

VACCINES WORK

Here Are the Facts

By Maki Naro



MAKI NARO IS A CARTOON CHARACTER AND FREELANCE ILLUSTRATOR. BY DAY, HE DRAWS COMICS ABOUT HOW SCIENCE IS AWESOME. BY NIGHT, HE DOES THE SAME... JUST IN THE DARK. HIS WORK OFTEN APPEARS IN PUBLICATIONS SUCH AS *THE NIB* AND ON HIS POPULAR SCIENCE BLOG, *BOXPLOT*. RECENTLY HE WAS A FINALIST IN PENNY ARCADE'S HIT REALITY WEB SERIES, *STRIP SEARCH*, WHICH HAS BROUGHT HIM NOTHING BUT FAME AND RUIN.

Medical technology has advanced further in the last 100 years than it has throughout history.



What's the matter?

Doc, it's my leg.



We live our lives relatively disease-free...

...and we owe so much of that to vaccines.



Despite the overwhelming evidence, people still have questions and concerns.



Polio? Smallpox?

They're going to inject what?

Which is okay.



In 1798, smallpox was killing **hundreds of thousands** of people every year.



Until Edward Jenner noticed that milkmaids who had contracted cowpox, a less deadly form of the disease, didn't get smallpox.

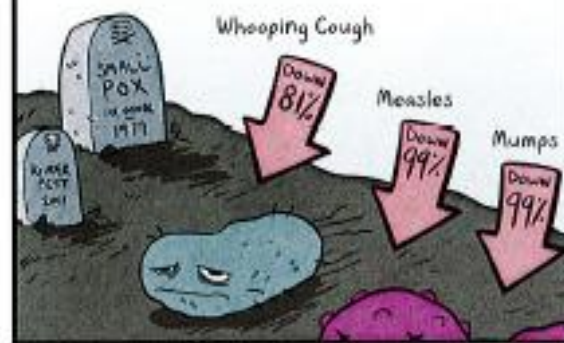


This was the first vaccine.

From there, your body has time to develop the proper antibodies and form an immunity.



Since their implementation, smallpox has been eradicated, and diseases like polio, measles, mumps, and rubella are on their way out.



Vaccines are like a training exercise for your body. They use dead or damaged viruses to provoke an immune response, without having to get sick.



If vaccines make me immune, why do I have to get a flu shot every year?



Evolution is a constant arms race. As you become immune to invaders, the invaders adapt to try to get around your immunity.



Each year scientists have to try to predict which flu strain will be the big one to vaccinate against.



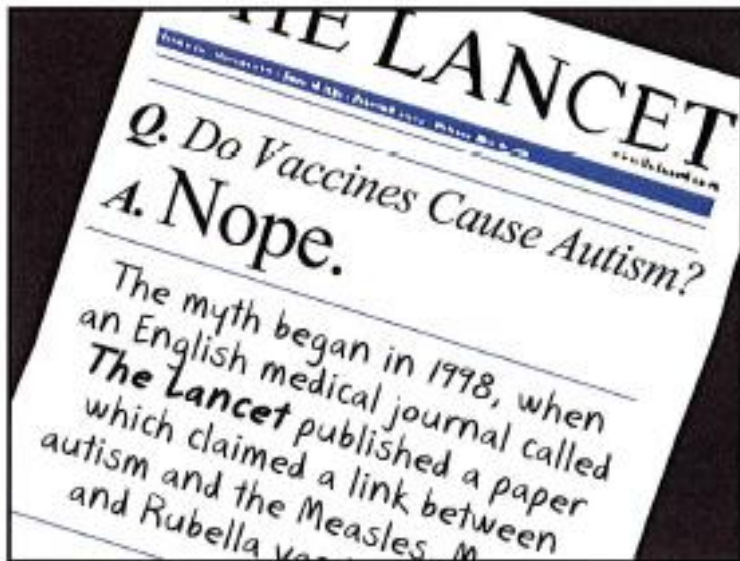
However, after a lengthy investigation, it was discovered that the author, **Andrew Wakefield**, had not only fudged the data...

...but also did a lot of other shady stuff.



For example, he paid kids for blood samples at his son's birthday party.

I heard that vaccines cause autism.



Wakefield also had numerous conflicts of interest.



Before publishing, he filed a patent for his own version of the MMR vaccine.



He was paid hundreds of thousands of pounds by the UK Legal Aid Fund for his expert testimony in a class action suit against MMR manufacturers.



All of it undeclared.



By the time Wakefield's misconduct had come to light, his paper retracted...



...and his medical license taken away...

The damage was done. Now he is held up as martyr by anti-vaccine proponents.



Before long, celebrities like Jenny McCarthy began latching onto the scare.



Soon it became trendy to keep your children "pure" by not injecting them with "chemicals."



Scientists aren't sure of the exact cause of autism, which is now understood to be a spectrum of developmental disorders...



...but none of them suspect vaccines.



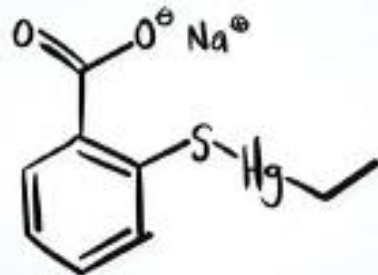
Somebody shared a list of vaccine ingredients and it sounds really scary!



People are afraid of what they don't understand. So a common tactic used by anti-vaccine proponents is to just list ingredients and let fear do the rest.



For example: Initially, a preservative called **thimerosal** was attacked as the cause of autism.



We forget that something we eat every day in every meal is made up of two of the most volatile and deadly elements on earth.

Na
SODIUM



Cl
CHLORINE



SALT

The mercury in thimerosal is **ethyl mercury**, which gets flushed out of the body.

Unlike its brother, **methyl mercury**, which is the bad mercury.



You know what has the bad mercury in it? Tuna.

It's an antifungal agent used to preserve multi-dose vials of vaccine. It also happens to have a mercury atom in it.

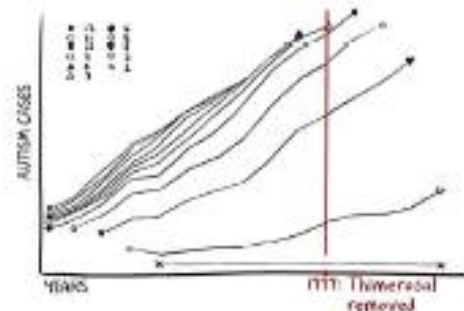


It lets us vaccinate many people from one vial.



We're taught that mercury is bad, but it's actually kind of complicated.

In a well-meaning but ultimately harmful effort to appease the misinformed mobs, the CDC stopped using thimerosal in vaccines, **even after an investigation found no link between it and autism.**



(A recent study has shown that the continued rise in autism spectrum disorders is due to greater awareness and broader diagnoses.)

Source: JAMA Psychiatry 2018

The ones who truly suffer are people in developing nations who now have to pay more money to buy and maintain single-dose vials of needed vaccines.



But if we remember back to our **pH scale**, acids can be added to an alkaline solution to make it pH neutral. Which is exactly what they are doing there.



People also don't understand that the difference between good and bad is about dosage. Even drinking too much water will kill you.



In 2007, a woman died after drinking 6 liters of water in 3 hours.

The amount of scary sounding chemicals in a vaccine is well within FDA approved guidelines. Take formaldehyde, which is a natural metabolic byproduct.



You've produced more in your body while reading this comic than you will ever get from a vaccine.

Finally, some of it is outright lies, propagated by websites with names like "vaccinetruth.org" or "the National Vaccine Information Center".

TOTALLY TRUE™
INGREDIENTS**

- ❌ ANTIFREEZE!!!
- ❌ MONKEY KIDNEY!!!
- ❌ ABORTED FETUS TISSUE!!!!

(Go big, or go home, right?)

**Not true at all

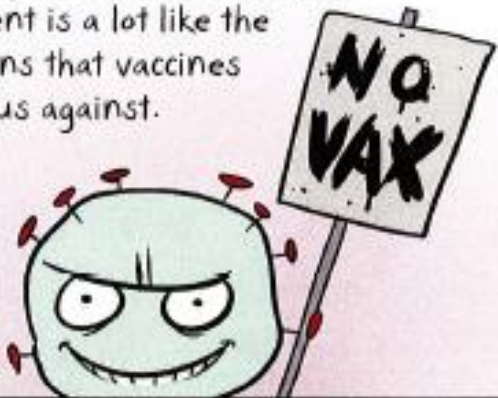
Another chemistry fail is the calling out of hydrochloric acid in vaccines.



If they're so wrong, why are there still people who are against vaccines?



Ironically, the anti-vaccination movement is a lot like the pathogens that vaccines protect us against.



Their fear campaign is an ongoing arms race against facts.



Some people don't want to vaccinate anymore. It's their choice right?



That'd only be true if their choice affected only themselves. An important benefit of vaccination is an effect called **HERD IMMUNITY.**

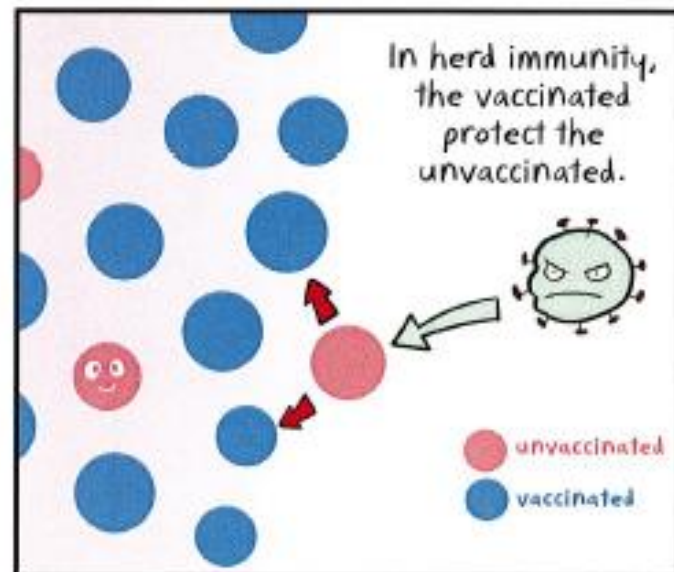


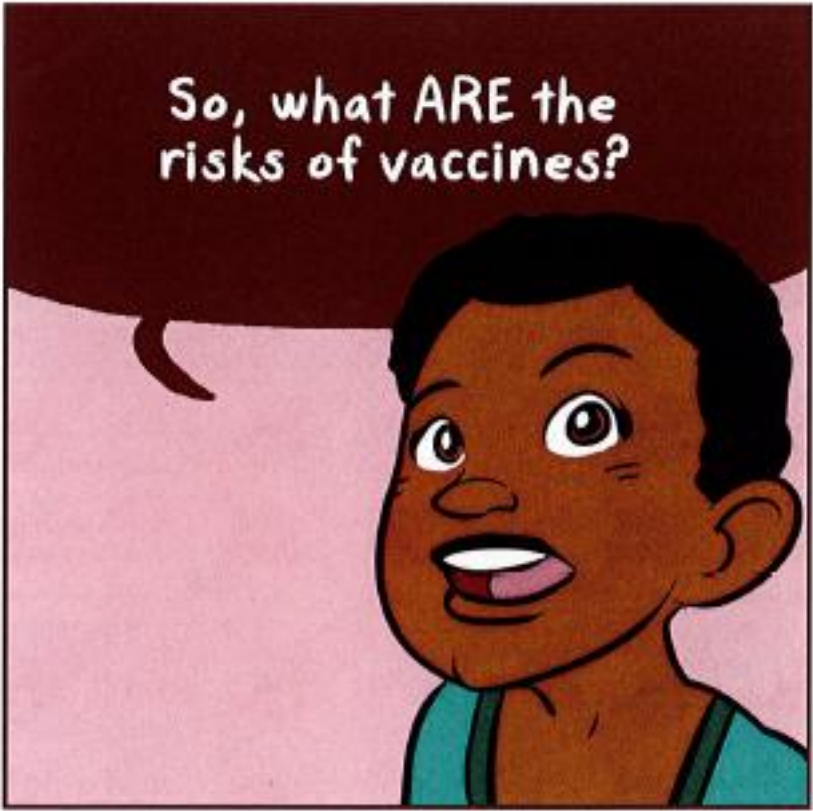
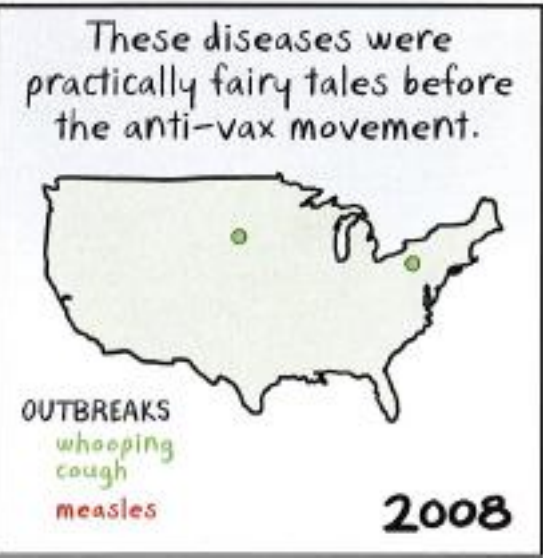
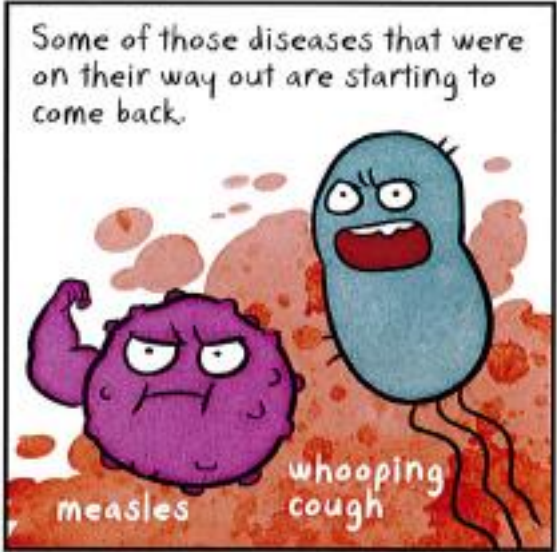
...they simply change their stance to something else.



Each time science has proven them wrong...

If enough people are vaccinated against a disease (typically 83-85%), it has trouble spreading. This protects people who are not vaccinated, either because they are too young or have an allergy or other underlying medical condition.





The benefit/risk ratio of vaccines is one of the highest of any medical intervention out there. But, like any medical procedure, they carry some risks. Most of them are very mild.



The more serious reactions are incredibly rare.



We're talking one-in-a-million.

But people are bad at assessing risks. They drive without a seat belt out of fear that it will break their collarbone in an accident.

I blow my money on lottery tickets instead of putting it into savings!



Like diseases, fear and misinformation spread easily to those who aren't vaccinated against them.



Help contribute to herd immunity by educating your community today!

