

## **Text #1: “Vaccines Prevent Infectious Diseases”**

A part of the National Institutes of Health, the National Institute of Allergy and Infectious Diseases (NIAID) is a federal research agency that conducts basic and applied research to better understand, treat, and ultimately prevent infectious, immunologic, and allergic diseases.

With the arrival of vaccines, numerous infectious diseases that struck hundreds of thousands of people in the United States each year—oftentimes lethally—have been eradicated and nearly forgotten today. Vaccines are effective because they artificially create acquired immunity, which naturally occurs after a person is infected and survives. This is achieved through delivering either a partial or weakened microbe to simulate infection that does not cause illness. Vaccines protect the immunized and the people around them; when a critical number of members in a community is vaccinated against a particular disease, known as herd immunity, the group is much less likely to get the disease. In addition, routine childhood immunization has greatly reduced the economic costs of infectious diseases.

Chances are you never had diphtheria. You probably don't know anyone who has suffered from this disease, either. In fact, you may not know what diphtheria is. Similarly, diseases like whooping cough (pertussis), measles, mumps, and German measles (rubella) may be unfamiliar to you. In the 19th and early 20th centuries, these illnesses struck hundreds of thousands of people in the United States each year, mostly children, and tens of thousands of people died. The names of these diseases were frightening household words. Today, they are all but forgotten. That change happened largely because of vaccines.

Chances are you've been vaccinated against diphtheria. You may even have been exposed to the bacterium that causes it, but the vaccine prepared your body to fight off the disease so quickly that you were unaware of the infection. Vaccines take advantage of your body's natural ability to learn how to combat many disease-causing germs, or microbes, that attack it. What's more, your body "remembers" how to protect itself from the microbes it has encountered before. Collectively, the parts of your body that remember and repel microbes are called the immune system. Without the immune system, the simplest illness—even the common cold—could quickly turn deadly.

On average, your immune system takes more than a week to learn how to fight off an unfamiliar microbe. Sometimes that isn't soon enough. Stronger microbes can spread through your body faster than the immune system can fend them off. Your body often gains the upper hand after a few weeks, but in the meantime you are sick. Certain microbes are so powerful, or virulent, that they can overwhelm or escape your body's natural defenses. In those situations, vaccines can make all the difference.

Traditional vaccines contain either parts of microbes or whole microbes that have been killed or weakened so that they don't cause disease. When your immune system confronts these harmless versions of the germs, it quickly clears them from your body. In other words, vaccines trick your immune system to teach your body important lessons about how to defeat its opponents.

Vaccines can prevent a disease from occurring in the first place, rather than attempt to cure it after the fact.

### **Vaccine Benefits**

Once your immune system is trained to resist a disease, you are said to be immune to it. Before vaccines, the only way to become immune to a disease was to actually get it and, with luck, survive it. This is called naturally acquired immunity. With naturally acquired immunity, you suffer the symptoms of the disease and also risk the complications, which can be quite serious or even deadly. In addition, during certain

stages of the illness, you may be contagious and pass the disease to family members, friends, or others who come into contact with you.

Vaccines, which provide artificially acquired immunity, are an easier and less risky way to become immune. Vaccines can prevent a disease from occurring in the first place, rather than attempt to cure it after the fact.

### **Benefits for You and Others**

It is also much cheaper to prevent a disease than to treat it. In a 2005 study on the economic impact of routine childhood immunization in the United States, researchers estimated that for every dollar spent, the vaccination program saved more than \$5 in direct costs and approximately \$11 in additional costs to society.

Vaccines protect not only yourself but also others around you. If your vaccine-primed immune system stops an illness before it starts, you will be contagious for a much shorter period of time, or perhaps not at all. Similarly, when other people are vaccinated, they are less likely to give the disease to you. Vaccines protect not only individuals but entire communities. That is why vaccines are vital to the public health goal of preventing diseases.

If a critical number of people within a community are vaccinated against a particular illness, the entire group becomes less likely to get the disease. This protection is called community, or herd, immunity. On the other hand, if too many people in a community do not get vaccinations, diseases can reappear. In 1989, low vaccination rates allowed a measles outbreak to occur in the United States. The outbreak resulted in more than 55,000 cases of measles and 136 measles-associated deaths.

### **How Vaccines Work**

The human immune system is a complex network of cells and organs that evolved to fight off infectious microbes. Much of the immune system's work is carried out by an army of various specialized cells, each type designed to fight disease in a particular way. The invading microbes first run into the vanguard of this army, which includes white blood cells called macrophages (literally, "big eaters"). The macrophages engulf as many of the microbes as they can.

Every microbe carries its own unique set of antigens, which are central to creating vaccines.

### **Antigens Sound the Alarm**

How do the macrophages recognize the microbes? All cells and microbes wear a "uniform" made up of molecules that cover their surfaces. Each human cell displays unique marker molecules unique to you. Microbes display different marker molecules unique to them. The macrophages and other cells of your immune system use these markers to distinguish among the cells that are part of your body, harmless bacteria that reside in your body, and harmful invading microbes that need to be destroyed.

The molecules on a microbe that identify it as foreign and stimulate the immune system to attack it are called "antigens." Every microbe carries its own unique set of antigens, which are central to creating vaccines.

Macrophages digest most parts of the microbes but save the antigens and carry them back to the lymph nodes, bean-sized organs scattered throughout your body where immune system cells congregate. In these nodes, macrophages sound the alarm by "regurgitating" the antigens, displaying them on their surfaces so other cells, such as specialized defensive white blood cells called lymphocytes, can recognize them.

### **Lymphocytes Take Over**

There are two major kinds of lymphocytes, T cells and B cells, and they do their own jobs in fighting off infection. T cells function either offensively or defensively. The offensive T cells don't attack the microbe directly, but they use chemical weapons to eliminate the human cells that have already been infected. Because they have been "programmed" by their exposure to the microbe's antigen, these cytotoxic T cells, also called killer T cells, can "sense" diseased cells that are harboring the microbe. The killer T cells latch onto these cells and release chemicals that destroy the infected cells and the microbes inside.

The defensive T cells, also called helper T cells, defend the body by secreting chemical signals that direct the activity of other immune system cells. Helper T cells assist in activating killer T cells, and helper T cells also stimulate and work closely with B cells. The work done by T cells is called the cellular or cell-mediated immune response.

B cells make and secrete extremely important molecular weapons called antibodies. Antibodies usually work by first grabbing onto the microbe's antigen, and then sticking to and coating the microbe. Antibodies and antigens fit together like pieces of a jigsaw puzzle—if their shapes are compatible, they bind to each other.

Each antibody can usually fit with only one antigen. The immune system keeps a supply of millions and possibly billions of different antibodies on hand to be prepared for any foreign invader. It does this by constantly creating millions of new B cells. About 50 million B cells circulate in each teaspoonful of human blood, and almost every B cell—through random genetic shuffling—produces a unique antibody that it displays on its surface.

When these B cells come into contact with their matching microbial antigen, they are stimulated to divide into many larger cells, called plasma cells, which secrete mass quantities of antibodies to bind to the microbe.

### **Antibodies in Action**

The antibodies secreted by B cells circulate throughout the human body and attack the microbes that have not yet infected any cells but are lurking in the blood or the spaces between cells. When antibodies gather on the surface of a microbe, it becomes unable to function. Antibodies signal macrophages and other defensive cells to come eat the microbe. Antibodies also work with other defensive molecules that circulate in the blood, called complement proteins, to destroy microbes.

The work of B cells is called the humoral immune response, or simply the antibody response. The goal of most vaccines is to stimulate this response. In fact, many infectious microbes can be defeated by antibodies alone, without any help from killer T cells.

### **Clearing the Infection: Memory Cells and Natural Immunity**

When T cells and antibodies begin to eliminate the microbe faster than it can reproduce, the immune system finally has the upper hand. Gradually, the virus disappears from the body.

## **Vaccines teach the immune system by mimicking a natural infection.**

After the body eliminates the disease, some microbe-fighting B cells and T cells are converted into memory cells. Memory B cells can quickly divide into plasma cells and make more antibody if needed. Memory T cells can divide and grow into a microbe-fighting army. If re-exposure to the infectious microbe occurs, the immune system will quickly recognize how to stop the infection.

### **How Vaccines Mimic Infection**

Vaccines teach the immune system by mimicking a natural infection. For example, the yellow fever vaccine, first widely used in 1938, contains a weakened form of the virus that doesn't cause disease or reproduce very well. Human macrophages can't tell that the vaccine viruses are weakened, so they engulf the viruses as if they were dangerous. In the lymph nodes, the macrophages present yellow fever antigen to T cells and B cells.

A response from yellow-fever-specific T cells is activated. B cells secrete yellow fever antibodies. The weakened viruses in the vaccine are quickly eliminated. The mock infection is cleared, and humans are left with a supply of memory T and B cells for future protection against yellow fever.

### **Source Citation**

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### **Text #2 "Governments Force Children to Get Vaccinated"**

Based in the United Kingdom, Christina England is an investigative reporter and anti-vaccine advocate. She is a regular contributor to Vactruth.com.

Around the world, governments are pressuring parents to vaccinate their children through elaborate scare tactics. In Australia, it is now mandatory for parents to show documented proof of their children's vaccinations for day care. In the United Kingdom, the media perpetuates a measles epidemic in Wales—year after year—despite the low number of actual infections. And in the United States, efforts to segregate students without chickenpox immunizations took place in Pennsylvania, where they were reportedly refused admittance to prom and graduation ceremonies. While studies show that unvaccinated children are no less protected than vaccinated children, governments—in cooperation with the pharmaceutical industry—continue to devise deceptive ways of increasing childhood vaccinations.

### **Parents are often misled to believe vaccines are safe and effective.**

Countries around the world are coming up with more and more elaborate tricks to pressure parents into fully vaccinating their children. Recently we have seen them telling barefaced lies, denying unvaccinated children access to day care facilities and excluding students from attending their graduation ceremony over a chicken pox scare. To learn more, please continue reading.

### **The Truth About the Measles Vaccine**

A paper written by Peter Aaby et al. for The Journal of Infectious Diseases in 1986, titled Vaccinated Children Get Milder Measles Infection: A Community Study from Guinea-Bissau, states that vaccinated

children who contracted measles developed a milder form of the disease. In fact, Aaby's paper states very clearly that vaccinated children are no more protected from the measles than their unvaccinated peers.

In his opening paragraph, Aaby states:

"When vaccinated children develop measles it is usually assumed that seroconversion did not occur because maternal antibodies neutralized the vaccine, because immunoglobulins were administered simultaneously, or because improper handling of the vaccine inactivated it. Numerous cases of 'vaccine failures' have been noted in reports from developing countries. It is often claimed that such failures create a lack of confidence in the immunization program. Some investigators have therefore suggested that the age of the child at vaccination be raised to get a higher rate of seroconversion."

In other words, when a vaccinated child contracts the measles, instead of realizing that the vaccine is ineffective, scientists look for external reasons as to why the vaccination failed. For example, they may look for any environmental factors, which may have contributed.

In this instance, they blame maternal antibodies for seroconversion not occurring and the poor handling of the vaccines. (Seroconversion is the development of detectable specific antibodies specific to, and in response of a particular antigen, such as a virus or a vaccine.)

Aaby continued by stating:

"In an urban area of Guinea-Bissau, where measles has been a major source of child mortality, an immunization program was introduced to control the disease. Nonetheless, measles has continued to cause many deaths, and many children are reported to catch measles after vaccination."

Dr. Viera Scheibner's detailed and valuable research supports Aaby's findings. In her paper *A Critique of the 16-Page Australian Pro-Vaccination Booklet Entitled 'The Science of Immunisation: Questions and Answers,'* in the section titled *Effectiveness of Vaccination,* she writes:

"Outbreaks in the fully vaccinated American children continued with increasing frequency and severity. Without disclosing the vaccination status of children in measles epidemics, claiming victory over measles is just empty jabbering.

Moreover, vaccinated children started developing an especially vicious form of atypical measles. [Late physician Vincent] Fulginiti described the occurrence of atypical measles in children given formaldehyde treated, aluminium precipitated measles vaccine, also referred to as 'killed' measles.

He explained the problem as due to the altered immunological host response caused by vaccination."

Up to this point atypical measles had only occurred in children who had received the 'killed measles' vaccine. However, Dr. Scheibner continued by adding:

"Later on, when live attenuated measles vaccine was introduced, the recipients starting developing atypical measles from it, as well."

Dr. Scheibner continues by quoting a study, written by Rath and Schmidt, who studied 386 children who had received three doses of the killed measles vaccine. They discovered that when 125 of these children were later exposed to the measles virus, 54 of them developed measles. The authors concluded:

"It is obvious that three injections of killed vaccine had not protected a large percentage of children against measles when exposed within a period of two and a half years after immunization."

Dr. Scheibner later explains how diseases such as whooping cough and measles can occur in ever-younger children not because the unvaccinated are spreading them, but because babies are born to vaccinated mothers who lack transplacentally transmitted immunity, which normally protects small babies against contracting any infectious disease.

She continues by adding that breastfed babies of vaccinated mothers are three times more likely to catch measles than babies breastfed by naturally immune mothers.

The US government has become so paranoid that unvaccinated children are a danger to the public that they have gone all-out to segregate them.

Various studies support this. A study titled *Waning of Maternal Antibodies Against Measles, Mumps, Rubella, and Varicella in Communities With Contrasting Vaccination Coverage* by Sandra Waaijenborg et al. published in *The Journal of Infectious Diseases* agrees. Waaijenborg's study researches whether using the MMR vaccine "successfully" for twenty years has adversely affected the maternal antibodies passed to infants by their mothers who were vaccinated as children. Her team concluded that:

"Children of mothers vaccinated against measles and possibly rubella have lower concentrations of maternal antibodies and lose protection by maternal antibodies at an earlier age than children of mothers in communities that oppose vaccination. This increases the risk of disease transmission in highly vaccinated populations."

These studies and papers strongly support that vaccinated children still catch the diseases that they are vaccinated against and that vaccines are not only unsafe, but they are also totally ineffective.

### **Scare Tactics Used in the United States**

The US government has become so paranoid that unvaccinated children are a danger to the public that they have gone all-out to segregate them. The most outrageous vaccine segregation that I have ever heard of took place at a school in Norwin, Pennsylvania, recently.

Nine students who had not received the chicken pox vaccination were informed that they would not be allowed to attend their prom unless they either received the chicken pox vaccination or had a blood test proving their immunity.

Despite the fact that study after study confirms that vaccinated children are no more protected than their unvaccinated peers, governments from around the world ... keep coming up with more elaborate ways to force parents into vaccinating their children.

The panic came after a fellow student caught the disease. However, the students were later informed that they could attend the prom after all because the event didn't fall within the time frame specified to avoid contagion and the school had miscalculated the dates. The health department recommended that students should be excluded eight to 21 days post-exposure to a person with chicken pox.

Pupils were informed that it was unclear whether or not they would be allowed to attend their graduation ceremony, which fell within the period spelled out by the health department.

Sadly, there has been no update on this story, so we do not know if they were allowed to attend their graduation or not.

### **Denying Parents' and Children's Rights**

Despite the fact that study after study confirms that vaccinated children are no more protected than their unvaccinated peers, governments from around the world, hand-in-hand with Big Pharma [pharmaceutical industry] and the medical professionals, keep coming up with more elaborate ways to force parents into vaccinating their children.

I find it very sad that governments are so keen to boost vaccination targets that they are denying parents the ability to earn a livelihood by denying their children's admittance into day care. This seems to me to be over the top and completely unnecessary. How do governments expect parents to be able to support their family if their children are denied access to day care provisions?

Social play is an essential part of a child's development and to deny children the right to play with their peers in a safe play environment purely because they are not vaccinated, in my opinion, amounts to little more than child abuse.

How is the Australian government planning to get around parents' right to opt for natural immunity for their children? Are they planning on changing the law to make vaccination mandatory or will they just make it mandatory for parents who use day care facilities?

Furthermore, to deny students the opportunity of attending their graduation ceremony just because they are not vaccinated with the chicken pox vaccine is totally ridiculous. Graduating from high school is one of the biggest days in a student's life. It is a once in lifetime occurrence. Once it is gone, it is gone.

It is about time that the governments wised up to the fact the unvaccinated children are the most protected children on the planet and that it is the vaccinated that are most at risk of disease and disability. They need to read the work of Dr. Scheibner and the many other researchers who have spent years studying the subject of vaccination and allow children to develop their own natural immunity.

### **Source Citation**

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### **Text #3 "The Anti-Vaccine Movement Disregards the Great Success of Vaccines"**

At the time of this book's publication, Yoo Jung Kim was an undergraduate researcher at the Geisel School of Medicine at Dartmouth and former editor-in-chief of the Dartmouth Undergraduate Journal of Science.

The anti-vaccine movement undermines the scientific consensus that vaccinations are highly effective and beneficial to public health. Present since the very discovery of immunization, opposition today is not based on medical validity, and is comprised of conspiracy theorists, advocates of alternative medicine, and celebrity activists. Their emotionally charged stories and uninformed opinions overshadow the scientific knowledge that supports the efficacy and safety of

immunizations is eroding and vaccine refusals and exemptions are rising, which creates the risk for dormant diseases to reemerge. The scientific community must counter the anti-vaccine movement and more effectively spread its own message.

In February 2010, *The Lancet*, a preeminent British medical journal, retracted a 1998 article that established a possible link between Measles, Mumps and Rubella (MMR) Vaccines and the development of bowel disease and autism spectrum disorders in young children. An investigative report published by the English newspaper, *The Sunday Times*, revealed that Andrew Wakefield—the article's lead author—manipulated patient data, broke several codes of medical research ethics, and received funding from solicitors seeking evidence to file a litigation against vaccine manufacturers. In 2010, the British General Medical Council ruled that Wakefield held a "fatal conflict" of interest during the course of his research; they found him guilty of multiple counts of serious medical misconduct; and stripped Wakefield of his license to practice medicine. Since then, subsequent papers in respected journals, such as *BMJ*, have debunked the connection between MMR vaccines and autism. Despite Wakefield's fall from grace, however, he has continued to assert the validity of his findings through public lectures and appearances, and his discredited research has further inflamed long-standing oppositions to vaccinations, with possible repercussions for the future of public health.

### **History of the Vaccine and the Anti-Vaccine Movement**

The history of vaccine oppositions spans as far back as vaccination itself. The British Vaccination Act of 1840 was the first case of state-mandated public inoculation, following the experiments of Edward Anthony Jenner. Based on the folk observation that milkmaids were generally spared from smallpox, Jenner, an English general practitioner, postulated milkmaids' direct exposure to cowpox lymph through sores on their hands protected them from the related and more virulent smallpox. He demonstrated that by inserting cowpox lymph into an incision made onto the skin, patients could gain immunity to smallpox. Jenner's idea, novel for its time, immediately met with public criticism. Protesters objected to the idea of infecting seemingly healthy individuals. Members of the clergy claimed that vaccination was ceremoniously unclean, because the body fluid used to confer immunity was derived from animals. Others objected to vaccination because they believed that subsequent government efforts to increase vaccination undermined individuals' rights to control their bodies and those of their children, a tension that escalated with the introduction of mandatory vaccination policies in England.

While vaccine technology has evolved tremendously in recent years, the anti-vaccine movement itself has changed little from the anti-vaccine leagues of the nineteenth century.

### **Vaccines and the Modern Anti-Vaccine Movement**

Vaccination technology has advanced greatly since the crude and direct infections of Jenner's time. Live-attenuated vaccines use lab-weakened microbes that elicit a strong antibody response, which often confers lifelong immunity to the patient. Inactivated vaccines utilize microbes killed by chemicals, heat, or radiation in order to confer immunity, and, although the vaccine is more stable and portable than the live-attenuated counterpart, the effects are generally not as long-lasting. Unlike both live-attenuated and inactivated vaccines, subunit vaccines use only the essential antigens used by the immune system to identify the disease microbe, thereby lowering the chances of adverse side effects.

Current developments in vaccine technology promise increased safety and efficacy. Still in its experimental stages, the DNA vaccine, modeled after the genes of the microbe, would evoke a strong antibody response to the free-floating antigen secreted by cells infected by the microbe and stimulate a strong cellular response against the microbial antigens displayed on infected cell surfaces. The



recombinant vaccine, also in its developmental stages, would use an attenuated virus or bacterium to introduce microbial DNA to cells of the body that closely mimics a natural infection and effectively stimulates the immune system.

While vaccine technology has evolved tremendously in recent years, the anti-vaccine movement itself has changed little from the anti-vaccine leagues of the nineteenth century. Its members encompass a vast range of individuals, from conspiracy theorists to educated consumers whose reasons against vaccines stem from a variety of popular reasoning such as "mixture of world views held about the environment, healing, holism ... and a critical reading of the scientific and alternative literature."

Many vaccine refusers continue to be wary of the growing encroachment of the state over individual health. By the 1980s, all fifty states had passed immunization requirements for public schools, and the vaccination requirements have since grown. Parents today are recommended to give their children thirty shots before the age of six, much more than the dozen or so shots that they received during their own childhood. The increasing requirements have piqued concerns regarding vaccine safety as more parents are taking advantage of states' immunization provisions for vaccination exemptions. As of March 2008, all states permitted medical exemptions from school immunization requirements, 48 states allowed religious exemptions, and 21 states allowed exemptions based on philosophical or personal beliefs.

Other major reasons for vaccine refusal in the United States can be attributed to increasing concern of vaccine safety and a decreasing concern regarding the risk of many vaccine-preventable diseases. Compared with parents of vaccinated children, parents who exempt their children from vaccination generally have a lower opinion of the severity and their children's susceptibility to vaccine-preventable diseases. In a sense, vaccination has become a victim of its own phenomenal success. As more people are vaccinated, the virulence of disease fades away from public memory, and the population's tolerance for side effects—even imagined ones—drops even further.

Frustrated by the lack of answers, concerned parents may mistake correlation as causation and create a state of misinformed fear that could convince other parents to refuse or delay vaccination for their own children.

The activities and theories of the vaccine refusers have been amplified to the general public through the Internet and mass media; a litany of celebrity activists and sensationalist media coverage have overshadowed scientific data. Opinions and speculations have triumphed over scientific consensus that there is no rational reason to fear immunization. Despite the lack of scientific proof, the vaccine refusers are gaining traction. An increasing number of American parents have refused or delayed vaccines for their children, creating a potential health risk for future generations and prompting a reemergence of long-dormant diseases.

### **Risk vs. Risk**

Concerns regarding vaccines are not unfounded. As a biological product, vaccines do carry real—but very rare—risks, ranging from rashes or tenderness at the site of injection to fever-associated seizures called febrile convulsions and dangerous infections. For instance, oral polio vaccine (OPV), a live-attenuated vaccine, is known to cause roughly one case of the disease per 2.4 million doses—a miniscule risk posed mostly to patients with compromised or underdeveloped immune systems, such as infants, the elderly, chemotherapy patients, and HIV-positive patients.

The risks posed by the extreme rarity of side effects are outweighed by the risk posed by non-vaccination, such as the resurgence of diseases long considered eradicated. For example, between 2001 and 2008, a

median of 56 measles cases were reported to CDC annually, yet during the first 19 weeks of 2011, 118 cases of measles were reported—the highest recorded figure since 1996—among which 105 patients were unvaccinated. Children with exemptions from school immunization requirements are at increased risk for contracting measles and pertussis (whooping cough), and may pose a risk to others who are too young to be vaccinated, those who cannot be vaccinated, or those who were vaccinated but are unable to muster a sufficient immunologic response. Because sufficiently high immunization rates must be maintained throughout a given population to prevent future outbreaks, unvaccinated children pose a potential risk to public health.

### **How to Face the Anti-Vaccination Movement**

Despite lack of scientific footing, the anti-vaccine movement is nevertheless fueled by the stories of parents who resolutely believe that immunization has harmed their children. Frustrated by the lack of answers, concerned parents may mistake correlation as causation and create a state of misinformed fear that could convince other parents to refuse or delay vaccination for their own children.

Laws concerning immunization are state-based; as such, the most efficient method to raise vaccination would be for state legislatures to make vaccination exemptions more difficult to obtain—for example, by requiring counseling on the hazards of non-vaccination for parents seeking exemption. Yet, state governments must tread carefully; a heavy-handed approach may threaten individual choice and further inflame the vaccine refusers, whereas a passive approach could potentially undermine public health. As such, in order to maintain high vaccination rates while preserving patient choice, the scientific community and local health providers must place an emphasis on educating the public to enable them to make informed decisions in consideration of the risks posed by vaccination exemption.

Medical providers have an important role in affecting their patient's choices of health consumption. A high proportion of those providing care for children whose parents have refused vaccination and those providing care for appropriately vaccinated children were both found to have favorable opinions of vaccines. However, health care practitioners providing care for unvaccinated children were less likely to have confidence in vaccine safety and less likely to perceive vaccines as benefitting individuals and communities, suggesting a correlation between practitioner and patient opinion.

Secondly, the scientific community must do a better job of disseminating its results to the wider public. Scores of data and professional opinion have gone unheeded, routed by baseless fears and rumors. The sidelining of scientific knowledge by uninformed clamor demonstrates the inability of the scientific community to effectively communicate with the masses, which may set a dangerous precedent for future fears.

According to researchers, the public must be educated in order to regain its confidence in the enormous benefits of vaccinations and to maintain those benefits within the wider society. Furthermore, the scientific community must become more effective in transmitting its message to the wider public, lest its lessons be swept away by the tide of misinformation.

### **Source Citation**

Kim, Yoo Jung. "The Anti-Vaccine Movement Disregards the Great Success of Vaccines." *Should Vaccinations be Mandatory?* Ed. Roman Espejo. Farmington Hills, MI: Greenhaven Press, 2014. At Issue. Rpt. from "Busting the Anti-Vaccine Epidemic." *Dartmouth Undergraduate Journal of Science* 12 (Fall 2011). *Opposing Viewpoints in Context*. Web. 11 Feb. 2015.