

# A response to some vaccination concerns

(This document is "safe" for printing as any quoted references include a footnote that can later be referenced if this is being read offline.)

A comment-enabled blog-based (Wordpress hosted) version of this can be found at: <http://wp.me/p5GD-2n>

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November 3, 2009

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# Introduction

## Impetus

This article is another of mine that is really not connected with software engineering or programming. Unless you have children you will probably be confused as to why someone would actually care about this stuff at all. If you're like most Americans you're fully vaccinated and don't know why you wouldn't be. Vaccines are a known safe and effective way to prevent some of the past deadly and disfiguring diseases that afflicted mankind. So what's the problem? Well, starting with a now-discredited study published in the Lancet in 1998, people have gotten the notion that vaccines (the study was actually specific to MMR) somehow lead to autism. They don't any more than any other factors. Nobody knows what causes autism.

Then, others followed suit with various unsubstantiated claims about other dangers of vaccines. The worst part is that actors and media pundits (Jenny McCarthy, Jim Carrey, Robert F. Kennedy Jr., great scientists all) have taken up the "cause". Unfortunately people listen to them. Oprah is willing to put them on TV without also showing that the scientific community has continuously disproved their claims. As a result, the herd immunity in some areas of the United States is beginning to drop and these diseases (especially Polio, Mumps, and Measles) are making a slow comeback! If you probe those who oppose vaccinations it will always end up back with the autism claims.

I recently linked to a [Bad Astronomy article "thanking" anti-vaxxers](#) in a tounge-in-cheek sort of way. I actually didn't expect much of a response but it did receive some comments pointing to some studies that potentially showed vaccines to be harmful. It turned out that for the majority of the conversation that ensued I was on the road to Vegas and so was not able to be involved in the majority of the debate. At this time, what appeared to be a large amount of evidence was brought forth. It seemed to me to be in my child's interest to take a look at these and see if there was anything to them. I wanted to address to specific studies and evidence that were brought to my attention. The document is based on the information I found both on the claims and the research which refutes them.

Before I really get started I fully acknowledge that this document will not persuade anybody who is already convinced that vaccines are dangerous and that the CDC, American Association of Pediatrics, the Aspies for Freedom, the majority of doctors and the scientific community at large are in cahoots to censor and hide the "truth" about vaccines.

This document is really intended for those who, like me, believe that the CDC, AAP, FDA and doctors have our best interests at heart and are doing their best to keep track of the latest substantiated research. Based on the comment thread you could have gotten the incorrect impression that there is in fact of scientific controversy about vaccines. There only is if you also consider there to be a controversy about whether or not we landed on the moon or whether or not the Earth is flat. In other words, there are some people who have a strange agenda against vaccines. But they have not in any way presented credible evidence. In the few cases that they even present testable theories, they have been quickly disproven.

This document is so when in the future you hear about these claims you can know that they are either completely untrue or not relevant.

I have made a very concerted effort to address as many of the claims as possible, and have not intentionally ignored any of them. I would be happy to look into any I missed in later

weeks (this current document was done over a weekend as I felt it incredibly important to get out as soon as possible).

## My Worldview

- The Scientific Method is the only surefire way to determine the facts of the natural world
- The scientific community at large applies the SM to the best of its ability, and will discontinue or modify theories if the data and evidence no longer support them
- The SM was used to create the initial and subsequent vaccines
- The SM is continuously used to prove the efficacy and safety of vaccines
- When a testable hypothesis is put forward about potential risks of vaccines, the SM has been used to show that there is not in fact the associated risk
- Therefore, I believe that the all available credible evidence supports the safety of vaccines for the vast majority of people (a doctor can advise on the rare cases when it would not be advisable for that particular child's situation and timing)
- I acknowledge that there *could* come a time in the future when somebody is able to provide some sort of evidence that holds water against vaccines (but I find it unlikely)
- Until the SM method is used to provide conclusive evidence against the safety of vaccines, I will continue to support them
- Due to Herd Immunity, I feel that those who do not vaccinate their children because of misinformation are putting both their own as well as other children at risk who might not also be vaccinated (perhaps cannot afford it or have not reached the age to have the full schedule of vaccinations)
- The News Media has the prime purpose of being entertaining, and should always be taken with a grain of salt when reporting science stories (on either side of the fence). It is for this reason that I have tried my best to avoid linking to news stories but rather to the direct study or association site.
- There is no conspiracy to withhold the truth the dangers of vaccines (rather, the supposed dangers get well publicised along with their scientific rebuttal... assuming they are testable in the first place)
- I don't believe those who are anti-vaccination have any ill intent towards children or in any way intend harm. I just believe they are misinformed and have misplaced their skepticism
- I am a father of one (and hopefully more later)

## Disclaimers

- I have ABSOLUTELY NO training in medicine or anything related to it. I cannot stress this enough.
- I am completely in favor of vaccines and you will need very strong evidence to dissuade me otherwise
- Naturally when looking up this information, I had my own opinions of what was, and wasn't, reputable and skipped over links that seemed to me to be inflammatory, anti-science or, in my opinion, clearly quackery. If your viewpoint on this is different than mine, then you might not have skipped those same articles. In that vein I have done my best to only link to things that most people would agree to be "unbiased" (or at least mostly mainstream). So even if it agreed with me but was just a random blog, it is hardly evidence of anything. My own blog included obviously :) All I can honestly do is point to sources that seem to me to be as balanced as possible.

- Vaccination has become a very emotional issue, and I have my views on the matter. Please do not take my word on any of this. Talk to your doctor and do your own research.

## Methodology

When available, I use primary sources (i.e. the actual studies) to link to and quote from. As much as possible, I don't quote from the news media or even Wikipedia except where I consider the topic to be general enough that any reader would consider it as good a source as any. Finally, in terms of "final analysis", I will quote from the Center for Disease Control (CDC), Food and Drug Administration (FDA), National Institutes of Health (NIH) and American Association of Pediatrics (AAP). Basically, because I cannot fully do my own meta-analysis or evaluation of the full body of science, I leave it to those who I consider to be the experts. *This is where your own worldview is important... if you see any or all of them as being untrustworthy or shills for Big Pharma then naturally my arguments will hold no sway with you.*

I do also provide some of my own commentary and analysis where I feel that I can properly summarize or link various pieces of evidence together. In the same vein as the policy of Wikipedia, I am not trying to do any "original research", but merely to quote from and lead you to primary sources and the positions held there.

In some cases, the claims are disjointed enough or not backed by any primary source, and I have had to piece it together from news sources or other non-scientific sources. In those cases, the entire section (claim and response) most likely does not contribute anything one way or another.

Any time I have used a source other than CDC, FDA, NIH, AAP, etc I have pointed it out, and the reader can use their judgement on the credibility of that source.

You could probably skip this whole article by just going to <http://sciencebasedmedicine.org/reference/vaccines-and-autism/#Key%20Research> which provides a list (with commentary) of all the major studies. However, my focus is specific to the claims that were presented to me.

## The Claims

### **Claim 1: Vaccines cause/lead to disorders on the Autistic spectrum (the route generally claimed to be via Mercury)**

#### **Analysis**

#### **Dr. Wakefield's 1998 Lancet-published study on MMR vaccine and Autism**

In 1998, [The Lancet published a study headed by a Dr. Wakefield](#) which kicked off the most recent scares about the dangers of vaccines. In it, he claimed that the MMR vaccine led to autism in 12 patients<sup>1</sup>. The current consensus is that this study was scientifically unsound, and wrought with conflicts of interest in funding. The editor of the Lancet has since [stated](#)<sup>2</sup>:

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1. <http://www.thelancet.com/journals/lancet/article/PIIS0140673697110960/fulltext>  
2. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC351866/>

There were fatal conflicts of interest in this paper. In my view, if we had known the conflict of interest Dr Wakefield had in this work I think that would have strongly affected the peer reviewers about the credibility of this work and in my judgment it would have been rejected.”

... As the father of a three year old who has had the MMR, I regret hugely the adverse impact this paper has had.” But he added: “Professionally, I don't regret it. The Lancet must raise new ideas.”

Thanks to the UK's [Brian Deer and his investigative journalism into the study](#)<sup>3</sup> (applauded by the British Medical Journal), the actual fraud (including [changing numbers in the actual study](#)<sup>4</sup>) was brought to the attention of the world and scientific community. A reviewer from the mentioned BMJ had to say<sup>5</sup>:

Presenter and journalist Brian Deer seems to have singlehandedly eaten away at the MMR story. His clear and simple presentation of this, his latest chapter—describing an enormous clash and conflict of interest between science, business, huge egos, and the potential to make megabucks—belies the huge and prolonged efforts he has clearly gone to in trying to get to the bottom of the MMR tale of woe.

The Times article that reported on Brian Deer's results led to a lawsuit by Wakefield and his funders, but all funding for that has since been dropped in the face of the lack of scientific credibility of the study<sup>6</sup>.

So before we've even gotten too deep... the study that kicked off the vaccine (specifically, MMR) scare in the first place was simply bad science and for personal gain.

### **Thimerosal**

In the late 90s and early 2000s, the new reasoning was that it must be the mercury in vaccines. This is because a compound known as Thimerosal was used in the majority of vaccines as a preservative. Yes, Thimerosal has "mercury" in it, but it is in a form known as *ethylmercury*, which is completely different from the *methylmercury* used in industrial processes and which all studies on the effects of mercury have been made. No study has found that ethylmercury has the same toxicity (if any) that methylmercury has, in the levels that are in Thimerosal (if it seems strange to you that something could contain any mercury at all and be considered safe... consider the proverbial analogy that Sodium (Na) and Chlorine (Cl) are both very dangerous elements that when combined (NaCl) get you a tasty seasoning in the form of table salt)

None of the published studies were found to be valid or to show enough association to warrant actual concern. Nonetheless, the CDC (rightfully I supposed) and FDA decided to err on the side of caution and immediately recommend that Thimerosal be removed from vaccines given to children. Starting around 1999 and ending in 2001, this was completed

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3. <http://briandeer.com/mmr/lancet-summary.htm>

4. <http://briandeer.com/mmr/lancet-versions.htm> - Note this is part of news reporting and is not itself a scientific article. So read and decide for yourself

5. <http://www.bmj.com/cgi/content/extract/329/7477/1293>

6. [http://www.legalservices.gov.uk/press/press\\_release31.asp](http://www.legalservices.gov.uk/press/press_release31.asp)

(only the [adult flu and Tetanus shots still contain it](#)<sup>7</sup>). Not only have the rates not dropped, in [some cases](#) they have gone up.

The following study was performed on Danish children, but I believe it is still relevant as it looked specifically at the link between Thimerosal and Autism<sup>8</sup>:

A total of 956 children with a male-to-female ratio of 3.5:1 had been diagnosed with autism during the period from 1971–2000. There was no trend toward an increase in the incidence of autism during that period when thimerosal was used in Denmark, up through 1990. From 1991 until 2000 the incidence increased and continued to rise after the removal of thimerosal from vaccines, including increases among children born after the discontinuation of thimerosal.

In [another study done in California between 1995 and 2007](#) by the Department of Developmental Services (therefore covering both times with and without Thimerosal)<sup>9</sup>:

The estimated prevalence of autism for children at each year of age from 3 to 12 years increased throughout the study period. The estimated prevalence of DDS clients aged 3 to 5 years with autism increased for each quarter from January 1995 through March 2007. Since 2004, the absolute increase and the rate of increase in DDS clients aged 3 to 5 years with autism were higher than those in DDS clients of the same ages with any eligible condition including autism.

...

The DDS data do not show any recent decrease in autism in California despite the exclusion of more than trace levels of thimerosal from nearly all childhood vaccines. The DDS data do not support the hypothesis that exposure to thimerosal during childhood is a primary cause of autism.

In other words, as expected, autism continued to be found in children whether or not they received vaccines containing Thimerosal.

Specifically, from [FDA's note on the removal of Thimerosal](#)<sup>10</sup>:

Thimerosal has been removed from or reduced to trace amounts in all vaccines routinely recommended for children 6 years of age and younger, with the

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7. <http://www.fda.gov/biologicsbloodvaccines/safetyavailability/vaccinesafety/ucm096228#t2>

8. <http://pediatrics.aappublications.org/cgi/content/full/112/3/604> Kreesten M. Madsen, MD, Marlene B. Lauritsen, MD, Carsten B. Pedersen, Msc, Poul Thorsen, MD, PhD, Anne-Marie Plesner, MD, PhD, Peter H. Andersen, MD and Preben B. Mortensen, MD, DMSc . Thimerosal and the Occurrence of Autism: Negative Ecological Evidence From Danish Population-Based Data

9. <http://archpsyc.ama-assn.org/cgi/content/full/65/1/19> California study following Autism incidence between 1995 and 2007

10. <http://www.fda.gov/biologicsbloodvaccines/safetyavailability/vaccinesafety/ucm096228>

exception of inactivated influenza vaccine (see [Table 1](#)). A preservative-free version of the inactivated influenza vaccine (contains trace amounts of thimerosal) is available in limited supply at this time for use in infants, children and pregnant women. Some vaccines such as Td, which is indicated for older children ( $\geq 7$  years of age) and adults, are also now available in formulations that are free of thimerosal or contain only trace amounts. Vaccines with trace amounts of thimerosal contain 1 microgram or less of mercury per dose.

So, assuming you agree that my above references and logic are correct, any study "finding" an "association" between the mercury and vaccines and childhood onset of Autism that was performed prior to 2001 are not currently relevant.

### **Specific studies brought up in comment thread**

As part of the discussion thread, it was claimed that a large amount of research had been done on this topic, and a few (of many) references were:

Bernard, S., Enayati, A., Roger, H., Redwood, L., Binstock, T. Autism: A Unique Type of Mercury Poisoning. Condensed draft of June 27, 2000.  
Kanner, L., Autistic Disturbances of Affective Contact. *The Nervous Child* 1942-1943;2: 217-250.  
CDC. Thimerosal in Vaccines: a Joint Statement of the American Academy of Pediatrics and the Public Health Service. *MMRW* 1999;48. 26:563-565.  
CDC. Recommendations Regarding the Use of Vaccines That Contain Thimerosal as a Preservative. *MMWR*, 1999; 48. 43. 996-998.  
Correspondence from Theresa(sic) Binstock to David Satcher, MD, PhD. July 5, 2000.  
Edelson, S.B. Mercury: The Basis Cause of Major Chronic Diseases of the New Millenium, 2000.  
Stajeck(sic), G.V., Lopez, G.P., Sokei, H., Sexson, W. Iatrogenic Exposure to Mercury After Hepatitis B Vaccination in Preterm Infants. *Journal of Pediatrics*, Vol 136, Number 5, May 2000, pp679-681.  
Steuerwald, U., Wibe, P., Jorgensen, P., Bjerve, K., Brock, J., Heinzow, B., Jorgenson, E., Grandjean, P., Maternal Seafood Diet, Methylmercury Exposure, and Neonatal Neurologic Function. *The Journal of Pediatrics*. Vol 136, Number 5, May, 2000, pp 599-605  
Haley, Boyd presentation The toxic effects of oral mercury, Mercury Toxicity Workshop, Dallas, Texas, May 4, 2000.  
Aschner, Michael. Environmental mercury toxicity presentation, Mercury Toxicity Workshop, Dallas, Texas, May 4, 2000.  
Case Studies in Environmental Medicine: Mercury Toxicity, March 1992, U.S. Department of Health and Human Services.

When another commenter in the thread noted that these articles were all older than 9 years (i.e. before Thimerosal was removed), the commenter acknowledged that these articles were old and offered another about Mitochondrial Dysfunction linkages to autism, which I'll discuss in a later section.

However, I would like to continue on these specific sources because other readers may be directed to them in their encounters with those who are against vaccinations.

First, I invite the reader to do a [Google search](#) for "Bernard Kanner Thimerosal Correspondance Edelson Stajeck Steuerwald Haley Aschner" (the last name or major keyword from each "study"). Interesting. The large amount of separate research all seems to correspond exactly to (when I ran it) 3 search results containing the text of "*Autism and Mercury: Testimony Presented By Stephanie Cave, M.D. Before the Committee on Government Reform U.S. House of Representatives July 18, 2000*". 1 of the links is to "[Chelation Therapy](#)" site, of which we'll discuss shortly. The original source for the [actual document seems to be a PDF](#) now hosted on vran.org<sup>11</sup>. If you think it's just a coincidence, please note the misspelling of the last name "Stajeck" (the actual spelling listed in the [referenced article](#) is "Stajich". That reference line by itself (without the "sic") will lead you to the same articles.

### Stephanie Cave's Testimony

This isn't actually a study so much as a speech given before the House of Representatives. Stephanie Cave is herself a family practice doctor, not a published researcher. In her speech she claims that incidence of Autism rose when Thimerosal was introduced in 1970. The current theory is that it is a result of [changes to the method of diagnosing](#) the full spectrum that the incidence seems to rise<sup>12</sup>. She also mentions the Stajeck (sic) study, which should be noted to actually be **only** about pre-term (i.e. premature) babies and so was not actually a study of infants in general. In any case, the gist is that she believes that the mercury is most definitely the cause of the autism and causes all sorts of toxic effects. As discussed in the previous section, there has not in fact been found any association between the ethylmercury in vaccines and autism (made clear when it was removed with no change to the rate). The part I find most interesting:

Our medical training did not adequately prepare us for this challenge. We learned little about testing for heavy metals and even less about treating. The word chelation is not in the vocabulary of most physicians. The few physicians who are treating these children are inundated with them in their practices. The good news is that they are responding well to the chelation treatment. The changes in neurological functioning are remarkable with each day of treatment.

There's that "chelation therapy"<sup>13</sup> again. Is this considered to be a safe and accepted practice for treating children with autism? No. In fact, the "[Aspies for Freedom](#)" (not themselves scientists, but instead an association and forum for people on all parts of the autistic spectrum, so clearly having some vested interest) has this to say about their mission<sup>14</sup> (second emphasis my own):

**\* To oppose physically or mentally harmful "treatments" targeting autistic people.**

Due to the public perception of autism, a large number of unethical treatments have become quite common. These include physically harmful treatments (such

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11. <http://vran.org/legacy/docs/stephanie-cave.pdf> - *Autism and Mercury: Testimony Presented By Stephanie Cave, M.D. Before the Committee on Government Reform U.S. House of Representatives July 18, 2000*

12. <http://www.ncbi.nlm.nih.gov/pubmed/14695031> Jick H, Kaye JA. Epidemiology and possible causes of autism.

13. [http://en.wikipedia.org/wiki/Chelation\\_therapy](http://en.wikipedia.org/wiki/Chelation_therapy) - Wikipedia page on Chelation therapy. Use your judgement on how accurate you believe Wikipedia to be in general.

14. <http://www.aspiesforfreedom.com/> - Aspies for Freedom homepage

as aversive behavioural therapies or restraints), mentally harmful treatments (such as 20-40 hr/week ABA, restriction of non-harmful stimming and other autistic coping mechanisms), **dangerous non-medically approved therapies based on discredited theories or religious beliefs (such as chelation or exorcism)**, and therapies that would be called "torture" if they were used on non-autistic children (such as the electroshock "behavioural" devices).

So I'll leave it to the reader to decide how credible the above testimony is and we'll continue on with some discussion of the actual studies referenced in the article.

*Bernard, S., Enayati, A., Roger, H., Redwood, L., Binstock, T. [Autism: A Unique Type of Mercury Poisoning](#). Condensed draft of June 27, 2000.*

This is was meta-study<sup>15</sup> which the [Institute of Medicine's Immunization Safety Review Committee looked at](#) and after reviewing initially<sup>16</sup>

concluded that the evidence was inadequate to either accept or reject a causal relationship between thimerosal exposure from childhood vaccines and the neurodevelopmental disorders of autism, attention deficit hyperactivity disorder (ADHD), and speech or language delay. Additional studies were needed to establish or reject a causal relationship. The Committee did conclude that the hypothesis that exposure to thimerosal-containing vaccines could be associated with neurodevelopmental disorders was biologically plausible.

They recommended that it was prudent to remove Thimerosal from vaccines. However, in 2004 they issued their final report (same reference as above):

The committee concluded that this body of evidence favors rejection of a causal relationship between thimerosal-containing vaccines and autism, and that hypotheses generated to date concerning a biological mechanism for such causality are theoretical only. Further, the committee stated that the benefits of vaccination are proven and the hypothesis of susceptible populations is presently speculative, and that widespread rejection of vaccines would lead to increases in incidences of serious infectious diseases like measles, whooping cough and Hib bacterial meningitis." In other words, this study did not lead to any consensus that there was a danger (but did indirectly lead to Thimerosal being removed).

Essentially, after much consideration (i.e. not simply pushing it under the rug) the study was found to show a true causal link.

This is not to say Thimerosal was found to be dangerous in the doses given in the vaccines ("Several cases of acute mercury poisoning from thimerosal-containing products were found in the medical literature with total doses of thimerosal ranging from approximately 3 mg/kg to several hundred mg/kg." however the dosage in vaccines is < 0.1

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15. <http://www.autism.com/triggers/vaccine/mercurylong.htm>

16. <http://www.fda.gov/BiologicsBloodVaccines/vaccines/QuestionsaboutVaccines/ucm070430.htm> - FDA summary of IOM reviews

µg/kg/day. In other words, several orders of magnitude less than the amount that any study could find even a remote link to.

[Kanner, L., Autistic Disturbances of Affective Contact. The Nervous Child 1942-1943;2: 217-250.](#)

This is basically the initial study (note the date) on Autism itself. It really has no relevance to a discussion about vaccines (we all know about Autism).

[CDC. Thimerosal in Vaccines: a Joint Statement of the American Academy of Pediatrics and the Public Health Service. MMRW 1999;48. 26:563-565.](#)

Again this, is pre-2001 so does not represent the current state of vaccines. Even so, the actual statement<sup>17</sup>:

PHS and AAP continue to recommend that all children should be immunized against the diseases indicated in the recommended immunization schedule. Given that the risks of not vaccinating children far outweigh the unknown and much smaller risk, if any, of exposure to thimerosal-containing vaccines over the first 6 months of life, clinicians and parents are encouraged to immunize all infants even if the choice of individual vaccine products is limited for any reason"

because (emphasis my own)

there are no data or evidence of any harm caused by the level of exposure that some children may have encountered in following the existing immunization schedule. Infants and children who have received thimerosal-containing vaccines **do not need to be tested for mercury exposure.**

Not exactly an indictment of vaccines I think you'll agree.

[CDC. Recommendations Regarding the Use of Vaccines That Contain Thimerosal as a Preservative. MMWR, 1999; 48. 43. 996-998.](#)

This is actually just the statement that (as the title mentions), recommended that Thimerosal be removed from vaccines as a precaution. I've discussed this above.

[Correspondence from Theresa Binstock to David Satcher, MD, PhD. July 5, 2000.](#)

You'll note this links to an article within the *whale.to* site, which I invite the reader to [visit the initial home page of](#)<sup>18</sup> and decide on the general credibility of. The gist of this one is that the author Teresa Binstock feels that the statement put out by the CDC was inaccurate with regard to Thimerosal and should be fixed. I unfortunately don't have the credentials to decide whether or not it's actually scientifically sound. But given that clearly the CDC did not

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17. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4826a3.htm> - Thimerosal in Vaccines: a Joint Statement of the American Academy of Pediatrics and the Public Health Service

18. <http://www.whale.to> - Home page of "Whale", a clearinghouse site for random bits of pseudoscience and alternate history

agree and autism rates haven't increased, etc, etc my personal opinion is that it does not hold much.

*Edelson, S.B. Mercury: The Basis Cause of Major Chronic Diseases of the New Millenium, 2000*

This is again pre-2001 and so not relevant to the current state of vaccines. Additionally, I challenge to reader/commenter to actually [locate this article](#) (the only result is for the Stephanie Cave link)<sup>19</sup>. The commenter perhaps was given a private copy.

*Stajich, G.V., Lopez, G.P., Sokei, H., Sexson, W. Iatrogenic Exposure to Mercury After Hepatitis B Vaccination in Preterm Infants. Journal of Pediatrics, Vol 136, Number 5, May 2000, pp679-681.*

*(Please note the name correction and that the link is via a site called "generation rescue" which was the only place I could find the full text as requires payment from Journal of Pediatrics for the full text. I have no reason to think that the linked version is different from what was in the journal).*

Firstly, this study is specific to pre-term infants, not children or full-term infants (though they were used as a sort of "control"). It found that levels of mercury were elevated after the Hepatitis B vaccine given shortly after birth. That said, as far as I can personally tell the study seems sound. The real issue with it is that it does not address (and admits so) what levels of mercury represent a risk. The study is really about the relative increase. From the discussion section<sup>20</sup>:

Because we found a statistically significant rise in total mercury levels in these infants after vaccination, we are concerned about the possibility of compounding the neurologic risk for these infants. However, no information is currently available to suggest such a causal link with immunizations. Until thimerosal-free hepatitis B vaccine is universally available, there are few practical alternatives in those situations in which the mother is seropositive for hepatitis B. Further studies are needed to assess the pharmacodynamics of mercury over the first days and weeks of life after hepatitis B immunization.

Basically, the authors had concerns that because pre-term infants were so much smaller, the increase in mercury levels had a **chance** to be cause for worry. The scientific consensus (as mentioned above) as that the levels of mercury that might accumulate over the entire schedule of vaccines was never considered to be of high risk. In any case, this one was specific to pre-Thimerosal-free Hepatitis B vaccines given to pre-natal infants.

While I personally (as a non-scientist) felt the study seemed sound, it was referenced in 2008 in a paper called "[Vaccination Safety Update](#)". In it<sup>21</sup>:

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19. [http://www.google.com/](http://www.google.com/#hl=en&q=%22the+Basis+Cause+of+Major+Chronic+Diseases+of+the+New+Millenium%22&aq=f&aqi=8)

#hl=en&q=%22the+Basis+Cause+of+Major+Chronic+Diseases+of+the+New+Millenium%22&aq=f&aqi=8  
- Google results for Edelson article

20. <http://www.generationrescue.org/pdf/stajich.pdf> - Generation Rescue is an anti-vaccination site, I only link here as it was the only PDF version of the study I could find and I have no reason to believe that it is a modified version.

21. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2680557/?tool=pubmed> - "Vaccinatio Safety Update"

The fear that the brain development in young infants might be damaged by vaccines containing thimerosal was misplaced. Inadmissibly, the ethyl mercury burden was derived from guidelines for methyl mercury

That specific section footnotes to the Stajich article. So you be the judge.

Steuerwald, U., Wibe, P., Jorgensen, P., Bjerve, K., Brock, J., Heinzow, B., Jorgenson, E., Grandjean, P., Maternal Seafood Diet, Methylmercury Exposure, and Neonatal Neurologic Function. The Journal of Pediatrics. Vol 136, Number 5, May, 2000, pp 599-605.

This study is actually about **methyl**mercury, not the **ethyl**mercury that was previously in vaccines. This sounds like an article on the effects of industrial mercury on the body of a fetus when the mother is exposed to the mercury. We know this is bad, and nobody would argue. It was never specifically relevant to the discussion of vaccines, and is especially irrelevant now (note the date, pre-2001).

Haley, Boyd presentation The toxic effects of oral mercury, Mercury Toxicity Workshop, Dallas, Texas, May 4, 2000.

Good luck finding this one, so I can't really evaluate it. Here's the [google search](#) for it. Strange, once again only result is the Stephanie Cave testimony<sup>22</sup>.

Aschner, Michael. Environmental mercury toxicity presentation, Mercury Toxicity Workshop, Dallas, Texas, May 4, 2000.

I challenge the reader to actually locate the said presentation. The only reference to it is in the Stephanie Case document, and I have been unable to locate it. However, as best I can tell Michael Aschner is not a practitioner of pseudoscience and does not appear to ever make claims about vaccines or the *ethyl*mercury that was previously in them. He's a [faculty member at Vanderbilt](#) and these are the titles of the articles he published in 2000 and 2001 with respect to mercury<sup>23</sup>:

[Yao, C P, Allen, J W, Mutkus, L A, Xu, S B, Tan, K H, Aschner, M. Foreign metallothionein-I expression by transient transfection in MT-I and MT-II null astrocytes confers increased protection against acute methylmercury cytotoxicity. Brain Res, 855\(1\), 32-8, 2000.](#)  
[Aschner, M, Yao, C P, Allen, J W, Tan, K H. Methylmercury alters glutamate transport in astrocytes. Neurochem Int, 37\(2-3\), 199-206, 2000.](#)  
[Aschner, M, Allen, J W. Astrocytes in methylmercury, ammonia, methionine sulfoximine and alcohol-induced neurotoxicity. Neurotoxicology, 21\(4\), 573-9, 2000.](#)  
[Aschner, M. Astrocytic swelling, phospholipase A2, glutathione and glutamate: interactions in methylmercury-induced neurotoxicity. Cell Mol Biol \(Noisy-le-grand\), 46\(4\), 843-54, 2000.](#)  
[Shanker, G, Aschner, M. Identification and characterization of uptake systems for cystine and cysteine in cultured astrocytes and neurons: evidence for methylmercury-targeted disruption of astrocyte transport. J Neurosci Res, 66\(5\), 998-1002, 2001.](#)

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22. [http://www.google.com/#hl=en&q="The+toxic+effects+of+of+oral+mercury"+%2Bboyd](http://www.google.com/#hl=en&q=)  
Google search for supposed Boyd presentation

23. [https://medschool.mc.vanderbilt.edu/facultydata/php\\_files/show\\_faculty.php?id3=11717](https://medschool.mc.vanderbilt.edu/facultydata/php_files/show_faculty.php?id3=11717) - Faculty page for Michael Aschner

[Shanker, G, Allen, J W, Mutkus, L A, Aschner, M. Methylmercury inhibits cysteine uptake in cultured primary astrocytes, but not in neurons. Brain Res, 914\(1-2\), 159-65, 2001.](#)  
[Allen, J W, Shanker, G, Aschner, M. Methylmercury inhibits the in vitro uptake of the glutathione precursor, cystine, in astrocytes, but not in neurons. Brain Res, 894\(1\), 131-40, 2001.](#)  
[Allen, J W, Mutkus, L A, Aschner, M. Methylmercury-mediated inhibition of 3H-D-aspartate transport in cultured astrocytes is reversed by the antioxidant catalase. Brain Res, 902\(1\), 92-100, 2001.](#)  
[Allen, J W, Mutkus, L A, Aschner, M. Mercuric chloride, but not methylmercury, inhibits glutamine synthetase activity in primary cultures of cortical astrocytes. Brain Res, 891\(1-2\), 148-57, 2001.](#)  
[Allen, J W, El-Oqayli, H, Aschner, M, Syversen, T, Sonnewald, U. Methylmercury has a selective effect on mitochondria in cultured astrocytes in the presence of \[U-\(13\)C\]glutamate. Brain Res, 908\(2\), 149-54, 2001.](#)

As far as I can tell from the titles he's a mainstream scientist studying the effects of industrial (methyl-)mercury on cells. So this would never have been relevant to the claimed case against Thimerosal and is certainly not relevant now. For all I know, however, he is a card carrying anti-vaxxer, but it does strike me as unlikely.

*Case Studies in Environmental Medicine: Mercury Toxicity, March 1992, U.S. Department of Health and Human Services.*

It sounds like it's about the general toxicity of mercury from the environment (which again we already know is bad, and won't dispute).

### **Summary**

No association between the ethylmercury in vaccines prior to 2001 and autism has been found. The precautionary removal of mercury had no effect on the incidence of Autism.

Of the 10 articles (all strangely linked from a single document) presented as evidence:

1 (meta-study Bernard et al) was found to not have shown any causal link by the CDC.  
1 (Kanner) is a description of Autism from 1943 and certainly not relevant to a case against vaccines.

1 (CDC/AAP joint statement) recommends continued vaccination given that there was little to no known risk outweighed by the risk of the diseases themselves

1 (Binstock correspondance) is not a study (in fact, Binstock was part of the meta-study with Bernard to be found wanting) but an opinion about the CDC/AAP statement.

1 (Stajich) is not a case against vaccines per se, but a reporting of an increase in mercury levels in pre-term infants given Hep B shots. It leaves open whether or not those levels represent a risk (and later studies found the levels to not present a risk)

2 (Steuerwald, Case Studies) are about methylmercury levels in the environment (seafood, etc)... you guessed it... not relevant

2 (Boyd, Aschner) - Cannot be fully evaluated as I cannot locate the supposed presentation. In the case of Aschner, however based on the author's faculty page list of published papers, his studies are about methylmercury and makes not claims about vaccines.

1 (CDC Recommendation) does recommend the precautionary removal of Thimerosal, and so could be argued that it is in favor of the claim against vaccines. But reading the recommendation it is clearly pre-cautionary despite there being found no link between Thimerosal and autism.

So, if we put the CDC recommendation in the case against vaccines... then that's 1/10. But even conceding that, it cancels out as the recommendation is about the removal of Thimerosal, which has been done to no effect.

Quite the mountain of evidence.

## **Claim 2: 600 children died in Mbarara, Uganda following Polio vaccines**

### **Analysis**

The source of this appears to be a transcript of a speech given at the 3rd Conference of the National Vaccine Information Center which was supposedly aired on C-Span (but I cannot find a video of it on the C-Span site, which does have video going back that far).

So I'll have to trust the [transcript](#) from whale.to (I always hesitate to link to this site, but it's the only thing I can find related to this claim)

The relevant quote<sup>24</sup>:

"At the main hospital in Mbarara during that month of 1977 more than 600 children had died following polio vaccination. 600 children," writes Ugandan Kihura Nkuba. "So even some of the timid medical practitioners who were initially afraid to come out, started coming out giving information and saying 'Oh, we knew this oral polio vaccine was trouble because as soon as the child receives it, they get a temperature and their health goes downhill and there is nothing that you could do.'"

*I believe that the "1977" printed here should actually be "1997" as the context around the quote refers to the 1997 National Vaccination Day.*

There was in fact the 3rd Conference from the National Vaccine Information Center in 2002. However, the National Vaccine Center, despite it's title, is not a government or mainstream (bad word I know) scientific institution, but actually an anti-vaccine group. I found it interesting that the [2002 program](#) has the heading "Anecdotal Evidence Shows the Way". Sorry, anecdotes aren't science. So you, the reader, can be the judge of even the general credibility of this group.

On the schedule linked in the above document it shows

2:45 - 3:15 p.m.  
Kihura Nkuba  
"Polio Vaccine Campaigns in Africa"

So I don't see a real reason to doubt that he did indeed speak at the conference.

Regardless, he does not speak about the incident of 600 children from direct knowledge, but rather from what someone told him (so it is second hand) and there is no other record of it

24. <http://www.whale.to/a/nkuba.htm> - Transcript of 3rd Conference of the National Vaccine Information Center (this was the only place I could find an actual reference for this transcript. The actual site is full of conspiracy theories)

that I can find. He also does **not** make any claims that it was some sort of intentional death program (which most of the articles on the Internet linking to it claim). He instead expresses rather that the OPV (Oral Polio Vaccine) which has a live virus but does not require trained nurses to administer was given improperly, and he wished that the IPV (Intravenous Polio Vaccine) which does require a trained nurse but has no live virus would have been used. The controversy is that many of those who were given the oral vaccine were apparently already sick (according to him), which goes against the policy for administration in the US. In fact the [use of OPV was discontinued in the United States in 2000 and in 2004 in the UK, but it continues to be used around the globe](#). The actual [recommendation to discontinue](#) appears to have been made in 1998 by the CDC<sup>25</sup>.

### Summary

In other words... anecdotally, the Oral form of the Polio vaccine may have been improperly administered in 1997 in Mbarara, Uganda. If this did occur, it is sad and possibly criminal if anybody knowingly gave the OPV to previously sick individuals despite policy. Whether or not this is true, it is absolutely irrelevant to the current (or most likely any time) in the United States. So, yes... if you are sick in a developing or third-world country... don't get the oral form of the flu vaccine. Feel free to look up Polio itself to see if it strikes you as a good idea to avoid the vaccine for it (which even Mr. Nikuba does not go as far as to suggest).

### Claim 3: Mitochondrial dysfunction coupled with (the mercury in?) vaccines can lead to Autism, and the CDC is investigating this

#### Analysis

The linked studies:

Daniel A. Rossignol, J. Jeffrey Bradstreet 2008. [Evidence of Mitochondrial Dysfunction in Autism and Implications for Treatment](#). Journal of Child Neurology, Vol. 21, No. 2, 170-172 (2006) DOI: 10.1177/08830738060210021401

[Mitochondrial dysfunction, impaired oxidative-reduction activity, degeneration, and death in human neuronal and fetal cells induced by low-level exposure to thimerosal and other metal compounds](#).. D.A. Gaeier, P.G. King, and M.R. Geier 2008

The first study does not itself have anything to do with vaccine causes of autism with respect to Mitochondrial Dysfunction, but it will be related later.

A portion of the abstract:

However, in many cases of autism, there is evidence of mitochondrial dysfunction (MtD) without the classic features associated with mitochondrial disease. MtD appears to be more common in autism and presents with less severe signs and symptoms. It is not associated with discernable mitochondrial pathology in muscle biopsy specimens despite objective evidence of lowered mitochondrial functioning. Exposure to environmental toxins is the likely etiology for MtD in autism."

Those environmental factors are gone into more detail in the section called "*Possible causes of MtD in Autism*", which does mention rubella and mercury. We can ignore the mercury portion because there is no longer a mercury compound in vaccines along with the previous found lack of association between mercury and autism.

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25. <http://www.cdc.gov/mmwr/preview/mmwrhtml/00055785.htm>

In the second, the main conclusion was:

The results of the present study showed that Thimerosal was able to induce significant mitochondrial dysfunction, reduced cellular oxidative-reduction activity, cell death, and cellular degeneration in a concentration- and time-dependent fashion.

Thimerosal is no longer in vaccines administered to children in the United States (see previous section). So I'll need the current relevance explained. So unless mitochondrial dysfunction has stopped...

And as usual, when available I prefer to link directly to the CDC's [current statement](#) on this:

**Do vaccines cause or worsen mitochondrial diseases?**

As of now, there are no scientific studies that say vaccines cause or worsen mitochondrial diseases. We do know that certain illnesses that can be prevented by vaccines, such as the flu, can trigger the regression that is related to a mitochondrial disease. More research is needed to determine if there are rare cases where underlying mitochondrial disorders are triggered by anything related to vaccines. However, we know that for most children, vaccines are a safe and important way to prevent them from getting life-threatening diseases.

Or if you don't trust the CDC, how about the [American Association of Pediatrics](#)<sup>26</sup> (second emphasis my own):

**WHAT IS MITOCHONDRIAL DISEASE?**

A recent case that was awarded compensation through the federal Vaccine Injury Compensation Program involved a child with a mitochondrial disorder or mitochondrial disease. This case has raised questions about what environmental triggers might bring on or worsen autism-like symptoms in children with such disorders.

- Mitochondria produce the energy needed for cells to function normally. There are a number of genetic disorders that cause mitochondria to produce less energy than cells need. Symptoms of these disorders can be very mild or quite severe. In some of the disorders, symptoms do not develop for many years. Some of the rarer mitochondrial disorders affect the brain and cause worsening neurologic symptoms over time. In many cases, an event that requires more energy, such as an infection, fever or other illness, can lead to the development of symptoms.
- Although details of the case and the decision cannot be disclosed by the U.S. Department of Health and Human Services, the agency published a statement on March 3, 2008, which said: "HRSA (the Health Resources and Services Administration) has reviewed the scientific information concerning the allegation that vaccines cause autism and has found no credible evidence to support the claim."

According to the Centers for Disease Control and Prevention (CDC), this was a

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26. <http://www.aap.org/advocacy/releases/autismparentfacts.htm>

unique case and information about it has not been accurately characterized in the media and other public forums. It represents one special case and does not change the immunization recommendations for children in whom vaccines are otherwise recommended. More information is available at the CDC Web site: [www.cdc.gov](http://www.cdc.gov).

According to the **United Mitochondrial Disease Foundation**, "There are no scientific studies documenting that childhood vaccinations cause mitochondrial diseases or worsen mitochondrial disease symptoms. In the absence of scientific evidence, the UMDF cannot confirm any association between mitochondrial diseases and vaccines.

The case being referring to is that of [Hannah Poling](#), who's parents won in a court case (not a scientific study) that a vaccine led to additional "stress" on a (possibly) pre-existing Mitochondrial Dysfunction. I've linked to the Time article that discusses the case.

[Additional information about the link between Mtd and Autism](#) (but not the link between vaccines and Mtd) (You'll need to *Google for "Mitochondrial Dysfunction May Play a Role in ASD Etiology"* to be able to actually view the article (which is otherwise password protected).

According to Dr. Shoffner, previous recent research has reported that up to 20% of children with autism have hyperlactacidemia and increased ratios of lactate/pyruvate. "When you consider the frequency of autism in the general population, and you take 20% of that as a rough estimate of the proportion of children that may have these biomarkers [of mitochondrial dysfunction], it begins to raise some interesting questions about how to approach diagnosis, mechanism of disease, and patient management in what could turn out to be significant numbers of individuals," said Dr. Shoffner.

I'm actually pretty excited about this research as if we can even begin to show some genetic linkage to autism, we're at least partly there. However, the claim that there is scientifically credible link to vaccines or that the CDC is even actively researching it is simply false.

#### **Sidebar: Mark and David Geier**

But lest you think that the article is simply irrelevant for time-based reasons, I would also like to provide some references as to the credibility of David and Mark Geier (a father and son team).

In a case of a little girl who suffered brain damage allegedly [following administration of a DTP vaccine from Wyeth laboratories](#), Dr. Geier was one of the "expert witnesses" on the side of the plaintiffs. Due to his "expert" testimony on the toxicity levels, the plaintiffs were initially awarded \$15,000,000.

However, it was later found that Dr. Geier had vastly over-estimated the levels of toxins From the [appeal transcript](#) :

In fact, it later appeared that Dr. Geier had erred in his computation of the toxicity of the Wyeth's DTP vaccine. Instead of Wyeth's vaccine having an endotoxin level of 240 micrograms per milliliter, it actually had only a level of 20 micrograms per milliliter. Thus, when Dr. Geier was deposed in a later case

entitled Talley v. Wyeth Laboratories, (case no. 87-349-C, E.D.Okla., Feb. 24, 1988), he testified:

107 Q: Your initial estimate of this Lederle [DTP vaccine] made by Wyeth was that it had 240 micrograms per milliliter, and then on subsequent reflection and further testing, you found that it had tenfold less than that; is that correct?

108 A: That's right, that one looks like an error of--what we call an order of magnitude error, that is when I did the calculation, I must have missed a zero.

109 Q: And a tenfold difference can be pretty significant in terms of your opinion, can't it?A: Sure.

110 (Tr. 468).

111 Dr. Geier, in a number of other depositions, had given substantially identical testimony to the effect that Wyeth's vaccine is not as toxic as he originally thought it was.<sup>25</sup> This testimony substantially undermined the weight of the evidence to which he testified in Graham's case.

Due to this, the [judgement was rightly reversed](#) :

We will affirm the denial of judgment NOV, reverse the denial of the motion for a new trial, and remand to the district court for a new trial on all issues. Additionally, we will reverse the district court's denial of [Wyeth's](#) Fed.R.Civ.Pro. 60(b) motion for post-judgment relief. Inasmuch as we are ordering a new trial on all issues, we assume that the subject matter of [Wyeth's](#) 60(b) motion will find expression during that proceeding.

I hesitate to link to Wikipedia, but [this article](#) is at least worth a look in terms of the Geiers credibility and ethics as scientists<sup>27</sup>.

### Summary

Yes, a link has been found between Mitochondrial Dysfunction and Autism (for potential 20% of cases of Autism). No, vaccines are not the cause. The scientific consensus (again, that's all I can go with as I am not myself a scientist researching these things) is that the Poling case is a very rare one and interesting to study but is absolutely not representative of a reason to discontinue vaccination. The one article that specifically deals with the link with vaccines is no longer relevant (pre-2001) assuming that it was ever good science in the first place.

### Claim 4: The Amish do not vaccinate and have no cases of Autism

*Actually I'm going to directly quote the claim that I received:*

.. don't forget about the study of over 10,000 Amish children who had NO vaccinations, and they found not ONE case of autism. ... And again, scientists cannot even tell us what causes autism, and why it's jumped so astronomically high in the past couple decades (Almost 1 in 100!) .. If even top scientists can't figure out the cause, how do you know with such certainty?"

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27. [http://en.wikipedia.org/wiki/Mark\\_Geier](http://en.wikipedia.org/wiki/Mark_Geier)

So there are 3 claims here:

1. The Amish don't vaccinate
2. The Amish have no cases of autism
3. The normal (non-Amish presumably) rate of Autism has "jumped astronomically" in the past couple decades

### **Analysis**

As far as I can tell, this claim originated with [an article by Dan Olmsted of UPI](#). So first thing to note at this was not a scientific study, but a news story.

Actually, we'll have to look further for the claim about "NO" children with autism<sup>28</sup>:

I have come here to find them, but so far my mission has failed, and the very few I have identified raise some very interesting questions about some widely held views on autism.

...

So far, from sources inside and outside the Amish community, I have identified three Amish residents of Lancaster County who apparently have full-syndrome autism, all of them children.

So, maybe it's from this quote, also from a [Dan Olmsted article](#)<sup>29</sup>:

But thousands of children cared for by Homefirst Health Services in metropolitan Chicago have at least two things in common with thousands of Amish children in rural Lancaster: They have never been vaccinated. And they don't have autism.

Or maybe that's for the claim that they don't vaccinate... ?

Anyhow, first off, [Amish do vaccinate](#).

Unfortunately the directly linked study is only available via abstract, so I will need to take at face value the statistics quoted from it by the [Left Brain/Right Brain site](#)<sup>30</sup>:

Responses were received by 225 (60%) of the 374 Amish households in the community with children aged <15 years. An additional 120 responses were received by households without children. A total of 189 (84%) households with children reported that all of their children had received vaccinations; 28 (12%) reported that some of their children had received vaccinations; and 8 (4%) reported that none of their children had received vaccinations

...

84% of Amish households reported all their kids had received vaccinations. Only

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28. [http://www.upi.com/Science\\_News/2005/04/19/The-Age-of-Autism-The-Amish-anomaly/UPI-95661113911795/](http://www.upi.com/Science_News/2005/04/19/The-Age-of-Autism-The-Amish-anomaly/UPI-95661113911795/)

29. [http://www.upi.com/Health\\_News/2005/12/07/The-Age-of-Autism-A-pretty-big-secret/UPI-68291133982531/](http://www.upi.com/Health_News/2005/12/07/The-Age-of-Autism-A-pretty-big-secret/UPI-68291133982531/)

30. <http://leftbrainrightbrain.co.uk/?p=535> - survey statistics on Amish vaccination rates

4% reported that none of their kids had received vaccinations. Among all respondents who knew their own vaccination status, 281/313 (90%) reported that they had received vaccinations as children.

That's hardly a case of not vaccinating. The "Left Brain/Right Brain" site is run by 2 parents with children on the autism spectrum and a drug reaction specialist, so it seems to be at least reputable.

Ok, so claim #1 is out the water unless anybody can find credible evidence otherwise.

So let's assume that #2 is true, namely that the Amish have a very low incidence of Autism. That would certainly not be a good thing for those who see vaccines as leading to Autism!

But let's address the second part of the claim directly.

Another set of journalists (so presumably just as credible as Dan Olmsted) [called up](#) the Clinic for Special Children of Strasburg.

From Dr. Kevin Strauss, director of the clinic<sup>31</sup>:

Autism isn't a diagnosis - it's a description of behavior. We see autistic behaviors along with seizure disorders or mental retardation or a genetic disorder, where the autism is part of a more complicated clinical spectrum." Fragile X syndrome and Retts is also common among the clinic's patients."

If that doesn't seem relevant, the [CSC](#)<sup>32</sup>

is a non-profit medical and diagnostic service for children with inherited metabolic disorders in Lancaster County, Pennsylvania.

This happens to be the exact area where Olmsted made his claims of there being no Amish with autism. Intriguing. Dan Olmsted makes the claim that because the CSC performs vaccinations that is why they see the cases with autism. You be the judge I suppose.

Additionally, the study "[A study of Old Order Amish children has identified the genetic mutation that causes a previously unknown disorder, with seizures that progress to autism and retardation](#)<sup>33</sup>" was published by Strauss.

So in other words:

1. The Amish do vaccinate
2. The Amish do in fact have cases of autism. The [actual statistic](#) that has been published for the general US population (as of 2000) is closer to 1 in 150 (8 in 1000) or about .67%<sup>34</sup>. The "1 in 100" figure is an [anecdotal claim](#) about an "unpublished" CDC filing<sup>35</sup>. In

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31. <http://combatingautismfromwithin.blogspot.com/2008/01/guess-what-amish-vaccinate.htm> - Blog journalism rebutting Dan Olmsted's claims

32. <http://www.clinicforspecialchildren.org/CSC/Home.htm>

33. <http://www.medpagetoday.com/Neurology/Seizures/2954> - Kevin Strauss study on Old Order Amish

34. <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5601a1.htm> - CDC autism rates

35. <http://vacruth.com/2009/09/27/cdc-quietly-revises-autism-rates-to-1-of-us-children/> - Unsubstantiated claim about raised incidence of Autism

the section in Autism above I also addressed the claim about the rising figures.

The last bit to address is this magic number of "10000". I believe that comes from another [Dan Olmsted \(shocking\) article](#). But even from the title ("Olmsted on Autism: 1 in 10,000 Amish") even Olmsted admits to some Autism (certainly not "NO"). Assuming that article is all factual in it's research, even it admits to a 50% rate of vaccination among the Amish based on Dr. Wiznitzer (apparently a neurologist for the Amish).

So this is about all I can find in terms of a very low incidence of autism in the Amish (which should obviously be looked into) but it's certainly not because they don't vaccinate. I actually hesitated to quote from above given that it's a news story rather than an actual scientific article. However, since Olmsted is the one making the claim in the first place, I admit that it is satisfying to use his own article against the claim.

### **Summary**

I'll admit this one is a bit of "he said, she said" with journalists given conflicting stories about the same apparent situation. However, the only actual *scientific evidence* on the situation finds that the Amish both vaccinate and have disorders on the spectrum of Autism.

As to the last part of the original quote... it is correct that "top scientists" do not know what causes autism. However, they **do** know that it is not mercury in the vaccines, nor has there been any association made between vaccines at all. So you can either choose the much higher risk of your child contracting a horrible illness against the completely disproven chance that your child would develop autism.

## **Claim 4: Pharmaceutical companies lied about the levels of Squalene and Theanine in their vaccines**

### **Squalene**

This is another one where I am unsure what the relevance is, I was not able to even find quack "science" claiming that squalene was bad.

From the World Health Organization (WHO) on [the topic of Squalene](#)<sup>36</sup>:

- \* Squalene is a naturally occurring substance found in plants, animals, and humans. It is manufactured in the liver of every human body and circulates in our bloodstream
- \* Squalene is also found in a variety of foods, cosmetics, over-the-counter medications, and health supplements.
- \* Squalene is commercially extracted from fish oil, and in particular shark liver oil. Squalene used in pharmaceutical products and vaccines is purified from this source.

Continuing from the same page:

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36. [http://www.who.int/vaccine\\_safety/topics/adjuvants/squalene/questions\\_and\\_answers/en/](http://www.who.int/vaccine_safety/topics/adjuvants/squalene/questions_and_answers/en/)

Since 1997, an influenza vaccine (FLUAD, Chiron) which contains about 10 mg of squalene per dose, has been approved in health agencies in several European countries. Squalene is present in the form of an emulsion and is added to make the vaccine more immunogenic.

*I could stop here... as I'm not really intending to address European vaccines when they differ from the US counterpart as my concern is whether children in the schools my kid attends are vaccinated or not and it would also be a completely separate set of research to look into worldwide vaccines.*

Again (emphasis my own):

- \* Twenty two million doses of Chiron's influenza vaccine (FLUAD) have been administered safely since 1997. This vaccine contains about 10mg of squalene per dose. \* No severe adverse events have been associated with the vaccine.
- \* Some mild local reactogenicity has been observed. Clinical studies on squalene-containing vaccines have been done in infants and neonates without evidence of safety concerns.
- \* A few people have **tried to link the health problems of Gulf War veterans to the possible presence of squalene in the vaccines these soldiers received.**
- \* One published report suggested that some veterans who received anthrax vaccines developed anti-squalene antibodies and these antibodies caused disabilities.
- \* It is **now known that squalene was not added to the vaccines administered to these veterans**, and technical deficiencies in the report suggesting an association have been published.

Scary indeed. It's also in [fingerprints](#)<sup>37</sup>.

It has not been found to be dangerous at all, so whether or not they "lied" is not all that relevant. Until a peer-reviewed study can be presented that shows that this is even dangerous, there is no point in continuing here.

## Theanine

Unlike squalene (which at least had people make unsubstantiated claims), I cannot find anything negative on Theanine. In an effort to at least discuss this, I'll link to what I found.

I could really only find things along the lines of this. Apparently it helps make [the Flu vaccine more effective](#)<sup>38</sup>:

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37. <http://www.astm.org/JOURNALS/FORENSIC/PAGES/4093.htm> - chemical composition of fingerprints

38. <http://www.green-tea-health-news.com/flu-vaccine-effectiveness.html> - Theanine in green tea plus flu vaccine

Research has already shown that green tea may help reduce the risk of flu. Now, research has found that theanine, a rare protein found in green tea, combined with cystine (a more common protein) may increase the immune response of some elderly patients after flu vaccination.

I did find some references to L-theanine? In fact, just do your own Google search and try to find anything negative about L-theanine in the first few pages (most quack claims will show up right away)... so I am truly baffled as to what the issue is here (but I am no doubt someone will point it out).

On [L-theanine](#) (actually I think this is the research being referred to above)<sup>39</sup>:

Co-administration of L-cystine and L-theanine before vaccination may enhance the immune response to influenza vaccine in elderly subjects with low serum total protein or hemoglobin.

### Summary

Nothing to see here. I could find no evidence that either of the chemicals is even considered dangerous.

### Claim 5: Viera Scheibner, PhD has done "enlightening" research

#### Analysis

Before we get started... a PhD is impressive but Dr. Scheibner's is not in one of the branches of science in any way related to medicine, epidemiology, childhood illness, etc. It is instead in "[micropalaeontology](#)" [Wikipedia link] ... she was an expert in very old tiny fossils<sup>40</sup>. She has every right to research anything she wants (obviously that's all I'm doing), but her PhD in this case does not make her any more authoritative than me or anyone else.

I invite the reader to peruse her various sites and decide on her credibility:

<http://www.vierascheibner.org/>

<http://www.vierascheibner.com/>

<http://vierascheibner.net/>

From her "[About](#)" page (emphasis mine)<sup>41</sup>:

...her study of baby's breathing patterns and cot death in the mid 1980s clearly pointed to vaccines as being behind the majority of cot deaths

...

Despite extensive research of orthodox medical research published on vaccines over the past 100 years **she could find no scientific evidence that these injections of highly noxious substances prevent diseases, quite the**

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39. <http://www.ingentaconnect.com/content/bsc/ggi/2008/00000008/00000004/art00005>

40. [http://en.wikipedia.org/wiki/Viera\\_Scheibner](http://en.wikipedia.org/wiki/Viera_Scheibner) - Wikipedia article on Viera Scheibner

41. [http://www.vierascheibner.com/index.php?option=com\\_content&view=article&id=50:about-viera&catid=31:general&Itemid=46](http://www.vierascheibner.com/index.php?option=com_content&view=article&id=50:about-viera&catid=31:general&Itemid=46) About page for Viera Scheibner

**contrary, that they increase susceptibility to them, in addition to causing a host of immune disorders and other damage to the body, including the brain.** She was forced to conclude that they represent nothing but a medical assault on the immune system. Having vaccinated her own two daughters when she was a young mother (and also having insisted on receiving a tetanus vaccine herself, not long before her research caused her to study vaccination) this was not easy to come to terms with.

Honestly, I highly doubt that even my commenter believes this nonsense emphasized.

For the first section, I think it seems only necessary to [quote from the American Academy of Pediatrics](#)<sup>42</sup>:

Reports of a possible association between diphtheria-pertussis-tetanus immunizations and SIDS<sup>81,82</sup> brought forth a series of reviews and studies that refuted the association.<sup>83,84</sup> Still, of 100 deaths reported to the federally administered Vaccine Adverse Event Reporting System from 1997 to 1998, approximately half were attributed to SIDS.<sup>85</sup> Recent reports, however, continue to show no association between immunizations and SIDS.<sup>86,87</sup>"

In addition to her views on vaccines, she is also a practitioner of [homeopathic "medicine"](#)<sup>43</sup> (from her site):

..Homeopathic remedies are an electromagnetic imprint of the structure of the substance on the solvent. Correctly administered, they address the individuality of disease conditions and there are no harmful side effects. After taking orthodox medications, people feel miserable, depressed, suicidal, even homicidal, while a few minutes after taking the homeopathic remedy one has a feeling of euphoria. This is particularly instructive with animals; one can hardly claim the placebo effect with animals.

*I actually invite you to read the whole linked page... it's laughably bad.*

Homeopathy has absolutely no scientific or medical value. But this entry is not about that.

On her theories of the misdiagnoses of ["shaken baby" syndrome](#) (i.e. abuse)<sup>44</sup>:

However, nowadays, with an alarmingly increasing frequency, the parents (or at least one of them, usually the father) may be accused of shaking the baby to

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42. <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;116/5/1245#SEC9> AAP note about vaccines and SIDS

43. [http://vierascheibner.org/index.php?option=com\\_content&view=article&id=76:the-hoax-of-modern-medicine-and-its-toxic-medications&catid=52:general-essays-by-viera&Itemid=63](http://vierascheibner.org/index.php?option=com_content&view=article&id=76:the-hoax-of-modern-medicine-and-its-toxic-medications&catid=52:general-essays-by-viera&Itemid=63) "enlightening" Viera Scheibner article on homeopathy and other randomness

44. [http://www.vierascheibner.org/index.php?view=article&catid=42%3Ashaken-baby-syndrome&id=58%3Ashaken-baby-syndrome&option=com\\_content&Itemid=58](http://www.vierascheibner.org/index.php?view=article&catid=42%3Ashaken-baby-syndrome&id=58%3Ashaken-baby-syndrome&option=com_content&Itemid=58) Viera Scheibner's "enlightening" theory about Shaken Baby

death. The accused may even "confess" to shaking the baby, giving the reason, for example, that having found the baby lying still and not breathing an/or with a glazed look in its eyes, they shook it gently-as is only natural-in their attempt to revive it. Sometimes, ironically, they save the baby's life, only to be accused of causing the internal injuries that made the baby stop breathing in the first place, and which in fact were already present when they shook the baby to revive it.

No matter what the parents say or do, everything is construed against them. If they are crying and emotional, they will be accused of showing signs of guilt. If they manage to remain composed and unemotional, they will be called calculating and controlling-and guilty because of that.

In another scenario the distraught parents try to describe the symptoms to an attending doctor in hospital or a surgery but are totally at a loss to understand what has happened to their baby. To their shock and dismay, they later discover that while they were describing the observed symptoms, the doctor or another staff member was writing three ominous words in the medical record: shaken baby syndrome.

Many of these parents end up indicted and even sentenced to prison for a crime that somebody else committed. Some of these cases have been resolved by acquittal on appeal or have been won based on expert reports demonstrating vaccines as the cause of the observed injuries or death. However, only God and a good lawyer can help those parents or care-givers who happen to be uneducated, or have a criminal record, particularly for violence, or have a previous history of a similar "unexplained" death of a baby in their care, or, worse still, a vaccine-injured baby with a broken arm or fractured skull. More and more often, the unfortunate parents are given the option of a "deal": if they confess and/or plead guilty, they will get only a couple of years in prison; but if they don't, they may end up getting 20 years.

So... a parent/nanny who has a previous history of violence or unexplained death gets to blame the vaccine on the strange coincidence of another child dying?

All I can say about this (as others would) is to think critically about the claim that a vaccine shot would over some period of time cause a child's body to completely beat itself up (broken bones, bruises, etc) without the parents noticing. It is much more likely that the child was abused. There is no actual scientific study showing an association between vaccines and "shaking baby syndrome". It is instead, as best I can tell, an unfounded theory of Veria Scheibner.

She makes claims that she is an "[accepted expert witness for injuries caused by vaccines](#)"<sup>45</sup>. I challenge the reader to discover what any of the cases were or the outcome of them.

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45. <http://www.vierascheibner.com/> - Refer to "About" section for claim about expert testimony

At first I was unsure how to specifically debunk her, but I think she mostly debunks herself for any reader who desires to peruse her site and "studies". Because her claims are so unscientific and unsubstantiated. It is difficult to directly address the scientific credibility of her studies because she operates so far outside of the mainstream as to not be referenced or even refuted by other scientists.

### Summary

Viera Scheibner holds absolutely not scientific credibility in the area of vaccination research or childhood disorders.

### Claim 6: D B M Hall and C J Bacon have published a "plethora" of work linking vaccines and SIDS

The claim:

There is a plethora of work by C J Bacon and D B M Hall that outline studies between vaccinations and SIDS

### Analysis

I challenge the reader to locate these studies, C J Bacon does in fact study SIDS (and D B M Hall co-authored one paper with him), but they certainly are not related to vaccines (not even tangentially).

<http://scholar.google.com/>

[scholar?hl=en&q=sids+author%3A%22cj+bacon%22+&btnG=Search&as\\_ylo=&as\\_vis=0](http://scholar.google.com/scholar?hl=en&q=sids+author%3A%22cj+bacon%22+&btnG=Search&as_ylo=&as_vis=0)

<http://scholar.google.com/>

[scholar?hl=en&q=sids+author%3A%22dbm+hall%22+&btnG=Search&as\\_ylo=&as\\_vis=0](http://scholar.google.com/scholar?hl=en&q=sids+author%3A%22dbm+hall%22+&btnG=Search&as_ylo=&as_vis=0)

How about just D B M hall by himself:

<http://www.google.com/search?hl=en&q=%22d+b+m+hall%22+vaccine> (6 results at the time I did the search)

The first result almost looks promising, but it's just a page that happens to contain the study by Bacon and Hall on the same page that mentions vaccines.

Here are a couple of Google searches you can use to try to find these claimed studies linking them to vaccines:

<http://www.google.com/>

[search?hl=en&as\\_q=vaccine+sids&as\\_epq=&as\\_oq=%22c+j+bacon%22+%22d+b+m+hall%22](http://www.google.com/search?hl=en&as_q=vaccine+sids&as_epq=&as_oq=%22c+j+bacon%22+%22d+b+m+hall%22)

So I am uncertain as to why this was brought up as evidence, but I would certainly be willing to take a look at any studies by either of them that show this supposed linkage. Refer to the response to the previous claim as to the AAPs stance on vaccines and SIDS.

The studies:

C J Bacon, D B M Hall, T J Stephenson, M J Campbell. [How common is sudden infant death syndrome?](#)

Abstract<sup>46</sup>:

Recurrence of sudden infant death syndrome (SIDS) is rare but may give rise to confusion and controversy because of the differential diagnoses of familial disease or covert homicide. We examine eight studies of recurrent SIDS published in English since 1970. These studies reported relative risks of recurrence, as compared with the population or with controls, ranging from 1.7 to 10.1. We assess the validity of the studies by three main criteria: accuracy of ascertainment, adequacy of investigation and matching of controls. We found that all the studies failed to meet these criteria, and we think that their flaws would have resulted mainly in overestimation of recurrence risk. We conclude that, although an increase in risk is probable on theoretical grounds, this risk cannot be quantified from the available evidence. We suggest that professionals should be cautious in their pronouncements on the chances of recurrence, and that parents who have lost a baby to SIDS can, with the exception of particularly vulnerable families, be reassured that the risk of recurrence is small.

S Levene, C J Bacon. [Sudden unexpected death and covert homicide in infancy.](#) Abstract<sup>47</sup>:

It is impossible to be certain, but it is estimated that each year in England and Wales there may be about 30–40 infant deaths from covert homicide, which represents about 10% of the current annual total of sudden unexpected deaths in infancy. This paper reviews the features that have been suggested as possible indicators of covert homicide, describes the difficulties in its identification and the need for better evidence, and emphasises the importance of thorough medical investigation of all sudden infant deaths.

S R Limerick, C J Bacon. [Terminology used by pathologists in reporting on sudden infant deaths](#) Results<sup>48</sup>:

Replies were received from 63 pathologists who carry out necropsies after sudden infant deaths. There was a pronounced variation in their use of the terms "sudden infant death syndrome" and "unascertained", with the last term being applied not only when there were apparently suspicious features but also in various other circumstances. Opinions were divided as to whether the term "sudden infant death syndrome" still serves a useful purpose. Deaths that had occurred while bed sharing were categorised in several different ways. Many pathologists commented on the inadequacy of the history available to them at the time of their report.

C J Bacon. [Cot death after CESDI](#) (*note: I had to go through a free registration to view the full article*)

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46. <http://adc.bmj.com/cgi/content/abstract/93/4/323?rss=1> - C J Bacon. How common is sudden infant death syndrome?

47. <http://www.fetalneonatal.com/cgi/content/abstract/89/5/443> - S Levene, C J Bacon. Sudden unexpected death and covert homicide in infancy

48. <http://jcp.bmj.com/cgi/content/abstract/57/3/309> - S R Limerick, C J Bacon. Terminology used by pathologists in reporting on sudden infant deaths

From the Introduction<sup>49</sup>:

The three year study of sudden unexpected death in infancy (SUDI), recently completed as part of the programme of the Confidential Enquiry into Stillbirths and Deaths in Infancy (CESDI), includes the largest and most comprehensive study of cot death yet conducted in the UK. Over 450 sudden deaths, of which 80% were classified as sudden infant death syndrome (SIDS) were investigated in five (former) NHS regions between 1993 and 1996, both by confidential inquiry and by case-control technique. Outline results for the first two years were given in the third report of the National Advisory Body for CESDI while more detailed reports on various aspects of the case-control study are being published in professional journals. The national intervention on sleeping position in 1991 was followed by a marked and most welcome fall in the incidence of cot death, the national rate declining from 1.61/1000 live births in 1990 to 0.6 in 1993. However SIDS is still the largest category of deaths in the postperinatal period, and the SUDI study has shown that several major problems remain to be addressed. Some of these I should like to discuss.

C J Bacon. [The case of Sally Clark](#) (an article in The Journal of the Royal Society of Medicine).

From the text<sup>50</sup>:

Since the large majority of SUDI, probably about 90%, arise from natural causes, a paediatric pathologist is the more logical initial choice. Early identification of a natural cause will spare the family from unjustified suspicion and the police from unnecessary work. If suspicious features are encountered, a forensic colleague can be invited to participate. Ideally a SUDI pathologist should have both paediatric and forensic qualifications, but very few have such dual training. Currently there is a serious national shortage of paediatric pathologists. Coroners may therefore have to refer SUDI cases to centres at some distance, accepting the delay in the interests of more expert assessment. If, however a non-specialist is selected, at the least it should be someone with an interest and experience in paediatric pathology.

C J Bacon, S M Hall. [Haemorrhagic shock encephalopathy syndrome in the British Isles](#). 1992. Archives of Diseases in Childhood.

Abstract (emphasis my own)<sup>51</sup>:

The aetiopathogenesis of haemorrhagic shock encephalopathy syndrome (HSES) remains unclear and after concern that a novel environmental agent was the cause, the British Paediatric Association and the Public Health Laboratory Service Communicable Disease Surveillance Centre in 1983 initiated surveillance of this condition in the British Isles. After 1986 cases were

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49. <http://adc.bmj.com/cgi/content/full/76/2/171> - C J Bacon. Cot death after CESDI

50. <http://jrsm.rsmjournals.com/cgi/content/full/96/3/105> - C J Bacon. The case of Sally Clark

51. <http://adc.bmj.com/cgi/content/abstract/67/8/985> - C J Bacon, S M Hall. Haemorrhagic shock encephalopathy syndrome in the British Isles. 1992. Archives of Diseases in Childhood.

ascertained via the British Paediatric Surveillance Unit 'active' reporting scheme; this report presents the findings for 1985-8. Sixty five patients were reported, of whom 52 satisfied the criteria for inclusion. Of those whose outcome was known, 24 (46%) died, 18 had severe neurological damage, and six survived apparently intact. Epidemiological features of note were: the median age of 15 weeks (range 3-140); statistically significant clustering of admission times suggesting a peak onset period at night; lack of geographic clusters, of secular trends and, except for a slight excess in winter months, of seasonality. Clinical and pathological features followed a highly consistent pattern, suggesting that HSES is an individual clinical entity distinguishable from conditions with similar presentations, such as septicaemia and Reye's syndrome. **There was no microbiological or epidemiological evidence to support the emergence of a novel environmental agent.** Many of the features of HSES were, however, the same as those described in heat stroke and we suggest that the two conditions are the same even though there is usually no history of overt overheating.

C J Bacon, S A Bell, E E Clulow, A B Beattie. [How mothers keep their babies warm](#). 1991.

Details of room temperature, clothing, and bedding used by night and by day and in winter and in summer were recorded for 649 babies aged 8 to 26 weeks. Room temperature at night was significantly related to outside temperature and duration of heating. Total insulation was significantly related to outside temperature and to minimum room temperature, but there was wide variation in insulation at the same room temperature. High levels of insulation for a given room temperature were found particularly at night and in winter, and were associated with the use of thick or doubled duvets and with swaddling. At least half the babies threw off some or all of their bedding at night, and at least a quarter sweated. Younger mothers and mothers in the lower social groups put more bedclothes over their babies, and the latter also kept their rooms warmer. Many mothers kept their babies warmer during infections.

Heartbreaking, but not related to vaccines.

### **Summary**

Based on the available research, there is no correlation between vaccines and SIDS. Additionally, there appears to be nothing to the claim that C J Bacon has attempted to make this correlation.

## **Claim 7: It took a long time for people to accept Copernicus, therefore anti-vaccinations claims should be taken seriously**

### **Analysis**

This is a common and misleading tactic of the anti-vaccination movement (it's actually got a logical fallacy devoted to it: [The Appeal to Pity](#) or the [Galileo Gambit/Argument](#)) .

Example<sup>52</sup>:

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52. <http://www.don-lindsay-archive.org/skeptic/arguments.html#pity> - Appeal to Pity

For example, "Scientists scoffed at Copernicus and Galileo; they laughed at Edison, Tesla and Marconi; they won't give my ideas a fair hearing either. But time will be the judge. I can wait; I am patient; sooner or later science will be forced to admit that all matter is built, not of atoms, but of tiny capsules of TIME."

Another example<sup>53</sup>:

The **Galileo fallacy** is the idea that if you are widely vilified for your ideas, you must therefore be right.

*They made fun of Galileo, and he was right. They make fun of me, therefore I am right.*

In "[reality](#)", in order to wear the mantle of [Galileo](#), not only must one be scorned by the establishment, but one *must be correct*.

Or as [Carl Sagan](#) put it;

*But the fact that some geniuses were laughed at does not imply that all who are laughed at are geniuses. They laughed at Columbus, they laughed at Fulton, they laughed at the Wright brothers. But they also laughed at Bozo the Clown.*

Another formal quote, apparently attributed to Robert L. Park states:

*It is not enough to wear the mantle of Galileo: that you be persecuted by an unkind establishment. You must also be right.*

No doubt your response might be, "but that doesn't make the theories *wrong* either!". And you'd be right. The point is that what happened to Copernicus (or Galileo or Columbus) bears no relevance whatsoever on the truth of any claims. The only thing that matters is whether or not they are based on good science and that when tested, they **turn out to be true**. In all cases, when those with an anti-vaccination agenda actually create a testable theory, the science doesn't hold up and they **turn out to be wrong**.

## Conclusion

As far as I am concerned, the evidence and studies presented here do not represent a viable claim against the safety of vaccines. I would also hope they serve as a warning of the *type* of "evidence" that is often found to be wanting here. For whatever reason, many people do not like vaccines and many others make a lot of money on books and "alternative medicine" for those who have been led to believe that vaccines are bad for their children. As always, extraordinary claims demand extraordinary evidence. Anecdotal, word-of-mouth "studies" do not for science make. To those who claim that those of us who "trust the scientists about vaccines", I hope that I have demonstrated that I *do* look at the science. A "mountain" of unsupported evidence does not in any way add up to even a molehill of actual evidence.

I realize most people will think I wasted my time putting this together, but I think it is important to not let those against vaccines (or really, followers of any brand of pseudoscience) attempt to use what appear to be volumes of data to silence critics.

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53. [http://rationalwiki.com/wiki/Galileo\\_fallacy](http://rationalwiki.com/wiki/Galileo_fallacy)

In the same way that I will not be cowering in fear when somebody claims that the sun won't come up tomorrow... I won't be stopping the vaccination of my kids until conclusive (or even any) evidence showing that vaccines are a) dangerous b) more dangerous than the disease they intend to prevent. And, speaking personally, I firmly believe you are not only placing your own children, but any other children who are not vaccinated, at risk.

--Joshua DeWald  
November 3, 2009  
<http://quay.wordpress.com>

## Appendix I: Further References

If you're interested in the ongoing battle against the pseudoscience of the anti-vaccination campaign I highly recommend:

Science-Based Medicine - <http://www.sciencebasedmedicine.org/> (a great blog written by actual doctors and scientists)

*After the writing of the majority of this I discovered that they have a sub-site summarising the available research on various topics:*

I'll be following with interest:

<http://sciencebasedmedicine.org/reference/category/vaccines/>  
<http://sciencebasedmedicine.org/reference/vaccines-and-autism/>

Phil Plait's "Bad Astronomy" blog - <http://blogs.discovermagazine.com/badastronomy/> (hosted by Discovery online, written by a really entertaining and well-informed astronomer)

Brian Dunning's Skeptoid - <http://skeptoid.com/> Brian produces some of the most amazingly researched, but concise, podcasts and articles delving into topics of pseudoscience and urban myth. Specifically, he has commented on vaccines, autism and chelation therapy (<http://skeptoid.com/episodes/4055>)

## Appendix II: Who Cares?

I initially had no plans to include any explicit "pro" vaccine information, as it seemed obvious to me. However, if there is even a chance that a single reader is seeing this and thinking "ok, so the vaccines aren't dangerous, but still why should I actually have my child vaccinated? Does it really matter that much?" then I think it important to show just why.

### Why do we even care about all these diseases since nobody gets them?

Well, people would start getting them again (more detail below). In fact, there has been a rise in Measles in both the US and UK, most likely as a result of the MMR scare. The [CDC has a great page](#) describing in more detail the incidence of these disease, and would happen if we stop vaccinating. Unless otherwise noted, my descriptions on numbers will be from that page<sup>54</sup>.

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54. <http://www.cdc.gov/vaccines/vac-gen/whatifstop.htm> CDC page describing incidence of diseases that we vaccinate for and what could happen if we stop

I've pasted largish sections below so that they can be referred directly.

## **Were the diseases really that bad, can't we just stop vaccinating now?**

From the CDC's recommended [vaccination schedule](#)<sup>55</sup>, the diseases are:

### **Hepatitis B**

[CDC Overview Seriousness](#)<sup>56</sup>:

Chronic hepatitis B is a serious disease that can result in long-term health problems, including liver damage, liver failure, liver cancer, or even death. Approximately 2,000–4,000 people die every year from hepatitis B-related liver disease.

So that's even after vaccinations.  
How have the vaccinations helped (CDC "whatifstop" page):

The number of new infections per year has declined from an average of 450,000 in the 1980s to about 80,000 in 1999. The greatest decline has occurred among children and adolescents due to routine hepatitis B vaccination.

### **Rotavirus**

[Seriousness](#)<sup>57</sup>:

Rotavirus is the leading cause of severe acute gastroenteritis (vomiting and diarrhea) among children worldwide.

Vaccine results:

The rotavirus vaccine currently licensed in the United States, Rotateq, has shown to be quite effective against rotavirus disease. This vaccine will prevent 74 percent of all rotavirus cases, about 98 percent of severe cases, and about 96 percent of hospitalizations due to rotavirus.

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55. <http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm#printable>

56. <http://www.cdc.gov/hepatitis/B/bFAQ.htm#bFAQ15> CDC FAQ on Hep B

57. <http://www.cdc.gov/vaccines/vpd-vac/rotavirus/default.htm>

## Diphtheria

Seriousness:

**Diphtheria is a serious disease caused by a bacterium. This germ produces a poisonous substance or toxin which frequently causes heart and nerve problems.** The case fatality rate is 5 percent to 10 percent, with higher case-fatality rates (up to 20 percent) in the very young and the elderly.

Vaccination results and risks if stopped:

In the 1920's, diphtheria was a major cause of illness and death for children in the U.S. In 1921, a total of 206,000 cases and 15,520 deaths were reported. With vaccine development in 1923, new cases of diphtheria began to fall in the U.S., until in 2001 only two cases were reported.

...

Although diphtheria is rare in the U.S., it is still a threat. Diphtheria is common in other parts of the world and with the increase in international travel, **diphtheria and other infectious diseases are only a plane ride away.** If we stopped immunization, the U.S. might experience a situation similar to the Newly Independent States of the former Soviet Union. With the breakdown of the public health services in this area, diphtheria epidemics began in 1990, fueled primarily by persons who were not properly vaccinated. From 1990-1999, more than 150,000 cases and 5,000 deaths were reported.

## Tetanus (Lockjaw)

Seriousness:

**Tetanus is a severe, often fatal disease.** The bacteria that cause tetanus are widely distributed in soil and street dust, are found in the waste of many animals, and are very resistant to heat and germ-killing cleaners. From 1922-1926, there were an estimated 1,314 cases of tetanus per year in the U.S.

...

People who get tetanus suffer from stiffness and spasms of the muscles. The larynx (throat) can close causing breathing and eating difficulties, muscles spasms can cause fractures (breaks) of the spine and long bones, and some people go into a coma, and die. **Approximately 20 percent of reported cases end in death.**

Vaccination results and risks if stopped:

In the late 1940's, the tetanus vaccine was introduced, and tetanus became a disease that was officially counted and tracked by public health officials. In

2000, only 41 cases of tetanus were reported in the U.S.

**Worldwide**, tetanus in newborn infants continues to be a huge problem. Every year **tetanus kills 300,000 newborns and 30,000 birth mothers who were not properly vaccinated**. Even though the number of reported cases is low, an increased number of tetanus cases in younger persons has been observed recently in the U.S. among intravenous drug users, particularly heroin users.

Tetanus is infectious, but not contagious, so unlike other vaccine-preventable diseases, immunization by members of the community will not protect others from the disease. Because tetanus bacteria are widespread in the environment, tetanus can only be prevented by immunization.

### **Pertussis (Whooping Cough)**

Seriousness/description (from "whatifstop" page):

**Pertussis can be a severe illness**, resulting in prolonged coughing spells that can last for many weeks. These spells can make it difficult for a child to eat, drink, and breathe. Because vomiting often occurs after a coughing spell, infants may lose weight and become dehydrated. In infants, **it can also cause pneumonia and lead to brain damage, seizures, and mental retardation**.

Vaccination results and risk (emphasis in original):

Before pertussis immunizations were available, nearly all children developed whooping cough. In the U.S., prior to pertussis immunization, between 150,000 and 260,000 cases of pertussis were reported each year, with up to 9,000 pertussis-related deaths.

...

During the 1970s, widespread concerns about the safety of the older pertussis vaccine led to a rapid fall in immunization levels in the United Kingdom. More than 100,000 cases and 36 deaths due to pertussis were reported during an epidemic in the mid 1970s. In Japan, pertussis vaccination coverage fell from 80 percent in 1974 to 20 percent in 1979. An epidemic occurred in 1979, resulted in more than 13,000 cases and 41 deaths.

...

Pertussis cases occur throughout the world. If we stopped pertussis immunizations in the U.S., we would experience a massive resurgence of pertussis disease. **A recent study\* found that, in eight countries where immunization coverage was reduced, incidence rates of pertussis surged to 10 to 100 times the rates in countries where vaccination rates were sustained**.

## Haemophilus influenzae type b (Hib)

Vaccination results and risk (emphasis in original):

**Hib meningitis once killed 600 children each year and left many survivors with deafness, seizures, or mental retardation.**

**Since introduction of conjugate Hib vaccine in December 1987, the incidence of Hib has declined by 98 percent.** From 1994-1998, fewer than 10 fatal cases of invasive Hib disease were reported each year.

This preventable disease was a common, devastating illness as recently as 1990; now, most pediatricians just finishing training have never seen a case. If we were to stop immunization, we would likely soon return to the pre-vaccine numbers of invasive Hib disease cases and deaths.

## Pneumococcus

Vaccination results and risk:

Before pneumococcal conjugate vaccine became available for children, pneumococcus caused 63,000 cases of invasive pneumococcal disease and 6,100 deaths in the U.S. each year. Many children who developed pneumococcal meningitis also developed long-term complications such as deafness or seizures. Since the vaccine was introduced, the incidence of invasive pneumococcal disease in children has been reduced by 75%. Pneumococcal conjugate vaccine also reduces spread of pneumococcus from children to adults. In 2003 alone, there were 30,000 fewer cases of invasive pneumococcal disease caused by strains included in the vaccine, including 20,000 fewer cases in children and adults too old to receive the vaccine. If we were to stop immunization, we would likely soon return to the pre-vaccine numbers of invasive pneumococcal disease cases and deaths.

## Polio

Seriousness:

Polio virus causes acute paralysis that can lead to permanent physical disability and even death. Before polio vaccine was available, 13,000 to 20,000 cases of paralytic polio were reported each year in the United States. These annual epidemics of polio often left thousands of victims--mostly children--in braces, crutches, wheelchairs, and iron lungs. The effects were life-long.

Vaccination results and risk if vaccination efforts stopped:

In 1988 the World Health Assembly unanimously agreed to eradicate polio worldwide. As a result of global polio eradication efforts, the number of cases reported globally has decreased from more than 350,000 cases in 125 countries in 1988 to 2,000 cases of polio in 17 countries in 2006, and only four countries remain endemic (Afghanistan, India, Nigeria, Pakistan). To date polio has been eliminated from the Western hemisphere, and the European and Western Pacific regions. Stopping vaccination before eradication is achieved would result in a resurgence of the disease in the United States and worldwide.

## Influenza ("the Flu")

[Seriousness](#)<sup>58</sup>:

Influenza (the flu) is a contagious respiratory illness caused by [influenza viruses](#). It can cause mild to severe illness, and at times can lead to death. The best way to prevent seasonal flu is by getting a seasonal flu vaccination each year. Each year in the United States on average, 5% to 20% of the population gets the flu; on average, more than 200,000 people are hospitalized from flu-related complications, and; about 36,000 people die from flu-related causes. Some people, such as older people, young children, and people with certain health conditions, are at high risk for serious flu complications.

The CDC has an [informative page about the misconceptions](#) about the risks of the flu vaccine<sup>59</sup>.

## Measles

Vaccination results and risks (emphasis in original):

As many as three of every 1,000 persons with measles will die in the U.S. In the developing world, the rate is much higher, with death occurring in about one of every 100 persons with measles.

Measles is one of the most infectious diseases in the world and is frequently imported into the U.S. In the period 1997-2000, most cases were associated with international visitors or U.S. residents who were exposed to the measles virus while traveling abroad. More than 90 percent of people who are not immune will get measles if they are exposed to the virus.

According to the World Health Organization (WHO), nearly 900,000 measles-related deaths occurred among persons in developing countries in 1999. In populations that are not immune to measles, measles spreads rapidly. If

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58. <http://www.cdc.gov/flu/about/disease/>

59. <http://www.cdc.gov/flu/about/qa/misconceptions.htm>

vaccinations were stopped, each year about 2.7 million measles deaths worldwide could be expected.

## Mumps

Seriousness:

**Before the mumps vaccine was introduced, mumps was a major cause of deafness in children**, occurring in approximately 1 in 20,000 reported cases. Mumps is usually a mild viral disease. However, rare conditions such as swelling of the brain, nerves and spinal cord can lead to serious side effects such as paralysis, seizures, and fluid in the brain.

Vaccination results and risk if stopped:

An estimated 212,000 cases of mumps occurred in the U.S. in 1964. After vaccine licensure in 1967, reports of mumps decreased rapidly. In 1986 and 1987, there was a resurgence of mumps with 12,848 cases reported in 1987. Since 1989, the incidence of mumps has declined, with 266 reported cases in 2001. This recent decrease is probably due to the fact that children have received a second dose of mumps vaccine (part of the two-dose schedule for measles, mumps, rubella or MMR) and the eventual development of immunity in those who did not gain protection after the first mumps vaccination.

We can not let our guard down against mumps. A 2006 outbreak among college students, most of whom had received two doses of vaccine, led to over 5500 cases in 15 states. Mumps is highly communicable and it only takes a few unvaccinated to initiate transmission.

## Rubella (German Measles)

Seriousness (from "whatifnow" page") (emphasis in original):

While rubella is usually mild in children and adults, up to 90 percent of infants born to mothers infected with rubella during the first trimester of pregnancy will develop **congenital rubella syndrome (CRS), resulting in heart defects, cataracts, mental retardation, and deafness.**

Vaccination results and risks:

In 1964-1965, before rubella immunization was used routinely in the U.S., there was an epidemic of rubella that resulted in an estimated 20,000 infants born with CRS, with 2,100 neonatal deaths and 11,250 miscarriages. Of the 20,000 infants born with CRS, 11,600 were deaf, 3,580 were blind, and 1,800

were mentally retarded.

Due to the widespread use of rubella vaccine, only six CRS cases were provisionally reported in the U.S. in 2000. Because many developing countries do not include rubella in the childhood immunization schedule, many of these cases occurred in foreign-born adults. Since 1996, greater than 50 percent of the reported rubella cases have been among adults. Since 1999, there have been 40 pregnant women infected with rubella.

If we stopped rubella immunization, immunity to rubella would decline and rubella would once again return, resulting in pregnant women becoming infected with rubella and then giving birth to infants with CRS.

## Varicella (Chicken Pox)

Seriousness (from "whatifnow" page)

Each year, the virus caused an estimated 4 million cases of chickenpox, 11,000 hospitalizations, and 100-150 deaths.

...

**A highly contagious disease, chickenpox is usually mild but can be severe in some persons.** Infants, adolescents and adults, pregnant women, and immunocompromised persons are at particular risk for serious complications including secondary bacterial infections, loss of fluids (dehydration), pneumonia, and central nervous system involvement. The availability of the chickenpox vaccine and its subsequent widespread use has had a major impact on reducing cases of chickenpox and related morbidity, hospitalizations, and deaths. In some areas, cases have decreased as much as 90% over prevaccination numbers.

Vaccination results and risks:

**Prior to the licensing of the chickenpox vaccine in 1995, almost all persons in the United States had suffered from chickenpox by adulthood.**

In 2006, routine two-dose vaccination against chickenpox was recommended for all children, adolescents, and adults who do not have evidence of immunity to the disease. In addition to further reducing cases, this strategy will also decrease the risk for exposure to the virus for persons who are unable to be vaccinated because of illness or other conditions and who may develop severe disease. If vaccination against chickenpox were to stop, the disease would eventually return to prevaccination rates, with virtually all susceptible persons becoming infected with the virus at some point in their lives.

## Hepatitis A

(This one seems to be less serious than many of the others)

[Seriousness](#)<sup>60</sup>:

A disease of the liver caused by hepatitis A virus

..

Because young children might not have symptoms, the disease is often not recognized until the child's caregiver becomes ill with hepatitis Anze

Finally (for blog/comment-enabled version):

To any commenters (what few of you there might be), please refrain from personal attacks of me or any other commenters. Let's discuss the merits of individual ideas, not the people who have them. As I hinted above, this is a very emotional issue and NOBODY on any side is intending harm. Also, if you have evidence in favor of your views (or against mine), please include actual links to the studies or articles in as reputable or mainstream a place as possible. If you believe the media is "censoring" the truth, then feel free to link to other sources. However, I don't really desire to become a forum for having a meta-argument about the accuracy of news reporting. If you can resist linking to sites within (<http://www.whale.to>) that would be great. To my readers out there who aren't conspiracy theorists, you can go there and see how "reputable" (yay, "Auschwitz Hoax", "Death Towers", "Mind Control", etc) and hilarious the site is. In many cases, the only "evidence" I could find for most of the claims was from that site.

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60. <http://www.cdc.gov/vaccines/vpd-vac/hepa/in-short-adult.htm>