**Why Vaccinations are Essential to your Heath**

Author: Corinne Washington   
Major: Biology   
Department of Microbiology and Molecular Genetics, Oklahoma State University, Stillwater, OK 74078, USA

**Key Words:**

**Vaccines, Vaccinations, Memory b-cells, pathogen**

**Abstract**

Vaccinations are the act of exposing the body to a specific **pathogen** (A microorganism that causes a disease) in an effort to ultimately protect the human body. This pathogen is presented to the body in the form of a vaccine. A vaccine is composed of a very small number of weak pathogens, and when these pathogens are then placed into the body they create memory b-cells. **Memory b-cells** are how the immune system fights off a virus or disease when you come in contact with it in the future. Not only do vaccinations provide protection to the individual but they also help to provide protection to the entire community by reducing the spread of disease. Vaccinations are one of the greatest achievements of biomedical science and public health. They help to reduce extremely high death rates to reductions of 99%, and some have even been eliminated (Orenstein). In the 20th century, diseases like smallpox, diphtheria, measles, mumps, and rubella were highly present throughout the United States killing approximately 790,364 people annually. While in 2016 these same diseases killed only 5, 385 people annually (Orenstein). It is also important to note that both smallpox and diphtheria were eliminated entirely. This significant decrease in death is due to a majority of the population receiving vaccinations. **Vaccinations** (the treatment of a vaccine to create immunity) have helped to reduce the number of diseases, they also can be extremely effective in preventing both death and disability that are caused by some infectious diseases. A vaccine alone does not prevent or protect anyone from an infectious disease. Which is why it is essential for everyone to get vaccinated.

**Background**

In 1796 Edward Jenner used the pus from a cowpox lesion, to create a vaccine. From this vaccine, he performed the world’s first vaccination. This method was proven to be effective by protecting the child who had been vaccinated from the smallpox virus (Alexandra). Jenner’s discovery of vaccines are one of the world’s largest medical advancement in history thus far. Since the creation of the first vaccine, vaccinations have been used to control death from preventable diseases. Over the years the number of vaccines increase, and the number of outbreaks declines. There have always been people who are skeptical about vaccinations. In recent years, vaccinations such as the measles, mumps, and rubella vaccines have been falsely linked to causing autism in young children. Although there is no scientific proof to support these claims, they were publicized and cause many people to deter from vaccinating their children. Vaccinations are not typically mandatory unless your child attends a school that requires them to be vaccinated. Left with the choice to vaccinate or not to vaccinate many parents are choosing not to vaccinate their children.

**Helpful or Harmful?**

An essential part of keeping communities healthy and disease free is actively keeping the entire community vaccinated. If an outbreak was to occur but the majority of the population had been vaccinated it is very likely that no one will contract the disease. But if an outbreak was to occur and the majority of the community had not been vaccinated there is a strong possibility that many people throughout the community will contract the disease. This exact reason is why most public schools require all children enrolled to be vaccinated.

Before a vaccine is administered to the public it is heavily tested for years before it is considered safe enough to be used. We test vaccines so thoroughly because they are administered to people of all ages, children, adults, the elderly, etc. Vaccinations affect the health of millions of people. Which is why all vaccines are tested by the Food and Drug Administration (FDA). The FDA requires that clinical trials be held where the vaccination is tested for many years to ensure the reliability, safety, and longevity of the vaccine. Once a vaccine has been approved by the FDA it is typically recommended to us by the Center for Disease Control and Prevention (CDC). For instance, every year it is recommended for everyone to receive a flu shot as a preventative measure to catching to flu. Both the Food and Drug Administration and the Center for Disease Control and Prevention are roadblocks set in place to keep a potentially harmful vaccination out of our communities. Each batch of vaccines is tested for three elements, potency, purity, and sterilization (U.S. Department of Health and Human Services). **Potency**, measures the power that the vaccine has on the body. **Purity**, searches for contamination within the vaccine. Finally, **sterilization** removes all unwanted microorganisms from the vaccine.

**Recent Controversies**

The public has always reacted strongly to vaccines, reactions vary from positive to negative and a lot of people remain skeptical. In recent years a large amount of skepticism stems from the false narrative that vaccinations are the cause of autism. In 1998, a study was published by Dr. Andrew Wakefield which stated, “Onset of behavioral symptoms was associated, by the [parents](https://www.psychologytoday.com/us/basics/parenting), with measles, mumps, and rubella vaccination in eight of the 12 children…” (Camarata). Within the next few years, this statement was removed from the publication when the basis for the research was found to be fraudulent. Dr. Andrew Wakefield was discredited and lost his license to practice medicine. Despite all of this, many people have held onto the belief that autism is caused by vaccinations.

With many parents choosing not to vaccinate their children they are not only putting their child at risk but they’re putting other children at risk as well. Dr. Orenstein wrote, “Diseases that once induced fear and sparked a desire for vaccines are now rare, and there is a false and dangerous sense of complacency among the public” (Orenstein). These diseases are only rare because vaccinations are being administered. The moment these vaccines are no longer being put to use, all of these deadly diseases will once again claim the lives of many. Despite a constant uproar of allegations, there has never been any scientific evidence that vaccinations cause autism.

**What can I do?**

The very first thing that you can do is to ask about your own vaccinations. Have you been vaccinated? If so, are your vaccinations up to date? It is important to know if you have been vaccinated so that you can properly protect yourself. As a student your most valuable asset to the community is your ability to learn, and to spread accurate information. Inform your friends, and family who may still hold onto these false narratives. Explain to them why vaccinations are necessary. The only way to lessen the negative stigma from vaccinations is to continue to educate as many people as possible.

**References**

Alexandra, M. S., & Markel, H. (2005). The history of vaccines and immunization: Familiar patterns, new challenges.*Health Affairs, 24*(3), 611-21.

Camarata, S., Ph.D. (2018, December 21). Vaccines Cause Autism: The Lie That Never Dies.

Orenstein, W. A., & Ahmed, R. (2017). Simply put: Vaccination saves lives. *Proceedings of the National Academy of Sciences of the United States of America*, *114*(16), 4031-4033.

U.S. Department of Health and Human Services. (2006, October 11). Vaccine Safety.