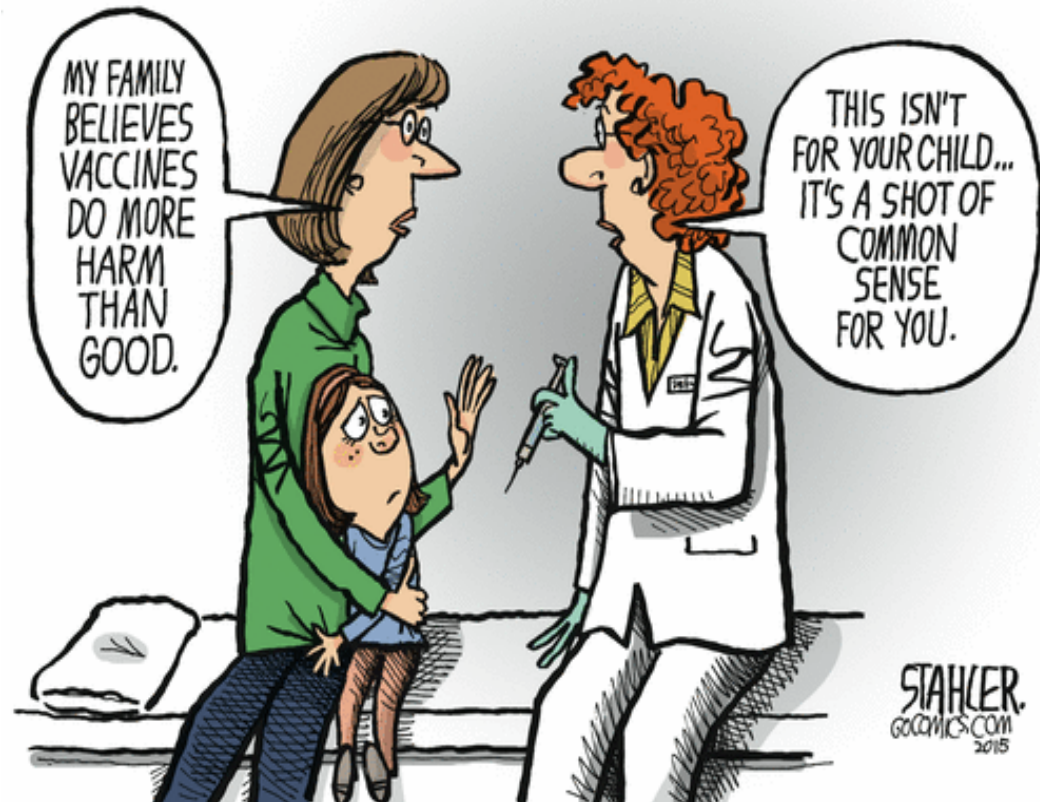


A vaccination against misleading vaccination information

“One of the greatest challenges for public health authorities is how to respond to today’s proliferation of misleading information about vaccines”

Bull World Health Organ 2017;95:670–671

<https://www.who.int/bulletin/volumes/95/10/17-021017.pdf>



Disclaimer

- The views and opinions expressed in this presentation are those of the Presenter and do not necessarily represent official policy or position of any of the organizations and bodies to which he is, or has been associated;
- The material in this presentation is general background information about vaccinations. This information is given in outline and summary form and does not purport to be complete. This presentation was created for informational purposes only. It **MUST** not be considered or used as medical/clinical advice or a recommendation.
- The content of this presentation is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Always seek the advice of your physician or other qualified health provider with any questions you may have regarding a medical condition. Never disregard professional medical advice or delay in seeking it because of something you have read in this Presentation.



Declaration of Interests

Prof. Andy Barraclough:

- I have the following financial interest or relationship(s) to disclose with regard to the subject matter of this presentation:
- I have received funding from, and/or worked in various capacities with the following organizations which have enabled my activities on vaccinations:
- ADB - Asian Development Bank
- APLMA - Asian Pacific Leaders Malaria Alliance
- Donor Organizations: UK DfID, Dutch DGIS, GTZ, CIDA, SIDA, AusAid/DFAT, USAID, etc.
- Empower School of Health
- Management Sciences for Health (a USA based, not for profit organization)
- UN agencies, World Bank, IADB, AfDB, Global Fund
- World Health Organization



Acknowledgments

- The majority of the materials contained in this presentation are extracted from published information which is freely available in the public domain, from such bodies as:
 - World Health Organization
 - UN agencies – especially UNICEF
 - USA CDC – Centre for Disease Control
 - USA FDA – Food and Drug Administration
 - UK – National Health Service
 - Australian Government – Department of Health
 - New Zealand Government – Department of HealthAll of which follow the WHO Vaccine Safety Net requirements.
- Wherever possible I have cited the internet link to the published information.



Personal Experience

- Although the majority of information in this presentation derives from published sources, in common with other Europeans of my age, I endured a series of childhood illnesses which are now largely prevented by vaccines.
- I am an unashamed and ardent vaccinator. In a long career I have also witnessed deaths, disfigurement, and disability from diseases which are entirely preventable by vaccination, and which have contributed to my very strident views in support of vaccination programs.
- Also, since I am now at the end of my career, I believe I can now express my opinions (more) openly on matters of effective communications of medical issues to the general public. (though I rather fear many of my colleagues might suggest I have never suffered inhibitions in this regard)



Informed Consent



- Before administering any vaccination it is necessary to have the informed consent of the patient/client or a responsible adult guardian.
- So since I propose to administer a ‘vaccination’ against vaccination misinformation to you, albeit in a non-invasive, audio visual form; I should first obtain your informed consent, and that in turn requires that I advise you of the potential, risks, benefits, costs and side effects, so that you may make an informed decision.
- I am not allowed to assume that silence is consent.

VAVM – Risks, Benefits

Risks:

- you are bored to sleep
- You become violently

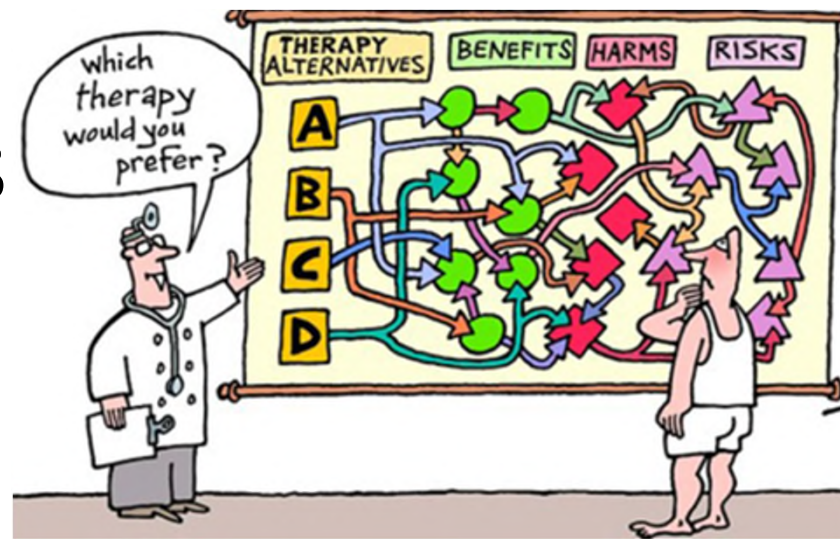
opposed to the anti-vaccination campaigns

Benefits:

- You are far better informed on the reality of vaccination issues
- You are better able to make decisions on vaccinations

Potential side effects:

- Excessive internet searching for vaccination data



VAVM – The Good News

- Cost: around one hour of your time
- Alcohol: it is normally recommended to refrain from ‘more than usual’ alcohol consumption for 24 hours after receiving general vaccinations. - although if your *normal* consumption is 7 large Leo a night, I might suggest a tad more abstinence – and for some vaccinations total abstinence for 48 Hours is suggested. Its usually not that interactions with alcohol are the direct cause of adverse effects, but rather that if any side effects do occur, the presence of alcohol can make them worse. However, it is NOT necessary to refrain from alcohol after this ‘vaccination’.
- Effectiveness: TBD



Consent



- Can I now request that you indicate your willingness to receive this vaccination by a show of hands

Informed consent is required for every invasive medical procedure, from getting your ears pierced to having an abortion.

– *Bob McDonnell*

1. INFORMED CONSENT:

- It is defined as voluntary acceptance after full understanding, by a competent patient, of a plan for medical care after physician adequately discloses the proposed plan, its risks and benefits, and alternative approaches.
- The decision-making capacity is free from coercion or manipulation by the patient/doctor

COMPONENTS :

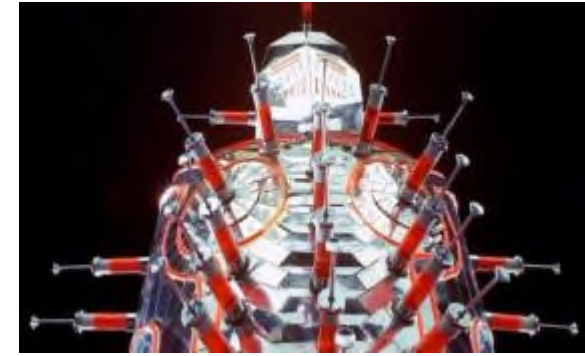
Informed consent must contain four vital components:-

- Mental capacity of the patient to enter into a contract (This also includes his ability to understand information given)
- Complete Information to be provided by doctor
- Voluntary acceptance of the procedure by the patient
- Should be **person** and the **procedure** specific

Your Experiences of Vaccinations ?

A show of hands please

- How many have received more than 5 vaccinations ?
- How many of you had your children vaccinated ?
- How many of you have never been vaccinated ?
- How many of you have more than 3 dental fillings ?
- How many of you eat tinned Tuna fish ?
- How many of you eat pears ?
- How many of you have NOT been vaccinated against Japanese Encephalitis, AND have visited an up-country farm area or a temple cave in Thailand?



What's Really at the
Heart
of the Vaccine Debate?

Debate or no Debate on Vaccines ?



“This has frustrated me for days... I keep hearing and reading about the vaccine debate. To be clear, there is no debate. I can’t imagine the guilt parents would feel if their child contracts and suffers from a completely preventable disease. I heard Chris Christie’s comments regarding the preservation of “choice” in the vaccine matter...what choice? The choice to let your child be unprotected against a virus that has the potential to maim and take life? That’s nonsensical free man ego talk right there.”

- <https://leftlanepassingonly.wordpress.com/2015/02/03/the-vaccine-debate/>

*“Opposition to vaccines has long existed, ever since the first anti-vaccination leagues sprang up to oppose compulsory smallpox inoculation in the 19th century. While the arguments of vaccine opponents have not changed over time, **their ability to reach large audiences with their messages has increased with the advent of the digital and social media.**”*

<https://www.who.int/bulletin/volumes/95/10/17-021017.pdf>

So is there a debate about vaccinations ?

Unfortunately, with declining vaccination rates in high-income countries, and disease outbreaks of preventative diseases, the answer is clearly - YES.

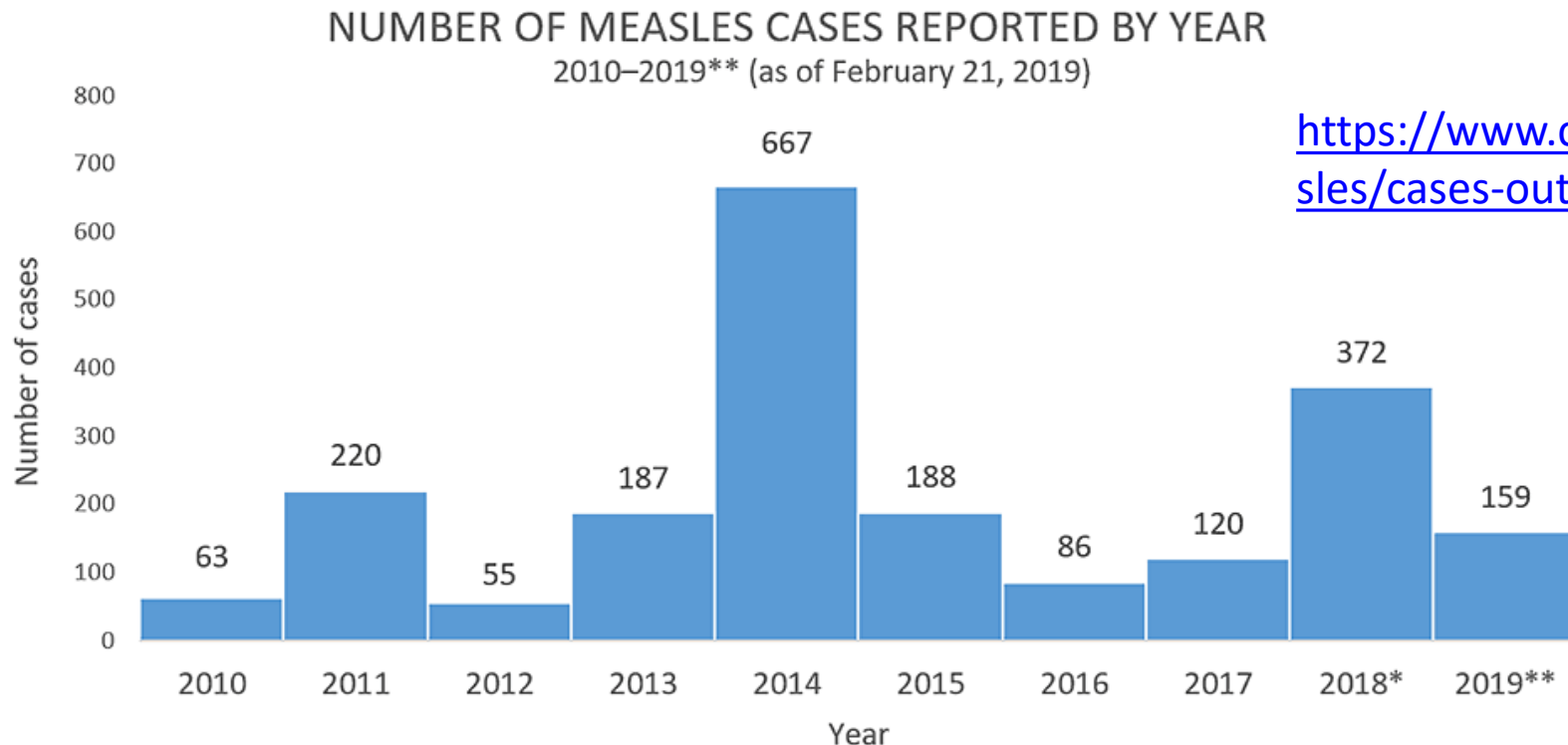
WHY ? - Surely the scientific evidence is overwhelming and irrefutable ?

- **IT IS,** - but there is a modern trend to be entirely dismissive of Science, and not to trust any kind of 'official' agency, and it now often takes more than science to convince people; especially amongst those who may have been made fearful by misinformation and/or are seeking absolute certainty, and idealistic, zero risk; when in life, of course, neither exists.
- In order to understand the situation – and so hopefully come to a reasoned conclusion - I believe that it is first necessary to understand WHY there is a debate- in some quarters.



Reality of the Debate - USA

- *From January 1 to February 21, 2019, 159** individual cases of measles have been confirmed in 10 states. In Washington, mistrust of health officials and pharmaceutical companies appears to be driving parents to opt out, leading to 65 cases.*



<https://www.cdc.gov/measles/cases-outbreaks.html>

Debate USA 2

- *Measles is back because states give parents too many ways to avoid vaccines - The era of religious and moral vaccine exemptions needs to end — and fast.*
- *Most of the people with measles right now weren't immunized from the virus.. .. the head of the Food and Drug Administration, Scott Gottlieb. "Some states are engaging in such wide exemptions that they're **creating the opportunity for outbreaks on a scale that is going to have national implications,**"*
- <https://www.vox.com/science-and-health/2019/2/16/18223764/measles-outbreak-2019-vaccines-anti-vax>
- *The wife of White House communications director Bill Shine In a series of tweets, Darla Shine lashed out against a CNN segment detailing the outbreak, which has seen more than 50 unvaccinated people contract measles in Washington state and Oregon.*
- *"Here we go LOL #measlesoutbreak on #CNN #Fake #Hysteria," Darla Shine tweeted. "The entire Baby Boom population alive today had the #Measles as kids. **Bring back our #ChildhoodDiseases they keep you healthy & fight cancer.**"*
- *"I had the #Measles #Mumps #ChickenPox as a child and so did every kid I knew," she went on to claim, adding: "Sadly my kids had #MMR so **they will never have the life long natural immunity** I have. Come breathe on me!"*
- <https://www.theguardian.com/us-news/2019/feb/13/darla-shine-vaccines-anti-vaxxer-measles>

The Pyramids of Evidence

Science



Pseudoscience



<https://globalvax.wordpress.com/tag/hib/>

Some consider You Tube more trustworthy than WHO

Shortcomings on all sides

It is **my** belief that:-

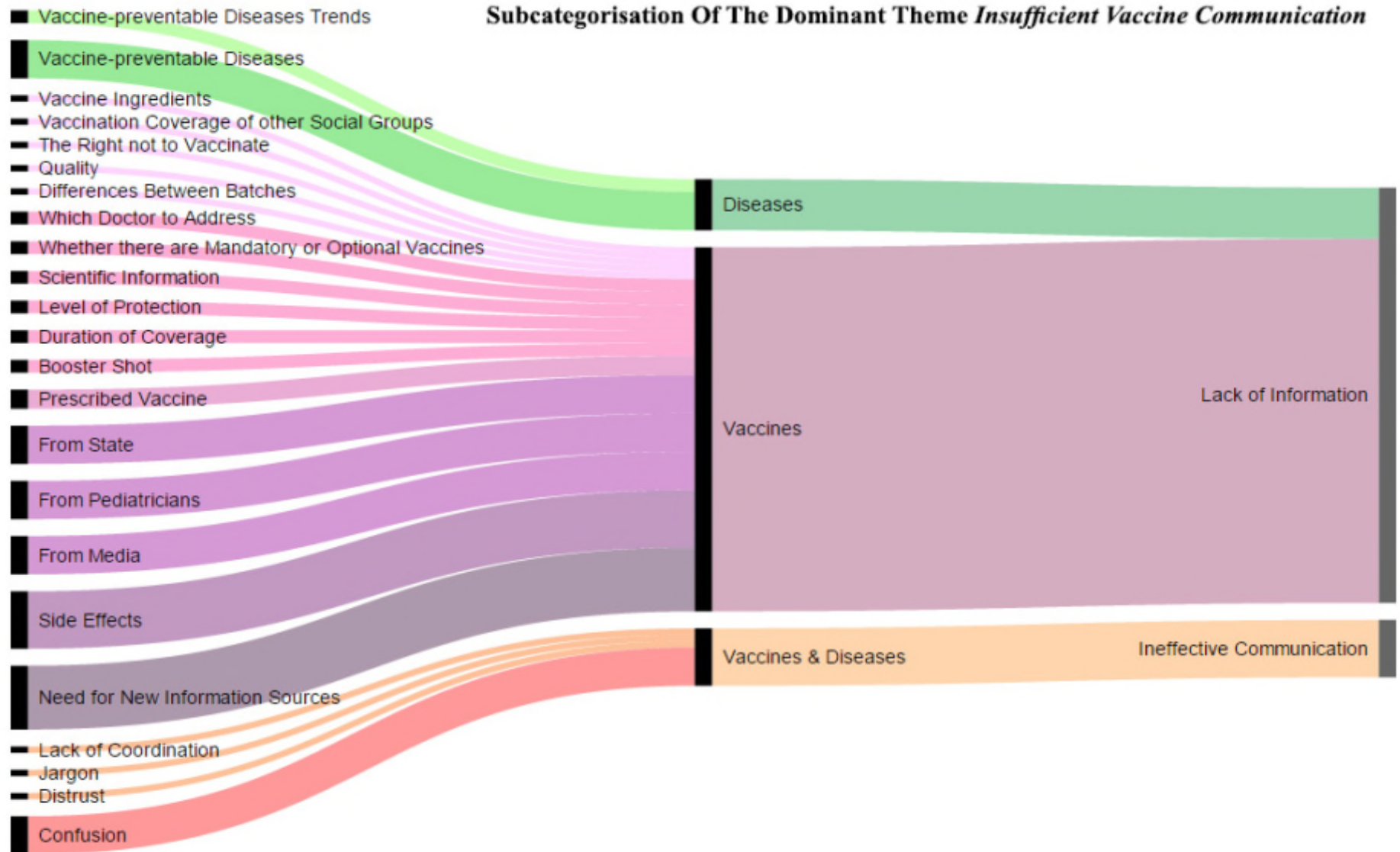
- There is a debate to be addressed – it no use trying to deny it – that just produces alienation.
- **The medical establishment has not always been able to communicate well** with the general public; and so has been perceived as elitist and uncaring. It has not always been willing to listen and address the issues expressed by concerned parents, and has been labeled as dismissive; and by refusing to address genuine issues is seen as being in thrall to Big Pharma.
- The anti-vaccine lobby does not want to understand statistical analysis, cause and effect, and benefit risk methodologies, public health for the majority of the population rather than the individual, and has an absolute, and unshakable certainty in conspiracy theories, and ulterior motives. This is often overlaid by irrational demands for zero risk - there is NO medical/surgical procedure which is risk free.
- All made worse by a media that seeks sensation over, admittedly very boring , scientific facts



*“The media often sets up a false opposition between public health officials and anti-vaccination campaigners, rather than conveying a clear message **that there is an overwhelming scientific consensus in favour of nationally recommended vaccines,**”*

<https://www.who.int/bulletin/volumes/95/10/17-021017.pdf>

Subcategorisation Of The Dominant Theme *Insufficient Vaccine Communication*



<http://www.cleoresearch.org/el/publications/articles-2/124-vaccine-efficacy-effectiveness-safety-and-markers-of-protections-the-impact-of-vaccine-communication-on-vaccine-acceptance-in-greece-a-qualitative-study>

Public Health Messages – Mixed Results

Public health officials and physicians have been combating misconceptions about vaccine safety for over twenty years. They've had mixed success. a growing number of parents are refusing to vaccinate their children.

WHICH HEALTH MESSAGES WORK?
EXPERTS PREFER NEGATIVE ONES BUT
THE PUBLIC FOLLOWS POSITIVE MESSAGES.



- Researchers now link falling immunization rates to recent resurgences of vaccine-preventable diseases. In 2010, California saw 9,120 cases of whooping cough, more than any year since the whooping cough vaccine was introduced in the 1940s. Ten infants too young to be vaccinated died of whooping cough during the outbreak. The CDC warns that events like these will become more frequent and harder to control if vaccination rates continue to fall.
- <https://www.publichealth.org/public-awareness/understanding-vaccines/vaccine-myths-debunked/>

Myth Debunking – not always successful

- Parents were less likely to think vaccines caused autism but strangely less likely to want their children to be vaccinated after being educated about the lack of a vaccine–autism link
- <https://www.scientificamerican.com/article/antivaccination-parents-dig-in-heels-even-after-receiving-medical-info/>

The science facts about

AUTISM AND VACCINES

WHAT STARTED THE RUMORS?



1998



Lancet published a paper by Dr. Andrew Wakefield, a dramatic study that found a connection between autism and vaccines

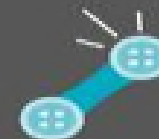
The Study Had Some Problems



Not based on statistics



No control group



It relied on people's memories

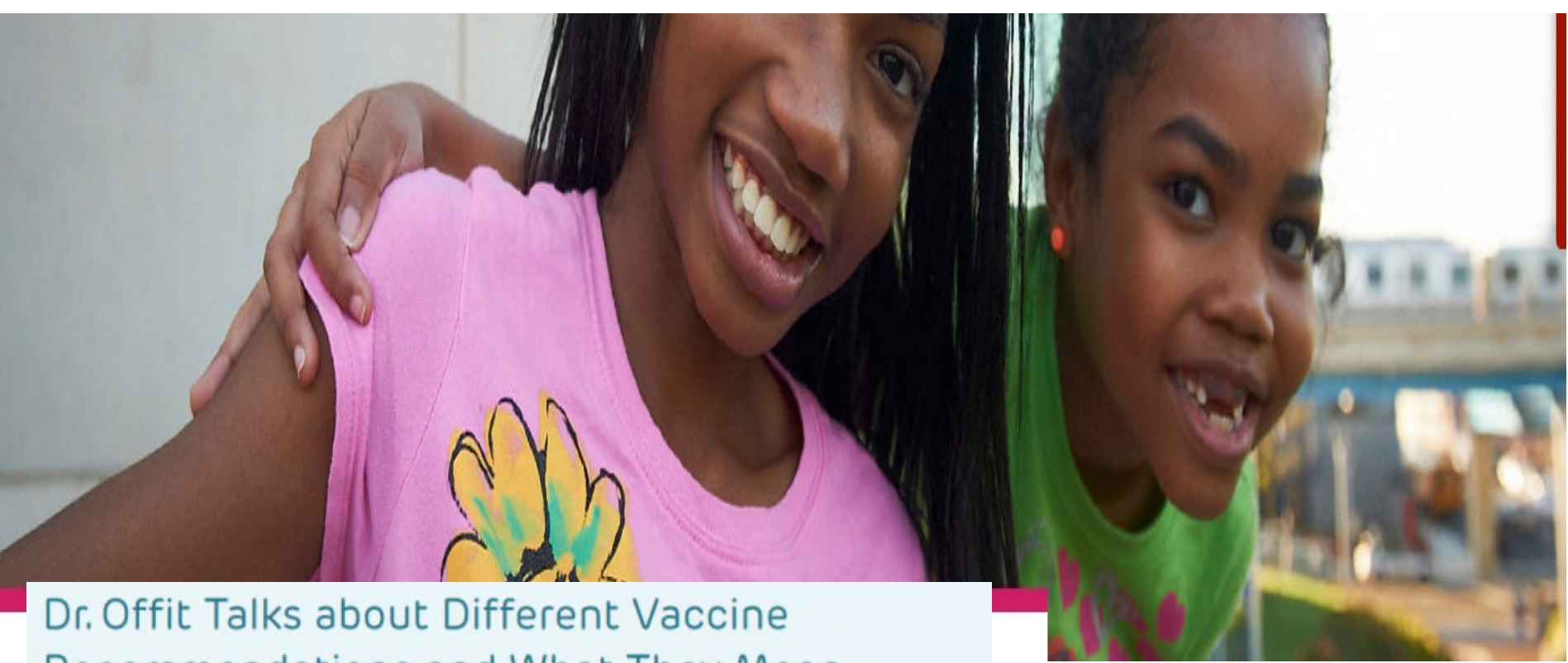


Made vague conclusions that weren't statistically valid

Vaccine Safety Net



- Due to the success of immunization, some diseases are no longer perceived as a threat. Certain groups have even questioned the utility of vaccination in spite of its proven success in controlling disease. In recent years, a number of web sites providing unbalanced, misleading and alarming vaccine safety information have been established, which can lead to undue fears, particularly among parents and patients. Acknowledging the above-mentioned issues and urged by governments, key non-governmental organizations and the United Nations Children's Fund (UNICEF), WHO initiated, in 2003, the Vaccine Safety Net Project (VSN).
- https://www.who.int/vaccine_safety/initiative/communication/network/vaccine_safety_websites/en/



Dr. Offit Talks about Different Vaccine Recommendations and What They Mean

Recommendations can vary for different vaccines. This can cause confusion for parents making vaccine decisions. In this short video, Dr. Offit describes different types of vaccine recommendations using the meningococcal B vaccine as a key example.



Vaccine Safety Net
Member

Vaccine Safety Net Member

Our website meets the criteria for credibility and content as defined by the Global Advisory Committee on Vaccine Safety.

[Learn More](#)

Are there really Fake News and Misinformation vaccination web sites ?

Vaccine Tricks to Fool Muslims.

Posted by Administrator

Vaccine Tricks To Fool Muslims

VACCINE SALES DEPARTMENT



Did You Know?

Vaccines may Contain Filth & Haraam.

Vaccines may contain filthy and impure substances from animals and humans, like cancer cells, cows blood & gelatine, dog kidney, infected homosexuals blood, monkey kidney, pigs blood & gelatine, pus from diseased animals and humans, plus many more! Vaccines may also contain many toxic substances like aluminium, antibiotics, abortion drugs, anti-fertility drugs, aspartame, heavy metals, mercury, MSG, polysorbate, sorbitol, and many more!

Vaccines have been linked to nearly every disease we see today like autism, autoimmune disease, cancer, cot death, infertility, neurological disease, sterility and death. Worse still, new diseases never seen before, continue to increase as more and more vaccines are injected into our innocent little babies and children.

Would you knowingly inject these substances into your child?

If the people really understood what was in a vaccine, it would be very difficult to sell harmful vaccines and polio drops to the public masses. To overcome this problem, many clever methods may be used that completely fool and confuse the Muslims, doctors and even religious scholars into supporting vaccination!

Incorrect Medical Knowledge.

Vaccination is based on a long-discredited theory that stimulation of antibodies in the human body equals protection from disease. This theory has not only failed

Hidden

Many suit disguised Christian linked to Vaccine is following rights, dis supplies, ingredient substances list compl contain it

Medica

Medical s and the n Vaccine s Why mos John P. A.

Polio Ri

Many dis To hide is simply re as acute meningiti monkey s

Epidem

Anti-Vaccine Groups

Australian Vaccination-skeptics Network

Boko Haram

Christian Science

Various "experts" writing for the Huffington Post

GreenMedInfo

InfoWars

Livingwhole.org

NaturalNews

Vaccination Information Network

The Taliban

https://rationalwiki.org/wiki/Anti-vaccination_movement#Additional_causes_of_confusion

<http://muslimhealthwatch.org/wp-content/uploads/2018/06/vaccine-tricks-to-fool-muslims-leaflet-2018-03-01.pdf>

International Ulama Conference on Polio Eradication

بين الاقوامی علماء کانفرنس برائے انسدادِ پولیو
المؤتمر الدولي للعلماء حول إستئصال شلل الأطفال
15-16 June 2014, Islamabad, Pakistan



ISLAMABAD DECLARATION / FATWA

International Ulama Conference on Polio Eradication
15-16 June 2014, Islamabad Pakistan

We, the Ulama of Islamic Republic Pakistan and the Muslim World along with international Islamic organizations including the Islamic Development Bank (IDB), Organization of Islamic Cooperation (OIC), Al Azhar Al Sharif, the International Islamic Fiqh Academy (IIFA), the International Islamic University of Islamabad (IIUI) and the National Islamic Advisory Group (NIAG) of Pakistan are participating in the International Ulama Conference in Islamabad; after having been briefed on the technical aspects of the polio eradication campaign, by senior Muslim health experts, we issue FATWA in the light of Sharia that the polio vaccine does not contain any harmful constituents, we reiterate that the use of polio vaccine is fully permissible under Islamic Sharia to protect individuals from polio.

My Declaration



- Lest it appear I am supporting the anti-vaccine lobby, as I seek to explain the objections and myths to vaccinations, let me clearly state:
- I am absolutely in support of vaccinations
- I have witnessed first hand the astounding success of vaccines, and the tragic and debilitating effects of failure to vaccinate.
- But:
- I also recognize for any Public Health program to be effective, it is necessary to have meaningful interaction with the public, and to be able to address their concerns, and explain – often very complex concepts - in ways which they can accept.
- These days, **its not enough to be right, you have to be able to explain why it is right**, in as calm and rational way as you can manage

World Health Organization-
“Immunization prevents deaths every year in all age groups from diphtheria, tetanus, pertussis (whooping cough), and measles. It is one of the most successful and cost-effective public health interventions.”

An Example of not listening



- Northern Nigeria, 2007, major opposition – labeled as a boycott- to childhood vaccination because it contained ‘hidden’ contraceptives.
- .. Datti Ahmed, a Kano-based physician who heads a prominent Muslim group, the Supreme Council for Sharia in Nigeria (SCSN), is quoted as saying “*We believe that modern-day Hitlers have deliberately adulterated the oral polio vaccines with anti-fertility drugs*”
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1831725/>
- Typical Medical Establishment initial response: incredulity. There is nothing in the vaccine which could possible act as a contraceptive, and how can vaccinating a child act as a contraceptive to the mother ? Its nonsense and hysteria whipped up be religious extremists.

What was *possibly* contributing ?



- The situation was very complex with many factors, mainly lack of trust, BUT:-
- In a number of societies, women do not wish their male partners to (openly) know they are using contraceptives.
- One way to achieve this is through the use of injectable contraceptives – there are a number of different types with medroxyprogesterone acetate (Depo-Provera) – which acts for a 3 month period - being the most popular.
- Typically the mother uses the ‘excuse’ of her taking her child to the well baby clinic – ostensibly for vaccination – and whilst there just ‘happens’ to request a contraceptive injection.

So who was right ?



- The vaccine was not causing any contraception – but the vaccination process was (sometimes) being ‘subverted’ as a means of obtaining ‘covert’ contraception, and fertility **was** being affected.

I believe that by not listening:

- the medical establishment (initially at least) failed to address the issue and caused great alienation, and further loss of trust
- by refusing to consider the science , the objectors were labeled idiots, and religious extremists

And that is how we get into a debate about a subject which should be so clear, from the sheer mass of evidence, that no debate should be needed

What is the message ?

“Communication must be HOT. That’s Honest, Open, and Two-way.” - Dan Oswald

- By not listening, and not looking beyond high level science, and not investigating concerns (however ‘misguided’ they may appear) alienation results and opposition becomes entrenched
- Honest, open and effective communication is essential for all Public Health campaigns – risks, and benefits, clearly stated



*“As a public health community we are now in a difficult situation because **we weren’t paying enough attention to public concerns in the past,**”*

*“We’ve invested in more and more vaccines and much less in bringing the public along with us. We need to pay attention to the public and **listen to their concerns** much earlier on,” Larson says*

<https://www.who.int/bulletin/volumes/95/10/17-021017.pdf>

Fundamental Communication Problems on Vaccination Information

- Its exceedingly difficult to prove a negative absence
- Fake news travels fast, is pervasive, and very long lived
- Not all vaccines provide 100% protection, explaining risks and probabilities and potential benefits is never easy
- There are (very rare) problems of fake and OOS vaccines which have not been well explained



“Fake news travels six times faster than the truth on Twitter”

<https://www.newscientist.com/article/2163226-fake-news-travels-six-times-faster-than-the-truth-on-twitter/>

Negative absence – an absurd example

- Myth: Excessive hair grooming causes cystitis
- Cystitis is a bladder problem, which produces a strong, persistent need to urinate frequently
- Cystitis has many potential causes - from renal deficiency to wearing tight nylon knickers - and its rarely possible to isolate just one cause – so very often for an individual patient there is just is no single clear cause.
- People with cystitis need to visit the bathroom frequently, and so whilst there, will often also groom their hair. So people with cystitis often have well groomed hair.
- BUT since you don't know what (specifically) does cause cystitis- in most cases - how can you prove that frequent hair grooming does not cause it ?



Some Causes of Cystitis

Bacterial Infection
Having sex
Poor toilet hygiene
Urinary catheter
Diaphragm for contraception
Bladder stone
Men – enlarged prostate
Female - Menopause
Diabetes
Chemical irritants
'Recreational' use of Ketamine ... etc., etc.

<https://www.nhs.uk/conditions/cystitis/causes/>

Negative Absence

- There would need to be a huge study of two groups who were completely matched, one with frequent hair grooming, one without, and the rates of cystitis measured between the two groups – and even then you could never be certain that you had controlled for all the factors that can give rise to cystitis.
- It would be a huge cost, could never be absolutely conclusive, and of zero medical benefit.



Argument from ignorance (from Latin: argumentum ad ignorantiam), also known as appeal to ignorance (in which ignorance represents "a lack of contrary evidence") is a fallacy in informal logic. It asserts that a proposition is true because it has not yet been proven false or a proposition is false because it has not yet been proven true.

Absurd to Autism

- The causes of autism are not clearly established
- Until recently, it was often detected at a similar time, or shortly after, childhood vaccinations
- Extensive studies have failed to show any connection – but how do you ‘prove’ no connection when you don’t know what causes autism (for certain)
- I will be discussing autism in greater detail shortly, but to be clear, I absolutely believe there is no connection whatsoever.

In some circumstances it can be safely assumed that if a certain event had occurred, evidence of it could be discovered by qualified investigators. In such circumstances it is perfectly reasonable to take the absence of proof of its occurrence as positive proof of its non-occurrence.

— Copi, *Introduction to Logic* (1953), p. 95

Debunking the Myths

<https://leftlanepassingonly.wordpress.com/2015/02/03/the-vaccine-debate/>

Faces of Vaccine Denialism

Autism Andy



Andy is convinced vaccines cause autism. No amount of peer review will dissuade him from that one article he read in 1998. To him Dr. Wakefield is a martyr.

Poisonous Pete



Pete is terrified by all the words he can't pronounce on the vaccine ingredient list. He doesn't know much about chemistry, but he does know formaldehyde is used in embalming and mercury is bad.

Loony Lucy



All antivaxers are a bit conspiratorial, but Lucy takes the cake. Vaccines are not just a ploy to make money they are tools of the illuminati. Vaccines were invented by the rich to sterilize poor children and depopulate the earth.

Hoaxy Holly



Holly knows the real reason for vaccines; PROFIT. Everyone from the local doctor to the World Health Organization is in on it. Vaccines don't work and never did. Parents who vaccinate their children are just lining the pockets of big pharma.

Hygienic Helen



Unlike most denialists Helen actually believes vaccines are safe and effective, she just doesn't think they are needed. Disease was eradicated by soap and clean water. Vaccines had nothing to do with it, they just happened to be invented around the same time.

Naturalist Nancy



Nancy is sure all this modern medicine is killing us. If we all went back to nature we would have eternal life. Natural Immunity is the way to go (even if 2 in 1000 cases of measles are fatal). Just don't tell her life expectancy before modern medicine was around 40....

HOT

- Honest, Open, Two way, communication
 - Its tempting and easy to dismiss vaccine objectors, as evil – and yes I believe some truly are evil – or more commonly, as crackpots, nutcases, or snowflakes; or more politely, as irrational.
 - But if we are to follow HOT principles, then we have to acknowledge:
 - There have been conspiracies – the hunt for Bin Laden – which invented and subverted a vaccine program- and has had a massive impact in Pakistan and Afghanistan
 - There have been attempts by Big Pharma to influence WHO activities
 - Few vaccines provide 100% protection
 - There are side effects and rare adverse reactions
- None of which detracts from the basic science and effectiveness of vaccinations
- BUT, by being open and honest, and taking the time to explain fully, I believe we STRENGTHEN the case for vaccination



“Most hesitant parents do not oppose the scientific evidence, but the appeals and messages of vaccine deniers make them feel afraid and uncertain.”

Philipp Schmid

<https://www.who.int/bulletin/volumes/95/10/17-021017.pdf>

Debunking the myths: 1

Myth 1: Vaccines do not work

- There is such a massive wealth of evidence that vaccines clearly do work, that it might appear impossible that anyone could seriously believe such a statement
- But if we are to be entirely open and honest, then, we have to acknowledge that; Public Health gains are not solely due to vaccines; not all vaccines provide 100% protection, and very rarely, some vaccine programs have failed due to fake and OOS products. None of which affect the fundamental message that vaccines work.

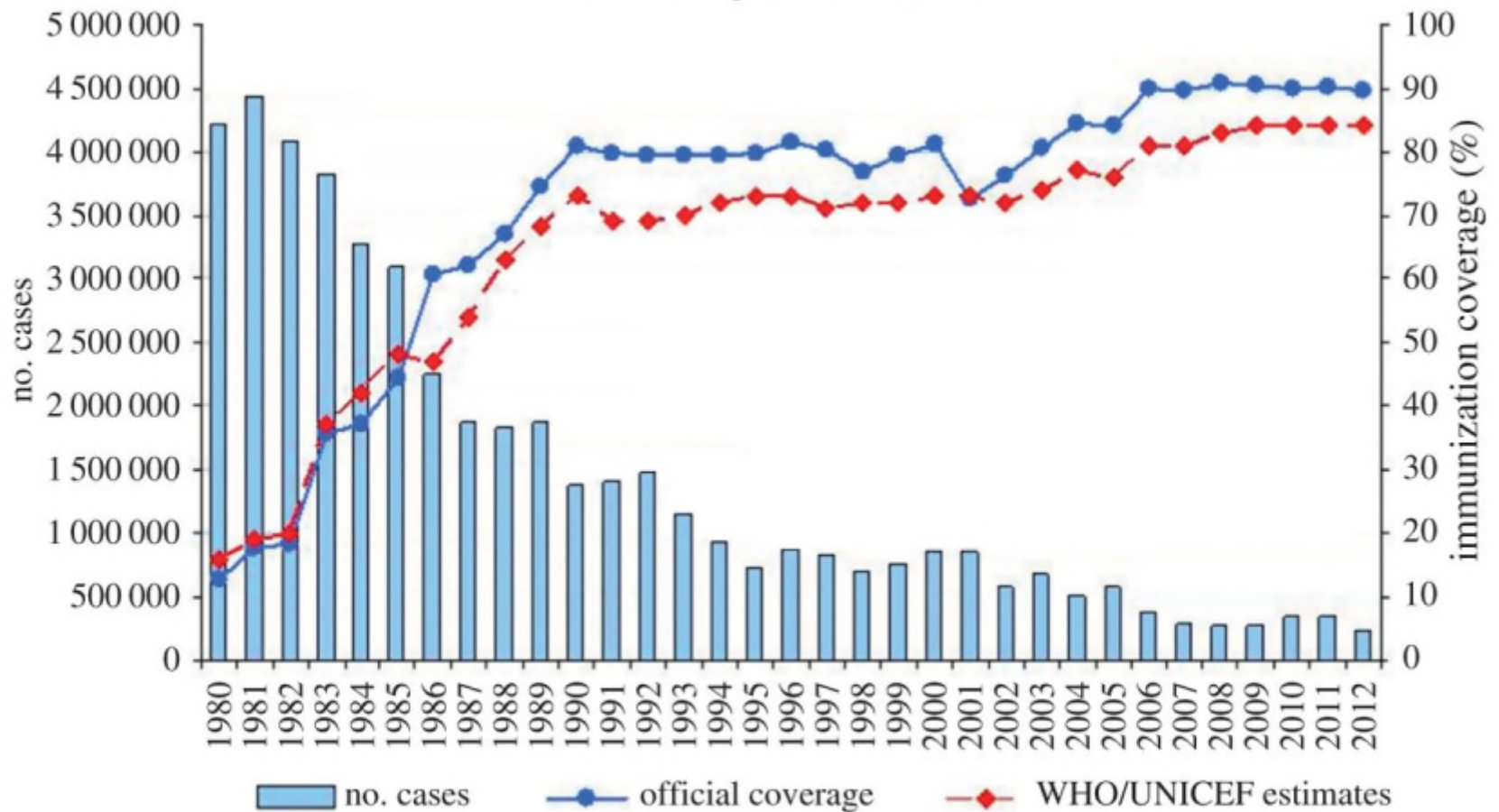


“We are not trying to change the minds of a tiny group of entrenched anti-vaccination people, .. But to communicate with a much larger group of people – mainly parents who are hesitating about whether or when to get their children vaccinated – to show them how to process the myths and messages of fear.”

Philipp Schmid

<https://www.who.int/bulletin/volumes/95/10/17-021017.pdf>

measles global annual reported cases and MCV coverage, 1980–2012

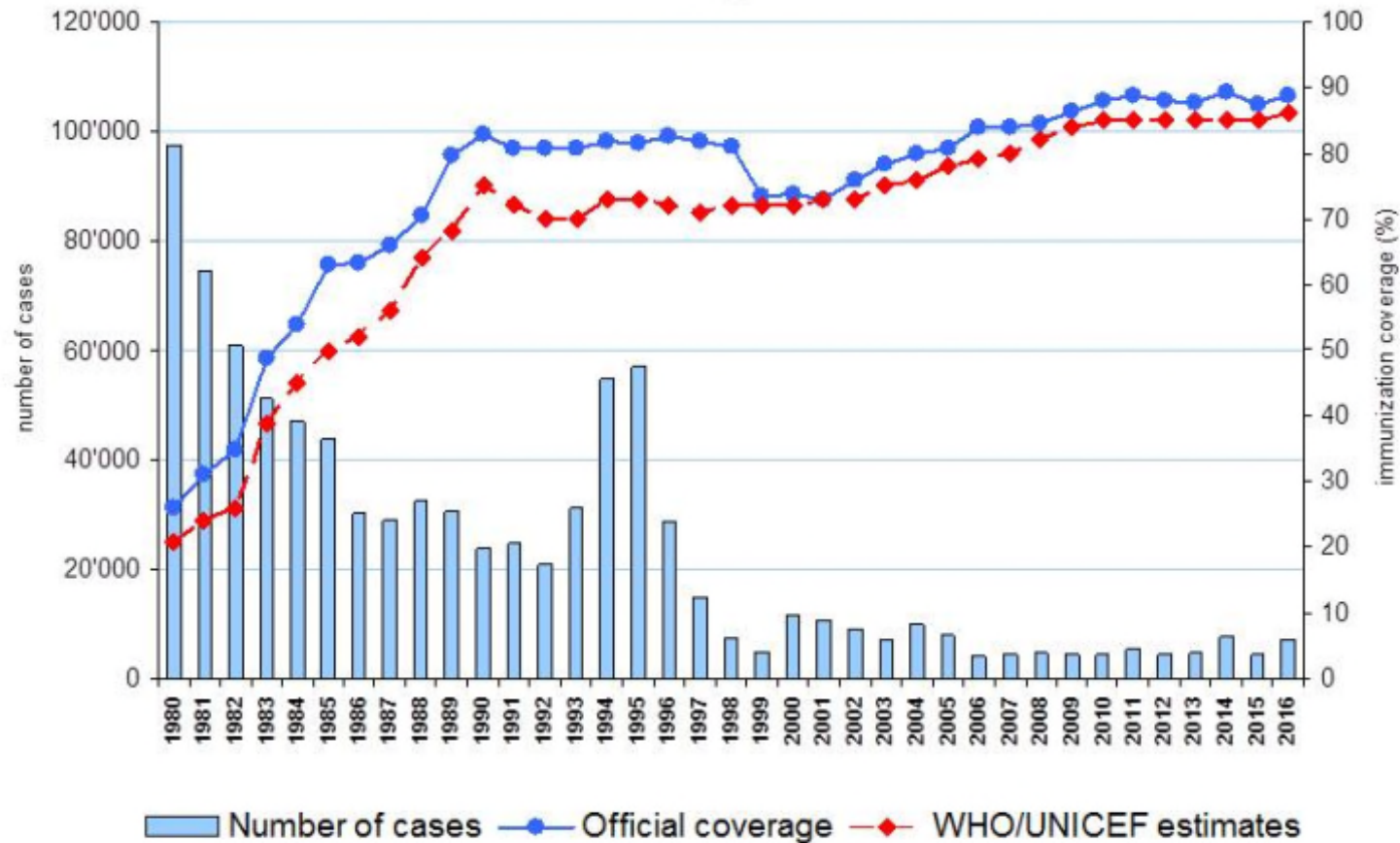


Source: WHO/IVB database, 2013
194 WHO Member States.
Data as of July 2013

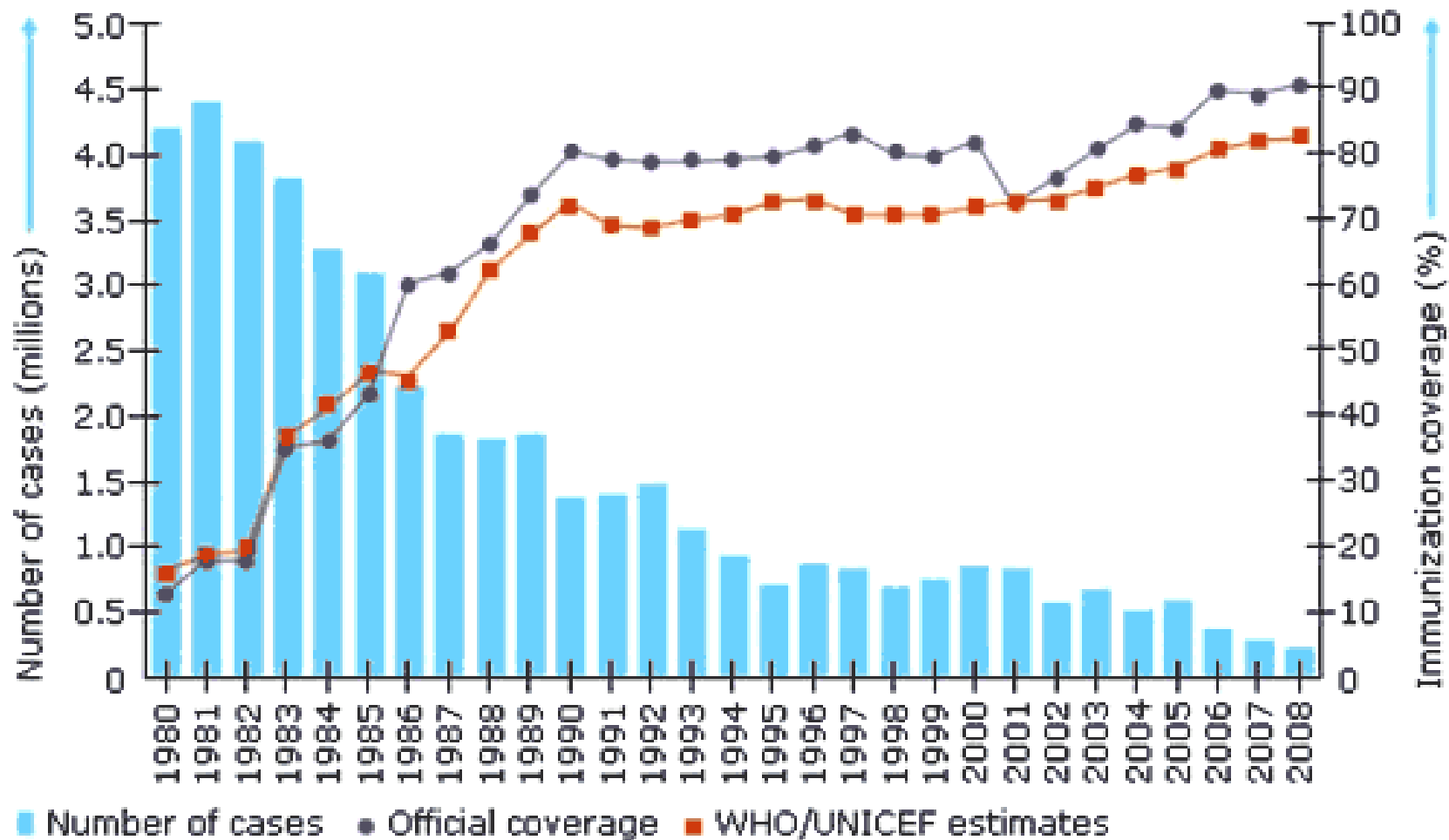
Data of slide: 12 July 2013



Diphtheria global annual reported cases and DTP3 coverage, 1980-2016



Polio



The Global Impact of Vaccines in Reducing Vaccine-Preventable Disease Morbidity and Mortality

1988-2015



AFGHANISTAN
PAKISTAN

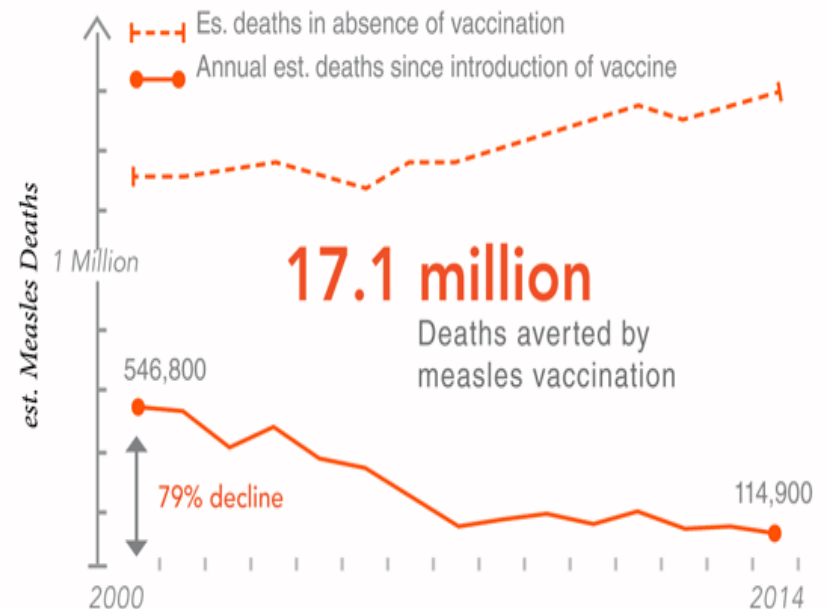
Only remaining polio endemic countries in the world, 2015



Region = WHO regions
Source: *Global Polio Eradication Initiative*
Figure: 3

2000-2014

Annual estimated measles deaths declined 79%,
from 546,800 to 114,900.

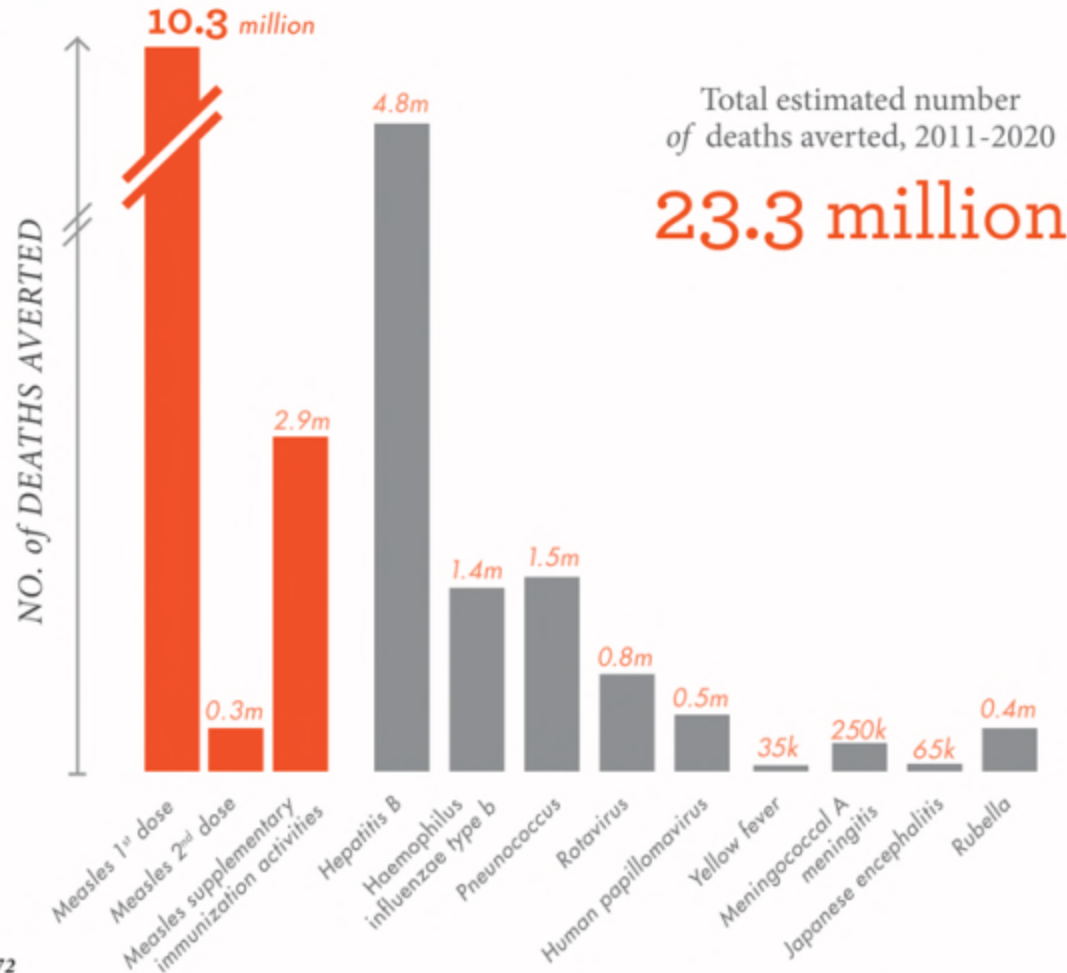


Source: *MMWR 2015; 64:1246-51*
Figure: 4

2011-2020

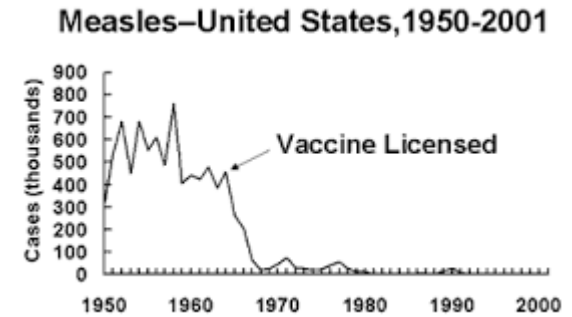
Estimated deaths averted with vaccines in low-income countries

Measles vaccine
Diseases with new or underutilized vaccines



Source: *Vaccine* 2013; 18;31 (Suppl 2): B61-72
Figure: 5

Anti-vaccine lobby claims Sanitation



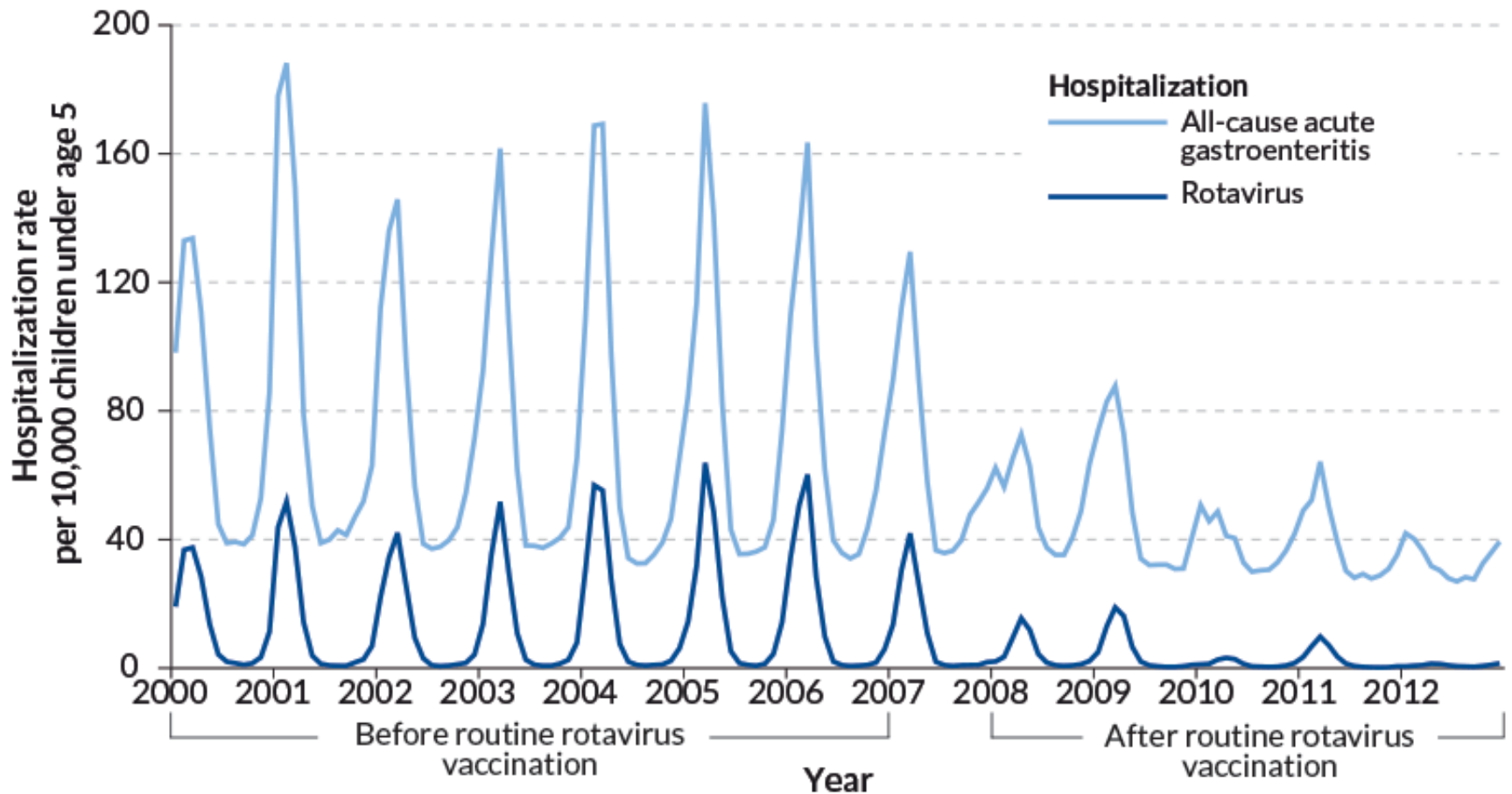
A common myth is that better hygiene and sanitation are actually responsible for decreased infections, not vaccines.

- And its true that Vaccines don't deserve all the credit for reducing or eliminating rates of infectious disease. Better sanitation, nutrition, and the development of antibiotics helped a lot too. But when these factors are isolated and rates of infectious disease are scrutinized, the role of vaccines cannot be denied.

<https://www.publichealth.org/public-awareness/understanding-vaccines/vaccine-myths-debunked/>

One example is measles in the United States. When the first measles vaccine was introduced in 1963, rates of infection had been holding steady at around 400,000 cases a year. And while hygienic habits and sanitation didn't change much over the following decade, the rate of measles infections dropped precipitously following the introduction of the vaccine, with only around 25,000 cases by 1970. Another example is Hib disease. According to CDC data, the incidence rate for this malady plummeted from 20,000 in 1990 to around 1,500 in 1993, following the introduction of the vaccine.

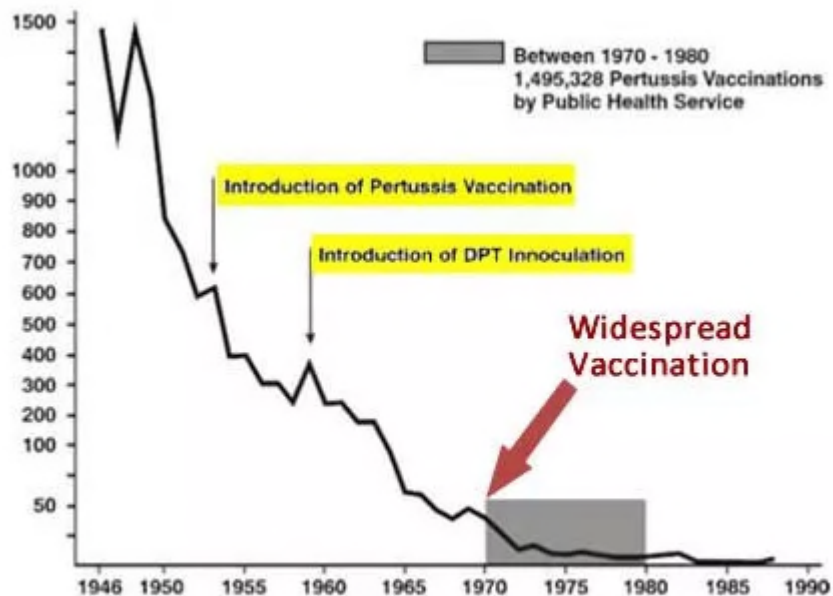
Hospitalization rates for children younger than 5 years old with intestinal infections



<https://www.sciencenews.org/article/rotavirus-vaccine-proving-its-worth>

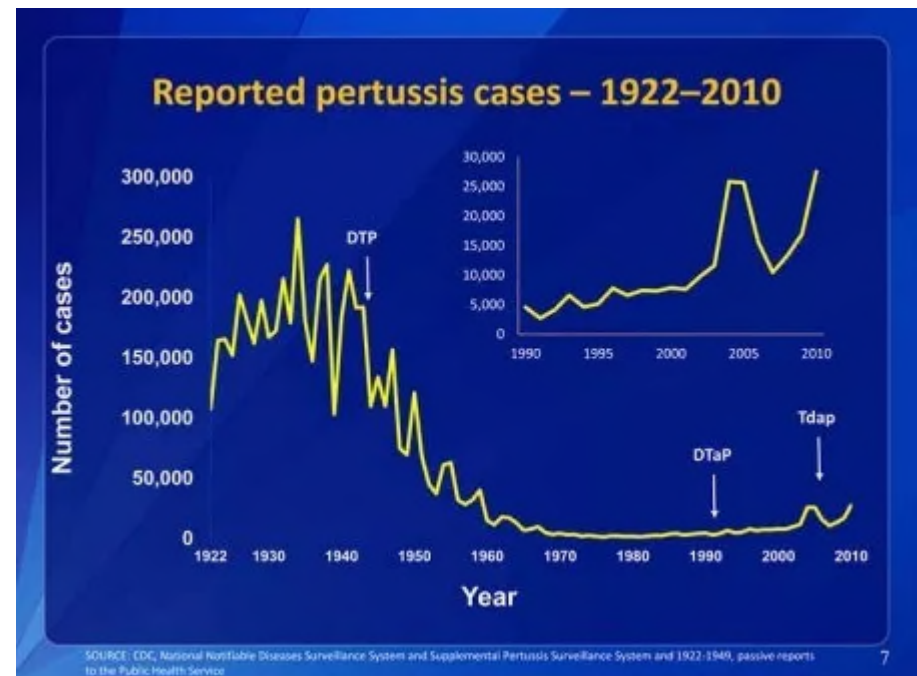
Mortality vs Morbidity

- A common ploy used by the anti-vaccine lobby is to use only data on the rate of deaths rather than number of people contracting the disease
- Its absolutely true that less children die of measles and other diseases because of much improved healthcare, but sanitation alone has not reduced the rates of infection – that is due to vaccines

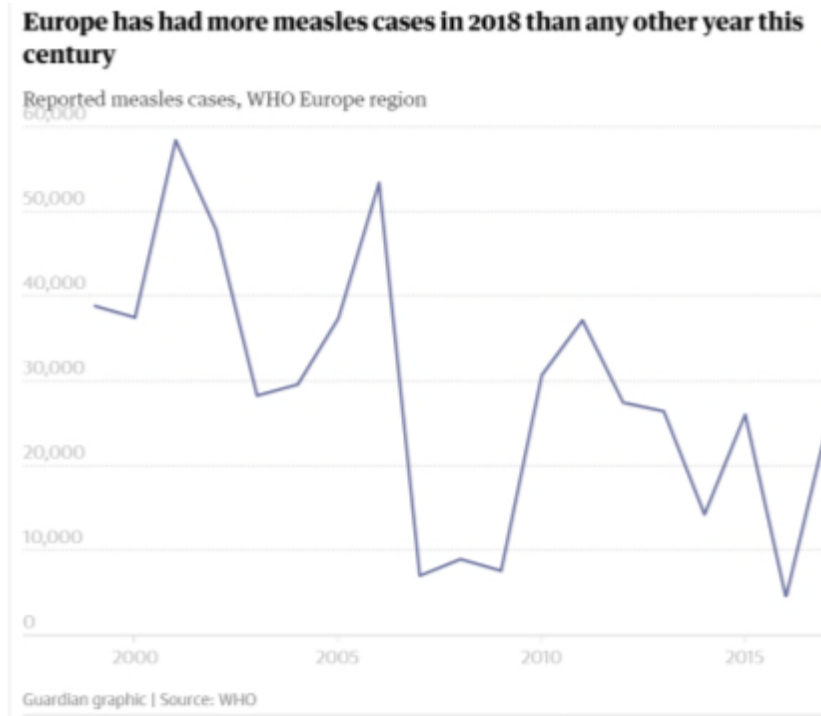


Pertussis mortality

Source: Statistisches Bundesamt Wiesbaden, Gruppe VIID.



What happens when you stop vaccinating ?



Between 1 January 2018 and 31 October 2018, there have been 913 laboratory-confirmed measles cases in England. This steep rise in cases (when compared to 259 lab-confirmed measles cases in 2017)

- Dr Mary Ramsay, Head of Immunisation at PHE, said:
- We will continue to see measles cases in unvaccinated individuals and are monitoring the situation carefully. People who have not had 2 doses of the MMR vaccine are particularly at risk.
- <https://www.gov.uk/government/news/measles-outbreaks-across-england>

If Vaccines are so effective why is there still disease ?

- Immunization averts 2 to 3 million deaths annually; however, an additional 1.5 million deaths could be avoided if global vaccination coverage improves. Today, an estimated 18.7 million infants – nearly 1 in 5 children – worldwide are still missing routine immunizations for preventable diseases, such as diphtheria, pertussis and tetanus.
- <http://www.who.int/en/news-room/detail/21-04-2016-world-immunization-week-2016-immunization-game-changers-should-be-the-norm-worldwide>



SIX GOALS OF THE GLOBAL VACCINE ACTION PLAN



CLOSE
THE IMMUNIZATION
GAP



IMMUNIZATION FOR ALL
THROUGHOUT LIFE

IMMUNIZATION AGAINST DIPHTHERIA, TETANUS AND PERTUSSIS

Target



Immunization coverage with 3 doses of diphtheria, tetanus and pertussis vaccines

Gap: **65 countries**

18.7 million children unvaccinated



MEASLES MORTALITY REDUCTION

Target



At least 4 WHO Regions to eliminate measles in 2015

Gap: **15%**

15% of all children not being immunized with one dose. Only one Region has eliminated measles



RUBELLA ELIMINATION

Target



Eliminate rubella from at least two WHO regions in 2015

Gap: **1/2**

Half of all children do not receive the rubella vaccine



MATERNAL AND NEONATAL TETANUS ELIMINATION

Target



Eliminate maternal and neonatal tetanus in 59 priority countries

Gap: **21 countries**

21 countries have not yet eliminated maternal and neonatal tetanus



POLIO ERADICATION

Target



A world free of polio

Gap: **2 countries**

Remain polio endemic



USE OF NEW OR UNDERUTILIZED VACCINES

Target



At least 90 low- and middle-income countries introduce one or more new or underutilized vaccine

On **TRACK**

86 low- and middle-income countries added at least one new or underutilized vaccine



Individual effectiveness of vaccines

- Some vaccines on the immunisation schedule are almost 100% effective. For example, two doses of the measles mumps and rubella vaccine (MMR) will protect 99% (99 out of 100) of people from measles and will protect about 88% (88 out of 100) of people from mumps.
- However, there will always be a very small number of people who will not make an immune response to a particular vaccine and will therefore remain unprotected from that disease. For measles, with two doses of the MMR vaccine this is about 1 out of every 100 people vaccinated, for mumps this is about 12 out of every 100 people vaccinated.
- <https://www.health.govt.nz/our-work/preventative-health-wellness/immunisation/vaccine-effectiveness>
- BUT, if vaccination rates are high, the non-immune can still be protected due to 'herd immunity'.

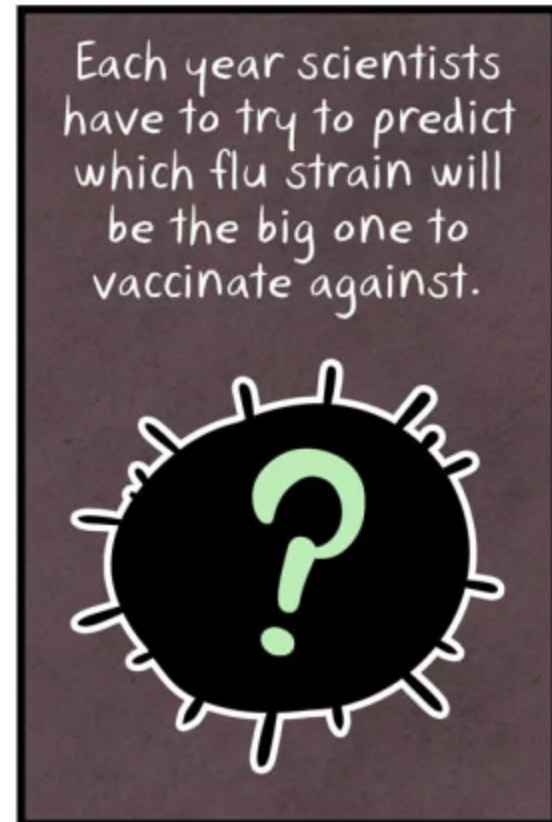
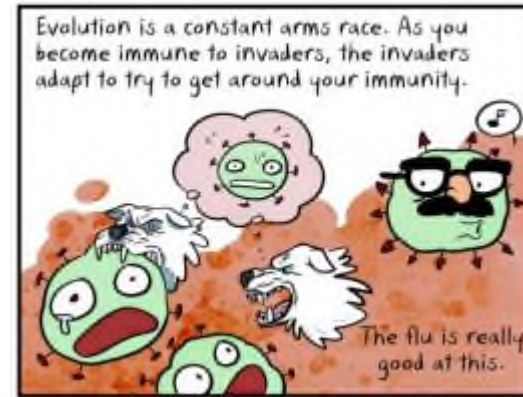
Long Term protection from Vaccines

- Most vaccines offer good protection for many years, however, levels of protection may naturally decrease over time, or may be reduced when the immune system is working less well because of medical conditions, medications or ageing.
- For some vaccines it is therefore necessary to give additional doses of vaccines to provide continued protection.
- Example Waning protection over time: Whooping cough (pertussis) vaccines
- The immune response to pertussis vaccines is known to decrease over time, BUT; The same is true if you catch whooping cough, you do not become immune for life. You can catch pertussis (again) even if you have had it before. This is a feature of the disease – not a plot by the Illuminati to generate income.
- However in immunised children who develop symptomatic infection, the disease course will tend to be less severe than in those who have not been vaccinated.



Diseases Change Over Time

- For vaccines to work, the strain of bacteria or virus in the vaccine needs to be the same as, or very similar to, the strain that causes disease in the population. Some viruses and bacteria change over time, and this can have an impact on how effective vaccines are.
- For example, the flu virus can change very rapidly, meaning that last year's flu vaccine is unlikely to protect you from the virus strains that are circulating this year. That is why it is important to get the flu vaccine every year.
- Some bacteria that cause disease come in many different types (such as pneumococcal bacteria). Vaccines are developed to protect against the main types that cause disease. However, sometimes new strains appear, or less common strains start to cause more disease. This can also have an impact on vaccine effectiveness.

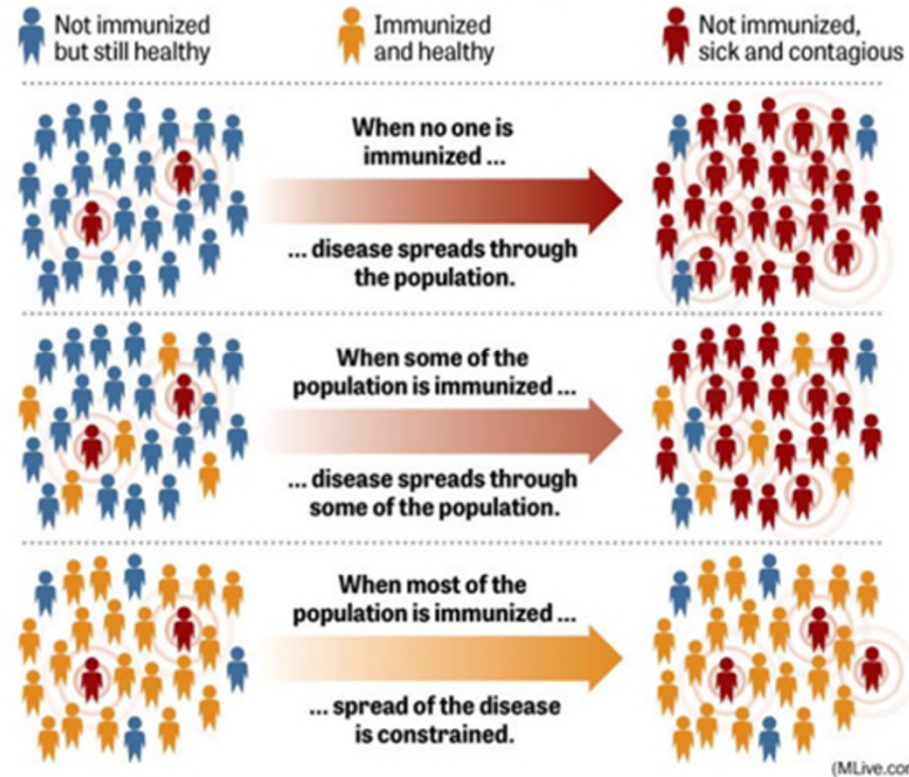


Herd Immunity

Infectious diseases move through populations by infecting people who are not immune to the disease and then spreading onwards. When a high percentage of the population is vaccinated, it is difficult for infectious diseases to spread because there are not many people who can be infected.

WHY DOES MY CHOICE MATTER TO OTHERS?

It matters because of the concept of "herd immunity." Here's how it works:



Immunisation programmes aim to protect individuals against disease AND also prevent the onward spread of disease within the **population as a whole**. This way of controlling disease is called herd immunity. However, herd immunity depends on high vaccination levels, and cannot protect every individual.

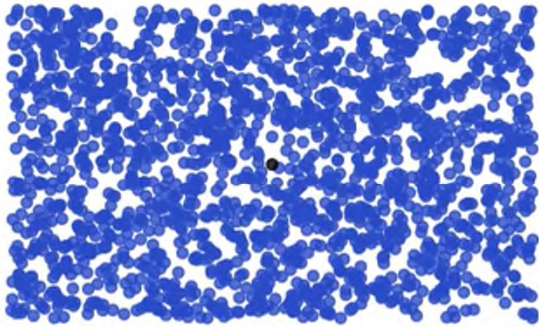
A Public Health/Community Perspective

“You are a human shield. “Have you ever wondered who we are protecting when we vaccinate?” Libster asks. It’s a deceptively simple question, because vaccines don’t just fight off an infection, they break a chain of infections. “People who are vaccinated are not only protecting themselves, they are indirectly protecting the people in this community who are not vaccinated,” says Libster. Even the most well-inoculated communities will have a vulnerable minority — the young, the old and the sick — whose immune systems cannot withstand the dose of weakened virus in a vaccine. Their first and only line of defense is other, vaccinated people, who when in the majority “create a kind of protective shield which prevents them from coming in contact with the disease,” Libster says.”

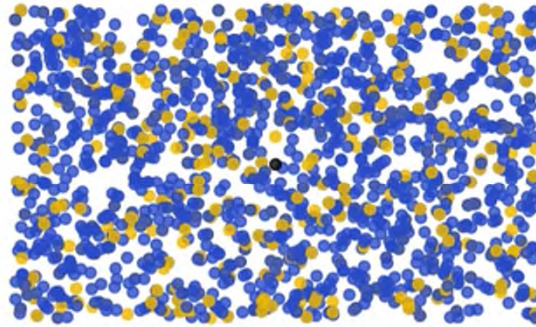
<https://ideas.ted.com/why-we-must-get-vaccinated-to-protect-the-people-who-cant/>

Herd Immunity: How It Works

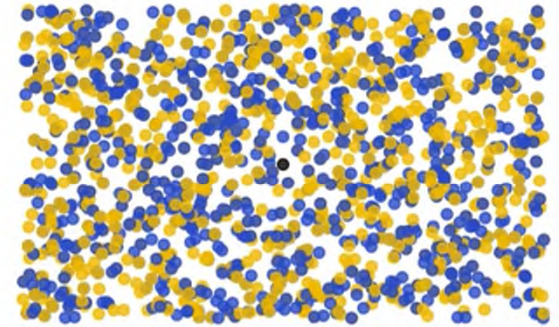
Percent Vaccinated: 0%



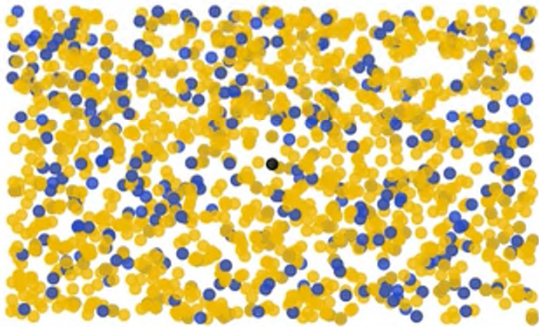
Percent Vaccinated: 25%



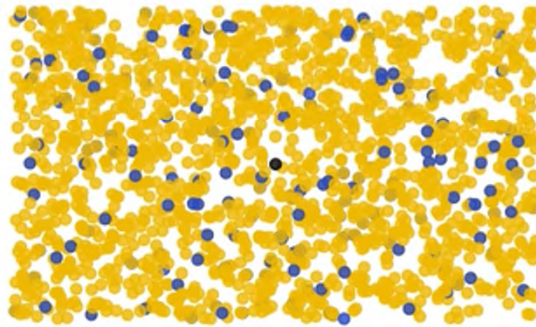
Percent Vaccinated: 50%



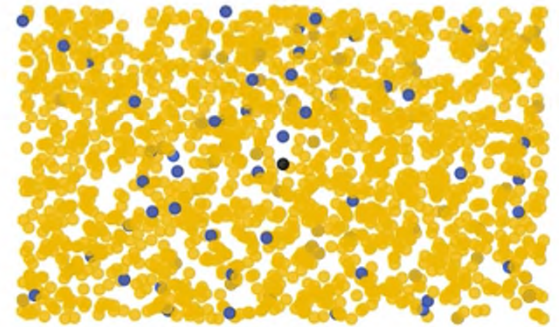
Percent Vaccinated: 75%



Percent Vaccinated: 90%



Percent Vaccinated: 95%



• Infected • Unvaccinated • Vaccinated

What about the stories of Vaccines that do not work ?



- Republic of Niger 2015. A month into the outbreak of meningitis, a health care worker at an NGO was taking a vaccine out of the fridge when she noticed that the ink around the expiry date appeared smudged . They alerted both the manufacturers and WHO.
- The manufacturers could tell from photographs that both products were falsified. Laboratory analysis... confirmed this product appeared to have been refilled and relabeled.
- In the end, 8580 cases of meningitis C were reported in Niger in 2015 and nearly 600 people died . There is no way of knowing how many of those cases might have been averted if every vaccination administered had been with a quality-assured product.
- In 2017 fake vaccines were again detected in West Africa

Fake Vaccines

- Do criminals really fake vaccines ?

FIG 11: VIALS OF MENINGITIS VACCINE FOUND IN NIGER IN 2015 HAD THEIR EXPIRY DATE MANUALLY EXTENDED BY TWO YEARS



The World Health Organization (WHO) also initiated an investigation before issuing Medical Product Alert No. 1/2017 entitled “Falsified meningococcal vaccine in circulation in West Africa.” This alert refers to the recent circulation in Niger of falsified confirmed versions of meningococcal serotype ACWY vaccine.

https://www.who.int/medicines/publications/drugalerts/drug_alert1-2017/en/

Indonesia on Friday (2016) ordered an immediate overhaul of the food and drug monitoring agency, a month after police uncovered a syndicate selling fake imported child vaccines to hospitals, pharmacies and clinics over the past decade.

<https://www.financialexpress.com/lifestyle/health/indonesia-orders-overhaul-drug-agency-fake-vaccine-scandal/317729/>



WHO Global Surveillance and Monitoring System

for Substandard and
Falsified Medical Products



BOX 2: What are substandard and falsified medical products?

For many years, the response to this important threat to public health was embroiled in the discussion of complex definitions that meant different things to different people. Reflecting this complexity, until May 2017, WHO used the term “substandard/spurious/falsely-labelled/falsified/counterfeit medical products” (SSFFC). The WHO Member State mechanism on SSFFC medical products was tasked with revising these definitions to ensure that they were based on a public-health perspective, with no account taken of intellectual property concerns. Based on their deliberations, the World Health Assembly, which governs WHO, adopted the following definitions:

Substandard medical products

Also called “out of specification”, these are authorized medical products that fail to meet either their quality standards or their specifications, or both.

Unregistered/unlicensed medical products

Medical products that have not undergone evaluation and/or approval by the national or regional regulatory authority for the market in which they are marketed/distributed or used, subject to permitted conditions under national or regional regulation and legislation.

Falsified medical products

Medical products that deliberately/fraudulently misrepresent their identity, composition or source.

Source: Appendix 3 to Annex, World Health Assembly document A70/23, 2017.

http://www.who.int/medicines/regulation/ssffc/publications/GSMSreport_EN.pdf?ua=1

con·spir·a·cy, noun, a secret plan by a group to do something unlawful or harmful.

FIG. 4: CUMULATIVE NUMBER OF FOCAL POINTS TRAINED, AND OF PRODUCTS REPORTED TO THE WHO SURVEILLANCE AND MONITORING SYSTEM DATABASE (FROM PILOT PHASE TO 2017)

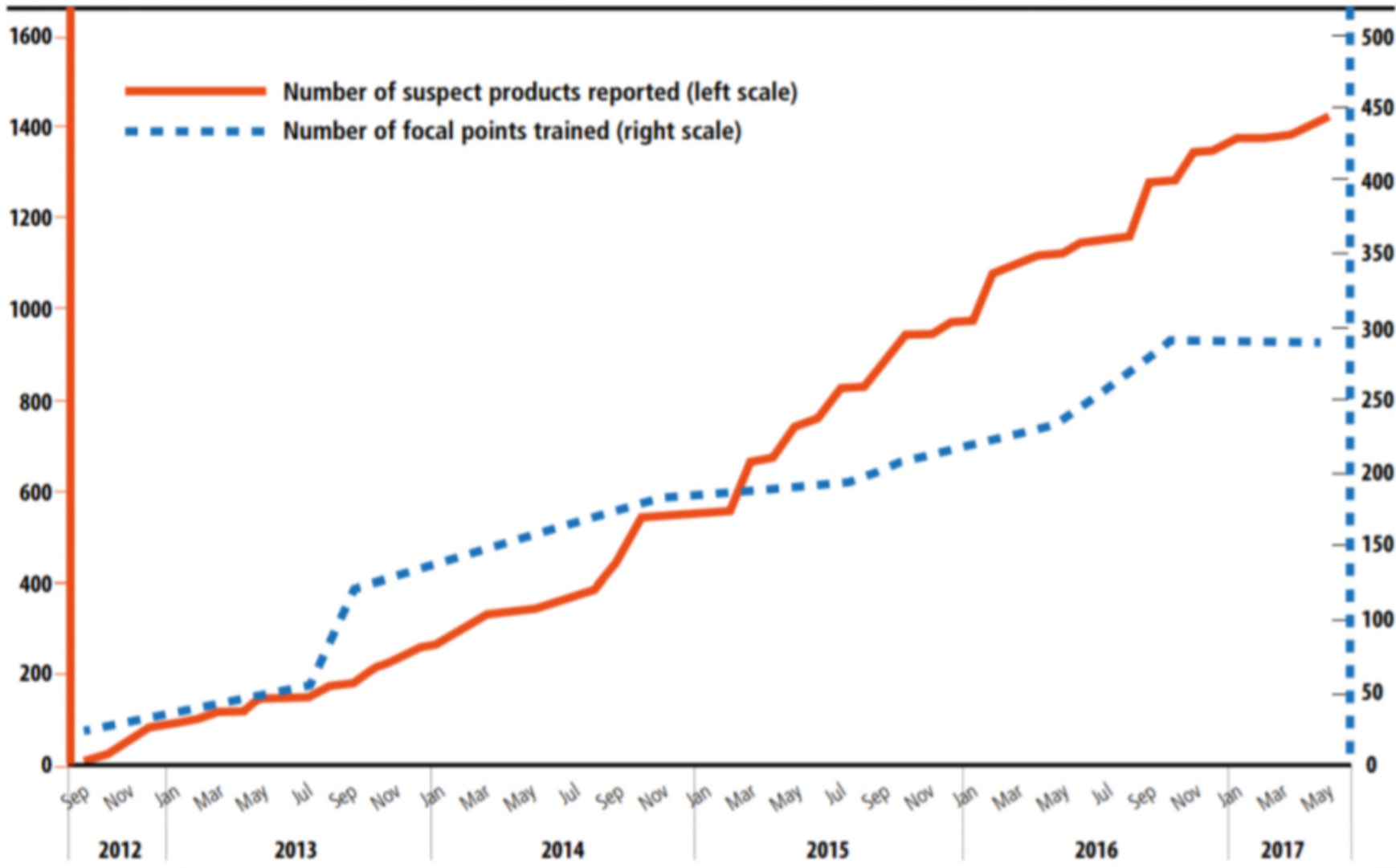
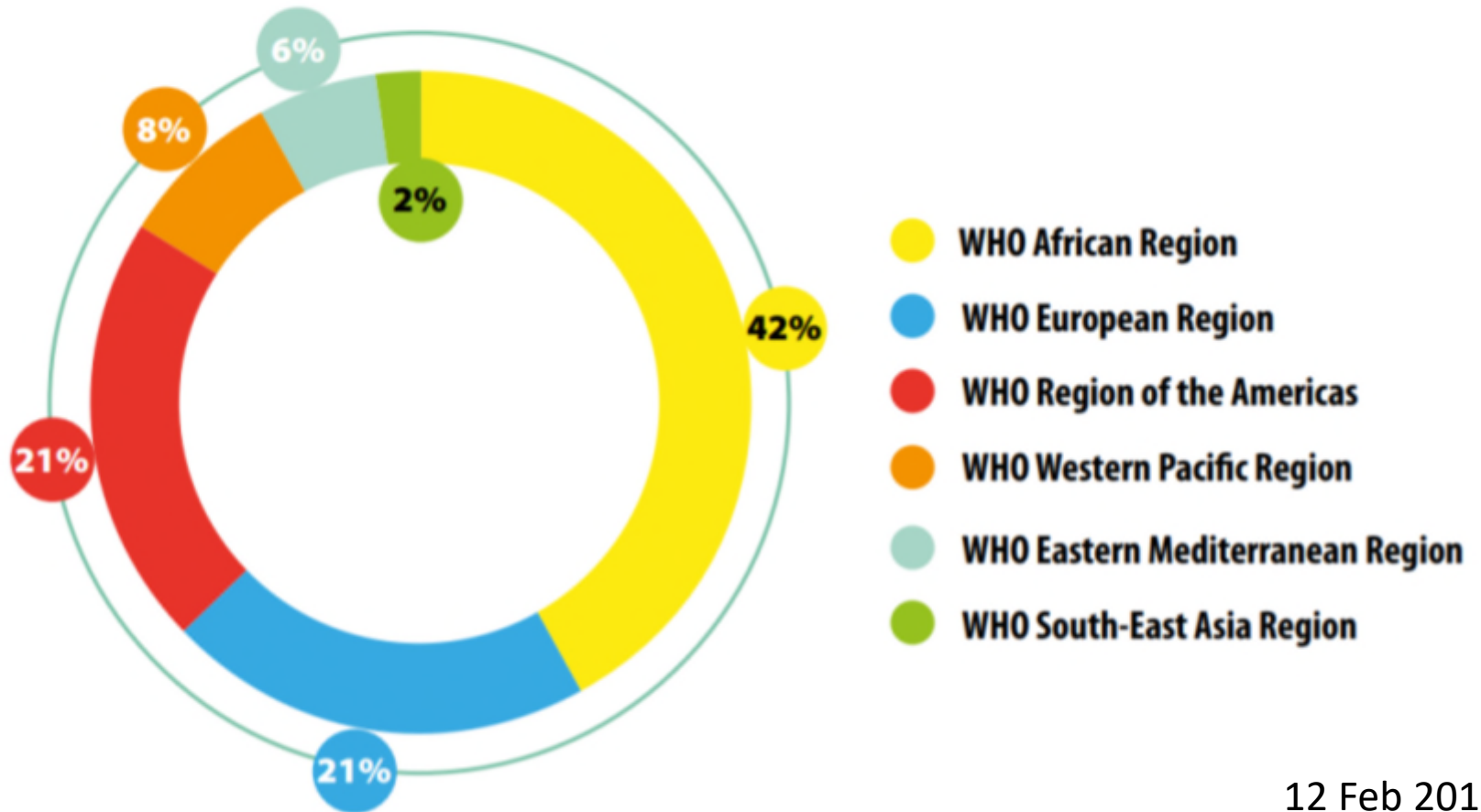


FIG. 5: PERCENTAGE OF REPORTS FROM EACH WHO REGION TO THE GSMS (2013–2017)



12 Feb 2016:

<https://travelhealthpro.org.uk/news/42/fake-yellow-fever-vaccine-circulating-in-south-east-asia-bangladesh>

FAKE YELLOW FEVER VACCINE CIRCULATING IN SOUTH EAST ASIA: BANGLADESH, World Health Organization report falsified AMARIL yellow fever vaccines circulating in Bangladesh
On the 9 February 2016, the Pasteur Institute in Dakar, Senegal, informed the World Health Organization (WHO) that they had identified a falsified version of AMARIL yellow fever (YF) vaccine circulating in Bangladesh.

TABLE 1: EXAMPLES OF SUBSTANDARD AND FALSIFIED PRODUCTS REPORTED TO THE GSMS (2013–2017)

| Type of product | Number of Member States reporting | Total number of product reports | Percentage of all products reported to database ^a |
|--|-----------------------------------|---------------------------------|--|
| Anaesthetics and painkillers | 29 | 126 | 8.5 |
| Antibiotics | 46 | 244 | 16.9 |
| Cancer medicines | 19 | 100 | 6.8 |
| Contraception and fertility treatments | 19 | 29 | 2.0 |
| Diabetes medicines | 7 | 11 | 0.8 |
| Heart medicines | 22 | 75 | 5.1 |
| HIV/hepatitis medicines | 9 | 43 | 2.9 |
| Lifestyle products ^b | 37 | 124 | 8.5 |
| Malaria medicines | 26 | 286 | 19.6 |
| Mental health medicines | 19 | 45 | 3.1 |
| Vaccines | 11 | 29 | 2.0 |

^a Since only selected products are reported in this table, the percentages in this column do not add up to 100%. A table showing the breakdown of all reports using the anatomical therapeutic chemical classification is provided in the Annex.

^b So-called lifestyle products include products for cosmetic use, erectile dysfunction, body-building and dieting.

Cost effectiveness of Vaccines

A new study, published February 2016 in the journal *Health Affairs*, puts a precise figure on the value of vaccinating children.



Saving in healthcare costs, lost wages and productivity due to illness

\$16

\$7

\$3

\$9

\$5

50¢

RETURN ON INVESTMENT

FOR EVERY \$1 INVESTED IN:

IMMUNISATION¹

PUBLIC INFRASTRUCTURE³

GOVERNMENT BONDS (10-YEAR)⁵

PRE-SCHOOL EDUCATION²

COMMUNITY HEALTH WORKERS⁴

CARDIOVASCULAR DISEASE RESEARCH⁶

Indicative figures based on the rounded average values cited in the following sources:

1. Returns on investment from childhood immunizations in low- and middle-income countries, 2011-20. *Health Affairs*, 35(2):1199-207. Ocasio S, Clark S, Portney A, Gremel S, Bravard L, Walker D, 2016.
2. The rate of return to the HighScope Perry Preschool Program. Department of Economics, University of Chicago, April 2009.
3. The Economic Benefits of Public Infrastructure Spending in Canada. The Centre for Spatial Economics, September 2015.
4. Strengthening primary health care through community health workers... Dissanayake H, Chambers R, Clinton C, Phongsathit J, Sittel J, Evans S, et al. 2015.
5. Example bond issued with a fixed coupon rate of 5% over a 10-year period.
6. Returns on SBIR/STTR funded Research and Development. Australian Society for Medical Research, 17 October 2011.



1.5 million children die annually from vaccine-preventable diseases.

Gavi, the Vaccine Alliance is dedicated to addressing this issue.

Immunisation not only saves lives, it contributes to the social and economic wellbeing of communities.

More than US\$ 586 billion in economic benefits for 94 of the world's poorest countries (2011-2020).

New data confirms immunisation as best buy in public health
Johns Hopkins University study shows 16-fold return on investment in immunisation from 2011 to 2020.

<https://www.gavi.org/library/audio-visual/infographics/immunisation---a-healthy-return-on-investment/>

Myth No.2 Vaccine causes Autism

- A case of bad Science and then Fake News
- The fear that vaccines increase risk of autism originated with a 1997 study published by Andrew Wakefield, a British surgeon. The article was published in The Lancet, a prestigious medical journal, suggesting that the measles, mumps, rubella (MMR) vaccine was increasing autism in British children.
- The paper has since been completely discredited due to serious procedural errors, undisclosed financial conflicts of interest, and ethical violations. Andrew Wakefield lost his medical license and the paper was retracted from The Lancet.
- Nonetheless, the hypothesis was taken seriously, and several other major studies were conducted. None of them found a link between any vaccine and the likelihood of developing autism



Myth De-bunking

- Today, the true causes of autism remain a mystery, but to the discredit of the autism-vaccination link theory, several studies have now identified symptoms of autism in children well before they receive the MMR vaccine. And even more recent research provides evidence that autism develops in utero, well before a baby is born or receives vaccinations.
- <https://www.publichealth.org/public-awareness/understanding-vaccines/vaccine-myths-debunked/>

A Danish study with 537,303 children in 2002 provided strong evidence against any link between MMR vaccine and autism. For all these children there was no link between the age at the time of vaccination, the time since vaccination or the date of vaccination and the development of autistic disorder.

http://www.euro.who.int/_data/assets/pdf_file/0005/339620/Myths-and-facts.pdf?ua=1



<http://www.vaccines.net/2014/05/vaccines-do-not-cause-autism-the-debate-is-over/>

Autism latest theories

- The exact cause of autism spectrum disorder (ASD) is currently unknown.
- It's a complex condition and may occur as a result of genetic predisposition (a natural tendency), environmental or unknown factors. Most researchers believe that certain genes a child inherits from their parents could make them more vulnerable to developing ASD.
- Cases of ASD have been known to run in families. For example, younger siblings of children with ASD can also develop the condition, and it's common for identical twins to both develop ASD.
- No specific genes linked to ASD have been identified, but it may be a presenting feature of some rare genetic syndromes, including Fragile X syndrome, Williams syndrome and Angelman syndrome.

Environmental triggers

- Some researchers believe that a person born with a genetic vulnerability to ASD only develops the condition if they're exposed to a specific environmental trigger.
- Possible triggers include being born prematurely (before 35 weeks of pregnancy), or being exposed in the womb to alcohol or to certain medication, such as sodium valproate (sometimes used to treat epilepsy during pregnancy).
- No conclusive evidence has been found linking pollution or maternal infections in pregnancy with an increased risk of ASD.
- <https://www.nhs.uk/conditions/autism/causes/>

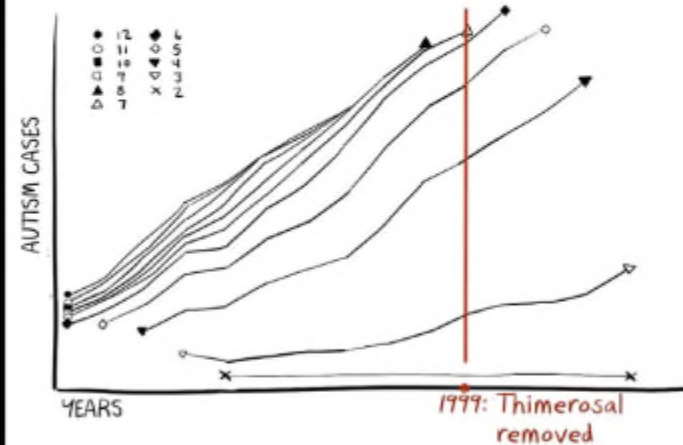
What does NOT cause Autism

Misconceptions about the causes of ASD

In the past, a number of things were linked to ASD, but extensive research has found no evidence to suggest that any of these contribute to the condition. These include:

- the MMR vaccine
- thiomersal – a compound that contains mercury, which is used as a preservative in some vaccines
- the way a person has been brought up
- diet, such as eating gluten or dairy products
- <https://www.nhs.uk/conditions/autism/causes/>

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.**

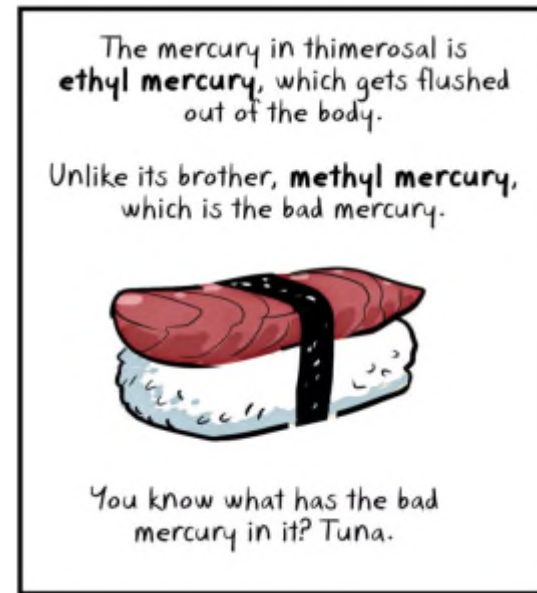


(A recent study has shown that the continued rise in autism spectrum disorders is due to greater awareness and broader diagnoses.)

Source: JAMA Psychiatry 2008

Thiomersal

- Much of the claims around autism being caused by vaccines relate not to the vaccine itself, but but to a preservative which was used in vaccines;
- Thimerosal is a mercury-based preservative that has been used for decades as a preservative in medical products.
- BUT, it was only used in multi-dose vials (vials containing more than one dose) of childhood medicines and vaccines, and since 2001 it has been eliminated from childhood vaccines.
- <https://www.cdc.gov/vaccinesafety/concerns/thimerosal/index.html>
- But, somehow mercury from other sources never gets implicated



How often can kids safely eat canned tuna? (due to mercury contamination)

| | KIDS under 6 (3 oz. serving) | KIDS ages 6-12 (4.5 oz. serving) |
|------------|------------------------------|----------------------------------|
| White Tuna | 1x / month | 2x / month |
| Light Tuna | 3x / month | 4x / month |

BETTER ALTERNATIVE = CANNED SALMON

Illustration by: Marika Cowan

<https://www.edf.org/oceans/mercury-alert-canned-tuna-safe>

Vaccines and Autism

- Analysis of 10 studies involving more than 1.2 million children reaffirms that vaccines don't cause autism;
- <https://www.autismspeaks.org/science-news/new-meta-analysis-confirms-no-association-between-vaccines-and-autism>
- Many carefully performed scientific studies have found no link between MMR vaccine and autism.
- <https://www.cdc.gov/vaccinesafety/vaccines/mmr/mmr-studies.html>
- Subsequent studies in the last 9 years have found no link between the MMR vaccine and autism or bowel disease.
- <https://www.nhs.uk/conditions/vaccinations/mmr-vaccine/>
- A number of high quality studies have compared the health of large numbers of vaccinated and unvaccinated children over many years. The largest study included 537,303 children born in Denmark and found that unvaccinated children were just as likely to develop autism as vaccinated children.¹ When the results of this study were combined with the results of nine other studies to include medical information from nearly 1.5 million children living all around the world, researchers were able to confirm that vaccination could not be causing autism.
- <https://beta.health.gov.au/resources/publications/vaccination-and-autism-fact-sheet>

Myth 3 – Infants Immune System cannot handle so many vaccines

- Infant immune systems are stronger than you might think. Based on the number of antibodies present in the blood, a baby would theoretically have the ability to respond to around 10,000 vaccines at one time. Even if all 14 scheduled vaccines were given at once, it would only use up slightly more than 0.1% of a baby's immune capacity. And scientists believe this capacity is purely theoretical. The immune system could never truly be overwhelmed because the cells in the system are constantly being replenished. In reality, babies are exposed to countless bacteria and viruses every day, and immunizations are negligible in comparison.
- Though there are more vaccinations than ever before, today's vaccines are far more efficient. Small children are actually exposed to fewer immunologic components overall than children in past decades.
- <https://www.nhs.uk/conditions/vaccinations/myths-truths-kids-vaccines/>

Myth 4 Natural immunity is better than vaccine-acquired immunity.

In some cases, natural immunity — meaning actually catching a disease and getting sick— results in a stronger immunity to the disease than a vaccination. However in most cases the immune response to vaccines is similar to the one produced by natural infection.

- The price paid for immunity through natural infection can be as high as mental retardation from Haemophilus influenzae type b (Hib), birth defects from congenital rubella infection, liver cancer from hepatitis B virus or death from measles.

If you wanted to gain immunity to measles, for example, by contracting the disease, you would face a 1 in 500 chance of death from your symptoms in a high income country and 1 in 100 in a low income country. In contrast, the number of people who have had severe allergic reactions from an MMR vaccine, is less than one-in-one million.

http://www.euro.who.int/_data/assets/pdf_file/0005/339620/Myths-and-facts.pdf?ua=1

For Ebola the death rate is 50 to 90%, but the survivors do have immunity.

Myth 5 Vaccines contain unsafe toxins

People have concerns over the use of formaldehyde, mercury or aluminum in vaccines. It's true that these chemicals are toxic to the human body in certain levels, but only trace amounts of these chemicals are used in FDA approved vaccines. In fact, according to the FDA and the CDC, formaldehyde is produced at higher rates by our own metabolic systems and there is no scientific evidence that the low levels of this chemical, mercury or aluminum in vaccines can be harmful.

<https://www.publichealth.org/public-awareness/understanding-vaccines/vaccine-myths-debunked/>

The Global Advisory Committee on Vaccine Safety concludes that there is no evidence of toxicity in infants, children or adults exposed to thiomersal (containing ethyl mercury) in vaccines.

https://www.who.int/vaccine_safety/committee/topics/thiomersal/statement_jul2006/en/

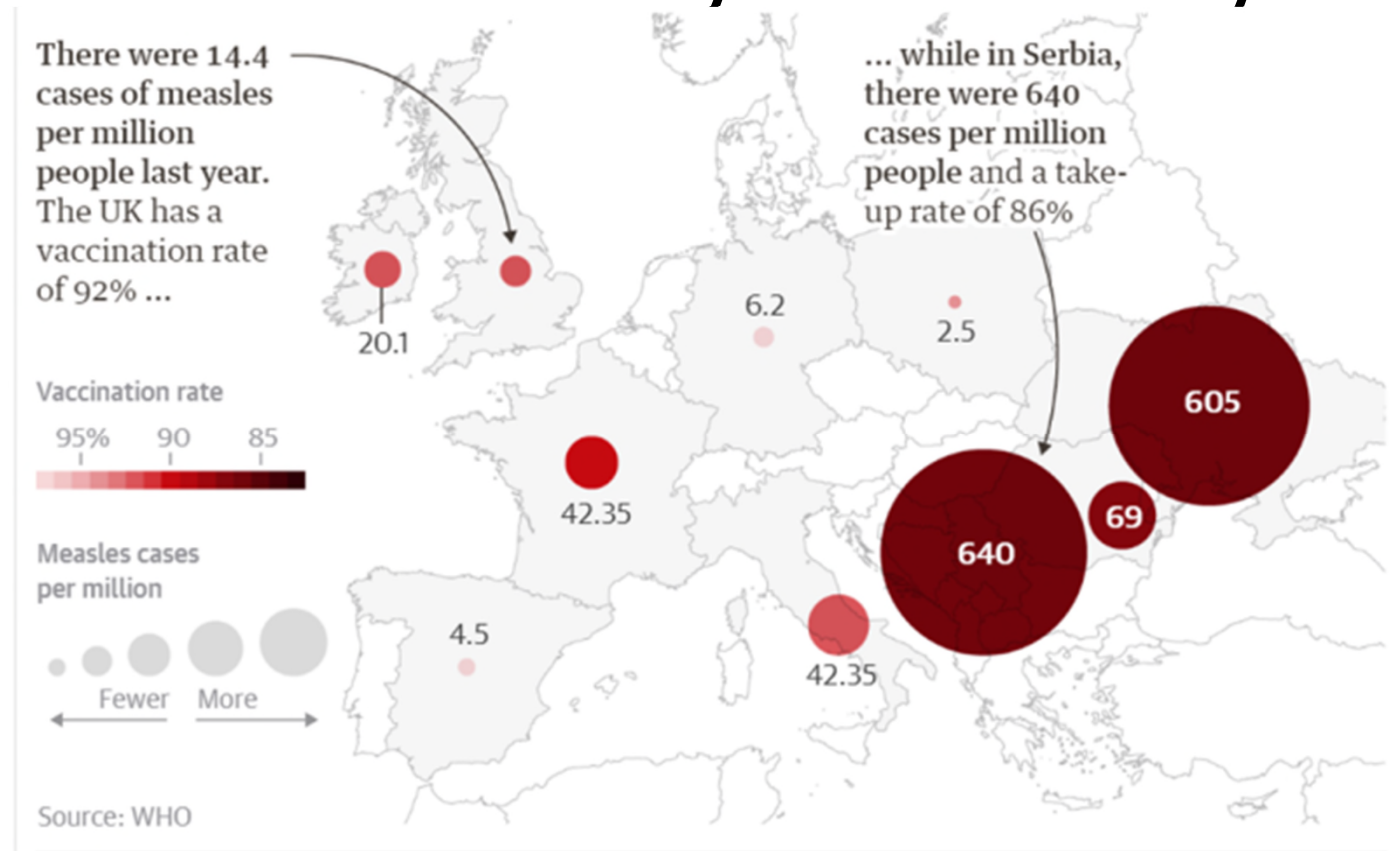
“FDA has reviewed the best available scientific evidence to determine whether the low levels of mercury vapor associated with dental amalgam fillings are a cause for concern. Based on this evidence, FDA considers dental amalgam fillings safe for adults and children ages 6 and above.”

<https://www.fda.gov/medicaldevices/productsandmedicalprocedures/dentalproducts/dentalamalgam/ucm171094.htm>

Myth 6: I don't need to vaccinate because infection rates are already so low

- Thanks to “herd immunity,” so long as a large majority of people are immunized in any population, even the unimmunized minority will be protected. With so many people resistant, an infectious disease will never get a chance to establish itself and spread. This is important because there will always be a portion of the population – infants, pregnant women, elderly, and those with weakened immune systems – that can't receive vaccines.
- But if too many people don't vaccinate themselves or their children, they contribute to a collective danger, opening up opportunities for viruses and bacteria to establish themselves and spread.
- But beware of national averages – local clusters, can give rise to local epidemics

Unvaccinated - How Many is too many ?

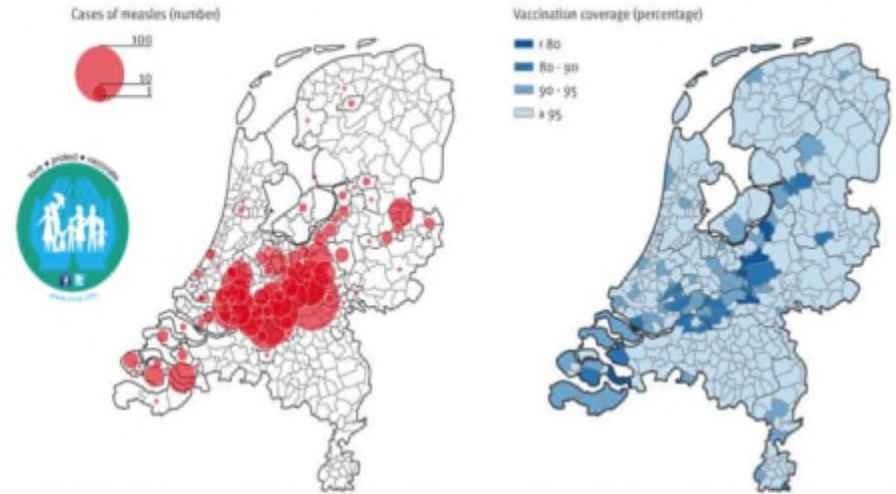


- When the number of secondary infections generated by each infective person is less than 1, transmission will stop - To achieve this for measles, the population immune needs to be 93-95%, the herd immunity threshold.
- http://www.who.int/immunization/sage/meetings/2017/october/2_target_immunity_levels_FUNK.pdf
- One measles case will typical infect 11-to 18 others

Herd Immunity

Herd immunity only works if most people in the population are vaccinated (for example, 19 out of every 20 people need to be vaccinated against measles to protect people who are not vaccinated). If people are not vaccinated, herd immunity is not guaranteed to protect them.

HERD IMMUNITY:
"If you don't catch it, you can't pass it on."



These maps are from the Netherlands in 2013.
On the maps, the darker the red, the higher incidence of measles,
the darker the blue, the lower the rates of immunisation against measles

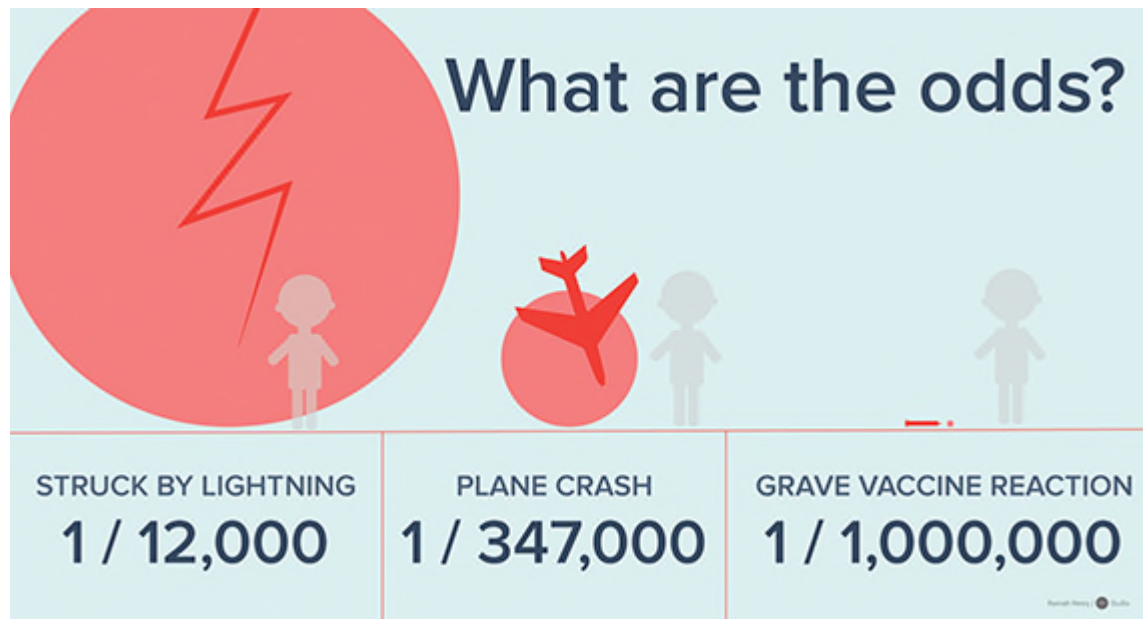
Ref: Knol, M.J. et al (2013). Large ongoing measles outbreak in a religious community in the Netherlands since May 2013. Euro surveillance: bulletin European sur les maladies transmissibles = European communicable disease bulletin, 18(36).

- If you live in an area where vaccine coverage is low, and your child is not vaccinated, it's quite likely that many of the people they come into contact with will not be vaccinated either. If one of these people gets an infectious disease like measles, they can easily pass it on to the other unvaccinated people around them, and in some cases the disease can then spread very quickly through the population. This is what happened during the 2013 measles outbreak in Wales.
- Unlike vaccination, herd immunity does not give a high level of individual protection, and so it is not a good alternative to getting vaccinated.
- <http://vk.ovg.ox.ac.uk/herd-immunity>

Myth 7 Vaccines have serious side effects

- While all vaccines have the potential to cause side effects in some people, the reality is that most tend to be mild and don't last longer than a few days. Some people don't get any side effects at all.
- A far less common, but serious, vaccine side effect is an immediate allergic reaction, also known as an anaphylactic reaction.
- These are dramatic and potentially life-threatening. However, they are very rare – occurring in less than 1 in a million cases – and are completely reversible if treated promptly by healthcare staff.
- <https://www.nhs.uk/conditions/vaccinations/reporting-side-effects/>

To have a balanced view, potential side effects have to be weighed against the expected benefits of vaccination in preventing the serious complications of disease.



In summary

- Vaccines work
- Vaccines do not cause autism
- They have an excellent risk benefit and cost benefit ratio
- Relying on herd immunity is unsafe
- Universal vaccine coverage is required if non-immune individuals are to be protected
- Not every vaccine is appropriate for every person, always consult your healthcare professional.
- Get your kids and your kids' kids vaccinated.



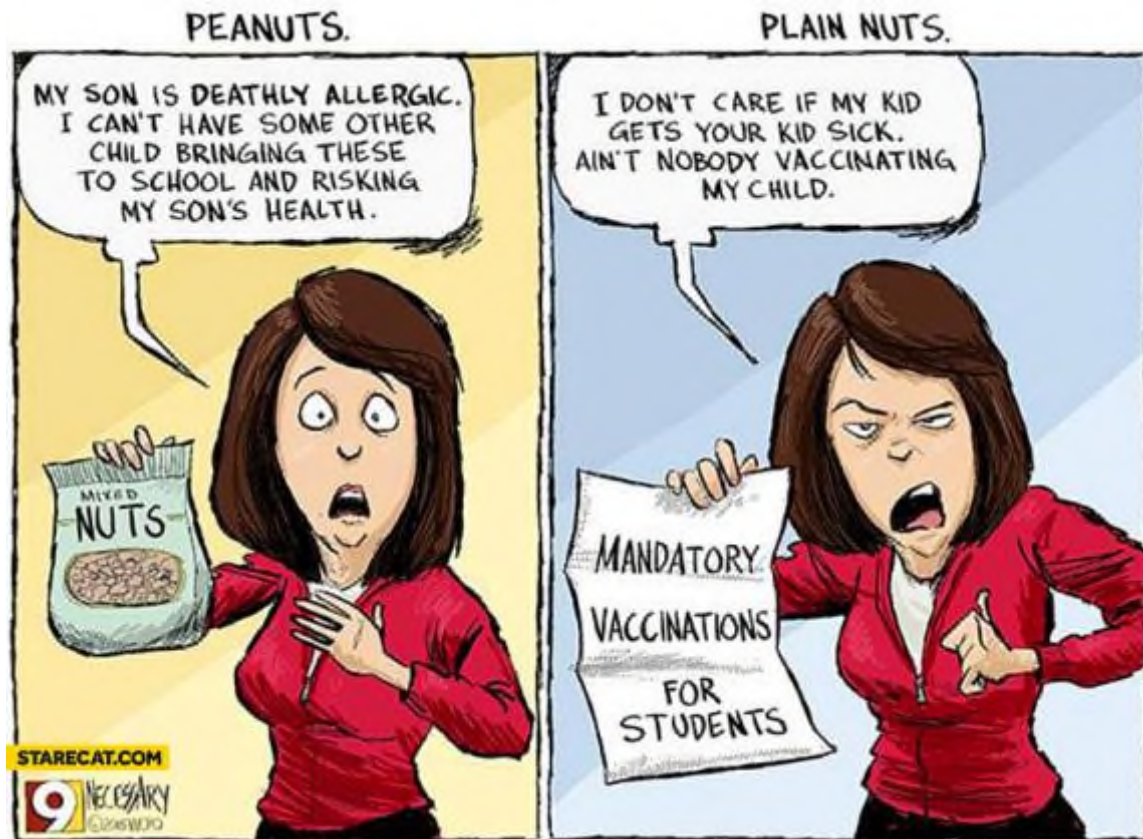
Try to Adopt a Public Health Perspective

“I think there should be a right ... not to vaccinate your child. But.... if your kid gets the measles...and makes my newborn baby die... shouldn't I be able to sue you for the harm you have done?”

<https://shotofprevention.com/2013/09/12/legal-responsibilities-in-choosing-not-to-vaccinate/>

<https://starecat.com/peanuts-plain-nuts-vaccination-i-dont-care-if-my-kid-gets-your-kid-sick/>

The unvaccinated people you see in infographics are not just hypothetical. They are our nieces and nephews, our children.





Chula VRC
Chula Vaccine Research Center
ศูนย์วิจัยวัคซีน จุฬาลงกรณ์มหาวิทยาลัย



The Fourth Vaccine Development Research Forum

Liposome and nanoparticle-based delivery systems

December 11, 2018

Bangkok, Thailand



OPTIONAL EXTRA 1

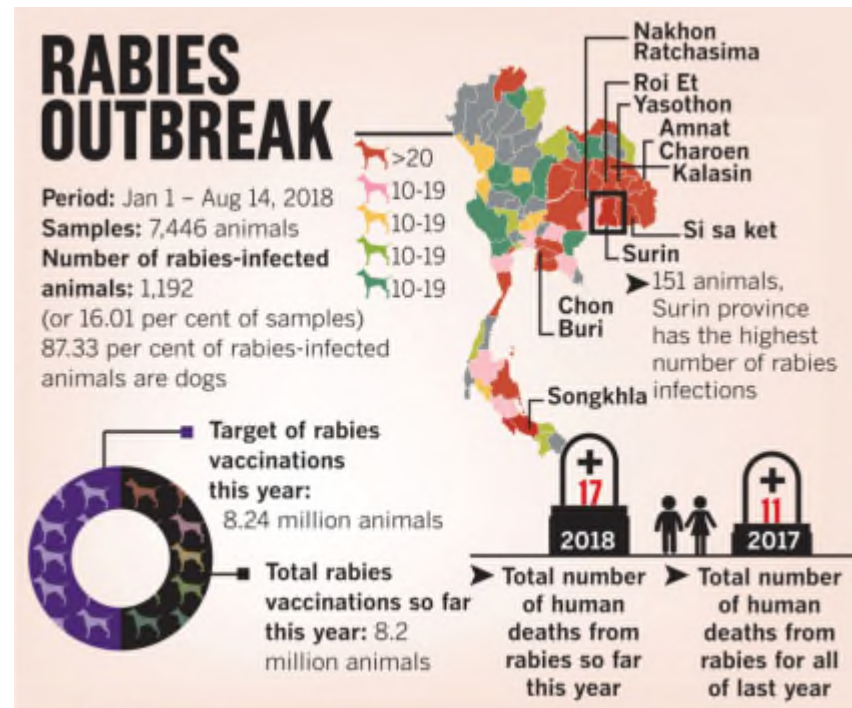
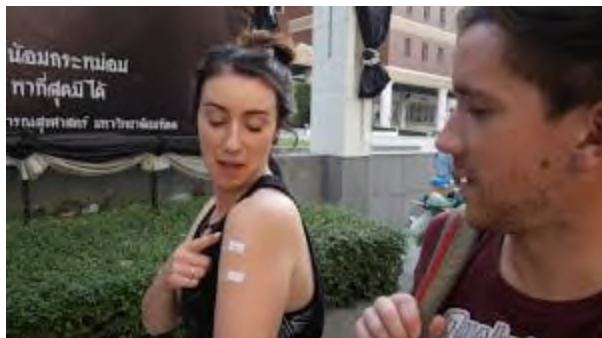
SITUATION IN THAILAND

SITUATION IN THAILAND

Vaccination program recommended by Pediatric infectious diseases society of Thailand

| Vaccine \ Age | Age | | | | | | | | | | |
|--------------------------------|----------|---------|---------|---------|--------|--------------------------------|----------|----------|------------------------|---------|-----------|
| | New Born | 1 Month | 2 Month | 4 Month | 6Month | 9 Month | 12 Month | 18 Month | 2-2 ^{1/2} Yrs | 4-6 Yrs | 11-12 Yrs |
| BCG | BCG | | | | | | | | | | |
| Hepatitis B | HBV 1 | HBV 2 | | | HBV3 | | | | | | |
| Diphtheria, Tetanus, Pertussis | | | DTP1 | DTP 2 | DTP3 | | | DTP4 | | DTP5 | dT |
| Polio | | | OPV1 | OPV2 | OPV3 | | | OPV4 | | OPV5 | |
| Mumps, Measle, Rubella | | | | | | MMR1 | | | | MMR2 | |
| Japanese encephalitis | | | | | | JE1,JE2 (3-12 months apart) | | JE3 | | | |

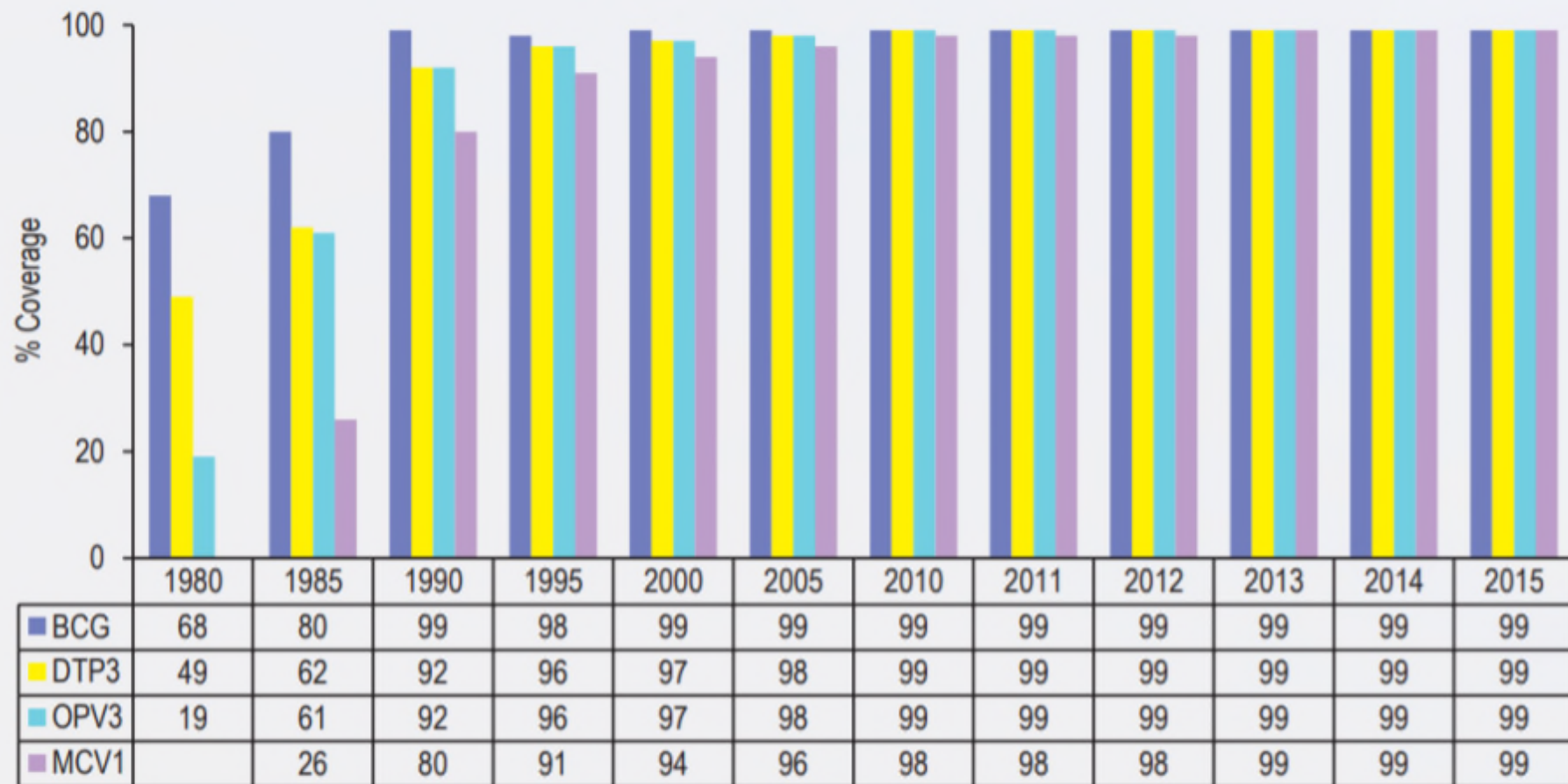
Its not just humans that need vaccination >>>>>>>



Source: Thai Rabies Net

NATION GRAPHICS

Figure 1: National immunization coverage, 1980–2015



Source: WHO and UNICEF estimates of national immunization coverage, July 2016 revision

[THAILAND](#)

<http://www.searo.who.int/immunization/data/thailand.pdf>

Table 5: Reported cases of vaccine preventable disease, 2006–2015

| Year | Polio | Diphtheria | Pertussis | Neonatal Tetanus (% of all Tetanus) | Measles | Rubella | Mumps | Japanese Encephalitis |
|------|-------|------------|-----------|--|---------|---------|--------|--------------------------|
| 2006 | 0 | 2 | 72 | 3 (2%) | 3 588 | 498 | 7 838 | 49 |
| 2007 | 0 | 3 | 23 | 4 (3%) | 3 893 | 341 | 9 299 | 43 |
| 2008 | 0 | 8 | 16 | 3 (3%) | 7 790 | 621 | 13 861 | 64 |
| 2009 | 0 | 12 | 25 | 1 (1%) | 6 071 | 594 | 20 383 | 36 |
| 2010 | 0 | 77 | 6 | 3 (2%) | 2 583 | 387 | 15 885 | 40 |
| 2011 | 0 | 28 | 12 | 1 (1%) | 3 156 | 517 | 10 077 | 52 |
| 2012 | 0 | 63 | 14 | 4 (4%) | 5 197 | 493 | 7 431 | 54 |
| 2013 | 0 | 28 | 24 | 2 (2%) | 2 641 | 539 | 5 907 | 59 |
| 2014 | 0 | 19 | 14 | 2 (2%) | 146 | 152 | 3 704 | 31 |
| 2015 | 0 | 19 | 51 | 0 | 154 | 240 | 3 121 | 23 |

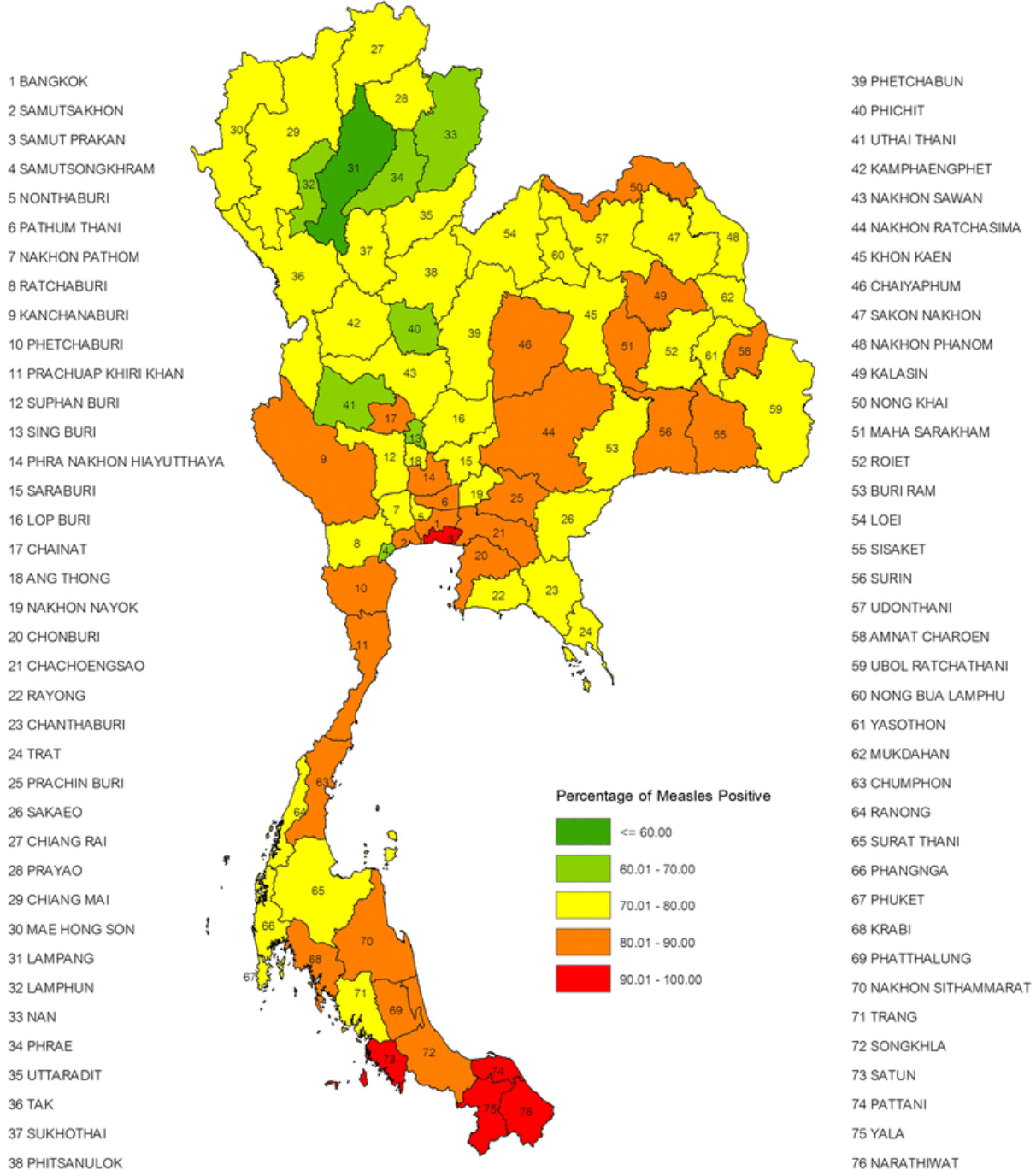
Source: WHO/UNICEF JRF

THAILAND

<http://www.searo.who.int/immunization/data/thailand.pdf>

BUT: if you remember from slide 72, averages/national figures do NOT tell the full picture

Measles seroprevalence in young Thai men, 2007–2008



- <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-2987-z>
- The overall, by province, and by age cohort measles seroprevalence in these young men was below the 93–95 % recommended by the WHO for population immunity [11]. These findings may explain partially the measles outbreaks occurring in adult populations in Thailand

Vaccine Denial Thailand

- Thailand: Measles has infected 2,280 people and killed 18 in the mainly Muslim border provinces in the South this year. 22 Nov, 2018: as officials try to fight vaccine denial
- <https://www.vaccineconfidence.org/thailand-measles-has-infected-2280-people-and-killed-18-in-the-mainly-muslim-border-provinces-in-the-south-this-year/>
- ‘Vaccine denial’ behind measles deaths in South, October 18, 2018 01:00 By PRATCH RUJIVANAROM THE NATION
- THE “vaccine denial” common in some Muslim communities has contributed to the deaths of at least six patients, including children, during a measles outbreak in the far South. The Department of Disease Control (DDC) is worried that a measles epidemic is quickly spreading in the three southernmost provinces of Yala, Pattani and Narathiwat -due to a large proportion of the residents rejecting immunisation for religious reasons.
- “The high proportion of vaccine denial among the population group has reduced the immunisation coverage down to 30-40 per cent in some areas, which highly increases the risk for mass infections of vaccine preventable diseases in that area” Pornsak said. The main problem is that many Muslims in the far South remain sceptical about the official clarification and advice from authorities. They are unconvinced and instead believe in the inaccurate teachings of their local Dato (Islamic teacher), who preaches against vaccination. He added that the lower than average vaccination coverage in the far South also raised the risks for a major outbreak of other vaccine preventable diseases, such as diphtheria, rubella and pertussis.

Suggested Vaccinations for Adults in Thailand

| VACCINATION LIST | <u>ALL TRAVELLERS</u> | <u>TREKKING</u> | <u>RURAL</u> |
|-------------------------------------|---------------------------|---------------------------|--|
| <u>TETANUS</u> | <u><i>Tetanus</i></u> | — | — |
| <u>DIPHTHERIA</u> | — | — | — |
| <u>HEPATITIS A</u> | <u><i>Hepatitis A</i></u> | — | — |
| <u>TYPHOID</u> | <u><i>Typhoid</i></u> | — | — |
| <u>HEPATITIS B</u> | — | <u><i>Hepatitis B</i></u> | — |
| <u>RABIES</u> | — | <u><i>Rabies</i></u> | — |
| <u>MENINGOCOCCAL MENINGITIS</u> | — | — | <u><i>Meningococcal Meningitis</i></u> |
| <u>CHOLERA</u> | — | — | — |
| <u>TUBERCULOSIS</u> | — | — | <u><i>Tuberculosis</i></u> |
| <u>JAPANESE B ENCEPHALITIS</u> | — | — | <u><i>Japanese B Encephalitis</i></u> |

<https://www.tmb.ie/destinations/vaccinations-for-thailand>

Particular Cautions

- Japanese encephalitis (JE) is a viral disease predominantly located in South East Asia and commonly associated with transmission between amplifying hosts, such as pigs, and the mosquito *Culex tritaeniorhynchus*,
- Its is not clear, but it is believed that caves with bats can act as a pool for some disease in Thailand
- *THAILAND is not safe from a Nipah virus outbreak, as fruit bats in Thailand are a natural host for the deadly infection that can cause encephalitis and has a mortality rate of up to 80 per cent, medical experts said.*
- <http://www.nationmultimedia.com/detail/national/30346549>

It's one of the reasons the 'wild boar' football team was isolated after their cave adventure



Yellow Fever

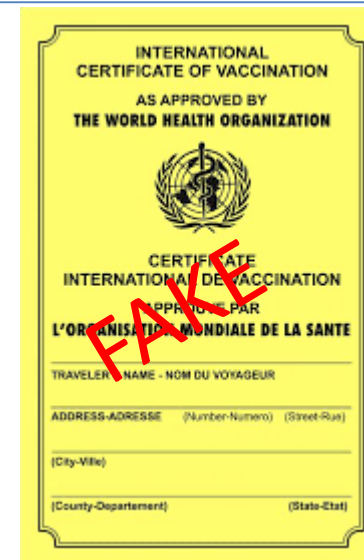


- Not required for Thailand BUT if you are travelling from a Yellow Fever zone:
- <http://www.mfa.go.th/main/en/services/4908/15384-List-of-countries-which-require-International-Heal.html>

and this is sometimes interpreted by airport immigration at Bangkok, as ALL of Africa and South America

Then a WHO format Yellow Fever vaccination certificate is required to enter Thailand.

There are fake vaccination certificates circulating mainly emanating from India.
Don't be tempted to buy one



Other Vaccinations for Adults

Some other adult vaccines you should know about are:

- Flu vaccine: Adults should consider a flu shot each year to protect themselves and those around them from the flu, which can be especially risky for adults ages 65 and older, pregnant women and people already living with serious health conditions.
- Shingles vaccine: The shingles vaccine is recommended for people ages 60 years old and older. Shingles, which can be very painful, is an outbreak of rash or blisters on the skin and is caused by the chickenpox virus.
- Tdap vaccine: The Tdap vaccine protects against tetanus, diphtheria and pertussis. If you are around infants, it's especially important to receive this vaccine.
- Pneumococcal vaccine: Pneumococcal disease can cause three major conditions — pneumonia, bacteremia and meningitis — and is a leading cause of serious illness among children and adults worldwide. It's an important vaccine for at-risk older adults.
- HPV vaccine: The HPV vaccine protects against strains of the human papillomavirus that can cause cervical and anal cancer.
- <http://www.getreadyforflu.org/facts/VaccinesAdults.pdf>

Childhood diseases infect adults too

December 2018

- More than 2,000 people in Japan have been diagnosed with rubella, or German measles, the worst outbreak in five years, prompting warnings to visitors – particularly pregnant women – to make sure their vaccinations are up to date.
- The 2,454 cases that have been confirmed as of early December is 21 times the total number reported last year, with the outbreak centered on Tokyo and the surrounding prefectures of Kanagawa, Chiba and Saitama, according to the Atlanta-based Centers for Disease Control and Prevention.
- The vaccination remained optional until April 1993, with many male students not having the injection. As a result, the latest outbreak is mostly affecting men between the ages of 30 and their early 50s.
- The Japanese government on Tuesday reacted to the outbreak by announcing that health authorities will offer free rubella vaccinations for the next three years for men between the ages of 39 and 56 who were not vaccinated under previous health programmes.

Benefits of the flu vaccination

52%

fewer hospitalizations among people with chronic lung disease

79%

fewer hospitalizations among people with diabetes

50%

reduction of flu-associated acute respiratory infection in pregnant women

33%

less likely for babies of vaccinated women to get the flu than babies of unvaccinated women

SOURCE: CDC

PHOTO ILLUSTRATION BY JACOB SINGLETON, BRIAN BAUER, AND NICOLE MORMANDO



**KEEP
CALM
AND**

**GET YOUR
FLU SHOT**

OPTIONAL EXTRA 2 FLU VACCINES



Flu Vaccine

- It's been 100 years since one of the deadliest diseases... well, ever. The 1918-1919 flu pandemic (usually and mistakenly called the "Spanish Flu") infected roughly a third of the world's population and killed somewhere on the order of 50-100 million people, leaving no corner of the world untouched. It came just as the world was beginning its recovery from the other global catastrophe of the time — the First World War. The pandemic is sometimes referred to as the "Forgotten Plague" because the extent of the devastation wasn't realized at the time, and it's been missing from most history books since.
- *A record number of US patients died from flu last year, with 80 000 deaths recorded in 2017-18, says the director of the Centers for Disease Control and Prevention (CDC), Robert Redfield. He gave the 80 000 estimate during an interview with the Associated Press in New York.*

<https://www.bmj.com/content/363/bmj.k4136.full>

- *While vaccine effectiveness can vary, recent studies show vaccine reduces the risk of flu illness by about 40% to 60% among the overall population during seasons when most circulating flu viruses are like the vaccine viruses. Similar reductions against hospitalization have been observed too.*
- *Specifically, flu vaccines have reduced the risk of medically attended illness caused by H1N1 or B by more than 60% on average among people age 65 and older (1)..*

<https://www.cdc.gov/flu/about/qa/vaccineeffect.htm>

Flu Vaccine who needs it ?

Australia:

- All children, Pregnant women, Aboriginal and Torres Strait Islander people, Health care workers, People aged 65 years and over

Thailand

- Pregnant women, Children 6 to 59 months, Health Care workers, Elderly, at risk individuals, Institutionalized individuals

UK: The flu vaccine is routinely given on the NHS to:

- adults 65 and over, people with certain medical conditions (including children in at-risk groups from 6 months of age), pregnant women, children aged 2 and 3, Children in reception class and school years 1, 2, 3, 4 and 5

USA

- ACIP recommends annual influenza vaccination for everyone 6 months and older (with medical condition exceptions)

Different types of Flu Vaccine

Table 1. Seasonal influenza vaccines available for use in Australia in 2018, by age

| Vaccine | Quadrivalent | | | | | Trivalent (for age ≥65 years only) | |
|---------------------------|---|----------------------------------|-----------------------------------|--------------------------------------|--------------------------------------|--|-------------------------------|
| | FluQuadri Junior 0.25 mL (Sanofi) | FluQuadri 0.50 mL (Sanofi) | Fluarix Tetra 0.50 mL (GSK) | Afluria Quad 0.50 mL (Seqirus) | Influvac Tetra 0.50 mL (Mylan) | Fluzone High-Dose 0.50 mL (Sanofi) | Fluad 0.50 mL (Seqirus) |
| Registered age group | | | | | | | |
| <6 months | x | x | x | x | x | x | x |
| 6 to 35 months (<3 years) | ✓ | x | x | x | x | x | x |
| ≥3 to 17 years | x | ✓ | ✓ | x | x | x | x |
| ≥18 years | x | ✓ | ✓ | ✓ | ✓ | x | x |
| ≥65 years | x | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Influenza virus strains included in the 2018 southern hemisphere seasonal influenza vaccines:

- A (H1N1): an A/Michigan/45/2015 (H1N1)pdm09 like virus
- A (H3N2): an A/Singapore/INFIMH-16-0019/2016(H3N2) like virus
- B: a B/Phuket/3073/2013 like virus
- B: a B/Brisbane/60/2008 like virus (not included in the TIVs)

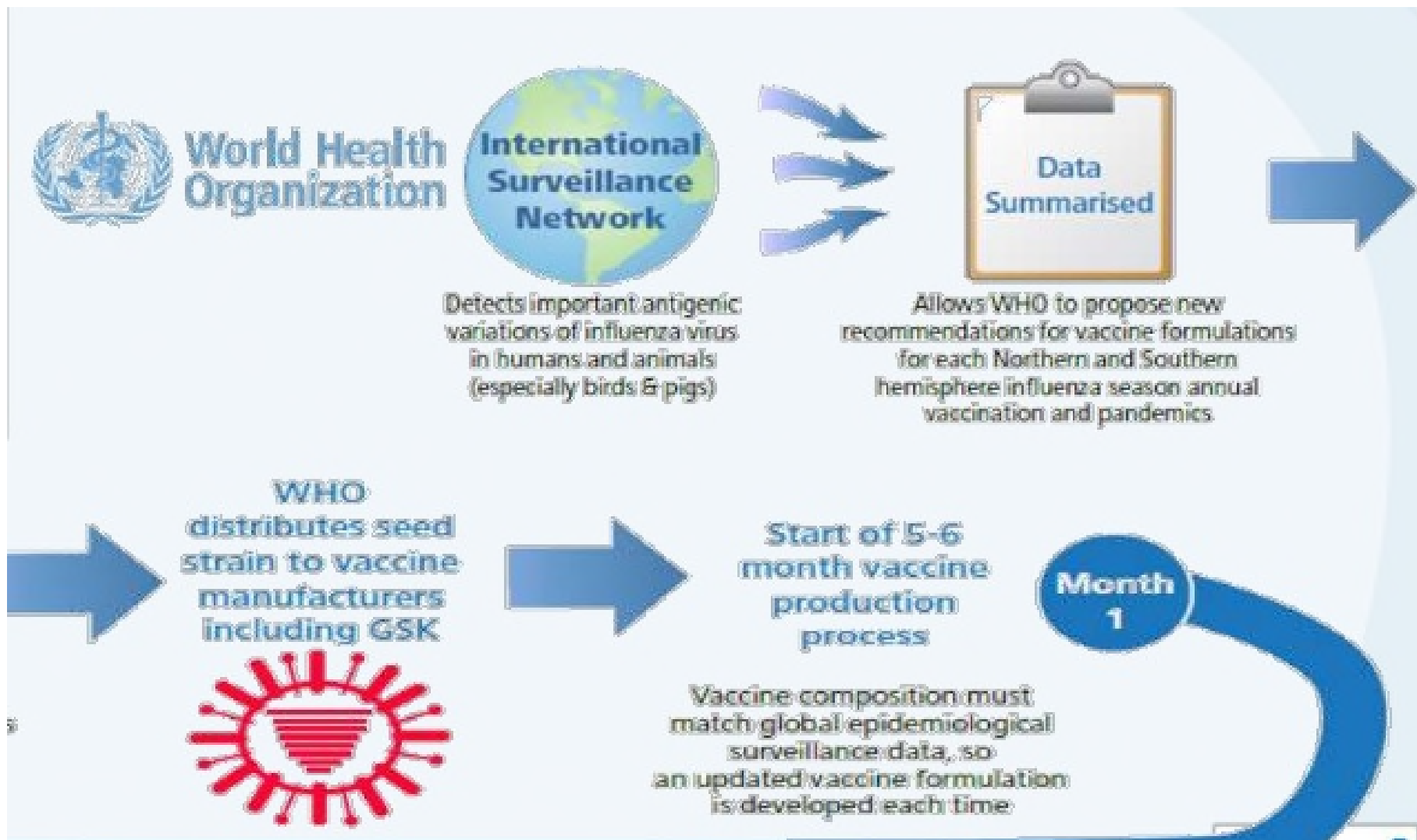
There haven't been any studies comparing the high-dose and adjuvant flu vaccines for older adults, so either option can help protect you from the flu.

Which vaccine is best for You



- Consult your physician !
- In essence:
- Trivalent — this vaccine protects against three strains of the flu: two A strains and one B strain. The trivalent vaccines have traditionally been the most popular and affordable flu vaccine.
- Quadrivalent — this vaccine offers protection against an additional B strain: - important for Thailand because this year it contains B/Phuket/3073/2013-like (Yamagata lineage)
- Higher dosage for the elderly (over 65) bi or tri valent
- **Opinions differ:** the higher doses might be better for older people but have a lower range of strains (bi to tri-valent). Australia suggests the higher dosage for the elderly is more important than the range; US thinks range can be more important than the higher dose. The wider range of strains (tetra-valent) are not (yet) widely available in higher doses.
- So, the higher dose version might be better for older people with limited international people contact, but a wider spectrum might be better if you have exposure to international travellers, and/or are around younger children
- Lifestyle and location matters in the selection process:- Air hostess or hermit – it can make a difference, but both flu vaccination types work.

Flu Vaccine Development - WHO



Flu Vaccine Production

