Collective Non-Compliance

Why Vaccines Remain Controversial

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«I heard that commentary
and dissent
had merged to form
dysentery»

Woody Allen (1977)
in the film 'Annie Hall'

Abstract

The vaccine is one of medicine's greatest achievements, yet has continuously been met with scepticism and opposition. Many are surprised to find that the arguments against immunisation are practically unchanged for over 200 years. Authors on the subject tend to explain the phenomenon by particularities of the human mind or particularities of a given sociopolitical context, but none of them have looked closely at the particularities of the vaccine itself. The present inquiry aims to identify the properties which distinguish vaccines from other medical interventions to explain why they, specifically, remain controversial. It will be argued that vaccines have a particular mode of administration, a particular mode of distribution and a particular mechanism and effect. While certain traits are shared with other medications, it will be demonstrated how it's the configuration of features which inspire vaccine controversies, where any single aspect might have varying importance. This configuration of properties is inherent to the vaccine and thus universal, but also subject to a variety of interpretations, depending on context. Many such interpretations are considered here in a review of the main arguments against vaccination. Through this analytical review, the following thesis is also an attempt to render vaccine opposition comprehensible. Finally it aims to explain the persistency of the phenomenon, by pointing to the fundamental concerns which are expressed through vaccine opposition. These reflect continuing debates in modern society and are concerns about the body, concerns about the relationship between state and individual and concerns about technology and human intervention.

Introduction

Cults and societies have arisen to break down the barriers that years of scientific investigation and endeavour have set up against disease.

- Morris Fishbein (1924)1

Vaccine opposition seems to lend itself easily to a multitude of different agendas and world views. It unites people across various socioeconomic backgrounds, professions, political and religious affiliations, and from different countries and cultures. From a medical point of view it seems rather perplexing that vaccines should inspire such passionate debate and dedicated opposition. While immunisation technology has evolved to become substantially safe and efficacious, the arguments

[1] In *Smallpox - A preventable disease.* New York: American Association for Medical Progress. (Colgrove 2005).

against it have changed surprisingly little over two centuries (Wolfe and Sharp 2002). Many researchers are astonished and naturally eager to identify the causes of this phenomenon. Numerous suggestions are made; individualism, selfishness, loss of trust, ignorance, misunderstandings, misinterpretations, miscalculation of risk, reasoning flaws, emotions, irrationality, rumours, the influence of alternative medicine, medical pluralism, the postmodern society, the spread of misinformation by the internet and uncritical media coverage[2].

Previously it was assumed that vaccine opposition resulted from a lack of knowledge and insight. However this inference has become discredited, by the very fact that providing people with accurate information seems to accomplish very little (Kata 2010). Among the current endeavours to account for vaccine opposition, two general tendencies can be recognised. One approach seems to emphasise the shortcomings of the human psychology, where perceptions of risk and causality are distorted by fear and misinterpretations. The second strategy has been to consider the social, cultural, historical and geographical circumstances of vaccine opposition, to explain it as a product of a specific sociopolitical context. While these approaches give valuable insights into how vaccines are understood by individuals and societies, they generally fail to answer two fundamental questions: First, why have vaccines in particular been so disputed, among many other possible medications and technologies? And second, why has this opposition persisted for such a long time, addressing nearly the same issues?

The following essay is an attempt to answer these questions by putting forward two connected arguments. First it's proposed that the vaccine has a configuration of particular features, which may render it controversial and suitable to reflect on larger medical, social and political matters. In other words, to grasp why they are unusually problematic, one must distinguish the properties which separate immunisations from other medical interventions. It will be argued here that vaccines are particular in their mode of administration, their mode of distribution and their mechanism and effect. While other medications might share some of these traits, vaccine controversies seem to be inspired by the configuration of properties, where any single aspect is given varying importance. Thus in contrast to the psychological and the sociocultural approach, the present inquiry places emphasis on the vaccine itself. It aims to identify its inherent and unusual characteristics, to elucidate how these are interpreted by vaccine sceptics. In doing so, this

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[2] For examples, see: (Jacobson et al. 2007), (Poland and Jacobson 2001) and (Kata 2010). Recent qualitative work has listed and critically reviewed several of the 'conventional explanations'. See: (Leach and Fairhead 2007), (Hobson-West 2003, 2007), (Streefland et al. 1999) and (Streefland 2001).

analytical review aspires to make vaccine opposition a comprehensible phenomenon, by uncovering its internal logic.

Secondly it's proposed that the larger concerns, which are expressed through vaccine opposition, reflect continuing debates in modern society. Therefore vaccine scepticism has persisted and will probably continue to do so in the foreseeable future. These are concerns about the body, concerns about the relationship between state and individual, and finally concerns about technology and human intervention.

Method

A systematic literature search was performed in October 2014 on Pubmed and Web of Knowledge. The search words used were: **anti-vaccine**, **anti-vaccination**, **anti-vaccine movement**, **anti-vaccine group**, **anti-vaccinationists**, **vaccine opposition, vaccine skepticism and vaccine controversy**. A second search was performed using the same combinations, but substituting the word 'vaccine' with 'immunisation' and 'immunization'. The criteria of inclusion were: Books and articles in english which considered historical or contemporary organised vaccine opposition. The references of these books and articles were examined, with relevant literature identified and included according to the same criteria. In addition, selected literature considering the perceptions of alternative healers and parents have been included for reference, as well as some works considering medical interventions in Africa. Finally a couple of illustrating examples have been purposefully chosen from the internet.

The 'Anti-vaccination movement'

Historical background

When Edward Jenner introduced the inoculation of cowpox material at the end of the 18th century, it replaced the earlier practice of smallpox inoculation, now termed variolation to avoid confusion (Wolfe and Sharp 2002). With possible origins in ancient China and India, variolation was certainly practiced in Europe and the US from the early 18th century to confer immunity against smallpox (Spier 2002) (Allen 2007). Since infectious disease was generally understood to reflect God's judgement, religious authorities warned against this horrendous interference with divine providence (Spier 2002). By that time, before the word 'vaccine' even existed, one of the central objections to immunisation was launched; that it upsets or interferes with divine, moral or natural orders.

Although Jenner's invention provoked loathing and disbelief throughout the early 19th century, massive opposition appeared first in the UK when legislation was passed to make vaccination compulsory. Among the early protesters were the variolators who saw their profession threatened and finally outlawed by the first vaccination act of 1840. The same act provided free vaccines for the poor, but the procedure remained voluntary until the second vaccination act was passed in 1853. Subsequently all infants had to be vaccinated before three months of age and non-compliant parents could be sanctioned with fine or imprisonment. In 1867 a third act was passed to make vaccination compulsory for all children under the age of fourteen and the sanctions were sharpened by introducing cumulative penalties. By extension of the law in 1871, local authorities had to appoint vaccination officers to track down and sanction defaulters. The compulsory acts attracted massive opposition from diverse strata of Victorian society, from liberal minded intellectuals to working class union men. The movement included doctors, alternative healers, religious sects and naturalists who, based on disparate reasoning, reached a similar conclusion to condemn vaccination and the new coercive laws. By far the largest mobilisation was seen within the working class, upon which the laws were enforced without leniency and where the economic sanctions hit hardest. After half a decade of protest and debate, a vaccination act was finally passed in 1889, allowing the possibility of conscientious objection. The conscientious objector had to convince a magistrate that he harboured a sincere disbelief in the procedure and positive effects of vaccination. In 1907 the process of obtaining such a status was loosened and exemptions allowed on a larger scale (Porter and Porter 1988) (Durbach 2000, 2005) (Weber 2010) (Swales 1992).

Vaccine opposition spread to other European countries, but more significantly, it spread to the United States where it enjoyed an immediate and prolonged support. Facing an increase in smallpox epidemics during the 1870s, many American states had attempted to pass compulsory vaccination laws. A common strategy was to require vaccination for enrolment in public schools. Several anti-vaccination groups were founded in response and successfully repealed such laws in various states (Wolfe and Sharp 2002) (Colgrove 2005, 2006). In early 20th century US, vaccine opposition became increasingly the realm of parents who believed their children to be damaged or killed by vaccination (Colgrove 2005). They were joined by a diverse gathering of ethnic minorities, antivivisectionists, libertarians, religious groups, alternative healers and others who appeared to have little in common except their vaccine dissent (Johnston 2004). Towards the middle of the 20th century, American vaccine opposition seemed to vanish, with the exception of extreme anti-communists who professed that polio immunisations were part of an elaborate socialist conspiracy (ibid).

The anti-vaccination movement was resurrected when a dispute arose over the whole-cell pertussis vaccine in the 1970s. It began in the UK where an article published in 1974 described 36 children with severe neurological complications following their DTP immunisations. This triggered a media storm of unanticipated dimensions and severe outcomes. Immunisation coverage fell rapidly and three major pertussis epidemics resulted with over 100.000 cases and about 36 deaths (Baker 2003). The controversy spread across the globe to countries such as Japan, Sweden, the Soviet Union and Australia. In these respective states, where the immunisation programme was compromised, a higher incidence of pertussis was seen compared to countries with sustained coverage (Gangarosa et al. 1998). In the US, the renaissance of vaccine opposition came in 1982 when a documentary called 'DPT: Vaccine Roulette' was aired on television. It quickly led to the foundation of 'Dissatisfied Parents Together' (DPT), an organisation for parents who claimed their children damaged by the pertussis component of the DPT vaccine. A major ambition for the DPT was the establishment of a federal compensation system for vaccine injuries, and this was achieved with the passage of the 1986 National Childhood Vaccine Injury Act. DPT later became NVIC, the 'National Vaccine Information Center', and remains one of the most influential vaccine critical groups in the US. Its agenda expanded to question the safety and necessity of every vaccine, in particular those of recent date (Johnston 2004). Despite all this commotion, it remains a fact that pertussis immunisation coverage never fell significantly in the US (Baker 2003).

By far the greatest vaccine controversy of our age was launched with Andrew Wakefield's Lancet publication, where he suggested a possible link between MMR vaccination, colitis and autism spectrum disorders (Wakefield et al. 1998). In a manner reminiscent of the pertussis controversy, media attention and public debate was followed by a significant drop in immunisation coverage and subsequent measles epidemics in several countries (Fitzpatrick 2004). Wakefield was later to face severe allegations of data manipulation, undeclared conflicts of interest and professional misconduct. When these were eventually confirmed, the Lancet made a retraction of his paper, partially in 2004 and then completely in 2010. After an extensive fitness to practice hearing, the General Medical Council struck him off the medical register (Deer 2011). Later studies have failed to establish an association between MMR and autism (Demicheli et al. 2012).

Among our most recent immunisations, the HPV vaccine has been highly disputed. Apart from the usual concerns about side effects and civil liberties, the vaccine has been accused of encouraging promiscuity and many question its gender biased distribution (Wailoo et al. 2010). During the H1N1 pandemic of 2009, public health campaigns to promote vaccination were met with scepticism. The safety and necessity of the new vaccines were called into question, as was later the

close links between WHO advisory groups and the pharmaceutical industry (Peretti-Watel et al. 2014) (Godlee 2010). Recent studies have confirmed an association between the ASO3 adjuvanted H1N1 vaccines and narcolepsy (Partinen et al. 2014). Throughout the pandemic, the internet proved vital in spreading and sharing of vaccine critical material (Seeman et al. 2010). The possibilities which digital communication has afforded contemporary vaccine sceptics can hardly be overestimated. Renowned vaccine critic Dawn Richardson has called internet 'the great equalizer', whereas Professor Scott C. Ratzan, believes it might offer '…unfettered opportunities for ignorance' (Johnston 2004) (Ratzan 2002). By and large unaltered, the vaccination debate continues into the 21st century.

Biomedical and sociopolitical arguments

Virtually every argument that has ever been raised against vaccination was already put forward in 19th century England. Indeed the only assertions to have surfaced later were unthinkable or irrelevant at the time. Concerns about how vaccines affect the immune system were for instance unthinkable, because the explanatory frameworks and concepts of immunology were far from established. Likewise the concern about multiple vaccinations was irrelevant, since only one had been developed. As will be outlined here, for over two centuries the claims of vaccine critics have generally been of two sorts:

In the first category we find scepticism towards the vaccine itself, against the procedure, the mechanism, the contents and adverse effects of immunisations. It further includes a disapproval of the medical concept of disease that underlies vaccination technology. This typically involves a rejection of germ theory and medical interventions in favour of holistic and 'natural' methods. All these notions might be classified as belonging to the 'biomedical category'. The second group of arguments are critical of the motivations behind, and sociopolitical consequences of, vaccine policy implementation. Public mass-immunisation is seen as an assault on civil liberties, the freedom and informed choice of parents and the individual ownership of the body. Questions are raised about the economic motives of doctors, public health institutions, governments and pharmaceutical companies and some suggest a larger conspiracy with various possible agendas. This might be labelled the 'sociopolitical category'. Finally you have notions which transcend this classification, notably the idea that vaccination upsets religious, moral or natural orders. A remarkable feature of vaccine critical groups is how these two sorts of arguments have continuously been voiced together.

A heterogenous phenomenon

Throughout its history, vaccine opposition has been characterised by its diversity and broad appeal. As the present circumstances are equally complex, one is required to make some useful distinctions. To capture the variety of vaccination behaviour, Streefland and colleagues (1999) have proposed the concepts 'acceptance', 'social demand', and 'non acceptance', with individual and collective forms 'refusal' and 'resistance'. Acceptance might be more or less active and reflects to varying degrees an informed and knowledgable vaccination culture. Social demand is understood as an active request for vaccines or better quality of vaccination services. The concept non-acceptance describes three different approaches to vaccination: First, willing to go, but unable to do so. Second, a refusal to go. And third, questioning the need for vaccination. As the authors claim, the latter approach '… may go beyond the sum of individual refusals and become organized resistance' (ibid). Streefland and colleagues' classification is constructed from people's actions, whether they vaccinate their children or not, and points to circumstances which explain their choice. A vital distinction must be made between action and words, between non-compliance and opposition. Parents who believe in vaccination can default for practical reasons, whereas others might vaccinate their children after having significant doubts. In recognising such discrepancies, the term 'vaccine hesitancy' has emerged to describe the continuum between acceptance and refusal (Larson et al. 2014).

A substantial amount of research has been dedicated to identify the factors that lead parents to refuse immunisations for their children[3]. It's perhaps both easier and more important to persuade the anxious masses than to confront the more avid parts of the 'anti-vaccination movement'. This essay however is mainly concerned with groups and individuals who share critical views of vaccination, and who frequently state them in public. Such groups might be more or less organised and their opinions might range from scepticism to outright hostility. Being an active and audible part of the public debate on vaccination, they necessarily form part of the backdrop which influence parents' decision making (Tafuri et al. 2014). Still, recognising that many groups are set up by parents themselves, they can be said to potentially influence each other.

The concept of 'the anti-vaccination movement' which figures a lot in medical literature is a heterogenous and poorly defined phenomenon. Indeed one might ask whether such a singular entity exists at all, given its varied and fragmented character. Another question is whether it should be considered a social movement and analysed within the relevant sociological framework (Blume 2006). The term which the English vaccine opposition applied to itself with pride in the 19th

[3] For a comprehensive review see: (Larson et al. 2014)

century[4] has become unfashionable. Some contemporary groups wish instead to appear in favour of something and label themselves as 'vaccine safety activists'(Johnston 2004). However, this rhetorical strategy may obscure the fact that such groups are consistently biased against vaccination (Kata 2012). Hobson-West (2007) has proposed the term 'vaccine critical groups', with a further distinction between reformist and radical orientations. The reformist groups consist of parents who claim personal experience with adverse effects, following the vaccination of their children. Consequently their main focus is recognition of vaccine injuries, treatment and compensation, without necessarily being negative to immunisation in general. The radical groups are more likely to consist of people with interests in alternative medicine, animal testing and 'big pharma', who for various reasons oppose all vaccinations (ibid). The same terminology is employed throughout this essay, with the additional terms 'vaccine scepticism', 'vaccine dissent' and 'vaccine opposition' to describe increasing degrees of active disapproval. In addition to these organised groups, there are communities which entertain specific views about vaccination without making it their dominant concern. Notable examples are practitioners of homeopathy, naturopathy and chiropractic as well as certain religious groupings and anthroposophical societies (Ernst 1997) (Streefland 2001).

This paper exhibits a staggering variety of arguments against vaccination, and to any medical professional it might seem odd that these are rarely countered or refuted. However such 'debunking' or 'corrective statements' are widely available elsewhere and secondary to the purpose of the following thesis. The objective here is, through a comprehensive reading of the scientific literature, to identify and elaborate the central themes of vaccine opposition and to explain their persistency. To achieve this, the present inquiry will place emphasis on the particular features of vaccines, to demonstrate how these have inspired controversies regardless of culture, politics, time and place.

The particular features of vaccines

As outlined in the introduction, a major objective of the following thesis is to identify the properties which separate the vaccine from other medical interventions. The purpose of this endeavour is twofold: First to explain why vaccines generate more hostility than other medications, and secondly to render this opposition somewhat comprehensible. In this paper, the particular features of vaccines will be grouped under three distinct headings: A particular mode of administration, a particular mode of distribution and a particular mechanism and effect. These categories are not entirely clear-

[4] One of their periodicals was even titled 'The Anti-Vaccinator' (Durbach 2000).

cut, but are delineated as such for the purpose of the following discussion. Since various medications share some of these traits, it must also be emphasised that it's the combination of these properties which is particular to vaccines.

A particular mode of administration

Most vaccines are given by injection, which might be painful and in some cases leave a scarring. It can be seen as a procedure where the active nurse, and in a larger sense the state, administers the vaccine to a passive and compliant individual. The procedure introduces a 'foreign substance' into the body, through a route which crosses its normal barriers. Once inside, the substance cannot be removed or controlled, and the process is thus irreversible.

A particular mode of distribution

Most vaccines are given to entire populations and depend on herd immunity for their full effect. They are given to small children and children's health is a sensitive subject which involves the ideas and convictions of their parents.

A particular mechanism and effect

Vaccines are prophylactic drugs with a counterintuitive mechanism. People receive the medication while they are healthy in order not to become ill. Those who become ill anyway may conclude that the vaccine doesn't work, while the majority who remain healthy might question the need for vaccination. Unlike many other medications, its mechanism is a lasting manipulation of the healthy body, and its effect (for good or bad) is perceived as long-term.

In the subsequent sections, the central themes of vaccine opposition will be reviewed according to which particular feature they are most associated with. As will be argued later in the discussion, vaccine opposition is frequently inspired by the configuration of all these properties, where any single aspect might play the dominant part. In this respect, several arguments could have been placed differently and the present division is merely an attempt to create a coherent picture of vaccine opposition.

A particular mode of administration

Although vaccine opposition cannot be reduced to a visceral fear of needles or even the fear of a foreign substance, the procedure itself has certainly inspired a wealth of negative interpretations. As

outlined previously, immunisation technology evolved from variolation by cowpox inoculation to our current injections. All these methods however, involve the introduction of a foreign substance by breaking the normal barriers of the skin. When it has entered the body, the substance cannot be removed or controlled, and the procedure is therefore perceived as irreversible. Furthermore this bodily intrusion is carried out by another person, who in turn acts on behalf of a larger system, whether it be the state or a community. Oral vaccination will be considered later when discussing the specific case of Nigeria.

The scar of the 'beast'

At the turn of the 20th century, when smallpox immunisation became a prerequisite for public school entry in some American states, the vaccination scar '…served as a visual form of certification of who was immunized and who was not.' (Davidovitch 2004). J.M. Peebles, a prominent anti-vaccinationist, stated that: 'Every child successfully vaccinated will carry on its body the scar - the brute-caused scar, the grievous sore, the scar of the 'beast' till death.' (ibid). The imagery of the state, putting its evil mark on innocent children, is still evident in some contemporary movements who post pictures of 'scary needles' and 'damaged kids' on their web sites (Bean 2011) (Kata 2010) (Wolfe et al. 2002). Some see being vaccinated as a passive and almost symbolic act where one accepts the superior knowledge and dominion of the state. This 'sheep mentality' is then contrasted with the enlightened perspective of the vaccine critic, which is obtained by personal investigations (Hobson-West 2007).

'A compulsory pollution of our veins'

An even more constant feature of vaccine opposition has been the fear of bodily pollution. In 19th century England, arm to arm vaccination between random people seemed to upset Victorian perceptions of purity and class boundaries (Durbach 2000). There were also considerable, and legitimate, anxieties that the procedure could transmit other diseases such as syphilis and scrofula (ibid). The following excerpt vividly illustrates how the Victorians equated environmental, moral and bodily pollution as products of parliamentary legislation:

First they achieved «in 1848 … their compulsory Act for polluting our rivers»; then, they legalized moral pollution by licensing «service men's sensuality» with the grossly unjust Contagious Diseases Acts; and finally, they brought in «a compulsory pollution of our veins». - Francis W. Newman (1882)[5]

[5] In (Porter and Porter 1988).

In the absence of immunological science, the introduction of diseased material into a healthy individual must have appeared highly experimental and audacious. Then as now, not only the technique, but also the ingredients of vaccines were portrayed as toxic and contaminating. They were 'foreign material' inoculated to pollute the blood of a pure and healthy infant, with unknown and perhaps fatal consequences. This notion seems to have been very persistent over time, whereas the suspected dangerous substance has changed frequently (Kata 2012). Contemporary critics are anxious about the injection of infectious material directly into the bloodstream, whereupon it penetrates 'deeper' and gains 'direct access to vital organs'(Leask and Chapman 1998). Other ingredients of concern are; formaldehyde, mercury/thiomersal, squalene, aluminium phosphate, foreign/animal proteins, ether, nanobacteria, anti-freeze and aborted foetal tissues (Bean 2011) (Kata 2010) (Leask and Chapman 1998). Some of these are actually found in vaccines and some of them are not. The mercury-containing preservative thiomersal was removed from vaccines in the U.S. despite no evidence of adverse effects and this remained a controversial decision (Jacobson et al. 2007). Cell cultures MRC5 and WI-38 originate from aborted foetuses and are used to grow the viruses in varicella, rubella and hepatitis A vaccines (Wolfe et al. 2002). This fact has raised moral issues for some and exemplifies the unease that people feel towards biotechnology in general.

Anxieties about the procedure and constituents of vaccines are both included here because they are so clearly interrelated. Some of these substances are linked, by vaccine critics, to specific unfavourable outcomes and this will be returned to when discussing mechanism and effect. A second topic which fall into the same category is the concern about multiple vaccinations, largely because it has a defined immunological basis.

A particular mode of distribution

It could be argued that the foremost disadvantage of immunisations is their dependency on herd immunity. This term refers to the fact that a high percentage of the population must be vaccinated in order to prevent pathogens from getting a foothold and cause epidemics (Murray et al. 2009 Ch. 13). Herd immunity is particularly important to those who cannot be vaccinated owing to immunosuppression or related conditions (Fitzpatrick 2004). Consequently if immunisation programmes are not compulsory, they require support and adherence. Generally speaking, three different strategies can be implemented to achieve herd immunity: Compulsion, compliance or concordance (Vernon 2003). Nothing seems to provoke more vaccine opposition than when compulsion or compulsion-like policies are adopted in otherwise democratic societies. This was apparent in 19th century England, in the U.S. over the public school issue and in France where

vaccination is still required to receive child benefits (Porter and Porter 1988) (Davidovitch 2004) (Hobson-West 2003). The compliance-policy remains the strategy of choice in most countries today, what Streefland (2001) has termed a 'promotive vaccination regime'. It can be described as a system where immunisations are not mandatory, but where one is expected and encouraged to receive them (ibid). This is the peculiar compromise that resulted from years of struggle, between those who valued civil liberties above infection control and those who didn't. As the last fragment of an era where doctors' authority and decisions went largely unquestioned, this policy is in complete disharmony with the current ethos of 'informed consent' and 'active participation' (Rogers and Pilgrim 1995). Some has therefore suggested a new approach of 'concordance', where people are more actively involved and their views taken into account (Vernon 2003).

The vaccine criticism of this section conforms largely to the sociopolitical category of arguments, as outlined previously. These can be further subdivided into one class of political and philosophical assertions and another of more or less conspiratorial claims. Frequently the distinction, between a valid political objection and more speculative suggestions, is subjective and difficult to make. This is particularly true of claims related to profit motivation. The second category is therefore meant to comprise, not only conspiracy theories in the sense of collusion, but also claims of unseemly collaboration and ulterior motives.

A 'medical totalitarianism'

The modern state is in a position to demand that its citizens surrender their immune systems as a public duty

- Paul Greenough (1995)

Following the compulsory acts in England, vaccination came to symbolise the intrusion of the state on spheres hitherto regarded as private (Durbach 2000). Along with the contagious diseases acts they '…suspended what we might call the natural liberty of the individual to contract and spread infectious disease…' (Porter and Porter 1988). The increasing triumphs of medical science were institutionalised through public health services, a process which prompted inevitable questions: Between the individual and the state, who owns and makes decisions about the body? Between parents and the state, who makes decisions about children and children's health?

Reverend William Hume-Rothery stated in 1872 that individual responsibility and parenthood would be undermined by the overprotective state and so 'if even vaccination were the greatest blessing in existence it would not be the duty of the state to enforce it' (Ibid). This was in

many ways the infancy of ‘medicalisation’, a process where the concepts and methods of medical science were increasingly applied to non-pathological phenomena (Williams and Calnan 1996). In this respect, ‘natural childbirth’ and vaccine refusal can be seen as contemporary attempts to reclaim child-rearing and reproduction as private domains.

Whilst a majority of countries have non-compulsory vaccination policies, claims of ‘medical totalitarianism’ tend to resurface quickly. In a promotive vaccination regime, immunisations are frequently experienced as mandatory on account of pressure exerted by health workers (Rogers and Pilgrim 1995). Web-based vaccine critical groups focus on how immunisation programmes violate civil liberties, by taking away parents’ rights to choose for their children (Kata 2010). This topic is particularly relevant in countries where vaccination default leads to the involvement of child protection services. Vaccine critics have also campaigned against the creation of immunisation registers, which they consider an expansion of government control that will eventually lead to compulsion (Leask and Chapman 1998). The attempted middle ground between compulsory and voluntary vaccination, which a promotive regime represents, is a perennial source of dispute. This continuous debate reflects genuine differences in political opinion, which cannot be settled by research or science. In addition, few have been willing to discuss the utilitarian aspects of vaccination policies and their compatibility with modern medical ethics. If we recognise that vaccines can have serious side effects, however rare, can it be justified to sacrifice the health of a few children to benefit the rest? (Leach and Fairhead 2007).

Conspiracies and ulterior motives

Public mass immunisation seems to ignite those of a paranoid disposition, yet even moderate vaccine critics have come to question the motives behind this enterprise. What follows is thus a collection of various ideas, from careful suggestions to veritable conspiracy theories. In one end of the spectrum you have concerned parents and reformist groups who claim that public health institutions and governments have been reluctant to inform about adverse effects. They maintain that doctors have been slow to report such incidents and quick to distrust any parent who presents their child with a suspected vaccine injury (Johnston 2004). The harmony of opinion that exists between doctors, public health agencies, governments and the pharmaceutical industry may seem questionable to some.

Jenner was accused of having mainly financial interests and this would extend to all doctors who advocated vaccination; ‘men who defend any abuse, however flagrant, if established and lucrative’ (W. White in Porter and Porter 1988). Similar arguments are found among contemporary

critics who believe profits to be the main incentive behind vaccination. The NHS had for several years a system where GPs were paid extra to achieve the necessary immunisation coverage, but it had to be abandoned as it led parents to question their advice (Leach and Fairhead 2007). Some critics even suggest that harmful side effects keep physicians and pharmaceutical companies in business (Kata 2010) (Leask and Chapman 1998) (Wolfe et al. 2002). Such criticism implies an unhealthy collaboration between doctors, pharmaceutical companies and governments; the 'unholy alliance for profit' (Leask and Chapman 1998) (Davies et al. 2002). This scheme supposedly depends on an elaborate web of lies and distorted information, in all essence a 'cover-up'.

The 19th century proponents of vaccination were also accused of manipulating the evidence, or interpreting it in an overly creative fashion (Porter and Porter 1988). Indeed the only conclusion that could be drawn from these debates is that one didn't have the kind of statistics that would prove or disprove the benefits of vaccination (Weber 2010). These numbers are readily available today, and it has become increasingly difficult to deny the eradication of smallpox or the tremendous reduction in polio cases (Leask and McIntyre 2003). Still, vaccine critics maintain that we escaped these ailments largely by improvements in hygiene, nutrition and standards of living. According to them, crucial vaccine information is deliberately withheld from the public. Yet somehow they have access to privileged knowledge, which is unknown or rejected by medical science. They further claim that governments protect doctors and manufacturers from liability and that adverse reactions are underreported. Finally they conclude that the hegemonic character of the medical establishment prevents sceptical doctors from speaking their mind (Kata 2010) (Leask and Chapman 1998) (Wolfe et al. 2002). When 'maverick doctors' decide to 'break away', they become prey to smear campaigns and professional shunning. The most celebrated of these is of course Andrew Wakefield (Fitzpatrick 2004) (Kata 2010). It is perhaps common sense to acknowledge that pharmaceutical companies have economical interests and to interpret their 'information' with an appropriate pinch of salt. It remains to be explained however, why governments would stage a massive cover-up to save an intervention which costs them millions of dollars a year and, according to the same argument, harms their citizens (Leask and Chapman 1998).

At the very opposite end of the spectrum you have those who believe that the vaccine is a constituent part of a more elaborate scheme involving the CIA, the New World Order, the Bildenberg foundation and/or many others. The asserted purpose of this conspiracy varies from mind-control to genocide[6]. While such notions are typically put forward in the West, the idea that

[6] See for instance; URL: http://www.whale.to/vaccines.html

vaccines are part of a genocidal scheme or cause infertility, has surfaced around the world. The global polio eradication initiative was disrupted in northern Nigeria in 2003. This happened when prominent religious and political leaders declared that the polio vaccine was an attempt to spread HIV and cause infertility in the muslim population (Yahya 2007). Similar claims have been expressed by Islamic leaders in Pakistan, Afghanistan and India and by Catholic organisations in South and Central America, with significant drops in immunisation coverage (Nichter 1995) (Warraich 2009) (Powell 2012). Recently a widespread and popular theory claims that the 2009 H1N1 epidemic was a so-called 'manufactured threat' (Bean 2011).

A particular mechanism and effect

To grasp the general mechanism of immunisations will require a modest comprehension of the immune system. It's critical to recognise that neither immunology, nor the germ theory of disease were generally acknowledged in 19th century England. Hence vaccination turned into a battle ground between the sanitarians, who believed in the atmospheric aetiology of disease, and the contagionists, who thought microorganisms were responsible. Vaccine critics sometimes confused these contrasting theories by advocating hygiene to prevent smallpox and quarantine to limit its spread (Porter and Porter 1988).

In contemporary western society, most people are vaguely familiar with both immunology and microbiology, but these frameworks are subject to highly personal interpretations. Vaccines are particularly vulnerable to this medical pluralism, because of their particular mechanism and effect. How people view the aetiology, prevention and the healing of disease greatly affects their attitudes to immunisation, as does their understanding of the immune system. In fact, both the real and perceived effects of vaccines threaten to compromise their success. Since they solve a hypothetical problem, the population needs to understand and believe in their purpose. But if such is the case, and everybody vaccinate themselves, the problem will remain hypothetical. Lacking experience with the relevant disease, people begin to question the need for vaccination. This is precisely what several researchers claim to observe in western countries today (Greenough 1995) (André 2003) (Kata 2010). In addition, no vaccines have a 100% efficacy rate and with insufficient immunisation coverage, pathogens will circulate and infect parts of the vaccinated population (Jacobson et al. 2007). These individuals and others might draw the conclusion that vaccines are ineffective.

Some reject the 'official' explanation as to how immunisations work, or they accept it but believe it has unfavourable consequences. Nevertheless, critics and proponents seem to share the perception that vaccination is a lasting manipulation of the immune system, with long-term effects

on the body. It could be argued that this temporal aspect is vital to understand how people have come to attribute certain conditions to vaccination.

Vaccines and the immune system

Mass childhood immunisation rests on the assumption that most children have similar immune systems, in the sense that they will all benefit from vaccination. However, one of the findings in recent qualitative work is that western parents tend to regard their children as highly particular (Leach and Fairhead 2007). Emily Martin has shown how the public understanding of the immune system changed throughout the 20th century to put emphasis on individuality and flexible adaptation to a changing environment (Martin 1995). Immunology itself has evolved considerably with modern genetics and vaccinology is likely to follow, with individual assessments of immune response and risk associated with infectious disease versus vaccination (Poland et al. 2009). Parents make their personal interpretations based on experience and social relations, rather than critical reading and risk calculations (Hobson-West 2003) (Leach and Fairhead 2007). A comprehensive review of parents' views and choices regarding childhood immunisations is beyond the scope of this thesis. Still, on the subject of immunity, their perceptions illustrate a discrepancy between lay and professional opinion which speaks volumes about the persistency of vaccine scepticism.

During their ethnographic fieldwork in Brighton, Leach and Fairhead (2007) came to identify some common themes in parental thinking about vaccines and immunity. Among the people interviewed, many considered their child's health to be strong or weak based on environmental, nutritional and inherited factors. Interestingly enough, this line of reasoning led the parents to entirely different conclusions. The parents of 'weak' children sometimes accepted the vaccine, thinking that they were prone to infections and complicated illness. Others rejected it on the assumption that their children would be particularly susceptible to adverse effects. Likewise some parents of 'strong' children opted out of the vaccine in the belief that they would tolerate the 'natural' infection, while others complied since their children evidently could 'deal with it'.

A popular notion was that the immune system needs to be built or trained through appropriate nurturing, nutrition and exposure to the world. It should be 'educated' by dirt and pathogens. Several accepted vaccination as a part of this 'education', while others made a distinction between 'natural' and 'artificial' immunity. According to this perspective, infection is preferable to vaccination because it's a 'natural' process which confers lifelong immunity. Vaccination on the other hand gives an 'artificial' and temporary immunity and can potentially harm the immune system, or impede its development. The maturing immune system, some parents

maintained, is particularly vulnerable and vaccines should therefore be delayed. The study reports another theory among the parents; namely that due to vaccination the immune system is deprived of its normal tasks and so turns against itself to cause autoimmune disease. Finally many of the study subjects expressed concern about the MMR triple vaccine and how it might constitute an 'immune system overload'(ibid).

Leach and Fairhead's fieldwork was conducted during the MMR controversy and it lent a particular flavour to the views and ideas that were recorded. As outlined earlier, parents and vaccine critical groups have complex interactions and seem to inspire each other. Web-based groups share several of these notions and might have played a key role in their dissemination (Wolfe et al. 2002) (Davies et al. 2002) (Kata 2010). An idea that seems entrenched in the minds of critics and parents alike, is that multiple vaccines may cause an 'antigenic overload'. The essence of this notion is that children receive too many vaccines, too early for their immature immune systems. By various immunological mechanisms this supposedly gives rise to adverse effects. Although there is no evidence to support such claims, some physicians now offer single vaccines and alternative immunisation schedules to meet the demands of anxious parents (Poland and Jacobson 2012).

Vaccines, the natural order and idiopathic disease

A truly essential claim among vaccine critics of every epoch, is that immunisations cause more disease than they prevent (Porter and Porter 1988) (Kata 2010). Through a complete reversal of medical evidence, they appear to believe that vaccines are both inefficient and dangerous at the same time, and for the same reasons. As will be argued here, at the core of their belief is a preference for anything 'natural' as opposed to 'artificial', what other researchers have called the 'back to nature'-rhetoric (Leask and Chapman 1998) (Davies et al. 2002) (Kata 2010). The term 'natural' could be understood as referring to objects, activities and processes which are not substantially affected by human technology and interference. The term 'artificial' on the other hand refers to objects, activities and processes which are substantially affected by human technology and interference, where a 'natural' alternative supposedly exists. As described in the previous section, the vaccine in this sense becomes 'artificial', whereas the infection is considered 'natural' (Leach and Fairhead 2007). By being 'artificial', the vaccine is thought to provide an inferior protection and simultaneously to tamper with 'natural' physiological processes, which in turn could have lasting negative effects.

While a few contemporary religious groups maintain that vaccination upsets the divine and moral order, the emphasis has gradually shifted to concern violations of the natural order. This

transformation was already underway in Victorian England where morality, the body and nature were all seemingly threatened by modern society (Porter and Porter 1988). The fundamental idea remains the same; that there is a proper and universal arrangement of things, which by being 'divine' or 'natural' is thought unquestionable. Any interference with this order is liable to tip the cosmological balance and provoke a retribution, either from God or nature itself. These notions, about the beneficial character of nature and the unfavourable consequences of human intervention, have led some vaccine critics to a specific understanding of disease. The following is an attempt to explain their perspective:

Nature and the infant body, in its untouched state, is perfect and in complete balance. Disease is therefore the result of bodily imbalance, caused by unhealthy lifestyles and human intervention in the natural order. Bacteria, viruses and other infectious agents are part of nature and cannot cause serious disease in the healthy and balanced body. Autoimmune disorders, cancer and other diseases where the body seemingly turns against itself cannot occur naturally and must be triggered by some human activity.

Among the prime suspects we find vaccination, which according to the above logic could be regarded as both unnecessary and dangerous. Indeed from the 1970s onwards, virtually every condition of unexplained origin has at some point been attributed to vaccination. The list is extensive and always expanding, but includes: Encephalopathy, epilepsy, ADHD, autism, alzheimer's, dyslexia, Guillain-Barre syndrome, 'sociopathic personality', infectious diseases, HIV/AIDS, autoimmune disorders, inflammatory bowel diseases, allergies, arthritis, SLE, MS, asthma, cancers, leukaemia, diabetes, infertility, chronic fatigue syndrome, gulf war syndrome, shaken baby syndrome and SIDS (Leask et al. 2010). When reading this list, we might certainly ask ourselves why the vaccine has become such a favoured culprit. Perhaps because vaccination is a lasting manipulation of the healthy body, its effects are also perceived to be long-term.

Leask, Chapman and Robbins (2010) have approached this question from another angle by identifying a number of shared features among the diseases allegedly caused by vaccination. These properties seem to be: An idiopathic nature, an apparent rise in incidence, face value biological plausibility, dreaded outcomes and close proximity to immunisation. In order to illustrate how these features combine to make the link sound plausible, we could pick autism as an example. Infantile autism has a multifactorial and poorly understood aetiology and seems to have increased over the last decades. It's a lifelong and disabling condition with onset in early childhood, about the time when several immunisations are given (Fitzpatrick 2004). The condition is therefore bound to sometimes appear shortly after vaccination, and this can be misinterpreted as a causal relation. A

rising incidence of autism is claimed to coincide with the introduction of new childhood immunisations, which again seems to explain the phenomenon. The face value biological plausibility is assured by suggesting an autoimmune aetiology, resulting from the vaccine's manipulation of the immune system. Being a serious illness with unknown origin and a rising frequency, autism is necessarily disturbing, because it's a threat that cannot be controlled or avoided. If vaccines are held responsible, this provides us with a convenient and preventable cause (Leask et al. 2010).

Discussion

Vaccines compared to other medications and technologies

Why have vaccines in particular been so disputed, among many other possible medications and technologies?

The present inquiry is an attempt to answer this question, by pointing to the features which separate immunisations from other medical interventions. It has been argued here that the particular character of vaccines results from the configuration of several properties. These traits have further been identified and fractioned into a particular mode of administration, a particular mode of distribution and a particular mechanism and effect. It's however vital to recognise that various medical interventions share some of these traits.

For instance, a patient who is admitted to hospital with pneumonia will perhaps receive antibiotics intravenously, but this treatment will only be offered to him and others with a similar condition. Although the patient may be unaware of its exact mechanism, the desired effect is obvious; to eradicate the infection. A number of medications are given by intravenous access to hospitalised patients and some are also given by injection. Both these parenteral modes of administration can be thought similar to that of immunisations. They involve the irreversible introduction of a foreign substance into the body, through a route which crosses its normal barriers. In a similar way the procedure is usually carried out by another person, but this health worker might be said to act in the interest of the patient, rather than on behalf of a larger system[7]. This brings us to the mode of distribution, where parenteral medication is significantly different from vaccination, in the sense that patients only receive the treatment which is indicated by their condition. Treatments

[7] Notable exceptions are the treatment of certain contagious diseases, and the treatment of people with severe mental disorders, which constitute dangers to the general public. Such treatments are usually given orally, but can be given by force, i.e. a different mode of administration in several ways.

such as antibiotics deal with the problem at hand, and when the problem is solved, the medication is discontinued. We tend to think that any adverse effects will subside when the medication is 'out of our system'. Our temporal perspective, of both positive and negative effects of such medications, is therefore short-term. When it comes to vaccines however, our perspective is long-term. Their mechanism is a lasting manipulation of the healthy body, and the effects are therefore also perceived to be long-term. On the whole, vaccines seem to stand out from other parenteral treatments in their mode of distribution and mechanism and effect.

Another medical intervention happen to resemble vaccines in both mode of administration and mode of distribution. These are the vitamin K injections that are given to all infants at birth to prevent hemorrhagic disease of the newborn. In terms of mechanism and effect, the injections are prophylactic, but not generally perceived to be a lasting manipulation of the healthy body. On the contrary, they provide a 'natural' substance which the body requires and will consume until it's gone. Be that as it may, neonatal vitamin K refusal has been reported and is clearly associated with non-immunisation (Sahni et al. 2014). The osteopath Joseph Mercola, an outspoken vaccine critic, has also advised against vitamin K injections[8]. The latter facts would appear to strengthen the argument that vaccine opposition is inspired by the configuration of its particular features. As the example might indicate, sharing two of these properties is apparently sufficient to cause refusal and opposition.

In a previous section of this thesis, it was argued that vaccination is perceived by some as violating the natural order. It does so by manipulating the immune system of the healthy body. Several products of human intervention, like biotechnology and climate change, might be said to change nature in rather more dramatic ways than immunisation. The controversies surrounding biotechnology demonstrate how powerful the notion is; that human interference with the natural order will bring about some unspecified misfortune. Biotechnology concerns the human body directly, through the food we eat and the medical care we receive. However people can choose not to be part of this development, by avoiding genetically modified products and refusing certain medical interventions. Climate change on the other hand concerns everybody, considering that its negative consequences will be experienced globally. Although it's predicted to affect everybody at some point, climate change is usually not perceived as a direct threat to the individual body.

Comparing vaccination to these other human alterations of nature, might provide us with a clue as to why this technology is particularly disputed. By virtue of their mechanism and effect,

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[8] URL: http://articles.mercola.com/sites/articles/archive/2010/03/27/high-risks-to-your-baby-from-vitamin-k-shot-they-dont-warn-you-about.aspx

vaccines constitute a human interference with 'natural' processes, analogously to biotechnology and climate change. In a manner even more pronounced than with biotechnology, they concern the human body directly through their intrusive and irreversible mode of administration. And finally, like climate change, they concern everybody due to their particular mode of distribution. In contrast to the threat of climate change, which people may deal with as they please, public health authorities usually require individuals to make a decision about immunisations. In this sense, the vaccine can be experienced as an immediate threat to the individual body, with the prospect of lasting negative consequences.

Dynamics and variations in vaccine opposition

Vaccines are unusual in the sense that by their very mode of administration, you are inclined to reflect on their mode of distribution and mechanism and effect. The fact that another person injects you on behalf of a larger system, compels you to hope that all of them have your best interest in mind. Likewise the irreversible introduction of a foreign substance into your body, is acceptable if you expect its mechanism to be harmless and its effect to be beneficial. When this trust is compromised, the particular features of the vaccine can lead people to ask what, how, on whom, by who and why.

To illustrate these dynamics and to challenge the propositions of the present inquiry, we return to a detailed consideration of the Nigeria case. As outlined previously, the global polio eradication initiative met with serious resistance in 2003, when muslim communities in northern Nigeria came to suspect that the oral polio vaccine was tainted with anti-fertility agents and the HIV virus (Yahya 2007). It was perceived as a combined effort between the central Nigerian government and powerful international partners to reduce the local muslim population. This was understood in conjunction with the US invasions of Iraq and Afghanistan post 9/11, in what was thought to be a western-led agenda to reduce muslim populations worldwide. Some parents seemed to accept childhood vaccination done in post-natal clinics, but were suspicious of the roaming health workers in the polio eradication campaign. Questions were also raised about the tremendous resources that clearly went into the effort, when there was hardly any regular health service available. The controversy was resolved to some extent by importing vaccines from Indonesia, which is a predominantly muslim country (ibid).

In analysing this specific case, it becomes evident how the particular features of vaccines are subject to local interpretations. The vaccines in question were given orally and we ought therefore to compare this mode of administration to the regular injection. Oral vaccination introduces a

foreign substance into the body, without causing pain and through a route which doesn't cross its normal barriers. Still, they are given by another person, on behalf of a larger system. The latter aspect was especially pronounced in Nigeria, where vaccinators literally came in cars to the north from the government headquarters in the south (ibid). Yet apart from this fact, the communities in the north didn't appear to question the mode of administration per se. This could be explained by the less intrusive character of oral vaccines compared to injections, but sociocultural studies of injections in sub-saharan Africa would suggest otherwise. Injections, although they might be considered incompatible with certain diseases, are generally seen as powerful and effective forms of healing (Bierlich 2000) (Birungi 1998). In Western Africa, vaccines are portrayed as 'strong' contributions to bodily strength and fluid balance (Leach and Fairhead 2007).

Although the popularity of injections in Africa seems to contrast with attitudes in western countries, a positive approach to the mode of administration is similarly determined by the expected mechanism and effect. Vaccine acceptance is not necessarily dependent on a biomedical understanding of mechanism and effect, but rather on the expectation of favourable effects in general (Streefland et al. 1999). During their ethnographic fieldwork in Gambia and Guinea, Leach and Fairhead (2007) found that many parents failed to differentiate between vaccines and other injections. These were all thought to have similar effects in building and strengthening the infant body. Their mechanism was variously described as cleaning the blood, chasing out illness and protecting the child from future disease. In this last respect, vaccines were compared to certain amulets which were hung around the infant's neck to protect him or her against misfortune. Interestingly enough, they also maintained that multiple injections were problematic, since the body would have difficulties to cope with all that substance (ibid). These perceptions may seem remote from the biomedical concepts of immunisation, yet they appear to have a central notion in common: That vaccines change the human body in order to achieve long-term beneficial effects. The idea that this change is a violation of the natural order does not seem prevalent in western Africa.

In northern Nigeria the vaccines were suspected to cause infertility, an allegation which has emerged frequently in African public health campaigns (Kaler 2009). Sterility has a special significance in threatening not only the individual body, but the long-term survival of the entire community (ibid). In this manner, the technology that was seen to strengthen and protect became reinterpreted as an instrument for evil powers to weaken and harm. Like in the West, the temporal perspective on vaccination effects seems to be long-term, whether they be positive or negative. To understand how this complete inversion is accomplished, several factors must be taken into account. First, according to Hausa tradition, polio is caused by a female spirit who consumes the limbs of

patients. It is therefore best handled by a traditional healer who has the appropriate contact with the spirit world. Since polio vaccination cannot protect against this event, it remained to be explained why such immense resources were allocated to this purpose (Yahya 2007). Questions about its mechanism and effect quickly led to questions about its mode of distribution.

It has been emphasised by many researchers how campaign style health interventions in Africa are subject to more resistance than regularly established clinics who offer a continuous health service (Kaler 2009) (Leach and Fairhead 2007). West African community leaders prefer to have vaccination officers eating and sleeping in their village, to create reciprocal and lasting relationships. This process is vital in building trust between the providers and benefactors of a particular health service (Leach and Fairhead 2007). Based on similar reasoning, Ugandan people prefer to own injection equipment themselves or to acquire it through trusted social contacts, rather than depending on public health institutions (Birungi 1998). These examples illustrate how the expected effect of a certain medical procedure can depend on its mode of distribution. Applied to the Nigerian case, it seems obvious that the top-down approach of the Nigerian government with roaming vaccination officers, a display of infinite resources and visible foreign presence, was likely to raise suspicion. In this way, questions about the mode of distribution led to questions about mechanism and effect. How significant the mode of distribution was in shaping local interpretations was revealed, when the controversy was nearly settled by importing vaccines from a muslim country.

The polio vaccine controversy in northern Nigeria is enlightening in several respects. On one level it demonstrates the essential dynamics of vaccine opposition, how questions about mechanism and effect lead to questions about the mode of distribution and vice versa. It was stated earlier in this section that the particular features of vaccines may lead people to ask what, how, on who, by whom and why. Having asked one of these questions, people often proceed to ask the rest of them. If one for instance considers vaccination harmful or ineffective, it seems a logical next step to ask about the real purpose behind public mass immunisation. Likewise if one thinks that the organisations and institutions who advocate and distribute immunisations are not trustworthy, it seems pertinent to ask whether vaccines are harmful or ineffective. This chain reaction of questions results from the particular features of vaccines, where mode of administration, mode of distribution and mechanism and effect are linked by people's interpretations.

A second lesson from the Nigeria case is how the particular features of vaccines, as defined previously in this essay, are subject to local interpretations. Being inherent to the vaccine, these properties are to some extent universal, but their ability to inspire vaccine opposition is largely

determined by context. In western Africa, injections are generally popular and public mass immunisation is unproblematic, as long as social relations are in order and the mode of distribution is accepted. The mechanism and effect of vaccines is not necessarily understood in biomedical terms, and depends to a large extent on their mode of distribution. Yet Africans seem to share the western notion that the effects of vaccination, for good or bad, will be long-lasting. Although the form and content of vaccine opposition may differ from the western context, the dynamics at work appear to be the same.

Concerns that are expressed through vaccine opposition

Why has this opposition persisted for such a long time, addressing nearly the same issues?

It was argued earlier in this thesis that the vaccine has a configuration of particular features, which may render it controversial and suitable to reflect on larger medical, social and political matters. The key to understand the persistency of vaccine opposition, lies perhaps in the character of these larger concerns. They all seem to reflect continuing debates in modern society, where resolution or agreement seems impossible. Without going into detail, the relevant issues are briefly listed below.

To begin with, vaccine sceptics express **concerns about the individual body**, about its integrity, balance and proper treatment. Questions are raised about who owns and decides over individual bodies in a modern society. Autonomy over one's own body becomes vital, since their alternative views about the aetiology, healing and prevention of disease may be incompatible with medicine and vaccination. Despite the monumental achievements of science and medicine, discrepancies between lay and professional opinion is a continuous phenomenon, and this is unlikely to change in the future. Secondly vaccine sceptics express **concerns about the relationship between individual and the state**. They consider vaccination policies a violation of civil liberties, and questions the right of the government to decide in matters of health and child-rearing. The issues which they address will be discussed as long as politics exist, regardless of the scientific evidence in favour of vaccination. Finally vaccine sceptics express **concerns about technology and human intervention**. As outlined previously, anxiety about human interference with the natural order has been a persistent feature of the western mindset. It seems probable that this uneasiness, towards technology and human intervention, will follow us into the foreseeable future.

Since vaccines appear to fit neatly into some of the most fundamental and lasting debates of modern society, it's perhaps not surprising that they remain controversial. An invention that can be

portrayed as threatening the body, civil rights and God's creation at the same time, offers great potential for discussion.

Conclusion

The present approach is limited by only considering works in English, and by mainly discussing vaccine opposition in a western context. This bias is somewhat adjusted by discussing the polio vaccine controversy in Nigeria and testing the earlier propositions against it. By focusing mainly on vaccine critical groups, this inquiry says less about vaccine acceptance and refusal in the general public. Its purpose is rather to explain how vaccine controversies can be inspired by the particular features of immunisations, at different times and in various places. This is not to imply that the configuration of particular features has to cause opposition, considering the fact that most people seem to accept immunisations. It must also be recognised that while all the features are present at any time, they are subject to local interpretations, and any single trait is given varying importance depending on context.

This thesis presents a variety of arguments against vaccination, and it must be emphasised that specific vaccine critical groups or individual critics might not agree with all of them. However, an attempt is made here to present a coherent picture of vaccine opposition, with a largely consistent and comprehensible logic. Although this thinking pattern is incompatible with medical science, to grasp its dynamics is vital to those who encounter vaccine sceptics in clinical practice and elsewhere. In explaining vaccine opposition as an understandable reaction to a peculiar technology, the present inquiry might also appear to discredit the specific claims of vaccine critics. As stated previously, it is not the intention here to discuss the validity of such claims, yet a central premise of the present analysis is that vaccine opposition is out of proportion with the minuscule risk it actually entails. If it was a measured reaction to a considerable threat, there would hardly be any need to explain it further. Finally no attempt is made here to provide a recipe on how to deal with vaccine scepticism, and this essay should rather be regarded as a solid basis for understanding the phenomenon.

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