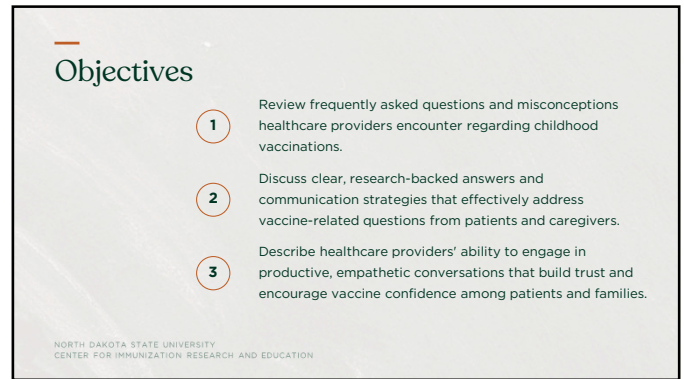
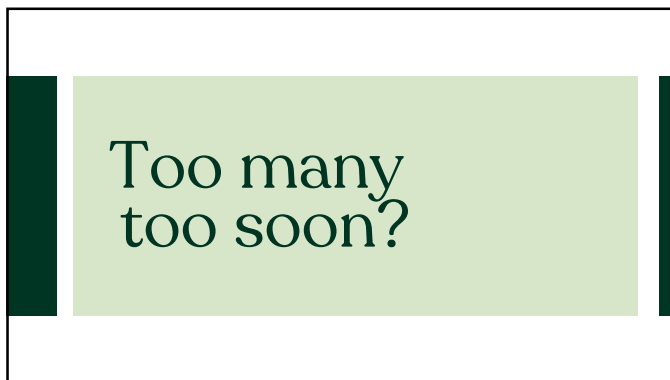




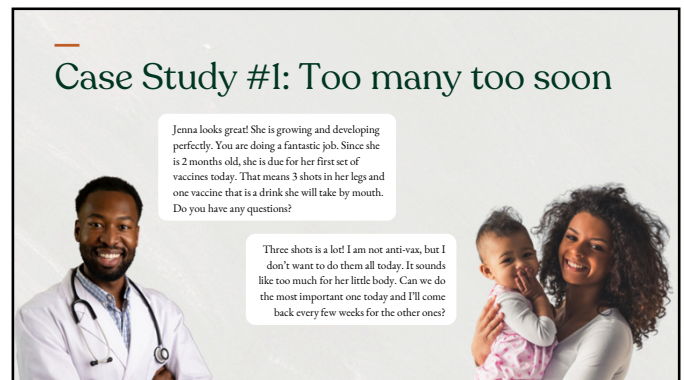
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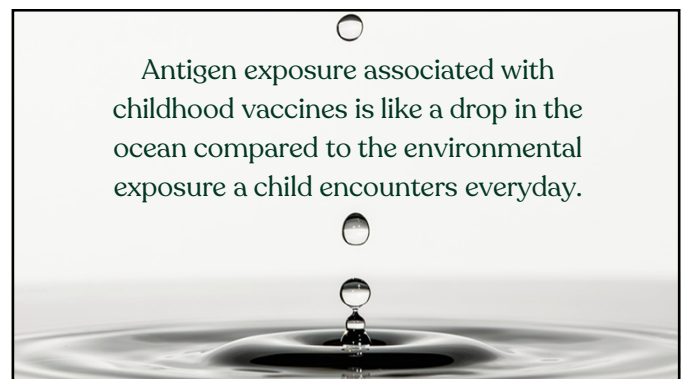
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6

The Facts: Too Many Too Soon

Thousands to Millions of Bacteria & Viruses:
Every day, babies encounter millions of germs—on their skin, in their mouths, through breathing, and by touching people and objects

Safety and Benefit:

Most germs babies encounter every day are harmless, but vaccine-preventable diseases can be serious. Vaccines safely train the immune system to fight these threats, helping prevent severe illness and hospitalization.

Hill et al, Microbiome, 2017; Dominguez-Bello et al, PNAS, 2010; IOM, 2002



7

More Childhood Vaccines - But Fewer Antigens

Number of Immunogenic Proteins and Polysaccharides Contained in Vaccines Over the Past 100 Years

1900		1960		1980		2000		2025	
Vaccine	Protein	Vaccine	Protein/Sugar	Vaccine	Protein/Sugar	Vaccine	Protein/Sugar	Vaccine	Protein/Sugar
Smallpox	-200	Smallpox	-200	Diphtheria	1	Diphtheria	1	Diphtheria	1
TOTAL	-200	Diphtheria	1	Tetanus	1	Tetanus	1	Tetanus	1
		Tetanus	1	WC pertussis	-3000	Acellular pertussis	2-5	Acellular pertussis	2-5
		WC pertussis	-3000	Polio	15	Polio	15	Polio	15
		Polio	15	Measles	10	Measles	10	Measles	10
		Mumps	9	Mumps	9	Mumps	9	Mumps	9
		Rubella	5	Rubella	5	Rubella	5	Rubella	5
		TOTAL	-3217	TOTAL	-3041	Hib	2	Hib	2
						Varicella	69	Varicella	69
						Pneumococcus	8	Pneumococcus	16-21
						Hepatitis B	1	Hepatitis B	1
						TOTAL	123-126	Rotavirus	11-16
								Hepatitis A	4
								TOTAL	146-160

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WC = whole-cell
OTIT, CHOP VEC, 2021

8

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Spacing Out Vaccines

THE PROBLEMS

- Increases child's vulnerability to disease
- Vaccine errors more likely
- More visits =
 - Increased risk of exposure at the clinic
 - More missed work/school
 - Overwhelm healthcare system during busy times
- Easy to get behind
- CDC/AAP schedule is tested and vetted; alternative schedules are not
- Multiple appointments more stressful for kids

OTIT, CHOP VEC, 2021

9

Case Study #1: Too many too soon

It IS a lot of shots! I get it! And certainly having concerns doesn't make you "anti-vax." I want you to feel comfortable with whatever decision you make, so these conversations are really important. Can we talk about why I would recommend getting all of the vaccines today instead of spreading them out?

Sure.

10

Case Study #1: Too many too soon

We give all of these vaccines at this young age because we want to protect Jenna as soon as possible from diseases that can cause serious illness or even death. Spacing them out will make her vulnerable longer. Even though it is a lot of shots, science has advanced so much that stress on her immune system is actually much less than it was when the only vaccine we gave was the smallpox vaccine! There is really no medication that is better studied than these childhood vaccines—we take safety very seriously since we are giving them to young, healthy patients. Does that make sense? What other questions do you have?

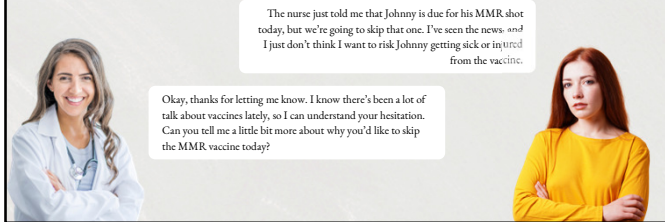
No, that makes sense, I guess we can do them all today.

11

Weighing the Risk of Measles and MMR Vaccine

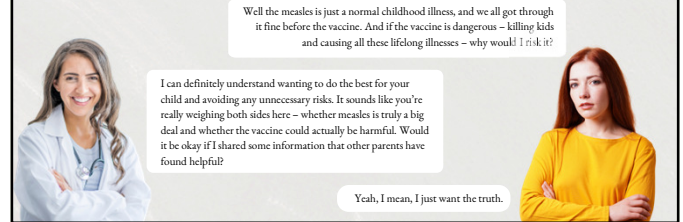
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Case Study #2: Weighing the Risk of Measles and MMR Vaccine

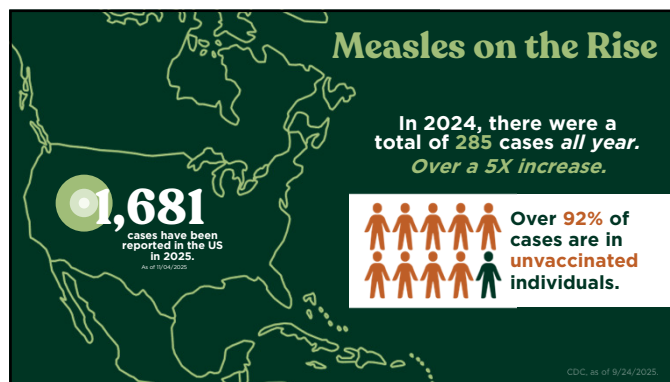


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Case Study #2: Weighing the Risk of Measles and MMR Vaccine



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CNN Health

Worried about splitting up the MMR vaccine into three separate shots? You should be, this doctor says

WHAT PATIENTS ARE HEARING:
Recent media reports suggest the CDC is considering splitting the MMR vaccine into separate shots.
Headlines imply a change in safety or policy — but no new recommendations exist.

WHY IT'S CONFUSING:
Mixed messages make parents question what's "safer" or "recommended."
Splitting vaccines would mean more shots, more visits, more missed doses.

THE COMBINED MMR REMAINS SAFE, EFFECTIVE, AND RECOMMENDED. HELP PATIENTS UNDERSTAND: THE SCIENCE HASN'T CHANGED — ONLY THE HEADLINES HAVE.

KPF, 2025

17

WHY IT'S CONFUSING:
Mixed messages make parents question what's "safer" or "recommended."
Splitting vaccines would mean more shots, more visits, more missed doses.

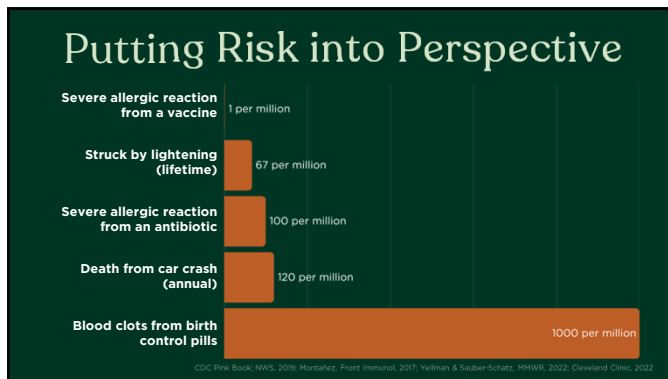
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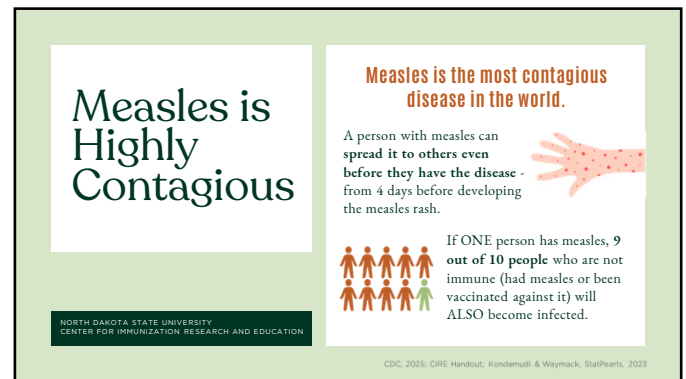
WHAT TO COMMUNICATE TO PATIENTS:
The combined MMR remains safe, effective, and recommended. Help patients understand: the science hasn't changed — only the headlines have.

KPF, 2025
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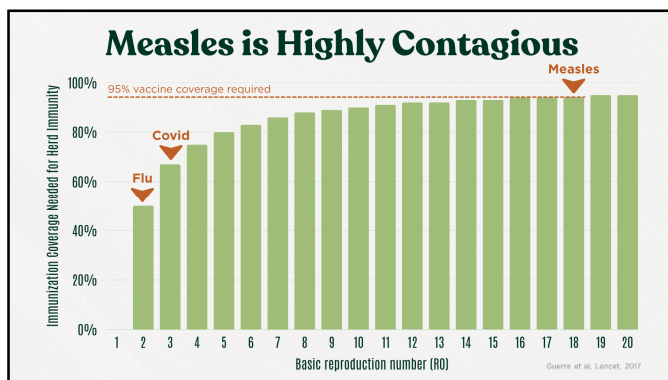
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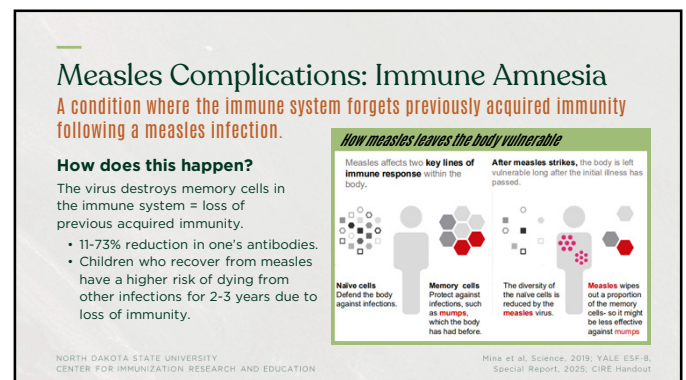
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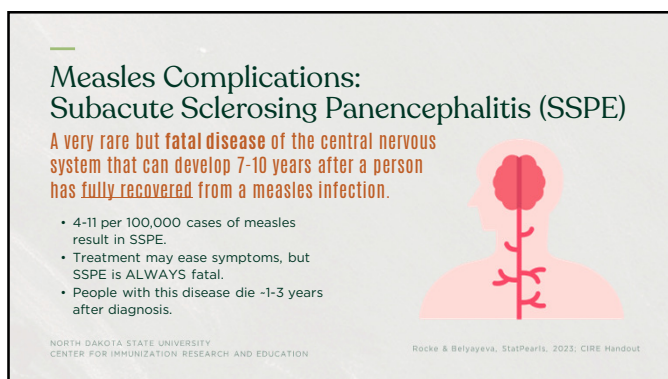
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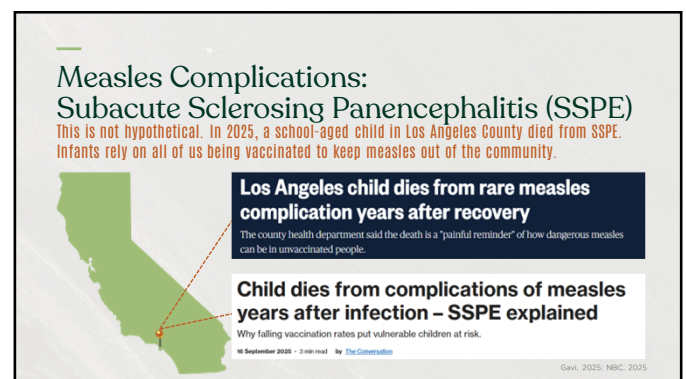
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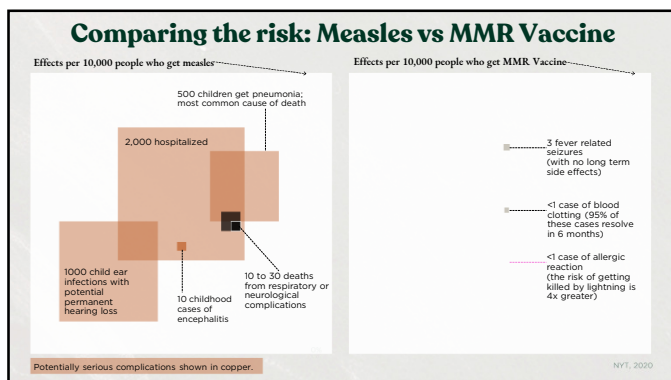
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25+ articles refute a connection between MMR vaccine and the development of autism. Let's look at a few...

Study	Location & Sample Size	Findings
Madsen et al., 2002	Denmark, 537,000+ children	No difference in autism rates between vaccinated and unvaccinated children.
Andrews et al., 2004	UK, 500,000+ children	No link between MMR and autism, even in high-risk children.
DeStefano et al., 2013	U.S., CDC study - 1,000+ children	No increased autism risk from MMR vaccine.
Taylor et al., 2014	Meta-analysis, 10 studies, 12M+ children	Comprehensive review found no association between MMR and autism.
Uno et al., 2015	Japan, 400+ children	Autism rates continued to rise even after MMR was discontinued, disproving causation.
Hviid et al., 2019	Denmark, 650,000+ children	MMR vaccine does not increase risk for autism, nor does it trigger autism in susceptible children.

immunize.org, 2023

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Case Study #2: Weighing the Risk of Measles and MMR Vaccine

I completely understand how confusing this can be, especially when there are mixed messages from people in leadership. The truth is, measles used to be one of the deadliest childhood diseases. Before the vaccine, hundreds of kids died from it every year in the U.S., and thousands were hospitalized with complications like pneumonia and brain swelling. Even today, in outbreaks, we still see kids getting very sick.

I guess I didn't realize measles could be that bad.

It's easy to forget because we don't see measles much anymore—that's because the vaccine has worked so well. But measles isn't just about the rash and fever - it can lead to death. Just in the outbreak in Texas this year, two previously healthy children have died from the virus. And even in kids who recover, measles can erase hard-earned immune memory, leaving them vulnerable to other infections like pneumonia and the flu.

What do you mean?

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Case Study #2: Weighing the Risk of Measles and MMR Vaccine

Measles can cause a condition called immune amnesia, where the immune system "forgets" how to fight off infections. This can affect both children and adults after a measles infection, though the severity varies. As a result, they become more vulnerable to other diseases they were previously protected against. Even after recovering from measles, a person may experience more frequent illnesses in the following months or years.

Wait, so measles wipes out immunity to other diseases?

Exactly. That's why after measles outbreaks, we sometimes see an increase in other infections like pneumonia and ear infections. It's like hitting the reset button on the immune system.

That's terrifying. I've never heard of that before. BUT what about the vaccine causing deaths? That's terrifying.

29

Case Study #2: Weighing the Risk of Measles and MMR Vaccine

I completely understand why that would be alarming. But I want to reassure you—decades of research have shown that the MMR vaccine is extremely safe. The claim that it routinely causes death is simply not true. Severe reactions are incredibly rare—much, much rarer than the complications from measles itself.

But how do we know for sure? Isn't the CDC looking into the vaccine causing autism?

Great question. We've used the MMR vaccine since the 1970s and have safety data from millions of children. Scientists closely monitor vaccine safety, and there's no evidence the MMR vaccine causes harm. Many studies have specifically looked for a link to autism and found none. In contrast, measles can be deadly.

I don't know... I just feel like I don't know who to trust anymore.

30

Case Study #2: Weighing the Risk of Measles and MMR Vaccine

I totally get that. It's overwhelming when there's so much conflicting information. My goal isn't to pressure you—it's to make sure you have all the facts so you can make the best decision for your child. If you'd like, I can show you some of the actual research and safety data so you can review it yourself.

Yeah, I think I'd like to see that. I just want to be sure I'm doing the right thing.

That makes total sense. I really appreciate how much thought you're putting into this. Let's go over the information together, and I'm happy to answer any questions you have.

Thanks for all the information, I think we are going to have think about it.

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Are these shots really necessary?

32

Case Study #3: Are these shots really necessary?

Since Mateo is 2 months old, it is time for his first set of vaccines! We have combination vaccines in our clinic, so this means he will get two shots in his thighs, and one vaccine that is a drink by mouth. Do you have any questions?

I know today's the first round of vaccines, but I've been reading up a bit, and honestly, I'm not sure they're really necessary. We don't see these diseases in the U.S. anymore, and from what I've read, they were already going away before vaccines were introduced thanks to better hygiene and nutrition.

Thank you for sharing that. It's completely understandable to want to know what's best for your baby—and it's great that you're doing your homework. Would it be okay if I talked through a few things that might help?

Ok, sure.

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It's true! Many of these diseases are now very rare in the U.S. thanks to vaccines and other advancements in public health. BUT:

 We live in an interconnected, global society, and diseases like polio and measles are just a plane ride away.

 Infections such as *Clostridium tetani* (tetanus) live in our natural environment, and so the threat will never be eliminated.


DID YOU KNOW?
Smallpox has been **eradicated** worldwide, and we no longer vaccinate against this disease - thanks to vaccines!

Talbird et al, Pediatrics. 2022; CDC, 2024; CDC HAN, March 14, 2024

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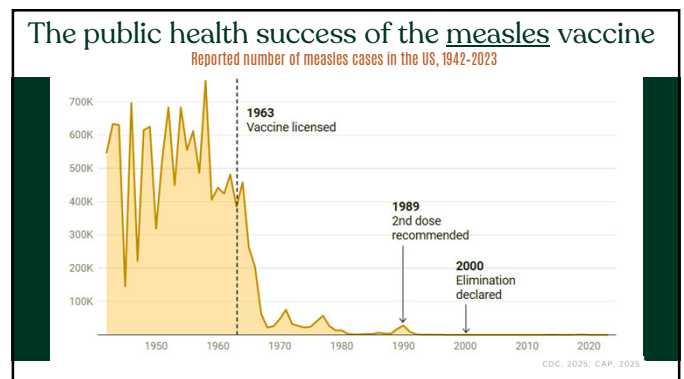
Improved hygiene and nutrition, among other factors, can certainly lower the incidence of some diseases.

Data documenting the number of cases of a disease before and after the introduction of a vaccine, however, demonstrate that vaccines are overwhelmingly responsible for the largest drops in disease rates.

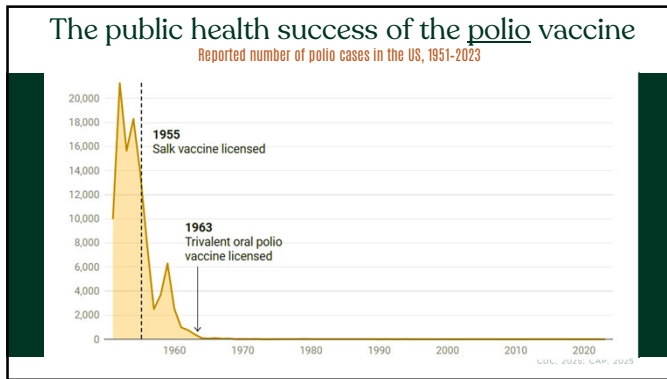


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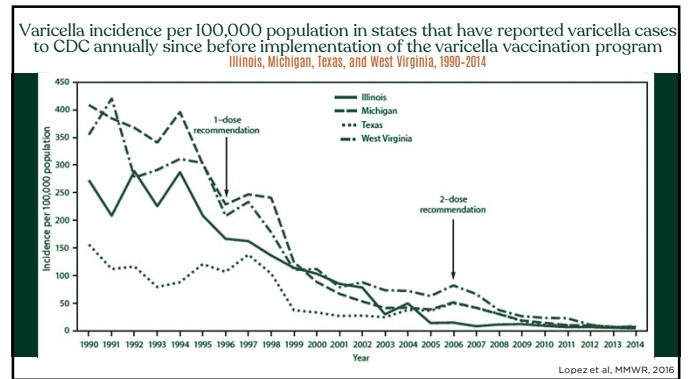
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Routine Vaccination Saves Lives

Disease	Illnesses prevented	Hospitalizations prevented	Deaths prevented
Diphtheria	7,528,000	7,528,000	752,800
Tetanus	5,000	5,000	700
Pertussis	80,738,000	3,646,000	28,400
Haemophilus influenzae type b	536,000	495,000	20,300
Polio	1,847,000	786,000	21,900
Measles	104,984,000	13,172,000	85,000
Mumps	63,355,000	2,020,000	300
Rubella	54,225,000	199,000	400
Congenital rubella syndrome	17,000	26,000	1,900
Hepatitis B	6,061,000	940,000	90,300
Hepatitis A	4,048,000	1,969,000	123,200
Varicella	106,270,000	272,000	1,900
Pneumococcus-related diseases	47,804,000	1,969,000	123,200
Rotavirus	30,265,000	819,000	400
Total	507,685,000	31,955,000	1,128,800

Zhou et al, MMWR, 2024; CAP, 2025; Shattock et al, Lancet, 2024

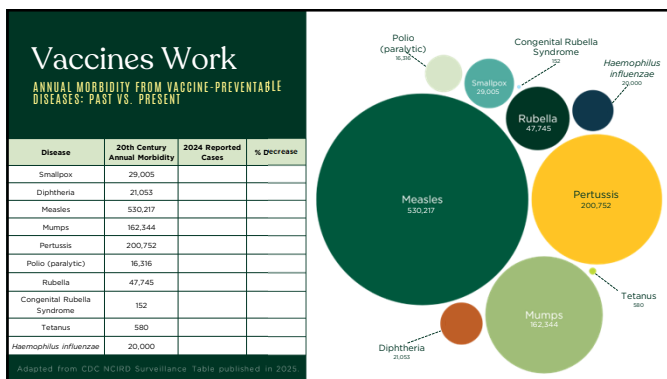
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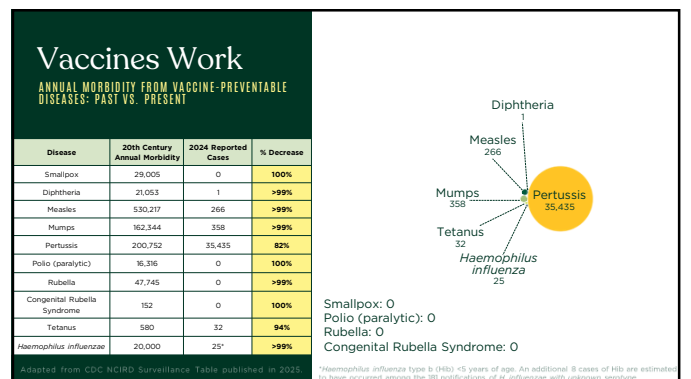
Vaccines have saved 6 lives a minute,
every minute,
for five decades.

Shattock et al, The Lancet, 2024

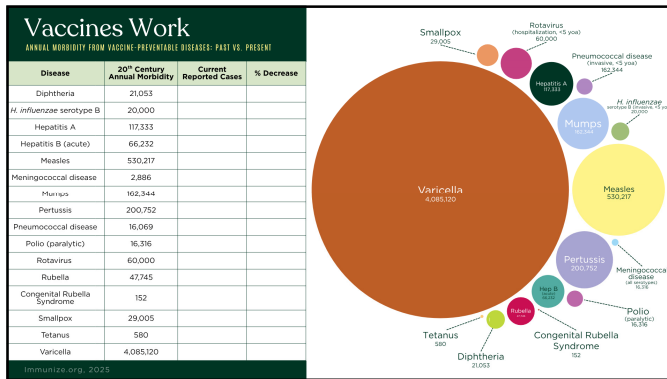
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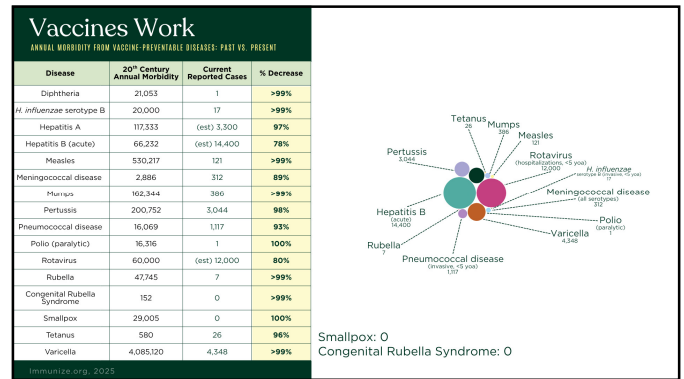
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Assessing Measles Outbreak Risk in the United States

An example of a school with 100 children and 1 infectious child, at different levels of MMR coverage

MMR coverage	# children susceptible	Chance of an outbreak
97%	6	16%
95%	8	29%
93%	10	36%
90%	13	51%
85%	18	61%
80%	22	64%
70%	32	78%

CDC, 2024

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Case Study #3: Are these shots really necessary?

You're absolutely right that things like clean water and better hygiene helped improve overall health. But when we look at the sharp, dramatic drops in diseases like polio, it happened after the vaccine was introduced. In the 1950s, polio paralyzed over 15,000 people every year in the U.S.—and after the vaccine came out in 1955, the numbers dropped quickly. We haven't had a case of naturally occurring polio in the U.S. since 1979.

So, it's gone?

It's gone here because we keep vaccinating—but polio still exists in other parts of the world. And it really is just a plane ride away. In fact, there was a case of paralytic polio in New York in 2022—an unvaccinated adult got infected after the virus was brought in from overseas and spread in an under-vaccinated community.

Wait, really?

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Case Study #3: Are these shots really necessary?

What other questions do you have about Mateo's vaccines today?

I guess I don't have any other questions. I'm just not sure I'm ready to make a decision today.

Of course, I want you to feel confident in the decision you make. I recommend these vaccines to all my patients—I feel it is an important part of keeping Mateo on track and healthy. If you'd like, I can provide some handouts that break down what we've talked about today, and we can check back in at his next appointment. Would that be okay with you?

Yes, sounds like a plan. Thanks for taking the time to talk to me about this today.

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Is the remedy worse than the disease?

48

Case Study #4: Is the remedy worse than the disease?

Alright Isaac, you are ready for kindergarten! I can't wait to hear about it! Before you start, you are due for some vaccines so you don't get sick and you don't get your classmates sick. Mom, Isaac is due for vaccines for MMR, chickenpox, tetanus and polio before starting school. Any questions?

We will pass on the chickenpox vaccine. I had chickenpox as a kid and I am fine, and he's so healthy I know he will be fine, too. Plus, our neighbor got a nasty rash after that vaccine, and I don't have time to deal with that right now.

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Is the remedy worse than the disease?

Varicella (Chickenpox) Disease	Varicella (Chickenpox) Vaccine
Rash (300-500 blisters)	Rash (30 blisters): 4/100 patients
Pneumonia or encephalitis: 1/1000 patients	Low grade fever
Birth defects: 1/50 infants whose moms have Varicella	Pain/swelling at site of injection
Bacterial co-infections	The benefits of a varicella vaccine: <i>Since the chickenpox vaccination program began in the United States, there has been over 97% decrease in chickenpox cases. Hospitalizations and deaths have become rare.</i>
Guillain-Barré syndrome (GBS) - rare	
Death (100/year prior to vaccine)	

Lopez et al, CDC Pink Book, 2024; OITL, CHOP VEC, 2023

50

Is the remedy worse than the disease?

Rotavirus Disease	Rotavirus Vaccine
Fever, upset stomach, vomiting, watery diarrhea (sometimes lasting multiple days). Symptoms generally last 3-9 days.	low-grade fever, mild vomiting and diarrhea
Intussusception occurs in 1 in 100,000 cases of rotavirus	Intussusception occurs in 1 in 20,000-100,000 doses of rotavirus vaccine administered
400,000+ clinic visits each year in US	The benefits of a rotavirus vaccine: 9 in 10 infants vaccinated are protected from severe rotavirus disease. 7 in 10 infants vaccinated are protected from rotavirus disease of any severity. 94-96% of vaccinated children are protected from hospitalization.
200,000+ ER visits each year in the US	
55,000-70,000 hospitalizations each year in the US	
20-60 Deaths each year in US	

OITL, CHOP VEC, 2024; Cortese & Haber, CDC Pink Book, 2024; Immunize.org, 2023

51

It is important to acknowledge that vaccine side effects exist.

- All meaningful medical interventions have some risk
- Tolerance is low for vaccine-related complications since those that get the vaccines are young and healthy
- Pre- and post-market surveillance helps to pick up rare side effects (1 per 100,000 or a million doses administered)



Serious complications are extremely rare.

Side effects from vaccines must be considered along with the potential complications from the diseases they prevent.

CDC, 2025

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Case Study #4: Is the remedy worse than the disease?

I'm sorry to hear about your neighbor! You are right, this vaccine can cause a mild rash and low grade fever about 1-2 weeks after it is given. However, it's extremely mild compared to the rash from chickenpox disease, and if he's infected, he will likely be out of school for 1-2 weeks! And while Isaac is healthy and is likely to recover without issue, if he gives chickenpox to a newborn baby or someone who is immunocompromised, they could get seriously sick. Also, one of the major reasons we vaccinate against this is because women who get chickenpox when they are pregnant can have babies with serious birth defects.

Hmmm. My sister is pregnant. I'll have to do some more research.

Sure! I know you don't take these decisions lightly. Can I offer you some resources to help with your research?

Yes, sounds good.

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Why do we vaccinate newborn babies against hepatitis B?

54

Case Study #5: Why do we vaccinate newborn babies against hepatitis B?

Sophia is due for her hepatitis B vaccine today, which helps protect her against a virus that can cause serious liver disease and cancer later in life. Any questions?

We don't understand why a brand-new baby needs a vaccine for something like hepatitis B. We don't think she's at risk right now.

What I hear you saying is that you're unsure why Sophia needs the hepatitis B vaccine so early, since she's a newborn and you don't see her as being at risk right now?

Exactly. We don't see how she could be exposed.

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9 in 10 babies <1 years old infected with hepatitis B have a chance of developing chronic hepatitis B.

25% of those who develop chronic hepatitis B infection will die from the disease.

AAP, 2025; Hepatitis B Foundation, 2025

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Hepatitis B Vaccine - What to Know



Recommended newborns receive the 1st dose of hepatitis B vaccine **within 24 hours of birth**.



After completing the full 3 to 4-dose vaccine series, **98% of healthy infants achieve full immunity**.



The hepatitis B vaccine has been around since the 1980's and test extensively - **it's safe and effective**.

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AAP, 2025; Hepatitis B Foundation, 2025

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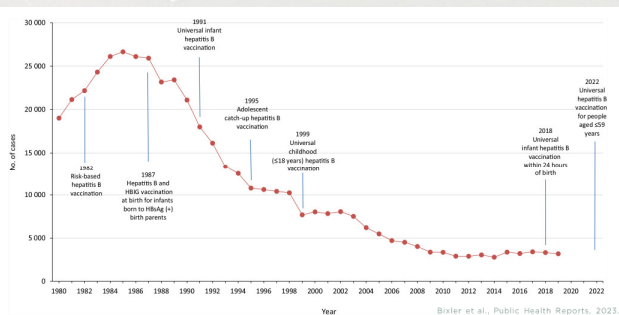
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- Maternal screening for hepatitis B is important—but not perfect.
- Rare errors can occur (missed infections, late exposures, or false negatives).
- The birth dose of the hepatitis B vaccine acts as a safety net—protecting newborns immediately, regardless of testing limitations.

IAC, 2025

58

Reported cases of acute hepatitis B and key hepatitis B vaccine recommendations from the Centers for Disease Control and Prevention (CDC), United States, 1980–2022.



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- Since 1980, over 1 billion doses of hepatitis B have been given.
- Before 1991, ~18,000 U.S. children infected annually—half at birth.
- Universal infant vaccination cut childhood hepatitis B infections by 95%.

AAP, 2025

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Case Study #5: Why do we vaccinate newborn babies against hepatitis B?

That's a common question. The reason we give the vaccine at birth is because hepatitis B can be passed from mother to baby during delivery, even if a mother's test was negative during pregnancy. Sometimes infections are missed or occur later in pregnancy. It can also spread from a friend or family member who doesn't know they're infected, since hepatitis B often has no symptoms. Babies who catch it are much more likely—about 90% of the time—to develop lifelong infection, which can lead to cirrhosis and liver cancer years later. The birth dose is a safety net that ensures Sophia is protected right away.

I didn't realize a negative test might not be enough.

Exactly. And giving the vaccine early also gets her series started on time so she has long-term protection well before any other exposures could happen. The vaccine itself has been studied for decades, is very safe, and has been shown to prevent liver cancer in children and adults.

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Case Study #5: Why do we vaccinate newborn babies against hepatitis B?

That does help put it in perspective.

Ultimately, it's your decision, but I strongly recommend starting Sophia's hepatitis B vaccine today. It's one of the best tools we have to protect her health long-term. What stands out to you about what I shared?

I guess I didn't realize how serious it could be or that babies could get it even if the test was negative. I just want to make sure we're doing what's safest for her.

I really appreciate how thoughtful you're being—that tells me how much you care about keeping her safe. The good news is, this vaccine has an excellent safety record and gives Sophia protection when she's most vulnerable. Starting today means she's covered from the very beginning.

That makes sense. I feel more comfortable with it now.

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An ounce of prevention

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Case Study #6: An ounce of prevention

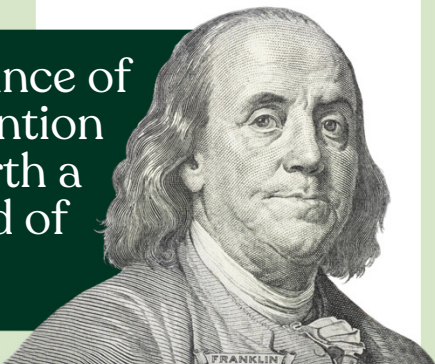
Great to see you today, Maria! Good luck in your soccer game this weekend. Now that you're 10, you are due for the HPV vaccine, which prevents certain kinds of cancer. I will have my nurse give that to you before you leave. Any questions?

Whoa! Already? We are not doing that vaccine, she's only 10! Besides, if she just gets regular Pap smears as an adult, she won't have to worry about getting cervical cancer.

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An ounce of prevention is worth a pound of cure.

BENJAMIN FRANKLIN



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An Ounce of Prevention:

HUMAN PAPILLOMAVIRUS (HPV)

HPV Vaccine

~100%

protection from persistent HPV infection, cervical intraepithelial neoplasia and adenocarcinoma in situ

99%

prevention of genital warts

Within 10 years of HPV vaccination approval, HPV types 6, 11, 16 and 18 decreased by:

86%
in 14-19 year old females

71%
in 20-24 year old females

MEITES, CDC PINK BOOK, 2024

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An Ounce of Prevention: HUMAN PAPILLOMAVIRUS (HPV)

MEITES, CDC PINK BOOK, 2024

Pap Smear

- 🔍 Detects pre-cancerous changes in cervical cells
- ✅ Includes HPV testing
- ⚠️ Does not prevent cervical cancer, but allows for early detection and treatment

When pre-cancerous/cancerous cells are found, further procedures and treatment are necessary.

It is important to acknowledge that the HPV vaccine doesn't cover every single HPV strain that causes cancer - the vaccine is not 100% effective (but close!)

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Comparing the risks:

HPV disease per year in U.S.	HPV vaccine
11,000 Cervical Cancer	Redness, swelling at injection site
196,000 cervical precancers	Low grade fever
Other cancers: 14,000 back of throat 6,500 anus 3,500 vulvar & vaginal 900 penile	Anaphylaxis (1-3 in 1,000,000 doses administered)

CDC, 2024

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Case Study #6: An ounce of prevention

I get it, 10 seems young to be thinking about this, but we want her protected before she is exposed to the virus. The vaccine is safe and young kids have a great immune response. And remember, Pap smears just detect cancer early. This vaccine can prevent her from getting it at all.

It just seems so soon! If you don't mind telling me, have your kids gotten this vaccine?

I don't mind at all, they absolutely have. In fact, every pediatrician in our practice has given this vaccine to their own kids when they were old enough. I wouldn't ask you to do anything for Marta that I wouldn't do for my own child.

That is really reassuring - ok let's do it!

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Questions?

THANK YOU FOR LISTENING

SPECIAL THANKS TO:

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EXTRA SLIDES

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I've heard aluminum in vaccines is dangerous.

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Case Study #7: I've heard aluminum in vaccines is dangerous.

I've been seeing a lot online lately about aluminum in vaccines. Some posts say it can cause autism or other brain problems in babies. I just don't know what to believe anymore.

It sounds like you've been seeing a lot of different messages, and that's left you unsure about what's true.

Exactly. Every time I read something new, it seems to say the opposite of what I heard before.

That's really understandable. There's so much information out there right now - it can be overwhelming to sort through, especially when it's about your baby's health. Can I share a little about what we know from the research on aluminum in vaccines?

Yes, please.



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Dangerous Chemicals?



- 3-methyl-butyraldehyde
- Ethyl ethanoate
- Tocopherol
- Alpha-terpanine
- Terpinyl-acetate
- Proline
- Octene
- Hexanal
- Benzaldehyde

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Dangerous Chemicals?



- **Sodium chloride** - better known as table salt
- **Sucrose** - that's just sugar
- **Monosodium phosphate** - a type of salt that helps keep the vaccine stable
- **Aluminum salts** - tiny amounts that boost your immune response, naturally found in food and water.
- **Gelatin** - the same ingredient used to make gummy bears, used here to keep the vaccines stable.

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What is in a vaccine?

Type of Ingredient	Purpose	Example	Most Common Source Found
Adjuvants	Improve the body's immune response to antigens	Aluminum salts	From drinking water, infant formula, or taking antacids, buffering aspirin, & antiperspirants
Preservatives	Prevent contamination	Thimerosal (only in multi-dose vials of flu vaccine)	From eating foods such as certain kinds of fish
Stabilizers	Maintain vaccine potency during transportation and storage	Sugars, gelatin	From eating Jell-O
Residual antibiotics	Prevent contamination by bacteria during manufacturing process	Neomycin	Antibiotics people are most likely allergic to - like penicillin - aren't used in vaccines
Residual inactivating ingredients	Killed virus or inactivate toxins during the manufacturing process	Formaldehyde	Resides in body naturally
Residual cell material	To grow enough of the virus or bacteria to make the vaccine	Egg protein	From eating foods containing eggs

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Aluminum

VACCINE INGREDIENTS

13

Al


Aluminum

26.9815385


The conversation has increasingly shifted to claims that injection fundamentally changes aluminum's safety profile compared to ingestion.

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Aluminum- What to Know



3rd most abundant element in Earth's crust - in soil, water, air, plants, and food.



Most adults consume 7-9 milligrams of aluminum daily.



Aluminum has been safely used in various products for decades.

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Steier et al. Unbiased Science, 2025

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Aluminum - Common Sources



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Steier et al, Unbiased Science, 2025

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Which vaccines contain Aluminum?

Aluminum is only used in vaccines that require it to stimulate a robust immune response.

Hepatitis A & B vaccines

- 0.225-0.5 mg per dose

DTaP/Tdap vaccines

- diphtheria, tetanus, pertussis
- 0.33-0.625 mg per dose

Hib vaccines

- 0.225 mg per dose

HPV vaccines

- 0.5 mg per dose

Pneumococcal vaccines

- 0.125 mg per dose

Meningococcal vaccines

- 0.25-1.5 mg per dose

Aluminum is NOT used in live vaccines like MMR (measles, mumps, rubella), varicella (chickenpox), or rotavirus vaccines.

CHOP, 2025; Steier et al, Unbiased Science, 2025

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Aluminum-Adjuvanted Vaccines: WHAT THE LATEST LARGE-SCALE STUDY SHOWS

Population: 1,224,176 children born in Denmark between 1997–2018, alive and residing in the country at age 2 years.

Exposure: Cumulative amount of aluminum (in mg) via vaccines during first 2 years of life.

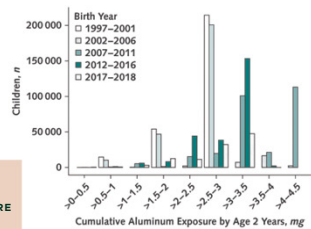
Outcomes: Incident diagnoses of 50 different chronic disorders, grouped into three main categories:

- Autoimmune disorders
- Atopic/allergic disorders
- Neurodevelopmental disorders (including autism spectrum disorder and ADHD)

NO EVIDENCE OF INCREASED RISK OF ANY OF THE STUDIED DISORDER CATEGORIES ASSOCIATED WITH HIGHER ALUMINUM EXPOSURE FROM VACCINES IN EARLY CHILDHOOD.

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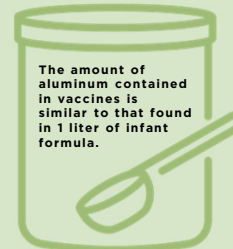
Early childhood vaccination with aluminum-adsorbed vaccines in Denmark, 1997–2020.



Andersson et al, Annals of Internal Medicine, 2025

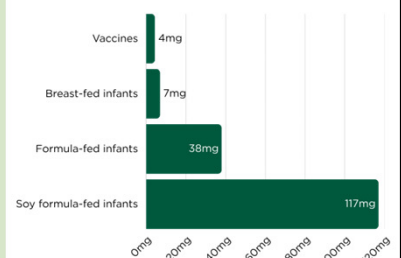
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Perspective ALUMINUM EXPOSURE



The amount of aluminum contained in vaccines is similar to that found in 1 liter of infant formula.

While infants receive about 4.4 mg of aluminum in the first 6 months of life from vaccines, they receive more than that in their diet.



CHOP, 2025; Steier et al, Unbiased Science, 2025

Note: 1 milligram (mg) = one-thousandth (1/1,000) of gram. 1 gram is the weight of 1/5 of a teaspoon of water.

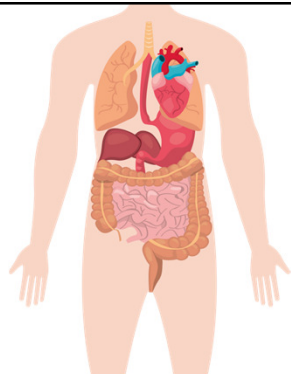
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What about injection vs ingestion?

Great question!

- Only ~0.3% of ingested aluminum absorbed; more absorbed when injected
- Ingested aluminum far exceeds vaccine exposure
- Elimination is the same regardless of source (ingested vs injected)
- Clearance: ~50% in 24h, ~85% in 13d
- Normal tissue levels: lung ~20 mg/kg, bone 5–10 mg/kg

CHOP, 2025; Steier et al, Unbiased Science, 2025



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Case Study #7: I've heard aluminum in vaccines is dangerous.

Aluminum salts have been used safely in vaccines for over 70 years. They help vaccines work better by training the immune system to recognize and fight infections. The amount of aluminum in vaccines is very small—babies actually get more aluminum naturally from breast milk, formula, and food than from vaccines. The body clears it through the kidneys, so it doesn't build up over time.

So it's been studied?

Yes, very carefully. There have been large studies in hundreds of thousands of children, and they've found no link between aluminum in vaccines and autism or other developmental problems.

That's good to hear. It just feels hard to know who to trust anymore—there's so much online, and it all sounds so convincing.

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Case Study #7: I've heard aluminum in vaccines is dangerous.

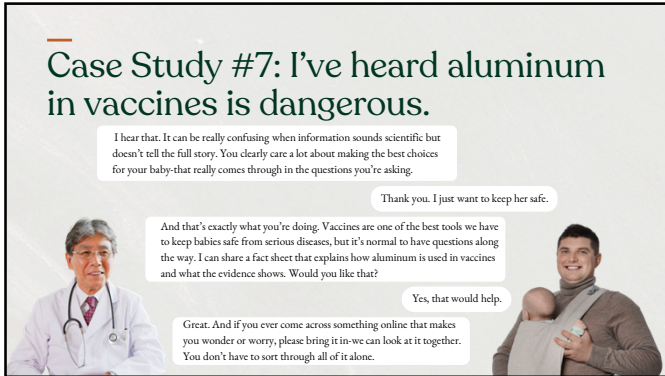
I hear that. It can be really confusing when information sounds scientific but doesn't tell the full story. You clearly care a lot about making the best choices for your baby-that really comes through in the questions you're asking.

Thank you. I just want to keep her safe.

And that's exactly what you're doing. Vaccines are one of the best tools we have to keep babies safe from serious diseases, but it's normal to have questions along the way. I can share a fact sheet that explains how aluminum is used in vaccines and what the evidence shows. Would you like that?

Yes, that would help.

Great. And if you ever come across something online that makes you wonder or worry, please bring it in-we can look at it together. You don't have to sort through all of it alone.



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