International Journal of Sciences: Basic and Applied Research (IJSBAR)

ISSN 2307-4531
(Print & Online)

http://gssrr.org/index.php?journal=JournalOfBasicAndApplied

The Ethics of Vaccination Against Infectious Diseases: The Two Sides of the Coin

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Abstract

Vaccination involves the use of killed or attenuated microorganism or its antigenic component such as the protein or toxin to stimulate the body to develop immunity against diseases caused by the organism. This process is believed to be one of the most successful means of infectious disease prevention and control. The public health is saddled with the responsibility of protecting the health of the population and assist with the identification and protection of at-risk individuals as mandated by the State. The success of vaccination is dependent on the attainment of herd immunity within the target population. To achieve and maintain herd immunity, it is expected that about 92-94% of the entire population needs to be immunised. However, there has been reported cases of vaccine failure where some individuals claim to have contracted the disease which, they were vaccinated against. Although vaccine failure does not imply that the vaccines are ineffective but such gaps in meeting the specific purpose of vaccination forms part of the reasons for voluntary vaccine dissension. Vaccination dissenters and critics of mandatory vaccination capitalize on these limitations and other views in their movement against mandatory vaccination policies. Hence, it becomes paramount to answer the question of whether vaccine refusal by some individuals is, a function of harming others or merely not benefitting from such vaccines. This poses an ethical dilemma of whether vaccination should be made compulsory by the State or remain a matter of choice.

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The concern then is to ethically justify the views of both the State and the individual voluntary vaccine dissenters. Despite the recent breakthroughs in the development of vaccines against certain cancer cells, much emphasis is placed on vaccination against infectious diseases caused by bacteria and viruses which, forms the epicentre of this debate. These ethical issues are examined from diverse perspectives ranging from the principle of beneficence, the autonomy of individuals, duty not to infect others, free riding, virtue ethics, and the exploration of liberalism and the harm principle based on available evidence.

Keywords: vaccination; ethics; autonomy; paternalism; free riding; dissenters; liberalism.

1. Introduction

The primary objective of public health is to prevent disease outbreak, while the secondary objectives may include identifying at risk population, asymptomatic or preclinical stages of a disease with the intention of preventing the disease progression [1]. Globally, there have been huge investments into vaccination programmes with the intentions of reducing most vaccine-preventable public health challenges. Interestingly, the benefits have been evidently perceived to be enormous relative to the risks, with the medical and ethical benefits being justified by both the State, and public health professionals [2]. Given that the success of the programme is dependent on maximum coverage (herd immunity), and vaccination is based on individual's choice which is most often based on personal gains without considering the societal impacts of their decision; the ethical challenge then is how to draw a clear line between individual autonomy and the societal paternalism [3]. Although there are limited examples of where mass immunisation has been successful in eradicating communicable diseases, there is a general believe about how immunisation has helped in containing disease outbreaks [4]. Hence, there are enough reasons to encourage and continue such public health practice. However, there are several concerns around the effectiveness and safety of the various available vaccines, people's religious beliefs, medical contraindications, and individual intentional refusal of vaccines [5]. Despite the success recorded with vaccine coverage in recent years, there is still an existing gap between the desired level of vaccination and what is achievable. This raises ethical questions on whether vaccination should be made mandatory or voluntary especially in times of disease outbreaks and pandemic, and in situations where the scientific integrity of the vaccine is being questioned [6]. For children, the ethical dilemma is on who makes medical decisions on their behalf, hence, raises the issue of parental autonomy and societal/physician paternalism [5]. In most societies, parental autonomy is favoured more than paternalism because it is assumed they know what is best for their children. However, the parents do not always make the best decisions for their kids. Therefore, when such parental decision is perceived to be harmful or places the child at risk, the medical decision-making authority is withdrawn from the parents by the court based on compromised parental-autonomy [5]. In this case, paternalism could be favoured. The primary intention of vaccination programmes is to achieve herd immunity because it is only then that the population is relatively protected against an infectious disease compared to just the individual vaccination [3]. At individual levels, there are issues about the inconveniences in taking vaccines, poor disease risk perceptions, and the believes about acquiring disease by being vaccinated [6]. Since the success of vaccination programme is dependent upon coverage by immunising a significant number of the population, some individuals believe that since others are immunised, they are unlikely to be infected. Hence, hide under the immune protection of the vaccinated individuals [1]. These individuals refuse to share in the challenges of the public such as the burdens or adverse

effects associated with vaccination. Therefore, they are referred to as the 'free riders' since they take advantage of the immunity created by those who have undertaken the risk to provide social good by being vaccinated [7]. To the free-riders, the risk of infection depends on the vaccination status of others who provide herd immunity, and their individual and family interests worth more than their civic responsibilities to protect the society by taking vaccines [7]. In this way, vaccines are said to be 'victims of their own success' since its effectiveness could be passively taken advantage of, by the 'free-riders' [5]. However, based on the principle of 'justice', to attain fairness and progress, the public health burdens and benefits should be equally distributed [8]. To the policy makers, what is important is how to define, identify, justify and distribute the benefits and unavoidable harms, rather than to promote the benefits and avoid the harms [9]. Therefore, the basic concern of public health ethics is how to define these benefits and harm, and determine the extent to which individual autonomy is restricted while trying to protect them, as in the case of vaccination [9]. This poses an ethical dilemma to the public policy, hence, the essence of this article: to determine the extent of freedom that the society is allowed to enjoy in the face of public health challenges and policies, and the extent to which the State is allowed to interfere with individual autonomy.

Autonomy: Liberalism, Harm Principle and Free-Riding Perspectives

According to Mill [10] in his 'harm/liberty principle', 'the only purpose for which power can be rightfully exercised over any member of a civilised community against his will is to prevent harm to others; his own good, either physical or moral, is not a sufficient warrant' [10]. In essence, an individual has the right over what benefits him, benefits others, and possibly, what harms him but not what harms others [1]. It is only when there is a considerable threat to harm others that the state has the right to interfere or coerce an individual to act against his or her will. Although the state may argue that the action of voluntary non-immunisers threatens to harm others; evaluating the argument of the autonomy of voluntary non-immunisers, it could be justified that such harm (if any) to the third party is due to the disease hence, should not be attributed to the decisions and or inactions of the dissenters [11]. Since it is acknowledged that vaccination confers protection against infectious diseases and undoubtedly, has saved many lives [5], it implies that people who contact vaccine-preventable diseases (as a result of voluntary non-immunisers' decision not to be immunised), are themselves not immunised, else, the vaccine should have protected them from the disease [11]. However, since they decided not to be immunised, invariably, they have also consented to the consequences of their inactions. Therefore, the dissenters of mass immunisation programmes should not be accused of doing harm to other unvaccinated third parties since they are responsible for their own actions [1]. The state may go further to argue that these third parties may not have consented to voluntarily opt out of mass immunisation but might not have been reached by the immunisation programme either due to timing, the location of vaccination clinic or even indecision based on their level of awareness [1]. However, the state should not infringe on dissenters' rights just to compensate for their lapses in meeting the needs of the citizens. This is because, if proximity is essential for infection to occur, it invariably means that both the dissenters and the third party apparently live within same geographical location, and as such, face the same fate. In this case, the blame on the government for their inability to protect the health of the masses through the provision of essential health facilities and empowerment of health personnel should not be transferred to vaccine dissenters. In support of this, Harris and Holm [12] in their 'reciprocity thesis' argue that it is only justifiable to expect individuals to meet their moral obligations if the state on its own, lives up to its expectations

by offering protection and compensations to individuals who compromise their comfort to keep others safe. For instance, if an individual offers to be vaccinated to meet his obligation of not infecting others, such individual should be compensated for helping the state to protect the citizens [12]. Similarly, the compulsive duty not to infect others could warrant an infected individual or a disease carrier to be isolated and restricted in a bid to avoid infecting others [13]. This could be very demanding on the part of the individual trying to protect others, and sometimes, the risks of these preventive measures outweigh the benefits of such illness [14]. In the case of vaccination, sometimes, the risks involved in taking up a particular vaccine may outweigh the anticipated protection that such vaccine would provide. Therefore, coercing the population to take on such risk is unethical and not morally justifiable [13]. Moreover, the duty not to infect others does not imply that one should take unnecessary action that can harm him/her without adding a credible value to the third party he/she intends to protect. In the case of influenza vaccination for example, taking a vaccine that does not match the circulating viral strain adds no significant value to the society, instead, it may be detrimental to the receiver. Therefore, any coercion based on harm prevention to a third party restricts freedom and violates autonomy [6]. As van Delden and his colleagues [13] would suggest, it is unfair to subject others (for instance, healthcare workers) to unjust harm in a bid to protect others [16]. In another instance in the United States, a pregnant nurse was dismissed from her work for refusing influenza vaccine against her hospital's vaccination policy. This is notwithstanding her midwife's advice and the vaccine manufacturer's declaration of the uncertainty of the effects of the vaccine on the developing foetus. Ethically, this is arguably a gross infringement of the nurse's autonomy, which also caused unfair psychological stress to her [15]. Although some voluntary non-immunisers are subjectively free-riders but based on intuitive reasoning, it may not be morally justifiable to condemn their decision not to be vaccinated since such decision neither add to the cost of vaccination programme, nor in any way affect the compliance of other participants [8]. If the decision of the immunisation free-riders does not affect the outcome of other participants nor the attainment of herd immunity, there is no moral ground for condemning their actions on the basis of being free-riders [1]. There could be exceptions where people dissent from vaccination programmes based on religious and philosophical reasons [17], and coercing such individuals to participate in a mandatory immunisation programme is ethically unjustifiable, and a denial of one's right to freedom [16]. Furthermore, vaccination dissention could in part be attributed to the dubiousness of the medical professionals, the pharmaceutical industries and the policy makers. For instance, the 1998 retracted fraudulent report on Measles, Mumps, & Rubella (MMR) vaccine has made more people lose confidence in vaccination programmes and some of the activities of the medical professionals [18]. Moreover, if the free rider (who are just a very few portion of the population) cannot be tolerated, why have the stakeholders given rooms for exemptions on nonmedical grounds such as religious or philosophical reasons [19]? This gives room for suspicion, and such exemptions on nonmedical grounds affirm that these decisions could be politically masterminded for peculiar interests [3, 18]. Therefore, in situations where it becomes obvious that the threat is not as serious as perceived, or the intervention is ineffective in ameliorating the threat, it is unjustified to infringe on the autonomy of the individual [16].

2. Paternalism

It is the responsibility of the State to protect the health of its citizens especially the vulnerable individuals and those whom for medical reasons, cannot protect themselves from vaccine-preventable infectious diseases [9]. For instance, in the interest of new-born who are not old enough to be vaccinated but are not well protected by the

acquired immunity from their mothers. Another category of at-risk individual are the older vaccinated individuals who for certain reasons are not well protected by the vaccine. Unfortunately, this group of people are not easily detected until they are exposed to the infectious disease. Others such as cancer and immuno-compromised patients who would not be vaccinated for fear of adverse and allergic reactions also need to be protected from infectious diseases [3]. For children, the ethical concern is whether to allow the parents decide whether to vaccinate them or not, irrespective of the consequences of endangering their lives and the community [18]. However, despite the dedicated public health efforts to encourage people to voluntarily take up vaccine by providing it free of charge, giving incentives, and providing mobile vaccination programmes, the uptake is still very low, making the whole efforts seem futile [6]. Since it is the responsibility of the state to provide this protection through herd immunity [8], it may be justifiable to take paternalistic approach by taking the side of consequentialism in protecting the interest of a greater number of the population. Hence, overriding the selfish interest of a few – an ethically reasonable approach supported by utilitarianism [20, 21]. Maintaining herd immunity means that a considerable percentage of the population must vaccinate, with an estimated coverage rate of about 92-94% [22]. Leaving this critical decision to the discretion of individuals would be detrimental to the entire society. The question remains whether the parents should be allowed to make this decision or should it be an unquestionable enforcement by the State [3]? Although the parents are charged with the responsibility of their children upbringing based on the understanding that they know what is essential and can interpret their children's needs [24]. This does not guarantee that they have deep understanding of the immunologic and epidemiologic implications of infectious diseases like measles and other infectious diseases. Therefore, though parents assume their decisions are in the best interest of their children including vaccine-refusal, some critical decisions such as those that endangers the live of a child or causes life-long damage should be based on objective and empirical facts. Although the parents just like every other adult have the right to their religious and philosophical believes which the State ordinarily should not interfere with, the State cannot afford to risk the life of the community just because the parents lack the requisite knowledge to make sound decisions [3]. For instance, the United States' 2013-2014 MMR full vaccination target for kids entering kindergarten was 95% to achieve herd immunity. However, some states like Colorado attained less than 85% due to noncompliance by the voluntary non-immunisers [3]. Such attitude of voluntary non- immunisers threatens herd immunity and results in sporadic vaccine-preventable infectious disease outbreaks which, has much socioeconomic implications on both the State and the entire population [17]. There was another scenario in 2014 where a voluntary unvaccinated child in Dutch infected three other younger children with measles which nearly claimed their lives because those infected kids were too young to be enrolled on MMR-vaccination programme [3]. In these scenarios, the state is justified in its action to override the rights of individuals to avert threats to public health especially in cases of infectious disease outbreaks [23]. Provided the intervention is the best possible option to avert the threat, controllable and reversible in case of any error, the state can impose mandatory measures such as vaccination exercise to contain the threat. This is an important means to ensure equal distributions of the burdens and benefits of vaccination. Therefore, during contagious disease outbreak, the need to maintain herd immunity supersedes every individual rights, and as such, vaccination should be made compulsory for the common good of the society [7]. When such arises, it is morally justifiable to withdraw the decision-making privilege from the parents because the State has the duty to protect the children from diseases until they are up to the age of reasoning and able to make their own independent decision [3, 4]. However, when the disease condition is non-contagious and the symptoms present

later in life when the child must have grown, paternalism may be relaxed [3]. The decision may sound coercive or offensive, but there are other neutral rejoinders to this opinion. For instance, adult patients who currently have polio as a result of their parents' decision not to vaccinate them when they were kids (during the outbreak of polio in Netherlands in 1993), now join forces in blaming their parents for the harm they caused them [25]. Parents may argue that the risk of vaccine-preventable infections such as measles is being exaggerated, and there has been a very few outbreaks in recent times, therefore, it is not worth the risk of vaccinating their children [6]. However, the clinical complications of these infections are beyond what these parents assume it to be – which falls back to their lack of understanding of the medical implications of their decisions. Moreover, the limited outbreaks nwhich the parents argue to be insignificant may be as a result of herd immunity conferred by other children whose parents comply with the immunisation programme, hence, a self-defeating argument [3, 4]. More so, from the Kantian perspective, if everyone is to be immunisation free rider, then, there would be no one to contribute to social good, and everyone would have to pay for the consequences. For instance, the Human Papillomavirus (HPV) is believed to be associated with cervical infections and genital warts, and the cost of managing these HPV-associated conditions have serious health, social and financial implications on both individuals and the State [26]. Similarly, from virtue ethics perspective, one who intentionally opts out of a safe mass vaccination programme with the objective of enjoying herd immunity lacks virtue and is free riding. Although the parents may assume, they are just free-riders and cause no direct harm; from the rule-utilitarian perspective, it is morally wrong since they neither make contributions nor take risks associated with vaccination [1]. This is morally objectionable, and the State is within its jurisdiction to coerce these individuals to participate in the programme to protect the population [4].

3. Conclusion

Liberty is often interpreted as negative freedom and this is seen in the manner individuals interpret their choice of participation in vaccination programmes. Liberty does not imply freedom from constraints which makes vaccine dissenters believe they are at freedom to decide not to immunise as long as it does not directly cause harm to others. However, counting on Kant's explanation of autonomy, it is a positive freedom which allows one to realise and admit to social and moral responsibilities. Therefore, autonomy in vaccination should not be misinterpreted as liberty to avert moral obligations but being in the right position to decide for oneself, and not being decided for: what is essential in meeting one's immunisation responsibility. In this way, mandatory vaccination would be interpreted as a strict measure in ensuring people meet their moral obligations and not a denial of autonomy.

4. Recommendation

On the contrary, the state should on its own adopt milder measures in ensuring compliance to vaccination programme and avoid measures that are apparently too strict while trying to enforce vaccination rules. By so doing, individuals would not perceive this as threats nor see the State as contenders. Similarly, adopting others measures such as more vaccination education and engaging key stakeholders in vaccination dissention such as the religious leaders and philosophers in the vaccination policy-making process would go a long way in communicating the importance of achieving herd immunity through mandatory vaccination.

Notwithstanding, it is ethically justifiable to base public health decisions (including vaccination) on the interest of a greater member of the population since freedom ends where public health begins.

Acknowledgement

I appreciate the support of the students and staff of the Department of Public Health and Health Promotion (MSc.) at Swansea University United Kingdom for inspiring the conversation around the subject.

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