Compulsory Vaccination in 19th Century Britain

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March 24, 2025

The rapid spread of Smallpox in the late 18th century caused havoc in Britain, killing millions in its wake. With the discovery of the vaccine in 1796, Edward Jenner bought new hope against this vile predator. To ensure widespread protection, the government passed a series of acts from 1840 to 1853 (Fenner, 1988), making the vaccine free and compulsory for all children under the age of 14. While many welcomed the vaccine as a breakthrough in public health, others vehemently opposed it, arguing that compulsory vaccination infringed on their personal liberties and religious beliefs. This essay aims to explore both sides of the debate in themes such as therapeutic efficacy, overall implementation, and the state of misinformation; it further aims to discuss, in retrospect, the overall effectiveness of mandatory vaccination.

It is crucial to first understand the need for vaccination in 19th century Britain. Smallpox was a malignant killer that had no available cure (Millward, 2019). The only therapeutic procedure used was *inoculation* — subcutaneous instillation of smallpox virus taken from a fresh matter of an affected individual into a nonimmune individual. Apart from the uncertainty to obtain immunity, this process was dangerous and could also spread other vile diseases such as *syphilis*. Thus, when Jenner discovered the vaccine, it was considered a massive breakthrough. He heavily vouched for vaccination around Britain and the world and presented various suppositions in his book *An Inquiry into the Causes and Effects of the Variolae Vaccinae* published in 1798 (Jenner, 2012). His claims included that the vaccine possessed such "singular properties as indisputably to render it one of the most important discoveries that have ever been made for the benefit of mankind.""',

Some of these claims were credibly proven through extensive testing conducted in 1801(World Health Organization, 2021); other claims such as that of the vaccine rendering permanent immunity, although unproven, greatly reinforced the dire need for mandatory vaccination against Smallpox in early 19th century.

Official statistics on deaths due to smallpox in London reported before and after the introduction of voluntary vaccination also showed promising results (Edwardes, 2007a). Deaths reported due to smallpox in the three decades (1771–1801) before the introduction of the vaccine stood between the range of 18,000 to 20,000 mortalities per decade. The death rate fell dramatically in the decades that followed the introduction of the vaccine (1801–1830). Only 12,534 deaths were reported from 1801–1811, followed by an even sharper decline with only 7,858 reported deaths from the period of 1811–1820[1]. Around the mid-1840s when the promotion of vaccination was in full gear, the reports mark the presence of *no deaths* from the period of 1843–1846, fortifying pro-vaccinators' beliefs on the miraculous nature of the vaccine(Edwardes, 2007b)

However persuasive, by the end of the century, there were many who rigorously questioned the efficacy of the vaccine. Dr. Alfred Russel Wallace, one of the most prestigious scientists (known to have independently discovered Darwin's theory of evolution) challenged the notion of mandatory vaccination and several assertions regarding vaccine efficacy in his book(Wallace and Wheeler, 1889). He refuted that death from smallpox was lower for vaccinated populations, the attack rate was lower for the vaccinated populations, and that vaccination alleviated the clinical symptoms of smallpox. He used actuarial statistics to support his arguments, such as the analysis of life tables and mortalities. While his opponents argued that the peaks in mortality, such as that of 1870–1873, were due to a widespread anti-vaccination movement, Wallace concluded that the same peaks were due to increased vaccination rates at the time when cumulative penalties were introduced and fewer dared to challenge the vaccination law (Centers for Disease Control and Prevention (CDC), 2010).

He argued that the problem of determining vaccination status was extremely difficult. Due to the incompleteness of the epidemiologic data for vaccination status, the vaccination status of 30%–70% of smallpox deaths

[1]The writer does not explicitly claim that the reduction in mortality was caused due to vaccination.

was unknown. Moreover, if a person contracted the disease shortly after a vaccination, it was often entirely unclear if the patient was to be categorized as vaccinated or unvaccinated. Finally, Wallace also believed that doctors were more willing to report a death from smallpox in an unvaccinated patient and that this led to a serious bias and an overestimation of vaccine efficiency.

Apart from Alfred Wallace's claims, evidence from 1880 onwards also confirmed that Jenner's contention about the lifelong immunity of the vaccine was incorrect(Colin R, 2003). Protection induced by primary vaccination in childhood did not necessarily last into adulthood. In Sheffield Borough Hospital during the 1887–88 outbreak, none of the nurses and attendants who had been re-vaccinated got smallpox, whereas 6 cases ensued in those who had received only a single dose as a child[2]. It proved that while the vaccine was beneficial, one needed to be vaccinated again for prolonged immunity.

Apart from the inferred vaccine efficacy and its ability to curb contagion, it can also be argued whether it helped curb the downright deteriorating effects of false information and lies spread by the Anti-vaccinators. John Campbell, a medical officer of health for Gloucester City and Port, in 1897 reported the anti-vaccinators had caused it to be rumored far and near that the true cause of the epidemic was the *unhealthy condition* of the city and not the want of vaccination(Faherty, 2017).

Even more so, outspoken people such as physician Benjamin Moseley (1742–1819) alarmed readers with luridly worded arguments against the abominable practice of introducing a "bestial humor into the human frame" while hinting darkly at the "strange mutations from quadruped sympathy" that might result in, as well as relating fantastical accounts of vaccinated children sprouting cow hair or developing facial features distorted "to resemble that of an Ox"(Moseley, 1807)(The Morgan Library, 2021). Misinformation related to the vaccine grew with the widespread anti-vaccination sentiment. As a result, the vaccination rates in some parts of Britain drastically fell by the end of the century. A report by the Vaccination Inquirer in 1896 described the horrific reality. In cities with the least vaccination in the country, such as Gloucester, almost *83%* of the population was failing to comply with the law(Faherty, 2017).

These lies were often spread via rhetoric and artistic means allowing for an easier diffusion into the socio-economic fabric of 19^{th} Britain. Notable examples include the *Cow Puck* (Gillray, 1802), depicting a rather menacing Edward Jenner vaccinating patients who develop features of cows, and *The Vaccination Monster* illustration(Williams, 1802), depicting vaccinators feeding their babies to a large, brooding vaccination monster.

While some of these artistic depictions spread lies and misinformation, they also did convey justifiable distrust, fear, anger, and in concavity, the true sentiments of the population regarding mandatory vaccination. It also presented the deep-rooted fact that the implementation of mandatory vaccination was deeply flawed by being unfair, thoroughly class-based, and coercive; the poor, working class were subjected to the full force of the law while better-off were provided with safer vaccines and could easily avoid punishment if they did not comply (Faherty, 2017).

Many, including Alfred Wallace, righteously argued that the mandatory nature of vaccination was an infringement of personal choice(The National Archives, 2022). William Tebb, President of the London Society for the Abolition of Compulsory Vaccination, 1887, also presented that the state has no right to encroach upon *parental responsibility* or to impose either religious or medical dogmas upon the people of this country on any pretense whatever(Tebb, 1887). Others believed that their child shouldn't have to go through a painful and dangerous procedure and that there were potential risks involved that need to be addressed. This claim was further supported after it was found that the widespread arm-to-arm vaccination, used until 1898, did in fact carry substantial risks, and the instruments used could contribute to severe adverse reactions(Baxby, 2002).

Overall, the arguments and examples presented above demonstrate the ambiguity in determining the effectiveness of mandatory vaccination in 19^{th} century Britain. While Edward Jenner's initial experiments proving the therapeutic benefits of his engineered vaccine — which he considered to have possessed singular properties to prevent smallpox — were perfectly valid, the vaccine had failed to prevent the smallpox epidemics of 1857–59, 1863–65, and 1870–72 (Colin R, 2003). Similarly, although Alfred Wallace's claims were quite reasonable, inferential statistics would have proven to be more helpful in proving his claims, which did not yet exist. The statistical approach could simply not resolve the issue of vaccine efficiency; thus, each side was free to choose the interpretation that suited its needs best. Although, it's safe to say that, in retrospect, the historical dance between mandatory vaccination and its opposition paved the way for the generation of more robust and rigorous methodologies, such as population-based risk assessments, regarding vaccine safety in the entire scientific community. Both sides were crucial in reducing smallpox mortality in 19^{th} Britain and eventually eradicating the disease for the better.

[2]The information was taken directly from the secondary source. The primary source wasn't found.

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