

The Role of Public Health Communication in Combating Vaccine Hesitancy: A Historical Comparison

Isabel Dewey¹

1. McMaster University, Honours Life Science, Class of 2021

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SUMMARY

Within this piece, a crucial aspect of public health is explored: science communication. When examining what drives vaccine hesitancy, a global public health issue, it becomes evident that science communication through the media, to a degree, is at fault. This piece looks back on the first instance of vaccine hesitancy surrounding the smallpox vaccination in the early nineteenth century. When taking a closer look at the historic smallpox pandemic, government responses to concerned individuals were beneficial in easing public concerns. However, similar government action has not been taken in response to newer vaccination resistance, as seen with the MMR vaccine. This piece describes the extensive media coverage and spread of misinformation regarding Andrew Wakefield's retracted research that linked vaccines to autism. To conclude, this piece realizes the differences between the smallpox and MMR vaccines. It attributes current hesitancy and the rise of anti-vaccination movements to poor science communication and government responses. Vaccine hesitancy is a significant public health issue that needs to be addressed, especially with the rise of new vaccines for the current COVID-19 pandemic.

ABSTRACT

In the current COVID-19 global health crisis, discussions of vaccine safety and hesitancy are being brought to light, as they were during many historical pandemics. In order to suggest effective public health interventions, it is important to examine the historically conventional interventions implemented during previous pandemics. In this review, the governmental role and communication strategies during the smallpox and the measles, mumps, and rubella (MMR) vaccine hesitancies are compared. Specifically, it assesses how these factors may have contributed to vaccine hesitancy and the difference in outcomes. This discussion emphasizes the importance of effective science communication and public health interventions in the prevention and eradication of diseases.

Keywords: MMR, smallpox, vaccine, science communication

INTRODUCTION

In the current media landscape, both credible and non-credible scientific information can be widely disseminated. As a result, misinformed opinions can be posted on the internet for anyone to access. People often have no way to validate these claims, increasing their vulnerability to being influenced. Before the internet, distribution of public health information was much more controlled. Misinformation has fueled many controversial public health debates, most prominently, vaccine hesitancy. This can be seen in the controversies of the measles, mumps, and rubella (MMR) vaccine, as well as the smallpox vaccination in the nineteenth century. When examining these two cases, it is crucial to ask what these debates have in common. Are differences in debates, governmental responses and media communication responsible for their outcomes?

SMALLPOX ANTI-VACCINATION MOVEMENT OF THE 19TH CENTURY

In the early nineteenth century, an anti-vaccination movement arose in response to a novel vaccination for smallpox.¹ Smallpox was a devastating illness, whose eradication in 1980 is one of the World Health Organization's greatest public health achievements.¹ In the late eighteenth century, the first scientific attempt to control the disease with vaccinations was led by Edward Jenner. He theorized that the immunity of individuals who had survived the disease could be replicated and used as a preventative vaccination.¹ This novel idea came with extensive skepticism. Many individuals were worried about the unknown effectiveness of these vaccinations. In addition, many concerns were based on religious beliefs.² In the nineteenth century, disease

was largely thought to be due to sin, with vaccination seen as an attempt to interfere with God's will.²

As a response to this rising fear and distrust, Vaccination Acts were created to enforce vaccinations and protect public health. The first Vaccination Act in 1840 provided free vaccinations to the poor. It also outlawed the formerly used procedure called variolation, which was much more dangerous than vaccination.³ In certain geographical areas, the acts proved to be effective, but in most regions, they were met with resistance.³ Following the Vaccination Act of 1853, the revised act of 1867 mandated vaccinations for anyone under the age of 14.⁴ This law was fought by the Anti-Compulsory Vaccination League, which had a seven-point statement focusing on the infringement of personal autonomy.⁴

Some anti-vaccination journals include the *Anti-Vaccinator*, the *National Anti-Compulsory Vaccination Reporter* and the *Vaccination Inquirer*.⁵ Propaganda was often used to visually represent and exaggerate vaccination concerns and was likely distributed in an attempt to grow the anti-vaccination movement.⁶ As a result, individuals increasingly opposed and refused vaccinations, causing outbreaks to flourish. For example, the vaccination system in Stockholm broke down due to the spread of misinformation, and vaccination rates fell to roughly 40% in 1872. The rest of Sweden had a rate of roughly 90%. As such, the undervaccination led to a smallpox epidemic in 1874, which eventually resulted in widespread vaccination.²

In response to the emerging anti-vaccination movement, the General Board of Health, created in 1848 in Great Britain, investigated the inaccuracies of the spreading propaganda. To settle misinformation surrounding vaccinations, they released a report summarizing the responses to a questionnaire sent to over 500 physicians.³ Another governmental response was the formation of a Royal Commission, which was appointed to examine both pro and anti-vaccination ideologies. In 1896, they declared that penalties for not vaccinating should be abolished despite the efficacy of the vaccination.³ A new Vaccination Act in 1898 integrated this change. The Commission also introduced the *Conscience Clause* which allowed exemptions for parents who believed that vaccinations were unsafe or ineffective.⁷ Overall, the smallpox anti-vaccination movement sparked the revision of multiple Vaccination Acts, which was instrumental in the development of safer vaccination procedures. Hesitancy, in the form of protests and propaganda, was met with appointed boards to weigh anti-vaccination concerns and scientific facts equally to reach conclusions that would benefit public health.

MMR VACCINE CONTROVERSY

Similar hesitancy still surrounds the MMR vaccine. Concerns arose after the 1998 publication of a research study by Dr. Andrew Wakefield that has since been retracted due to fabrication of data. Wakefield's study declared an association between the MMR vaccination and the onset of autism.⁸ Apprehension about this finding spread quickly due to the extensive media coverage surrounding this study. A survey was later conducted to quantify this media coverage and researchers found that the public was misled to believe that equal evidence existed both for and against the vaccination.⁹

Certain religious groups in the U.S. are likely to oppose the vaccination and are granted "religious faith exemptions".¹¹ Other individuals may seek philosophical exemptions, that are not faith or group based, but rather focus on the individual's objection. However, many people have collectively formed anti-vaccination groups that believe vaccinations "are either more dangerous than clinicians will admit or somehow not conducive to the natural development of a child".¹¹

Though this controversy began in 1998, its impacts are still felt today. Much like Stockholm, this anti-vaccination movement sparked a measles outbreak in 2015, in a Disneyland park in California. As the outbreak spread to multiple states, this event initiated the re-evaluation of vaccine exemptions.¹¹ In the United States, vaccination exemptions have led to geographical clusters of intentionally unvaccinated individuals.¹² These areas are at high-risk for outbreaks of preventable diseases like measles. Ultimately, undervaccination contributes to preventable outbreaks that put a strain on public health systems.¹³

CONCLUSION

The MMR and smallpox vaccination controversies were driven by questions surrounding vaccination efficacy, desire for autonomy and parental choice, and religious and ethical concerns. When comparing the smallpox and MMR vaccination controversies, arguments for religious beliefs and autonomy have persisted. It is evident that the nature of the media coverage and communication likely played a significant role in the outcomes of these two preventable diseases. The MMR controversy was fueled by great media attention that was not met with effective governmental response. As cases of measles persist, it is clear that governments and public health officials should focus on improving their communication methods to limit misinformation and misguided concerns. Ultimately, both examples demonstrate the need for proper science communication surrounding vaccines, as they can protect people worldwide from dangerous communicable diseases.

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