

VACCINE FEARS
OVERTURNED
BY FACTS



Authored by Back to the Vax, Heather Simpson and Lydia Greene
Presented by Immunize Kansas Coalition

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Introduction

Vaccines are life-saving. Vaccine misinformation and anti-vaccine messages can instill fear that prevents people from getting this crucial component of health care. This booklet is a collaboration between Immunize Kansas Coalition and the creators of Back to the Vax, Heather Simpson and Lydia Greene, it's intended to be a factual rebuttal with personal stories to address common vaccine myths. Whether you're a parent, someone who has a fear of needles, or a clinician caring for patients on immunization day, this booklet is for you. We hope this resource assists in addressing concerns surrounding vaccines, answers burning questions, and generates confidence in the power of vaccines.

— Immunize Kansas Coalition

In addition to the topical reviewers this resource was reviewed by Immunize Kansas Coalition's Education and Awareness Team Resource Review Subcommittee in part or in whole. Members of the subcommittee included: Amanda Applegate, PharmD, BCACP, Director of Practice Development at Kansas Pharmacists Association; Cindy Olson Burgess, RN, CIC, Infectious Disease Nurse; Elaine Johannes, PhD., KHF Distinguished Professor in Community Health and State Extension Specialist at Kansas State University/K-State Research and Extension; Susan Wood, RN, BSN, IKC Education and Awareness Strategic Team Chair. Thank you also to IKC Partner, Dr. Hina Z. Zaidi, Pediatric Infectious Diseases Physician for her clinical review of this resource.



Throughout the booklet, you'll see QR codes like this! References and resources are available by scanning the code with a device or visiting immunizekansascoalition.org/vaccine-fears-overturned/references.asp

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Key Facts

Short on time? Scan these key facts and dig into the booklet when you have more time.

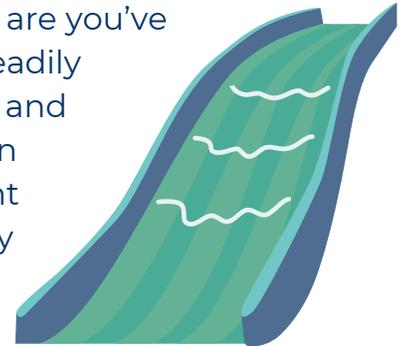
<p>Do vaccines cause autism? (pg. 3)</p>	<p>No. Studies have shown that there is no link between receiving vaccines and developing autism spectrum disorder.</p>
<p>Is formaldehyde a dangerous vaccine ingredient? (pg. 5)</p>	<p>No. Formaldehyde is essential to human metabolism, and is used to build energy for physical and mental daily tasks! Formaldehyde in vaccines does not exceed 0.2 mg, but a newborn will have about 50x that naturally in their body.</p> <p>Fun Fact: There is about 60x more formaldehyde in a pear than in any vaccine!</p>
<p>Is mercury a dangerous vaccine ingredient? (pg. 7)</p>	<p>No. Mercury is found naturally in the earth's crust, air, soil, and water. Thimerosal is a mercury-based preservative, it's a safe compound of mercury, used to keep vaccines sterile. In 2001, "mercury" was removed from all childhood vaccines, excluding multi-dose flu vaccines.</p>
<p>Can polysorbate 80 in vaccines open the blood brain barrier? (pg. 9)</p>	<p>No. Polysorbate 80 is used as a stabilizer in vaccines, used to keep vaccines effective during storage and transport. However, it's used in quantities nowhere close to causing harm.</p> <p>Fun Fact: We ingest polysorbate 80 everyday! In our food, it's used as a binding agent in peanut butter, ice cream, jello, and more!</p>
<p>Is aluminum a dangerous vaccine ingredient? (pg. 11)</p>	<p>No. Aluminum is used in vaccines as an adjuvant - a component that boosts the immune response to a vaccine. Infants are exposed to more aluminum in breastmilk than in all of their recommended vaccines during the first 6 months of life!</p> <p>Fun Fact: Aluminum is found in fruits, vegetables, meats, and fish because it's the 3rd most abundant element on earth.</p>

<p>Does the HPV vaccine cause infertility? (pg. 27)</p>	<p>No. The HPV vaccine can actually protect against cancers that can lead to issues with fertility. The HPV vaccine protects against 6 different cancers in males and females.</p>
<p>Is herd immunity real? (pg. 15)</p>	<p>Yes. Herd immunity, or community immunity, is when a large part of the community has immunity to a contagious disease, so community members who can't be vaccinated are protected. The safest way to achieve this is through vaccines.</p>
<p>Is infection-derived immunity better than vaccine-acquired immunity? (pg. 17)</p>	<p>No. Exposure to disease to gain infection-acquired immunity can be unpredictable, causing suffering, long term complications, and even death. You can get immunity safely with vaccines.</p>
<p>Does mRNA in some COVID-19 vaccines alter DNA? (pg. 23)</p>	<p>No. It's physically impossible for the mRNA in COVID-19 vaccines to change human DNA.</p>
<p>Do the COVID-19 vaccines cause infertility and miscarriage? (pg. 25)</p>	<p>No. The COVID-19 vaccine is safe and recommended for people who are pregnant, breastfeeding, trying to get pregnant now, or might become pregnant in the future. Vaccination during pregnancy protects both mother and baby.</p>
<p>Do COVID-19 vaccines contain harmful ingredients? (pg. 13)</p>	<p>No. Nearly all of the COVID-19 vaccine ingredients are also ingredients in many foods - fats, sugars, and salts.</p>
<p>Do vaccines cause cancer? (pg. 45)</p>	<p>No. Some childhood vaccines lower the risk of cancer. The HPV vaccine reduces your child's risk of developing 6 different cancers. The hepatitis B vaccine also reduces their risk of liver cancer!</p>

Social Media & the Slippery Slope of Anti-Vaccine Information

Dear Reader,

Misinformation and the anti-vaccine world is a beast. Chances are you've encountered those influenced by this monstrous amount of readily available false information, or you've been influenced yourself, and that's okay - WE WERE TOO. You are not alone. It doesn't mean someone is stupid or gullible. In fact, we know people just want the best for their children. Parents suspect danger and they try to connect the dots just as we've been doing since humans began. It's how we ensure our children survive.



The overwhelming number of studies assures us that vaccines are the absolute safest and best choice. And yet, as former anti-vaxxers, we were misled to believe that this was not the case. How did this happen to us?! From our experience, here's what turns parents away from vaccination.

Social Media Tribes

Social media has allowed people with similar interests to form groups that connect each other from all over the world. I (Lydia) personally have friends I have met all over Canada and the United States through these online groups. There was a group on attachment parenting, breastfeeding, and even cloth diapering. Heather too, found a tribe on Facebook. She became an anti-vax influencer and had thousands of followers. It's as if every aspect of parenting can be turned into a group or social movement. It was then that I found myself in my first anti-vaccine group called "I'm Not Vaccinating". This group made me feel like not vaccinating was the norm. In real life, most parents vaccinate their children. People who refuse vaccinations are few, but the internet makes it feel like they are a majority. They are a loud minority.



Echo Chambers and How We End Up in Them

The term "echo chamber" is used a lot, but we often don't know how exactly we end up in one, or if we are in one at all. An echo chamber means that every piece of information you are surrounded with confirms what you want to believe. There is a phenomenon known as the triple filter bubble. There are three layers to the echo chamber to fight your way out of:

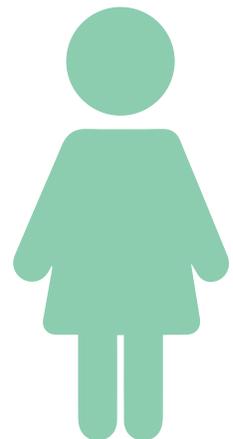
- First, there is your **individual filter**, which is made up of your life experiences.
- Second, there is the **social filter**, which is made up of the people you choose to have in your life and the people you trust to give you information.
- Third, there is the **technological filter**, which is your search engine and social media algorithm bringing you content it thinks you want to see. While it may be what you want to see, it's not always what you need to see.

The Disinformation Dozen: When "Expert Opinion" Conflicts with the Science

There are millions of doctors and scientists who agree vaccines are the best choice we can make for our children. The number of them who are against vaccination is very few and far between. But they do exist. Looking back, we thought these doctors had some secret knowledge their colleagues were ignoring. The Center for Countering Digital Hate reports that just 12 anti-vax influencers are responsible for almost two-thirds of the anti-vax disinformation we see online today (Counterhate.com). Some of them are doctors. Some of them are natural health practitioners. Nearly all of them have financial incentives to spread disinformation and profit from selling an alternative to vaccination via supplements, appointments, books, and webinars.

Anti-vaccine Disinformation Targets Women and Mothers

According to Matoff-Stepp (2014), the most recent statistics show that women in the U.S. make about 80% of the family's health care spending decisions, from vaccines to diet, to choosing a pediatrician and booking appointments. So, it makes sense that the anti-vaccine industry hacks into the psychology and social expectation of motherhood to make the most profit.



Public Health Influence is Underpowered on Social Media

The global wellness industry drives much of the anti-vax sentiment because it's good for their bottom line. That market is worth \$1.5 trillion dollars (McKinsey.com 2021). Companies can spend 5% of their profit or more on marketing each year. That's \$7.5 billion a year. You can see why social media companies do very little to curtail disinformation. It isn't profitable. Contrast that with the \$300 million per year the CDC spends to promote childhood vaccination. The governments just doesn't have the funding to compete. For every public health ad, a person is exposed to dozens of conflicting pieces of information. Public health is effectively drowned out.



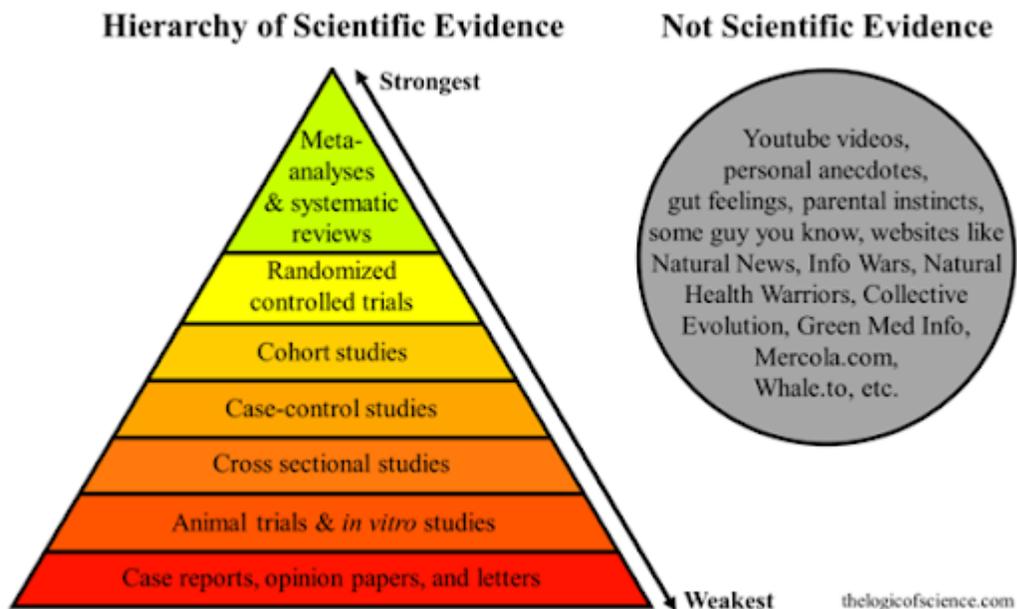
The Moral Panic Created by The Wakefield Study and the MMR/Autism Folk Devil



In 1998, Dr. Andrew Wakefield published a paper linking vaccines to autism in 8 children. It was retracted due to unethical data collection, among other issues. However, the negative effects of his fraudulent study still persist today. Several measles outbreaks can be traced to low vaccination rates created by this inaccurate study. Despite this link being disproved with studies that included 650,000 children (Hviid et al. 2019), this myth has not been put to rest.

How Do You Know if the Information is Accurate?

It takes practice to evaluate evidence and even we are still learning. To determine how much weight to give a piece of information, try holding it up against the hierarchy of evidence.



If I am still confused, I will ask someone who is an expert in the field. As newly vaccinating moms, nothing calmed us down like asking a blood-brain barrier expert to explain why vaccines do not cross the blood-brain barrier.

We interviewed Jonathan Jarry, science communicator and a skeptic, for tips on how to spot pseudoscientific grifters.

- 1 Not a fan of the peer review system and of criticism. Many anti-vaxxers shun the hierarchy of evidence. That is a huge red flag.
- 2 They will then cherry-pick the data they just shunned. This means they pick and choose which pieces of information to follow, while ignoring the rest of the information if they don't like it.
- 3 Absence of progress. The anti-vax tropes don't change, and they just get recycled over and over.
- 4 Evidence they don't like is quickly dismissed and explained away with conspiracies.
- 5 Fake experts. Often the expert they choose isn't even an expert in the subject they are talking about.



Anti-vaccine beliefs are a deeply complicated hole we fell into and dug our way out of.

There is no shame in being taken in by these tactics and it takes a strong person to step out of this echo chamber and challenge their views. If you are in the midst of this journey, we commend you. You are doing something most people have a very difficult time doing, which is admitting that they could be wrong.

Lydia and Heather

Creators of Back to the Vax

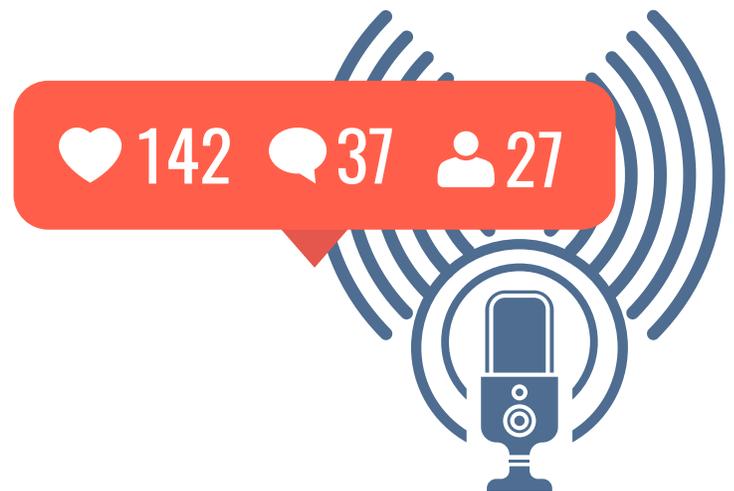
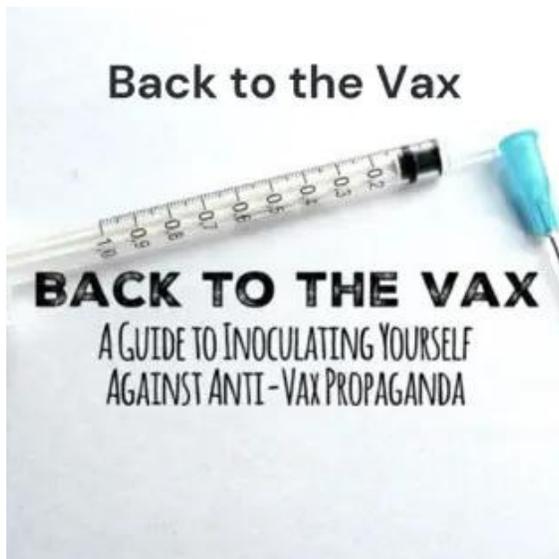


Are You Stuck in a Social Media Echo Chamber?

By Lydia Greene, Back to the Vax

Social media algorithms will show you what it thinks you want to see, not what you **NEED** to see. It's crazy how the social media algorithm works. Did you happen to click on an anti-vaccine article? Now your social media algorithms will bring you similar content. Soon it will seem like everyone you know and follow is anti-vaccine, when in reality, the majority agree that vaccination is the best way to prevent disease, death, and suffering.

We at Back to the Vax know this all too well, so we have created a list of social media experts to follow, so that you can fill your social media with accurate and helpful scientific information regarding vaccines. We have gotten to know many experts in our journey to gaining vaccine confidence and have been truly touched by how helpful the scientific community is. We also have a podcast called Back to the Vax, where we interview experts on common vaccine misconceptions.



Social Media Resources:

Immunize Kansas Coalition

www.immunizekansascoalition.org

Vaccinate Your Family

www.vaccinateyourfamily.org

Voices for Vaccines

www.voicesforvaccines.org

Immunize.org

www.immunize.org

Stronger, identifying the spread of misinformation online

www.stronger.org

Kristen Stuppy, M.D., Kansas Pediatrician

Follow her on Twitter [@pediatricskc](https://twitter.com/pediatricskc)

Edward Nierenberg, Medical Student, Science Communicator, and Founder of

www.deplatformdisease.com

Victoria Crabb, Ph.D. Epidemiologist

Follow on Twitter [@crabb_vicki](https://twitter.com/crabb_vicki)

Dan Wilson, Ph.D. in Molecular Biology and Science Communicator with the YouTube channel Debunk the Funk with Dr. Dan Wilson, where he observes current disinformation trends and debunks them with facts

Jonathan Howard, M.D., Neurologist

Dr. Howard has written many informative articles on COVID-19 contrarians and more. Visit this website to find articles: sciencebasedmedicine.org

Follow on Twitter [@19joho](https://twitter.com/@19joho)

Vincent Iannelli, M.D., Pediatrician, and Founder of Vaxopedia.org

Vaxopedia is a wonderful debunking resource on vaccine disinformation. He works hard to stay on top of all the newest disinformation.

Thomas A. Nguyen, D.O., Pediatrician

Follow on Twitter [@quality_nguyen](https://twitter.com/@quality_nguyen)



Do Vaccines Cause Autism?

By Lydia Greene, Back to the Vax

Short Answer: No. Wow, that was easy. (kidding).

Long Answer: Here is how I realized that **vaccines do not cause autism** from the lens of a former anti-vax parent. I have 3 children, and I stopped vaccinating when my oldest was just 4 months old. My next 2 children were completely unvaccinated. Being in the anti-vax crowd led me to have the wrong idea of what autism is. Parents in these groups blamed vaccines on almost everything. They promised that if you just avoided vaccines, you would have the perfect neurotypical child. The way they talked about autism made me think it was one of the worst things that could befall a child. All I knew about autism was negative. They said it would ruin your family, your marriage, and your life.

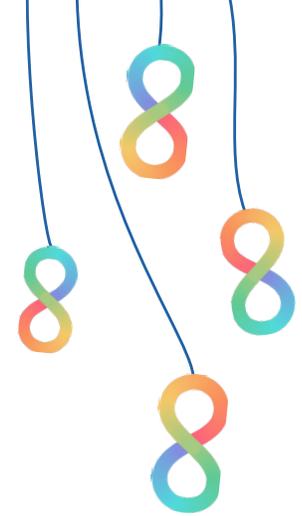
When the pandemic started, a lot of events made me question my stance on vaccination. Realizing I was truly wrong about something I believed wholeheartedly for so many years made me question what else I could be wrong about. After seeing with my own eyes that my children were just fine after their first vaccinations, I moved forward to catch them up as fast as I could. It began to occur to me - *if the well-meaning people in my life were right about vaccines, what if they were right about other things?* Memories came back about the times that family members and preschool teachers suggested that my son could be autistic or developmentally delayed. At the time, I was so offended. My son is beautiful, unique, and perfect the way he is. He may be a little behind, but he does not have autism. He is none of the things the parents in those groups talked about. He is an absolute joy to be around. Could he be all these things and autistic at the same time? I didn't know, but I decided to call our doctor and voice my concerns. Our doctor did some simple behavioral tests in her office, and we booked an assessment. She told me to brace myself for an autism diagnosis. She was right. He was diagnosed with level 2 autism spectrum disorder under the DSM-5.



My unvaccinated boy was in fact, autistic.

The “vaccines cause autism” myth gained momentum with the infamous, fraudulent Wakefield study from the 1990s. The study was retracted in 2010, but the myth has remained. I can see why. Autism seems as if it occurs at random, and regression is traumatic for parents to witness. People need a reason, because it gives us a sense of control in a chaotic world. Science has done a wonderful job in proving that vaccines are completely unrelated to autism. A recent Danish study (Hviid et al. 2019) with over 650,000 children concluded that MMR was not associated with an increase in autism, using data from siblings that have and have not been vaccinated.

I vaccinated my other son at age 2 and he did not develop autism. I know this is an anecdote, but my anecdote is supported by science. Some claim the Danish study only looked at MMR, but there was a group of 4,729 completely unvaccinated children in the study and the results were the same. Vaccines don't cause autism. In another study researchers also found the same result. They collected data from 904 autistic children and found no association between MMR and autism (Uchyama et al. 2007).



While it does seem that autism is on the rise with 1 in 54 children (CDC, 2020) being diagnosed, the rise may not be as dramatic as portrayed. In truth, most of the rise is not actually due to an increase in the incidence of autism itself. Updates in diagnostic criteria now capture cases sooner so early intervention can occur. The DSM-5 has changed the way autism is diagnosed. Other neurological conditions now fall under the autism spectrum disorder umbrella. These children used to be diagnosed as mentally retarded, globally delayed, antisocial, and even schizophrenic.

Autism tends to become apparent at approximately the ages that vaccinations are given to toddlers, so it's easy to make the false connection between the two. My son regressed around that time, despite being unvaccinated. I empathize strongly with any parents' struggle, but we must follow the evidence. Stopping vaccinations will not put an end to autism, but it will bring back numerous serious infectious diseases that will devastate society.



Reviewed by: Edward Nierenberg, Medical Student, Science Communicator and Founder of deplatformdisease.com



Facts Dismantle Fears of Formaldehyde

By Heather Simpson,
Back to the Vax

A prevalent argument I ran across during my time as an anti-vaxxer was that formaldehyde, an ingredient in some vaccines, was dangerous. This made immediate sense to me. In my brain, formaldehyde was equal to poison and that was all there was to it. I did not want to inject literal poison into my tiny baby's body. I loved her. Why would I do that?!

I couldn't understand people who just blew past this fact. Injecting formaldehyde felt very traumatic to me. I couldn't do it and I wouldn't do it. It wasn't until I really dug into why we use it in vaccines, the amount used, and what it actually was that I felt completely fine with it. I'm convinced that fighting freaky vaccine myths with indisputable facts that just make sense is the best way to dispel insecurities and vaccinate your child with confidence.



Formaldehyde is essential in human metabolism and is required for the synthesis of DNA and amino acids (the building blocks of protein). Therefore, all humans have detectable quantities of natural formaldehyde in their circulation (about 2.5 ug of formaldehyde per mL of blood). Assuming an average weight of a 2-month-old of 5 kg and an average blood volume of 85 mL per kg, the total quantity of naturally occurring formaldehyde found in an infant's circulation would be about 1.1 mg. This is about 1,500 times more than the amount an infant would be exposed to in any individual vaccine.

- Children's Hospital of Philadelphia



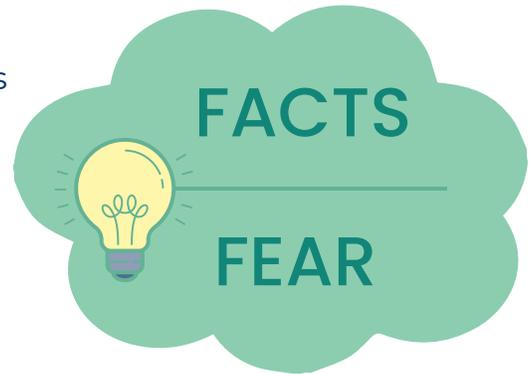
This means that your kiddo already has way more formaldehyde circulating in their system than in any vaccine they will be given. The fact that it is essential for the human body gave me a huge sigh of relief. You don't need to worry that you are injecting some foreign poison into your child's body, because you are not.

To break down the exact amount that is in vaccines:



DTaP	Quantity per dose: ≤ 0.005 mg – ≤ 0.1 mg
Polio	Quantity per dose: ≤ 0.02
HepB	Quantity per dose: < 0.0075 mg (pediatric)
Hib	Quantity per dose: < 0.005 mg

As you can see, these numbers are significantly smaller than the amount already found in your child's blood. The dose makes the poison. When someone uses the argument that formaldehyde in vaccines is dangerous, it's easy to feel that there may be a large amount of it being injected. The facts can immediately put this rumor and fear to rest.



Questions surrounding vaccination?



Visit [IKC's Answers to Common Questions Page](#)



Reviewed by: Vincent Iannelli, M.D., Pediatrician, and Founder of [Vaxopedia.org](#)



The Truth About Vaccine Mercury

By Heather Simpson,
Back to the Vax

This myth feels like it is as old as time itself. If I had a dollar for every time someone warned me about mercury in vaccines, I would be rich!

When I was an anti-vaxxer, I remember doing a “Facebook live debate” with a pro-vaxxer in the absolute height of my anti-vaccine beliefs. Then I had an “Oh no, what if I am wrong?” moment. It was at this moment, you see, that I learned and finally understood that there are many different kinds of mercury, including the bad kind of mercury found in fish, and a safe kind found in vaccines. I was frozen with regret when I realized how categorically wrong I had been. I immediately dropped the mercury argument and moved onto a different topic for the debate.



Mercury has scared people away from vaccines for decades- namely, because it sounds scary. Who wants to inject their child with mercury? Isn't mercury the stuff in glass thermometers that if you so much as spill it then it shuts down schools and causes people in hazmat suits to appear?

But even if you were scared about mercury in vaccines, you might ask yourself:

Why am I still scared about mercury in vaccines?

Remember, “mercury” was removed from most childhood vaccines over twenty years ago! So how many vaccines still contain mercury? While none actually contain “mercury,” multi-dose flu vaccine vials do contain **thimerosal**, a preservative that contains an ethylmercury group.

Notice how I just said thimerosal, **not mercury**. That is because mercury and thimerosal are completely different molecules, just like water (H₂O) and formaldehyde (CH₂O) are completely different compounds. Heavy metal mercury breaks down into methylmercury. The mercury found in thimerosal, (aka what's used in multi dose vials of the flu shot), breaks down into ethylmercury.

Yes, thimerosal is used as a preservative in multi-dose influenza vaccines, however it is also used in cosmetics, tattoo inks, eye drops and contact lens solutions, disinfectants, as well as in products used to treat contact dermatitis.

Methylmercury is the type of mercury found in fish. It can be toxic to humans at high exposure levels. This is why the FDA recommends limiting your intake of some types of fish.



Compounds containing ethylmercury, on the other hand, are cleared from your body faster than methylmercury and don't appear to be toxic. For example, methylmercury takes around 20-80 days to be cleared by half from the body, whereas thimerosal takes around 7 days to be cleared by half from the body, as shown below:

“Methylmercury is what accumulates in water and fish and can cause health problems. Ethylmercury is a very different compound that doesn't appear to be toxic. If you want to understand the difference one carbon atom can make, consider the difference between methanol and ethanol. Drinking ethanol (alcohol) will make you tipsy at a dinner party. Drinking methanol can make you go blind.” (Iannelli, 2021)

Should We Worry About Metals in Vaccines?

What if you don't even want to deal with a small amount of ethylmercury in flu shots? Just ask for a thimerosal-free flu shot from a pre-filled syringe, which is how over 90% of flu vaccines are now made.

It's that simple, and you can avoid “mercury” altogether.



Reviewed by: Rod Cook, Human Bequest Coordinator and Anatomy Facility Manager, School of Human Anatomy and Pathology at James Cook University



Polysorbate 80 & the BBB

By Heather Simpson,
Back to the Vax

As a former anti-vaxxer, the argument that polysorbate 80 was the key to vaccines causing autism was extremely compelling to me. It sounded so scientifically sound. The theory by anti-vaxxers goes that polysorbate 80 opens up the blood-brain barrier (BBB), allowing chemicals from vaccines to “slip” into it and wreak havoc on the child’s brain.

WHAT? IS THE BLOOD-BRAIN BARRIER?

The blood-brain barrier (BBB) is a crucial immunological feature of the human central nervous system (CNS). Composed of many cell types, the BBB is both a structural and functional roadblock to microorganisms, such as bacteria, fungi, viruses or parasites, that may be circulating in the bloodstream.

Where did this idea come from?

My friend and blood-brain barrier specialist, Rod Cook, broke it down for me:

“Around 40 years ago, a study (Spigelman et al., J Neurosurg 1984) suggested that if you give enough polysorbate 80 (PS80) injected right at the base of the neck (carotid artery), you could open the BBB for drugs like etoposide (an anti-cancer drug). But here is the catch: the PS80-treated group showed a statistical significance versus saline when given 60mg (= 60,000ug)/kg dose. HBV (hep b) vaccine for newborns contains 50ug of PS80. If we do the math for an average newborn (~3kgs), we would need something close to 3600 doses of HBV vaccines (~180'000microg) injected straight into a baby’s neck to have a possible chance to observe an opening of the BBB. 40 years later and we have yet to see anything with PS80 used as drug delivery against brain tumors or brain diseases.”



So, it is true that a study was done that showed promising outcomes of being able to open up the blood-brain barrier for different medical treatments. He told me how huge this would be if we could use polysorbate 80 to open up the blood-brain barrier to deliver drugs to treat brain tumors!

Unfortunately, we can't. It's not possible. Literally, thousands of vaccine doses would have to be injected straight into a baby's neck to have a chance at opening up the child's blood-brain barrier.

That's not gonna happen!

Dont forget! We ingest polysorbate 80 everyday!

That's because it works great as an emulsifier to help keep ingredients together and can be found in peanut butter, ice cream, dairy products, baked goods, shortening, margarine, etc. It would feel silly to worry about the polysorbate 80 in ice cream, right? I hope now you can be absolutely confident that the polysorbate 80 in vaccines is completely safe for your baby.



Reviewed by: Vincent Iannelli, M.D., Pediatrician,
and Founder of Vaxopedia.org



Aluminum and Vaccines

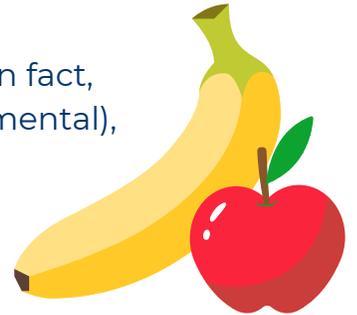
By Heather Simpson,
Back to the Vax

When I was anti-vaccine, one of the most prevalent myths being spread was that aluminum in some vaccines would enter the baby's brain through macrophages that sneak past the blood brain barrier (BBB) and cause a chain reaction of inflammation. This, in turn, would cause autism. It sounded scientific, and I didn't know how to dispute it.

This is one of the big dangers of anti-vaccine arguments – they sound extremely scientific and complicated, so they seem true! But, of course, just because something sounds complicated and scientifically correct, does not mean it is.

Fortunately, I finally did a little digging, and it blew my mind. When you can dispute false science with real science that makes sense, everything gets less scary. I was able to take this idea with me when I was still low-key freaked out on vaccination days.

The studies that many anti-vaxxers quote to prove this myth do, in fact, show aluminum (Al) in the brain...but they all show Al^{3+} (environmental), not aluminum salts – the type found in vaccines. That's a **MAJOR** difference. It's like comparing apples to bananas. They might both be fruits, but they are not the same.



In studies that show aluminum inside brain tissues/samples, go look at the Methods section. I can almost guarantee you that every one of them looked at Al^{3+} and not Al salts (E.g. aluminum hydroxide ($Al(OH)_3$), aluminium phosphate ($AlPO_4$) or aluminum hydroxide oxide ($AlOOH$)). The main reason why they looked at Al^{3+} is because most of the Al salts will dissolve when in contact with water, like the table salt you dissolve in your boiling water when making pasta.

Furthermore, chemicals can only cross the blood brain barrier if they are fat soluble – meaning they can dissolve in fat or oils (e.g. alcohol, nicotine, caffeine). If they're not fat soluble, they likely can't cross it. Why does this matter? The aluminum in vaccines is not fat soluble. Which means it's not getting into your baby's brain at a rate or amount higher than the amount of aluminum your baby gets from food and drinks.

Need some more knockout facts? I did. I ate these up because they helped me feel confident about vaccinating.

Next, we have the fact that molecules that can pass the blood brain barrier have to be the right size and charge. Al salts found in vaccines (e.g. $\text{Al}(\text{OH})_3$, AlPO_4) are too large to pass the BBB.

Okay, but how did some of those studies find any form of aluminum in the brain at all? Yes, the studies didn't find vaccine aluminum in the brain, but what about other forms of aluminum? I also read that studies on strands of hair found aluminum in them. How is that a thing?

Al^{3+} can cross the BBB, as Al salts do dissolve and release their Al^{3+} over time, with an acidic environment (e.g. stomach juice) accelerating such dissolution. Hair isn't part of the brain, as skin/scalp is part of the integumentary system (skin) and not the brain. Hair follicles are naturally irrigated with blood and will incorporate chemicals found in blood as hair grows. Hence why hair is a great biological sample to determine if someone has been exposed to something in the past. Hair aluminum is always found as Al^{3+} (environmental) not aluminum (salt hydroxide/phosphate) (vaccines).

I talked to my scientist buddy who told me he wished chemicals were easier to get across the brain because it would be a medical breakthrough and so beneficial for different medical treatments, but it is so hard to get anything across the BBB, no matter how hard we try. He cited a study that determined only 5% of drugs and chemicals known to mankind are capable of crossing the BBB if they are small molecules. If you are talking about something much bigger (proteins such as vaccine antigens), their chance to cross the BBB is close to zero.

Bottom line? I'm not worried about aluminum in vaccines anymore.



Reviewed by: Abraham Alahmad, Ph.D., Associate Professor in Pharmacology, Texas Tech University Health Sciences Center



Breaking Down COVID-19 Vaccine Ingredients

By Heather Simpson,
Back to the Vax

If you are anything like me, you probably want to know exactly what ingredients are that go into your child's body. I get it. I used to study ingredients on every single box of food before giving it to my baby, therefore it felt natural to research every ingredient in vaccines. What I quickly found was that the vaccine ingredients are typically big and somewhat scary sounding words. When you break them down to what they mean in everyday life, however, they become much easier to understand and digest.

To demonstrate this, below are the ingredients found in lavender essential oil.



For a while, there was a meme being passed around that listed these lavender ingredients, with a caption of “Look at these scary vaccine ingredients!” followed up by some fine print that said “These were actually lavender essential oil ingredients.” It was a very powerful and eye opening meme, to say the least.

Below are the ingredients to two different vaccines that are available for children right now, Pfizer and Moderna. Beside each ingredient, I have written what that means in real life.

Vaccine Ingredient	Meaning/use
Sodium phosphate dibasic [dihydrate] (Pfizer)	Emulsifier
Sodium chloride (Pfizer)	Salt
Potassium chloride (Pfizer)	Potassium
Sucrose (Moderna, Pfizer)	Table sugar
Acetic acid (Moderna)	Vinegar
Sodium acetate trihydrate (Moderna)	Shelf-life extender, pH regulator
Monobasic potassium phosphate (Pfizer)	Buffer
Tromethamine hydrochloride (Moderna)	Makes blood or urine more alkaline or less acidic
DSPC (Moderna)	Used in prep of liposomes for transfection & drug delivery applications
Lipids (Moderna, Pfizer)	Tiny balls of fat called lipid nanoparticles (LNPs) <ul style="list-style-type: none"> • Ionized lipids • Pegylated lipids • Phospholipids • Cholesterol
mRNA (Moderna, Pfizer)	Messenger ribonucleic acid is a type of RNA found in cells. They carry the genetic information needed to make proteins.



Vinegar and table sugar sound way less scary than their scientific names. And they should, because they are not scary ingredients. Remember, all of these ingredients were put into vaccines for a reason – to make them safer and more effective.



Reviewed by: Melody Mitchell, Medical Oncology Researcher



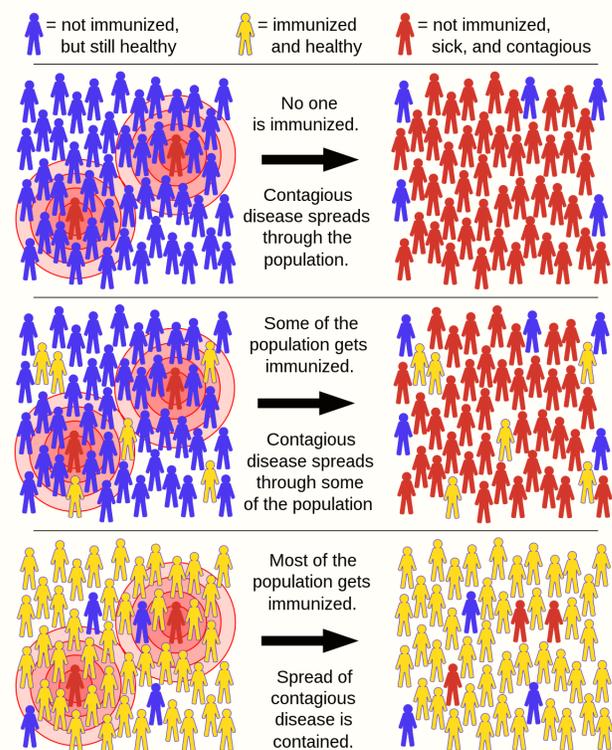
Is Herd Immunity Real?

By Lydia Greene, Back to the Vax

Herd immunity is defined as the way a population gains immunity from a disease by vaccinating a high percentage of their members, so that the disease can not thrive in the community if introduced. As an anti-vaxxer, I wanted to believe the myth that herd immunity was not real. I *needed* to believe this myth. It was how I justified not caring that I was gaining from the herd immunity established by vaccinations. I was hiding in the herd.

Over the years I would look for outbreaks of diseases in vaccinated groups of people in order to justify my choice. "See!!" I would scoff. "Herd immunity isn't real! Vaccines don't work." Well, that is simply not true. Are vaccines perfect? No, but they are pretty amazing. Even in the most vaccinated populations, there are going to be some factors which make people vulnerable to outbreaks. Some people are non-responders to vaccines, and even after multiple boosters, they just do not make antibodies.

Unvaccinated people are vulnerable to catching disease. They fall into two categories. First, there are people that can not get vaccinated due to contraindications, like medications, medical conditions, and children too young for the vaccine. These people are even more vulnerable to the disease and its complications. For instance, I am on immunosuppressant medications and, as a result, I can not be vaccinated with live vaccines. I rely on others to do their part, so I don't get exposed to diseases that I am at an increased risk of having complications with due to my suppressed immune system. Second, there are people that choose not to be vaccinated.

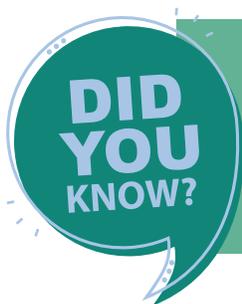


(A graphic representation of how herd immunity can prevent or slow the spread of disease through a population.

Image: Tkarcher / CC BY-SA)

What makes things worse is that unvaccinated people tend to live in the same areas as each other and send their children to the same schools, leaving the local vaccination rate well below the amount needed for herd immunity to work. So, while the entire town could have a good vaccination rate, one or two schools will not, and that is all it takes to have an outbreak. Then people who were just like me say “SEE! Herd immunity doesn’t work!” and the cycle goes on.

We also find out that immunity wanes sooner than we think. There were mumps outbreaks as a result in mostly young adults, as their immunity waned with age. With the hole in herd immunity, mumps was spreading fast in this group. These issues make it more important to increase vaccine coverage. It does not mean that vaccinations are useless.



Sometimes solving this issue is as easy as adding a booster. Sometimes immunity wanes with time. This is not an unsolvable problem, as adults can get boosters too.



That said, I only had one MMR vaccine as a child and I still have positive titers at 40 years old. The answer is never to avoid vaccinations because while outbreaks can occur occasionally in highly vaccinated populations, they are still way more likely to occur in under-vaccinated populations. The amount of people needed to be vaccinated to achieve herd immunity depends on the effectiveness of the vaccine and the contagiousness of the disease. Pertussis and measles are highly contagious, so the vaccine uptake must be high. Even today, these two diseases tend to have outbreaks. This is why contributing to the herd immunity threshold is so important.

Disease	R ₀	Threshold (%)
Mumps	4-7	75-86
Polio	5-7	80-86
Smallpox	5-7	80-85
Diphtheria	6-7	85
Rubella	6-7	83-85
Pertussis	12-17	92-94
Measles	12-18	83-94



Reviewed by: Vincent Iannelli, M.D., Pediatrician, and Founder of Vaxopedia.org



The Safest Way to Get Immunity from a Disease

By Lydia Greene, Back to the Vax

All immunity is natural, and our bodies produce it via a natural process. Distinguishing vaccine-acquired immunity from naturally acquired immunity is like distinguishing the cardio benefits from a treadmill versus walking outside. Your heart doesn't know the difference, and it's the same for your immune system. As a former anti-vaxxer, infection was sold as the "right" way to get immunity, and if your children were healthy enough, these diseases would not be a problem for them to overcome. However, even healthy children are prone to suffering the severe consequences of a virus and there is no way to predict if they will be vulnerable at any given time. If you think your healthy child can handle measles, they can certainly handle a vaccine which is the attenuated (weakened) version of the virus.

Vaccines not only prevent death, but they also prevent suffering, and if you have ever taken care of an ill child, you know you hate to see them suffer.

After seeing my own unvaccinated 3-year-old go through a severe case of COVID, I certainly do not want to see him suffer through any other vaccine-preventable disease again.

At the pandemic's beginning, most people hadn't been exposed to COVID-19. People that had been vaccinated prior to contracting COVID-19 did better than their unvaccinated counterparts. They had fewer complications and lower death rates. And, although vaccines don't prevent transmission, they do reduce it - even with Omicron (Tan, S. T. et al., 2022; Lyngse et al., 2022). Infected people also had some immunity but had to go through the disease to get it. Statistically, the chance that a healthy person would be okay was much higher, but healthy people still got sick and even died. Infection-acquired immunity is unpredictable. In some people, immunity can last months and in others a few weeks, so there is no guarantee of protection. The vaccine's protection can also wane with time, but with more predictability. **Booster vaccines can be recommended as needed, providing a much better, lower risk choice than getting the virus.**



Stay up-to-date on booster dose recommendations



We now know that most people in the U.S. have had COVID-19 or will get it in the near future. However, research now shows that hybrid immunity is best.



IS HERD IMMUNITY?

Herd immunity works to control the spread of disease when a specific amount of that population (threshold) becomes immune to the disease through vaccination or infection and recovery.



IS HYBRID IMMUNITY?

Hybrid immunity occurs in those who have been both infected with and vaccinated against the disease.

Ideally, you want to be vaccinated before exposure to reduce the risk of severe outcomes. Even if you were not, you can still get vaccinated after infection to boost your resistance to COVID-19. People who have had both the vaccine and the virus have the best immunity to COVID-19, also known as hybrid immunity (Hammerman et al. 2022).

Multiple studies have now ranked immunity against COVID-19, and they rank as follows: 1) Hybrid, 2) Only vaccinated, and 3) Infection-acquired. So if hybrid immunity is best, and vaccination prevents severe outcomes, the safest way to get hybrid immunity is by getting vaccinated prior to infection. Another study (Zar et al. 2022) in South African mothers showed that mothers with hybrid immunity had better protection against Omicron than mothers that didn't. If infection-acquired immunity is unpredictable, then the best way to ensure lasting protection is to get vaccinated to boost your protection after infection. Either way, it is a good idea to get vaccinated.

Vaccine critics often say that infection-derived immunity is best but often fail to explain the risks that it entails. Many will purposely expose their children to chicken pox over vaccination because they believe the immunity is better.

It actually increases the child's risk for things like scarring, encephalitis, and getting shingles later in life. You can get the same immunity from a vaccine with much less risk (Shapiro et al. 2011). The same goes for COVID vaccines, which lower the risk of severe complications and death.



Reviewed by: Susan Oliver, Ph.D. in Nanomedicine



Did Sanitation Eradicate Disease?

By Heather Simpson,
Back to the Vax

The myth that improved sanitation eradicated vaccine-preventable diseases was one that I was absolutely sure of. Suzanne Humphries, renowned anti-vaxxer, caused quite a ruckus when she came out with her book, *Dissolving Illusions*. As an anti-vaxxer myself at the time, I bought a copy and ate up everything she had to say. Her main claim was that sanitation and better hygiene, not vaccines, wiped out diseases such as measles and polio. She uses fancy graphs to prove that diseases were already declining due to clean water and sanitation when vaccines were introduced. She did such a compelling job at backing up her argument, that unless you really dug into the other side of the story, one could easily believe her.

But that's the thing about the anti-vax world, you really do have to learn the other side of the story to see how very wrong the anti-vax side is. The problem with some lies is that they are so close to the truth that they become hard to differentiate. Did sanitation and clean water slow the spread of disease in general? Sure. **Did it stop diseases? Absolutely not.**



Vincent Fonseca, MD, a public health and general preventable medicine specialist in San Antonio, states, "Out of all the anti-vax arguments, it's the easiest to prove that **it's simply not true.**"

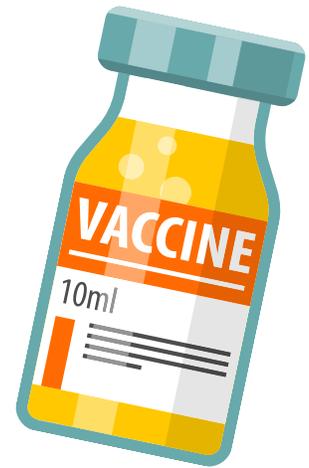
Questions surrounding vaccination?



Visit IKC's Answers to
Common Questions Page

The most compelling evidence that disease was not wiped out by simple sanitation and clean water are the dates that each disease was wiped out in the U.S.

Vaxopedia.org does an amazing job of breaking this down:



- Yellow fever (1905)
- Polio (1979)
- Smallpox (1980)
- Measles (2000)
- Neonatal tetanus (2000)
- Congenital rubella syndrome (2004)
- Respiratory diphtheria (2009)

If vaccines "don't really work and it is just sanitation and hygiene", then why aren't the dates that these diseases are eradicated or controlled all the same?

In the article, "Misconceptions About Vaccines", we can see that chickenpox is one of the most compelling arguments for vaccines being responsible for disease disappearing. They say that if hygiene was enough to drop disease rates, it would have been eradicated long before the vaccine was introduced. The number of cases in the early 1990's in the US was about 4 million per year. The vaccine was introduced in 1995, and cases dropped by about 85% by 2004.

Still believe this myth? Then ask yourself why better sanitation and hygiene only prevents chickenpox in countries that routinely use the chickenpox vaccine?



Reviewed by: Dr. Vincent Ianelli, M.D., Pediatrician, and Founder of Vaxopedia.org



Vaccines and Autoimmunity

By Lydia Greene, Back to the Vax

I have had severe fistulating Crohn's disease since I was a teenager. It is an autoimmune disease where the immune system attacks the digestive tract and creates ulcerations and fistulas. It's been over 20 years with this disease, with many ups and downs. Having had surgery, I am now missing about a third of my colon. I have had a temporary colostomy and almost died from sepsis. When I say I would do anything to prevent my children from going through what I went through, you know I mean it. Having a life-threatening, chronic condition is what made the “crunchy lifestyle” so appealing to me when I held my anti-vax beliefs. It gave me a sense of control. If I just did everything perfectly I could prevent my kids from suffering as I did. So when I came across a tiny scientific article on Autoimmune/Inflammatory Syndrome Induced by Adjuvants (ASIA), it stopped me in my tracks. It implies that vaccine adjuvants can trigger autoimmune disease. Not vaccinating seemed like a way I could lower my children's risk of developing autoimmune disease. It gave me a point of control.

WHAT? IS AUTOIMUNE/INFLAMMATORY SYNDROME INDUCED BY ADJUVANTS?

An entity that incorporates diverse autoimmune conditions induced by the exposure to various adjuvants. Adjuvants are agents that entail the capability to induce immune reactions.

When changing my mind on vaccination, this was one of my biggest hesitations. I had to read and ask the scientific community so many questions in order to feel confident that vaccinating was the right choice. When I read a much larger study that showed that viral and bacterial infections (that we currently vaccinate against) can trigger autoimmunity, it allowed me to reconsider my stance against vaccines.



Viral and bacterial infections can trigger autoimmunity. Nobody ever talked about that in my anti-vax forum. I had no clue, because I was stuck in an echo chamber that reinforced my belief that *vaccines* cause autoimmunity. For instance, there seems to be a causative factor between people who have had the Epstein-Barr virus and getting multiple sclerosis later in life (Soldan and Lieberman 2022). As a result, a new vaccine is being developed, and we will be able to see the results over time, just like we now know that the HPV vaccine, Gardasil, prevents cervical cancer. There are also correlations between rotavirus, influenza, measles, mumps, and rubella infections with autoimmunity (Smatti et al 2019). Bacterial infections can also trigger autoimmune disease and this is an extra benefit of vaccinating against Hib, tetanus, diphtheria, pneumococcal and meningococcal bacteria as well (Kim et al. 2014).

As for that tiny ASIA study that scared me, two much larger data sets showed there is no correlation between aluminum adjuvants and autoimmune disease (Ameratunga et al. 2017). The authors concluded that current studies do not support the existence of ASIA. Most experts consider the ASIA hypothesis a myth and there isn't science that supports it. I now understand that vaccinating my children protects them against disease and also has the potential to reduce the risk of autoimmune disease by protecting them against those illnesses. For what it's worth, I caught up all 3 of my children on an accelerated vaccination schedule and none of them are autoimmune a year later, despite their extra genetic risk from being my kids. I feel reassured that I made the right decision after reading a recent study that the MMR vaccine actually reduces the risk of inflammatory bowel diseases later in life.

Learn more about HPV and vaccination

IKC's HPV
Toolkit



Find resources and references



Reviewed by: Vincent Iannelli, M.D., Pediatrician, and Founder of Vaxopedia.org



Does mRNA Alter DNA?

By Heather Simpson,
Back to the Vax

One of the biggest rumors floating around about the mRNA inside of the Moderna and Pfizer COVID-19 vaccines is that mRNA permanently alters our DNA. On the surface, this seems to make sense. If mRNA means “messenger RNA”, that means they can enter a cell to teach it what to make. To inject something with that much power seems like it could have a high risk of altering the DNA inside the cell as well, right?

Nope, it can't. Let's dive in.

What exactly is mRNA? mRNA is a type of RNA that is necessary for protein production. That definition doesn't help if you don't know what RNA is. Ribonucleic acid (RNA) is an acid that is present in all living cells, and nucleic acids are large molecules that play essential roles in all cells and viruses.

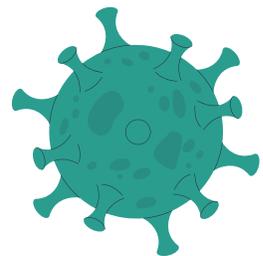


Scientists created vaccine mRNA in a lab to teach our cells how to make a protein or piece of a protein, to fight off COVID. Once you get jabbed, the mRNA immediately enters muscle cells in your arm or thigh and gets to work. Once mRNA inside of your muscle cells, they use the cell's own mechanisms to produce a piece of the spike protein. This is the protein found on the surface of the COVID virus.



Then, the body immediately starts to rid itself of the mRNA protein, leaving the body as waste. The decaying mRNA half-life can be as short as 1-2 minutes and up to around 10 minutes.

Next, our cells proudly display their new spike proteins on their surfaces. In doing this, our immune system sees them, recognizes they don't belong there, and triggers an immune response to produce antibodies and activate other immune cells. This is how your body uses the vaccine to learn to fight off COVID, without you being exposed to it.

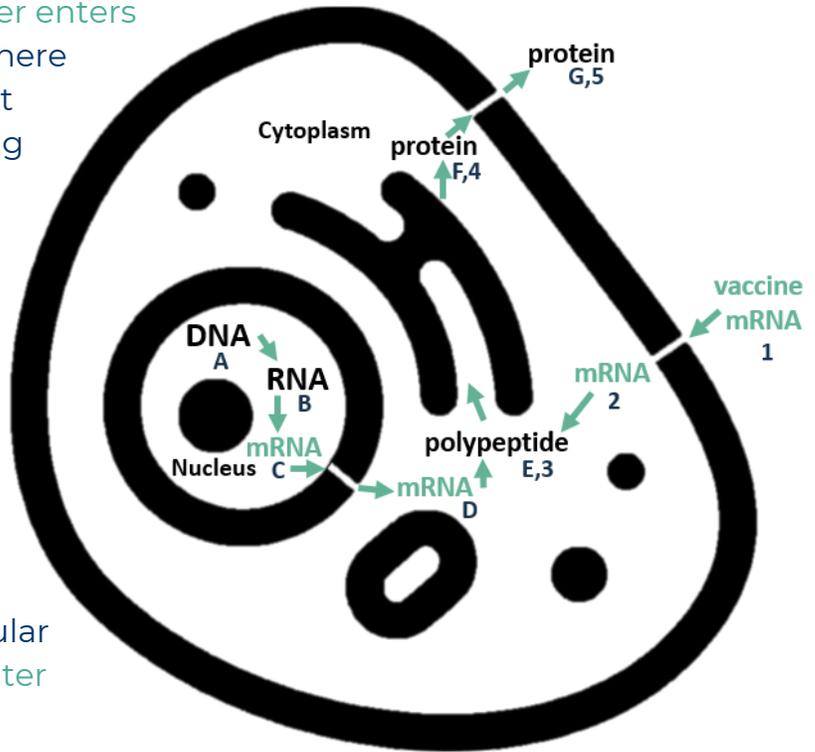


So why can't this mRNA alter our DNA?

The mRNA from these vaccines **never enters the nucleus** of your cells, which is where your DNA is located. This means that the vaccine has a 0% chance of being able to alter our DNA.

This is shown in the image of the cell:

mRNA from the vaccine enters the cytoplasm, and is then translated into a polypeptide, folded, and then released from the cell into extracellular fluid. **At no point does the mRNA enter the nucleus.**



After all, if the mRNA from COVID vaccines could alter our DNA, then mRNA from the virus itself, when you get COVID, could also alter our DNA. And that doesn't happen either!

When I saw how physically impossible it was for the mRNA in COVID vaccines to change our DNA, I realized I had nothing to worry about and I got vaccinated. It's a big rumor and a compelling argument, but it's still a lie nonetheless that makes no sense when you look at the science behind it.

Reviewed by: Rod Cook, Ph.D., Human Bequest Coordinator and Anatomy Facility Manager, School of Human Anatomy and Pathology at James Cook University



Does the COVID Vaccine Cause Infertility & Miscarriage?

By Heather Simpson,
Back to the Vax

Rumor: “The COVID vaccine causes infertility and miscarriage.”

This is one of the most powerful rumors I've seen floating around online for what seems like forever now. And the thing that gets you - at least, this is what convinced me when I was an anti-vaxxer- is how scientific the anti-vaccine argument sounds when explaining exactly how the COVID vaccine could cause infertility and miscarriage.

The theory goes that the vaccine contains a spike protein called Syncytin-1, which is vital for the formation of the human placenta. Their logic is that if the vaccine causes the body to form an immune response to Syncytin-1, then the body will also attack the placenta.



That checks out at first glance. It *sounds* sciency!

At the time, it really hit home for me because it made sense. That's the tricky thing about anti-vaccine information. It can make sense and sound extremely detailed and scientific and still be 100% wrong.

IKC's Vaccines for My Baby During Pregnancy Education Module

Learn about the vaccines you need during pregnancy to protect both you and your baby.





Are you ready for this theory to completely fall apart?

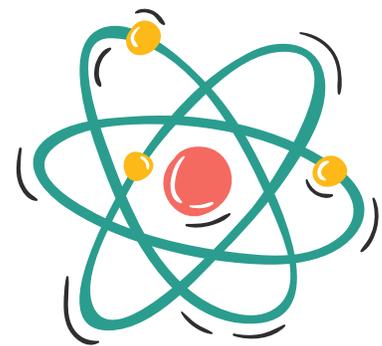
A group of independent, reproductive health experts published an article "COVID-19 Vaccine and Infertility: Baseless Claims and Unfounded Social Media Panic" in the American Society for Reproductive Medicine's Fertility and Sterility Journal. They really got to the bottom of it. First of all, they reassured us that there is no Syncytin-1 in the COVID-19 vaccine, just a spike protein that "resembled" Syncytin-1.

However, anti-vaxxers took this bit of info even further, stating that if the spike protein "resembles" Syncytin-1, then your body will get confused and attack the Syncytin-1 needed for pregnancy, therefore rendering you infertile.

The health experts in that article, however, decided to look closely at the genetic sequences of the spike protein vs Syncytin-1. They found that genetically, the COVID-19 vaccine spike protein is so dissimilar to Syncytin-1, that it's only as similar as any other protein in the human body is to it!

So...basically...not at all. They are two different genetic sequences and two different proteins.

Knowledge is power. And this argument, while extremely compelling at first, falls apart the minute the science hits it.



Reviewed by: Melody Mitchell, Medical Oncology Researcher



Does the HPV Vaccine Cause Infertility?

By Heather Simpson,
Back to the Vax

Before I was even anti-vaccine, I heard the rumors constantly— “Whatever you do, do not get the HPV vaccine, you will end up infertile.”

Much later on, when I became pro-vaccine and intended to vaccinate my child, I always held the HPV shot as an exception. I internalized those rumors. I met women who swore the HPV vaccine made them infertile. I couldn't and wouldn't risk it. There was not even a chance I was going to vaccinate my children against HPV.

The rumor that this shot causes infertility originates from several Facebook posts that went viral—all claiming that the vaccine causes premature menopause, or Primary Ovarian Insufficiency (POI). However, a study of close to 59,000 girls who received the vaccine showed only one who later developed possible symptoms of POI. Out of 59,000 (Aug 21 Journal Pediatrics). The study's lead author, Allison Naleway, said that she would have expected to see more of an increase in POI cases if there was a link, but they simply found no elevated risk for these girls.

What speaks to me the most, though, is the thought of my daughter contracting HPV and subsequently developing ovarian . is a realistic, evidence-based concern if she was not protected by the vaccine; rather than the completely unsubstantiated infertility risk.



IKC's HPV Toolkit



Learn about the importance
of vaccinating against HPV.

You know what absolutely is linked to infertility? **Ovarian** . This is unquestioned in the medical world.

1 in 59,000 girls **HINTED** at possible symptoms of POI-meaning it wasn't even a for sure thing. Do you know what the lifetime odds of getting struck by lightning are?

1 in 15,300.



You are **about 4 times as likely to get struck by actual lightning** than to be the girl in the study who possibly had symptoms of diminished ovarian reserve.

You can safely and confidently put the infertility rumor to rest. It was scary and was one of the hardest rumors for me to overcome, but it's worth putting fear aside and gripping onto the science and hard evidence we have that show HPV vaccines are a safe choice for your child.



Reviewed by: Melody Mitchell,
Medical Oncology Researcher



COVID-19 and Children: Is it Just a Cold?

By Lydia Greene, Back to the Vax

Pediatricians will tell you that while COVID-19 can be mild for most children, they are seeing an increase in certain health problems after even mild infection.

Children are not immune to long COVID (Funk et al. 2022), and experience symptoms like fatigue, anosmia (loss of smell), ageusia (loss of sense of taste), dizziness, fainting, hives, autoimmunity and breathing issues long after the initial infection is over. The virus that causes COVID-19 is a new one, so we still do not know the long-term effects of infection. There are other vaccine-preventable diseases that will present as mild in most children, but we vaccinate because we know that there are long-term effects. For example, approximately 70% of all polio infections in children are asymptomatic (CDC), but 1/200 infections of poliomyelitis leads to irreversible paralysis (WHO). When the polio vaccine became available parents lined up immediately. Contrast that with today. If polio happened today in the world of social media, I fully believe we would see the same low vaccination rate that we see for children and COVID-19. Parents have been scared by disinformation and when their children get COVID-19 they cross their fingers and hope it's mild. They tell themselves that only immune-compromised children will get severely sick or die. The data doesn't support this theory. Yes, immune-compromised children have a higher risk, but the risk is also present for healthy children. Since the beginning of the pandemic to January 11, 2023, 1,620 children have died from COVID-19. A study published in September 2020 on COVID-19-associated deaths among persons aged <21 years reported 25% were previously healthy with no pre-existing conditions (CDC MMWR). That is much higher than the diseases we already vaccinate for.

I see anti-vax doctors pushing the narrative that children shouldn't be vaccinated for COVID-19, but none of them are pediatricians. These doctors are incentivized by money and followers to spread falsehoods when they have never treated a child seriously ill with COVID-19. They speak on the side effect of myocarditis, which is a risk in teen boys and young men post-vaccination (1 in 6,837). They fail to point out that the risk of myocarditis following COVID-19 infection is 6x higher and much more severe when caused by infection (Singer et al. 2022). Millions of children under 12 have been vaccinated and there are no myocarditis cases like were observed in teen boys. Also, the fact that this increased risk was caught shows that the monitoring systems are working. That is a good thing. Myocarditis from the vaccine was much milder as opposed to myocarditis from COVID infection or other viruses (Mevorach et al. 2021).

COVID can cause many more complications than myocarditis. For example, multisystem inflammatory syndrome in children (MIS-C) is a serious post COVID complication and vaccines reduce the risk of that occurring after an infection (Yusuf et al. 2020).

Table S1. Demographic and Clinical Characteristics of the Study Participants.

In the table, you can see that death is rare for children overall, but non-existent in vaccinated children. Hospitalization was also lower in vaccinated children.



Characteristic	No. of Children	SARS-CoV-2 Infection		Hospitalization		Death	
		No. and Proportion		No. and Rate Out of Infections*			
		All	Omicron	All	Omicron	All	Omicron
Total	887,193	193,346	103,338	309 (0.4%)	99 (0.4%)	7 (0.0%)	3 (0.0%)
Vaccination Status							
Unvaccinated	614,036 (69.2%)	174,281 (90.1%)	84,466 (81.7%)	294 (0.5%)	84 (0.5%)	7 (0.0%)	3 (0.0%)
1 dose	37,759 (4.3%)	3,048 (1.6%)	2,924 (2.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
2 doses	228,123 (25.7%)	15,986 (8.3%)	15,917 (15.4%)	15 (0.1%)	15 (0.3%)	0 (0.0%)	0 (0.0%)
Booster	7,275 (0.8%)	31 (0.0%)	31 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

(Dan Yu Lin et al 2022)

As a parent who was once against vaccination, I witnessed the effects of vaccination in my own home. It verified that changing my mind was the right thing to do and the data supports this. My 3 children were caught up on all their missing vaccines in just over a year. In my experience, in terms of minor side effects, the COVID vaccine was the mildest vaccine they received. Side effects are consistent with other vaccinations and are typically mild. My 3 children tolerated them well, and my youngest had zero side effects. Unfortunately, my youngest couldn't get vaccinated before catching COVID. His vaccinated siblings had a minor course of the disease and recovered quickly. My youngest was not so lucky. The virus affected every body system. My son is a healthy, active, and robust little boy. He recovers from colds quickly with no severe illness. COVID was a different beast altogether. He had high fevers, ear infections, viral pink eye, fatigue, belly pain, and pneumonia. He needed emergency care. I had never seen any of my children this ill. It took him weeks to recover and had the strangest fatigue spells in the weeks that followed. This infection did not stop him from getting COVID again 4 months later. It was almost as bad except he didn't get an ear and lung infection that time.

Studies show hybrid immunity is best, ideally being vaccinated before infection. My youngest son wasn't fortunate enough to be vaccinated either time but that didn't stop me from vaccinating him at the first opportunity I had. COVID infection is a terrible lottery and you want to do what you can to prevent serious outcomes like what happened to my son, or worse. The data shows that vaccines will skew the odds in your favor.



Reviewed by: Kristen Stuppy, M.D., Kansas Pediatrician



Vaccine Inserts & the Myth of the DTaP Cry

By Lydia Greene, Back to the Vax

The myth about DTaP cry refers to the belief that the DTaP shot causes swelling in a baby's brain, referred to as encephalitis, that in turn causes the baby to cry in a certain pitch that is referred to as the "DTaP cry." Using the possible side effects listed on vaccine inserts is very prevalent in anti-vax circles to cause fear and convince new parents that something went wrong during their child's first vaccinations. I am not arguing that vaccines are risk-free or symptom-free, but that they are low-risk. The benefits of vaccination far outweigh any risk of side effects. The benefits of vaccination not only protect your children, but your grandparents and your grandchildren.

You likely exist today because you or someone in your lineage had access to one of two things: vaccines and antibiotics.

We take calculated risks every day. We drive cars, we let our kids play at the park, we compete in contact sports, and we attempt DIY home projects. These things can have disastrous outcomes and yet we do them often.



The risk of vaccines is far less, and yet some of us pause because stories are powerful, despite being the lowest form of evidence. In *Vaccine Adverse Events: Separating Myth From Reality*, the research shows disease is far riskier than the vaccine itself (Spencer et al. 2017). For example, encephalitis occurs in 1 in 1000 cases and the vaccine has a 1 in a million risk. It is much safer to be vaccinated considering that the MMR vaccine is very effective in preventing measles.

When I brought my daughter for her 8-week vaccines, I was filled with hesitancy and fear. I had this idea that once we gave her vaccines, we could not undo it. What if something went wrong? At this point, I was overcoming breastfeeding issues, and this natural parenting forum helped me so much, where my own doctor didn't give me support. I may have heard some anti-vax myths at that point, but I had a background in science and still planned to vaccinate her. When I brought her home later that night, she started crying and wouldn't stop. It was impossible to nurse her, and in between, she would sleep so deeply that it scared me. Looking back, of course, she slept deeply because crying likely exhausted her. The nurse I called dismissed my concerns and said it was normal. When I went to my newfound, "natural" parenting community, they were quick to point out that my daughter's reaction was serious.

"I should just read the vaccine inserts, and I would know what happened."

So that's what I did, and sure enough, it says that right in the insert. Here is an excerpt from the INFANRIX DTaP insert.

5.4 Adverse Reactions following Prior Pertussis Vaccination

If any of the following reactions occur in temporal relation to receipt of a pertussis-containing vaccine, the decision to give any pertussis-containing vaccine, including INFANRIX, should be based on careful consideration of the potential benefits and possible risks:

- *Temperature of 40.5 C (105 F) within 48 hours not due to another identifiable cause;*
- *Collapse or shock-like state (hypotonic-hyporesponsive episode) within 48 hours;*
- *Persistent, inconsolable crying lasting 3 hours, occurring within 48 hours;*
- *Seizures with or without fever occurring within 3 days.*

So while it did give me what I thought was a reason to never allow a DTaP vaccine in my daughter ever again, I didn't even listen to the insert and talk to my doctor about what had happened. When I saw "Nervous System Disorders- Encephalopathy, headache, hypotonia, syncope" in the Post Market Experience Section, I completely ignored that it also said, "Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to vaccination."

WHAT EXACTLY IS A VACCINE INSERT?

It is a legal document. All pharmaceutical products have a package insert - a pamphlet with legal details - and vaccines are no different. They must list all possible risks and post-market adverse events, so when a doctor goes against the insert, the manufacturer is not responsible. Just because something was reported as an adverse event, doesn't mean it was caused by the vaccine. In the Gardasil HPV vaccine insert there are gunshot wounds and automobile accidents listed in the adverse events. Why? Because they track all negative events after vaccination during the studies, even if they have nothing to do with the vaccine. This should actually make you feel better about the process because NOTHING is hidden. They are being transparent. In the pediatric COVID-19 vaccine trials, a swallowed coin is in the adverse events. Did the vaccine cause a child to swallow a coin? Of course not.

So what happened to my daughter? Why was she so distraught? Why the screaming, poor feeding, and deep sleeping? Was her brain actually inflamed?

Nope.

In catching up on my own vaccinations, I also got a Tdap. IT HURT. My arm hurt every time I moved it.



Learn about recommended vaccines for adults.

Vaccines for Adults

Now picture an 8-week-old baby's leg. My daughter was only 8 lbs or so at her 8-week check-up. Her legs were tiny. The likely explanation is pain - a localized pain reaction. Studies show children fully recover from such reactions (Blumberg et al. 1988, 1993). They also show it is unlikely to happen again (O'Leary & Maldonado 2017). My daughter was back to herself on the third day after her shot.

Just like this insert says, this is why it is so important to discuss with your doctor and not just assume something like encephalopathy happened. There are many more symptoms of encephalitis than just what my daughter went through. My daughter had none of the other symptoms. While the thought of encephalitis is scary, it is also important to note that many of the diseases we vaccinate for can cause encephalitis at a much higher rate than any vaccine. The vaccine is statistically much safer than the disease.

Today, my daughter, along with my other two children, are fully caught up on their vaccinations, including DTaP. Outside having some minor side effects, they all tolerated their vaccines just fine. Don't allow these stories to sway you.

Vaccines for Adolescents

Learn about recommended vaccines for adolescents.



Reviewed by: Vincent Iannelli, M.D., Pediatrician, and Founder of Vaxopedia.org



Can Vaccines Cause SIDS?

By Lydia Greene, Back to the Vax

A popular anti-vaxxer has a heartbreaking tale she attributes to vaccines. She claims that she put her child to bed a couple of days after her routine vaccinations and that her daughter died in her sleep as a result. Her story is very compelling and it strikes at the heart of any parent. However, the evidence does not indicate that vaccines caused the infant's untimely death. The evidence of the case is that the child tragically died of unsafe sleeping circumstances.

The infant was sleeping beside her and at some point, apparently, ended up on her stomach. During the autopsy, they found that the infant had creases in the skin on her face from a blanket and a pooling of blood on the front of her body, which indicated she died while face down. To spare the parent the guilt of responsibility, they classed it as undetermined (Sudden Infant Death Syndrome or SIDS) during the report. When the parent contested the cause of death and asked for an inquiry, they formally changed it to positional asphyxia (suffocation due to sleeping position). True SIDS is rare, and there are many things we can do to ensure that infants are sleeping safely. I will include references so you are informed on how best to protect your infant from a similar fate.

UNDERSTANDING WHAT SIDS IS AND IS NOT

SIDS stands for Sudden Infant Death Syndrome. It occurs in infants under 12 months of age, and although science is getting close to understanding why it happens, we are still not quite sure. The Boston Children's Hospital states that "While the cause of SIDS is unknown, many clinicians and researchers believe that SIDS is associated with problems in the ability of the baby to arouse from sleep, to detect low levels of oxygen, or a buildup of carbon dioxide in the blood." It is not accidental suffocation. SIDS is a diagnosis of exclusion, including the exclusion of accidental suffocation. This is why safe sleeping habits are so important.



WHAT DO THE DATA AND RESEARCH SAY ON SIDS AND VACCINATION?

Well, there are a few studies that demonstrate no association between SIDS and vaccination, and a study that shows vaccinated babies have a lower risk of SIDS. There is a study from Sweden (Lindgren et al. 1997) I refer to. In the 1980s, parents in Sweden became concerned that SIDS was caused by infant DTP vaccination. For a few years, Sweden stopped vaccinating infants for DTP. This resulted in children getting pertussis at a much higher rate, and in infants, pertussis is quite dangerous. There was no decrease in SIDS rates.

What did decrease SIDS rates was a change in recommendations like the Back to Sleep campaign (a campaign that encouraged parents to place their infant on their backs to sleep) and other recommendations. Another study (Vennemann et al. 2007) demonstrates lower SIDS rates in vaccinated babies by half. They have also done studies that demonstrate there is no relationship between the occurrence of SIDS and the timing of vaccination. This study shows that occurrences appear to be random in timing (Brotherton et al. 2005). With random occurrences we will see that on occasion SIDS will occur after vaccination, but the correlation does not indicate causation. Parents want to do everything they can to lower SIDS risk, but avoiding vital childhood vaccinations is not the way.

Alone, Back, Crib



For current guidelines on safe sleep visit the AAP website (www.aap.org).



Reviewed by: Thomas A. Nguyen, D.O., Pediatrician



VAERS Reports: Does Correlation = Causation?

By Lydia Greene, Back to the Vax

Before COVID-19 vaccines arrived on the scene, not many people knew what VAERS was. You may see all kinds of misleading information on vaccination using VAERS reports.

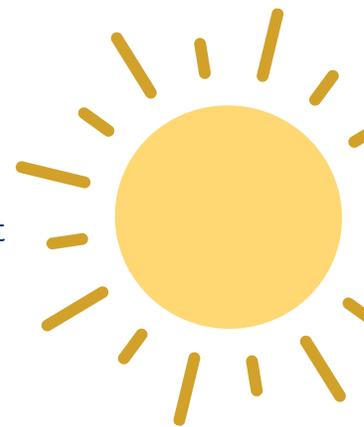
WHAT? IS VAERS?

It stands for the Vaccine Adverse Event Reporting System. Anyone can access it and anyone can make a report. It is a vaccine monitoring system and its purpose is to detect any issues that are above baseline occurrence. There are other monitoring agencies that investigate further and even investigate causation. VAERS can not infer causation because there is no control group.

Every negative symptom has a rate of occurrence in a population. If you give a million people a simple glass of water, a few will develop , a few will die, and a few will get diagnosed with a new condition. Does that mean it was the water? No.



Here's another example. Every time ice cream sales rise so does the occurrence of sunburn. Does ice cream cause sunburn? No. What is the actual connection? Hot sunny weather increases ice cream sales and sunburn.



During the pandemic, VAERS experienced an increase in the number of deaths reported. This was likely due to increased awareness of VAERS and the publicity surrounding the COVID vaccine and its safety. We saw this with the HPV vaccine, Gardasil, too. Can we be sure the vaccine is to blame? No. However, the cause of death in these case reports is thoroughly investigated when possible. The report will remain in the VAERS database, even if they can not attribute the death to the vaccine.



A common anti-vaccine trope is that “only 1-10% of vaccine reactions are reported to VAERS according to a Harvard Study”. That is a terrifying statistic. Does this mean that vaccines are up to 100x worse than we are told?

No. Here's why:

- 1 That statistic is an FDA statistic on medication adverse events. It's not about VAERS and it's not about vaccines.
- 2 When anti-vaxxers say it's a Harvard study, they are implying it came from Harvard University, but it can be traced to a Harvard Pilgrim grant.

Harvard Pilgrim is a health insurance company. This was also just a hypothesis but not actually proven by Harvard Pilgrim. Anti-vaxxers make the implication that it was Harvard University on purpose, to make it seem like it has a lot more weight and credibility behind it than there actually is. Logically we can assume that minor adverse events like fever, headache, and rash are underreported but severe issues like death and disability are not.

In Rosenthal and Chen's study, they show us that a serious reaction to the oral polio vaccine had a reporting rate of 72% and the less serious rash reaction to MMR had a reporting rate of just 1%. Again, anti-vax proponents don't want people to use logic, they want people to be very afraid of vaccination.

Why is this important?

Well, millions of people have been vaccinated for COVID-19, many more than once. So, let's look at the current VAERS information:

At the time I wrote this, the CDC reported that 600 million COVID-19 vaccines were administered in the USA with 16,000 preliminary reports of death. If one were to extrapolate the under-reporting myth it would mean deaths could be between 160,000 to 1.6 million deaths. 1 million people died of COVID-19, so this implies that the death rate for the vaccine is somehow worse, and we didn't notice. That is so unlikely it borders on impossible that somehow nobody noticed the vaccine was killing this many people. Also, this was not seen in the clinical setting. All excess COVID hospitalizations were in the unvaccinated, or the vaccinated who were immunosuppressed. 26 deaths were reported for every million COVID-19 vaccine doses given.

Now recall what I said earlier about the water, and you know that some of those deaths likely had nothing to do with the vaccine, and just happened to coincide with the timing. Any death is a tragedy, but when deciding to vaccinate one must consider the risk of the vaccine vs the risk of getting the disease, and far more than 16,000 people died of COVID-19.



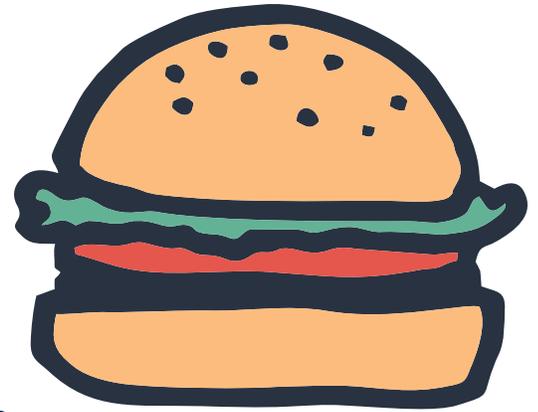
Reviewed by: Victoria Crabb, Ph.D, Epidemiologist



Were COVID-19 Vaccines Rushed?

By Lydia Greene, Back to the Vax

There is a difference between something being rushed and something being prioritized and expedited. The word "rushed" implies steps were missed. Say you are at a restaurant and you order a cheeseburger.



Somehow, your cheeseburger was forgotten while the kitchen made the rest of your table's orders. Panic ensues and they quickly throw your order together in hopes that everyone will get their food at the same time. You get your burger and it's missing the cheese, and it has pickles when you specifically said you didn't want them. That is "rushed". Let's take that same situation except this time they bring out everyone else's food and then tell you it will just be a few moments longer for your burger. In the kitchen, they have now chosen to prioritize this burger over the other orders, and when it gets to your table it's exactly as you wanted it. In both situations, the burger was desperately needed, but only in one case was it carelessly done with errors. I know this is an oversimplification, but words matter. COVID-19 vaccines were not carelessly rushed, they were expedited and prioritized over other things. If a job takes 1 person 10 hours, then 10 people can do it much faster. Not everything is like this in determining safety, as some things will take time no matter what, but those vital steps were not shortened.

The COVID-19 vaccine went through the same steps as other vaccines. None were skipped.

Exploratory Stage:

This step was already well underway in terms of mRNA technology decades beforehand. We had a lot of information to go off of.

Preclinical Stage:

This stage includes testing in-vitro on animals. Despite several myths that all of the animals died in preclinical trials, this is untrue. However, animals are destroyed after testing and tissue samples are further analyzed.



Clinical Stage:

This stage usually takes a long time. However, money, resources, and person-hours were devoted to getting this done efficiently. Trials were planned with overlap to save time. During the process, stage 1 overlapped with stage 2, and stage 2 with stage 3. Stage 4 is post-market and continuous, as with all new drugs and vaccines. This does not mean any steps were skipped, nor does it mean we don't know long-term side effects. Over 2 years have passed since stages 1-3: we have a lot of data. Resources were readily available, as there was no shortage of trial volunteers and scientists who chose to prioritize making COVID-19 vaccines. While vaccines are monitored for long-term effects indefinitely via post-market surveillance, vaccine trials show that long-term effects do not occur beyond 8 weeks. There is no more vaccine left in the body and the immune system has finished responding well before then.





Regulatory Review & Approval Stage:

During this step, we want to protect the most vulnerable, so the government and FDA issued an Emergency Use Authorization (EUA). First, the elderly, immunocompromised, and healthcare workers were given priority. When no major safety signals were identified, then other groups were encouraged to get vaccinated. Once each demographic of people had no major side effects, clinical trials were started for children. It began with older children and as each age group demonstrated safety, they started trials with younger populations. Now mRNA vaccines are fully approved and not under EUA. There are now traditional subunit vaccines (like Novavax) available for those still hesitant about mRNA technology and the side effect profiles of the vaccines are similar.



Manufacturing Stage & Quality Control Stage:

These last two steps I can personally speak to, as I used to work at a pharmaceutical manufacturing plant. Pharmaceutical plants must submit to a 3rd party auditor and get certified by current Good Manufacturing Practices (GMP). This applies to drug manufacturers that supply medications from outside the US as well. Plants must be fully inspected before manufacturing a new product and demonstrate their procedures from beginning to end. Everything is tested including starting materials, cleaning materials, and even containers used for packaging. My job was quality control. Every single task is documented. Documents must remain on site for a certain number of years and then they are moved to storage for another number of years. Before a plant can begin to manufacture, the manufacturing process must be approved. Then, constant quality control is done with thorough records. As a quality control chemist, I couldn't even write on scrap paper as everything had to be retained. All calculations are kept, and everything is documented and saved. If a GMP audit finds something that could potentially harm patients, the plant is shut down and the public will be notified if there is any risk to them no matter how small. FDA warnings can be alarming, but they are evidence of a system that catches issues. Though I am new to vaccinating as a formerly hesitant parent, I do trust the manufacturing process is being done with care.

Multiple vaccine monitoring agencies like VAERS, V-SAFE which was specifically made for COVID vaccines, and the Vaccine Safety Data Link which goes through the raw data from VAERS to determine both causation and safety signals. COVID vaccines were not rushed, they were expedited with great care.

VAERS Vaccine Adverse Event Reporting System
www.vaers.hhs.gov


v-safeSM
after vaccination
health checker



Reviewed by: Melody Mitchell, Medical Oncology Researcher



Do Vaccines Cause Cancer?

By Heather Simpson,
Back to the Vax

When I was an anti-vaxxer, I remember cancer being a major focus. I actually believed vaccines could cause my child to get cancer! By not vaccinating my daughter, I believed I would save her from all forms of cancer, forever. I viewed it as a magical secret that allowed me to never have to deal with childhood cancer.

And then my friend's unvaccinated child got cancer... My world was shaken. I didn't understand how that was possible. Everything I thought I knew came crashing down.

Now, coming out on the other side, I realize that not only do vaccines NOT cause cancer, there is research to show they can help PREVENT cancer.



So why do some people think that vaccines can cause cancer?

Between 1955-1962, the polio vaccine became contaminated with a monkey derived virus called SV40 (Simian Virus 40). Of course, experts didn't find this out until much later. By then, tens of millions of people around the world had received SV40 contaminated poliovirus vaccines.

Eventually, lab studies on mice hinted at an association between SV40 and some cancers. These studies also showed that SV40 had been found in some tumors. However, a 2002 National academics review of the subject determined there was not enough data to establish a causal link. And a very large-scale expert review in 2005 concluded that a link was unlikely, especially since SV40 was found in tumors of people who never had a polio vaccine and there was no extra risk of cancer in people who had a potentially contaminated polio vaccine.

Of course, the polio vaccines in current use contain no trace of SV40.

In fact, some studies show that childhood vaccinations may actually lower the risk of cancer.

A study of 439 children from 1989-1993 suggested that infants receiving the conjugate Hib vaccine may be at a reduced risk of childhood acute lymphoblastic leukemia (Groves et al., 1999).

And of course, there is the fact that HPV vaccines can reduce your child's risk of developing cervical cancer, oral cancer, and throat cancer. The hepatitis B vaccine also reduces their risk of liver cancer!

IKC's HPV Toolkit

Learn about the importance of vaccinating against HPV.



As parents, we do not need to worry about our child getting cancer from a vaccine. While it is a compelling, completely fear based argument, it's false.



You can confidently vaccinate your child knowing that, at worst, you are not giving them cancer, and at best, you are helping to prevent cancer.



Reviewed by: Rod Cook, Ph.D., Human Bequest Coordinator and Anatomy Facility Manager, School of Human Anatomy and Pathology at James Cook University



Does the COVID Vaccine Cause Sudden Adult Death Syndrome?

By Heather Simpson,
Back to the Vax

If you have an anti-vax friend on your Facebook list, the odds of you coming across an article that supposedly links sudden death in adults to the COVID-19 vaccine is pretty high. An article from Daily Mail recently made the massively viral social media rounds, with the fear-inducing title “Healthy Young People are Dying Suddenly and Unexpectedly From a Mysterious Syndrome - as Doctors Seek Answers Through a New National Register.”

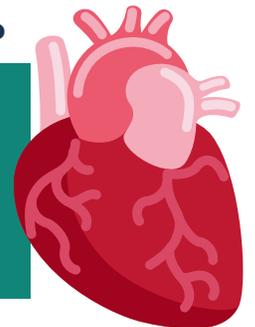
This post was often shared with the caption “Hmm...I wonder what new medical intervention this could possibly be linked to...” with sarcasm spilling over. The term “Sudden Adult Death Syndrome” was coined and taken over. Fast.

Before we can even begin to break down how this argument holds zero merits, we have to start with the most basic thing this rumor got wrong: the diagnosis. It is not called SADS because it stands for “Sudden Adult Death Syndrome.” It is called SADS because it stands for “Sudden Arrhythmic Death Syndrome”. Meaning it’s a literal heart condition and not simply an unexplained cause of sudden death.

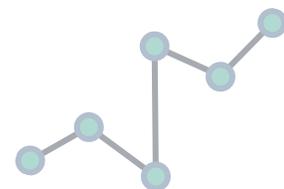
WHAT?

IS SUDDEN ARRHYTHMIC DEATH SYNDROME?

Sudden Arrhythmic Death Syndrome is caused by one of several genetic conditions that can disturb the heart’s rhythm and can lead to sudden death in seemingly perfectly healthy young people.



The thing is, life goes on at the same rate it did before and after the COVID vaccine came out. Life happens at the same exact time as vaccinations happen, so if a case of SADS were to happen in June of 2022, it was going to happen with or without the vaccine. Unfortunately, if that person just so happened to have recently been vaccinated, then people are going to connect the imaginary dots. It’s what we do. We are curious beings who desperately want to make sense of the chaos of the world.



According to Dr. Michael J. Ackerman, the professor at Mayo Clinic College of Medicine and chair of the SADS Foundation Board of Directors, "There's not a single signal of increased LQTS events or CPVT events (major players in SADS) among diagnosed and treated patients who've been vaccinated [against COVID-19]."

LQTS and CPVT are two of the main genetic conditions that can cause SADS. Those two conditions haven't had any increase in events since before the vaccine. So, like we just touched on, if John Doe was going to die of SADS in June 2022, he was going to die of SADS with or without the COVID-19 vaccine.

None of us want to believe that the vaccine we give our child might cause them to drop dead. That's horrifying. And it's not true. But fake news breeds fear, and fear is powerful. That's why this argument is so pervasive and compelling on social media.

Sudden death is not linked to the COVID vaccine.

IKC's COVID-19 Resource Page

Resources at the state and national level for vaccine information, guidance and data, and tools to effectively educate and communicate about the COVID-19 vaccines.



Reviewed by: Vincent Ianelli, M.D., Pediatrician, and Founder of Vaxopedia.org



COVID-19's False Profits

By Lydia Greene, Back to the Vax

Years ago, Andrew Wakefield published an article that made the measles vaccine a bad guy by connecting it to autism and gut issues. However, his main plan after this was to develop and patent a new measles vaccine after scaring parents about the old one. A similar situation has occurred with COVID-19 vaccines, with some doctors spreading misinformation. Dr. Robert Malone and Dr. Geert Boosche both had plans to make their own COVID-19 vaccine, which motivated them to spread misinformation about mRNA technology. It's common for anti-vax scientists and doctors to act like they have selfless concerns. However, if you scratch the surface of their "selflessness", you will find other motivations, like money. Here are a few of the more famous anti-vax doctors and scientists. Many have tens of thousands of followers and make \$50K or more a month. They like to make themselves appear as the underdog against "big bad pharma", but they are anything but the underdog with how much they profit from selling disinformation.

Robert Malone, M.D., Biochemist

- Claims to have invented mRNA. He did not, although he contributed to the technology decades ago as part of a team. None of his former colleagues support him.
- He's vaccinated with mRNA technology.
- He uses the term "mass hysteria" to denounce any criticism.
- Dr. Malone has a COVID-19 vaccine patent.

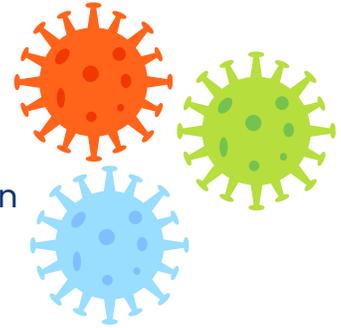


Geert Bossche, DVM., Veterinarian

- Proposes using a new type of vaccine based on natural killer cells, which he claims he is working on, but for which there is no published evidence. He is using the Wakefield formula, like Malone, to discredit the current vaccine in hopes of promoting his own.
- Warned vaccines would lead to the virus becoming more dangerous and lethal via mutation.
- Claimed herd immunity would be established via natural infection. (It wasn't.)

Mike Yeadon, Retired Pharmacologist, and former Pfizer employee

- Declared the pandemic over in October 2020 and a few times after. He was wrong each time.
- Claimed (with zero evidence) that healthy people can not spread COVID-19.
- Claimed (with zero evidence) the vaccine causes infertility in women.
- Founded his own political movement.



Peter McCullough, M.D., Cardiologist

- Claims COVID-19 vaccines can alter your DNA. This is scientifically impossible. He KNOWS this is impossible as he is educated in biology.
- Claims there is “an explosion” in myocarditis caused by the vaccine. There isn’t. Since the risk is 6x higher from infection, we know COVID-19 infection causes the increase.
- Claimed infection causes permanent immunity. It does not.
- Hosts a podcast with advertising.
- Took nearly \$2 million from big pharma 2015–2021

Vinay Prasad, M.D., Oncologist

- Claims that masks don't work and even advocates against them in healthcare settings. This is so dangerous for the immunocompromised, including his CANCER PATIENTS.
- He claims that vaccines are more dangerous for children than COVID-19, despite never treating children with COVID-19 and not being a pediatrician.
- He called masks child abuse, despite never treating children who have suffered abuse.
- Estimates show he makes \$20k a month on Youtube
- Dr. Prasad allows anti-vaxxers to spread misinformation in all of his comment sections, while blocking all his colleagues who constructively criticize him.



Marty Makary, M.D., Surgeon

- Dr. Makary claimed COVID-19 was over several times. He was wrong.
- Claimed that healthy children don't die from COVID-19. 1/3 of pediatric COVID deaths were in healthy children (CDC).
- Claimed that only three children died from COVID-19, when it was hundreds at the time he made the claim. The tally is 1,400 in September 2022.
- Glosses over morbidity caused by COVID-19 in children, like long COVID-19 and MIS-C. Morbidity is a reason we vaccinate children for other diseases. COVID-19 is no different in that respect.



John Campbell, Ph.D. in Nursing

- Early in the pandemic, he reported the case numbers and observed the pandemic unfold.
- He became optimistic about ivermectin and his Youtube subscriptions exponentially grew.
- Will not debate ivermectin, as being challenged by his peers is “unbecoming.”
- Nets \$323, 455 dollars on his Youtube channel, spreading disinformation on ivermectin.
- Was pro-vaccine, is vaccinated, and now recommends unproven treatments for COVID-19 like ivermectin and high doses of vitamin D.

It may seem like a good idea to get a centrist point of view to get both sides. However, just because a doctor recommends other routine vaccines and not COVID-19 vaccines, doesn't mean they are centrist. In fact, it makes them a hypocrite. Vaccines are one of the most basic standards of healthcare we can offer a population. Vaccines have allowed us to forget what diseases like diphtheria and polio even look like. An anti-vaxxer often looks at mortality rates and completely glosses over morbidity associated with vaccine-preventable disease. These "centrist" doctors do the very same thing. As an anti-vaxxer, I followed a few “centrist” pediatricians and even bought their books. I was able to justify not vaccinating my children with the content of their books. Luckily, my kids were protected by herd immunity while I figured out I was wrong about vaccines, and for that, I am grateful. These doctors are marketing themselves to a niche market to make a dollar.

Don't fall for it as I did.



Reviewed by: Jonathan Howard, M.D., Neurologist



Social Media & the Spread of Misinformation

By Heather Simpson,
Back to the Vax

The rate at which false news & information spreads on social media is quite alarming. The most ridiculous stories can be posted on Facebook and be spread thousands of times before your very eyes. Take these wild statistics, for example:

- 80% of us actually have consumed fake news.
- 50% of Americans think that fake news is a significant problem.
- 56% of Facebook users can't recognize fake news that aligns with their beliefs.
- In 2020, there were 1.8 billion fake news engagements on Facebook.

When I first came out of my anti-vax days, I was supposed to get my flu shot at noon on a Friday. I had just started taking an antibiotic and started to have a very bad reaction to it. I started throwing up blood due to the antibiotics causing esophagitis.

Since I started throwing up blood a few hours before my flu shot was scheduled to happen, I canceled my flu shot. However, had I gotten my flu shot early that morning then started throwing up blood, I could have easily taken that to Facebook.



All I would have had to say was “OMG, I just got the flu shot and now I’m throwing up blood!” That would have likely gotten shared many times, even though the flu shot had nothing to do with it.

That is exactly how misinformation spreads. Stories without proven causation run amuck and freely on social media.

One of the most compelling stories for the lack of proven causation is from Dr. Paul Offit, the director of vaccine education at Children's Hospital of Philadelphia, tells this story:



"There's a story that I tell because I think it's a powerful one. My wife is a privately practicing pediatrician in the suburbs. And she was in the office one day and there was a four-month-old sitting on her mother's lap. And my wife was drawing a vaccine into a syringe that she was about to give this child. Well, while she was drawing the vaccine into a syringe the child had a seizure, and actually went on to have a permanent seizure disorder: epilepsy. And there had been a family history of epilepsy, so she was certainly at risk for that. If my wife had given that vaccine five minutes earlier, I think there's no amount of statistical data in the world that would have convinced that mother that anything other than the vaccine caused the seizure, because I think those sort of emotional events are very hard to argue against."

-Dr. Paul Offit



Social media is great, but remember that many of those posts and stories about vaccines that sound scary aren't true. Do your own real research to fight misinformation and spot fake news.

Spot Misinformation using IKC's *Identifying Vaccine Misinformation* Education Module



Learn how to navigate through websites, media reports, and social media platforms to base your health decisions on accurate and reliable information.



Reviewed by: Melissa Ballenthin, RPN



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