

# The impact on public health of the 19th century anti-vaccination movement

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Today smallpox vaccination is an issue of public concern due to the threat of bioterrorism. Yet a different aspect of this topic was a cause of controversy more than a century ago, as Colin Howard describes.

Public confidence in vaccination is being eroded in the face of mounting criticism from lay people as well as a vocal minority of medical opinion. A current controversy centres on the safety of measles vaccine and MMR. Yet vaccination is among the most effective health care measures available to modern medicine. Despite the scientific evidence in its favour, scepticism as to its value lies deep within the British psyche. I believe the origins of doubt can be traced back to the early 1800s when Jenner's smallpox vaccine began to be widely used.

## ● Late 18th century concepts of infectious disease

Towards the end of the 18th century medical explanations of disease tended towards the holistic, the result of a disturbance to the normal health-maintaining balance between the individual, the climate and environment. Smallpox was the exception. Physicians already understood the specific passage of contagious material by inoculation, the deliberate introduction of smallpox into the skin, as a means of protecting the susceptible against the ravages of disease, although many doctors opposed it. Market forces came into play, however, as the well-to-do insisted on protection for themselves and their families. The situation was quite different amongst ordinary people; as inoculation was usually carried out by amateurs and itinerant practitioners, and they could not afford the 2–3 week inoculation period away from work and subsequent long convalescence.

In Jenner's time, there was a lull in the arrival of new pathogens into Britain. Smallpox, however, erupted into epidemics at intervals. In the towns and cities it was essentially a childhood affliction, whereas in the countryside the risk groups were adolescents and adults and so the socio-economic impact of deaths from epidemics was much greater. Inoculation therefore gained greater acceptance in rural areas than in the rapidly expanding conurbations where smallpox was but one affliction to which an infant was exposed. It was not practised widely in towns until around 1790.

## ● Jenner's discovery and medical practice

The medical profession was not prepared for the Jennerian approach. Unsympathetic to the contagion theory, it was difficult for the authorities of the day to accept, let alone understand, the significance of his findings. The implication was that,

not only was the disease of smallpox specifically the result of contact with an infectious agent, but that a contagion of cattle was sufficiently similar to confer protection in humans. In the absence of knowledge of germ theory, the initial reaction of the educated and public alike was that transfer of animal matter may be necessary but was definitely undesirable. This is epitomized in Gillray's famous cartoon of the period.

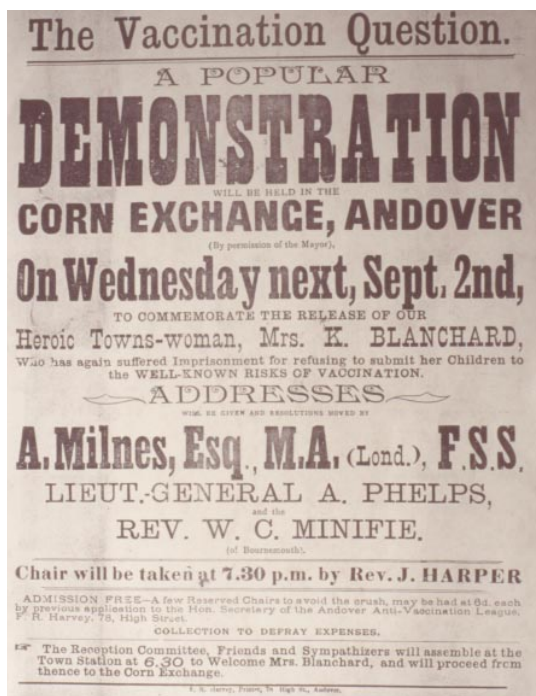
The early 19th century saw a progressive decline in smallpox despite apathy among parents who often trusted in providence. The anti-vaccinationists (dubbed the 'anti-vacks' by Jenner) were isolated voices and failed to organize themselves into a coherent movement. In contrast, influential supporters of the Jennerian approach had come together to sign a supporting declaration as early as 1800. The public was content to accept their judgement, at least whilst the disease was under control. The Napoleonic Wars also undoubtedly diverted public attention away from any contention over vaccination.

In February 1806 the *Medical Observer* appeared, providing an effective mouthpiece for early anti-vaccinationists such as Moseley and Birch. Jenner fully understood the power of the media, but he never used it to defend his work. Although worried, he was reluctant to get embroiled in publishing claim and counter-claim. In contrast, the anti-vaccination movement was quick to realize the value of the press. (Little has changed save that the power of the Victorian pamphlet has been replaced by the website. Entering the term 'vaccine' into any search engine invariably produces more links to anti-vaccination literature than to information as to the benefits of immunization!)

The *Medical Observer* gave publicity to the increasing number of smallpox cases presumed to be the result of vaccine failure and by 1808 pressure had mounted for a more rational explanation of these. Unfortunately for Jenner, the tools of epidemiology we use today were unavailable for the critical analysis of anecdotal cases of vaccine failure. The anti-vaccinationists capitalized

RIGHT:  
A coloured print of a cartoon, thought to be by James Gillray, 1802, showing people developing bovine characteristics immediately after vaccination. The vaccinator may be Edward Jenner. Although this cartoon appears to be anti-vaccination, it may read as a satire on claims made by the opponents of vaccination.  
COURTESY THE JENNER MUSEUM, BERKELEY, GLOUCESTERSHIRE





LEFT:  
A poster advertising a demonstration in Andover Town Hall in support of a Mrs Blanchard on her release from imprisonment for refusing to allow her children to be vaccinated (date unknown).  
COURTESY THE JENNER MUSEUM, BERKELEY, GLOUCESTERSHIRE

on this, arguing that if the safety and efficiency of vaccination with cowpox could not be proved, then it was best to stick with inoculation of smallpox virus, the drawbacks of which were well recognized.

Undoubtedly Jenner's unstinting belief that vaccination gave longevity of protection, combined with the total lack of quality control and standardization of the lymph used for vaccination, accounted for much of the confusion. A further disadvantage was that he diluted the lymph to ensure safety; this led to the need for a further dose in early adulthood. The supply of calf lymph was a major problem, even to the extent that Jenner had to resort to the inoculation of his own son with smallpox.

### ● The introduction of compulsory vaccination

The founding of the National Vaccination Establishment in 1808 quickly led to the collapse of the voluntary organizations that promoted the benefits of vaccination. The next decades saw increasing distrust in vaccination with a significant number of failures and the increasing use of lymph of dubious origin. Attitudes to public health only changed with the arrival of cholera from Asia around 1830. Suddenly the country was in the grip of a disease, the nature of which had hitherto not been experienced. Smallpox and other infectious diseases remained endemic, but did not focus the public mind so vividly as cholera. The state was motivated to become actively involved with public health. Ultimately this led to compulsory legislation for smallpox vaccination, but it was not immediate. The government first introduced an Act in 1840 which enabled anyone to be vaccinated at public expense.

The demand for compulsory vaccination against smallpox came from the medical fraternity led by Dr Edward Seaton. Importantly, he convinced parliamentarians that vaccination was universally regarded as infallible. The Bill became law in August 1853, making vaccination compulsory for all infants under the age of 3 months.

This Act signalled the start of organized opposition to compulsory vaccination. John Gibbs, who is credited with initiating the nationwide movement, wrote that the Act 'invades the liberty of the subject, and the sanctity of the home ... (it) denies him possession of reason; outrages some of the finest feelings of the human heart ...' Such appeals to those in Government were to no avail. However, the Act was difficult to enforce and in 1867 it became a

criminal offence for a parent to continually deny a child vaccination up to the age of 14 years.

### ● The rise of the anti-vaccination movement

A powerful anti-vaccination lobby sprang up to defend the sanctity of the human body and to press the individual's right to chance their luck of becoming infected. Opposition was particularly well organized in Leicester, where the first imprisonment under the 1853 Act is recorded; William Johnson served 14 days after refusing to allow his child to be vaccinated. Supporters rewarded his intransigence with a silver watch. Other martyrs to the cause included Ann Supple, who received 25 summonses for refusing to have her child vaccinated, preferring to face gaol rather than 'be party to the poisoning of her baby'.

Faith in vaccination was further dented with another extensive smallpox outbreak in 1870 affecting some 44,000 people. In 1871 another Act was passed which attempted to strengthen previous legislation by making it mandatory for local Poor Law Boards of Guardians to appoint vaccination officers. Fines of up to £1/5s were introduced for parents who refused to have their offspring vaccinated. The anti-vaccination protesters based their objections partly on individual freedom, partly on the political resistance to interference in the sanctity of the home and family, and on the more rational grounds that there were alternative means to limit and control smallpox. These distinctions were to become increasingly blurred, however, as the passion of the debate increased.

Leicester remained the epicentre of the anti-vaccination movement. Between 1869 and 1884, 61 people were imprisoned for non-compliance with the Smallpox Acts. On 23 March 1885 some 100,000 defaulters processed from the Temperance Hall to the Market Place where copies of the Vaccination Acts were burnt in full view of the Mayor and Chief Constable of Leicester. The cause, according to *The Times*, was '... a widespread belief that death and disease have resulted from the operation of vaccination...' The precipitating event was the failure of the Local Government Board to endorse the 'Leicester Method', which, in the eyes of the Board of Guardians, was proving so successful in controlling smallpox in the city. It called for strict quarantine of cases and all their contacts, coupled with a programme of disinfecting the infected person's dwelling and burning their bedding and clothing. It is likely, however, that this strategy owed as much to medical expediency as it did to pressure from local opinion leaders.

The Leicester Anti-Vaccination League came to have an influence out of all proportion to its size, largely thanks to the activities of J.T. Biggs, a local sanitation engineer. Local politicians and the MP for Leicester were all to come under his influence. Peter Taylor, the local MP, was eventually to become the President of the

London Society for the Abolition of Compulsory Vaccination, thus giving the Leicester perspective a national outlet. Although it is possible that the effect nationally of the anti-vaccination movement has been overestimated, we should note that it was highly organized and articulate, using the press and public debate to good effect.

Unquestionably, compulsory vaccination had failed to prevent the smallpox epidemics of 1857–59, 1863–65 and 1870–72. The anti-vaccinators' case became at times personal and critical of events that occurred many decades previously. Doctors were accused of spreading the disease in the 18th century by inoculation and Jenner remained the butt of criticism nearly 90 years after he published his inquiry in 1798. A further point focuses on the almost fetish preoccupation of the Victorian public health movement with cleanliness and sanitation, although improvements in water supply, sanitation and public works did not really take hold until the latter part of the century. Even so it was clear that the decline in incidence of smallpox, which began with the introduction of inoculation in the 18th century and which accelerated once vaccination was available, must have been specifically due to this active prevention because there was no corresponding reduction in other filth-borne diseases.

Evidence from 1880 onwards confirmed that protection induced by primary vaccination in childhood did not necessarily last into adulthood. Thus Jenner's contention that lifelong immunity followed vaccination was wrong. 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. The outbreak still clearly showed the benefits to those who had been vaccinated but once and were subsequently exposed to the disease years later.

Anti-vaccinators began to argue that other diseases could be transmitted, such as infantile syphilis, but such fallacies were unnecessary as the movement achieved its immediate goal of decompulsion with the Vaccination Act of 1898. This introduced a 'conscience clause' whereby parents could opt out of vaccination by applying to local magistrates for an exemption certificate. This was not a soft option, however, as the lack of a vaccination certificate excluded Londoners from council housing and elsewhere non-vaccination meant that life insurance and employment were that much harder to come by.

In Leicester, home of resistance to vaccination, the decline was so steep that in 1890 only 3% of babies were vaccinated in their first year. Nationally, the trend was little better. The number of vaccinated infants declined, from 96% in England and Wales in 1875 to 78% in 1889. This drop reflects at first sight parental apathy in the face of a disease that was steadily declining coupled with the Victorian strength of feeling that government

should advise, persuade and provide rather than coerce both parents and local government into compliance.

With the tension over compulsion defused, the end of the 19th century saw a more rational and structured approach to application of vaccination policies. In 1903 Elizabeth Garrett Anderson wrote in *The Times* that the evidence strongly supported the 'protective power of vaccination'. Experience during the London 1902 outbreak led to the inescapable necessity of re-vaccination at school age. Interestingly, Anderson promoted the concept of a more targeted approach to control, with rapid and effective isolation of index cases followed by rigorous re-vaccination of contacts, a central feature of the 'Leicester Method' which had evolved in the seat of the anti-vaccination movement.

This approach was used in 1968 in Nigeria and eventually proved to be the turning point in the WHO smallpox eradication programme, faced as it was with diminishing supplies of vaccine in West Africa. Vaccination became limited only to those persons who had contact with infected individuals, the victims being kept in strict isolation. This policy of surveillance and containment gradually became accepted universally from 1973 onwards, even to the extent of predominating over mass vaccination. It contributed significantly to the conquering of the disease some 180 years after Jenner's original discovery and has much to recommend it for the control of other infectious diseases.

### ● The lessons from history

The application of any discovery is often fraught with public misconception, mistrust of scientific opinion, inadequate planning, and a failure to identify weaknesses in methodology. Despite the brilliance of Jenner's seminal observations, his publications were anecdotal and lacked conviction. His flawed insistence that immunity was lifelong did not help acceptance of his discovery. A centralized faith in public engineering as a reaction to cholera combined with difficulties in enforcing the vaccination acts turned opinion against vaccination, fuelled by the ascendancy of the press. The control of infectious disease requires great awareness of environmental and social issues, as recent outbreaks of infections in the national livestock industry have shown only too painfully. It took Victorian Britain over a century to grasp Jenner's original concept of vaccination and apply this in a socially acceptable manner. It teaches us much that is relevant today.

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### Further reading

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