VIEWPOINT

Safe Vaccinations for a Healthy Nation
Increasing US Vaccine Coverage Through Law, Science, and Communication

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Memory can be dangerously short. Measles once accounted for 2.6 million deaths globally every year. In the 1950s, 400 to 500 individuals in the United States died annually, with 3 to 4 million infected. With the discovery of a measles vaccine, the number of deaths plummeted to 110 000 deaths globally in 2017.[1] Measles was officially eliminated from the United States in 2000. Yet, misinformation has influenced parents to refuse vaccination for their children. Most measles cases have occurred among unvaccinated children.

Measles can have serious consequences, with as many as 30% of children in some studies developing complications, including pneumonia, encephalitis, and hearing loss. Between 1994 and 2016, childhood immunizations prevented an estimated 381 million illnesses and 855 000 deaths, and saved $1.65 trillion in societal costs.[2] Not only have measles outbreaks increased, but there have been more cases of mumps and pertussis.

Behind the Outbreaks

As summarized by the National Academy of Medicine, large clinical trials, and numerous observational studies, have definitively refuted any connection between vaccines and autism.[3] Further, multiple vaccines spaced together, another expressed health concern, pose no greater risk. Two doses of vaccine provide 97% protection for measles. "Herd immunity" requires 95% immunization coverage to provide community protection against measles.

Yet, measles outbreaks have become more common, with a national vaccination rate of 91%, below estimated herd immunity levels. Far lower rates of vaccination coverage are clustered in communities claiming religious or philosophical exemptions.[4] For instance, Clark County, Washington, experienced a measles outbreak, with only 78% of children vaccinated. In 2017, 17 outbreaks occurred across the country. In 2014-2015, a measles outbreak in Disneyland in California led to 147 cases across the United States; Amish communities in Ohio reported 383 cases in 2014. This year (2019) is on track to have more cases than any year since measles was officially eliminated. In addition to medical consequences, outbreaks are expensive to manage.[5]

Public distrust of vaccinations has a long history, but unfounded fears are now spread rapidly through social media (Facebook, Twitter, and WhatsApp), along with search engines that fail to separate evidence-based health information from false claims. Automated bots and trolls escalate the penetration of misinformation. Parents often are unable to distinguish between reliable and misleading reports. Research shows that misinformation spreads more quickly on social media than accurate information.[6] The Facebook group called Stop Mandatory Vaccinations, for example, shares videos of parents of children purportedly harmed by vaccines. Some physicians have publicly cast doubts on vaccine safety.[7]

State Vaccination Laws

The Centers for Disease Control and Prevention recommends a series of childhood immunizations, but states have sole authority to mandate vaccinations. Every state requires vaccines as a condition of school entry, and all states grant exemptions for medical necessity. States routinely grant medical exemptions to children at risk, for example, with compromised immune systems or allergies. California, Mississippi, and West Virginia offer no nonmedical exemptions. Every other state permits religious exemptions, while 17 states also permit philosophical exemptions based on "personal" or "moral" beliefs.[8] When California eliminated nonmedical exemptions following the Disneyland outbreak, the state vaccination rate for kindergarten-aged children increased from 92.6% to 97.3%, with a reduction in measles cases.[9]

In the seminal case of *Jacobson v Massachusetts* (1905), the Supreme Court upheld a local ordinance that fined individuals for refusing smallpox vaccinations. Public health powers had to be necessary and proportionate. In 1922, the Court upheld compulsory school vaccinations. Thus, even though states must grant medical exemptions, they are not constitutionally required to offer religious or conscience exemptions. The Supreme Court has made clear that generally applicable state public health laws do not infringe on religious freedom. Consequently, courts have upheld vaccination mandates in Arkansas and West Virginia that made no exception for religious beliefs. Even if a state chooses to offer religious exemptions, it can take steps to ensure parents' beliefs are sincere; New York scrutinizes every claim for a religious exemption, whereas Illinois requires parents to specify the religious belief that conflicts with immunization.

Communicating Facts, Not Falsehoods

Most parents who refuse vaccinations for their children do so with good intentions. If they had access to high-quality information from trusted sources, many would choose to have their children vaccinated. Increasing vaccine coverage will require a shift in the informational environment, both to curtail circulation of false information and to educate parents about vaccination facts.

False information is often spread through social media platforms and Internet search engines. Companies that operate these platforms have a social responsibility to filter out misleading information. In early March 2019, Facebook pledged to reject advertisements with false vaccine claims and lower rankings of pages that purvey falsehoods. When Pinterest discovered misinformation on its site, it blocked all vaccine searches and sought longer-term solutions. YouTube is removing advertising from videos that spread false information and deleting them from recommendation engines. Amazon is removing antivaccination videos from its Prime Video service. The major search engines, however, have not yet acted to distinguish "levels of evidence" in the vaccine information they provide in response to search queries.

Safe Vaccinations for a Healthy Nation

Policy makers have clear tools to increase vaccine coverage, thus reducing harm to children and their families. Because vaccines play such a critical role in the health of children, a long-term national health communication campaign to build vaccine literacy, potentially called *Safe Vaccines for a Healthy America*, could be useful in increasing and restoring faith in the safety and importance of vaccines. The dissemination of evidence-based information should be a key part of the program and should be uncontroversial. As part of such a campaign, the Department of Health and Human Services could partner with states, foundations, and the private sector to spearhead multisectoral action that is parent-friendly and nonjudgmental. State grants or contracts could provide resources and technical assistance on effective health communication. The campaign could deliver information in plain language using trusted sources, including celebrities and, critically, parents. For example, the parents of immunosuppressed children could explain why their children are at risk of contracting a preventable infection.[10] Health professionals could correct misleading information on social media, offering science-based content. Pediatricians and obstetricians could also counsel parents, reassuring them about vaccine safety. When parents request vaccine exemptions, states could require a physician's certificate affirming they have discussed vaccines' benefits and risks, and indicate that they are aware that false responses have legal consequences.

Corporate Social Responsibility

Public information campaigns compete with a complex web of false information. Public health authorities, therefore, should partner with the private sector to improve the informational environment. Encouragement, and oversight, of major social network organizations is needed to stem the flow of misleading information. Private and publicly traded companies should screen out false antivaccine messages and cease providing a platform for harmful exchange of falsehoods that promote childhood disease, just as they do for sexually explicit, violent, or threatening messages. Social media companies could go further, exercising corporate responsibility by disseminating science-based health information to advance societal well-being and vaccine confidence.

End or Tighten Religious and Philosophical Exemptions

The federal government should encourage states to end or tighten religious or philosophical exemptions, following the lead of California, which enacted evidence-based policies. If states fail to act, federal authorities have the power to incentivize compliance. They could, for example, condition a portion of Medicaid or Affordable Care Act funding on states tightening their vaccine laws. Conditional funding should not be overly coercive, and Congress should take steps to avoid harming already disadvantaged populations. While the federal government has limited power to compel vaccination, the Supreme Court has affirmed its use of conditional funding. In 1987, the Court upheld a law conditioning national highway funding based on states enacting a minimum drinking age of 21 years. Immunization is a national problem as childhood diseases transcend state borders; vaccine hesitancy, therefore, requires a national solution.

Parents may object to stronger measures to ensure children are vaccinated. Until a child gains the capacity to make medical decisions, few would deny that parents have broad autonomy to act in the child's best interests. Yet, the rights of parents do not extend to decisions that potentially harm their, or other, children's health. Young children, and *any* child who is immunosuppressed, is imperiled if vaccination rates fall too low. They too should have the freedom to attend school or play with friends without fear of contracting a serious disease.

ARTICLE INFORMATION

Conflict of Interest Disclosures: None reported.

Published Online: April 19, 2019. doi:10.1001/jama.2019.4270

Additional Contributions: Jonathan Fielding, MD, MPH, MA, MBA (University of California, Los Angeles), Eric A. Friedman, JD, and Jingyi Xu, LLM (Georgetown University), contributed to the conceptualization, research, and writing of this Viewpoint. They did not receive compensation.

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