

# The Anti-Vaccine Movement Disregards the Great Success of Vaccines

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*Should Vaccinations be Mandatory?*, 2014

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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 [vaccines](#). As a result, public confidence in 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

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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

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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

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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

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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.

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## Further Readings

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### 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. 9 Feb. 2015.

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**Gale Document Number:** GALE|EJ3010616221