the 1990s; their efficacy in trials was 80 to 85 percent.[817] CDC says protection from the acellular vaccine fades, and that "waning immunity is thought to play a key role" in the rise of cases since the 1990s.[818] To protect newborns, Tdap has been recommended in every pregnancy since 2012, which CDC notes is an off-label use.[819]

The honest summary. This is a vaccine that clearly saves babies' lives and also clearly does not last as long as anyone would like.

Polio

What it is. A virus that usually causes no symptoms. CDC says about 70 percent of childhood infections are silent and 1 to 5 percent cause a form of meningitis. A small fraction cause paralysis.[820]

How it spreads. Mainly through contact with infected stool, and sometimes through the mouth and throat.[821]

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[812] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[813] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[814] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[815] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[816] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[817] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[818] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[819] Centers for Disease Control and Prevention, *Pink Book, Chapter 16: Pertussis*, updated April 12, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-16-pertussis.html (accessed November 12, 2026).

[820] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

How serious. Chapter 2 tells the story. In 1988, polio paralyzed about 350,000 people a year in more than 125 countries.[822]

The vaccine. The United States uses only the inactivated polio vaccine (IPV), given as shots. The live oral vaccine is no longer used here because, rarely, it caused paralysis itself (Chapter 2).[823]

Measles

What it is. A virus that causes high fever, cough, runny nose, red eyes and a rash. It is one of the most contagious diseases known.[824]

How serious. Complications include ear infections, pneumonia, brain swelling (encephalitis) and death. A rare, fatal brain disease called subacute sclerosing panencephalitis (SSPE) can show up years later.[825] About 30 percent of U.S. measles cases from 1987 to 2000 had at least one complication.[826] Before the vaccine, CRS reports, the country had an estimated 3 to 4 million cases, 48,000 hospitalizations and 500 deaths a year.[827]

CDC's clinical page for doctors, dated August 5, 2026, adds detail. About 1 in every 1,000 measles cases develops acute encephalitis, which often causes permanent brain damage, and 1 to 3 of every 1,000 children who get measles die from breathing or brain complications. It also describes "immune amnesia," a temporary loss of immunity to other diseases a person was already protected against, which can leave someone open to serious infections for months or years after recovering. Measles in pregnancy can cause pneumonia and death in the mother and can lead to pregnancy loss, premature birth and low birth weight. The groups at highest risk of

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[821] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[822] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[823] Centers for Disease Control and Prevention, *Pink Book, Chapter 18: Poliomyelitis*, updated April 17, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-18-poliomyelitis.html (accessed November 12, 2026).

[824] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[825] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[826] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[827] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

complications are children under 5, adults over 20, pregnant women and people with weakened immune systems.[828]

How it spreads. Through the air and by droplets. Up to 9 out of 10 people without immunity who are in close contact with a patient will catch it, and the virus can stay infectious in the air for up to 2 hours after the sick person leaves a room. People are contagious from 4 days before to 4 days after the rash appears.[829] One caution about that same CDC page: it says the yearly case count since 2000 has ranged from 37 in 2004 to 1,282 in 2019. That was out of date when the page was dated, since 2025 and 2026 were both higher (Chapter 16).[830,831]

The vaccine. Two doses of MMR (or MMRV), at 12 to 15 months and 4 to 6 years. About 95 percent of children respond to the first dose, and more than 99 percent of people who get two doses develop immunity.[832] CRS describes the two-dose series as 97 percent effective at preventing measles.[833] An expert review found MMR can cause severe allergic reactions, fever seizures, a temporary drop in platelets, temporary joint pain and, in people with serious immune problems, a rare brain infection from the vaccine virus.[834]

Mumps

What it is. A virus best known for swollen cheeks and jaw from swollen salivary glands.[835]

How serious. Before the vaccine, it was one of the most common causes of viral meningitis and hearing loss in U.S. children.[836] Swelling of the testicles affects about 30 percent of unvaccinated males past puberty who get mumps, and 6 percent of vaccinated ones.[837]

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[828] Centers for Disease Control and Prevention, *Clinical Overview of Measles*, August 5, 2026, https://www.cdc.gov/measles/hcp/clinical-overview/index.html (accessed November 12, 2026).

[829] Centers for Disease Control and Prevention, *Clinical Overview of Measles*, August 5, 2026, https://www.cdc.gov/measles/hcp/clinical-overview/index.html (accessed November 12, 2026).

[830] Centers for Disease Control and Prevention, *Clinical Overview of Measles*, August 5, 2026, https://www.cdc.gov/measles/hcp/clinical-overview/index.html (accessed November 12, 2026).

[831] Centers for Disease Control and Prevention, *Measles Cases and Outbreaks*, data as of November 5, 2026, https://www.cdc.gov/measles/data-research/index.html (accessed November 12, 2026).

[832] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[833] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[834] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 13: Measles*, updated April 11, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html (accessed November 12, 2026).

[835] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

The vaccine. First licensed in 1967, now given in MMR. Studies after licensing found one dose 78 percent effective and two doses 88 percent effective.[838] That is lower than for measles, which helps explain the outbreaks among vaccinated college students described in Chapter 3.

Rise and fall. Mumps became a nationally reported disease in 1968, with about 152,000 cases that year. By 1985, fewer than 3,000 cases were reported a year.[839] After a second MMR dose was recommended for school-age children in 1989, reported cases fell from about 5,700 that year to fewer than 300 in 2004. CDC credits the two-dose program with a drop of more than 99 percent in yearly cases.[840]

The comeback. Starting in 2006, cases rose again. Since 2014, more than 1,000 cases have been reported each year, and from January 2016 through June 2017 there were 150 outbreaks in 37 states, with more than 9,000 cases.[841] CDC says that since 2006, most cases have been in people who had already received two doses of MMR, and most outbreaks happened in close-contact settings such as households, schools, universities and sports teams.[842] During an outbreak, health officials can recommend a third MMR dose for groups at higher risk.[843]

You might ask: if most cases are in vaccinated people, does that mean the vaccine fails? Not by itself. This part is my own reasoning, not a CDC statement. When nearly everyone in a group is vaccinated, most cases will come from that group even if the vaccine works well, because there are so few unvaccinated people left to catch it. The 88 percent figure above also means some vaccinated people stay at risk, and close living quarters give the virus many chances. Both facts

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[836] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

[837] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

[838] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

[839] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

[840] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

[841] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

[842] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

[843] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 15: Mumps*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html (accessed November 12, 2026).

are true at once: the vaccine cut mumps by more than 99 percent, and it does not stop every case.

Rubella (German measles)

What it is. Usually a mild illness with a rash. Up to half of infections cause no symptoms, but those people can still spread it.[844]

How serious. The danger is to unborn babies. Infection in pregnancy can cause miscarriage, stillbirth and congenital rubella syndrome, which can include deafness, eye problems and heart defects. CDC says preventing that syndrome is "the main objective" of rubella vaccination.[845] Brain inflammation occurs in about 1 in 6,000 cases.[846]

The vaccine. In MMR. At least 95 percent of people develop immunity after one dose, and protection is probably lifelong.[847] Endemic rubella was declared eliminated in the United States in 2004.[848]

Hib (Haemophilus influenzae type b)

What it is. A bacterium, not the flu, despite the name. Before the vaccine it was the leading cause of bacterial meningitis in children under 5. About 1 in 200 young children got serious Hib disease.[849]

How serious. Meningitis made up 50 to 65 percent of cases. Even with treatment, 3 to 6 percent of children with Hib meningitis died, and 15 to 30 percent of survivors had hearing loss or other lasting nerve damage.[850]

The vaccine. Conjugate vaccines, which link the germ's sugar coating to a protein so babies' immune systems respond, have cut Hib disease by 99 percent.[851]

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[844] Centers for Disease Control and Prevention, *Pink Book, Chapter 20: Rubella*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-20-rubella.html (accessed November 12, 2026).

[845] Centers for Disease Control and Prevention, *Pink Book, Chapter 20: Rubella*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-20-rubella.html (accessed November 12, 2026).

[846] Centers for Disease Control and Prevention, *Pink Book, Chapter 20: Rubella*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-20-rubella.html (accessed November 12, 2026).

[847] Centers for Disease Control and Prevention, *Pink Book, Chapter 20: Rubella*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-20-rubella.html (accessed November 12, 2026).

[848] Centers for Disease Control and Prevention, *Pink Book, Chapter 20: Rubella*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-20-rubella.html (accessed November 12, 2026).

[849] Centers for Disease Control and Prevention, *Pink Book, Chapter 8: Haemophilus influenzae*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-8-haemophilus-influenzae.html (accessed November 12, 2026).

[850] Centers for Disease Control and Prevention, *Pink Book, Chapter 8: Haemophilus influenzae*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-8-haemophilus-influenzae.html (accessed November 12, 2026).

Hepatitis B

What it is. A virus that infects the liver.[852]

How it spreads. Through blood and body fluids, including from mother to baby at birth. The virus can survive at least 7 days on surfaces.[853]

How serious. Age at infection is the key. As many as 90 percent of infected babies develop lifelong (chronic) infection, compared with 30 to 50 percent of children 1 to 5 and about 5 percent of adults. About 25 percent of people chronically infected in childhood die early of cirrhosis or liver cancer.[854]

Why a birth dose. Before preventive treatment, about 30 to 85 percent of babies born to infected mothers became infected, depending on the mother's viral markers. With vaccine and hepatitis B immune globulin at birth followed by the full series, that falls to about 0.7 to 1.1 percent.[855] CDC's strategy has been to test every pregnant woman and to vaccinate every baby starting at birth, as a backstop for missed or wrong tests.[856] In December 2025, ACIP voted to move the birth dose to shared decision-making for babies whose mothers test negative (Chapter 14).[857] That debate is about whether the backstop is worth it for low-risk babies.

The result. Reported acute hepatitis B fell about 90 percent, from 9.6 cases per 100,000 people in 1982 to 1.0 in 2018. People 19 and younger now have the lowest rate of any age group.[858]

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[851] Centers for Disease Control and Prevention, *Pink Book, Chapter 8: Haemophilus influenzae*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-8-haemophilus-influenzae.html (accessed November 12, 2026).

[852] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 10: Hepatitis B*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-10-hepatitis-b.html (accessed November 12, 2026).

[853] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 10: Hepatitis B*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-10-hepatitis-b.html (accessed November 12, 2026).

[854] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 10: Hepatitis B*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-10-hepatitis-b.html (accessed November 12, 2026).

[855] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 10: Hepatitis B*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-10-hepatitis-b.html (accessed November 12, 2026).

[856] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 10: Hepatitis B*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-10-hepatitis-b.html (accessed November 12, 2026).

[857] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[858] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 10: Hepatitis B*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-10-hepatitis-b.html (accessed November 12, 2026).

Hepatitis A

What it is. A liver virus spread mostly through contaminated food, water or close contact (Chapter 3).[859]

How serious. Overall, 0.3 to 0.6 percent of cases are fatal, rising to 1.8 percent in adults 50 and older. In 2017 outbreaks in four states, 71 percent of 1,521 patients were hospitalized and 41 died.[860]

The vaccine. In a trial of 40,000 children in Thailand, two doses were 94 percent effective.[861]

Chickenpox (varicella) and shingles

What it is. A herpes-family virus. The first infection is chickenpox. The virus then hides in nerve cells and can come back years later as shingles.[862]

How serious. Before the vaccine, nearly every child caught it, about 4 million cases a year, and about 10,500 people a year were hospitalized. Death rates rose with age, from about 1 per 100,000 cases in children 1 to 14 to 21 per 100,000 in adults.[863]

The vaccine. Since the program began in 1995, chickenpox hospitalizations have fallen 93 percent and deaths 94 percent.[864] Ninety-nine percent of people show immunity after two doses.[865] Vaccinated people can still get "breakthrough" chickenpox, usually milder, and more than half of cases now occur in vaccinated people because so few people are unvaccinated.[866]

[859] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 9: Hepatitis A*, updated May 21, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-9-hepatitis-a.html (accessed November 12, 2026).

[860] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 9: Hepatitis A*, updated May 21, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-9-hepatitis-a.html (accessed November 12, 2026).

[861] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 9: Hepatitis A*, updated May 21, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-9-hepatitis-a.html (accessed November 12, 2026).

[862] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 22: Varicella*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-22-varicella.html (accessed November 12, 2026).

[863] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 22: Varicella*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-22-varicella.html (accessed November 12, 2026).

[864] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 22: Varicella*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-22-varicella.html (accessed November 12, 2026).

[865] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 22: Varicella*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-22-varicella.html (accessed November 12, 2026).

[866] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 22: Varicella*, updated May 9, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-22-varicella.html (accessed November 12, 2026).

That last fact is a good example of why the share of cases in vaccinated people, by itself, says little about whether a vaccine works.

Rotavirus

What it is. A virus that causes severe diarrhea and vomiting in babies and young children.[867]

How serious. Before the vaccine, nearly every U.S. child was infected by age 5. Each year it caused about 410,000 doctor visits, 55,000 to 70,000 hospitalizations and 20 to 60 deaths among children under 5.[868] CDC notes that rotavirus caused a similar share of severe childhood diarrhea in rich and poor countries, "suggesting that improved sanitation alone is not sufficient to prevent infection."[869]

The vaccine. Taken by mouth. In trials, it prevented 74 to 87 percent of rotavirus illness and 85 to 98 percent of severe illness.[870] It carries a small risk of a bowel blockage called intussusception (Chapter 8).[871]

Pneumococcal disease

What it is. A bacterium that causes ear infections, pneumonia, blood infections and meningitis. Many healthy children carry it in their noses.[872]

How serious. It causes more than half of all bacterial meningitis in the United States, about 2,000 cases a year. About 12 percent of people with a pneumococcal blood infection die.[873]

The vaccine. Conjugate vaccines for babies have cut disease from the covered types by 90 percent in children (Chapter 3).[874]

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[867] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 19: Rotavirus*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-19-rotavirus.html (accessed November 12, 2026).

[868] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 19: Rotavirus*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-19-rotavirus.html (accessed November 12, 2026).

[869] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 19: Rotavirus*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-19-rotavirus.html (accessed November 12, 2026).

[870] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 19: Rotavirus*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-19-rotavirus.html (accessed November 12, 2026).

[871] Centers for Disease Control and Prevention, *Rotavirus Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/rotavirus.html (accessed November 12, 2026).

[872] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 17: Pneumococcal Disease*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-17-pneumococcal-disease.html (accessed November 12, 2026).

[873] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 17: Pneumococcal Disease*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-17-pneumococcal-disease.html (accessed November 12, 2026).

Meningococcal disease

What it is. A bacterial infection that can cause meningitis and a fast-moving blood infection.[875]

How serious. Even with antibiotics, 10 to 15 percent of patients die. Up to 20 percent of survivors have lasting damage such as hearing loss, brain damage or loss of a limb.[876] Rates are highest in babies, with a second peak at ages 17 to 21. College students have more than three times the risk of serogroup B disease of other people their age.[877]

The vaccines. The MenACWY vaccine is routine at 11 or 12 with a booster at 16. MenB vaccines are recommended for higher-risk people 10 and older and, by shared decision-making, for older teens.[878,879]

Flu

What it is. A respiratory virus that changes every year.[880]

How serious. CDC's Pink Book estimates that 9.3 million to 45 million people in the United States get sick with flu symptoms each year, with an average of 37,463 flu-related deaths a year since 2010. The groups most at risk of complications include people 65 and older, pregnant women and those who recently gave birth, children under 5 and people with certain medical conditions. The Pink Book says flu causes more hospital stays among young children than any other vaccine-preventable disease.[881] In the 2024-25 season, 280 children died of flu, the most

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[874] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 17: Pneumococcal Disease*, updated May 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-17-pneumococcal-disease.html (accessed November 12, 2026).

[875] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 14: Meningococcal Disease*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-14-meningococcal-disease.html (accessed November 12, 2026).

[876] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 14: Meningococcal Disease*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-14-meningococcal-disease.html (accessed November 12, 2026).

[877] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 14: Meningococcal Disease*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-14-meningococcal-disease.html (accessed November 12, 2026).

[878] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 14: Meningococcal Disease*, updated April 25, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-14-meningococcal-disease.html (accessed November 12, 2026).

[879] Hannah-Alise Rogers, Congressional Research Service, *CDC's Updated Childhood Vaccine Schedule: Litigation and Potential Implications for Vaccine Injury Compensation Program (CRS Legal Sidebar LSB11427, version 3)*, May 4, 2026, https://www.congress.gov/crs_external_products/LSB/PDF/LSB11427/LSB11427.3.pdf (accessed November 12, 2026).

[880] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 12: Influenza*, updated April 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-12-influenza.html (accessed November 12, 2026).

[881] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 12: Influenza*, updated April 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-12-influenza.html (accessed November 12, 2026).

in any non-pandemic season since those deaths became reportable in 2004, and 89 percent of them were not fully vaccinated against flu.[882]

How it spreads. Mostly through droplets from coughs and sneezes, and sometimes smaller airborne droplets or contaminated surfaces. Adults can spread it from the day before symptoms start to about 5 to 7 days after; children can spread it for 10 days or more. In most U.S. seasons, flu has peaked in January or later.[883]

The vaccine. A new formula each season, picked months ahead (Chapter 6). It works less well than most childhood vaccines, from 19 to 60 percent against doctor visits in recent seasons (Table 6.1).[884] Under the 2026 schedule, now stayed by a court, flu vaccine for children would move to shared decision-making (Chapter 14).[885]

HPV

What it is. The most common sexually transmitted infection in the country. Most infections clear on their own, but some cause cancer years later.[886]

The vaccine. Gardasil 9 protects against nine HPV types. Its safety record is covered in Chapter 8.[887]

What this appendix shows: The diseases on the schedule are not all alike. Some, like tetanus, protect only the person vaccinated. Some, like measles, spread so easily that community coverage matters a great deal. Some vaccines, like measles and rubella, give near-lifelong protection; others, like pertussis and flu, fade or vary. A single opinion about "vaccines" in general misses those differences.

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[882] Hill HA, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 75(11):146-155, *Vaccination Coverage by Age 24 Months Among Children Born in 2021 and 2022, National Immunization Survey-Child, United States, 2022-2024*, March 26, 2026, https://www.cdc.gov/mmwr/volumes/75/wr/mm7511a2.htm (accessed November 12, 2026).

[883] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 12: Influenza*, updated April 1, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-12-influenza.html (accessed November 12, 2026).

[884] Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, *Past Seasons' Vaccine Effectiveness Estimates*, March 16, 2026, https://www.cdc.gov/flu-vaccines-work/php/effectiveness-studies/past-seasons-estimates.html (accessed November 12, 2026).

[885] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[886] Centers for Disease Control and Prevention, *Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book), Chapter 11: Human Papillomavirus*, updated April 23, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-11-human-papillomavirus.html (accessed November 12, 2026).

[887] Centers for Disease Control and Prevention, *HPV Vaccine Safety*, https://www.cdc.gov/vaccine-safety/vaccines/hpv.html (accessed November 12, 2026).

Appendix E: Common Questions, Short Answers

These are the questions I heard most often while writing this book, with short answers and the chapter where each is covered in full. The short answers lean on the same sources as the chapters, cited here again so you can check them without flipping back. The information stops at November 12, 2026.

1. Are vaccines safe? No medical product is risk-free, and the official sources say so. The Pink Book states, "no vaccine is completely without risk."[888] Most side effects are mild, like a sore arm or a fever. Serious ones are real but rare, and Chapter 8 lists them with how often they happen. "Safe" in medicine means the benefits outweigh the known risks for the people it is recommended for, not that nothing can go wrong.

2. Do vaccines cause autism? The large body of research on MMR found no link, and the 1998 paper that started the fear was retracted.[889,890] At my cutoff, CDC's own autism page called the statement "vaccines do not cause autism" "not an evidence-based claim," while its thimerosal page said research shows no link.[891,892] Chapter 15, Claim 1, explains why the verdict there is False (debunked) for MMR and what the official reviews said about other vaccines.

3. What is actually in a vaccine? The part that trains the immune system, plus small amounts of stabilizers, sometimes an adjuvant such as aluminum salts, and leftovers from manufacturing such as formaldehyde, egg protein or antibiotics.[893] Chapter 6 covers each, including thimerosal and the cell lines used to grow some vaccines.

4. Were vaccines tested against a placebo? Some were, including the 1954 polio trial, the rotavirus trials and the COVID-19 trials. Many childhood vaccines on today's schedule were

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[888] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[889] Laura Eggertson, CMAJ (Canadian Medical Association Journal) 182(4):E199-E200, *Lancet retracts 12-year-old article linking autism to MMR vaccines*, February 4, 2010, https://pmc.ncbi.nlm.nih.gov/articles/PMC2831678/ (accessed November 12, 2026).

[890] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[891] Centers for Disease Control and Prevention, *Autism and Vaccines*, July 22, 2026, https://www.cdc.gov/vaccine-safety/about/autism.html (accessed November 12, 2026).

[892] Centers for Disease Control and Prevention, *Thimerosal and Vaccines*, October 28, 2025, https://www.cdc.gov/vaccine-safety/about/thimerosal.html (accessed November 12, 2026).

[893] Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, *Vaccine Basics (ingredients page)*, August 10, 2024, https://www.cdc.gov/vaccines/basics/ (accessed November 12, 2026).

licensed after trials against another vaccine or a control shot rather than saltwater.[894,895,896] That is a real point of debate (Chapter 4 and Claim 7).

5. Why are there so many shots now? More diseases have vaccines than in the past. By 2011, U.S. vaccine policy targeted 17 diseases.[897] Chapter 12 explains how the schedule grew and how it compares with other countries, and Chapter 15, Claim 12, looks at the "too many too soon" concern.

6. Can I space out my child's shots? That is a question for your child's doctor. What this book can tell you is that KFF found 48 percent of parents believe spacing is healthier, that KFF described that belief as incorrect, and that I found no study showing a slower schedule is safer. Delaying shots also leaves a child unprotected for longer.[898] Chapter 17 has the details. This book is not medical advice.

7. What happens if my child has a bad reaction? Get medical care first. Then the provider, or you, can report it to VAERS.[899] If you believe the vaccine caused a lasting injury, you may be able to file a claim with the vaccine court, which has deadlines (Chapter 10). For COVID-19 vaccines, a different program with a one-year deadline applies (Chapter 11).[900]

8. Can I sue a vaccine maker? Not directly at first for most routine vaccines. The 1986 law requires going through the vaccine court before suing, and it blocks lawsuits claiming a vaccine's design was defective.[901,902] You can reject the court's result and then sue in some cases (Chapter 10).

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[894] University of Michigan School of Public Health, *1955 Polio Vaccine Trial Announcement (reproduces the April 12, 1955 press release)*, April 12, 1955 (release), https://sph.umich.edu/polio/ (accessed November 12, 2026).

[895] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[896] Oliver SE, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 69(50), *The Advisory Committee on Immunization Practices' Interim Recommendation for Use of Pfizer-BioNTech COVID-19 Vaccine, United States, December 2020*, December 18, 2020, https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e2.htm (accessed November 12, 2026).

[897] Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 60(19):619-623, *Ten Great Public Health Achievements, United States, 2001-2010*, May 20, 2011, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6019a5.htm (accessed November 12, 2026).

[898] KFF (survey fielded by SSRS), *KFF Tracking Poll on Health Information and Trust: Fall 2026 Update on Vaccine Views*, October 20, 2026, https://www.kff.org/public-opinion/kff-tracking-poll-on-health-information-and-trust-fall-2026-update-on-vaccine-views/ (accessed November 12, 2026).

[899] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

[900] Centers for Disease Control and Prevention, *Pink Book, Chapter 4: Vaccine Safety*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-4-vaccine-safety.html (accessed November 12, 2026).

[901] United States Code (Legal Information Institute, Cornell Law School), *42 U.S.C. 300aa-11, Petitions for compensation*, current text, https://www.law.cornell.edu/uscode/text/42/300aa-11 (accessed November 12, 2026).

[902] Supreme Court of the United States, *Bruesewitz v. Wyeth LLC, 562 U.S. 223 (2011) (opinion of the Court by Justice Scalia; dissent by Justice Sotomayor)*, February 22, 2011, https://tile.loc.gov/storage-services/service/ll/usrep/usrep562/usrep562223/usrep562223.pdf (accessed November 12, 2026).

9. How much has the vaccine court paid? As of November 1, 2026, about $5.7 billion in total outlays since 1988, including about $5 billion to petitioners.[903] Chapter 10 has the full table.

10. What does a VAERS report prove? By itself, nothing about cause. CDC says, "A report to VAERS does not mean that a vaccine caused an adverse event."[904] VAERS is the smoke detector. Other systems, like the Vaccine Safety Datalink, check whether there is a fire (Chapter 7 and Appendix C).

11. Did the COVID-19 vaccines work? They strongly reduced severe illness and death, especially in older adults, but protection against infection faded and they did not stop spread the way many people were told.[905,906] Chapter 13 has the numbers.

12. Did the COVID-19 vaccines cause heart problems? Yes, rarely. Myocarditis was confirmed after mRNA vaccines, most often in young males after the second dose.[907] Chapter 15, Claim 5, gives the verdict and the comparison with the risk from infection.

13. Can an mRNA vaccine change my DNA? No. Chapter 15, Claim 4, explains why the verdict is False (debunked).

14. Is natural immunity better? Sometimes it is strong, but you have to survive the disease to get it, and some diseases do lasting harm. A CDC study found vaccination still added protection for people who had already had COVID-19.[908] Chapter 15, Claim 6, has the details.

15. Why is measles back? Mostly because vaccination rates have dropped in some communities. In 2026, 96 percent of U.S. cases were in people who were unvaccinated or whose status was unknown.[909] Chapter 16 has the numbers.

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[903] Health Resources and Services Administration (HRSA), *National Vaccine Injury Compensation Program Data and Statistics*, updated November 1, 2026, https://www.hrsa.gov/sites/default/files/hrsa/vicp/vicp-stats-11-01-26.pdf (accessed November 12, 2026).

[904] Centers for Disease Control and Prevention, *About the Vaccine Adverse Event Reporting System (VAERS)*, April 17, 2026, https://www.cdc.gov/vaccine-safety-systems/vaers/index.html (accessed November 12, 2026).

[905] Moline HL, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(32):1088-1093, *Effectiveness of COVID-19 Vaccines in Preventing Hospitalization Among Adults Aged 65 Years and Older, COVID-NET, 13 States, February-April 2021*, August 13, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7032e3.htm (accessed November 12, 2026).

[906] Brown CM, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(31):1059-1062, *Outbreak of SARS-CoV-2 Infections, Including COVID-19 Vaccine Breakthrough Infections, Associated with Large Public Gatherings, Barnstable County, Massachusetts, July 2021*, August 6, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7031e2.htm (accessed November 12, 2026).

[907] Gargano JW, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 70(27), *Use of mRNA COVID-19 Vaccine After Reports of Myocarditis Among Vaccine Recipients: Update from the Advisory Committee on Immunization Practices, United States, June 2021*, July 9, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7027e2.htm (accessed November 12, 2026).

[908] Plumb ID, et al., Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report 71(15):549-555, *Effectiveness of COVID-19 mRNA Vaccination in Preventing COVID-19-Associated Hospitalization Among Adults with Previous SARS-CoV-2 Infection, United States, June 2021-February 2022*, April 15, 2022, https://www.cdc.gov/mmwr/volumes/71/wr/mm7115e2.htm (accessed November 12, 2026).

16. Is vitamin A a cure for measles? No. It is a real part of treatment for children sick with measles, but it does not prevent or cure measles. Chapter 15, Claim 15, rates the claim Partly true and explains why.

17. Who decides which vaccines are recommended? For decades, CDC's advisory committee (ACIP) voted and the CDC Director adopted its advice. In 2025 and 2026 that process changed, and a court stayed the 2026 schedule.[910,911] Chapters 12 and 14 tell the story.

18. Which schedule is in effect right now? At my cutoff, a federal court had stayed the January 2026 schedule, and CDC's website showed the 2025 schedule.[912,913] Some states follow the American Academy of Pediatrics schedule instead.[914] Check the current status, because this may change.

19. Can my state require vaccines for school? Yes. Every state requires certain vaccines for school, and the Supreme Court has upheld that power since 1922.[915] States decide which exemptions to allow, and that question is back in the courts (Chapter 18).

20. Can the federal government make me get a vaccine? Its power is more limited than a state's. In 2022 the Supreme Court blocked the OSHA rule for large employers but allowed the rule for health care workers at facilities paid by Medicare and Medicaid.[916,917] Chapters 13 and 18 explain.

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[909] Centers for Disease Control and Prevention, *Measles Cases and Outbreaks*, data as of November 5, 2026, https://www.cdc.gov/measles/data-research/index.html (accessed November 12, 2026).

[910] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[911] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *U.S. Measles Outbreaks 2025-2026: Overview and Issues for Congress (IF13322)*, September 29, 2026, https://www.congress.gov/crs_external_products/IF/PDF/IF13322/IF13322.2.pdf (accessed November 12, 2026).

[912] Kavya Sekar and Alexandria K. Mickler, Congressional Research Service, *Changes to CDC Vaccine Recommendations in 2025 and 2026 (CRS Insight IN12684, version 7)*, July 29, 2026, https://www.congress.gov/crs_external_products/IN/PDF/IN12684/IN12684.7.pdf (accessed November 12, 2026).

[913] Centers for Disease Control and Prevention, *Child and Adolescent Immunization Schedule by Age, Recommendations for Ages 18 Years or Younger, United States, 2025 (Addendum updated July 2, 2025)*, July 2, 2025 (as displayed November 12, 2026), https://www.cdc.gov/vaccines/hcp/imz-schedules/child-adolescent-age.html (accessed November 12, 2026).

[914] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[915] Wen W. Shen, Congressional Research Service, *An Overview of State and Federal Authority to Impose Vaccination Requirements (Legal Sidebar LSB10300)*, May 22, 2019, https://www.congress.gov/crs_external_products/LSB/PDF/LSB10300/LSB10300.2.pdf (accessed November 12, 2026).

[916] Supreme Court of the United States, *National Federation of Independent Business v. Department of Labor, OSHA, 595 U.S. ___ (2022) (per curiam)*, January 13, 2022, https://www.supremecourt.gov/opinions/21pdf/21a244_hgci.pdf (accessed November 12, 2026).

[917] Supreme Court of the United States, *Biden v. Missouri, 595 U.S. ___ (2022) (per curiam)*, January 13, 2022, https://www.supremecourt.gov/opinions/21pdf/21a240_d18e.pdf (accessed November 12, 2026).

21. Do vaccines use cells from abortions? Some do. The rubella and chickenpox vaccines, among others, are grown in cell lines that began with two elective abortions in the early 1960s. The final vaccines do not contain those cells, and no new fetal tissue is needed.[918,919] Chapter 6 covers the facts and what one major religious authority has said.

22. Is aluminum in vaccines dangerous? Aluminum salts are used in small amounts to boost the immune response. One study found a possible link between total aluminum exposure from vaccines and asthma; other researchers disputed what it showed.[920,921] Chapter 15, Claim 13, gives the verdict.

23. Why do countries have different schedules? They weigh disease burden, cost, health systems and trust differently. Denmark, for example, does not use the rotavirus vaccine.[922] Chapter 14 sets the case for following Denmark beside CRS's critique.

24. Where can I check the numbers myself? Chapter 19 lists the places: VAERS on CDC WONDER, CDC disease and coverage pages, the Pink Book, HRSA's vaccine court data, the Federal Register, CRS reports and the Supreme Court docket.

25. Does this book tell me whether to vaccinate? No. It gives you the record, with sources, and marks what is not known. Talk with a doctor you trust about your own situation.

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[918] Centers for Disease Control and Prevention, *Pink Book, Chapter 20: Rubella*, 2024, https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-20-rubella.html (accessed November 12, 2026).

[919] Children's Hospital of Philadelphia, Vaccine Education Center (reviewed by Paul A. Offit, MD), *Vaccine Ingredients: Fetal Cells*, reviewed September 9, 2026, https://www.chop.edu/centers-programs/vaccine-education-center/vaccine-ingredients/fetal-tissues (accessed November 12, 2026).

[920] Centers for Disease Control and Prevention, *Adjuvants and Vaccines*, December 20, 2024, https://www.cdc.gov/vaccine-safety/about/adjuvants.html (accessed November 12, 2026).

[921] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

[922] Kavya Sekar, Alexandria K. Mickler and Vanessa C. Forsberg, Congressional Research Service, *The 2026 Childhood Immunization Schedule (CRS Report R48982)*, June 11, 2026, https://www.congress.gov/crs_external_products/R/PDF/R48982/R48982.5.pdf (accessed November 12, 2026).

Appendix F: Bibliography by Tier

Every source cited in this book, grouped by the tiers explained in the Introduction. All web addresses were checked on November 12, 2026.

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- CDC COVID-19 Response Team and FDA, Morbidity and Mortality Weekly Report 70(2), *Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine, United States, December 14-23, 2020*, January 15, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7002e1.htm.
- CDC COVID-19 Response Team and FDA, Morbidity and Mortality Weekly Report 70(4), *Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Moderna COVID-19 Vaccine, United States, December 21, 2020-January 10, 2021*, January 29, 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7004e1.htm.
- Centers for Disease Control and Prevention, *About the Clinical Immunization Safety Assessment (CISA) Project*, May 12, 2025, https://www.cdc.gov/vaccine-safety-systems/hcp/cisa/index.html.
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About This Book

The Shot is a plain-language guide to how vaccines in the United States are made, approved, watched for safety and paid for when they cause harm. It covers the history from smallpox to COVID-19, the federal agencies and laws involved, the real side effects and how often they happen, the vaccine court, the 2025 and 2026 changes to federal vaccine advice, and 18 common claims tested against the records. It is part of a series of free, nonpartisan books that put every fact next to its source so readers can check it themselves.