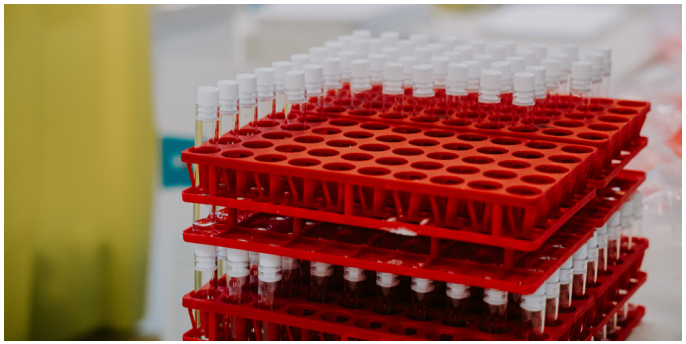
Scabs and Jabs: A History of Immunity and Inoculation

A staple of childhood and now a hot topic of debate, childhood immunisation is a part of modern life. But where does it come from and why is it so controversial?

You would have to have been living under a rock to have not heard the term 'millennial'. Used to describe anyone born between 1981 and 1996, millennials are often clumped together as lazy and entitled smashed-avocado lovers who came of age simultaneously with the internet. United in their experiences of dial-up, chat rooms and MTV, there was another rite of passage that many millennials underwent which is now confined to the history books: the BCG, also known as the tuberculosis vaccine. Every Year 9 dreaded the day, having heard the myths from their forebears (Year 10s); stories of pain, swelling and aching arms abounded and injected fear into the minds of every third year. Being Year 9 meant traversing the tricky line between indulging in hormonal hysteria and yet not wanting to seem immature or childish. After all, it was only one needle and one injection, and even babies had injections, right?

21 years later, for those vaccinated around the millennium, all that remains is a 5p-sized, slightly raised, round reminder of the pre-injection worries and fears. The injection itself obliterated from memory but its gift ongoing. This tiny tattoo marks the shield of immunity procured through the vaccine. Once the thief of a quarter of adult lives in Europe, TB no longer decimates populations in the same way it used to. In fact, reduction of TB in the UK has been so successful that in 2005 it stopped featuring as part of routine childhood vaccinations and now is only offered to vulnerable people in high-risk areas.



COVID-19 vaccine production, 2021

Moreover, the impact of vaccinations globally has changed the life expectancy and mortality rates so greatly that the UK Health Protection Agency (HPA) claims vaccinations to be the 'second most effective public health intervention worldwide (after clean water) for saving lives and promoting good health.' Unsurprisingly then, as the COVID-19 pandemic ravaged our lives, freedoms and opportunities, the race to develop a vaccine was of the utmost importance. Its release in December 2020 was heralded as a 'historic moment' and since the delivery of the first dose to the first volunteer, 91-year-old Margaret Keenan, over 5.85 billion

doses have been given worldwide, with about 31.6 million continuing to be given each day. However, far from being a simple story of a modern medical marvel, the COVID-19 vaccine has been met with continuing controversy which positions it as part of a long history of vaccines and the controversy that surrounds them.

Lady Mary Wortley Montagu

Although Edward Jenner is often credited with having 'created' the smallpox vaccine, earlier in the 18th century writer Lady Mary Wortley Montagu was living in Turkey with her husband and 3-year-old son. She wore the scars of smallpox all over her face but noted that it did not attack the Turkish people in the same way it did her home country of England. So before returning to England where the threat of smallpox abounded, she decided to let her son undergo the treatment offered. This meant a woman with a nutshell filled with smallpox pustules and a needle came to her house and inserted some of the pustules into her son's arm. Her son went on to encounter but not contract smallpox and Wortley Montagu attempted to promote the use of inoculation as a defence against the deadly illness. Unfortunately, her experience was met with disdain. The scientific community did not want to accept advice from an untrained woman that had been discovered in an unchristian country. It was only after tests had been conducted on prisoners and orphans that its use became more widespread.

What's in a Name?

The word vaccine comes from the Latin word 'vacca' for cow. It was used by Dr Edward Jenner after he heard a Bristol milkmaid boast, "I shall never have smallpox for I have had cowpox. I shall never have an ugly pockmarked face." This legendary milkmaid had identified that having had the cowpox virus would offer protection from the human pox virus. This ultimately led Jenner to taking the pus from an infected cow and inserting it into a cut in 8-year-old James Phipps' arm. Six weeks later, Phipps was exposed to the virus and yet remained well. Jenner continued his research and in 1798 he published *Inquiry into the Causes and Effects of the Variolae Vaccinae, A Disease Discovered in Some of the Western Counties of England*. However, recent DNA sequencing of the original vaccine strains show that it more closely resembles that of horsepox, so perhaps equisine from the Latin 'equine' for horse would be a better name?

Edward Jenner vaccinating patients in the Smallpox and Inoculation Hospital at St Pancras

The First Vaccine

For anyone with a needle phobia, vaccines are obviously terrifying. However, back in the 1500s, Emperor K'ang Hsi of China had his children inoculated from smallpox with no needle necessary. He had survived smallpox in childhood and wanted to ensure his children would too. The method, which some sources claim dates back as early as 200 BCE, involved grinding up smallpox scabs and snorting them! Yummy.

Anti-Vaxxers: Not a New Phenomenon

For months, British Members of Parliament have been debating the use of the new COVID-19 vaccine. Questions have been raised about the safety of the vaccine, its efficacy and who exactly should have it. Debates around 'vaccine passports' have been reported in the news and some countries now require proof of vaccination to gain entry.

However, there are many people who are not convinced that the vaccine is effective or safe. High-profile celebrities, like Nicki Minaj, who have expressed their doubts have been given great media attention, with journalists even asking British Prime Minister Boris Johnson his thoughts on her refusal to be vaccinated. Social media and the speed with which information can be transmitted via the internet has been blamed for 'misinformation' and scare stories that are feeding the anti-vax movement.

However, this is not a new phenomenon. The 1853 Vaccination Act made inoculation against smallpox compulsory for infants up to 3-months-old and by 1867 this had been extended to 14 years with penalties given to those who refused to vaccinate their children. In 1885 the Leicester Demonstration March organised by the Anti Vaccination League had between 80,000 and 100,000 attendees.

Rally of the Anti-Vaccination League of Canada, 1919

This was a large-scale protest, impressively co-ordinated without social media, and included banners, a child's coffin and an effigy of Edward Jenner. Reasons for not wanting to vaccinate were often religious – the vaccine was "unchristian" because it came from an animal. There was also a general fear of medicine and the belief that enforcing vaccines by law was a violation of civil liberties. In many ways these are like the contemporary protests seen today. The large Leicester protest resulted in a study of the effects of vaccination, the results of which were published in 1896. The commission decided vaccination was effective but suggested the removal of penalties. By 1898, the Vaccination Act introduced a 'conscientious objector' clause and parents could get an exemption certificate for their children.

Stand Up X Rally in Central London, 2020

An Ethical Conundrum

In 1946, compulsory vaccination requirements were repealed in the UK and so today the debate about whether the COVID-19 vaccine should be made compulsory rages on, with some saying it is a protective measure that should be written into law like that of wearing a seatbelt. Researchers who have studied this ongoing debate have broken it down into two main ethical conundrums:

- Whose opinion matters more: the child who will be vaccinated or the parent of that child?
- Whose opinion matters more: the individual who will be vaccinated or the society that needs protecting with herd immunity?

Some governments adopt a utilitarian approach, a philosophy which determines that any action which benefits the overall majority is the right course to take. In Belgium in 2008, parents who refused the polio vaccine for their children were fined and sentenced to 5 months in prison. Conversely, Australia has used financial incentives to persuade parents and with good effect, increasing uptake from 75% to 94%!

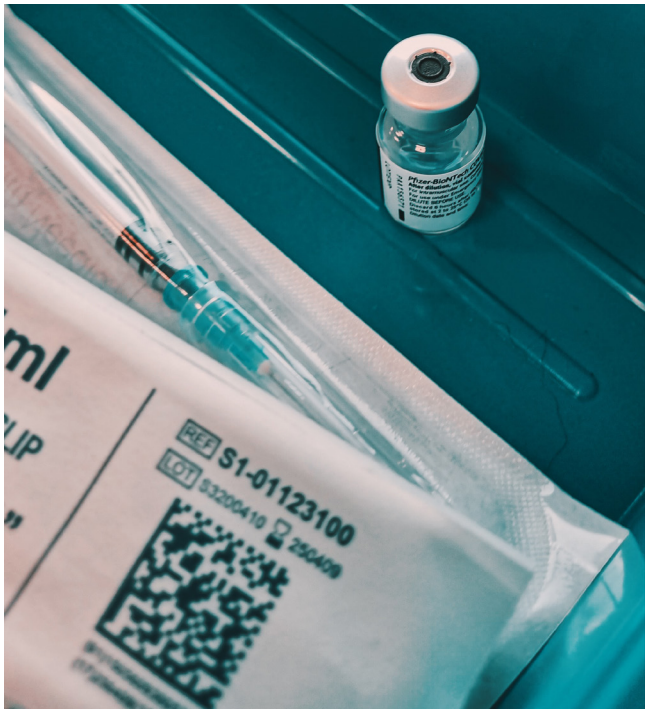
If the COVID-19 pandemic has taught us anything, it is that for as long as viruses persist in attacking immune systems, vaccines will be developed and the debate about their usage, especially for parents of young children, will continue.

The Psychology of Risk

Much vitriol has been slung at the anti-vax minority, however an understanding of the thinking behind their decision can illuminate what could be perceived to be a selfish choice.

Stand Up X Protests in Trafalgar Square, London

Psychologists argue that people are bad at accurately assessing risk and many people have something called omission bias. This is the idea that causing harm through inaction is more acceptable than causing harm through action. Therefore, a parent might be more willing to risk their child catching a contagious virus than actively choosing to give them a vaccination that might result in unwanted side effects. Prophylactic treatment requires a brave trust in the benefits of medicine and medical institutions and many people have an imbedded distrust of the state healthcare system, perpetuated by hyperbolic media reporting which is not held accountable.



COVID-19 vaccine, 2021