

Vaccination Hesitation

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### Abstract

This paper explores the history of vaccination, the first forms of vaccines, common misconception, and how vaccines are a good thing. I will also explore the deadly consequences that arise when people decide to opt out of vaccinating. The recent measles outbreak will be discussed in relation to the wave of antivaxxers. Common misconception based on lack of knowledge of vaccines will also be discussed including the myths that vaccines cause autism and the government is pumping us full of chemicals. I will explain where these myths come from. This paper explains where to find correct information about vaccines from the scientists who make the vaccinations.

## Vaccination hesitation

### Introduction

Despite vaccines eradicating diseases and saving billion of lives, some people have deemed them as unsafe and refuse to vaccinate themselves, and their kids. As a result, preventable diseases, mainly measles, are making a comeback. For many years, there has been a controversy about whether or not vaccinations should be mandated for everyone. In the United States, many diseases such as polio, diphtheria, measles, and whooping cough used to be extremely common, until vaccinations came around and started preventing these diseases. Just this year we have had several measles outbreaks in the U.S. Deadly diseases that should be a thing of the past are coming back to life. Many people recall the wave of rubella in the 60s that left many newborn babies deaf, blind, or dead. I was alive during the swine flu pandemic between 2009 and 2010. Older generations remember the age of polio, rubella, and measles. Centuries ago, the black plague eliminated one-third of Europe's population. These diseases affected life in many negative ways. These illnesses once caused country wide panics, so why are people choosing to not receive the one thing that can stop them-vaccination? People should vaccinate their children because it would save many lives and protect society, and major studies behind vaccines being harmful were found to be false. The research that has been vaccination has proven it to be safe, and this information is readily available to the public at any time.

### History

The development of vaccines are one of the greatest achievements in public health developments, but many people have negative ideas about being vaccinated. The first known vaccination comes from 10<sup>th</sup> century China. They would inhale smallpox scabs in order to gain immunity from small pox. This was messy, gross, and sometimes ineffective, but it inspired

future vaccines. Fast forward to 1769, British physician Edward Jenner discovered something else that would pave the way for future vaccinators. He noticed that milkmaids were notorious for not contracting small pox. Instead, they got cow pox. Cowpox was much less fatal than small pox. He had a hunch that they were gaining the immunity from the cows. He tested this by injecting the cowpox infected pus and using it to inoculate a random 8-year old boy. He hypothesized the boy would not get small pox if injected with cowpox. He named his discovery *vacca* after the cow, and this contributed to its controversy. He later exposed the boy to smallpox to confirm his theory, and the boy did not get sick (Seeker, 2017). Many lives were saved after he published his work. His work took us from snorting scabs to having a legit vaccine. Despite being a lifesaving breakthrough in medicine, his work was met with controversy. Many people believed that you were going to develop cow features by taking the vaccine. This is just one notoriously false claim that comes from vaccination misconceptions.

#### Measles: The Comeback

If you let them do their job, vaccines work hard to save lives. When you reject vaccines, outbreaks happen. Measles were eradicated in 2002, but because of antivaxxers, the disease is back with a vengeance. This is alarming considering the rate at which it is unnecessarily spreading. “A total of 17 measles outbreaks affecting more than 370 individuals have been confirmed in 2018 alone, and 10 states are already reporting cases this year. Unfortunately, many more communities are at risk for outbreaks because of areas with low vaccine coverage”(Giroir et. Al. 2018) This information comes from “This Is the Truth About Vaccines”, a New York Times article about the emerging measles epidemic. It is written by Brett P. Giroir, Robert R. Redfield and Jerome M. Adams. Admiral Giroir is the assistant secretary for Health and Human Services. Dr. Redfield is the director of the Centers for Disease Control and Prevention. Vice Admiral Adams is the surgeon general. The authors of this article are experts on health, illness,

and medicine. They have a clear understanding of what happen when people are not vaccinated. This article explores the ways in which unvaccinated individuals are effecting society as a whole. The measles vaccination eradicated the disease in 2002, and it is readily available, but it is not being used to its full potential. Because of this, the disease is rapidly spreading in certain populations, and it is setting us back decades.

### Protecting the Heard

One argument against vaccination is heard immunity. The mentality behind heard immunity is that if the majority of a population has been vaccinated, then it does not matter if a few people are not. This may have a negative effect on babies, the elderly, and people who simply choose not to vaccinate. Measles is a viral infection that causes symptoms including fever, runny nose, cough and a rash that affects the face and body. In severe cases, measles complications can include pneumonia, brain swelling and death. It is highly contagious and is spread through the air. Vaccination is supposed to protect the whole community, including individuals who are too young or old to receive the vaccine. Marcel Salathé , an assistant professor of biology at Pennsylvania state university, explains the conditions in which heard immunity would be effective in the Washington Post:

Herd immunity against measles requires that 90 percent to 95 percent of the entire population are immune, whereas vaccination coverage is measured as the percentage vaccinated of the target population – which only includes people who are eligible for vaccination. This means that to achieve 95 percent immunity in the population for measles, vaccination coverage needs to be higher than 95 percent (Salathe 2016).

In short, if the vaccinated population does not meet a certain percentage, herd immunity is no longer valid. Because of this, the part of the population that is not eligible for the vaccinating is vulnerable, and so are people who choose not to get vaccinated.

The idea of herd immunity comes into question when New York's measles epidemic is brought up in "A measles outbreak is dividing families in this Orthodox Jewish community", a CNN article written by Ray Sanchez. This discusses how measles spread quickly from one source. This source was an unvaccinated child who traveled to Israel, an area where measles were present. That child came back to the U.S. and spread the disease to other unvaccinated children. 359 cases of measles have been confirmed in Brooklyn as of April 19<sup>th</sup> 2019 (Sanchez, 2019). The Health Department ordered Yeshivas and childcare centers in parts of Brooklyn neighborhoods to keep children home from school if they had not received the full course of the MMR vaccine, but one person ignored this order. In January Yeshiva Kehilath Yakov the mandate and allowed an unvaccinated student to return to school (, 2019). The student turned out to have measles, resulting in more than 40 cases connected to this one source. The disease continues to spread today.

#### Fictitious MMR Study

Many people who protest vaccination do so because they believe vaccines cause autism and other diseases. This rumor was started by a British man named Andrew Wakefield. The study was traced to a 1998 study done by Wakefield, who was later discredited. The study was later redacted, and Wakefield was stripped of his license to practice medicine. In 1998, Andrew Wakefield and 12 of his colleagues published a case series in *The Lancet*, a medical journal, which suggested that the measles, mumps, and rubella (the MMR vaccine) cause disorders, mainly autism in children who received these vaccines. A scholarly journal written by

Chittaranjan Andrade from the department of Psychopharmacology in India wrote, “Despite the small sample size (n=12), the uncontrolled design, and the speculative nature of the conclusions, the paper received wide publicity, and MMR vaccination rates began to drop because parents were concerned about the risk of autism after vaccination” (Andrade, 2011). The main reason many people reject vaccines is because of the belief that they cause autism. In 2012, The Lancet completely redacted Wakefield, et al.’s article. They admitted that several aspects of the study were wrong. They conducted invasive studies on the children without obtaining necessary ethical clearings, and their sampling was reported as consecutive, but it was selective. They also picked data that supported their case, so the outcome was very biased. Several medical journals have published articles on the exposure of the fraud. It is true that autism has increased in the past few decades. It is because autism has become diagnosed better, more sensibly, and we have a better understanding of it than in the past. The Wakefield fraud has gone down in history as one of the most heinous frauds in medical history because it lead many parents to not vaccinate their children based on lies which caused mass hysteria.

### Vaccine Safety Concerns

Another misconception about vaccines is that they are unsafe. People find the amounts of chemicals and ingredients unnatural and alarming. *Vaccine Safety Research, Data Access, and Public Trust* is a book released by the Institute of Medicine. It addresses concerns about vaccines being unsafe. It also goes into the process of how vaccines are made, evaluated, and approved for public use. The book talks about the Vaccine Safety Datalink (VSD) in chapter 4. The VSD was created to answer some of the questions people have about vaccine safety. The VSD keeps track of everchanging vaccines and it does studies about the rare and serious events that may follow immunization. When a vaccine is updated or a new vaccine is created, the VSD monitors the safety of these vaccines. The VSD exists :

- To conduct research on important vaccine safety questions in large populations
- To conduct vaccine safety studies that come from questions or concerns in the medical literature or from other vaccine safety systems, like the Vaccine Adverse Event Reporting System (VAERS)
- To monitor possible adverse events when new vaccines are licensed or when there are new vaccine recommendations
- To provide information to committees who make recommendations for the nation (CDC.org)

The book also explores the Shelby amendment and the Information Quality Act. “The Shelby Amendment and the IQA are often viewed as compatible and mutually enforcing in that both promote public access to government information (Copeland and Simpson, 2004), the Shelby Amendment focusing on issues of access and the IQA focusing on issues of quality” (Institute of Medicine, 2005, p.31) the Shelby Amendment is a law that requires researchers to release data research that has resulted from federally sponsored research projects. This allows the vaccine manufacturing and production to be totally transparent to those who are taking it. With all of this information readily available, it can be assured that vaccines are safe.

### Conclusion

Vaccines has come a long way since 10<sup>th</sup> century China. Vaccination is highly important, because it provides protection not only for vaccinated individuals but for those who cannot be vaccinated due to biological and genetic reasons and for young babies who cannot be vaccinated due to their age. Vaccination is important for the whole society. The ability to vaccinate children to prevent disease is, without a doubt, one of the greatest medical breakthroughs to be achieved by mankind. Vaccines save lives, prevent, diseases from spreading, and they are safe.

Misconceptions about vaccination have spread, but if you do your research from actual science, you will find that there is virtually no risk in getting vaccinated. All of the information about you would be putting in your body is available whenever. Do the right thing, keep yourself and others safe by vaccinating yourself and your children. .

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