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# The Controversy of Vaccinations

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### The Controversy of Vaccinations

Throughout history, societal advancements have always occurred despite great criticism from a group or even a majority of people who opposed the idea. When the Wright brothers invented flight, Galileo accurately described the solar system, and Columbus proved that the world was round, there were very strong oppositions that had to be overcome. Advancements in science and technology have often faced criticism and opposition. Today, a similar struggle presents itself as the anti-vaccination movement gains popularity and vigor. The ability to eradicate certain diseases has been developed, yet there are many individuals who completely oppose the use of vaccinations. It is not uncommon to hear of parents refusing to vaccinate their children out of fear that the vaccinations are unsafe, because of reasons listed below. However, the refusal to immunize children is becoming a serious issue in America and will lead to devastating health problems in our country.

Why do people fear immunizations? One of the primary fears that parents have is that immunizations may cause autism, a developmental disability that affects the way individuals interact with and process information. The link between Autism and vaccinations was established in 1998, when a study was published by a British medical doctor named Andrew Wakefield. In this study, 12 patients were vaccinated with the MMR vaccine (a very common immunization for children in the U.S.) and analyzed. MRIs were taken on the children and signs of autism were found and linked to the

vaccinations these children received.<sup>1</sup> However, Wakefield later admitted that the data in his study was grossly distorted and as a result the entire study was retracted. Furthermore, Britain revoked Wakefield's medical license, as his study was deliberately infused with fraud.<sup>2</sup>

Legitimate studies have been conducted on vaccines and their possible links to autism, and those studies have shown that there is no reason to believe that vaccinations cause autism. For example, the Center for Disease Control (CDC) conducted a study in 2013 that analyzed the antigen number in vaccinated autistic patients, and in individuals who were vaccinated yet did not develop autism. The results showed that patients with and without autism received the same amount of antigens from the vaccinations. Therefore, the vaccine itself did nothing different in the bodies of the healthy patients compared to the bodies of the patients who developed autism.<sup>3</sup> Thimerosal (a common vaccine ingredient) is said to be a causative of autism. However, 9 CDC-funded studies have been conducted on this mercury-based preservative and all studies have shown that there is no link between thimerosal and autism.

Another fear that many people have in regard to vaccinations is the harm that may come from heavy metals such as aluminum and mercury as well as other ingredients such as formaldehyde which are added to vaccinations. The concern is that these additives are harmful, external compounds that are introduced in the body in toxic amounts. While these additives may sound frightening, and most people would be alarmed at the idea of mercury and formaldehyde entering their bodies, an analysis of the purposes of these additives and a consideration of their natural sources should put those fears to rest.

Aluminum is included in most vaccines in order to heighten the recipient's immune response to the pathogen. Without this additive, larger amounts of the pathogen would be required to activate the human immune system leading to a larger possibility of the individual actually contracting the disease. Therefore, aluminum is incorporated into vaccines in order to make them significantly safer. In the first six months of life, infants will receive about 4.4 milligrams of aluminum through vaccines. However, breast-fed infants will receive about 7 milligrams of aluminum, and formula fed infants will receive 38 milligrams of aluminum through their diet during the same period. Adults consume about 10 milligrams of aluminum per day through their diet.<sup>4</sup> Therefore, aluminum is not a foreign, unfamiliar compound to the body and should not cause much alarm in vaccines. Furthermore, the FDA has conducted multiple studies to learn more about how the body responds to different levels of aluminum, how aluminum is filtered in the kidneys, and what the baseline aluminum levels are at birth. Based on the results of such studies, safety precautions have been made by the FDA in order to introduce safe levels of aluminum in the body through vaccines.<sup>5</sup>

Preservatives are used in vaccines in order to prevent the growth of harmful bacteria or fungi. The differences between vaccines with preservatives such as thimerosal and those without them are drastic. One tragic example of the failure of vaccines without preservatives is found in the immunization of 21 children in Australia. These children were immunized with a diphtheria vaccine that did not contain additives such as thimerosal. 12 of the 21 children died. Later study into this incident revealed that the deaths of the children were caused by bacterial growth in the contaminated vaccine.<sup>6</sup> Had

additives such as thimerosal been introduced into the bodies of the children along with the vaccine, this tragedy would have been avoided.

Formaldehyde is introduced into vaccines in order to inactivate the pathogen so that it does not cause disease in the recipient. For example, the poliovirus is treated with formaldehyde in order to create the polio vaccine (which contains inactive poliovirus). Formaldehyde has a long history of safe usage in vaccinations and has never been a target of criticism until recently. Since formaldehyde is found prevalently in the environment, humans have a biochemical mechanism in their bodies that breaks it down into harmless materials. Also, formaldehyde is a by-product of multiple biochemical pathways, and therefore, the body continuously processes both environmentally introduced and naturally produced formaldehyde.<sup>7</sup> Formaldehyde in vaccines is processed the same way. Formaldehyde is not foreign to the human body as infants are born with 50-70 times more formaldehyde in their bodies than one dose of a vaccination. Therefore, formaldehyde in vaccines should not be a concern when considering the risks of vaccinations.

Even though the scientific evidence alone is enough to put to rest any fear of immunizations, one can also look to how vaccinations have impacted society as a whole to set aside further doubt of immunizations. Since the implementation of the first vaccination by Edward Jenner, the world has become a much safer place. As a direct result of vaccinations, disease case numbers have drastically decreased, and the eradication of certain diseases has been made possible.

In the twentieth century, polio was a dreaded childhood disease. 35,000 cases of this debilitating disease were recorded in the late 1940s and early 1950s. However, in

1955 the Salk polio vaccine was first introduced and in 1957, the case number dropped to 2,500. By 1965 only 61 cases were reported. A small spike in the case number occurred from 1980 to 1999 as 162 cases of polio were reported. This was a result of the implementation of a new, live vaccination. Additives such as formaldehyde were not introduced in this new version of the vaccine in order to inactivate the virus, which resulted in a spike in the cases reported in the U.S. This new vaccination was quickly revoked, and inactivated viruses with additives such as formaldehyde were again administered. Because of the polio vaccine, cases of this devastating disease are almost never seen anymore. Vaccinations have also almost completely eradicated measles and small pox, and are protecting people from very serious illnesses such as hepatitis and HPV. However, the growing anti-vaccination movement is causing serious health problems in our nation.

*The New York Times* reported that in the first month of 2015, the United States has seen more measles cases than are usually seen in an entire year.<sup>8</sup> In 2000 the measles was declared to be eradicated in the United States; however, currently we are experiencing an alarming rate of outbreaks. This can be directly linked to the decreasing vaccination rates in the U.S. Unfortunately, the anti-vaccination movement, even with its minimal scientific backing, has grown to a point where fewer and fewer individuals are vaccinating their children against serious diseases such as measles, and the effects are being seen.

Herd immunity is a term that health professionals use to describe the percentage of a population that is immunized for a disease. If the herd immunity is at a safe level, the entire population is safe based on the fact that there is very little of the disease being

circulated in a population. However, once the percentage drops below the safe level, outbreaks of the disease begin to occur. The drop in herd immunity percentage can explain the measles outbreaks experienced in 2015.

A lack of scientific knowledge and misinformed individuals are creating a movement that will be detrimental to our society. As more people are misinformed about vaccines, more cases of disease occur. Educating our communities on the health benefits of vaccinations and debunking the myths of immunization need to take place in order to insure that our communities remain healthy and safe.

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