

**Is Vaccinating Children Wrong?**  
**A Cooperative Analysis of a Question of Value**

Produced by the Students in Pablo Martin's  
Communication Studies 160: Argumentation Course, Fall 2014

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**Foreword**

This paper was produced by compiling some of the best papers produced by the students in my COMS 160: Argumentation course during the fall of 2014 at San Diego Miramar College. The course was a study of argumentation with emphasis placed on learning to think critically and argue cooperatively. As a class, the students decided to focus on the following question of value: "is vaccinating children wrong?" Although initially some students believed that there wasn't enough controversy to keep us occupied all semester, we quickly found this wasn't the case as students delved into the issue and it's many sub-topics.

Work groups were created based on which sub-topics the students were interested in, and these groups worked together for the latter half of the semester to explore the question of value together. Throughout the semester I was impressed by my students' diligence, open-mindedness, and dedication to finding the best answer to our question, regardless of their original stance. At the end of the semester, each student wrote an individual paper arguing their position based on what they learned in regard to one or two of the major sub-points regarding our question of value. This document is a compilation of what I believe to be the papers that best explored the pertinent issues and demonstrated a sense of cooperative or collaborative argumentation. The latter is something I believe our world needs much more of, and these men and women display it well.

Note: The ratio of papers included here that argued in the affirmative or the negative represent the ratio that was present in the class's final papers—5:1. Please forgive any errors in this document.

## **An Overview of the Issues and Commonplaces** by Degan Loewe-Pollock

“Vaccine: [vak-seen] (noun) 1. any preparation used as a preventive inoculation to confer immunity against a specific disease, usually employing an innocuous form of the disease agent, as killed or weakened bacteria or viruses, to stimulate antibody production.” (Dictionary.com, 2014) The one thing this definition does not provide is the possibility of vaccines being ineffective. Vaccines were once thought to be the greatest medical advancement in recent history, but now there is some speculation to that notion. Vaccines have become a very controversial topic as more and more people have adopted the natural immunity way of living. This paper will address both the issues and commonplaces that arise when discussing vaccines.

Should we vaccinate our children? That has been our “Question of Value” all semester. It’s the main issue of vaccines. One side believes that we should give our children vaccines; the other side believes that we should not. Which side is right? That’s unknown, and a completely different topic. What is known is that there are two main sides: pro-vaccines and anti-vaccines. Even with all of the disagreement between the two sides, they can both agree on one major commonplace. The overall health of children is very important. Parents want to ensure the best, healthy life for their children. One side believes that this objective is achieved with the assistance of vaccinations and the other believes it is achieved without vaccinations.

The biggest issue present besides the Question of Value is the issue with the ingredients contained in vaccines. The main question around this issue is, “Are the ingredients used in vaccines safe?” Parents are worried that there could be harmful ingredients in vaccinations given to their children. Parents are concerned about why we are giving our children vaccines that contain thimerosal/mercury, formaldehyde, and aluminum. The contents of vaccines leads to another issue: “Is there a link between autism and vaccines?” Some people on the anti-vaccine side believe that ingredients such as thimerosal, which contains mercury, cause a very serious mental disorder known as autism. Pro-vaccine side says there is no link. “However, in 2001 thimerosal was removed or reduced to trace amounts in all childhood vaccines except for one type of influenza vaccine, and thimerosal-free alternatives are available for influenza vaccine. Evidence from several studies examining trends in vaccine use and changes in children does not support such an association between thimerosal and autism.” (CDC, 2014a) The pro-vaccine side not only believes there is no link between thimerosal and autism, but they also know that the dangerous ingredients in vaccines are

actually reduced to miniscule amounts rendering them harmless. Anti-vaccine believes that even though thimerosal/mercury has been removed or reduced, what about the other ingredients? This doesn't fully exempt vaccines from its relation to autism. They believe that there needs to be more research done on vaccines in the United States. This is actually a commonplace between both sides. There is too much unknown when dealing with vaccines. There has been some research but there needs to be more so that we may make a better decision.

The next issue between the two sides is, "How effective is a vaccination?" It was once believed that vaccines were 100% effective and that they lasted forever. We are just recently learning that this is not the case. "Studies indicate that immunologic memory remains intact for at least 20 years among healthy vaccinated individuals who initiated Hepatitis B vaccination >6 months of age." (CDC, 2014b) Hepatitis B is only one of many vaccines that don't last a lifetime. "Vaccines work really well. Of course, no medicine is perfect but most childhood vaccines produce immunity about 90 - 100% of the time." (Vaccines.gov, 2014) Both sides tend to use both pieces of new information as support for their own argument. Anti-vaccine believes that the fact that it doesn't last a lifetime and that it isn't a guarantee of protection as reason to not get vaccinations. The fact that there is even an amount of risk dismays some parents. The fact that vaccines carry risks is a commonplace between both sides. Most medicine carries risks and vaccinations are no different. Pro-vaccine believes that the odds outweigh the risks drastically. The lowest success rate of 90% is still great odds. Pro-vaccine also relies on vaccine's rich history. Another commonplace agreed upon by both sides is vaccines past success. Vaccines have eradicated, eliminated, and reduced the incidence of some diseases such as polio.

Other issues that stems from vaccines are: "What vaccinations are necessary during infancy?" and "Is the vaccination schedule safe?" Pro-vaccine believes that all vaccines administered during the vaccination schedule are both safe and necessary. Why would you not want to prevent your child from being protected from the most diseases possible? They also believe that an infant's immune system, contrary to popular belief, is more than capable of receiving an abundant amount of shots. Anti-vaccine parents are worried about how much is administered during the vaccination schedule. They feel as though it is too much for an infant to handle all at once and all so suddenly. They also feel that not all of the vaccines administered at such a young age are necessary. They argue that the Hepatitis B vaccine is pointless because it is a sexually transmitted disease.

Some more issues revolve around whether it is more important to protect the individual or the population as a whole. "Should we be more concerned about the protection of the individual from side-effects of the vaccine, or about the protection of the population from the disease?" Pro-vaccine

is in favor of protecting the entire population from a dangerous disease. They believe in herd-immunity, "When a critical portion of a community is immunized against a contagious disease, most members of the community are protected against that disease because there is little opportunity for an outbreak." (Vaccines.gov, 2014) Anti-vaccine groups are in favor of protecting the individual from side-effects caused by the vaccination. Vaccines should be 100% safe before administering them. They also make the argument that herd-immunity only applies to natural immunity, not immunity gained through vaccinations. The theory of herd-immunity is another issue that neither can seem to agree upon.

Another issue that arises from the topic of vaccines is, "Who should decide whether or not to vaccinate children?" Some believe that it should be the government or society's choice on whether or not to vaccinate a child. It shouldn't fall on the parent because they are biased. It is all about the greater good, a vaccinated population. Others believe that the decision should be made by the parents because it is their child. It is also uncertain whether we can trust the government or not. An issue tied into this is, "Can we trust the Center for Disease Control and Prevention (CDC)?" Some say that we can trust the CDC as they stand for something bigger than ourselves: the protection of humanity from disease. Others are not so quick to trust. This stems from recent news that the CDC had altered some of their results in a study that focused on the connection of vaccines and autism in young African-American boys. It isn't that they don't want to trust the CDC and our government; it is just that recent news of "stat-correcting" is too troubling to ignore. This is a final commonplace between both sides. They want to believe in the CDC and they want it to be responsible for its higher standards.

In conclusion, there are many issues revolving around vaccines. All of them need to be resolved in order to answer the ultimate question of, "Should we vaccinate our children." The two sides are so far apart and entrenched in their own thoughts and ideals that it's almost impossible to come to a resolution. It is important that these issues don't block out the commonplaces within this argument that are important. The ultimate goal should still be to better the lives of our children and future generations.

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### **Position Statement 1** by Edward Pouliot

After carefully wading through pages of research I believe vaccinations provide a great firewall that protects our children against some of the most life threatening diseases known to man. There is a great deal of scientific studies done proving the theory that vaccines do more good than harm. As well as a vast quantity of testing done by professionals to ensure that today's vaccines are as safe as possible.

In September of 2010 a study was done by the CDC on "Prenatal and Infant Exposure to Thimerosal from Vaccines and Immunoglobins and Risk of Autism which consisted of 1,008 children and their mothers and 256 kids had Autism and 752 kids did not." (CDC,8/2/11) Each child was administered a normal regiment of vaccinations containing the suspect ingredient thimerosal which contains ethylmercury. Each mother and child followed the current vaccination schedule from pregnancy to 20 months of age. The results that were found were similar in both boys and girls and that result was that thimerosal did not pose any risks. Other professionals such as , doctors Jeffrey S. Gerber and Paul A. Offit of the Division of Infectious Diseases at The Children's Hospital of Philadelphia in Pennsylvania state in their article "Vaccines and Autism: A Tale of Shifting Hypotheses" in the oxford Journals that "Twenty epidemiologic studies have shown that neither thimerosal nor MMR vaccine causes autism." (Gerber,Offit, 10/14/08) Such as, "in Denmark, researchers performed a study comparing the incidence of autism in children who had received 200 µg (1961–1970), 125 µg (1970–1992), or 0 µg of thimerosal (1992–2000) and again demonstrated no relationship between thimerosal exposure and autism." (Gerber,Offit 10/14/08) The list of countries goes on and on and all of the studies produced similar results regarding the ingredient thimerosal. Autism isn't the only side effect in question. Let's switch gears and discuss the affects that can occur from being vaccinated for polio. All medications, surgeries, disease treatment and prevention procedures are not 100 percent safe. Vaccines are no different and possibly will ever be perfectly safe. Some people are born with autoimmune dysfunction or a weakened immune system

which could cause serious complications when being vaccinated as a child. The Nature International Weekly Journal of Science published an article with the story of John Salamone and his family. They live in Mount Holly, Virginia and discovered the risks and side effects of vaccines first hand. "John's son David became weak and unable to crawl shortly after receiving the oral polio vaccine in 1990. David went through numerous doctor visits and physical therapy sessions for two years so that his family could figure out that he had a weakened immune system and caught polio from being vaccinated." (Kwok, 25 May 2011) There are many issues like this across the United States causing people to worry about vaccine safety. A vast minority of parents across the country, around 1.8 percent, opt out of vaccines by citing either religious, philosophical reasons or they are fearful of David's story becoming their reality. These non-vaccinators have, in recent years, been the subject of intense media scrutiny. Partially you can blame people such as the former Playboy bunny Jenny McCarthy, Jim Carry and Dr. Joseph Mercola. Let's not forget to mention that these high profile professionals have enormous soap boxes to stand on. For example Mrs. McCarthy was recently hired by ABC as a new host on The View. She also has waged a passionate and vocal campaign against vaccines that she believes were responsible for causing her son's autism. Though cases like Jenny's son and David's are sad, people should also take into account that the polio vaccination causes about one case of the disease per 2.4 million doses given to patients. (Kwok, 25 May 2011)

The Measles-Mumps-Rubella vaccine is another heavily scrutinized vaccination. Dr. Andrew Wakefield states in an article he wrote "that the measles epidemics regularly occur in vaccinated populations. In outbreaks that took place in the United States, over 95 percent of the cases had a history of being vaccinated." Now that may be true but Dr. Wakefield never states what those vaccinations were. They could have been any one of the vaccinations on earth today. The CDC had this to say regarding the measles, "To update national measles data in the United States, CDC evaluated cases reported by states from January 1 through May 23, 2014. A total of 288 confirmed measles cases have been reported to CDC, surpassing the highest reported yearly total of measles cases since elimination (220 cases reported in 2011). ( CDC.gov, 6/6/2014) Dr. Andrew Wakefield is saying, according to his earlier 95 percent statement, that 284 of those confirmed case would have been vaccinated. Well the CDC goes on to say "Most of the 288 measles cases reported this year have been in persons who were unvaccinated (200 [69%]) or who had an unknown vaccination status (58 [20%]); 30 (10%) were in persons who were vaccinated. Among the 195 U.S. residents who had measles and were unvaccinated, 165 (85%) declined vaccination because of religious, philosophical, or personal objections, 11 (6%) were missed opportunities for vaccination, and 10 (5%) were too young to receive vaccination." ( CDC.gov, 6/6/2014) Those numbers were generated from

nine different doctors and are far more realistic than Dr. Wakefield's estimate. The Measles is just one disease this vaccine prevents. The Mumps have their own set of symptoms and issues. Claimed by Immunizationinfo.org the mumps begin with "swelling and tenderness of one or more of the salivary glands. This would go on for about a week then some of the following complications can include inflamed testicles which happen in 20% to 50% of post-pubertal males infected. In 15% of cases mumps can also cause brain aseptic meningitis, and inflammation of the pancreas (2% to 5% of cases) and ovaries (5% of post-pubertal females). Permanent deafness occurs in 1 out of 2,000 cases and 20 to 30 deaths reported each year in the United States." (Imunizationinfo.org, 4/22/2010) The bottom line here is before the MMR vaccine "there were roughly 3–4 million people in the U.S. infected each year, of which 400–500 died, 48,000 were hospitalized, and another 1,000 developed chronic disability from measles encephalitis. (Vara, 3/11/2014) Today we do not really even think about these viruses nor do we have to because vaccines have been preventing them for decades.

The other hot word within the vaccine controversy is Safety. Questions of the testing of vaccines and the safety of being vaccinated loom within American minds. The New York Department of Health states "The creation of a vaccine involves scientists and medical experts from around the world, and it usually requires 10 to 15 years of research before the vaccine is made available to the general public. The first step of this extensive process involves several years of laboratory research, in which scientists and researchers identify an antigen that can prevent a disease." (health.ny.gov, 7/2014) This antigen is identified almost before this 10 to 15 year clock starts ticking and once it is identified it has to be approved by the FDA and then three more phases of testing follow. Once a vaccine is licensed, "the FDA regularly inspects vaccine manufacturing facilities to make sure they are following strict regulations" (fda.gov, 7/2011). Of course there have been many incidences where there have been complications because of vaccines. Like the story I brought up earlier of John Salamone's son David. That's why the FDA runs a multitude of test types continuously from the moment any vaccine hits the market until it is no longer administered to the public. Scientists use the vaccine safety data link and the vaccine adverse reporting systems created by the CDC in order to populate data about vaccine side effects.

The Vaccine Safety Data network, or VSD, is a network of eight managed care organizations across the United States. The combined population of these organizations is more than 9.2 million people. Scientists can use the Rapid Cycle Analysis to constantly scourer the information that is coming into the VSD. Experts like "Nicola Klein, co-director of the Kaiser Permanente Vaccine Study Center in Oakland, California can attempt to build the American people's confidence by using VSD and performing studies on vaccines. Nicole and her colleagues found that children aged between 12

and 23 months who had been immunized with a combination vaccine for measles, mumps, rubella and varicella (MMRV) had more febrile convulsions 7–10 days after vaccination than those receiving separate MMR and varicella vaccine.” (Kwok, 5/25/2011) Knowing that experts around the world are still testing vaccines that were created fifty years ago to continuously make them safer should make everyone feel a little more warm and fuzzy when getting vaccinated. Even with all this testing diseases like polio are still a threat in other countries.

Doctors and medical students spanning throughout the world are continuously doing their best to test these and other important vaccines. Experts in France “At the Institute of Research and Development, researchers have identified that the polio virus is responsible for deadly and recent outbreaks. The genetic order shows two mutations, unknown until now, of the proteins that form the "shell" (capsid) of the virus.” ( Science Daily, 11/4/2014) This study was performed on a small amount of people but that’s because there wasn’t many people infected to begin with. Over the semester students raised the issue of the CDC not caring about the individual and that they only care about the greater good of the population. Well “Joseph Dimasi of the Tufts Center for the Study of Drug Development says, on average, the capitalized cost comes out to about \$1.3 billion (adjusted to 2009 dollars).” (Feyman, 1/24/2014) The majority of that dollar figure goes toward regulatory costs for FDA testing. Plus, 1.3 billion dollars is a low ball figure. In March of 2014 “the NIH awarded a five-year, \$28 million grant to establish collaboration between researchers from 15 institutions who were working to fight Ebola.” (Dellorto, Wilson, 8/5/2014) That’s a good chunk of the 1.3 billion dollar figure given by Mr. Dimasi spent in one month on the process of making the Ebola vaccine safe and effective. In Canada, Tekmira, a Vancouver-based company has a 140 million dollar contract with the U.S. Department of Defense to develop an Ebola drug, began Phase 1 trials with its drug in January. (Dellorto, Wilson, 8/5/2014).

The internet is crawling with facts that show the pros and cons of vaccines. Both are extremely necessary in order to keep medical experts, big pharmaceutical companies, and the government in check. Though I am on the pro vaccination side of things I do respect some of the point the anti-vaccination side brings to the table.

However, throughout the research I have performed I have come to the conclusion that vaccinating your child certainly isn’t wrong. Societies all over the world are better off today because of vaccines. Furthermore the safety of vaccinations is amongst the top priorities of medical experts all over the world and they are doing everything in their power to keep us as safe as humanly possible.



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### **Position Statement 2** by Tina Pajouhesh

"It is time to give your child his first set of vaccinations. Please sign these papers and we will proceed." Millions of people hear these words from their doctors when they become a new parent and some of them refuse to let the doctor take further action. The reasons for this can vary yet they

are not necessarily guaranteed to be true. As a nation and a world as a whole, we want to live in a safe environment surrounding healthy and happy people including ourselves. We have acknowledged that there have been vaccinations that eradicated or reduced disease yet we still like to see the United States research more thoroughly on the effectiveness of these vaccinations. We have agreements on the idea that vaccinations carry risks but the question for the society is whether the risks of vaccines are still worth it in the long run. For some, living a healthy life means to follow the vaccination schedule as an extra precaution and for others it means to take matters in their own hands and not trust every vaccination provided to the children of the public. As the society grows and knowledge continues to expand our scientific creations, it is safe to say that vaccinations are beneficial for children and will positively impact our future. Vaccinations assist in creating community immunity and have been approved by professional and trustworthy companies such as the center of disease control and prevention (CDC).

Vaccinations do the opposite of harming children. In fact, they prevent children from encountering harmful diseases by destroying the existence of the diseases with community immunity (Goldstein). To first understand the claim at hand, it is crucial to define and understand community immunity. Community immunity is when a community is immunized against a contagious disease. Therefore, if most of the community is protected against that disease, there will be little opportunity for an outbreak. For example, an effective small pox vaccination discovered by the English Physician Edward Jenner was proven to eradicate the small pox disease after "the United Nations launched its global vaccination campaign in the mid-60's" (Goldstein). This proves to show how when a vaccination goes global and a wide range of the population takes part in protecting themselves, they can over power the spread of harmful diseases. Eradicating a disease is such a powerful act and us humans can have control over it if we become unified and vaccinate ourselves as well as our children. Furthermore, the polio virus was eliminated from the Western Hemisphere after the U.S. public health authorities decided to make Jonas Salk and Albert Sabin's polio vaccination available universally to all children in the 1950s (Goldstein). This indicates that we need to embrace the knowledge and the scientific discoveries that are made in order to make a difference in the world. With that in mind, there are some parents who have never experienced the disease outbreaks and therefore they do not realize the severity and risk of not vaccinating their children (Palfreman, 2010). The parents of these children who are not vaccinated are frequently blamed for the new outbreaks that occur in the United States such as one in San Diego with a child that attained the measles disease (Palfreman, 2010). It does not seem reasonable to oppose vaccinations and deny that this action can cause outbreaks to reoccur in a community. It is true that there are children who are too

young to get a certain vaccination, but community immunity helps protect these children as well. For example, children under the age of one years old are too young to receive the measles vaccination but they can still receive some form of protection from people around them who have acquired the vaccination (Satcher, 2000). Even the smallest amount of protection for the community counts as a step toward the right direction. We can not only think of ourselves and our own children when deciding a stance on vaccination. We must consider those who depend on community immunity in order to live a healthy lifestyle. These people include, those who do not have a fully-working immune system, people with HIV, elderly people, and newborn babies who are too young to be vaccinated as mentioned before (Loving, 2014). In order to make a positive impact in the society and create a safe and healthy environment for children to live and thrive in, it is crucial to be unified as an immunized community to permanently eliminate dangerous diseases. We can not sit back and let the disease take control.

In addition to community immunity benefiting children health and life, the Center of Disease Control and Prevention does its best to provide accurate studies and research on the vaccinations given to the public. With every claim, there are those who believe the opposite. There are some individuals who claim that vaccinating children has not been proven to be safe because of the Center of Disease Control Preventions (CDC) failing to provide accurate research on how vaccinations do not harm children (Green, 2014). Opponents of CDC and vaccinations claim that the CDC incorrectly studied whether vaccinations cause autism in children. They explain that the CDC studies only used “young children, from 0-3 years of age, even though average age for an autism diagnosis at the time was 4.4 years” (Green, 2014). With this being an accurate statement, it still does not prove that vaccinations are harmful to children or correlate with autism. The CDC perhaps should study the right age group for the vaccinations in their future researchers but it is also important to understand that there have been more children diagnosed with autism because diagnostic techniques have advanced (Goldstein, 2000). It is not that CDC is hiding the correlation between autism and vaccinations but that they also see autism and vaccinations expanding simultaneously as a coincidence.

Further more, stating that the CDC is untrustworthy is also an inaccurate claim to make when the CDC, FDA, and doctors have been analyzing vaccinations in the most effective ways. According to David Satcher, an Assistant Secretary for Health, a Surgeon General, and member of the U.S. Public Health Service and U.S. Department of Health and Human Services, the CDC’s studies have been published in scientific and peer reviewed publications and therefore they are highly credible. In his article, “Statement on Risk vs Benefit of Vaccinations”, Satcher states how the CDC has established a credible program called the Vaccines Safety Datalink (VSD). The VSD links vaccination, hospitalization

and medical records to large managed care organizations. VSD's primary goal is to identify the health outcome of interest, link the date in vaccination records, and most importantly, to compare the health event in those who are vaccinated, unvaccinated, and vaccinated at different times (Satcher, 1999). This indicates that the CDC is doing its job in researching vaccinations and presenting accurate information for the general public. One has complete access to the CDC's studies and can research on specific vaccinations they have concerns with. It is understandable if one has a concern with a vaccination but not giving the CDC credit for their hard work and research skills does not seem appropriate in this situation. Not only are vaccinations being studied extensively by large credible organizations such as CDC but they are also required to follow the same pathways as drugs and other biologics. In order to have a vaccination available to the public, it must first submit an Investigational New Drug application (IND) to the FDA. The IND is a crucial document that describes the quality and the method of manufacture of the vaccination. It also provides information of the "vaccination's safety and ability to elicit a protective immune response in animal testing as well as the proposed clinical protocol for studies in humans" (Satcher, 1999). After being approved by the FDA, the vaccination must go through three phases of trial, submitted to the Biologics License Application (BLA), and given appropriate product labeling in order to be released to the public (Satcher, 1999). Even with efforts the CDC takes to produce safe vaccinations for the public, some may still doubt all their work. CDC is constantly striving to enhance their vaccination safety efforts. In order to do so the CDC had The Institute of Medicine (IOM) of the National Academy of Sciences undertake broad reviews of vaccination safety (Satcher, 1999). The reviews for instance, "examined all available data specific to pediatric vaccines and drew independent conclusions on the safety of each vaccine" (Satcher, 1999). Additionally, the Task Force on Safer Childhood Vaccines is also involved in examining issues and making recommendations to "ensure development of safer childhood vaccines and improve licensing, manufacturing, processing, warning, ... and research on vaccines" (Satcher, 1999). It is clear to see that the CDC has many groups of professionals in different fields assisting them in making accurate judgments and providing factual evidence in their researches. It does not seem to be likely that the professionals with background in health and medicine take all their time studying to come out with false claims and accusations. There is a common place for everyone that we want a safer environment for ourselves and our children. The individuals in CDC have made it their lifetime career to provide safety for the general public. With the extensive list of requirements, studies and guidelines that the CDC and FDA provide, vaccinations are proven to be safe for the public. These large corporations are studying these vaccinations extensively to make a mistake and harm the public. They want the best for the children and the society as well as themselves.

All in all, with some set backs, vaccinations seem to be a great discovering and creation for our world to take advantage of. Its an outlet for a healthier, happier, and disease free future. If we all participate in eradicating and eliminating diseases with the concept of community immunity, we can truly succeed in creating a better world for us and our future children to live in. Trusting professionals and groups of people that put in hours of work each day to provide the best products for the public should not be looked down upon. We must have a positive outlook and see the best in everything that has be done for us. If we have eradicated a disease before, it would be reasonable to continue the process and believe in the powerful and positive impacts of vaccinations.

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#### **Position Statement 3** by Angelica Terre

"I am the 70s child of a health nut. I wasn't vaccinated. I was brought up on an incredibly healthy diet: no sugar till I was one, breastfed for over a year, organic homegrown vegetables, raw milk, no MSG, no additives, no aspartame. My mother used homeopathy, aromatherapy, osteopathy, we took daily supplements of vitamin C, Echinacea, cod liver oil...As healthy as my lifestyle seemed, I contracted measles, mumps, rubella, a type of viral meningitis, scarlatina, whooping cough, yearly tonsillitis, and chickenpox, some of which are vaccine preventable. In my twenties I got precancerous HPV..." (Parker, 2013). While there are many horror stories of the adverse effects of vaccinating, Amy Parker's story is one of the few that tell of the adverse effects of not vaccinating against easily preventable diseases. With technological advances of the 21<sup>st</sup> century, humans are equipped for modern warfare with weapons but against biological warfare, we have but one weapon we can use to

our advantage; vaccines against deadly diseases. In the realm of the unknown, the utilization of precautionary measures, especially vaccinating children, is necessary to the health and vitality of population as a whole.

Of the major issues surrounding vaccination, the biggest controversy appears to be centered on that of the ingredients within vaccines. The long list of vaccine ingredients accompanied by their risks easily transforms the perception of vaccines as a form of strengthening the immune system to a chemical cocktail of potential adverse effects.

The first concerning ingredient of vaccines is aluminum. Aluminum is utilized within vaccines as an adjuvant, or a compound that allows the immune system to be more receptive to the vaccine's respective antigen. In the 2011 study, "Aluminum Vaccine Adjuvants: Are they Safe?" by Tomljenovic and Shaw, they conclude, "...the continued use of aluminum-containing placebos in vaccine clinical trials may lead to an underestimation of the true rate of adverse outcomes associated with aluminum-adjuvanted vaccines." (Shaw, Tomljenovic, 2011). There have been no published, educational studies within the past two decades that have directly correlated aluminum-containing adjuvants used in vaccines to human adverse reactions affecting the central nervous system. Tomljenovic and Shaw claim that the average infant receives "14.7 to 49 times more than the FDA safety limits for aluminum from parenteral sources from vaccines..." (2632). The FDA claims the maximum limit of aluminum infants can be exposed to is 4.225 milligrams, furthermore according to the Children's Hospital of Philadelphia, the combined ten recommended shots in an infant's first 6 months of life does not exceed an aluminum amount of 3.555 milligrams. Furthermore, the USDA estimated, "daily aluminum intakes of 0.10 mg Al/kg/day for 6–11-month-old infants; 0.30–0.35 mg Al/kg/day for 2–6-year-old children..." from natural exposure alone. In one year, this estimate equates to exposure to 36.5 milligrams of aluminum, roughly ten times more than what is reported present in vaccines and almost nine times the recommended amount of exposure from the FDA.

Although there are apparent and immediate risks to high exposure of aluminum, technological advances have allowed vaccines to retain their potency and still be received effectively all while reducing the dosage of adjuvants and specifically aluminum-based adjuvants present. Aluminum is a naturally occurring substance in the universe and it is commonly present in the air, water, breast milk, infant formula, antacid, aspirin, and pots and pans that we prepare food with. It is due to this fact that we cannot conclude that aluminum adjuvants in vaccines are the direct link to toxic levels of aluminum and the proposed adverse reactions associated with it. As stated by Dr. Tomljenovic, the study of aluminum within vaccines must continue to be rigorously tested so that a full conclusion may

be drawn. Aluminum's presence within vaccines serves the purpose of enabling the immune system of children to be responsive to the vaccine. The above research however, does not take into account individuals with weakened livers, in which excess amounts of aluminum is fatal.

Although aluminum is justified as a natural element, many parents continue to feel uneasy about the ingredients individually, and anti-vaccinators argue that although natural, these ingredients are poisonous. For example, another major ingredient within vaccines that is deemed a "naturally occurring substance" by the The Children's Hospital of Philadelphia, is formaldehyde. For those unfamiliar with formaldehyde, it is a substance commonly used to preserve dead bodies. In 2000, the U.S. Environmental Protection Agency (EPA) deemed formaldehyde a "probable carcinogen" associating exposure to "lung and nasopharyngeal cancer". So why is this known carcinogen included as an ingredient in vaccines? Oncologist David Gorski states in his Science Based Medicine article, "During the vaccine manufacturing process, it's used to inactivate live virus, and traces do remain after manufacturing. Why on earth would those traces be allowed to remain? Remember again: The dose makes the poison. In trace amounts, formaldehyde is not dangerous. Also, it doesn't last long in aqueous solution, such as vaccines. It breaks down to formic acid and carbon monoxide." (Gorski, 2008).

Also similar to aluminum, formaldehyde serves a purpose to the overall effectiveness of the vaccine itself. Without the presence of formaldehyde, vaccines would contain full-strength, disease carrying antigens, not weakened ones. Furthermore, Dr. Gorski mentions in the human body, formaldehyde is broken down to formic acid and carbon monoxide – this is due to the methanol make-up of formaldehyde. Linda Crampton, a biologist compares this methanol breakdown process to that of a similar methanol substance; aspartame. Aspartame is a common low calorie sweetener found in "Equal" and "NutraSweet". "The body breaks down aspartame into aspartic acid, phenylalanine and methanol. The methanol is then converted into formic acid." (Crampton, 2011). This example of the human body having an intrinsic method of natural extraction of formaldehyde from its system is a point to consider when confronted with the idea that infant immune systems are weak.

Of the major ingredients in vaccines that have a bad reputation, none quite have worse of a reputation than that of thimerosal. In Andrew Wakefield's infamous 1998 study on the MMR Vaccine, he linked the vaccine along with thimerosal, a 50% mercury preservative found in vaccines to the development of Autism in children. Although the national study has been retracted, the fear of vaccines causing developmental disorders in children remains ingrained in public opinion.

According to the World Health Organization, "thimerosal is an organic, mercury-containing compound added to some vaccines as a preservative. It is the most widely-used preservative for vaccines that are provided in multi-dose vials." (WHO, 2013) Just like aluminum and formaldehyde, thimerosal is once again, a naturally occurring element that serves a purpose to the overall effectiveness of vaccines.

The FDA states that the usage of thimerosal in vaccines has been greatly reduced to almost 0, and the presence of thimerosal is limited to prevent bacterial growth in vaccines. Megan Pond, the founder of [vaxtruth.org](http://vaxtruth.org) discusses in her article, "Vaccine Ingredients – A Comprehensive Guide", how the FDA claims that for a vaccine to be considered "thimerosal free" it must contain less than 0.3 micrograms of the substance, thus deeming it not truly "thimerosal free". She then goes on to discuss how "thimerosal free" vaccines contain up to 0.6 ppm's of thimerosal. According to a 2011 Consumer Reports article on mercury levels in canned tuna, of 42 samples of varied cans and pouches, "every sample contained measurable levels of mercury, ranging from 0.018 to 0.774 parts per million." (Consumer Reports, 2011). Tuna readily available for consumption potentially contains equivalent, if not exceeding levels of mercury compared to vaccines.

Vaccines are not a "one size fits all" option, they are "one size fits most". The above studies, and arguments aforementioned apply to individuals that are considered "healthy". As technology continues to improve, the global community continues to get closer and closer with each new generation. As a community that faces the unknown it would be in everyone's best interest to protect ourselves to the best of our ability with the tools that science has provided with us. Everything in life has inherent risk, but it is up to us to educate ourselves on all aspects of vaccines that will allow our personal ethical codes and judgments weigh what risks are appropriate to take. As demonstrated above, the one subject of controversial ingredients is multi-faceted and cannot be approached as a black or white subject. Just as the old medical saying goes, "seek a second opinion".

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We all want to trust the pharmaceutical companies and agencies that are creating and distributing vaccinations not only to us but more importantly to our children, but the question is can we? The fact that we even need to ask this question is absurd. The Center for Disease Control is responsible for making sure the vaccines we are injecting into our children are safe and are helping them have an over all better quality of life. That is the point of vaccines correct? Not only do parents have to deal with the pressures of vaccinating their children from doctors but also from their peers, and the media. It is said that if you don't vaccinate your child you are putting all other children at risk. Well I say if the vaccines work, like they are supposed to, why would it matter if my child were vaccinated or not? Many parents, school, and communities believe in herd immunity. Herd immunity is when at least 95% of the population is vaccinated against disease and it makes the population immune to the disease. Herd immunity is thought to not only help protect the community as a whole but the individuals who cannot be vaccinated or the children who do not have all of their vaccines yet. Recent studies show that herd immunity is not real. The questions of whether the CDC is trustworthy or if herd immunity is a hoax or not, can go on and on forever but in this paper I would like to share with you my findings after through research of both topics.

I would love to think that the CDC and pharmaceutical companies are one hundred percent of the time looking out for the best interest of everyone, but I have seen that that is not the case, starting with lying about the safety of ingredients in vaccines. The CDC has been proven to be wrong by a new study published in Biomed Research International that mercury in vaccines do in fact harm children. "According to the review, there are over 165 studies that have focused on Thimerosal, an organic mercury (Hg) based compound, used as a preservative in many childhood vaccines, and found it to be harmful. Of these, 16 were conducted to specifically examine the effects of Thimerosal on human infants or children with reported outcomes of death, poisoning, allergic reaction, malformations, and auto immune reactions," (Green 3). Another study showed that, "Researchers pointed out that a study conducted by the CDC epidemiologists found a 7.6 fold increased risk of autism from exposure to Thimerosal during infancy," (Green 2). A disease as serious as Autism shouldn't be taken lightly and definitely should not be covered up. How would you feel if your child received a vaccine that was supposed to increase their quality of life and it actually gave them a devastating disease like Autism?

Even after knowing the risks of a vaccine, it can be tempting to vaccinate your child against certain viruses and diseases, however the dangers and consequences are usually unseen. For example, " The MMR vaccine manufacturer concedes that diabetes, thrombocytopenia (a serious blood disorder), arthritis, encephalitis (brain inflammation), Guillain-Barre syndrome (paralysis), and

death, have all been reported during clinical trials of its vaccine," (Miller 1). There have been many cases like this one that go unnoticed by the public but have a huge impact on certain unfortunate individuals. If the vaccine is causing all of these known problems why is it still being distributed to the public? Another study showed more shocking results, "Peer reviewed studies link the haemophilus influenzae type B (Hib) vaccine to epidemics of type one diabetes, the hepatitis vaccine to autoimmune and neurological disorders, and the flu vaccine to paralytic ailments," (Miller 2). Hepatitis B is irritation and swelling (inflammation) of the liver due to infection with the hepatitis B virus (HBV). HBV is a sexually transmitted disease or through blood. The targeted group explained by the Heb B manufacturer is "sexually promiscuous adults and IV drug users." Heb is also the very first shot your child will get when they are born. Seems unnecessary right? Pediatricians think that as well. "When hepatitis B vaccine was initially introduced 87% of pediatricians did not believe it was needed by their patients. Doctors knew that children rarely develop this disease. According to the hepatitis b manufacturer children are targeted because a vaccine strategy limited to high risk individuals has failed," (Miller 3). Our children should not have to be injected with any unnecessary chemicals just because the originally targeted group has failed. The counter argument states the question, "What if your child is raped? Wouldn't you want them to have the vaccine then?" The answer is of course yes, but I think a newborn child does not need this vaccine. If proven to be safe, then later in their life the child should receive it.

The original definition of herd immunity was "the protection to the population at large occurred only if people contracted the infections naturally." (Blaylock 1). When you naturally acquire a disease or infection and beat it your immunity lasts a lifetime. Herd immunity is now described as "If 95% of the population is vaccinated then the population can become immune to a disease," (Blaylock 1). There is one major flaw when it comes to the theory of herd immunity. "Vaccine induced immunity lasts for only a relatively short period, from 2 to 10 years at most," (Blaylock 1). This is why doctors suggest booster shots for most vaccines, "even the common childhood infections such as chickenpox, measles, mumps, and rubella," (Blaylock 1). Even with booster shots a problem still arises, "Then they discovered the boosters were lasting for only 2 years or less," (Blaylock 2). Since the baby boomer generation, America has thought that there hasn't been any outbreaks of infection or disease because of herd immunity when herd immunity has not existed and in fact still does not exist. It is very obvious to see that herd immunity is a hoax when you look at the fact that vaccines wear off after 2-10 years as well as booster shots only elongating that period by two years. A perfect example to show why herd immunity is a fib is the outbreak of measles in a 6-12 school in Illinois. It is the law in the state of Illinois that every child has to be vaccinated for the measles

before they are 15 months old. Therefore, this school was 100% vaccinated against the measles. Then, all of a sudden, there was an outbreak. "The affected high school had 276 students and was in the same building as a junior high school with 135 students. A review of health records in the high school showed that all 411 students had documentation of measles vaccination on or after the first birthday, in accordance with Illinois law," (Gold 1). If this doesn't prove that herd immunity doesn't exist then I'm not sure what will.

As adults, we need to stand up for what is right and the good of not just our children but for every child. It is unnecessary for children to be getting certain vaccines during infancy that will do nothing but hurt them. As a nation we need to take a stand and make sure the CDC does not mandate vaccines that are harmful to our children or cover up studies that should be public information. It is our responsibility to make sure everyone knows that herd immunity does not and will not ever exist and that there is nothing wrong with not vaccinating your child.

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### **Position Statement 5** by Jake Collins

After considering all that we have learned I am a proponent of vaccination. Many factors lead in to my standpoint and I only came to this conclusion after observing both sides of the issue at great length, both researching on my own and with my classmates. I have come to the conclusion that we should vaccinate our children because vaccines are proven to prevent harmful diseases and are made with safe ingredients. I will elaborate on these points and the counter points respective to each issue using historical data and information from a variety of sources I came across in my research.

Vaccines exist to prevent the spread of dangerous infectious viruses, ones that were or are killing off, injuring, or disfiguring much of the worlds population. Vaccines have eliminated many diseases from the majority of the population and have even eradicated smallpox from the face of the earth "the disease is now eradicated after a successful worldwide vaccination program."(CDC, vaccines 3) The difference between being eradicated and eliminated being that when you have eliminated a disease it may no longer occur in one particular segment of the world but it can and does occur naturally in other parts of the world, eradicating it like we have done to smallpox means it no longer exists (outside of laboratories) to infect people and be spread.

Smallpox was a disease that killed people for centuries, when infected in children it had an 80% death rate, and was responsible for 300-500 million deaths the 20th century. (History, 3). Obviously not the type of thing one would wish upon any child. The vaccine was introduced in the early 1800s and as time went on and the vaccine and health care in general progressed it became clear it was effective. Although there were variety of campaigns to get the vaccine circulated through communities the World Health Organization (WHO) arguably pushed the most aggressive vaccination pattern in the late 1960's and by 1979 the disease had been eradicated from the world with stores existing in laboratories as the only known examples of the disease. (CDC, Smallpox 1). By using the vaccine millions of children's lives were saved, proving that vaccines can in-fact prevent spread of dangerous virus. Although the vaccine is not without side effects 14-52 people out of every one

million people may suffer life threatening conditions but only 1-2 of those people actually suffer death as a result of these complications (CDC Smallpox 1). Meaning that yes there is some level of risk while taking the smallpox vaccine but over all the risk of death or harm for a child was much higher if one was to not vaccinate for the disease. Because of the widespread use of the vaccine even after it was eliminated from many nations, children today don't have to face the deadly disease that is smallpox. A prime example of why vaccinating kids is something we should do as it saved millions of children and continues to positively impact all of our lives.

Another disease that has been greatly affected by our vaccines is Polio. Polio has again been around for ages but unlike Smallpox has not been eradicated from the world. "Polio used to be very common in the United States and caused severe illness in thousands of people each year before the polio vaccine was introduced in 1955" and "Most people should get the Polio vaccine when they are children" says the CDC (CDC Polio fact sheet, 2). The reason polio used to be so common and vaccines were recommend amongst children were because Polio is spread "with the stool of an infected person and may also be spread through oral/nasal secretions." (Vaccines and Immunizations: Polio, 3), To put in layman's terms snot ,spit and feces are the primary vehicles for the disease to be spread, all substances children have been known to be less than tidy with. The CDC describes the symptoms in the following quote "Most people who get infected with poliovirus do not have any symptoms. A small number of people (4 to 8 people out of 100) will have flu-like symptoms. These symptoms usually last 2 to 5 days then go away on their own." (Vaccines and Immunizations: Polio 2) However the best known and more disabling symptom of polio, the one that can ruin a child's quality of life is explained in greater detail in the following quote from the same passage "In rare cases, poliovirus infection can be very serious. About 1 out of 100 people will have weakness or paralysis in their arms, legs, or both. This paralysis or weakness can last a lifetime." (Vaccines and Immunizations: Polio 2). These symptoms can cause permanent disabilities that may cripple a child for the rest of their life. However a simple vaccine protects children from this disease and has virtually eliminated the disease from the USA. Again in 1955 when there were over 14,000 cases of polio by 1956 the number of cases dropped to slightly over 5,000, (History 4) a dramatic decrease that continued until polio was officially eliminated from the USA in the mid 1990's as a result of vaccines. However Polio still exists in Afghanistan, Nigeria and Pakistan although it is currently on the loosing end of an eradication schedule similar to the one that wiped out smallpox (CDC, Smallpox 1). Polio should be of special concern to parents as it primarily effects children five or younger and one in two hundred cases lead to paralis and five to ten percent of those paralyzed die as a result. (WHO Poliomyelitis, 4). Despite the dangers of contracting Polio some parents favor

avoiding this vaccine in their children. Two reasons are commonly cited for this, the first being that we have been polio free in the United States since 1994 (WHO Poliomyelitis, 4 ) so why vaccinate your child for something they won't be exposed to? Second being the oral polio vaccine was shown to cause polio in about 1 out of every 2.4 million doses administered, so why expose your kid to something that is shown to infect some people when you can simply live with your chances in polio free America? To answer the first question, yes we are polio free in America, but as mentioned earlier there is still polio in other parts of the world and if someone infected with the disease were to visit or move to the United States they could easily give the disease to those not vaccinated which could easily spread amongst children who have not finished the series of Polio shots or those who do not have access to healthcare, causing an outbreak amongst the young and impoverished. As this CBS article states vaccination rates are high but follow ups that complete vaccination schedules are low amongst the poor. "Poor children are less likely to get booster shots, and the full series of polio, rotavirus and hepatitis B vaccines, according to the report" (Reinberg, 13). Making it crucial for parents who can to limit the amount of children susceptible to polio. Now considering that there is a small but statistically measurable portion of those that received the oral polio vaccine to come down with the actual virus, perfectly explains why many parents would be skeptical of a polio vaccine for their child, however the Polio vaccine used in the United States today is not the oral vaccine. By the year 2000 the USA had moved from a reduced oral polio vaccine schedule to completely removing it and replacing it with the much safer IPV Polio vaccine. ( SOURCE) In short the Polio vaccine has saved and estimated 1.5 million lives, and is one more example of how much more beneficial it is to vaccinate your child. However parents should focus on giving their kids the IPV Polio vaccine as it is much safer.

Vaccines like those used for Smallpox and Polio are great examples of how vaccines can protect children from infectious diseases, why they are important even when diseases have been eliminated from your area, and are safe for your child. But as I pointed out in the section on the Polio vaccine some vaccines do have problems with their ingredients, that may cause harm to children, however vaccines today have been modified to be safer and are tested to ensure safety for children and other users.

Many people are concerned about the ingredients in vaccines and how they affect children, especially infants as they have weaker immune systems compared to adults, and this concern is rightfully placed as good health is the point of vaccines in the first place. One ingredient that concerned many people is Thimerosal. Thimerosal is a derivative of mercury and the FDA describes its use in the following quote "Since the 1930s, it has been widely used as a preservative in a number

of biological and drug products, including many vaccines, to help prevent potentially life threatening contamination with harmful microbes." (FDA, Thimerosal 1) However people became concerned that Thimerosal was causing health issues as it is a derivative of mercury and mercury is shown to be toxic toward humans effecting us neurological and causing developmental issues in children as shown in the same FDA article. However those negative effects of mercury are related to methyl mercury so separate tests are being done for Thimerosal as it is based off of ethylmercury. However the FDA noticed that while none of the vaccines by themselves posed a threat in terms of mercury levels in infants the vaccines cumulative effects when taken in the then current vaccine schedule may pose a risk "At the time of this review in 1999, the maximum cumulative exposure to mercury from vaccines in the recommended childhood immunization schedule was within acceptable limits for the methylmercury exposure guidelines set by FDA, ATSDR, and WHO. However, depending on the vaccine formulations used and the weight of the infant, some infants could have been exposed to cumulative levels of mercury during the first six months of life that exceeded EPA recommended guidelines for safe intake of methylmercury." (FDA, Thimerosal 2) In short some individuals could possibly suffer the effects of being over exposed to mercury. As a result all theimerisol was removed from the american vaccine schedule by 2000 (with the exception of some seasonal flu vaccines). So by fully acknowledging the possibility that Thimerosal could be dangerous to some it was removed from our vaccines with the noted exception of some seasonal flu vaccines, meaning the risk of possible mercury related side effects caused by multiple Thimerosal vaccines in quick succession is virtually eliminated.

But what of the countless other ingredients used in vaccines? Many would contest that they pose just as much if not more of a risk then Thimerosal. however they go through a rigorous testing schedule. Although the responsibility for vaccines being safe should rest on the manufactures several organizations monitor weather or these are safe, the WHO, FDA, and CDC all are responsible for the quality of vaccines in the USA. As WHO states on their website "WHO first adopted recommendations for the national control of vaccines and sera in 1981. This regulatory oversight of biological medicinal products was revised in 1992 to include regulatory procedures for both manufacturing and importing countries, the function of the national control laboratory, and post-licensing monitoring. This guidance was further updated in 1994 to include recommendations for newly developing regulatory authorities." (WHO Regulation...Vaccines, 1). One of the many things WHO does to check vaccines is to check specific lots of vaccines and review the steps done by the company to ensure their safety as described in this passage on the WHO website "Independent lot release involves the confirmation that each lot meets the specifications in the approved marketing authorization for the product and

includes, as a minimum, a review of summary protocols of the results on quality tests conducted by the manufacturer. In some situations, re-testing of some critical parameters by the National Control Laboratories of the regulatory authority may be appropriate." (WHO Regulation...Vaccines, 1)

Although these guidelines are extensive there is more. When a company wants to introduce a new vaccine to the market in the United States they must go through extensive FDA testing. "vaccine clinical trials are typically done in three phases, as is the case for any drug or biologic. Initial human studies, referred to as Phase 1, are safety and immunogenicity studies performed in a small number of closely monitored subjects. Phase 2 studies are dose-ranging studies and may enroll hundreds of subjects. Finally, Phase 3 trials typically enroll thousands of individuals and provide the critical documentation of effectiveness and important additional safety data required for licensing. At any stage of the clinical or animal studies, if data raise significant concerns about either safety or effectiveness, FDA may request additional information or studies, or may halt ongoing clinical studies." (FDA Vaccine...Process 1) In other words the FDA goes through a series of tests first involving animals then involving humans that increase in sample size as long as the tests are going safely. These trials however do not ensure the passing of the vaccine it is then reviewed by the FDA "To be considered, the license application must provide the multidisciplinary FDA reviewer team (medical officers, microbiologists, chemists, biostatisticians, etc.) with the efficacy and safety information necessary to make a risk/benefit assessment and to recommend or oppose the approval of a vaccine. Also during this stage, the proposed manufacturing facility undergoes a pre-approval inspection during which production of the vaccine as it is in progress is examined in detail." (FDA Vaccine...Process 1). Further more the FDA recognizes that it can not predict every possible side effect or outcome of one taking the vaccine until it is taken by the general population as every individual has different reactions to a variety of things. The FDA's approach is further described in this quote from their website "Thus, many vaccines undergo Phase 4 studies-formal studies on a vaccine once it is on the market. Also, the government relies on the Vaccine Adverse Event Reporting System (VAERS) to identify problems after marketing begins." (FDA Vaccine...Process 1) So while there are risks when a new vaccine is introduced into the market the FDA has an intense system of testing prior to approval and continued testing after after after approval to make sure vaccines are safe. But outside of WHO and FDA approval the CDC also monitors vaccines. While the CDC doesn't do the same in house inspections the FDA is responsible for it does the following described on their website "Once vaccines are licensed in the United States, CDC actively monitors the safety of these vaccines through several systems. If any vaccine is found to cause health problems, the vaccine may be withdrawn and no longer given to the public."(CDC vaccine quality 1) Although FDA monitors and



controls similar aspects of vaccines the CDC also checks these things separate of the FDA providing overlapping and comprehensive monitoring of the safety of vaccines.

Vaccines can and have posed some health issues in the past, however they are safe, effective and our current system provides a flexible and effective system of monitoring vaccines that are taken by the public. This is showcased by Smallpox being eradicated the polio vaccines effective use, the US governments quickness to review thimerosal and remove it to ensure safety for children taking the vaccines, and the on going efforts of the FDA WHO and CDC. It's never bad for parents and others to question the safety of vaccines and other medicines especially when concerning children, but it is my belief that vaccines effectiveness and heavy regulation by the government make them not only a safe choice but the best choice for children, even in the face of possible risks, as those risks are mitigated and the alternative is much more dangerous.

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### **Position Statement 6** by Melissa Navarro

The health of our loved ones, of our community, and of the world is the main objective when we discuss medicine and vaccination. Although there are various concerns that many parents and people have with regards to vaccines, it is important to acknowledge that the overall benefits

outweigh the minor risks. For this reason, people and children should be vaccinated. The main concerns that should be evaluated more closely are herd immunity, the trustworthiness of the CDC, and the link between autism and vaccines.

Herd immunity and acquired immunity are both concepts which have been discussed widely when the subject of vaccines arises. For many who choose not to vaccinate, the effects of contracting a deadly disease and naturally fighting it off through the immune system outweighs getting a vaccine for that same curable disease. This is known as acquired immunity. However, according to [merckmanuals.com](http://merckmanuals.com), "Acquired immunity takes time to develop after first exposure to a new antigen." With this information, it is evident that a new born baby, who is first building immunity, is at a higher risk for contracting a disease that it cannot fight off yet. An example of this is seen in one of the videos we watched in class, *Vaccines: Calling the Shots*. A new born baby with a newly developing immune system contracted pertussis, or the whooping cough, by another child. The new born baby was scheduled for her pertussis shot in a few days, but unfortunately contracted the disease before. In this case, her immunity was too weak to fight off the disease, resulting in severe consequences and critical medical attention. Herd immunity would have been the solution in this case. Herd immunity refers to a large number of vaccinated people in a population, who help decrease disease outbreaks, and the overall spread of diseases. In this case, if more children around her were vaccinated against pertussis, the likelihood of her contracting the disease would have been significantly lower. Herd immunity is believed to be beneficial to everyone, especially those individuals who are vulnerable. Furthermore, herd immunity only works if about 19 out of 20 people are vaccinated. The reason for this is because if there is an area in which vaccination rates are low, and someone contracts a disease, another person who is also unvaccinated will have increased chances of acquiring that same disease, making it more likely that the disease will spread within that same unvaccinated population. This is what occurred in the measles outbreak in Wales, in 2013. ([www.ovg.ox.ac](http://www.ovg.ox.ac). "Vaccine Knowledge Project.") Additionally, it is beneficial for the overall population to be vaccinated in order to protect the community as a whole and for herd immunity to be effective.

The CDC's overall concern is public health. However, because the CDC is a vast agency, concerns with trustworthiness often arise. Recently, there has been a report that stated that the CDC covered up valuable information from the public, regarding possible links between vaccines and autism in African American boys. (*Healthimpactnews.com* "Whistleblower-CDC Covered Up MMR Vaccine...") Nonetheless, the CDC does a lot to ensure that public safety concerns are addressed. This is done primarily through their website [cdc.gov](http://cdc.gov). Common questions regarding vaccination amounts and doses, the ages and safety associated with vaccines, infant's immune systems, and

possible side effects, are all addressed and are of access to the public. (*cdc.gov* "Vaccine Safety.") In addition, their website also has what is called a "Pink Book." The Pink Book is a list of all vaccines, and all ingredients used in vaccines. Both the CDC and the FDA play a role in addressing questions regarding ingredient usage. For instance, on *fda.gov*, there is a list that was published on May 2014 which talks about why certain ingredients are used, and the amount that is used in each vaccine. Some of these include aluminum, and formaldehyde. They state that aluminum is added to enhance the immune response, and that all vaccines containing aluminum have a demonstrated safety profile. Formaldehyde is used to inactivate viruses so that they cannot cause disease. For example, the polio vaccine was made with the polio virus. If formaldehyde is a concern to parents, the CDC states that that the amount present is so small, it does not pose safety concerns. In fact, formaldehyde is also produced naturally in the body to produce energy, and build materials needed for life processes. (*fda.gov* "Vaccines, Blood & Biologics.") The CDC also plays a role in tracking side effects associated with vaccines. They have what is known as VAERS, or Vaccine Adverse Event Reporting System. Through this system, individuals can report and send in any side effects they have experienced after receiving vaccination, including minimal ones. Through VAERS, the CDC can monitor vaccine safety more efficiently and take preventative measures for any possible severe side effects. (*Vaers.hhs.gov* "Report an Adverse Event.") Being concerned with the overall trustworthiness of the CDC and larger industries associated with vaccines is comprehensible; however, it is evident that the CDC has done their part in making sure various questions and safety concerns are addressed." The CDC is committed to protecting the health of all Americans-including infants, children, and adolescents." (*Cdc.gov* "Concerns about Autism.")

"Autism is a range of complex neurodevelopment disorders, characterized by social impairments, communication difficulties, and restricted, repetitive, and stereotyped patterns of behavior." ([www.ninds.nih.gov](http://www.ninds.nih.gov) *Autism Fact Sheet*.) Since 1999, there have been growing concerns about the preservative thimerosal, which was previously used in the MMR vaccine, and its link to autism. According the CDC website, "in 2001, thimerosal was removed or reduced to trace amounts in vaccines." They have also provided alternative vaccines that are thimerosal free. In addition; there were several studies which examined the trends in vaccine use and changes in autism, and no links between thimerosal and autism were found. The Institute of Medicine also states that "the evidence favors rejection of a causal relationship between thimerosal-containing vaccines and autism." In fact, there have been no correlations between any vaccine ingredients and autism. (*Cdc.gov* "Concerns about Autism.") Another concern that has emerged is the schedule of certain vaccines. The fear is that children might be receiving too many vaccinations at once, damaging the immune and

neurological systems. The Journal of Pediatrics conducted a study looking at possible links between autism and vaccine schedules. This study analyzed the vaccination and medical records of more than a thousand children, and "totaled each child's exposure to the immune-stimulating compounds, or antigens, in vaccines up to age 2, and totaling the maximum exposure to vaccine antigens that each child received in any single day." They then tracked the children's development through at least age 6. The results "found no link between increased risk of autism spectrum disorder (ASD) and higher exposures to vaccine antigens in the first two years of life, and no association with increased early exposure to the immune-stimulating compounds in vaccines." (*autismspeaks.org* "Too Many Too Soon...," *Vaccine Concerns*.)

For many people, the risks associated with vaccines overrule the benefits. For others; choosing to vaccinate their children is not a question of matter, but an obligation. It is evident that many diseases throughout history have been eradicated, decreased, and prevented because of the use of vaccines. To this day, there are 16 vaccine-preventable diseases that are treated through vaccination. These include polio, measles, and chicken pox. The concern pertaining to the CDC's trustworthiness is addressed because the CDC and FDA are actively engaged in maintaining vaccines safe for public use. In addition, herd immunity is beneficial for individuals who are vaccinated, as well as for the community as a whole. Next, although autism continues to be a deadly disease with inexplicable cause, there has been no evidence suggesting that vaccines and autism are linked in any way. Lastly, social media is very beneficial in today's world; however it cannot be relied on completely to decide whether or not vaccination is right for your child. Overall, vaccines are innovations that have gradually improved human health, and overall lifespan. "The increase in life expectancy during the 20th century is largely due to improvements in child survival; this increase is associated with reductions in infectious disease mortality, due largely to immunization." (*healthypeople.gov* "Immunization and Infectious Diseases.")

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