

Vaccine Safety: From Myth to Science

Michael J. Smith, MD, MSCE
Pediatric Infectious Diseases
University of Louisville
School of Medicine

Disclosures

I have received research funding from Novartis and Sanofi-Pasteur for vaccine clinical trials

These vaccines are not yet FDA approved and will not be discussed during this talk

Outline

Introduction to vaccine hesitancy

The science of vaccine safety

Vaccines in the courtroom

A scientific look at vaccine safety concerns



The Cow-Pock or the Wonderful Effects of the New Inoculation! — the Publications of the Anti-Vaccines Society.

How Big is the Problem?

National Immunization Survey (NIS):

Rates for most childhood vaccines greater than 90%

Does not (for the most part) give reason for undervaccination

Does not account for clustering

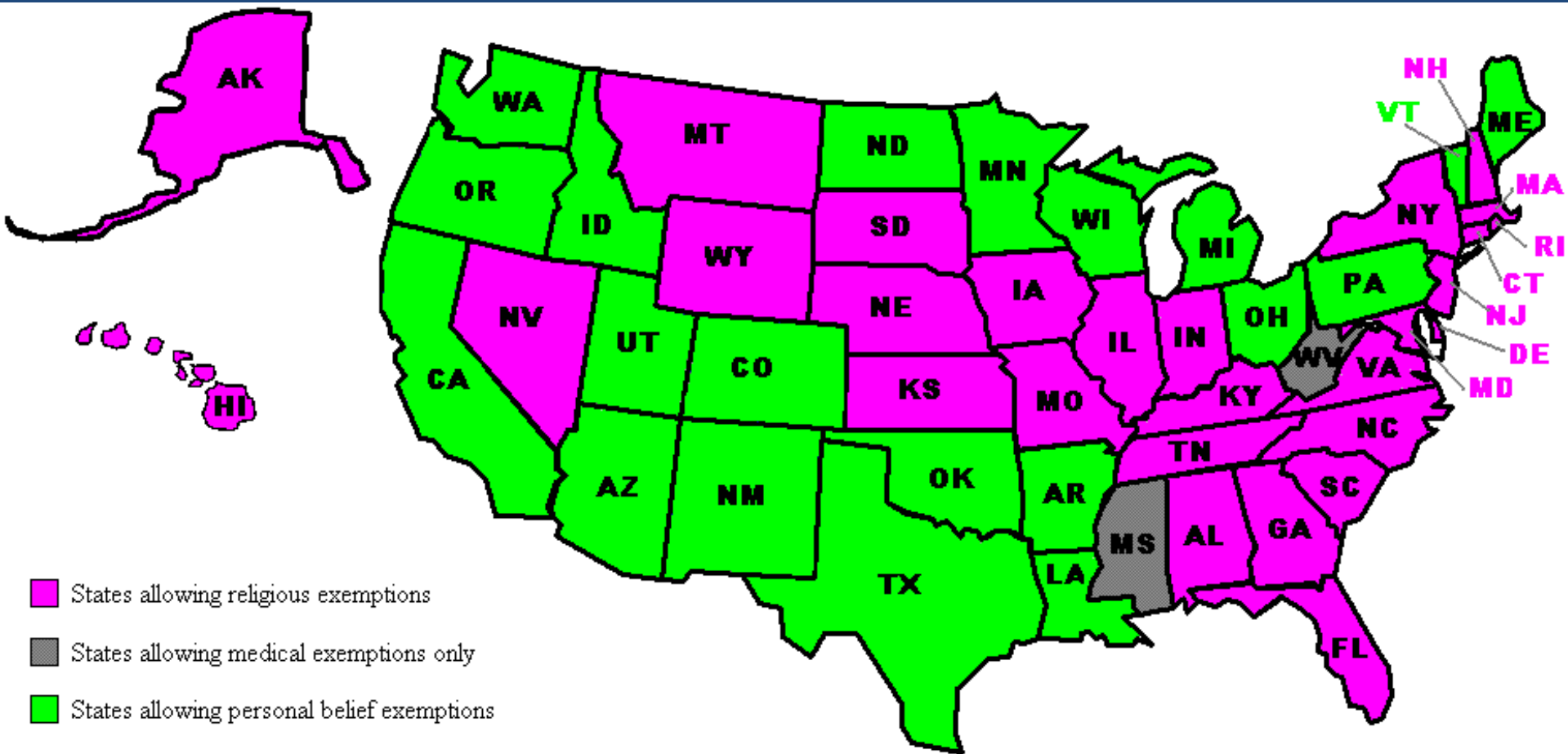
How Big is the Problem?

Exemptions to vaccine mandates

Better sense of intentional vaccine behavior

Difficult to compare states

Some may choose home-schooling



MMWR 6/3/2011

Data from 48 grantees

Rates of exemption 0.1% (MS) to 6.2% (WA)

15 grantees \geq 3.0%

West Virginia: 1.3%

How Big is the Problem?

Nationally representative survey of 366 pediatricians
and 330 family medicine physicians

60% reported refusals for 1-4% of children

8% reported refusals for $\geq 10\%$ of children

79% reported at least one refusal/month

How Big is the Problem?

Nationally representative survey of 1552 parents:
90% thought were a good way to protect their children

54% had concerns about serious adverse effects of vaccines

25% believed that vaccines cause autism

11.5% had refused at least one vaccine

Factors Contributing to Vaccine Hesitancy

Risk-benefit perception

The power of the anecdote

The internet

Issues of trust

Risk Perception

The majority of parents today are not familiar with vaccine-preventable diseases

They are familiar with autism, which is widely, but incorrectly, associated with childhood vaccines

For many parents the perceived risk of vaccines outweighs the perceived benefits

Comparison of 20th Century Annual Morbidity and Current Morbidity: Vaccine-Preventable Diseases

Disease	20th Century Annual Morbidity [†]	2010 Reported Cases ^{††}	Percent Decrease
Smallpox	29,005	0	100%
Diphtheria	21,053	0	100%
Measles	530,217	61	> 99%
Mumps	162,344	2,528	98%
Pertussis	200,752	21,291	89%
Polio (paralytic)	16,316	0	100%
Rubella	47,745	6	> 99%
Congenital Rubella Syndrome	152	0	100%
Tetanus	580	8	99%
<i>Haemophilus influenzae</i>	20,000	270*	99%

[†]Source: JAMA. 2007;298(18):2155-2163

^{††}Source: CDC. MMWR January 7, 2011;59(52);1704-1716. (provisional MMWR week 52 data)

* 16 type b and 254 unknown serotype (< 5 years of age)

Comparison of Pre-Vaccine Era Estimated Annual Morbidity or Mortality with Current Estimate: Vaccine-Preventable Diseases

Disease	Pre-Vaccine Era Annual Estimate	2008 Estimate	Percent Decrease
Hepatitis A	117,333 †	11,049	91%
Hepatitis B (acute)	66,232 †	11,269	83%
Pneumococcus (invasive)			
all ages	63,067 †	44,000 #	30%
< 5 years of age	16,069 †	4,167 ##	74%
Rotavirus (hospitalizations, < 5 years of age)	62,500 † †	7,500###	88%
Varicella	4,085,120 †	449,363	89%

† Source: JAMA. 2007;298(18):2155-2163

†† Source: CDC. MMWR. February 8, 2009 / 58(RR02):1-25

Source: CDC. Active Bacterial Core surveillance Report; *S. pneumoniae* 2008. <http://www.cdc.gov/abcs/surveys/spneu08.pdf>

Source: 2008 Active Bacterial Core surveillance

Source: New Vaccine Surveillance Network

National Center for Immunization & Respiratory Diseases

Historical Comparisons of Vaccine-Preventable Disease Morbidity in the U.S.



①

Prevaccine

②

Increasing Coverage*

③

Loss of Confidence

④

Resumption of Confidence

⑤

Eradication

Incidence

Disease

Vaccine Coverage

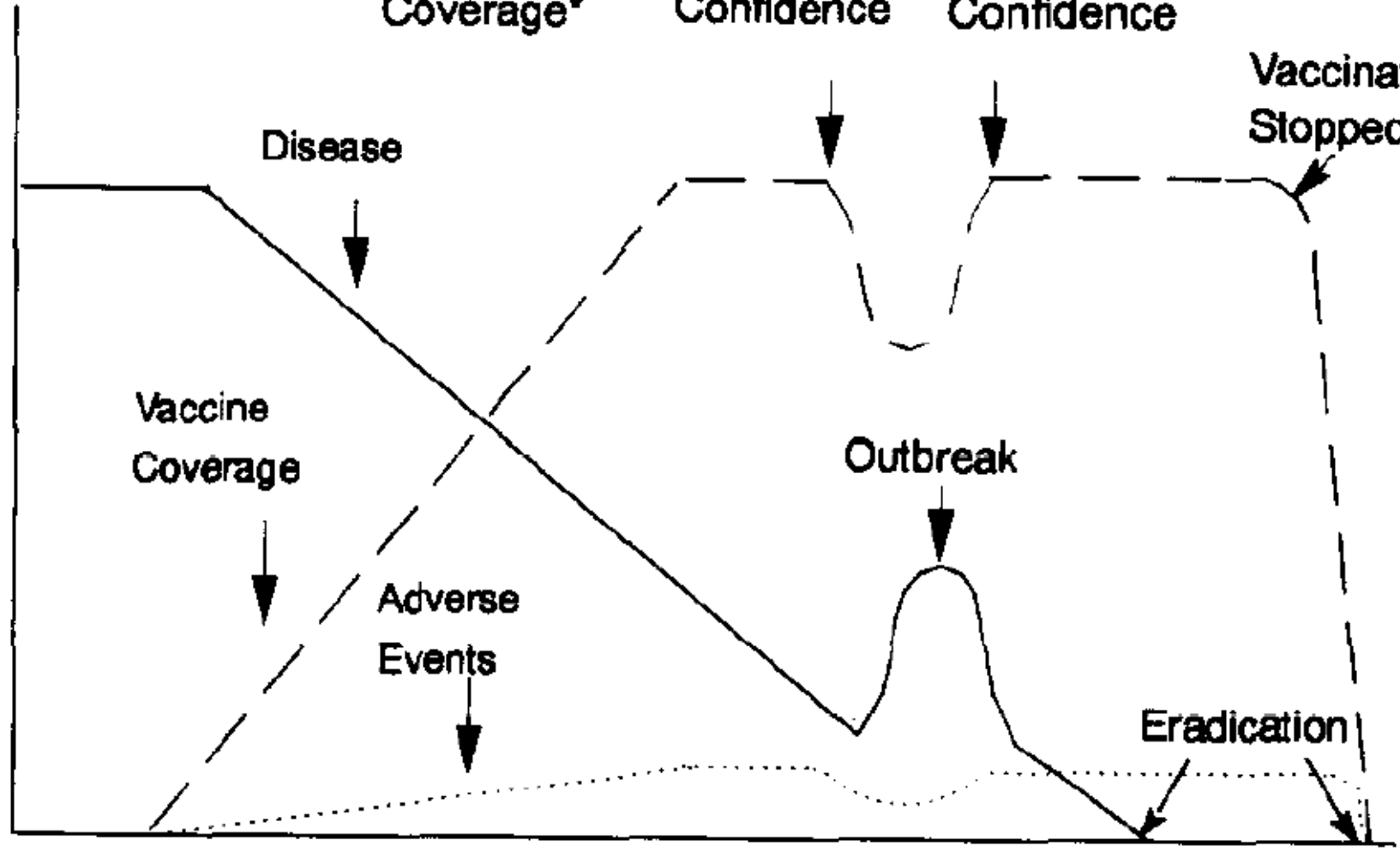
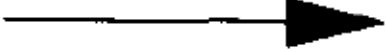
Adverse Events

Outbreak

Vaccinations Stopped

Eradication

Maturity



Measles 2008

140 cases

Most since 1996

Only 17 originated outside the United States

91% unvaccinated

of these, 2/3 due to non-medical reasons

Measles 2011

118 cases in first 19 weeks of 2011

105 associated with importation

- 46 direct

- 49 import-linked

 - 5 imported virus

105 unvaccinated

47 hospitalizations (46 unvaccinated)

- 9 pneumonia

Measles 2011

45 US Residents 1-19 years:

39 unvaccinated

24 religious or philosophical exemption

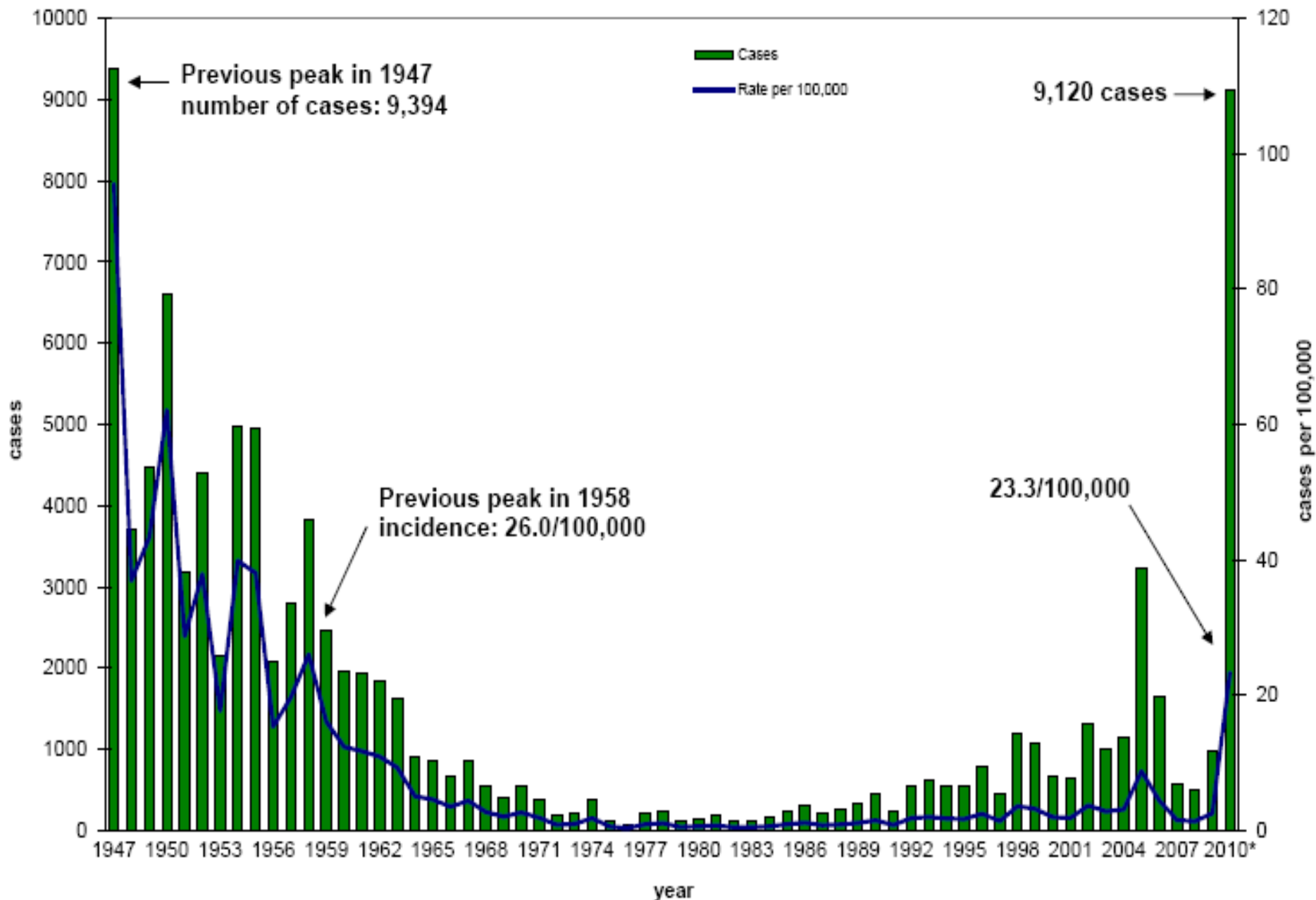
8 missed opportunities

42 US Residents > 19:

35 unvaccinated

6 religious or philosophical exemptions

Figure 2. Number of reported pertussis cases by year of onset -- California 1947-2010



Vaccine Risk Perception

Vaccine-preventable diseases are clearly still threats

That said, vaccines are not 100% risk-free

Must put these risks in context when talking to parents

Cause versus Coincidence

The good news: NIS estimates that less than 1% of children in the United States received absolutely no vaccines

The bad news: Virtually ANY bad thing that happens during the first two years of life will happen shortly after receiving a vaccine

	Something bad happened	Nothing bad happened
Received vaccine	A	
Did not receive vaccine		

	Something bad happened	Nothing bad happened
Received vaccine	A	
Did not receive vaccine		D

	Something bad happened	Nothing bad happened
Received vaccine	A	B
Did not receive vaccine	C	D

The Internet - Pandora's Box

Approximately 74% of Americans report using the internet on a daily basis

Of these, 13% have specifically searched for information about immunizations on-line

Blogs, YouTube and social media also contain (mis)information about vaccine safety

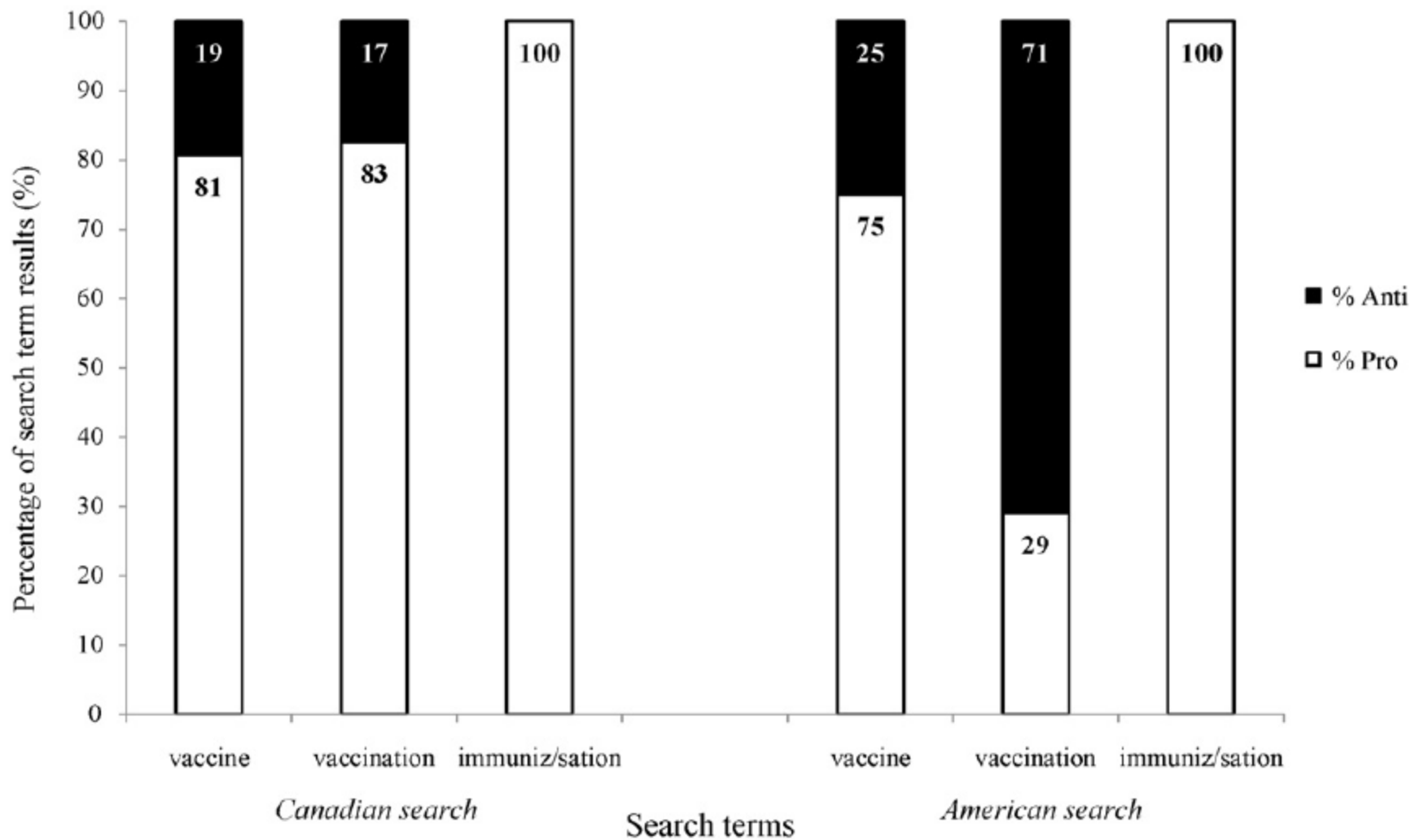


Fig. 1. Proportion of pro- and anti-vaccination websites returned per search term from American and Canadian Google searches.

The Internet - Pandora's Box

National Vaccine Information Center

Vaccine Education Center

Vaccine Safety Website

The Internet - Pandora's Box

The number of anti-vaccination sites is increasing

Often linked together

Fortunately, there are a considerable number of websites with useful, evidence-based information for providers and parents alike

Recent study shows that only 29% of physicians use these resources

Governmental

Center for Biologics Evaluation and Research (CBER), Food and Drug Administration (FDA)

<http://www.fda.gov/CBER>

National Center for Immunization and Respiratory Diseases (NCIRD), Centers for Disease Control and Prevention (CDC)

<http://www.cdc.gov/vaccines>

National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH)

<http://www3.niaid.nih.gov>

National Vaccine Program Office (NVPO)

<http://www.hhs.gov/nvpo>

International

Pan American Health Organization (PAHO)

<http://www.paho.org/english/ad/fch/im/Vaccines.htm>

World Health Organization (WHO)

<http://www.who.int/immunization/en>

Professional

**American Academy of Family Physicians
(AAFP)**

<http://www.aafp.org>

American Academy of Pediatrics (AAP)

<http://www.cispimmunize.org>

**American College Health Association
(ACHA)**

<http://www.acha.org>

American Nurses Association (ANA)

<http://nursingworld.org>

American Pharmacists Association (APhA)

<http://www.pharmacist.com>

**American Public Health Association
(APHA)**

<http://www.apha.org>

**Association for Prevention Teaching and
Research (APTR) (formerly the Association
of Teachers of Preventive Medicine)**

<http://www.atpm.org>

**Infectious Diseases Society of America
(IDSA)**

<http://www.idsociety.org>

Pediatric Infectious Diseases Society (PIDS)

<http://www.pids.org>

Advocacy and Safety Assessment

All Kids Count

<http://www.allkidscount.org>

Allied Vaccine Group

<http://www.vaccine.org>

**Children's Vaccine Program at
PATH**

<http://www.childrensvaccine.org>

Every Child by Two (ECBT)

<http://www.ecbt.org>

**Global Alliance for Vaccines and
Immunization (GAVI)**

<http://www.gavialliance.org>

**Immunization Action Coalition
(IAC)**

<http://www.immunize.org>

**Institute for Vaccine Safety, Johns
Hopkins Bloomberg School of Public
Health**

<http://www.vaccinesafety.edu>

**National Foundation for Infectious
Diseases (NFID)**

<http://www.nfid.org>

Sabin Vaccine Institute (SVI)

<http://www.sabin.org>

For Parents

**Children's Hospital of Philadelphia
Vaccine Education Center**

<http://www.vaccine.chop.edu>

**National Network for Immunization
Information (NNii)**

<http://www.immunizationinfo.org>

**Parents of Kids with Infectious
Diseases (PKID)**

<http://www.pkids.org>

Vaccinate Your Baby

<http://www.vaccinateyourbaby.com>

Voices for Vaccines

<http://www.voicesforvaccines.org>

A Question of Trust

Distrust of big pharma and the government is prevalent

Recent data on practice-based costs of immunization demonstrate that physicians are not motivated by large profits

A trusting relationship with the primary care provider is the single most important element in effective vaccine risk communication

The Science of Vaccine Safety

Epidemiology 101

Descriptive Studies:

Case report – One individual

Case series – Multiple individuals

Interesting, but don't really prove anything

May be useful for generating hypotheses

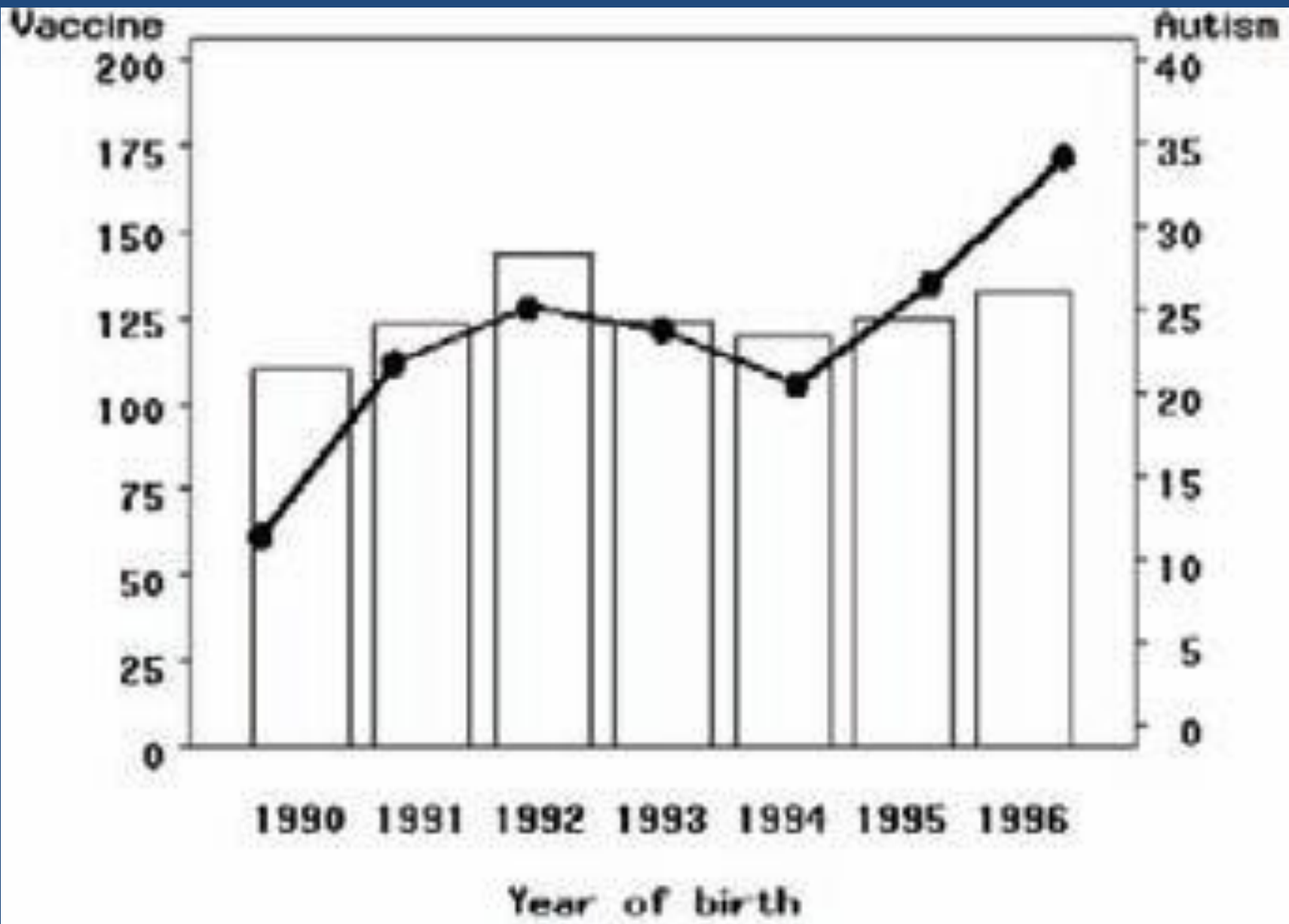
Epidemiology 101

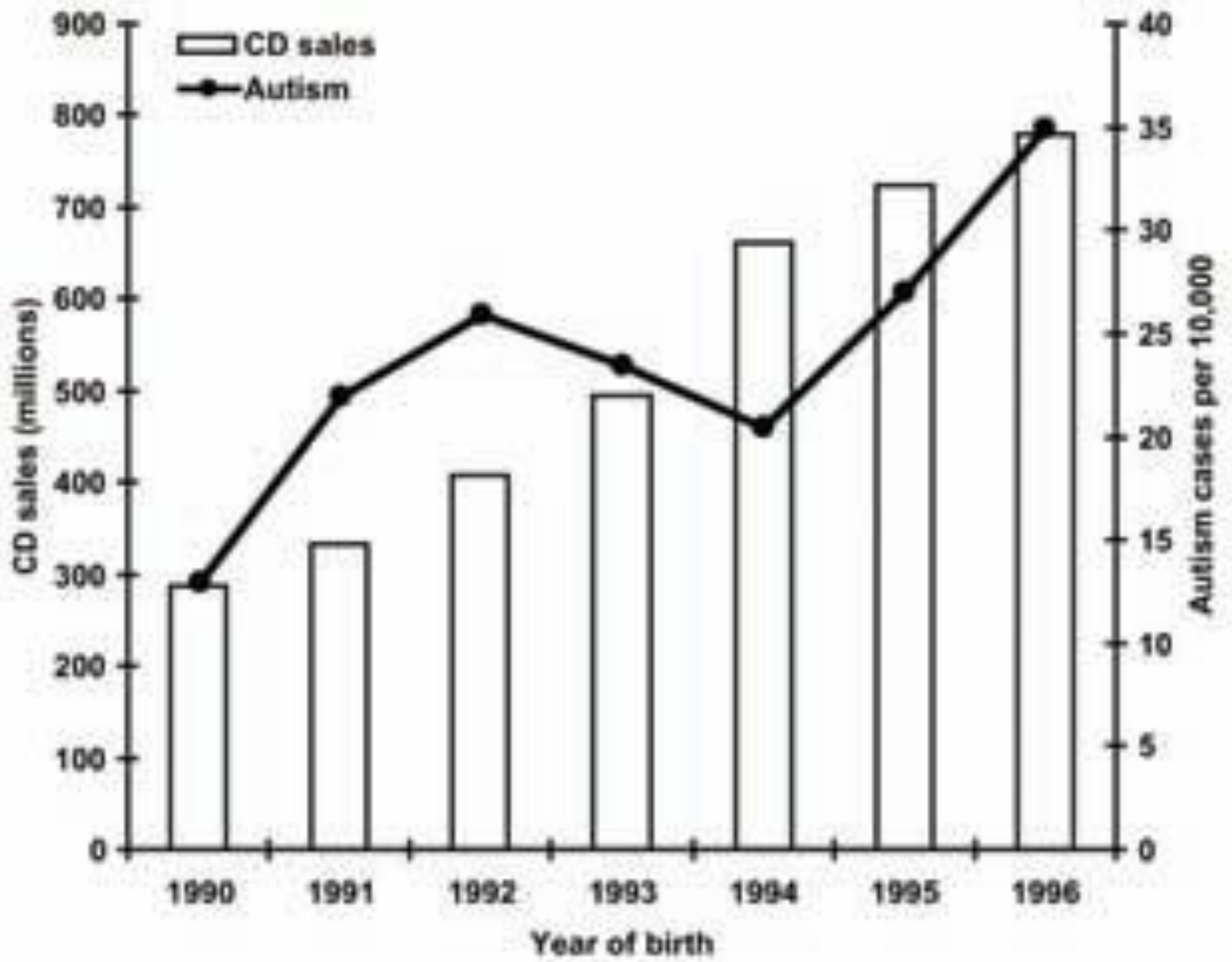
Ecologic studies – Multiple individuals and a population, not individual, exposure of interest

Ecologic fallacy

Useful for generating hypotheses

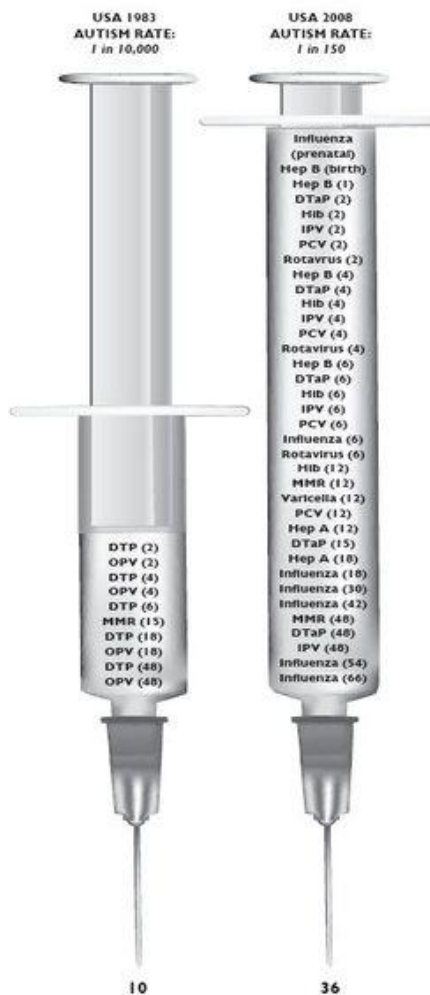
A negative ecologic study may be helpful





ARE WE POISONING OUR KIDS IN THE NAME OF PROTECTING THEIR HEALTH?

COMPARISON OF CDC MANDATORY SCHEDULE
Children birth to six years (recommended month)



Green our vaccines.
And administer them
with greater care.

Mercury. Aluminum. Formaldehyde.

Ether. Antifreeze. Not exactly what you'd expect—or want—to find in your child's vaccinations. Vaccines that are supposed to safeguard their health yet, according to our studies, can also do harm to some children.

The statistics speak for themselves. Since 1983, the number of vaccines the CDC recommends we give to our kids has gone from 10 to 36, a whopping increase of 260%. And, with it, the prevalence of neurological disorders like autism and ADHD has grown exponentially as well.

Just a coincidence? We don't think so. Thousands of parents believe their child's regression into autism was triggered, if not caused, by over-immunization with toxic ingredients and live viruses found in vaccines. The Centers for Disease Control and the American Academy of Pediatrics dispute this but independent research and the first-hand accounts of parents tell a different story.

Why are we giving our children so many more vaccines so early in life?

Why do we only test vaccines individually and never consider the combination risk of vaccines administered together? Given the dramatic rise of autism to epidemic levels, isn't it time for the scientific community to seriously consider the anecdotal evidence of so many parents? We urge the CDC and AAP to help us find the answers to these questions and learn why the increase in the number and composition of so many vaccinations has led to a surge in neurodevelopmental disorders. Our children deserve no less.

GENERATION RESCUE
www.generationrescue.org

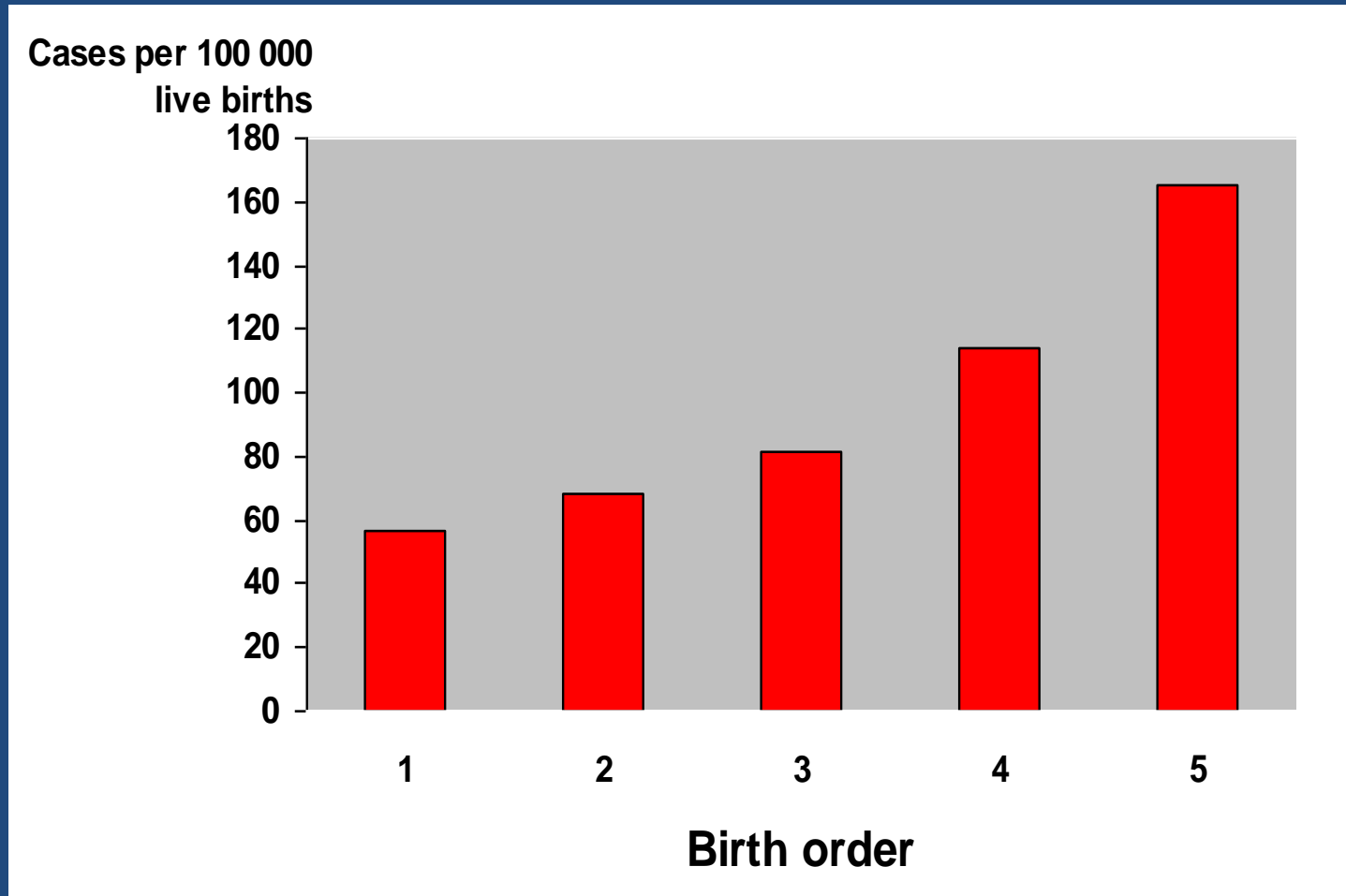
Epidemiology 101

Observational:

Case-control – Start with an outcome of interest and compare exposures between those with the outcome and those without

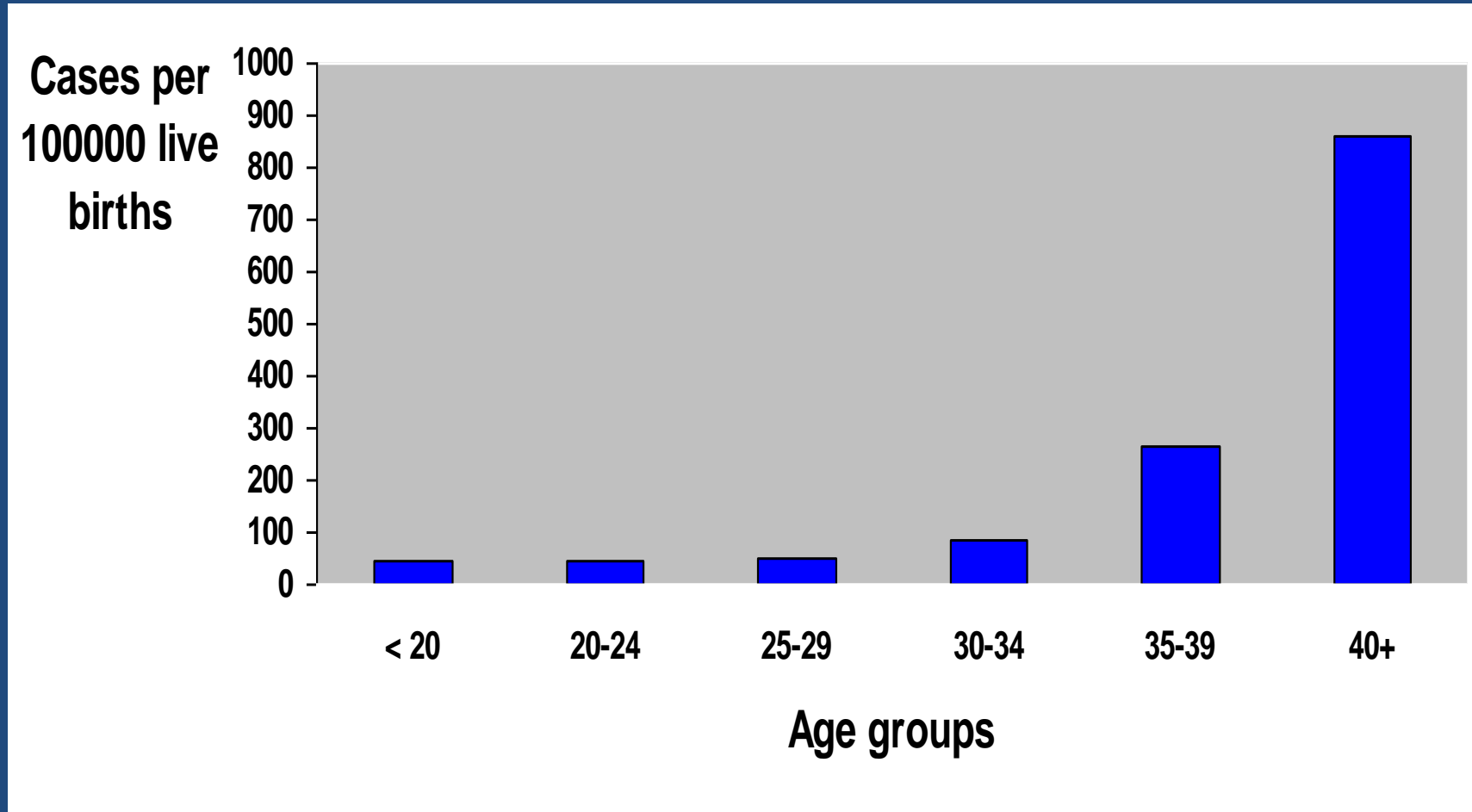
Cohort – Follow a group of individuals over time and compare outcomes between those with a given exposure and those without

Is birth order associated with Down syndrome?



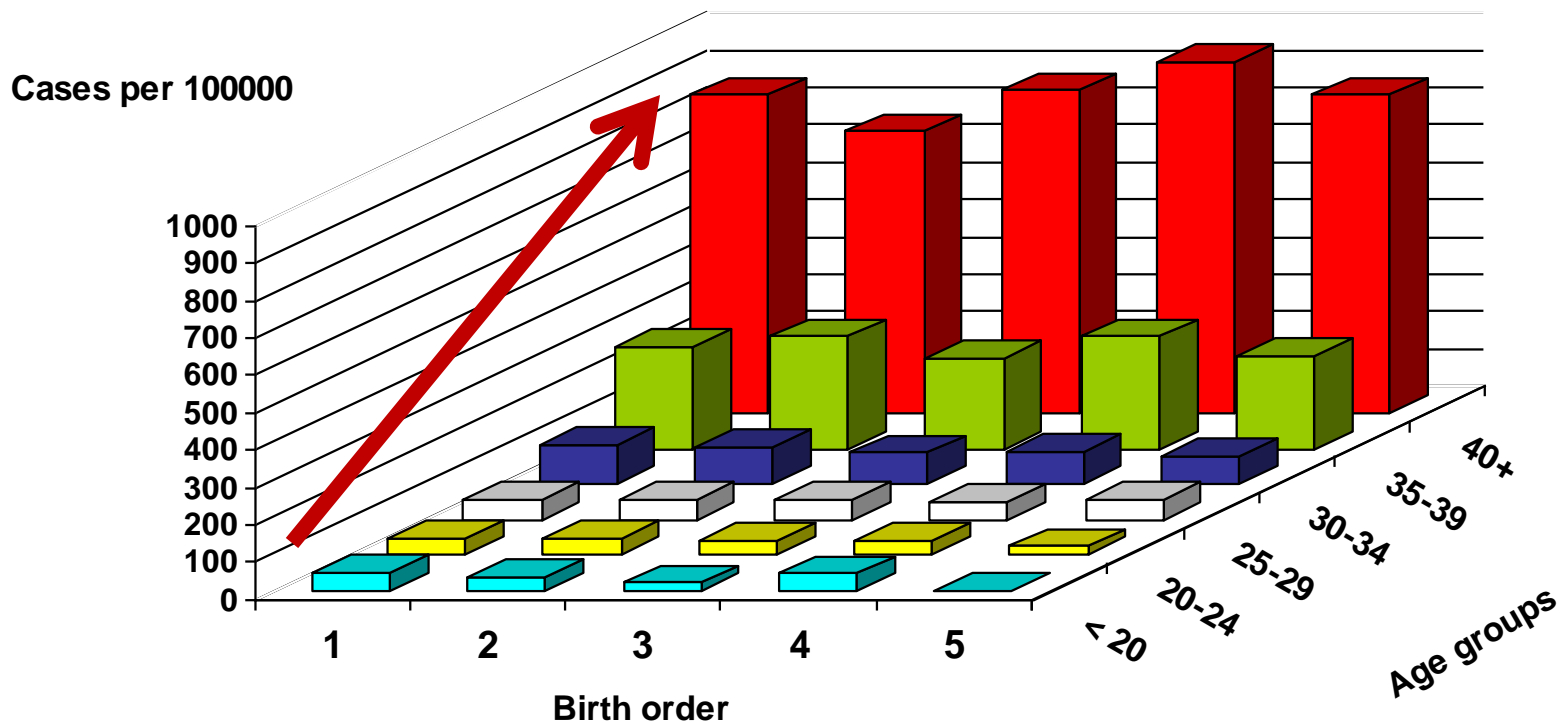
Stark CR, Mantel N. J Natl Cancer Inst. 1966;37:687-98.
Filtered via Rothman 2002; <http://www.dorak.info/epi>

Maternal age is associated with Down syndrome



Stark CR, Mantel N. J Natl Cancer Inst. 1966;37:687-98.
Filtered via Rothman 2002; <http://www.dorak.info/epi>

Birth order is related to maternal age... but not Down syndrome



Stark CR, Mantel N. J Natl Cancer Inst. 1966;37:687-98.
Filtered via Rothman 2002; <http://www.dorak.info/epi>

Epidemiology 101

Experimental:

Randomized control trial – Similar to a cohort study except the exposure of interest is proscribed

Randomization accounts for known and unknown confounders

Considered the highest level of evidence

Randomized trials unethical once a vaccine becomes the standard of care at a given point in time

Pre-licensure Studies

Usually powered for efficacy and common adverse events

May not detect rare adverse events

Notable exceptions are the recently approved rotavirus vaccines, which included 60-70,000 children

The Vaccine Adverse Event Reporting System (VAERS)

Passive post-licensure reporting system, maintained jointly by the Food and Drug Administration (FDA) and the Center for Disease Control (CDC)

Reports may be filed on-line, fax, or via mail

<http://vaers.hhs.gov/>

The Vaccine Adverse Event Reporting System (VAERS)

Strengths:

- National surveillance system

Limitations:

- Temporality versus causation

- Numerator data only

- Reporter bias (and conflict of interest)

Think of VAERS as a case series

The Vaccine Safety Datalink (VSD)

Partnered with eight large managed care organizations (MCO's) and prospectively collects data on millions of individuals each year

Provides a true denominator that may be used to calculate the incidence of adverse reactions after vaccination

Think of the VSD as a cohort study

The Vaccine Safety Datalink (VSD)

Limitations:

- Most children in the United States are vaccinated
- Only includes data on children enrolled in MCO's

BUT . . . VSD remains the most robust system for assessing vaccine safety in the United States

Scientific notion of causation

Coherence with existing information

Time sequence

Specificity

Consistency

Strength of association

National Vaccine Injury Compensation Program (VICP)

Formed in 1986 as part of the National Childhood Vaccine Injury Act

Parents can sue the federal government for compensation for vaccine injuries

“No-fault” system funded by excise taxes

***National Childhood Vaccine Injury Act
Vaccine Injury Table^a***

Vaccine	Adverse Event	Time Interval
I. Tetanus toxoid-containing vaccines (e.g., DTaP, Tdap, DTP-Hib, DT, Td, TT)	A. Anaphylaxis or anaphylactic shock	0-4 hours
	B. Brachial neuritis	2-28 days
	C. Any acute complication or sequela (including death) of above events	Not applicable
II. Pertussis antigen-containing vaccines (e.g., DTaP, Tdap, DTP, P, DTP-Hib)	A. Anaphylaxis or anaphylactic shock	0-4 hours
	B. Encephalopathy (or encephalitis)	0-72 hours
	C. Any acute complication or sequela (including death) of above events	Not applicable
III. Measles, mumps and rubella virus-containing vaccines in any combination (e.g., MMR, MR, M, R)	A. Anaphylaxis or anaphylactic shock	0-4 hours
	B. Encephalopathy (or encephalitis)	5-15 days
	C. Any acute complication or sequela (including death) of above events	Not applicable

<http://www.hrsa.gov/vaccinecompensation/table.htm>

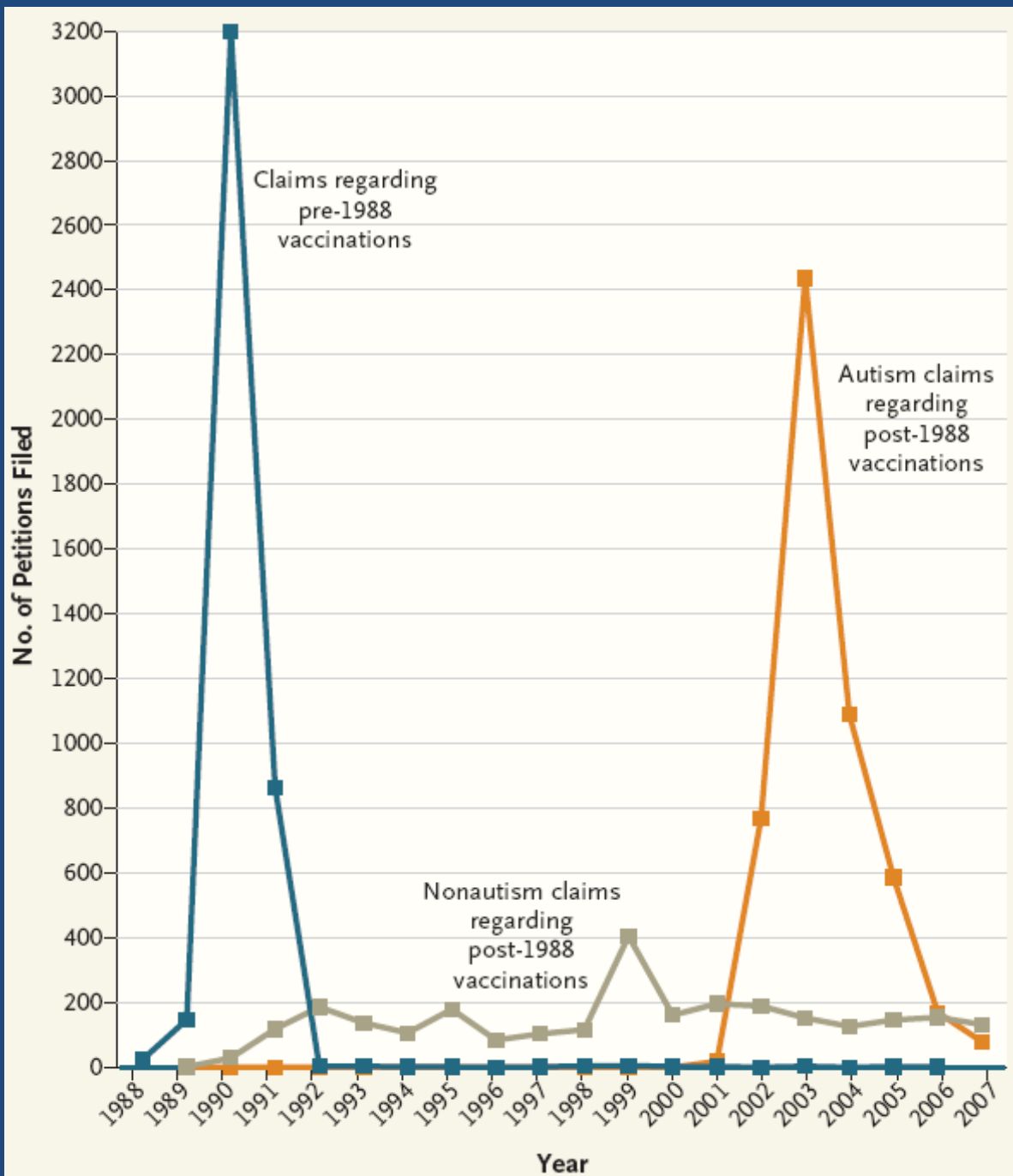
Legal causation

For other injuries, must demonstrate proof of causation or significant aggravation

Not as rigorous as scientific notion of causation

“Preponderance of the evidence,” showing that causation is “more likely than not”

Proof “beyond a reasonable doubt” is not required



Autism Omnibus Proceedings

Nearly 5,000 cases distilled to three theories:

- 1) The combination of thimerosal-containing vaccines and MMR combine to cause autism
- 2) Thimerosal-containing vaccines alone cause autism
- 3) MMR vaccine alone causes autism

Vaccines and Autism

If you caused
**A
6,000%
INCREASE
IN AUTISM**
wouldn't you try to cover it up, too?

**"IT'S TIME FOR THE CDC TO COME CLEAN
WITH THE AMERICAN PUBLIC..."**

- Robert F. Kennedy Jr., March 2, 2008

We believe the Centers for Disease Control (CDC) knows that the ambitious
vaccination schedule begun in the 1980s, nearly tripling the amount of
mercury injected into our children, created an epidemic of autism in America.

We are appalled that mercury remains in children's vaccines and that the
CDC and American Academy of Pediatrics are fighting those laws banning
mercury. Why?

Thousands of children are recovering from autism by having the mercury
removed from their bodies using the Infant Autism Flow Protocol. Yet,
the CDC doesn't investigate these stories of recovery. Why?

We call on our elected officials, journalists, and all Americans to help us
in the fight for recovery, truth, and justice for our children. As long as
the CDC denies that mercury from vaccines is responsible for this epidemic,
proper treatment will never be made widely available to the more than
one million American children who could be treated today.

We salute the many autism organizations and parents at the Mercury
Generation March today in Washington, D.C.

To read more about the controversy and the cover-up, please visit
www.PutChildrenFirst.org. Using the Freedom of Information Act, we
are releasing new documents today revealing the CDC's deception.



IT'S TIME TO PUT OUR CHILDREN FIRST
putchildrenfirst.org



Early report

THE LANCET • Vol 351 • February 28, 1998

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

Findings Onset of behavioural symptoms was associated, by the parents, with measles, mumps, and rubella vaccination in eight of the 12 children, with measles infection in one child, and otitis media in another. All 12 children had intestinal abnormalities, ranging from lymphoid nodular hyperplasia to aphthoid ulceration. Histology showed patchy chronic inflammation in the colon in 11 children and reactive ileal lymphoid hyperplasia in seven, but no granulomas. Behavioural disorders included autism (nine), disintegrative psychosis (one), and possible postviral or vaccinal encephalitis (two). There were no focal neurological abnormalities and MRI and EEG tests were normal. Abnormal laboratory results were significantly raised urinary methylmalonic acid compared with age-matched controls ($p=0.003$), low haemoglobin in four children, and a low serum IgA in four children.

We did not prove an association between measles, mumps, and rubella vaccine and the syndrome described. Virological studies are underway that may help to resolve this issue.

MMR and Autism

Not very convincing data

Conflict of Interest

Results have NEVER been verified

Interpretation retracted by 10 of the original authors in 2004



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

Following the judgment of the UK General Medical Council's Fitness to Practise Panel on Jan 28, 2010, it has become clear that several elements of the 1998 paper by Wakefield et al¹ are incorrect, contrary to the findings of an earlier investigation.² In particular, the claims in the original paper that children were "consecutively referred" and that investigations were "approved" by the local ethics committee have been

proven to be false. Therefore we fully retract this paper from the published record.

The Editors of The Lancet

The Lancet, London NW1 7BY, UK

- 1 Wakefield AJ, Murch SH, Anthony A, et al. Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children. *Lancet* 1998; 351: 637–41.
- 2 Hodgson H. A statement by The Royal Free and University College Medical School and The Royal Free Hampstead NHS Trust. *Lancet* 2004; 363: 824.

Published Online
February 2, 2010
DOI:10.1016/S0140-
6736(10)60175-4

Measles once again endemic in UK

Ecologic Studies

Two studies compared rates of autism before and after the introduction of national programs and found that the prevalence and incidence of autism decreased after the introduction of MMR

Other studies employing time-series approaches found that trends in the number of children diagnosed with autism did not parallel trends in MMR coverage

Madsen et al, 2002

537,303 children born from 1991 to 1998

2,129,864 person-years total

1,647,504 person-years MMR receipt

482,360 person-years no MMR receipt

No significant difference in rates of autism (RR 0.92, 95% CI 0.68 to 1.24) or other autistic-spectrum disorders (RR 0.83, 95% CI 0.65 to 1.07) in children who had received MMR as compared to those who had not

Virologic Study

Hornig et al, 2008

38 children with GI disturbances undergoing colonoscopy (25 with autism, 13 without)

Measles RNA assessed using RT-PCR

One child in each group tested positive

Thimerosal and Autism

FDA Modernization Act of 1997

Data on mercury in vaccines came to light in 1999

EPA guidelines for *methylmercury* but not
ethylmercury

July 1999

Recommendation made that thimerosal be removed from all routine childhood immunizations

AAP – “Parents should not worry about the safety of vaccines. The current levels of thimerosal will not hurt children, but reducing those levels will make safe vaccines even safer.”

Fig 1. Incidence of autism by age and calendar year

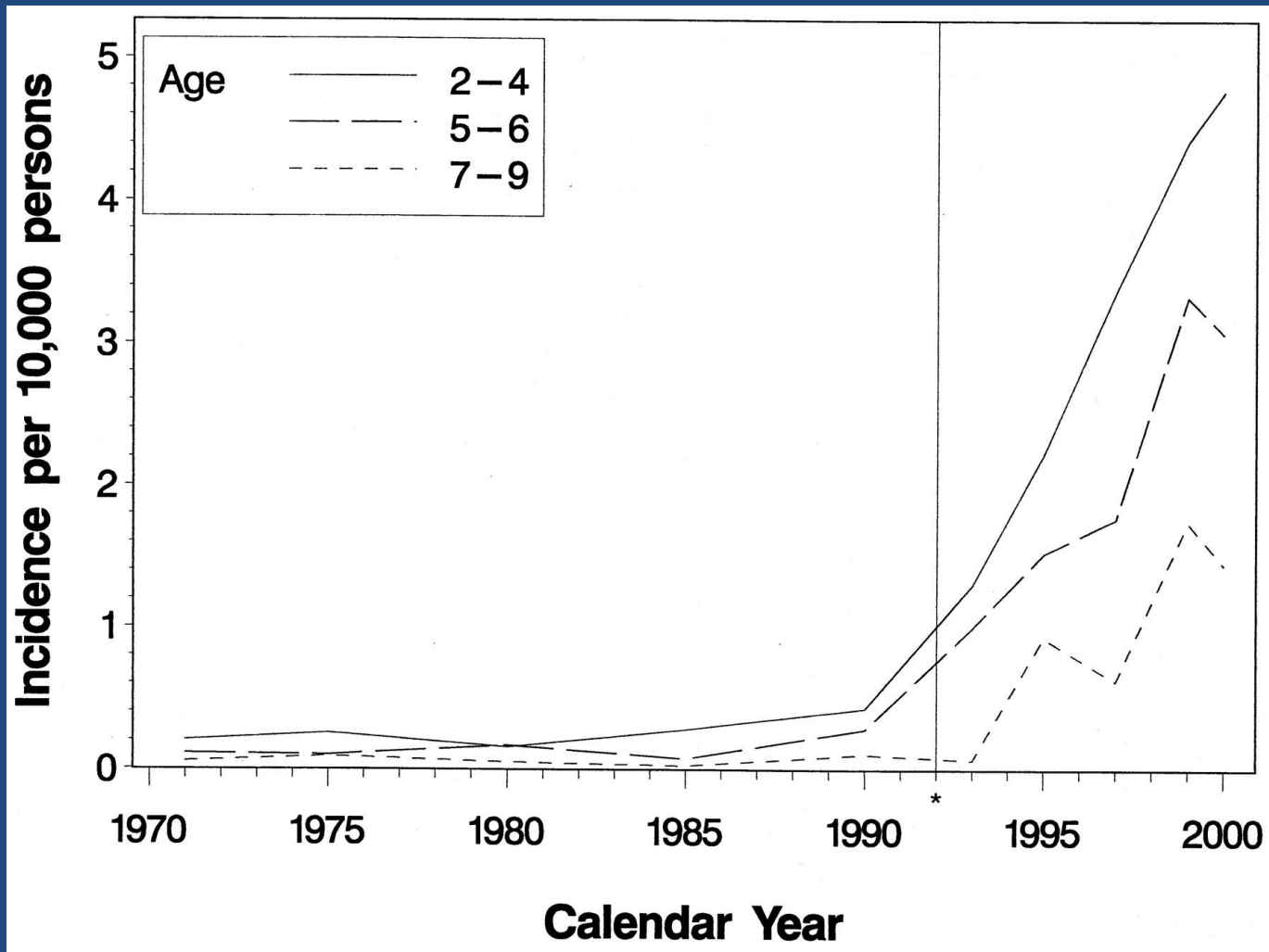
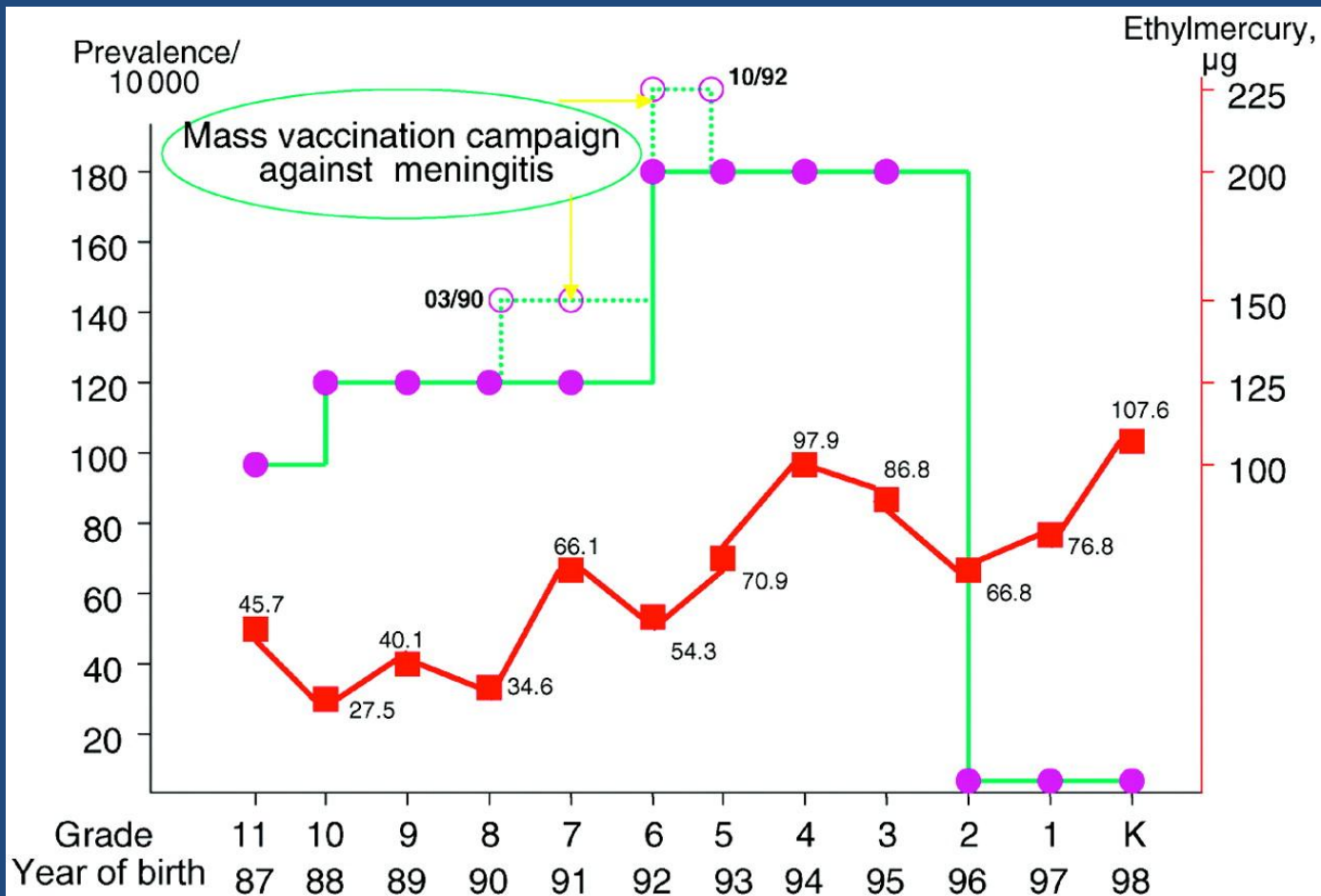


FIGURE 2 Birth cohort prevalence rates and ethylmercury exposure



Fombonne, E. et al. Pediatrics 2006;118:e139-e150

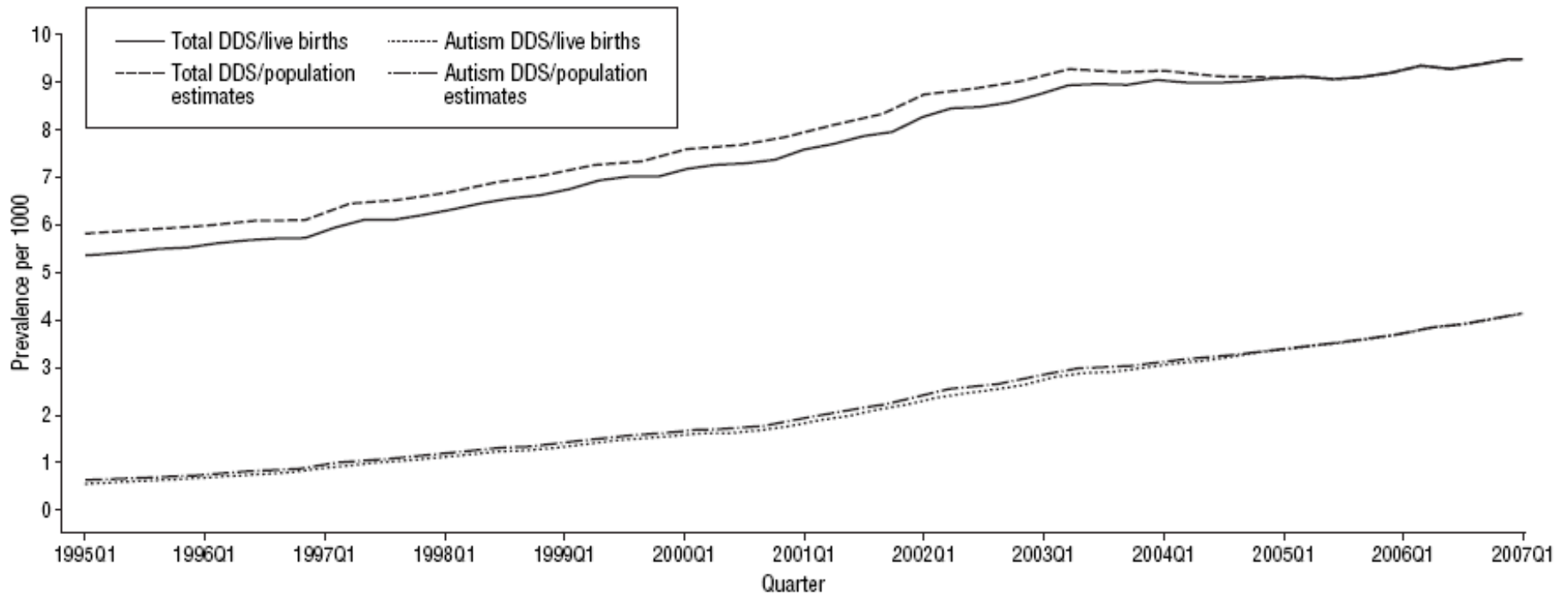


Figure 3. Prevalence of autism and total California Department of Developmental Services (DDS) client enrollment reported by the DDS for children aged 3 to 5 years by reporting quarter (Q), January 1, 1995, through March 31, 2007. Prevalence is estimated by dividing the number of active status children with autism²⁸ by the number of live births in California for each quarterly cohort from 1989 to 2003²⁶ (solid and dotted lines) and the number of children estimated to reside in California for each quarter from 1995 to 2004²⁷ (hashed lines).

VSD studies

- Verstraeten et al, 2004: Cohort study of 124,170 children. Questionable association between thimerosal and tics/language delay but no association with autism or other developmental conditions
- Thompson et al, 2007: Cohort study of 1047 children undergoing in-depth neuropsychological testing
- Price et al, 2010: Case control study of 1000 children found no association between thimerosal and autism

TOO MANY



TOO SOON

Vaccine Ingredients:

mercury, aluminum, antifreeze, formaldehyde,
aborted human fetus cells, chick embryos,
monkey kidney cells, fetal bovine serum, etc.

www.safevaccines.org

Alternative Schedules

Which vaccines to delay?

Either way, increased susceptibility to vaccine-preventable diseases

Increased office visits . . . IF they happen at all

Increased “shot-days” results in increased infant stress and may lead to needle phobia

There is no evidence that delaying vaccinations has any protective effect whatsoever

Smith and Woods, 2010

Reanalysis of data from Thompson et al, with timely vaccination as the exposure of interest

Children were considered up-to-date if all vaccines in the first year of life were received within 30 days of recommended age

Smith and Woods, 2010

In univariate analysis children with timely receipt performed better on 12 of 42 outcomes

After controlling for other factors, timely receipt remained associated with better performance for 2 outcomes

Timely receipt was not associated with poorer performance for any outcome

TABLE 3 Neuropsychological Outcomes Associated With Timely Vaccination in Multivariable Analysis

Outcome	Coefficient	95% CI	<i>P</i>
NEPSY speeded naming test	1.08	0.16–2.00	.022
WISC performance IQ	2.72	0.91–4.52	.003

Both analyses controlled for age, gender, birth weight, poverty status, Home Observation for Measurement of the Environment score, maternal IQ, maternal education, study site, computer experience, presence of siblings, use of English as primary language, duration of breastfeeding, prenatal fish exposure, iron deficiency, use of attention-deficit/hyperactivity disorder (ADHD) stimulants, and cumulative ethyl mercury exposure during the first 7 months of life. Additional covariates in the speeded naming test model include maternal age, participation in home-based child care, history of intrauterine growth restriction, prenatal exposure to nicotine, prenatal exposure to alcohol, prenatal exposure to tuna, prenatal exposure to organic mercury, maternal speech delay, maternal language delay, and maternal ADHD. CI indicates confidence interval; NEPSY, Developmental Neuropsychological Assessment; WISC, Wechsler Intelligence Scale for Children.

Summary

No scientific evidence to suggest that:

MMR vaccine causes autism

Thimerosal in vaccines causes autism

Spacing out vaccines offers any benefit



West Virginians for Vaccination Exemption

No forced vaccinations. Not in America. Not for free Mountaineers.

1. Will herd immunity be compromised in West Virginia because of exemptions?
2. Will our immunized children start catching diseases because of exemptors?
3. Will our immunocompromised children, who cannot be vaccinated for medical reasons, start catching diseases because of exemptors?



West Virginians for Vaccination Exemption

No forced vaccinations. Not in America. Not for free Mountaineers.

4. Will exemptions cause diseases to return and kill people?
4. Isn't public health more important than individual rights?
5. If public health is not at stake, then why pass laws that force people to vaccinate?

PIDS Statement

The personal belief must be sincere and firmly held.

Before a child is granted an exemption, the parents or guardians must receive state-approved counseling that delineates the personal and public health importance of immunization, the scientific basis for safety of vaccines, and the consequences of exemption for their child as well as other children in the community who are vulnerable to disease and cannot otherwise be protected.

Before a child is granted an exemption, the parents or guardians must sign a statement that delineates the basis, strength, and duration of their belief; their understanding of the risks that refusal to immunize has on their child's health and the health of others (including the potential for serious illness or death); and their acknowledgement that they are making the decision not to vaccinate on behalf of their child.

PIDS Statement

Parents and guardians who claim exemptions should be required to revisit the decision annually with a state-approved counselor and should be required to sign a statement each year to renew the exemption.

Children should be barred from school attendance and other group activities if there is an outbreak of a disease that is preventable by a vaccination from which they have been exempted. Parents and guardians who claim exemptions for their children should acknowledge in writing their understanding that this will occur.

States that adopt provisions for personal belief exemptions should track exemption rates and periodically reassess the impact that exemptions may have on disease rates.

Full document available at:

<http://www.pids.org/images/stories/pdf/pids-pbe-statement.pdf>

Thank you !

Questions?