

# Science-Based Medicine

Exploring issues & controversies in science & medicine

## **The So-Called Vaccine Debate, False Balance in the Mass Media, and the Risk to Public Health: Terry Roark’s Opinion Piece in the *San Diego Union-Tribune* (Oct 5, 2017) , “Exemptions should be option for parents”**

**by Joel A. Harrison, PhD, MPH**

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*The San Diego Union-Tribune* (UT) recently published two opinion pieces on vaccine mandates, responding to California Senate Bill 277 which removed the “personal belief” exemption to vaccine requirements for children entering into day care, elementary or secondary schools. The bill was passed by the California Legislature in 2015:

Mark Sawyer (2017 Oct 5). Immunizations stop infectious outbreaks. San Diego Union-Tribune, page B21-22.

Terry Roark (2017 Oct 5). Exemptions should be option for parents. San Diego Union-Tribune, page B21-22.

Mark Sawyer, MD is a professor of clinical pediatrics in the Division of Infectious Diseases in the UCSD Medical School. Terry Roark is the advocacy director in California for the nonprofit National Vaccine Information Center.

Each piece was given equal length, giving the impression that each side represented a legitimate position, creating a false balance. In all fairness, the UT has posted articles and editorials on other occasions that clearly supported vaccines and the science behind them, e.g., “In a win for science and for student safety, school vaccination rates are the highest they have been in California in at least 15 years” (The San Diego Union-Tribune Editorial Board, 2017). I am using *The San Diego Union-Tribune*, not to single it out; but as an example of how the mass media often creates a false balance which in this case endangers public health.

The problem is that people often have short term memories, may not have read the previous pro-vaccine articles in the UT, or, seeing two articles, were influenced more by the one than the other. Research has found that once people form opinions, they seldom change them, i.e., “most

people, when directly confronted by evidence that they are wrong, do not change their point of view or course of action but justify it even more tenaciously” (Tavris, 2007, p. 2). What’s more, additional research, often called the Dunning-Kruger effect, has shown that in some situations, many “people fail to adequately assess their level of competence — or specifically, their *incompetence . . . robbing them of the ability to critically analyse their performance [opinions].”* ([RationalWiki, Dunning-Kruger Effect](#))

As will be shown in this paper, the article by Terry Roark is full of inaccuracies, falsehoods, and misrepresentations, cultivating readers to form an opinion that is invalid. Like Roark, the vast majority of antivaccinationists lack the basic understanding of the science underlying vaccines, view the world as all or none, subscribe to paranoid conspiracy theories, and their certainty of the rightness of their opinion clearly reflects both the research discussed in Tavris (2007) and the Dunning-Kruger effect.

## **What is False Balance?**

Balanced reporting is generally considered good journalism, and balance does have its virtues. The public should be able to get information on all sides of an issue—but that doesn’t mean that all sides of the issue deserve equal weight. Science works by carefully examining the evidence supporting different hypotheses and building on those that have the most support. Journalism and policies that falsely grant all viewpoints the same scientific legitimacy effectively undo one of the main aims of science: to weigh the evidence. ([Understanding Science, 2013](#)).

When the evidence is clear-cut, the assumption that good journalism requires mutually opposed views to be treated as equally valid simply doesn’t hold. False balance arises when journalists present opposing view-points as being more equal than the evidence allows ([Grimes, 2016](#)).

False balance, sometimes called “false equivalency,” refers disparagingly to the practice of journalists who, in their zeal to be fair, present each side of a debate as equally credible, even when the factual evidence is stacked heavily on one side. ([Spayd, 2016](#)).

For an excellent book, I highly recommend: Naomi Oreskes and Erik M. Conway (2010). *Merchants of Doubt: How a Handfull of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*. Bloomsbury Press. There is also an excellent 2014 documentary with the same title based on the book, *Merchants of Doubt*, in DVD format available at many public libraries, for inexpensive purchase online, and currently on YouTube for free viewing.

While one can always find in a world of seven billion a few “scientists” who take a position opposing the vast majority, throughout history there have been very few whose opposing stance stood the test of time (Shermer, 1997, p. 50). Unfortunately, lay people often judge the credibility of the scientist or medical researcher and the strength of their research based on whether it fits in with their “ideology” , not on a critical analysis based on scientific and logical principles (e.g., [Skeptical Raptor, 2017a](#)).

I remember asking in an exchange of comments with one person who writes a lot of antivaccinationist articles if he had ever read a textbook, taken a course, or even read a few articles in *Scientific American* on any relevant subjects such as Immunology, Microbiology, Epidemiology, Biostatistics, History of Infectious Diseases, or Philosophy of Science (how we know, how we form causal connections). His answer was he didn’t need to, that he based his knowledge on experience and a careful reading, though he didn’t specify reading of what. His articles were often based on newspaper and magazine articles or, at best, one or two actual journal articles. Newspaper and magazine articles do NOT usually give the details of the design of any research, just the conclusions, which may or may not hold up when additional research is conducted or when the methodology is critically evaluated. And, in essence, one is basing an argument on second-hand knowledge, i.e. the newspaper article authors judgment and accuracy. If he was referring to reading one or two journal articles, well, I can carefully read a medical journal article in Spanish. I can read it over and over again, perhaps recognizing a few words; but since I have NEVER studied Spanish, no matter how carefully I read it, I wouldn’t understand it. In addition, I may think I recognize some words; but that can be misleading. In Swedish, “rolig” means fun, in Norwegian it means calm. In fact, even words in the same language change over time. John Adams, our Second President, once attended a Catholic mass and when asked what he thought, replied it was “awful.” Well, 200 years ago “awful” meant “awe inspiring,” not exactly what it means today ([McClarey, 2009](#)). So, without even basic knowledge of the above disciplines, how can a lay person judge? For instance, “statistical significance” does NOT mean important, not even close. For more in depth discussion of how people just get it wrong, check out:

Christopher P. Toumey (1996). *Conjuring Science: Scientific Symbols and Cultural Meanings in American Life*. Rutgers University Press.

Thomas Gilovich (1991). *How We Know What Isn’t So: The Fallibility of Human Reason in Everyday Life*. Free Press.

David J. Hand (2014). *The Improbability Principle: Why Coincidences, Miracles, and Rare Events Happen Every Day*. Scientific American.

## **One Example of False Balance from *The San Diego Union-Tribune*:**

Years ago, *The San Diego Union-Tribune* devoted more space to Editorials and Opinion pieces, thus, there might have been a chance for a rebuttal to Roark’s opinion piece; but that is highly

unlikely today. However, even if a rebuttal were allowed, as discussed above, once an opinion is formed, it would be difficult to change it.

Nowadays, the only possibility for rebuttal is for readers to submit a letter, restricted to 150 words. While one may be able to express an opinion in 150 words, refuting point by point a position with NO credibility requires a longer piece. Note that years ago, the UT allowed longer letters.

The following will show that each and every point in Roark's piece is just plain WRONG, impossible to do in 150 words. Given, as I will explain, the potential seriousness of vaccine-preventable diseases, it is irresponsible of *The San Diego Union-Tribune* to have created a false balance. Even publishing Roark's piece was a mistake; but, at the least, they should have first sent it to several experts and allowed one or more to publish a rebuttal published at the same time. While Dr. Sawyer's piece was excellent, it does NOT directly address Roark's piece.

Roark and like-minded collaborators who are fueling the anti-vaccine movement are responsible for the resurgence of diseases that were once under control by high compliance with the nation's immunization program. In Los Angeles: "In some schools, up to 60 to 70 percent of parents have filed these PBEs [Personal Belief Exemptions], indicating a vaccination rate as low as that of Chad or South Sudan. Unlike in Santa Monica, however, parents in South Sudan have trouble getting their children vaccinated because of an ongoing civil war." ([Khazan, 2014](#)) Publishing Roark's article just plain furthers the unscientific and illogical antivaccine movement.

## **Rebutting Roark's "Exemptions Should Be Options for Parents"**

Every nation has quarantine laws, used to isolate people who may possibly have been exposed to a communicable disease. Many communicable diseases have incubation times where they are contagious often long before they become symptomatic. For instance, the incubation period for measles is 10-12 days ([CDC Pink Book: Chapter Measles, 2015](#)). Thus, persons infected by the measles virus can transmit the virus before they even know they are infected, complicating efforts to control disease spread. "In 1920, [in the United States] 469,924 measles cases were reported, and 7575 patients died." ([CDC, 1999](#)) Most deaths were from secondary opportunistic bacterial pneumonia. With the advent of antibiotics the death rate from measles plummeted, reaching an asymptotic level prior to the advent of vaccines of an average of 450 deaths per year during the 1950s compared with an average of 5300 during 1912-1916. In addition to deaths, an average of 48,000 were hospitalized and 4,000 had encephalitis often resulting in loss of hearing or mental retardation. ([Orenstein, 2004](#)). Measles is just as contagious today as ever and there is NO scientifically validated treatment. With the ever increasing development of antibiotic resistant infections and a population more than double that of the 1950s, it is not illogical to speculate that without the vaccine, the US would experience at least a doubling of the above and probably even higher.

In 2008, San Diego experienced an outbreak of measles attributed to an unvaccinated American child who had visited Switzerland with his parents ([CDC, 2008](#)). Thanks in part to a rapid response by the CDC and local health departments, only a few cases developed and fortunately there were no deaths or permanent disabilities. However, without vaccinated children breaking the chain of transmission (herd immunity) it could easily have spread. Nowadays, with jet travel, millions of tourists, and porous borders, there is virtually NO way we can prevent vaccine-preventable diseases from entering the US.

We mainly live in dense urban environments, not isolated farms. People often assert their rights; but rights form only one side of the coin, the other is responsibilities. Many vaccines, including against measles, are not routinely given to children younger than 12 months of age, leaving most infants potentially susceptible to several vaccine-preventable diseases. There are also children who, for medical reasons, cannot be vaccinated, e.g., autoimmune disorders, undergoing chemotherapy, etc. The law clearly exempts them from vaccine requirements. And the immune system of others sometimes don't respond effectively to vaccines. These children are part of our community. They go to day care/school, to play grounds, to restaurants, shopping with their parents. As part of our community, our responsibility is to them as well as to our own children. No man is an island!

### **Vaccines Are Far Less Profitable, Riskier to Produce than Other Pharmaceuticals, and Much More Highly Regulated**

Roark writes:

Among proponents lobbying for the bill's passage were large public health and medical trade associations, including the Immunization Action Coalition [note that IAC is not a medical trade association] and American Academy of Pediatrics (AAP), which are funded by the CDC and vaccine manufacturers; Biocom, which is funded by PhRMA; and the California Medical Association. A June 2015 report revealed that drug companies donated millions of dollars to lawmakers in the 2013-2014 legislative session before the vote on SB 277.

Firstly, the profit margins on vaccines is very small. Vaccines are biologics, difficult to manufacture. Governments and large insurance companies negotiate prices that allow for small profit margins. Vaccine manufacturers often donate vaccines to Third World nations. Vaccine sales worldwide account for only about 2 to 3 percent of world-wide pharmaceutical sales. Vaccines are much more highly regulated than any other pharmaceutical product in that unlike other drugs, they are administered to healthy persons, usually children. Given the target population, the bar for demonstrating safety and efficacy as part of the FDA approval process is very high and the benefit-risk ratio must be shown to be exceptional. Intensive post-marketing testing and surveillance for adverse events further adds to the high costs associated with manufacturing these complex biologics. Doctors sometimes lose money on vaccines, break even,

or manage only a very small profit. And doctors give them because their professional organizations, research, and the CDC recommend them (CDC Pink Book, 2015, Chapter 4: Vaccine Safety; Harrison, 2015, pp. 8-9; Harrison, 2017, pp. 6-10; Institute of Medicine, 2003; Offit, 2005; Robbins, 2015; Ubel, 2016). So to suggest that medical associations are putting forth a huge effort to support bill passage just so they can, at the most, make a few pennies per vaccine dose is ludicrous.

As to the drug companies investing millions of dollars to promote this bill, yes, it is likely that profit is a motive. But so what? Everything sold in the United States is sold for a profit. If the sole criterion for deciding the value of a product, the validity of its manufacturer's claims, is profit, then would Roark advise against using insulin, antibiotics, chemotherapy for cancer, cornflakes, etc? I am a bit of a health nut. As mainly a vegan I try to maintain a diet with limited salt intake, little refined sugar, with high fiber and protein. I can buy cereals with high sugar, high fat, high salt, little fiber, and little protein or those that meet what I consider a healthy diet. Both are sold by the same companies, both for profit. Yes, the pharmaceutical industry wants to sell more vaccines, especially with their small profit margins; but that proves nothing. If drug companies only wanted to increase their profit margins, they would stop manufacturing vaccines and focus on their drug development portfolio. The vaccine manufacturing sector is so unprofitable that many companies just stopped making them.

Given the overwhelming evidence from immunology, microbiology, epidemiology, and the history of infectious diseases, that vaccines have played a major role in public health, so why shouldn't an industry showcase one of its "truly positive" products. What would antivaccinationists say about manufacturers of car seats for infants if they lobbied to make them mandatory? Or how about manufacturers of bicycle helmets lobbying to make them mandatory for minors? Would they be outraged that their civil rights are being violated? Probably not because this whole civil rights argument by the antivaccinationists is a false narrative. They are anti-vaccine. Period. If the Bill instead stated that parents are prohibited from vaccinating their children in the state of California, would some of these people be jumping up and down about their civil rights? More than likely, some would be partying in the streets.

Given that many antivaccinationists websites give as partners or sponsors purveyors of Complementary and Alternative Medicines, what do they have to say about these groups lobbying for laws in their favor (Bellamy, 2017)? The National Vaccine Information Center who Roark is affiliated with lists as one of their partners, Mercola, a for-profit company selling "health products". I guess the profit-motive is a negative only when associated with vaccines?

Unfortunately, antivaccinationists often subscribe to paranoid conspiracy theories. Though it doesn't discuss vaccines, a fascinating book is: David Aaronovich (2010). *Voodoo Histories: The Role of the Conspiracy Theory in Shaping Modern History*, Riverhead Books.

Antivaccinationists would have us believe that a world-wide conspiracy of the pharmaceutical industry, governments, public health agencies, non-profits, and the medical profession are colluding just for the 2 to 3 percent profits, knowing full well, at least in the minds of

antivaccinationists, that the vaccine-preventable diseases aren't all that dangerous and/or that vaccines don't work all that well, and/or the serious risks associated with vaccines are high. And what's more, every vaccine advocate I have known, including those at the CDC, have vaccinated their children. So, all of us pro-vaccine types are willing to sacrifice our own children and those of our friends and neighbors just to further the profits of the vaccine industry. Wow!

As for the American Academy of Pediatrics lobbying for the bills passage, of course they would. Pediatricians go through the same long grueling education and training of any doctor; yet, on average, have the lowest incomes ([Hamblin, 2015](#)). So why choose Pediatrics? Because they care about children, because they are the true practitioners of preventive medicine. And, despite what antivaccinationists choose to believe, vaccines are among the all time best approaches to preventive medicine ([CDC, 1999](#)). And, again, despite what antivaccinationists choose to believe, pediatricians only break even or make a slight profit on vaccines ([Harrison, 2015](#), pp. 8-9; [Harrison, 2017](#)). They would make more treating children ill from the vaccine-preventable diseases.

## **Seeing the World as All or None: Either Vaccines Work Perfectly or They Don't Work at All**

### **Roark writes:**

In California in 2014, 90 percent of child pertussis cases with vaccine records had been vaccinated. In the 2015 Disneyland associated measles outbreak, 30 percent of measles cases with vaccine records had been vaccinated with over half the cases in adults and only 18 percent in school children. The measles outbreak ended in four months using traditional disease control measures, with 131 cases reported among the state's 39 million residents and a total of 188 cases nationally in a U.S. population of 321 million. There were no reported deaths or permanent injuries from measles.

Roark's out-of-context highlighting of the statistic that 90 percent of cases of pertussis in children have occurred in vaccinated individuals was done for either one of two reasons: (1) either because she truly finds this to be evidence that the vaccine does not work, or (2) because she wants to mislead readers into a false conclusion that vaccines do not work. If the former, then one seriously needs to question Roark's competence (if you do not already), and if the latter, then she is plain dishonest. Either way, she lacks objectivity and credibility. Let's start with why this statistic does not imply that the pertussis vaccine (typically given as DTaP, the combined Diphtheria, Tetanus, and acellular Pertussis vaccine) does not work (in fact, it shows that it works quite well indeed). No vaccine is 100% effective. In fact, almost nothing is. A comprehensive analysis of acellular pertussis vaccine efficacy estimated overall efficacy at 73% ([Casey, 2005](#)). A casino giving out those odds would go bankrupt in five minutes.

Roark correctly states in her article that about 93% of children enrolled in kindergarten in California had received at least two doses of the MMR vaccine in the 2014-15 school year. The estimated pertussis vaccine coverage among kindergarteners was about the same ([CDC, 2015](#)). It is only logical that when vaccine coverage is very high, and efficacy is less than 100%, most cases of the disease the vaccine is supposed to prevent will occur in vaccinees. For example, let's take a random population of 100,000 children in California. Applying the statewide statistic of vaccine coverage of about 93%, then about 7% of this population (7,000 children) would be potentially unprotected because they were not vaccinated and of the 93,000 vaccinated children, about 25,100 children would be potentially unprotected due to a vaccine efficacy of 73%. If everyone in this hypothetical population of 100,000 children was exposed to pertussis, then of the 32,100 unprotected kids (7,000 + 25,100), 78% of pertussis cases would be expected to occur in vaccinated individuals (25,100/32,100). If the parents of all 100,000 children exercised their Personal Belief Exemption and opted to not have their children vaccinated, instead of 32,100 cases of pertussis, there would be 100,000 cases. Granted, this example assumes that everyone is exposed and the disease is 100% contractible, but it illustrates the point. Keep in mind that if none of the children were vaccinated then the chain of transmission would be unbroken. If one could figure out the exposure factor and the contractibility factor you can reduce these number accordingly, but both sides of the ratio would be affected equally and you would still arrive at a result that nearly 80% of cases would occur in vaccinated persons. The take home message here is that the statement "90 percent of child pertussis cases with vaccine records had been vaccinated" only has meaning when you know the subject matter, and when you do, it shows that the vaccine has performed very well. So, is Roark ignorant, or is she disingenuous? Not sure it matters much. The fact is that she is wrong to imply that the pertussis vaccine does not work and she is wrong to encourage parents not to have their children vaccinated.

In addition, "serious pertussis symptoms and complications are less common among AAV [age-appropriate number of pertussis vaccines] pertussis patients, demonstrating that the positive impact of pertussis vaccination extends beyond decreasing risk of disease. . . Although currently available pertussis vaccines cannot prevent all cases of pertussis illness, adherence to ACIP pertussis vaccine recommendations for infants, children, and adults remains critical to reduce pertussis-associated morbidity and mortality ([McNamara, 2017](#))."

Now, let's look at the rest of Roark's statement as she relishes the opportunity to point out that during the 2015 Disneyland associated measles outbreak, 30% of measles cases with vaccine records had been vaccinated, that only 18% of cases occurred in school children, that the outbreak was short in duration, and that no deaths or permanent injuries occurred. Actually, there was one death, the first measles death in 12 years ([Szabo, 2015](#)). Again, let's put this in context of the facts. Measles vaccine coverage in children in California at the time of the outbreak was about 93% ([CDC, 2015](#)). Measles vaccine coverage in adults is probably similar, but might be a percentage or two lower at the most. Let's be overly conservative for the sake of argument and assume that 10% of the Disneyland population was unvaccinated. Wouldn't any reasonable person find it informative that this tiny group accounted for 70% of the cases? Which group would you want to be in? As to Roark's dismissive summary of the benign nature of the measles

outbreak and how the number of cases is insignificant when measured against the entire U.S. population, that is just too idiotic to even comment on. Measles is a highly contagious serious disease. In 2015, the WHO estimated 134,200 deaths due to measles, that's 367 deaths every day (WHO, 2017)! That the disease was relatively contained in the Disneyland outbreak and resulted in only one death and no permanent disability is a testament to herd immunity (thanks to vaccines), a very robust and rapid public health response (which cost millions of dollars), and access to high-quality medical care.

“So, the tiered model of antibody response leaves a small percentage of vaccinated people susceptible. But note: It's also the reason why you're better off being vaccinated even if you end up getting infected. Your antibody levels might not be high enough to completely protect you, but they'll still help—the CDC has seen vaccinated patients with measles who only get a rash for about an hour, says Wallace. And, importantly for octogenarians (whose immune systems are weaker) and infants, vaccinated patients are much less likely to transmit the disease to other people (Hong, 2015).”

Given random chance and the small numbers of cases, the fact that there was only one death and no permanent injuries gives a false sense of security. Even mild cases of vaccine-preventable diseases involve serious discomfort to the child, if of school age, missing classes, and nowadays with most families needing two wage earners to make ends meet, one parent staying home to take care of the child.

To understand the foolishness of antivaccinationists all or none approach, let's use a few analogies: Kevlar vests. Often the targeted person, police officer or military, has the breath knocked out of them, is knocked over, sustains a serious bruise, and some times fail to stop high velocity armor piercing rounds. So, Kevlar vests don't completely prevent any harm or even serious wounds or death; Seat belts and airbags (not counting those manufactured by Takata) save lives and prevent serious injuries; but not always and, on occasion, can cause injuries. The advent of penicillin resulted in the saving of literally millions of lives; yet, it didn't work all of the time and some people experienced serious adverse events, including anaphylactic shock. So, using the logic or should I say “the illogic” of antivaccinationists, should we abandon use of Kevlar vests, seat belts and airbags, and penicillin? Antivaccinationists often claim they are not against vaccines, just want safer ones. One can say that antivaccinationists are guilty of the Nirvana Fallacy:

The nirvana fallacy is the informal fallacy of comparing actual things with unrealistic, idealized alternatives. It can also refer to the tendency to assume that there is a perfect solution to a particular problem. A closely related concept is the perfect solution fallacy.

By creating a false dichotomy that presents one option which is obviously advantageous—while at the same time being completely implausible—a person using the nirvana fallacy can attack any opposing idea because it is imperfect.

Under this fallacy, the choice is not between real world solutions; it is, rather, a choice between one realistic achievable possibility and another unrealistic solution that could in some way be “better”. ([Wikipedia, “Nirvana Fallacy”](#))

So, using antivaccinationist logic, should we abandon the use of Kevlar vests, seat belts/airbags, and penicillin? Vaccines protect the vast majority of recipients, and the efficacy for some is close to 100%; but when they don’t, they usually reduce the severity of the symptoms, including risk for hospitalization and death and risk of transmission to others ([The Immunization Partnership, 2017](#)).

## **The Supreme Court’s Jacobson Decision and the Public Health**

Roark writes, in protesting Senate Bill 277 which eliminated personal beliefs exemptions for school attendance:

The law violates the human right to informed consent to medical risk-taking, as well as other internationally recognized human rights, including the right to autonomy and freedom of thought, conscience and religious belief [and goes on]: The U.S. Supreme Court majority, ruling in *Jacobson v. Massachusetts* in 1905 said, “all laws should receive a sensible construction” to prevent being “cruel and inhuman to the last degree.

I think it instructive to give a more accurate quote from the *Jacobson* decision by the U.S. Supreme Court:

It is easy, for instance, to suppose the case of an adult who is embraced by the mere words of the act, but yet to subject whom to vaccination in a particular condition of his health . . . or body would be ***cruel and inhuman in the last degree*** [from Roark’s quote]. We are not to be understood as holding that the statute was intended to be applied to such a case, or, if it was so intended, that the judiciary would not be competent to interfere and protect the health and life of the individual concerned.

***'All laws,' this court has said, 'should receive a sensible construction*** [from Roark’s quote]. General terms should be so limited in their application as not to lead to injustice, oppression, or an absurd consequence. It will always, therefore, be presumed that the legislature intended exceptions to its language which would avoid results of this character. The reason of the law in such cases should prevail over its letter.' *United States v. Kirby*, 7 Wall. 482, 19 L. ed. 278; *Lau Ow Bew v. United States*, 144 U.S. 47, 58 , 36 S. L. ed. 340, 344, 12 Sup. Ct. Rep. 517. Until otherwise informed by the highest court of Massachusetts, we are not inclined to hold that the statute establishes the absolute rule that an adult must be vaccinated if it be apparent or can be shown with reasonable certainty that he is not at the

time a fit subject of vaccination, or that vaccination, by reason of his then condition, would seriously impair his health, or probably cause his death. No such case is here presented. It is the cause of an adult who, for aught that appears, was himself in perfect health and a fit subject of vaccination, and yet, while remaining in the community, refused to obey the statute and the regulation adopted in execution of its provisions *for the protection of the public health and the public safety, confessedly endangered by the presence of a dangerous disease* [my emphasis]. (United States Supreme Court, 1905).

The entire decision is only eight pages. I think it would be well worth the reader's time to read it in its entirety. The decision makes it clear that State punishment of a fine or imprisonment on those who refused vaccines was acceptable, but those individuals could not be forcibly vaccinated. Unfortunately, this is typical of antivaccinationists, taking things out of context. In Roark's case, even reversing the order and combining two phrases. For the history behind the Jacobson decision and later Court cases see: Michael Willrich (2011). *Pox: An American History*. The Penguin Press. Specifically, the Supreme Court in 1922 upheld school immunization requirements in *Zucht v. King* (*Zucht v. King et al.*; Mariner, 2005).

## **Risks To Children**

Roark writes: "The Institute of Medicine acknowledges in published reports that some children are genetically, biologically and environmentally more susceptible to being harmed by vaccines, but doctors cannot accurately identify who they are because of gaps in vaccine safety science."

Absolutely true. However, what Roark fails to understand is if a child is susceptible to being harmed by a vaccine composed of killed or attenuated microbes, then if exposed to the natural, "full strength", pathogen their risk would be potentially even greater. And science is making progress on recognizing and developing diagnostic tools for identifying those at risk. In the meantime, if more and more parents were to decide, given one can't know if their child is susceptible, to forgo vaccinations, we will reach a critical point where many children, including their own will be at ever increasing risk.

I have often fantasized of being able to transport antivaccinationists to a parallel universe where everything is the same, level of technology, clean water, nutrition, and medicine, except vaccines have never been developed. Well, there would be one more difference, many of us wouldn't be there as ancestors would have died from vaccine-preventable infectious diseases or we would have died in infancy. The population alive in the parallel universe would be significantly smaller, have a significantly higher percentage of deaf, blind, mentally retarded, crippled, and disfigured people than in our universe. And the infant mortality rate would be horrendous, 50% not reaching the age of 10. And, despite what antivaccinationists choose to believe, without vaccines, the statistics on Autism Spectrum Disorders would be just as high.

## **The Vaccine Court**

Roark writes: “The National Childhood Vaccine Injury Act of 1986, which shielded pharmaceutical corporations and doctors from civil liability for vaccine injuries and deaths, confirmed that fact and \$3.7 billion in federal vaccine injury compensation has been paid to vaccine casualties since 1988.”

According to the National Vaccine Compensation Program website:

Over 80 percent of all compensation awarded by the VICP comes as result of a negotiated settlement between the parties in which ***HHS has not concluded, based upon review of the evidence, that the alleged vaccine(s) caused the alleged injury*** [my emphasis].

According to the CDC, from 2006 to 2015 over 2.8 billion doses of covered vaccines were distributed in the U.S. For petitions filed in this time period, 4,587 petitions were adjudicated by the Court, and of those 2,987 were compensated. This means for every 1 million doses of vaccine that were distributed, 1 individual was compensated

Since 1988, over 18,652 petitions have been filed with the VICP. Over that 29-year time period, 16,721 petitions have been adjudicated, with 5,680 of those determined to be compensable, while 11,041 were dismissed. Total compensation paid over the life of the program is approximately \$3.7 billion (National Vaccine Compensation Program, 2017).

So, the average amount per case was \$651,409, not shared with the lawyers (see below).

"One injury from vaccines is one too many, but it is also important to keep perspective," says Sarah Atanasoff, a physician at the VICP in Rockville, Maryland. "The benefits of vaccination to the individual, the local community, and the nation as a whole far outweigh the risks." (Wadman, 2017).

Despite what antivaccinationists claim, the Vaccine Court was NOT created to protect the pharmaceutical industry; but to protect the vaccine supply and make compensation easier. As mentioned above, many cases are settled without clear evidence that a vaccine was responsible. Plaintiff attorneys as well as witnesses are paid by the Court. “In the regular courts, plaintiffs would have to show a product defect, which . . . would be difficult, especially given the extensive process for licensing vaccines. Additionally, in the regular courts, plaintiffs would have to show general causation, while bound by rules of evidence. With its relaxed caution standard, the VICP reduces the burden on petitioners in regard to admitting evidence. In other words, people believed to be injured by a vaccine will likely find it much harder and often impossible to win a case in the regular courts (Reiss, 2015; Reiss, 2017). In addition, if one wins, a huge chunk goes to the attorneys. The Vaccine Court was established NOT to protect the pharmaceutical

companies; but to protect a tried and true public health intervention (see below). In fact, since the Court often pays without clear evidence of vaccine causation, the benefit of the doubt is to the plaintiffs advantage. This is intentional in order to foster confidence in vaccines, that they confer immense benefits; but there are small risks and the government will help those families who incur these risks. And since lawyers are paid by the Court, they are more willing to take cases. In fact, the Vaccine Court's website has a [list of lawyers](#), though one is free to use any attorney.

And it is the vaccine manufacturers who pay any awards, thus are held accountable. They are assessed a "\$0.75 per dose of each taxable vaccine. The tax per dose on a vaccine that contains more than one taxable vaccine is \$0.75 times the number of taxable vaccines" ([IRS Tax Map 2014](#); [Harpocrates Speaks, 2014](#)). If one accepts that only about one possibly vaccine-injured child per million doses, then if the average award is \$651,409, the manufacturers have paid into the fund \$750,000, more than enough to cover the award together with lawyer and witness fees. Given that the chances of winning from a normal lawsuit would be less and much more time consuming, this benefits both families of possibly vaccine-injured children and protects what science and history has shown to be an extremely valuable tool of preventive medicine.

The Court awards are often quite high given the lifetime costs of a child with special needs, including medical costs. Given our current fragmented, dysfunctional, *for-profit* health care systems, courts are often the last hope for desperate parents. We are the only health care system among the modern industrialized democracies designed first and foremost to make a profit. In other nations, quality health care is a given, thus, rewards for vaccine injuries are usually much lower. However, if we didn't have vaccines, far far more children would incur hospital expenses, lifetime injuries, and even death. Who would compensate the families for these? *You can't sue mother nature!* For more information on our for-profit healthcare system vs a non-profit single-payer system, including comparative international studies of outcomes, check out [Physicians for a National Health Program's webpage](#).

Given the overwhelming evidence of the benefits of vaccines, why were fewer and fewer companies manufacturing them? Though on a different medical intervention, Marcia Angell's book, "Science on Trial: The Clash of Medical Evidence and the Law in the Breast Implant Case" shows how juries can award huge damages, in one case literally putting a company out of business, based on NO credible scientific evidence. Juries, especially when confronted with a special needs child, may well suspend their need for scientific evidence, assuming the deep pockets of an industry, and award the plaintiff. Unfortunately, when they do this, it ends up costing us all, both in increased prices, if the company stays in business, or, as has been the case with vaccines, shortages due to many companies not willing to risk lawsuits for the small profits involved (see above).

## **National Vaccine Information Center**

Despite its pretentious name, the NVIC to which Roark is the advocacy director in California, though sounding like it is affiliated with the government it is not, nor is it an especially large organization.

Barbara Loe Fisher is the Co-Founder and President of NVIC. In a keynote presentation at the Health Freedom Congress, Fisher said:

Vaccination is a medical procedure that has been elevated to a sacrosanct status by those in control of the medical-model based health care system for the past two centuries. Vaccination is now being proclaimed as the most important scientific discovery and public health intervention in the history of medicine.

Using religious symbols and crusading language, medical scientists describe vaccination as the Holy Grail. Vaccines, they say, are going to eradicate all causes of sickness and death from the earth and anyone who doubts that is an ignorant fool.

In the 21st century, if you refuse to believe that vaccination is a moral and civic duty and dare to question vaccine safety or advocate for the legal right to decline one or more government recommended vaccines, you are in danger of being branded an anti-science heretic, a traitor and a threat to the public health. You are viewed as a person of interest who deserves to be humiliated, silenced and punished for your dissent. (Fisher, 2014).

Whether one ranks vaccinations “as the most important scientific discovery and public health intervention in the history of medicine”, it is certainly among the most important (CDC, 2013). Just as one example, take smallpox. Prior to vaccinations, in the late 18th Century smallpox killed around 1/4 to 1/3 of the population, up to 1/2 of children, left some of those who survived blind, and almost all disfigured. And the suffering, every part of ones body on fire, must have been horrendous. During the first part of the 20th Century, an estimated 200 million deaths were caused by smallpox in the Third World as vaccination in the US and Western Europe was standard. Starting in 1967, the World Health Organization began a campaign to end smallpox as humans were its only reservoir. One can follow the end of smallpox country by country, including the poorest most backward nations on Earth. Nothing else changed in these nations to have ended smallpox, not better nutrition, cleaner water, etc. The evidence is overwhelming (Carrell, 2003; Fenn, 2001; Fenner, 1988; Glynn, 2004; Wikipedia. “Smallpox”, Williams, 2010). The plummeting of disease incidence in response to the introduction and widespread use of vaccines is undeniable. Disease incidence declined by over 99% from the pre- to post-vaccine eras for measles, diphtheria, polio, and rubella. For others, such as mumps, tetanus and pertussis, the reduction in disease incidence was greater than 90% (Roush, 2007).

Given that most vaccine-preventable diseases, without vaccines the vast majority, close to 100% of all children would have been infected, suffering for days, would easily have involved 100s of

thousands of hospitalizations per year, thousands of disabilities and deaths, missing weeks of school, and one parent staying home, vaccines certainly have been beneficial ([CDC, 1999](#)). Despite what antivaccinationists choose to believe, the evidence is overwhelming on the benefits conferred by vaccines and equally overwhelming they aren't associated with autism ([CDC, 2015c](#)) and the risks, though real, are far outweighed by the benefits.

For those interested in delving deeper into both autism spectrum disorders and vaccines, I suggest starting with the following books:

John Donvan & Caren Zucker (2016). *In a Different Key: The Story of Autism*. Crown Publishers.

Roy Richard Grinker (2007). *Unstrange Minds: Remapping the World of AUTISM*. Basic Books.

Seth Mnookin (2011). *The Panic Virus: A True Story of Medicine, Science, and Fear*. Simon & Schuster.

Paul A. Offit (2008). *Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure*. Columbia University Press.

I also encourage the reader to check out my articles for *Every Child By Two*, [Expert Commentaries](#), refuting a number of antivaccinationist claims. I go point by point through a number of antivaccinationist articles showing them to be deficient in science, logic, and even common sense.

As for “Using religious symbols and crusading language, medical scientists describe vaccination as the Holy Grail. Vaccines, they say, are going to eradicate all causes of sickness and death from the earth and anyone who doubts that is an ignorant fool.”

Really? Scientist are saying vaccines will wipe out “all causes of sickness and death”? Does this even sound rational? And those refusing vaccines “being branded . . . anti-science heretic, a traitor and a threat to the public health. . . viewed as a person of interest who deserves to be humiliated, silenced and punished for [their] dissent.” Well, yes they are anti-science (Check out my [Expert Commentary articles](#)); but it sounds to me like the psychological defense mechanism of projection, that is, projecting undesirable feelings, emotions, or behaviors onto someone else, rather than admitting to or dealing with the unwanted feelings/behaviors, coupled with paranoid conspiracy fantasies.

It is antivaccinationists who attack the integrity and honesty of anyone who supports vaccines, anyone who earns an income directly or indirectly from them ([Fox, 2017](#)). For examples of those holding other antiscientific views and their vicious attacks on scientists, check out the

documentary “Merchant of Doubt”, DVD available at many public libraries, for sale on the internet, and currently shown for free on YouTube. And recently,

Paul Offit and colleagues devoted 25 years to the development of a rotavirus vaccine, Rotateq. In the United States, “Rotavirus infection was responsible for more than 400,000 physician visits, more than 200,000 emergency department (ED) visits, 55,000 to 70,000 hospitalizations, and 20 to 60 deaths each year in children younger than 5 years” (CDC Pink Book. Chapter 19: Rotavirus, 2015). In the Third World “Each year, rotavirus cause[d] approximately 111 million episodes of gastroenteritis requiring only home care, 25 million clinic visits, 2 million hospitalizations, and 352,000–592,000 deaths (median, 440,000 deaths) in children <5 years of age” (Parashar, 2003). The actual patent for Rotateq was owned by Offit’s employer, Children’s Hospital of Philadelphia. They sold the patent and, as standard policy, shared the royalties with the researchers. Offit received \$6 million (Armstrong, 2008; Left Brain Right Brain, 2009). As a pediatrician who had seen the anguish of parents watching an infant hooked up to multiple devices and the possibility of death, Offit and colleagues devoted many years to developing the vaccine. Divide \$6 million by 25 = \$240,000 per year. Given that pediatricians earn the lowest incomes of all specialties, at best, this would bring Offit’s income up to that of the higher paid specialties, that is, if one chooses to believe he and his colleagues, having chosen pediatrics, devoted so much time and effort into the vaccine with financial motivations, not preventing untold suffering and even deaths. And compared to the immense suffering caused by rotavirus, including economic costs, e.g., hospitalizations, \$6 million is a bargain. Unfortunately, antivaccinationists, ignoring the success of vaccines, must think the worse of people, at least those who oppose their view of vaccines.

Andrew Wakefield earned approximately \$750,000 (based on exchange rate at time) consulting with the Dawburn Law Firm who was representing parents who believed their children were harmed by vaccines (Orac, 2007). A patent for a monovalent measles vaccine was submitted in the name of the Royal Free Hospital, Wakefield’s employer, which has a similar policy of sharing the royalties with researchers (Deer, 1997). A second application was filed listing the Royal Free Hospital and Neuroimmuno Therapeutic Research Foundation as applicants (Left Brain Right Brain, 2010; Wakefield, 1998).

I guess, as with the hypocrisy of listing one for-profit company while criticizing the profit motive of others, anything goes in the hypercritical illogic of antivaccinationists. There have been numerous instances of Offit and others supporting vaccines being threatened and harrassed (e.g., Childs, 2008; Skeptical Raptor, 2017b). As another example, Dr. David Gorski, author of numerous articles debunking antivaccinationists and practitioners of Complementary and Alternative Medicine has been viciously attacked, including accusations of pedophilia (Gorski, 2017, go to bottom page 4). The psychological projection defense rears its ugly head, literally “ugly head”.

Given that Roark is the advocacy director in California for the nonprofit National Vaccine Information Center, from the above by Barbara Loe Fisher, the organization’s Co-Founder and

President, and the bogus arguments in Roark's opinion piece, and the fact that the NVIC constantly misrepresent vaccine information (e.g. [Harpocrates, 2013a](#); [Harpocrates 2013b](#); [Let's Be Honest About NVIC webpage](#); [Orac, 2010](#)), it should never have been printed by *The San Diego Union-Tribune*.

## Summary and Conclusion

In publishing Roark's opinion piece, in my opinion, *The San Diego Union-Tribune* is guilty of creating a false balance. My intent is NOT to single out the UT as this is a problem belonging to our mass media in general. However, as the UT is my hometown newspaper, it provided an excellent example.

As I've demonstrated in this article, not one point made by Roark is valid. The underlying premise she is coming from is based on a lack of the basics of science, thus, a bogus opinion on vaccines, a lack of understanding of the economics of vaccine production, and a misleading quote, taken out of context, from a Supreme Court decision. Her affiliation with the *National Vaccine Information Center* and its Co-Founder and President, Barbara Loe Fisher, as shown by Fischer's statement, leaves little doubt that besides a lack of scientific knowledge, antivaccinationists suffer from paranoid delusions of conspiracy theories, project their own, often vicious, attacks on the integrity and honesty of those promoting vaccines, including threatening statements, and see the world in terms of the Nirvana Fallacy (for more on Barbara Loe Fisher as the main spokesperson for the National Vaccine Information Center, [see Orac, 2017](#)). Attacks on the integrity and honesty of scientists says more about the attackers than the scientists. Such attacks indicate that antivaccinationists are incapable of systematically and validly using microbiology, immunology, epidemiology, biostatistics, and the history of infectious diseases to make their case and display, in my opinion, a crass lack of integrity and decency, basically anything and everything goes to influence people's opinions, regardless of how unscientific, illogical, and including threats and character assassination.

Given that *The San Diego Union-Tribune* has, on the whole, been supportive of vaccines, it would behoove them, as well as our mass media in general, to re-evaluate their choice of opinion pieces and even letters that clearly do not reflect, have NO validity, on other issues as well. One possibility would be to allow more and longer Opinion pieces on the UT website with a short Summary in the printed paper. And, they should consider allowing Letters to the Editor of at least up to 250 words when the content calls for it. The UT's policy regarding Letters to the Editor, "It is also our policy to attempt to publish letters supporting or opposing a particular issue in a ratio reflecting the number received on each side," when one side is clearly taking an unscientific, invalid position, promotes false balance and is a disservice to readers ([The San Diego Union Tribune. Letters and Commentaries](#)).

## ADDENDUM

## Some Vaccines are Profitable. So what?

After finishing the above article I came across several articles discussing that the profitability of vaccines has been increasing. According to Ward (2016), Pfizer's best-selling product was the vaccine Prevnar, which prevents pneumonia, meningitis and other infections caused by the pneumococcus bacteria:

Prevnar generated revenues of \$6.25bn last year . . . after the expert panel that advises on US vaccine policy recommended its use in over-65s as well as in children. While vaccines play a big role in frontline healthcare, they are often an afterthought for a pharmaceuticals industry more focused on treating diseases than preventing them. But the success of Prevnar shows they can be as lucrative as any drug. Pfizer is one of just four pharma groups with large vaccines operations. The others are GlaxoSmithKline of the UK, Sanofi of France and Merck of the US. There are several factors driving this growth. One is the expansion of immunisation programmes in newly industrialised countries such as China. Sanofi's sales for polio and whooping cough vaccines in emerging markets grew 33 per cent last year. . . . With children already extensively vaccinated in the developed world, much of the industry's focus has turned to older age groups. GSK last year reported positive clinical trial data on a vaccine for shingles — a condition caused by the same varicella-zoster virus as chicken pox, but which is most common in over-70s. (Ward, 2016; see also: Guzman, 2016; Williams, 2015).

In 2016, Prevnar ranked 10th in a list of the 15 best selling drugs. (Philippidis, 2017). However, Pfizer announced in 2017 that “Global Prevnar/Prevenar 13 revenues declined 23% operationally. In the U.S., Prevnar 13 revenues decreased 33% due to the continued decline in revenues for the Adult indication due to a high initial capture rate of the eligible population following its successful fourth-quarter 2014 launch, which resulted in a smaller remaining “catch up” opportunity compared to the prior-year quarter, as well as the unfavorable impact from the timing of government purchases for the pediatric indication.” (Pfizer, 2017)

Whereas the profit margins for the mandated childhood vaccines in the US have, to some extent, been held in check by various government programs negotiating prices, together with negotiations with large health care companies such as Kaiser, vaccines not mandated are sold based on whatever the companies feel the market can bear. When new vaccines such as Prevnar are first recommended, sales skyrocket as those older than the recommended age play catchup to get the vaccine; but sales eventually lower to each cohort entering the recommended age group. And except for the paranoid antivaccinationists fringe, one would be hard pressed to place China and other countries' decision to purchase childhood vaccines as participating in some world-wide conspiracy to further the interests of a few Western pharmaceutical companies. And one could question why a vast world-wide conspiracy would exist for vaccines; but not just about everything else we purchase? And if the super paranoid conspiracy theorist were to respond in

the affirmative that world-wide conspiracies for many products exist, why the focus on just one of them, vaccinations?

Let's focus just on the United States. The question then is: "Do these newer vaccines confer a benefit, are they cost-effective? To keep this short, I'll just give a few examples for the pneumococcal vaccine, e.g. Prevnar:

"Routine infant immunisation with seven-valent pneumococcal vaccine began in the USA in 2000. . . At the end of 2004, all-cause pneumonia admission rates had declined by 39%." (Grijalva, 2007)

According to Simonsen (2014):

Our model results showed that PCV13 [Pneumococcal conjugate vaccine] was associated with significant reductions in hospital admissions for all-cause pneumonia for some children (21% [95% CI 14-28] in children aged <2 years, 17% [7-27] in those aged 2-4 years) and for empyema (50% [95% CI 22-68] for children age <2 years, 46% [21-64] for 2-4 years, and 37% [13-54] for 5-17 years). All-cause pneumonia was significantly reduced in adults aged 18-39 years (12% (6-17) but not for other adult age groups. The vaccine also reduced admissions for invasive pneumococcal pneumonia and non-invasive pneumococcal or lobar pneumonia in children and adults, indicating herd protection, although the reduction was only significant in some age groups. (Simonsen, 2014)

According to Tsai (2008):

During 1994–2004, there were 21,396 hospitalizations and 2684 deaths (12.5%) due to pneumococcal meningitis in the United States. In children aged 12 years, the average annualized rates of pneumococcal meningitis hospitalizations per 100,000 population decreased from 7.7 in 1994–1999 to 2.6 in 2001–2004 (change, 66.0%; 95% confidence interval [CI], 73.5% to 56.3%). Among children aged 2–4 years, the hospitalization rate decreased from 0.9 to 0.5 per 100,000 (change, 51.5%; 95% CI, 66.9% to 28.9%). Average rates also decreased by 33.0% (95% CI, 43.4% to 20.9%) among adults aged 65 years. After PCV7 introduction (2001–2004), an estimated 1822 and 573 pneumococcal meningitis hospitalizations were prevented in persons aged 15 years and 65 years, respectively. Overall, an estimated 3330 pneumococcal meningitis hospitalizations and 394 deaths were prevented in persons of all ages during 2001–2004 in the United States. (Tsai, 2008).

In an excellent summary of the history and recent developments in the manufacture and sales of vaccines, Lam (2015) writes:

In fact, vaccines were so unprofitable that some companies stopped making them altogether. . . There are many factors that make vaccine production tricky, and thus less lucrative: Live vaccines are troublesome to manufacture, and they're closely regulated by the FDA for quality control. Public agencies often buy vaccines at capped prices (though research has shown that doesn't necessarily make companies exit the market, because they buy at high volumes). Altogether, a combination of high production costs, low market prices, and heavy regulation may have contributed to occasional vaccine shortages. But then a couple things happened to turn the vaccine market around in recent years. Global demand, particularly in developing countries, shot up. . . "blockbuster" vaccines also hit the market: pneumococcal conjugate for meningitis and other bacteria infections . . . The industry grew. One estimate puts the vaccine market now at \$24 billion—huge, but a mere 2 to 3 percent of a trillion-dollar worldwide pharmaceutical industry. . . So while the vaccine industry is likely more profitable now than in the 1970s or 1980s, this is the result of global market forces, not a reason to skip a child's vaccinations: Pharmaceutical companies need incentives to keep producing vaccines, because regardless of profits the economic and social benefits of vaccination are huge. ([Lam, 2015](#); see also: [Robbins, 2015](#))

Quite simply, as already discussed, focusing on profits by antivaccinationists is both illogical and devoid of common sense as everything sold in the United States is for-profit. That's how the economy works. That is why you have a job and can buy things, like food and toilet paper. Historically, the profits made on vaccines were minimal, so small in fact that some companies just stopped producing them. That profits have recently increased is great news for public health as it reduces the risk of companies deciding to divert resources to more profitable endeavors. However, this is not even a relevant discussion. The question is not whether sales of any product result in profit; but whether the product confers some benefit, its cost-benefit ratio. Antivaccinationist, lacking in-depth study of the history of infectious diseases. lacking in appreciation of endemics of vaccine-preventable diseases but a plane flight away, and lacking a basic understanding of the sciences involved, e.g. microbiology, immunology, biostatistics, and epidemiology, seeing the world in black and white, either downplay the dangers of vaccine-preventable diseases, downplay the effectiveness of vaccines, and grossly exaggerate the risks from vaccines. The antivaccinationist litmus test for the validity of any paper and/or the credibility of any author/researcher is based not on understanding of the science; but simply on confirmation bias, that is, does the study and/or author agree with their rigid beliefs.

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