# Perspectives on Vaccine Hesitancy

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# Disclosures

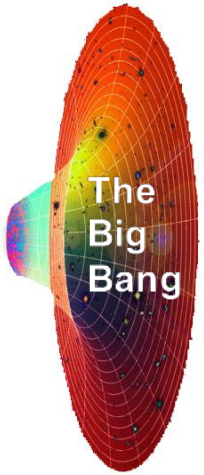
| | |
|---|---|
| **Ad hoc consultant** | **GlaxoSmithKline** |
| **Principal investigator** | **Merck** |
| | **Novartis** |
| | **Pfizer** |
| | **Sanofi Pasteur** |
| | **Seqirus** |

# Objectives

**After completion of this activity, participants should be able to…**

- **Explain why people accept anecdotal experiences as indicative of causal relationships**
- **Counteract thought patterns that lead to vaccine refusal**
- **Maintain high immunization rates despite pervasive vaccine hesitancy**

# Vaccinology Through the Ages




1796

1954

1998

Pestilence and Disease

Era of Discovery

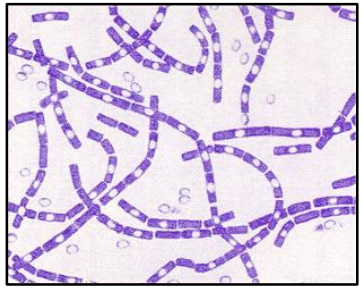
Golden Age

Era of Second Thought

# Era of Discovery: 1796–1953

**Jenner inoculates James Phipps with cowpox**

**Pasteur vaccinates animals with attenuated *B. anthracis***



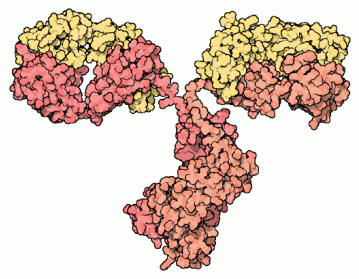
# Era of Discovery: 1796–1953

**Pasteur inoculates Joseph Meister against rabies**

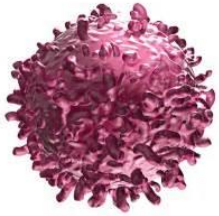
**von Behring discovers the protective effect of anti-toxins**

# Era of Discovery: 1796–1953

**Ehrlich develops the concept of antibodies**

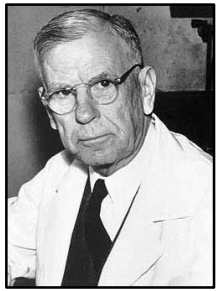


**Metchnikoff develops the concept of cellular immunity**



# Era of Discovery: 1796–1953

**Goodpasture propagates viruses in eggs**



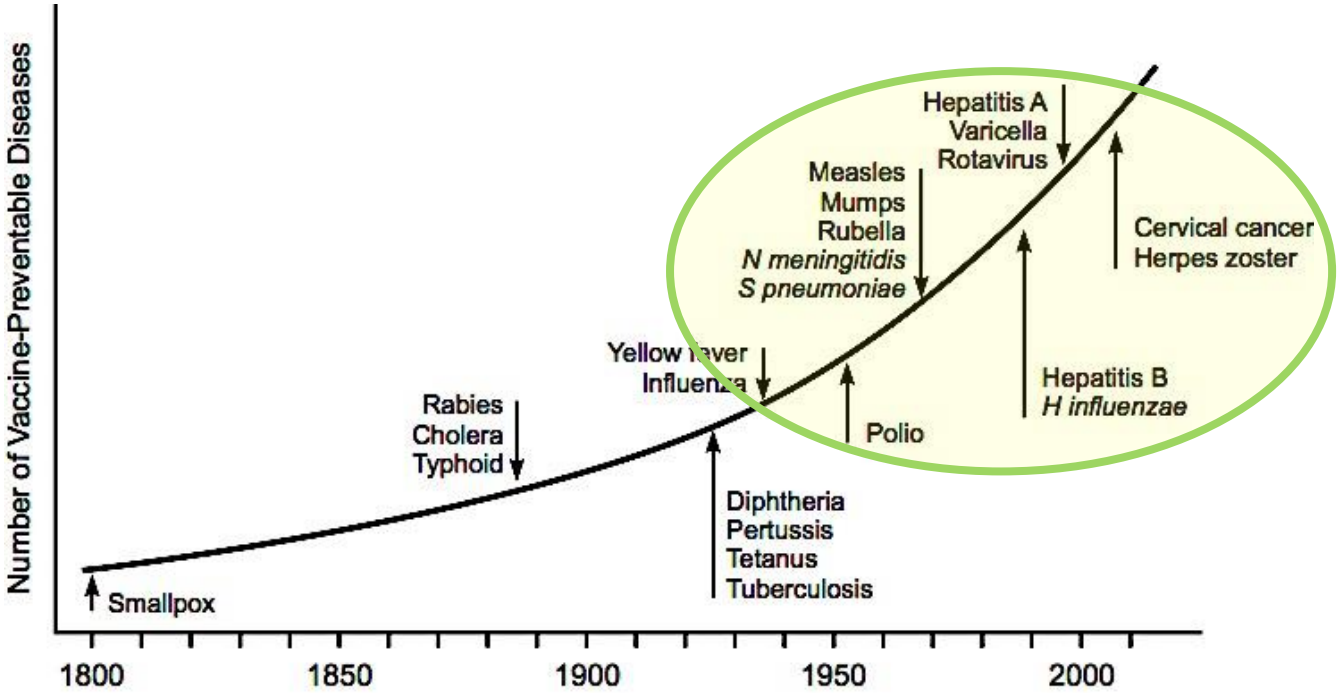
**Enders propagates viruses in cell culture**

# 1954: The Shot Heard ’Round the World

**Salk vaccine is effective against polio**


POLIO PIONEER
1954
THE NATIONAL FOUNDATION FOR INFANTILE PARALYSIS

# Golden Age: 1954–1997




*Marshall. The Vaccine Handbook, 6th Edition. PCI Books, Inc.; 2017*

# Golden Age: 1954–1997

## *Technological advances*

**Capsular polysaccharides**
**Protein-polysaccharide conjugation**
**Cold adaptation**
**Reassortment**
**Purified protein antigens**
**Recombinant-expressed protein antigens**
**Virus-like particles**
**Engineered attenuation**
**Reverse vaccinology**
**Adjuvants**
**Delivery methods**
**Manufacturing**
**Quality control**

***Plotkin. Nature Med 2005;11:S5***

# Golden Age: 1954–1997

## *Programmatic advances*

**Disease surveillance**
**Economic analysis**
**Safety monitoring**
**Refinement in clinical trials**
**Effectiveness studies**
**Correlates of protection**
**Recommendations**

*Marshall. The Vaccine Handbook, 6th Edition. PCI Books, Inc.; 2017*

# Golden Age: 1954–1997

**Last case of smallpox anywhere on Earth—1977**

**Last case of type 2 polio anywhere on Earth—1999**

***http://www.who.int/iris/handle/10665/155528***
***http://polioeradication.org/news-post/global-eradication-of-wild-poliovirus-type-2-declared/***

# Golden Age: 1954–1997

**Last endemic case of measles in the Americas—2002**

**Last endemic case of rubella in the Americas—2009**

***http://www.paho.org/hq/index.php?option=com_content&view=article&id=12528%3Aregion-americas-declared-free-measles&Itemid=1926&lang=en***
***http://www.paho.org/hq/index.php?option=com_content&view=article&id=10798&Itemid=1926&lang=en***

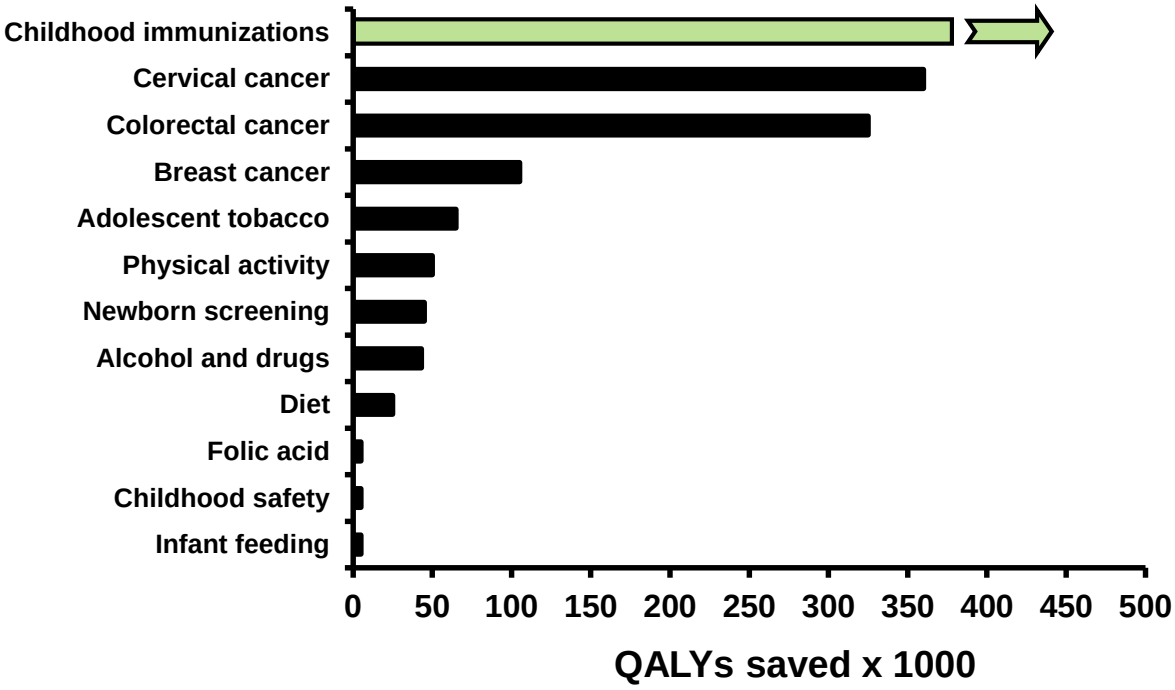
# Impact of Routine Childhood Immunizations

## *US, 1994–2013*

| | |
|---|---|
| Cases prevented | 322 million |
| Hospitalizations prevented | 21 million |
| Deaths prevented | 732,000 |
| Net societal costs saved | $1.38 trillion |

*Whitney. MMWR 2014;63:352-55*
*Cohort=78.6 million children. Analysis includes all vaccines except influenza and HepA. Costs adjusted to 2013 dollars; future disease costs discounted 3% annually.*

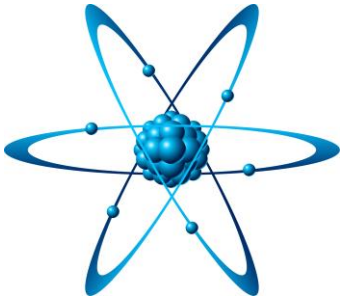
# Public Health Impact of Vaccines




*Coffield. Am J Prev Med 2001;21:1*

# Golden Age: 1954–1997

***Science-mindedness***



# Golden Age: 1954–1997

## *Science-mindedness*

# Era of Second Thought: 1998–Present



Early report

## Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children

*A J Wakefield, S H Murch, A Anthony, J Linnell, D M Casson, M Malik, M Berelowitz, A P Dhillon, M A Thomson, P Harvey, A Valentine, S E Davies, J A Walker-Smith*

### Summary

**Background** We investigated a consecutive series of children with chronic enterocolitis and regressive developmental disorder.

**Methods** 12 children (mean age 6 years [range 3–10], 11 boys) were referred to a paediatric gastroenterology unit with a history of normal development followed by loss of acquired skills, including language, together with diarrhoea and abdominal pain. Children underwent gastroenterological, neurological, and developmental assessment and review of developmental records. Ileocolonoscopy and biopsy sampling, magnetic-resonance imaging (MRI), electroencephalography (EEG), and lumbar puncture were done under sedation. Barium follow-through radiography was done where possible. Biochemical, haematological, and immunological profiles were examined.

### Introduction

We saw several children who, after a period of apparent normality, lost acquired skills, including communication. They all had gastrointestinal symptoms, including abdominal pain, diarrhoea, and bloating and, in some cases, food intolerance. We describe the clinical findings, and gastrointestinal features of these children.

### Patients and methods

12 children, consecutively referred to the department of paediatric gastroenterology with a history of a pervasive developmental disorder with loss of acquired skills and intestinal symptoms (diarrhoea, abdominal pain, bloating and food intolerance), were investigated. All children were admitted to the ward for 1 week, accompanied by their parents.

#### *Clinical investigations*

We took histories, including details of immunisations and exposure to infectious diseases, and assessed the children. In 11 cases the history was obtained by the senior clinician (JW-S),

***Lancet 1998;351:637-641***

# Era of Second Thought: 1998–Present

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# Era of Second Thought: 1998–Present

# Pervasiveness of Vaccine Hesitancy

## *United States*

**54% of parents are concerned about adverse events**

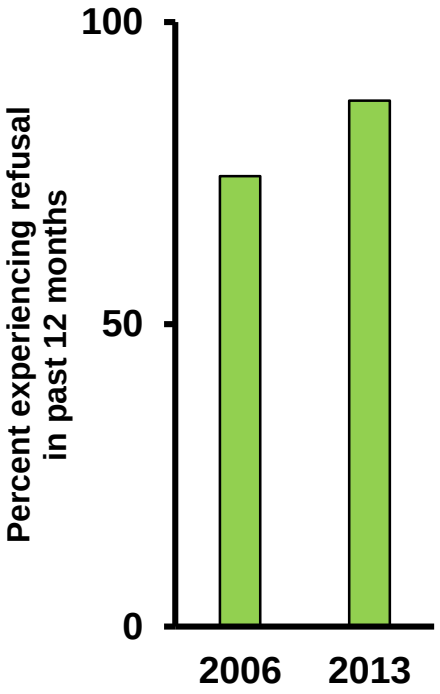
**25% of young infants are following an “alternative” schedule**

**74% of physicians are willing to spread vaccines out**

*Freed. Pediatrics 2010;125:654 (N=1552 parental respondents)*
*Nadeau. J Pediatr 2015;166:151 (N=222,628 children ≤9 mo of age)*
*Kempe. Pediatrics 2015;135: DOI 10.1542/peds.2014-3474 (N=534 pediatricians and family physicians)*

# Pervasiveness of Vaccine Hesitancy

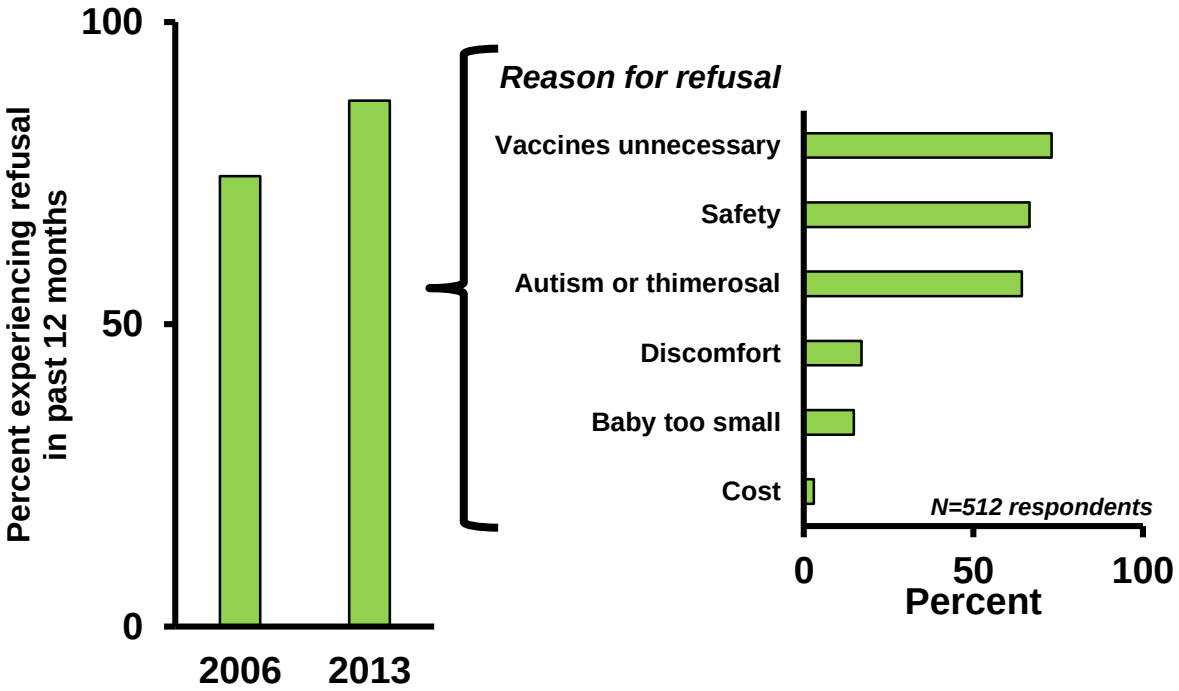
## *United States*




*Hough-Telford. Pediatrics 2016;138:e20162127*
*Data from AAP Periodic Surveys (N=852 respondents in 2006 and 854 in 2013)*

# Pervasiveness of Vaccine Hesitancy

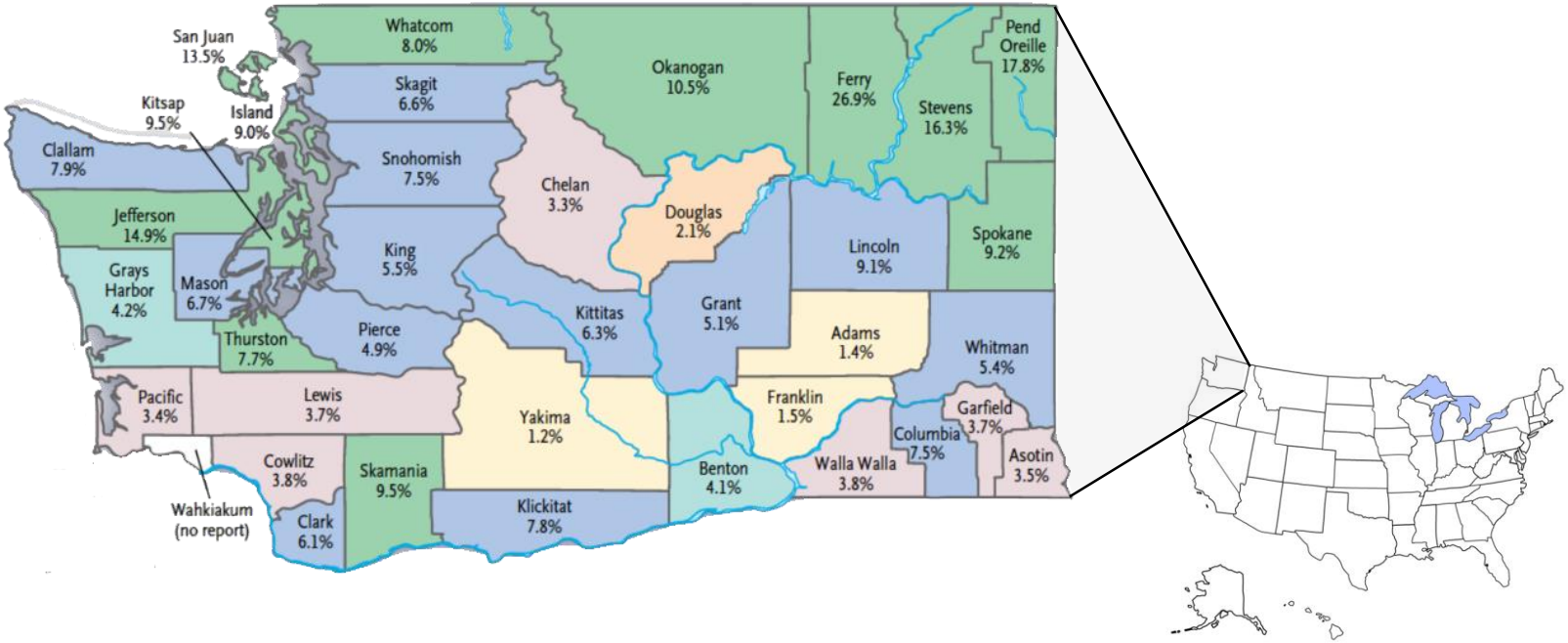
## *United States*




*Hough-Telford. Pediatrics 2016;138:e20162127*
*Data from AAP Periodic Surveys (N=852 respondents in 2006 and 854 in 2013)*

# Pervasiveness of Vaccine Hesitancy

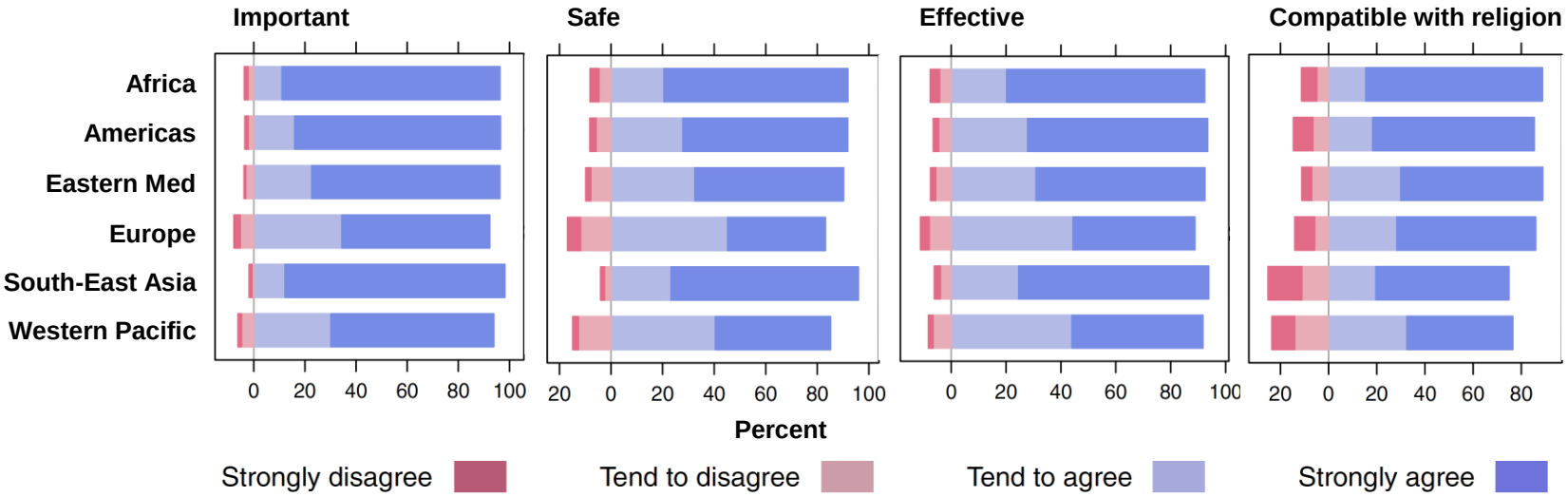
## *United States*




*Omer. N Engl J Med 2009;360:1981*

# Pervasiveness of Vaccine Hesitancy

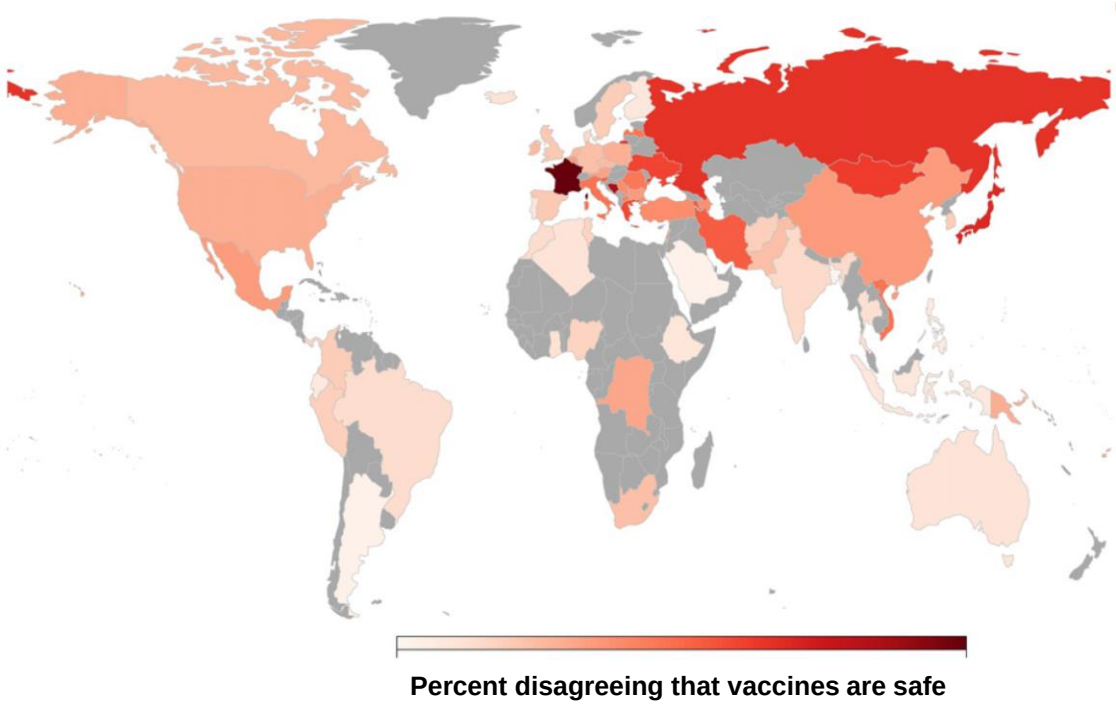
## *Worldwide*




*Larson. EBioMedicine 2016;12:295 (N=65,819)*

# Pervasiveness of Vaccine Hesitancy

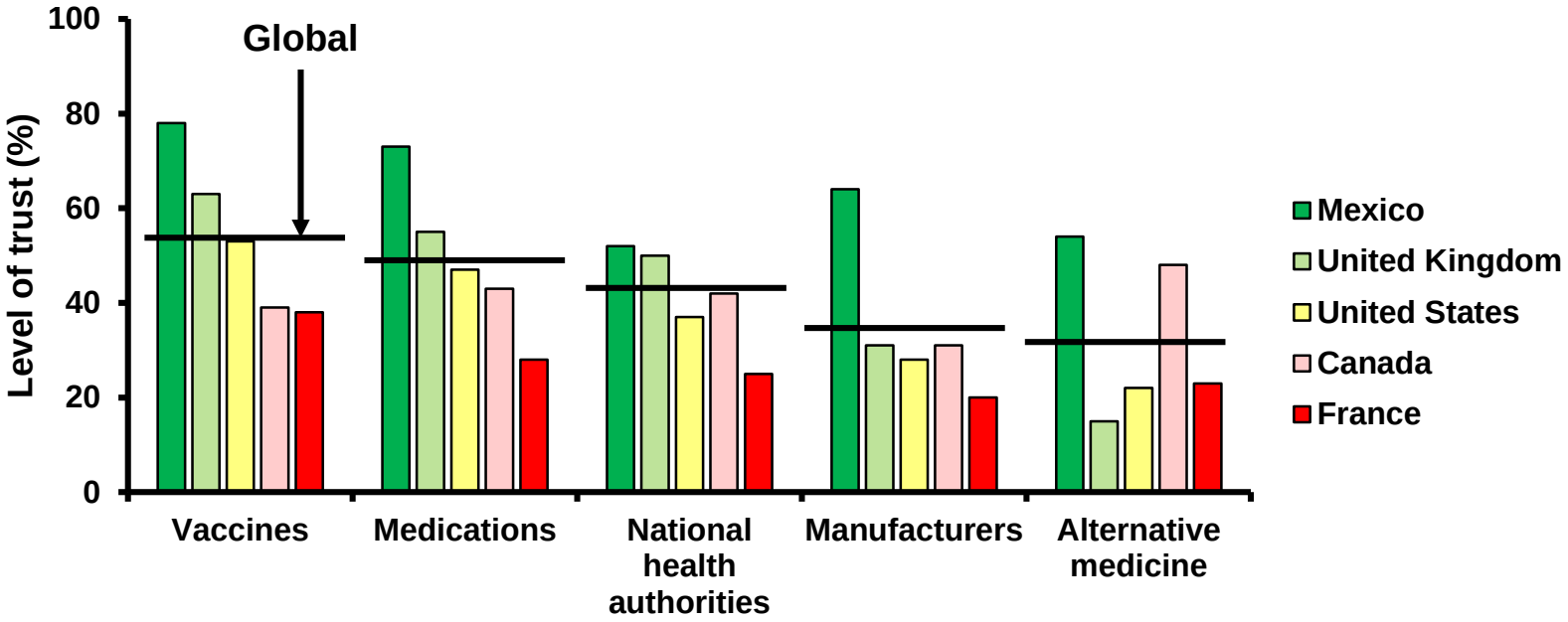
## *Worldwide*




*Larson. EBioMedicine 2016;12:295 (N=65,819)*

# Pervasiveness of Vaccine Hesitancy

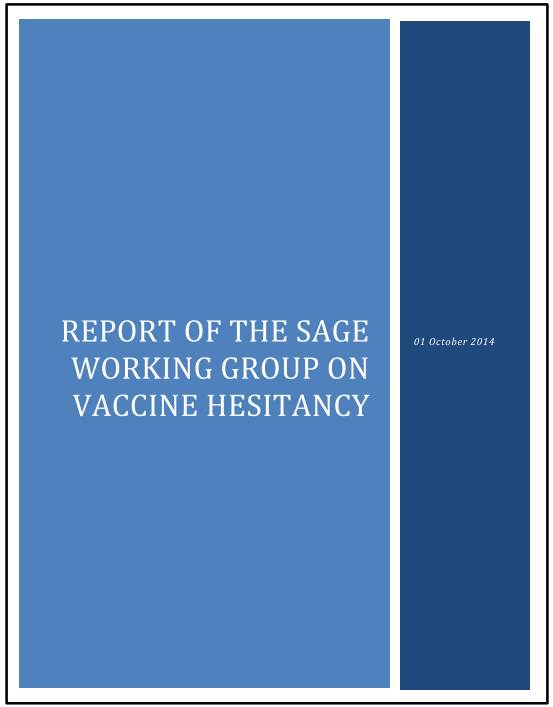
## *Worldwide*




*Imperial College, London (unpublished data)*
*Individual countries, N=837–848; Global, N=4178*

# Pervasiveness of Vaccine Hesitancy

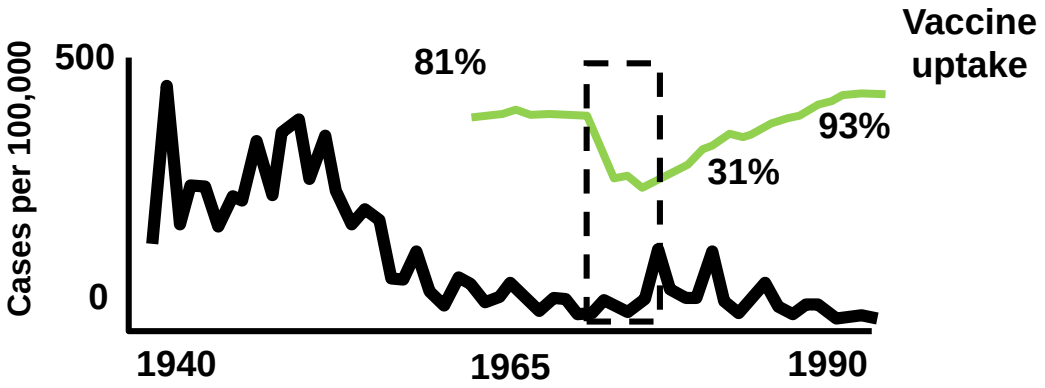
## *Worldwide*




***WHO Strategic Advisory Group of Experts on Immunization: October 2014***

# Vaccine Hesitancy—a Threat to Public Health

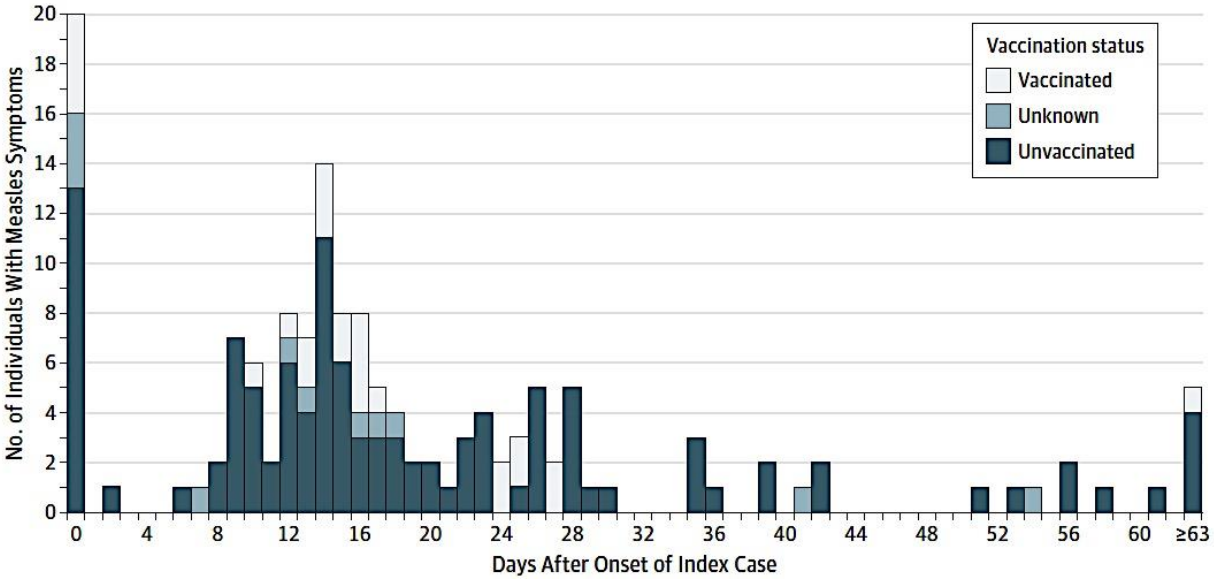
## *Pertussis in England and Wales*




*Gangarosa. Lancet 1998;351:356*
*Cherry. Curr Prob Pediatr 1984;14:1*

# Vaccine Hesitancy—a Threat to Public Health

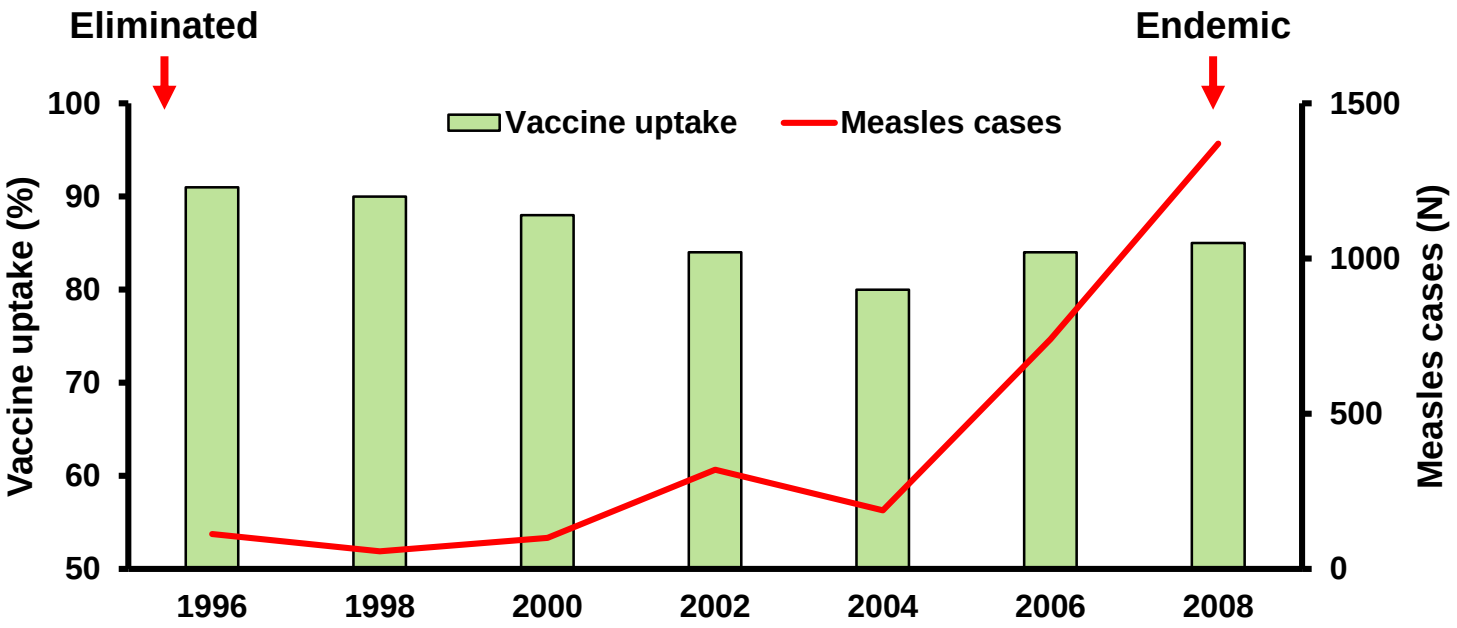
## *Measles outbreaks in the United States*




***Phadke. JAMA 2016;315:1149***
***Cumulative epidemic curve of 18 outbreaks, 2000–2015***

# Vaccine Hesitancy—a Threat to Public Health

## *Measles cases in the United Kingdom*




*Leask. Nature. 2011;473:443; Tannous LK. JRSM. 2014;5; www.eurosurveillance.org/viewarticle.aspx?articleid=18919*

# Vaccine Hesitancy—a Threat to Public Health

## *Measles among Somali immigrants in Minnesota*

The Washington Post

Health & Science

### Anti-vaccine activists spark a state's worst measles outbreak in decades

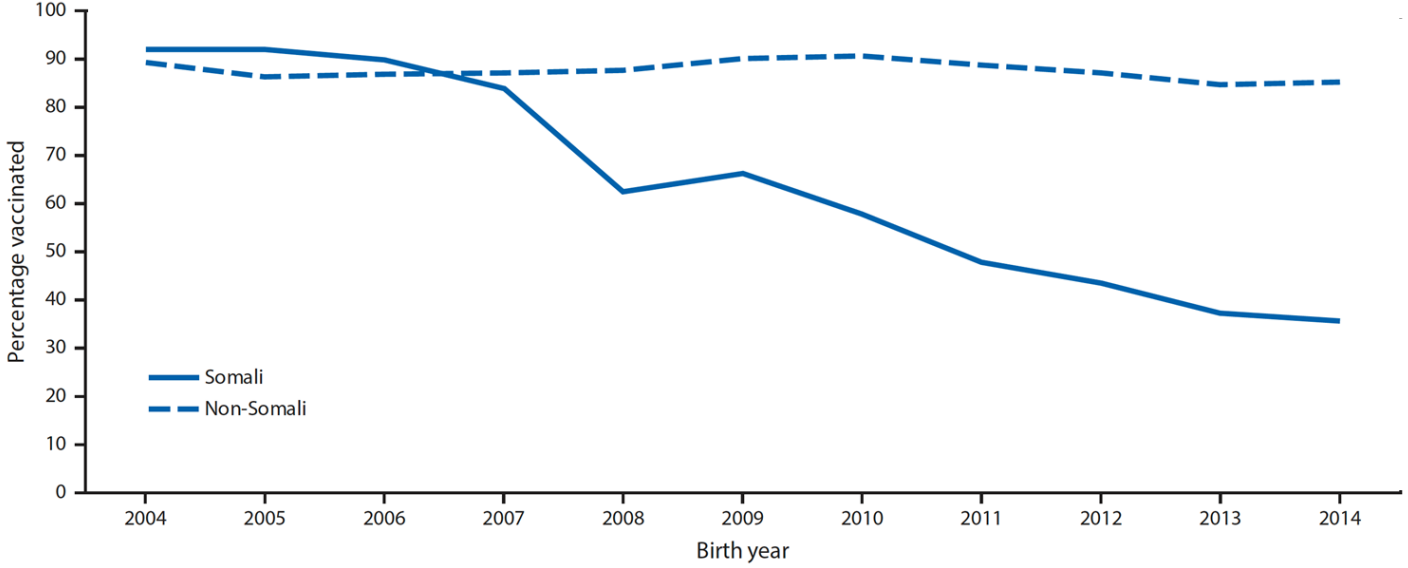
By Lena H. Sun May 5 at 7:00 AM

The young mother started getting advice early on from friends in the close-knit Somali immigrant community here. Don't let your children get the vaccine for measles, mumps and rubella — it causes autism, they said.

Suaado Salah listened. And this spring, her 3-year-old boy and 18-month-old girl contracted measles in Minnesota's largest outbreak of the highly infectious and potentially deadly disease in nearly three decades. Her daughter, who had a rash, high

# Vaccine Hesitancy—a Threat to Public Health

## *Measles among Somali immigrants in Minnesota*




***Hall. MMWR 2017;66:713***

# Vaccine Hesitancy—a Threat to Public Health

## *Measles among Somali immigrants in Minnesota*

**Humanitarian Health Action**

WHO Grade 3 emergency

World Health Organization

**WHO and the Federal Ministry of Health of Somalia call for urgent support to scale up response and address measles outbreak**

WHO/A. Zouiten

16 August 2017 – WHO urgently requires US$ 6.8 million to scale up its response activities in Somalia and conduct a measles immunization campaign for 4.2 million children in November 2017.

As millions of people in Somalia remain trapped in a devastating cycle of hunger and disease, WHO and health partners are working with national health authorities to save lives and reach the most vulnerable with essential health services.

Read the full story from the Regional Office website

***http://www.who.int/hac/crises/som/en/***

# Vaccine Hesitancy—a Threat to Public Health

## *Polio vaccine boycott in Nigeria*



- Aboriginal TV station overturns ban on alcohol advertising
- Experts warn of AIDS threat to eastern Europe
- Refugees are often left out of AIDS plans, report says
- Antidepressants are sold as antiretrovirals in DR Congo
- UNICEF renews appeal for humanitarian funds
- US FDA calls for technological attack on drug counterfeiting
- News in brief
- African women denounce bride price


### Nigerian states again boycott polio-vaccination drive

Muslim officials have rejected assurances that the polio vaccine is safe—leaving Africa on the brink of reinfection

Tens of thousands of volunteers embarked on an emergency campaign on Feb 23 to immunise 63 million children against

initiative. "The polio vaccine is a safe and essential protection for children. We must not allow these unfounded rumours to come

neighbouring countries that had previously been declared polio free.

In addition to Nigeria, the vaccination drive will target

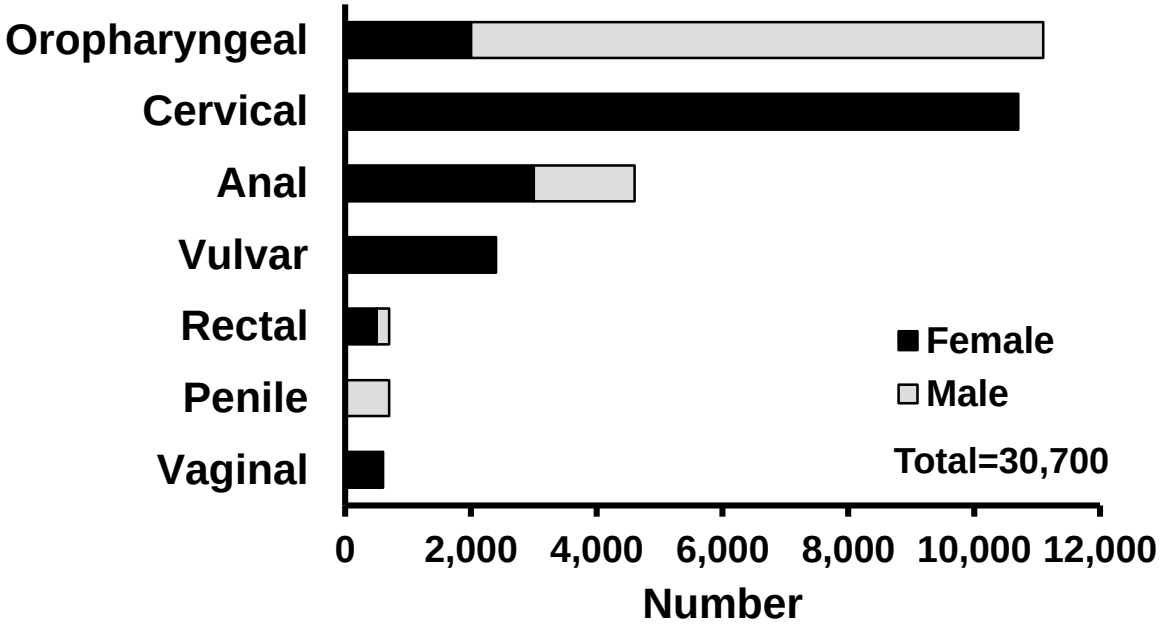
reports indicated that the uptake of immunisation was patchy, with many locals turning away volunteers. The state of Zamfara continued its boycott.

The standoff in Nigeria has left the international public health community frustrated, especially in view of the widespread belief that power politics between the central government in Abuja and the self-styled Supreme Council

*Kapp. Lancet 2004;363:709*

# Vaccine Hesitancy—a Threat to Public Health

## *Annual attributable cancers in the US, 2008–2012*




*Viens. MMWR 2016;65:661*

# Vaccine Hesitancy—a Threat to Public Health

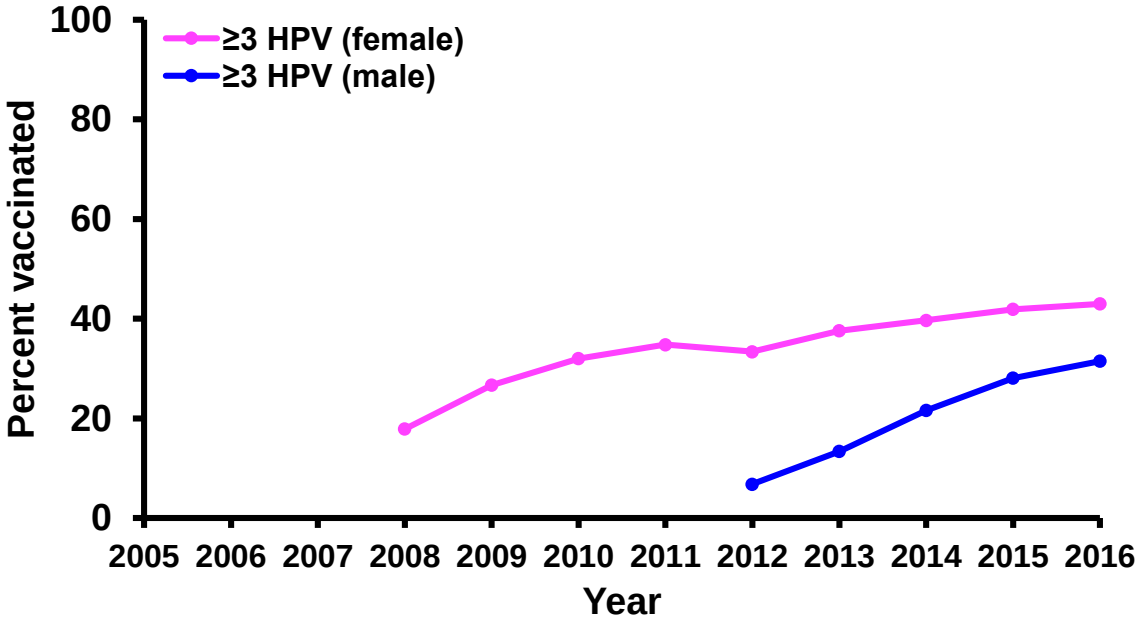
## *Cost-effectiveness*

| Intervention | Cost per QALY saved ($) |
|---|---|
| HPV4 for boys and girls, versus no vaccination | 5500 |
| HPV9 for boys and girls, versus HPV4 | Cost-saving |
| Colorectal cancer screening | 12,000 |
| Breast cancer screening | 20,000 |
| Cholesterol screening | 30,000 |
| Td booster | 170,000 |
| MenACWY (2 doses) | 212,000 |

*Brisson. JNCI J Natl Cancer Inst 2016;108:djv282 (model assumes cross-protection)*
*Coffield. Am J Prev Med 2001;21:1*
*Cohn. MMWR 2013;62:RR-2*

# Vaccine Hesitancy—a Threat to Public Health

## *Coverage rates, ages 13–17 years*




*CDC. MMWR 2016;65:850*

***It is easy to scare people…***
***It is much harder to unscare them.***

**—Paul A. Offit, M.D.**

*Offit. PNAS 2015;doi10.1073/pnas.1516574112*

# Vaccine Hesitancy Cascade

**Initial conditions** — LEVEL–I

**External factors** — LEVEL–II

**Internal factors** — LEVEL–III

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

**The Internet**

**External factors** — **LEVEL–II**

**Culture of anti-science**

**Internal factors** — **LEVEL–III**

**Anecdotal thinking**

# LEVEL–I: Initial Conditions

## *The Internet*

Google

dangers of vaccination

All | News | Images | Videos | Shopping | More | Settings | Tools

About 588,000 results (0.53 seconds)

Six Reasons to Say NO to Vaccination - The Healthy Home Economist
https://www.thehealthyhomeeconomist.com/six-reasons-to-say-no-to-vaccination/
Jun 5, 2017 - You should neither assume shots are **dangerous** just because your friend down the street doesn't **vaccinate** her kids. The key here is education ...

Objective, science-based analysis of vaccine dangers vaccinepapers ...
vaccinepapers.org/about/
Science shows that **vaccines** cause brain damage. VaccinePapers.org uses peer-reviewed science to report the truth about **vaccine dangers**.

Anti-Vaccine Scientific Support Arsenal – Scientific proof the media ...
https://avscientificsupportarsenal.wordpress.com/
There is absolutely undeniable scientific proof that **vaccines** cause autism. ..... The website provides studies showing the **dangers** of mercury exposure and the ...

The Brilliance of Dr. Suzanne Humphries on The Dangers of Vaccines ...


https://www.youtube.com/watch?v=McfXd_Xuojs
Oct 21, 2014 - Uploaded by PreventDiseaseTV
http://preventdisease.com/**vaccines** There will come a day when all Doctors will understand that **vaccination** ...

Doctors-Scientists Warn about Dangers of Vaccination Immunisation
www.medicinekillsmillions.com/.../doctors-scientists-warn-dangers-of-vaccination-im...
Quotes from Doctors & Scientists who warn against **Dangers of Vaccination** & Immunization.

# Vaccine Hesitancy Cascade

**Initial conditions** **LEVEL–I**

I read that vaccines cause autism

**External factors** **LEVEL–II**

Culture of anti-science

**Internal factors** **LEVEL–III**

Anecdotal thinking

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

I read that vaccines cause autism

**External factors** — **LEVEL–II**

Culture of anti-science

**Internal factors** — **LEVEL–III**

Anecdotal thinking

# LEVEL–II: External Factors

## *Culture of anti-science*


***Kyetrak Glacier, Cho Oyu Region, Himalayan mountains***

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

I read that vaccines cause autism

**External factors** — **LEVEL–II**

Science isn’t always right

**Internal factors** — **LEVEL–III**

Anecdotal thinking

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

I read that vaccines cause autism

**External factors** — **LEVEL–II**

Science isn't always right

**Internal factors** — **LEVEL–III**

Anecdotal thinking

# LEVEL–III: Internal Factors

## *Anecdotal thinking*

| | | Outcome | |
|---|---|---|---|
| | | Yes | No |
| Exposure | Yes | a | b |
| | No | c | d |

*Offit. Expert Rev Vac 2003;2:89*

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

I read that vaccines cause autism

**External factors** — **LEVEL–II**

Science isn't always right

**Internal factors** — **LEVEL–III**

One case is enough to convince me

# Vaccine Hesitancy Cascade

**Initial conditions** — LEVEL–I

**External factors** — LEVEL–II

**Internal factors** — LEVEL–III

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

**Vaccine successes**

**External factors** — **LEVEL–II**

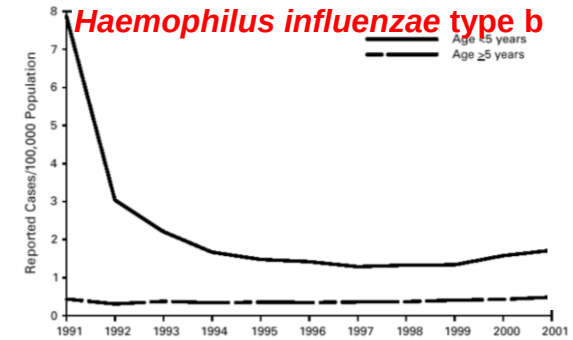
**Medical training paradigm**

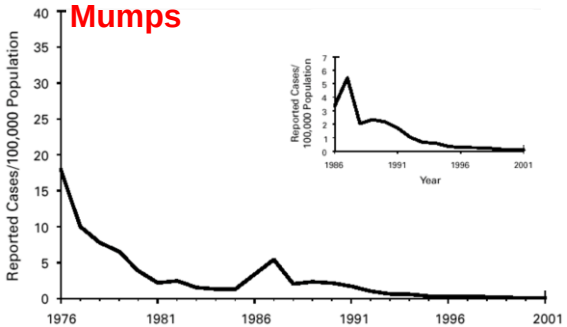
**Internal factors** — **LEVEL–III**

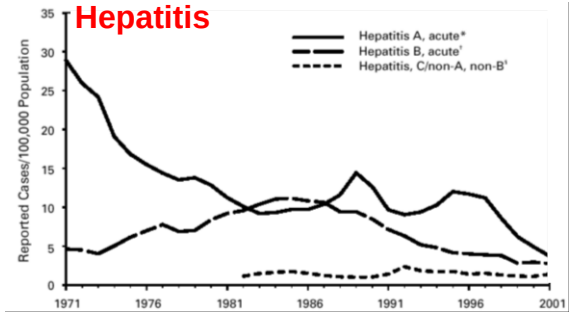
**Distorted risk perception**

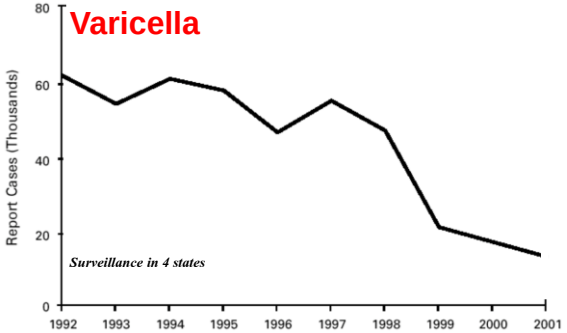
# LEVEL–I: Initial Conditions

## *Vaccine successes*




***Groseclose. MMWR 2003;50:1 (U.S. data)***

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

**I've never seen a case**

**External factors** — **LEVEL–II**

**Medical training paradigm**

**Internal factors** — **LEVEL–III**

**Distorted risk perception**

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

I've never seen a case

**External factors** — **LEVEL–II**

Medical training paradigm

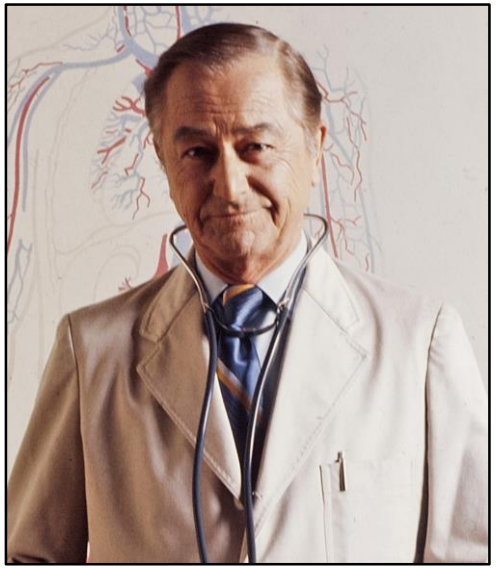
**Internal factors** — **LEVEL–III**

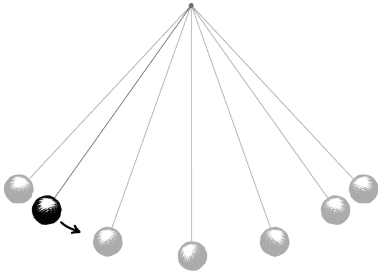
Distorted risk perception

# LEVEL–II: External Factors

## *Medical training paradigm*

***Marcus Welby***

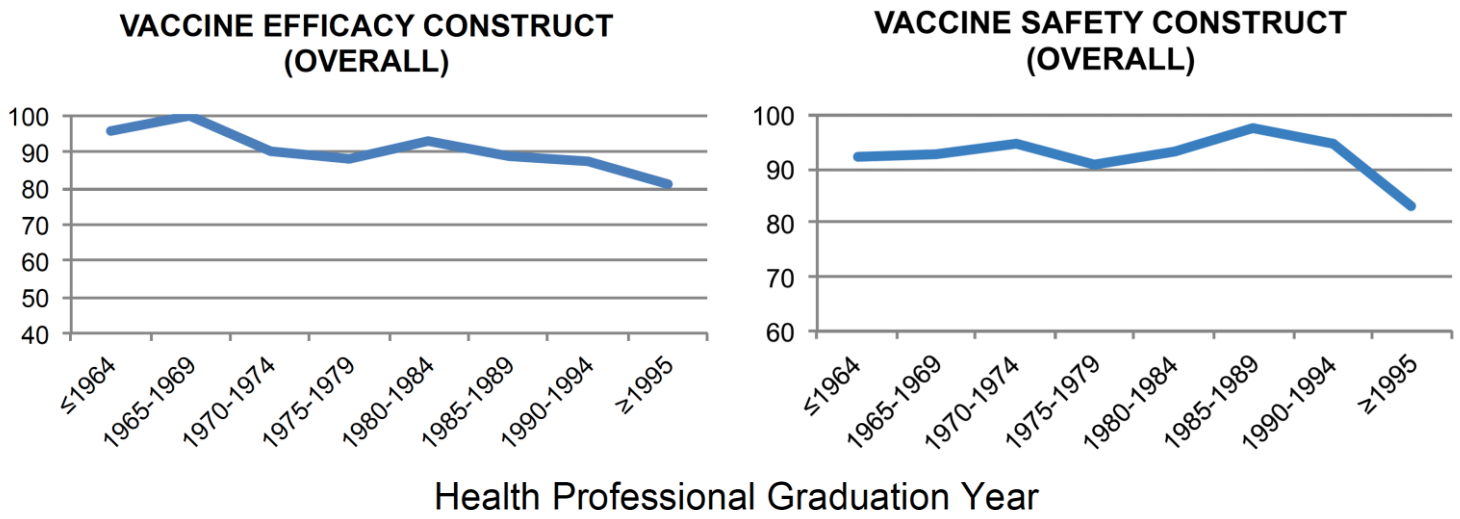




***Kumbaya Medicine***

# LEVEL–II: External Factors

## *Medical training paradigm*




***Mergler. Vaccines 2013;1:154 (N=551)***

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

I've never seen a case

**External factors** — **LEVEL–II**

I need to partner with the parent

**Internal factors** — **LEVEL–III**

Distorted risk perception

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

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**Internal factors** — **LEVEL–III**

Distorted risk perception

# LEVEL–III: Internal Factors

## *Distorted risk perception*

| What we're afraid of | What the real risk is |
|---|---|
| Shark attacks (28) | Dog bites (4.5 million) |
| Murder (14,180) | Suicide (33,289) |
| Death by peanut allergy (50) | Death by poisoning (27,531) |
| Death by plane crash (321) | Death by car crash (34,017) |

*BLALOCK.ssrn.com/abstract=677549; Gigerenzer. Psych Sci 2004;15:286.*

# LEVEL–III: Internal Factors

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***Deaths from…***
***the 9/11 attacks: 2,976***
***automobile accidents attributable to the 9/11 effect: 350-1,200***

***BLALOCK.ssrn.com/abstract=677549; Gigerenzer. Psych Sci 2004;15:286.***

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

I've never seen a case

**External factors** — **LEVEL–II**

I need to partner with the parent

**Internal factors** — **LEVEL–III**

The vaccine is riskier than the disease

# Vaccine Hesitancy Cascade

**Initial conditions** — LEVEL–I

**External factors** — LEVEL–II

**Internal factors** — LEVEL–III

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

**Vaccine side effects**

**External factors** — **LEVEL–II**

**Poor science and math education**

**Internal factors** — **LEVEL–III**

**Heuristics**

# LEVEL–I: Initial Conditions

## *Vaccine side effects*

| Vaccine | Event | Risk |
|---|---|---|
| Any | Anaphylaxis | 1 in 1,000,000 |
| MMR | ITP | 1 in 40,000 |
| RRV-TV | Intussusception | 1 in 11,000 |
| MMRV | Febrile seizures | 1 in 2,300 |
| RV1 and RV5 | Intussusception | 1 in 20,000–100,000 |

*Bohlke. Pediatrics 2003;112:815; Mantadakis. J Pediatr 2010;156:623; Peter. Pediatrics 2002;110:e67; Klein. Pediatrics 2010;126:e1; ACIP Meeting. June 2013*

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

Vaccines can have serious side effects

**External factors** — **LEVEL–II**

Poor science and math education

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Heuristics

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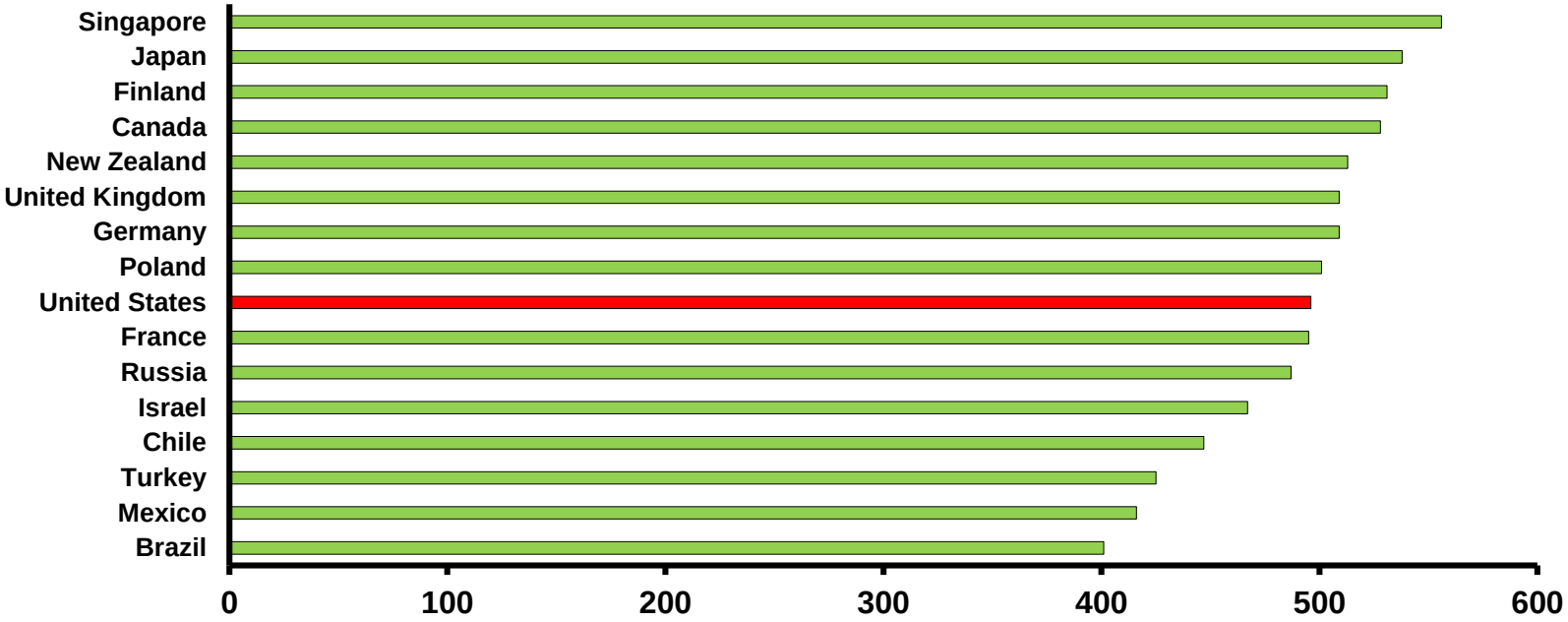
# LEVEL–II: External Factors

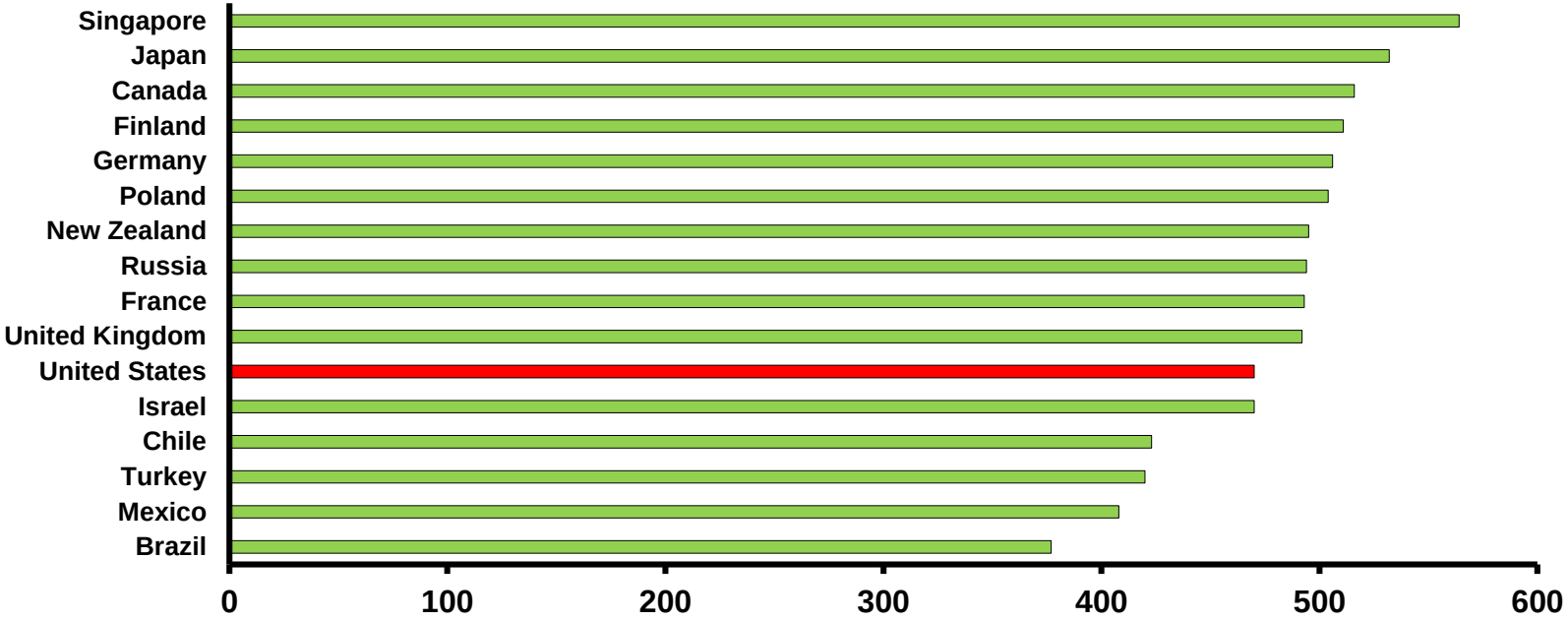
## *Poor science education*




***Program for International Student Assessment Science Literacy Scale, 15-year-olds (2015)***
***https://nces.ed.gov/surveys/pisa/pisa2015/index.asp***

# LEVEL–II: External Factors

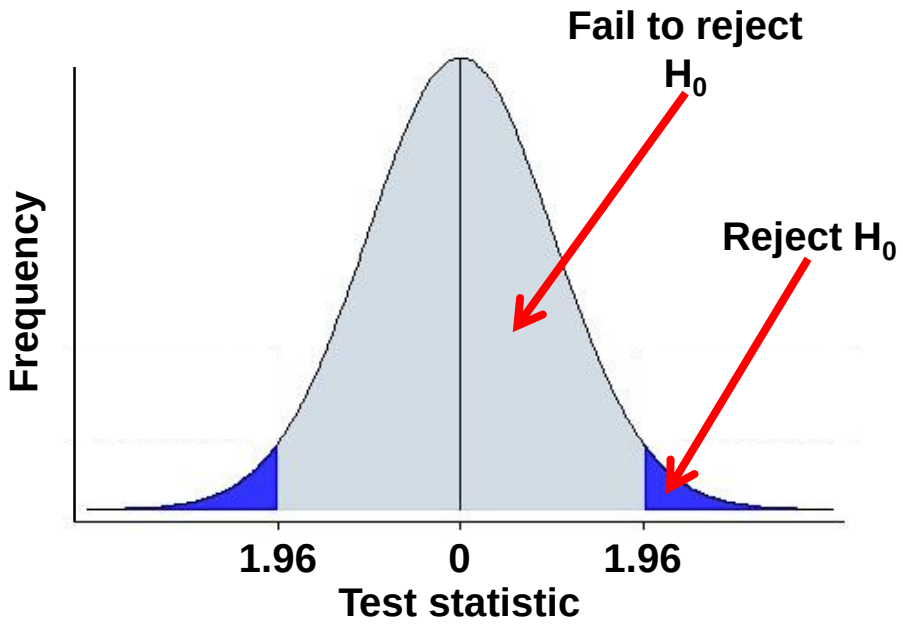
## *Poor math education*




***Program for International Student Assessment Mathematics Literacy Scale, 15-year-olds (2015)***
***https://nces.ed.gov/surveys/pisa/pisa2015/index.asp***

# LEVEL–II: External Factors

***Failure to understand science***



# Vaccine Hesitancy Cascade

**Initial conditions** **LEVEL–I**

**Vaccines can have serious side effects**

**External factors** **LEVEL–II**

**They can’t prove the vaccines are safe**

**Internal factors** **LEVEL–III**

**Heuristics**

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

Vaccines can have serious side effects

**External factors** — **LEVEL–II**

They can’t prove the vaccines are safe

**Internal factors** — **LEVEL–III**

Heuristics

# LEVEL–III: Internal Factors

## *Heuristics*

| | |
|---|---|
| **Availability** | **The perceived probability of an event correlates with how easily similar events are remembered** |
| **Do no harm** | **A bad outcome seems more tolerable if it occurs because of inaction rather than action** |
| **Ambiguity** | **A known risk is more acceptable than an unknown risk** |
| **Compression** | **Rare risks are overestimated and common risks are underestimated** |

***Evans. Risk Comm and Vac. Natl Acad Press, 1997; Ball. Pediatrics 1998;101:453***

# Vaccine Hesitancy Cascade

**Initial conditions** — **LEVEL–I**

Vaccines can have serious side effects

**External factors** — **LEVEL–II**

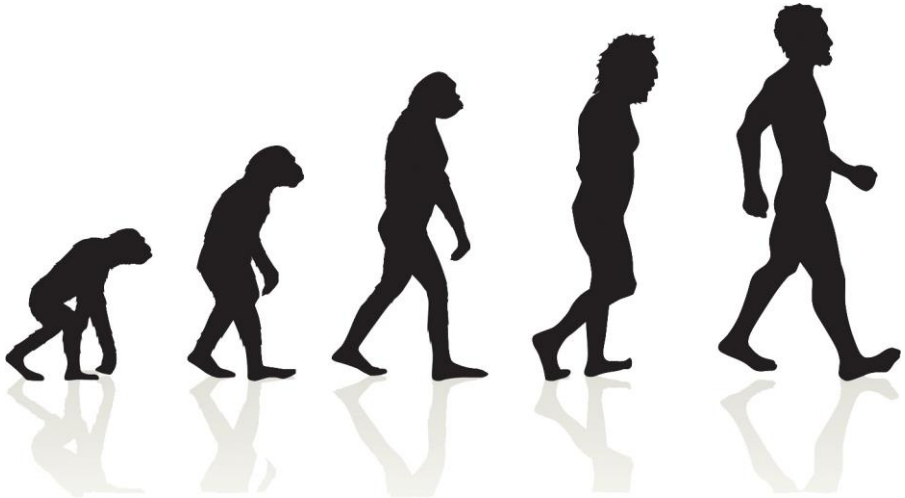
They can’t prove the vaccines are safe

**Internal factors** — **LEVEL–III**

This kid down the street got sick after getting a vaccine, so it must be common

# Other Things About Being Human

## Folk numeracy



*Shermer. Sci Amer 2008;Sep;40*


*Shermer. Scientific American, Sep 2008*

# Folk Numeracy

**10,000,000 pregnant women get a shot**

→ **6 weeks later**

**16,684 have a spontaneous abortion**

*Shermer. Sci Amer 2008;Sep;40; Black. Lancet 2009;374:2115*

# Folk Numeracy

**10,000,000 pregnant women get a shot**

→ **6 weeks later**

**16,684 have a spontaneous abortion**

***If the shot is a placebo!***

*Shermer. Sci Amer 2008;Sep;40; Black. Lancet 2009;374:2115*

# Sample Size Needed to Detect Adverse Event

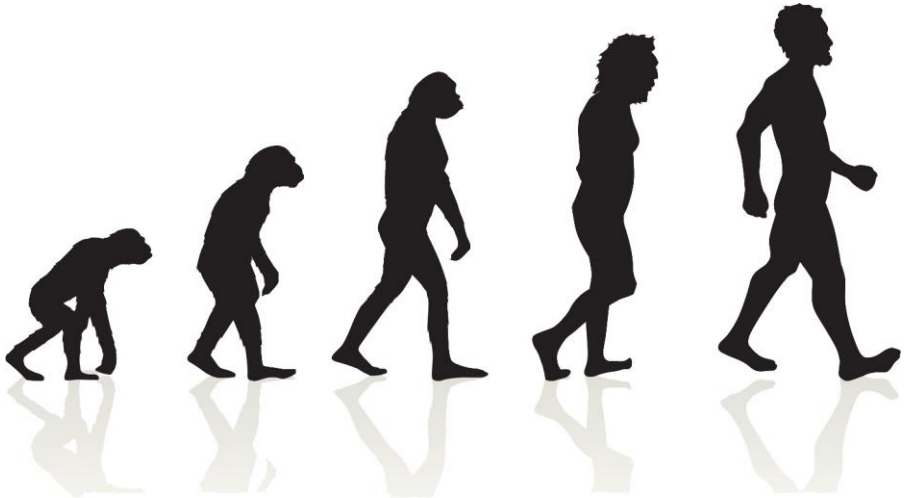
| Background rate in general population | Rate in vaccinated population | | |
|---|---|---|---|
| | 2-fold higher | 10-fold higher | 100-fold higher |
| 1 in 10,000 | 141,000 | 5,500 | 500 |
| 1 in 100,000 | 1,238,000 | 53,500 | 2,500 |
| 1 in 1,000,000 | 12,951,500 | 532,500 | 23,500 |

*Evans. J Infect Dis 2009;200:321*
*Assumes 5% risk of Type I error and power of 90%*

# Other Things About Being Human

Folk numeracy

**Patternicity**



*Shermer. Sci Amer 2008;Sep;40*

# Patternicity

***Grilled cheese sandwich sold on eBay in 2004 for $28,000***

HOME SHOP ABOUT CONTACT BUZZ

# THE POPE TOASTER

2015 COMMEMORATIVE

## *Toast the Pope!*

Celebrate Pope Francis's first visit to America with The Pope Toaster—the best thing since sliced bread! The Pope Toaster brands the pope's picture and other images onto your toast.

The 2015 commemorative, one-of-a-kind, 2-slice toaster comes with two impression inserts: the pope's picture and the words "Spread the Love." Just pop in some bread and enjoy *your* pope on toast.


*Spread the Love*

Only **$48.95**
**BUY NOW!**

**Includes:**
White toaster with two pope inserts and two Spread the Love inserts

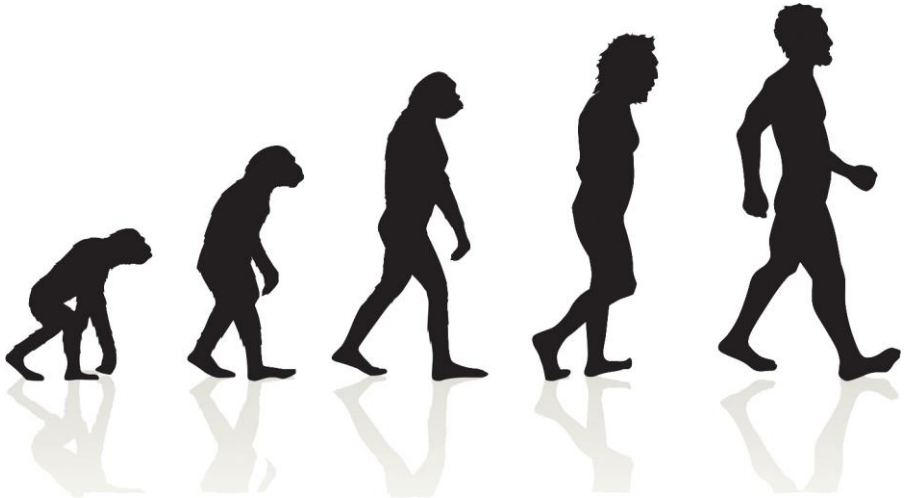
**Additional impression inserts available for all occasions.**
Inserts are removable and interchangeable. For wholesale orders, email us at info@fireworksbydesign.com.

# Other Things About Being Human

Folk numeracy

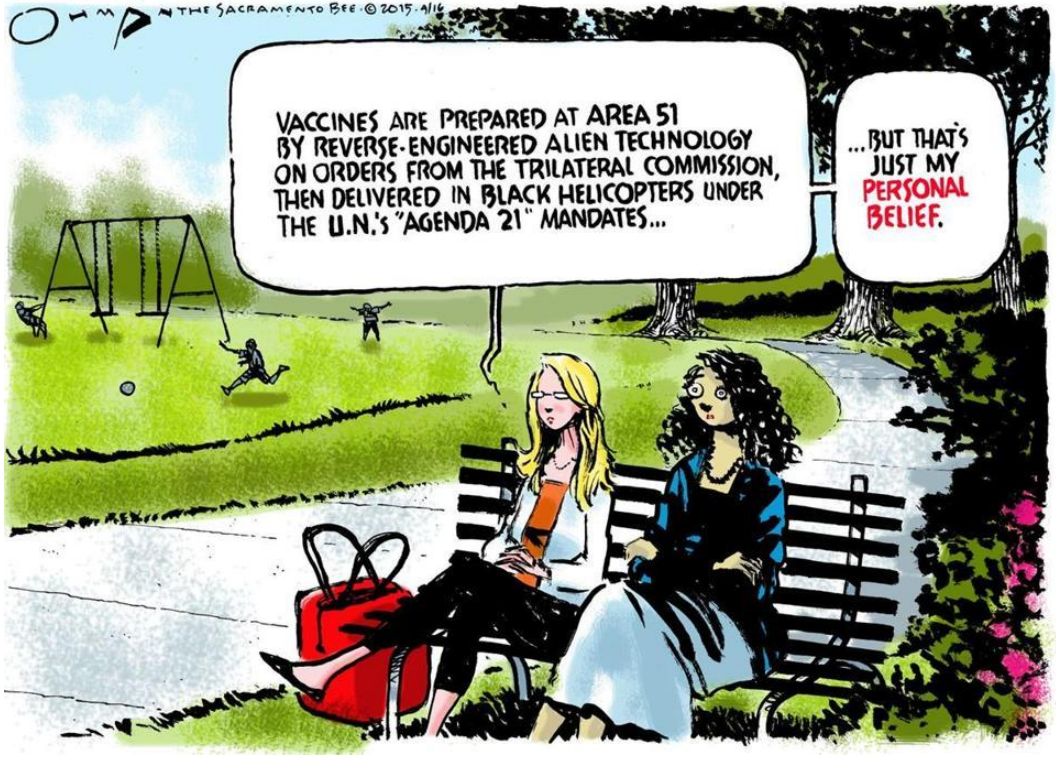
Patternicity

**Confirmation bias**



*Shermer. Sci Amer 2008;Sep;40*

# Confirmation Bias


THE SACRAMENTO BEE · © 2015 · 4/16
VACCINES ARE PREPARED AT AREA 51 BY REVERSE-ENGINEERED ALIEN TECHNOLOGY ON ORDERS FROM THE TRILATERAL COMMISSION, THEN DELIVERED IN BLACK HELICOPTERS UNDER THE U.N.'S "AGENDA 21" MANDATES...
...BUT THAT'S JUST MY PERSONAL BELIEF.

# Vaccination Against Fear and Misinformation

| | | |
|---|---|---|
| Anecdotal thinking | → | Scientific thinking |
| Heuristic thinking | → | Deductive reasoning |
| Folk numeracy | → | Statistical numeracy |
| Patternicity | → | Hypothesis testing |
| Perception of risk | → | Risk:benefit analysis |
| The tragedy of the commons | → | The common good |

# The Tragedy of the Commons


***Hardin. Science 1968;162:1243***
***https://ideas4sustainability.wordpress.com***

# Strategies: Begin Discussion Early

**Tdap and IIV for pregnant women**

**Prenatal meetings**

**HepB in the nursery**

# Strategies: Have a Plan

Outline scheduled vaccines for each visit

Give VIS

Explain importance of each vaccine

Screen for contraindications

Anticipate common side effects

# Strategies: Take a Strong Position

**Presumptive**

***"We've got some shots due today."***

**Participatory**

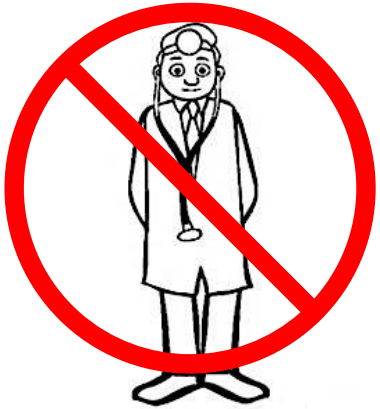
***"What do you want to do about shots today?"***

# Strategies: Take a Strong Position

**Presumptive**

***"We've got some shots due today."***

**Participatory**



***"What do you want to do about shots today?"***

***Be persistent—***
***"These shots are really important."***
***"If he were my kid, I'd definitely do it.***

# Strategies: Take a Strong Position

***"My child does not need a vaccine against a sexually transmitted disease."***

**—This vaccine will protect your child from cancer.**

***Modified from Immunization Action Coalition. Needle Tips; Nov 2013***

# Strategies: Take a Strong Position

***"My child does not need a vaccine against a sexually transmitted disease."***

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***"My child is too young to be getting this vaccine."***

**—The vaccine works best at younger ages, and I want your child protected long before there is any exposure.**

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# Strategies: Take a Strong Position

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**—This vaccine will protect your child from cancer.**

***"My child is too young to be getting this vaccine."***

**—The vaccine works best at younger ages, and I want your child protected long before there is any exposure.**

***"Being vaccinated will open the door to sexual activity."***

**—That's like saying, "Good thing I've had the typhoid vaccine. Now I can drink the sewer water in Mumbai!"**

***Modified from Immunization Action Coalition. Needle Tips; Nov 2013***

# Strategies: Use a Team Approach


*“Good news—protection from measles today!”*


*“Can I answer any questions?”*

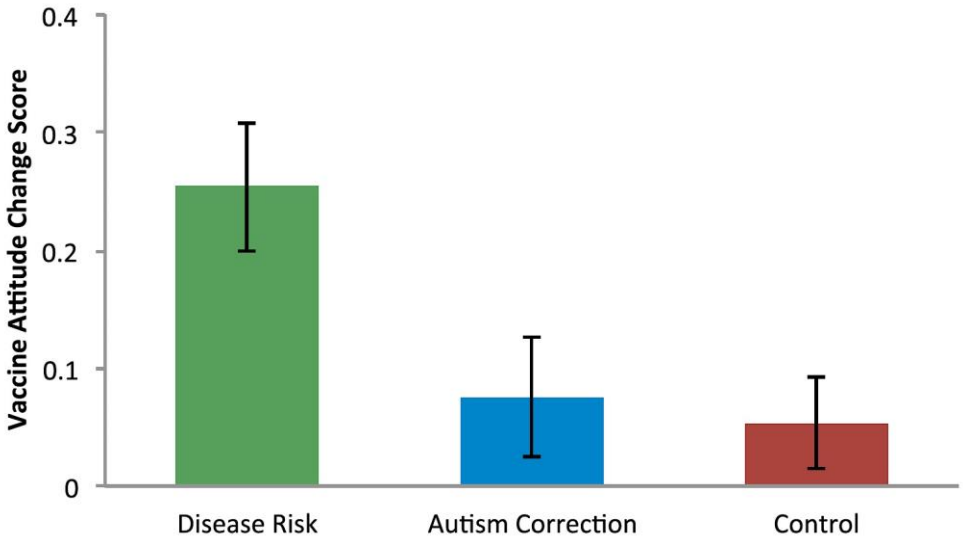
# Strategies: Be Consistent

# Strategies: Organize Visits Efficiently

- Preparatory phone call
- Screening questionnaire
- Printed brochures
- Take-home materials
- Off-peak scheduling
- Maximize face-to-face time

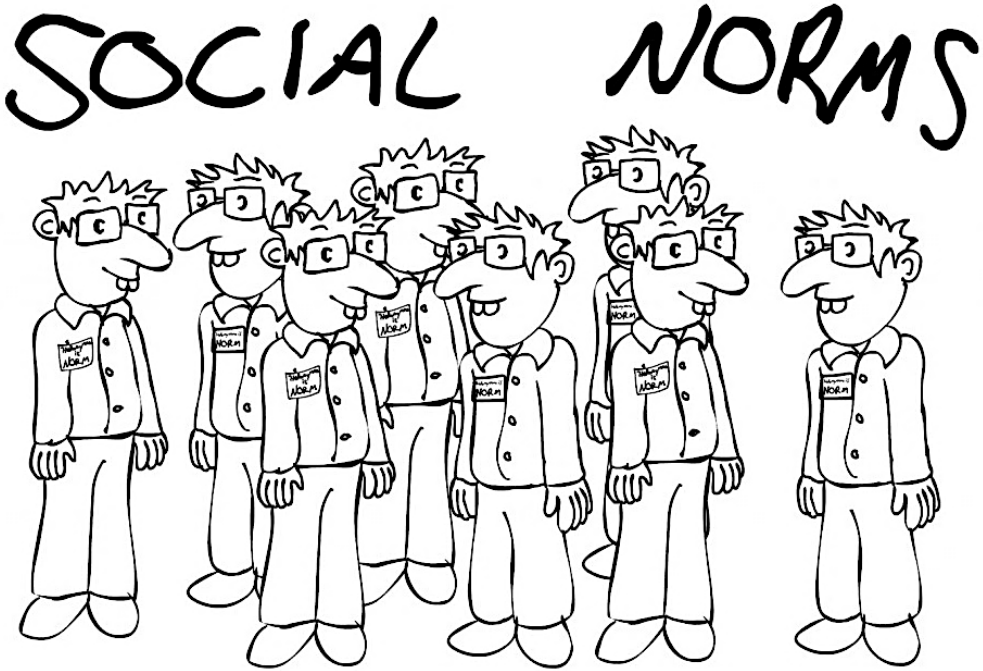
# Strategies: Layer Information Appropriately

# Strategies: Emphasize Disease Risks




*Horne. Proc Natl Acad Sci 2015;112:10321*

# Strategies: Normalize Vaccination



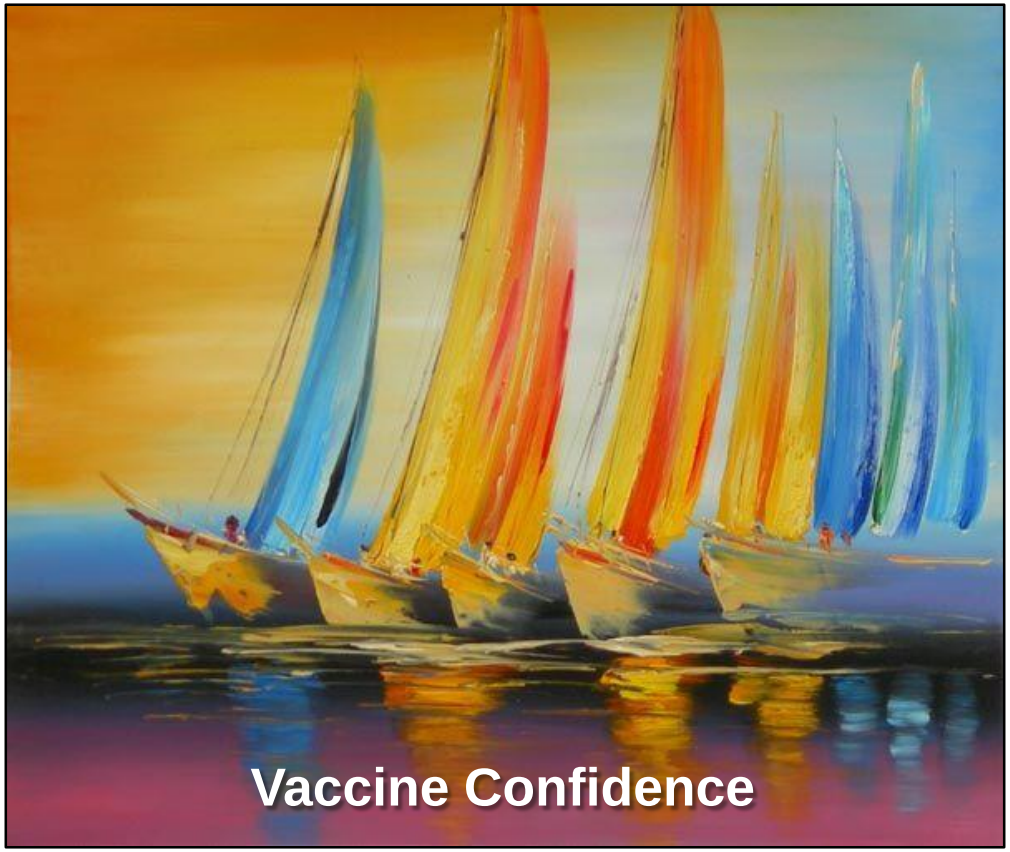
# Vaccine Hesitancy

**Pervasive**

**Threat to public health**

**Complex phenomenon with deep roots**

**Imperative to implement strategies to increase vaccine confidence**


Vaccine Confidence

**The good thing about science is that it’s true, whether or not you believe in it.**

**—Neil deGrasse Tyson**