Before the creation of their respective vaccines, rubella infected 12.5 million Americans, caused 11,000 miscarriages, and led to the death of nearly 2,000 babies from 1964 to 1965; hundreds of Americans died from measles every year; and 15,000 Americans died from diphtheria in 1921. In the United States, diseases like polio (1979), smallpox (1980), and measles (2000) had been eliminated because of vaccines.¹

Vaccines provide immunity (protection against an infectious disease) for those who are vaccinated as well as those who cannot be vaccinated due to medical reasons and those who do not develop immunity. As more individuals are vaccinated, the likelihood of an outbreak spreading and infecting those who do not have immunity decreases (a concept known as herd immunity).²

In recent years, vaccination rates have declined and vaccine preventable outbreaks have increased. A 2017 Centers for Disease Control and Prevention (CDC) report found that nearly 1.3 percent of children two years old and younger had not received any of the 14 vaccines recommended. This represents a 0.4 percentage point increase from 2013 and a 1 percentage-point increase since 2001. Nearly 30 percent of children between the ages of 19 and 35 months had not received the combined 7-vaccine series.³ This brief will examine the issue of vaccine hesitancy in the United States and the ways that state policies affect the issue.

Did You Know?

In a joint survey by Research!America and the American Society for Microbiology:⁴

81% of adults agree that failure to vaccinate a child puts other children at risk.
The Anti-vaccine Movement

There have been anti-vaccine sentiments throughout the course of American history. The movement has grown faster more recently with the spread of misinformation through the Internet and social media. According to a study in *Vaccine*, there are four distinct themes in the anti-vaccination discourse:

Mistrust of the scientific community
Some people who oppose vaccines say they do not trust health authorities or believe they are uneducated and unqualified. In reality, vaccine efficacy studies undergo an extensive review process.

Belief in natural alternatives
Some people believe that there are homeopathic or natural alternatives to vaccines that do not contain chemicals. Others believe that our bodies will naturally develop immunity after the illness takes its course. Unfortunately, babies’ immune systems may not be strong enough to overcome infectious diseases and have a high likelihood of disability or death.

Concerns around the safety of vaccines
Many parents believe that vaccines contain ingredients that cause autism. The Institute of Medicine (IOM) and the CDC performed large-scale studies on individual vaccines and found no link. A recent Denmark study of 657,461 children contributed to the body of literature that vaccines do not increase the risk of autism.

Some parents are concerned that vaccines contain dangerous metals. Vaccines contain aluminum, which helps trigger a better immune response and is already naturally found in food, water, and breast milk.

Some parents believe that vaccines have dangerous side effects that increase the risk of mortality. In a joint study with the IOM, the Department of Health and Human Services conducted a large-scale review and concluded that few adverse experiences were linked to vaccines. Most side effects are mild and tend to dissipate quickly. The majority of people do not experience any side effects. They also concluded that vaccines do not cause or exacerbate existing medical conditions.

Belief in government conspiracies about vaccines
Finally, some people believe that the government is covering up information about the adverse effects of vaccines or that the government is using vaccines to control people.

Misinformation is dangerous mainly because it leads to vaccine hesitancy and parents begin to seek exemptions for their children for philosophical reasons. In light of recent vaccine preventable outbreaks, YouTube pulled anti-vaccine advertisements, and Facebook announced that it would change its algorithm to ensure that anti-vaccine pages do not proliferate.
Measles Outbreaks in the United States

In the last ten years, there has been a resurgence of measles (a contagious virus spread by coughs and sneezes) in the United States that is correlated with the decline in vaccination rates. In 2014, there were 23 outbreaks, including one that occurred in Disneyland leading to more than 100 infected children and adults. The latest 2019 count (387 cases) includes three months and has surpassed every annual caseload in the past nine years except 2014 (667 cases). Researchers found that over half of those cases involved patients who were unvaccinated and approximately 71 percent of those were not vaccinated due to religious or philosophical reasons.

States and Vaccine Exemptions

While all school children in the US are required to receive all their vaccines, parents may attain one of two exemptions: medical exemptions (MEs) and nonmedical exemptions (NMEs). Medical exemptions are given to children who cannot be vaccinated because they are immunocompromised or at risk of having a severe allergic reaction. These can be granted in all of the states.

As for nonmedical exemptions, two types exist: those that are granted for religious beliefs and those that are granted for personal beliefs. An example of a religious belief exemption is an opposition to the ingredients in a vaccine due to religious dietary laws. An example of a personal belief exemption is opposition to vaccines due to the unfounded belief that vaccines cause autism. Currently, 47 states allow NMEs based on religious reasons while 17 states allow NMEs based on philosophical, personal, or other objections.

States and Alternative Strategies

Currently, vaccine exemption laws are left up to the states. In many states, legislation to prohibit NMEs may face resistance from the public and other lawmakers. As a result, states are testing alternative solutions. For instance, Utah, Arkansas, and Oregon have begun testing optional online educational modules for parents who want to print a certificate for the exemption. Michigan allows philosophical exemptions and has seen a 25 percent decline in the number of exemptions between 2014 and 2017 after it began requiring parents to participate in an educational component. California banned NMEs in 2015.
Looking Ahead

Between 2009 and 2017, the number of children with NMEs increased in two-thirds of the states that allow NMEs for philosophical reasons.\(^{18}\) As a result, some experts have proposed using federal interventions such as Congress issuing legislation that preempts state laws by requiring immunization, expressly forbidding the use of NMEs or issuing grants to incentivize states to develop or sustain immunization program infrastructures.\(^ {19}\) A majority of Americans believe that unvaccinated children pose a risk. If states have difficulty in containing outbreaks within state lines, perhaps it is time for a federal public health measure to prevent outbreaks of vaccine preventable diseases between states.

References

7. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4944327/
11. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4944327/
15. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4944327/

\(^{18}\) The MMR vaccine is for immunization against measles, mumps, and rubella.

\(^{19}\) Did You Know?

According to a 2016 survey conducted by the Pew Research Center:\(^ {20}\)

88% of adults reported that the benefits of the childhood vaccine MMR* outweigh the risks

82% of adults reported that the MMR* vaccine should be required in order to attend public school

*The MMR vaccine is for immunization against measles, mumps, and rubella.