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## Vaccinate her? I hardly know her!: Understanding Vaccine Hesitancy

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EASTERN KENTUCKY UNIVERSITY

Vaccinate her? I hardly know her!  
Understanding Vaccine Hesitancy

Honors Thesis  
Submitted  
in Partial Fulfillment  
of the  
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By  
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**Abstract**

Vaccines are a first defense against highly communicable diseases such as measles. For vaccines to protect the population, a vast majority must be vaccinated to maintain herd immunity. Vaccine hesitancy is delaying vaccination from the suggested schedule or refusing vaccination outright. The hesitance is commonly portrayed as a lack of knowledge or scientific literacy. But highly educated people are still just as likely to be hesitant. The basis of hesitance is likely ethically similar to that of vaccination. Understanding the methods of the vaccine hesitant will better inform attempts to persuade them. Individuals have an obligation to the community to aid herd immunity. The government has an obligation to its citizens to aid herd immunity. Mandatory vaccination is unlikely in the near future so other coercive methods must be used to convince the populace to comply with vaccination recommendations. Education is a just form of coercion that is already implemented by the medical establishment but must consider ways to improve positive interaction with hesitance.

Keywords/phrases: vaccination, vaccine ethics, vaccine hesitancy, just coercion, exemption

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## **Introduction**

Vaccines are a primary method of disease prevention in modern medicine. The earliest instance of inoculation was to intentionally spread smallpox in small, controlled quantities so that the individual would contract the disease and fall ill, but the illness would be far reduced in severity and end in permanent protection. As medical technology and knowledge improved, so did the safety of vaccines. Moving past the point of intentional infection to the vaccines of today that rarely leave more than minor soreness. Along with improvements to sanitation and medical care during the 19<sup>th</sup> and 20<sup>th</sup> centuries, humanity has been able to control the spread of some of its most vicious opponents. Highly communicable diseases such as polio and measles are a rare occurrence, and smallpox was eradicated, the poster child for the triumphant of medical knowledge.

No new technology is without opposition. Our human instinct is to avoid disease as much as possible, but vaccination creates a counterintuitive narrative that requires intentional exposure to avoid the worst of it. This concept would not

be an easy sell to anyone. Antivaccination movements have existed in the West since their introduction. Some disliked them on religious grounds, disliking injection foreign material into the perfect human form or trying to prevent sickness that was meant as a punishment from above. But the new method was contested by medical professionals as well, needing more evidence before accepting its safety or disagreeing with the theory behind them completely. Even today there are still plenty of movements that refuse vaccination. These movements and their members will, for the most part, not be the subject of this thesis. There are individuals that are not completely opposed to vaccination but simply are resistant to some aspect of it. These individuals will be referred to as vaccine hesitant. Those that are vaccine hesitant will delay some or all vaccines from their recommended schedule or refuse certain vaccines they deem riskier.

For the remainder of this thesis, the term vaccine hesitant will be used to refer to people who are concerned about vaccines and delay the suggested immunization schedule, opt out of certain vaccines, or opt out of vaccination altogether. Using this term has two advantages. First, other terms such as antivaxxer or antivaccination are commonly used in a derogatory fashion. Some self-identify using such terms but in discourse for vaccinations, they get used as a heap into which everyone that is wrong is thrown. In an academic environment, this sort of hostility toward “the other” should be avoided to direct the writing toward as large an audience as possible. The second advantage scope. Antivaccination means a rejection of vaccination as a whole. This group is not the majority that have issues with vaccines. Broadening the term to vaccine

hesitancy includes all individuals that have made a decision that deviated from the suggested schedule. Trying to increase vaccination rates does not only include convincing those that totally reject it but also those that believe vaccines work but refuse this one or that one. What vaccine hesitancy does not encompass is those that are not vaccinated because of lack of access to sufficient medical care. While these people could be hesitant of vaccines, there is way for them to make a real choice.

Vaccine hesitancy can be distinguished into thoughts and actions. The two do not have to align. A parent can be concerned about the safety of a vaccine, yet still allow their child to be vaccinated. An individual can be for vaccines but fail to receive their yearly influenza vaccine. Ideally, somehow changing the mind and actions of the vaccine hesitant would result in much higher compliance. It is unlikely one course would change both. Education or discussion is needed to change the mind, while legal policy could change the actions. Without both together, we only get a population that is unwilling but compliant to standards (Austvoll-Dahlgren & Helseth, 2010) or a population is that is willing but unmotivated to act on their judgement. The first would create great public unrest and distrust of the government, the second a common opinion without any action to back it.

Many states in the US require children be up to date with their vaccination based on a recommended schedule before they are admitted to public school. Vaccine hesitant parents, though, sometimes have another way to qualify their child for public school: acquiring a nonmedical exemption (NME) from the

mandated vaccine schedule. The process for the exemption varies state to state, but it allows a child that is delayed on their vaccines or completely unvaccinated to attend public school like any other. NME are granted based on religious or philosophical opposition. They are an expression of individual liberty over what is done to one's body that conflicts with vaccination which in the end is a communal affair. Several states have done away with NME all together. California removed them from public schools in 2016 partially in responsive to the measles outbreak that began at Walt Disney Land the year prior. Before that removal, 3.09% of Californian kindergarteners in 2013 were covered under a NME. While this is not an incredibly high percentage, the exemptions were highly regional clustered, meaning the population vaccination rate in some areas was very low (Delameter, et al., 2018).

### **Efficacy and Safety of Vaccination**

There are two broad question that matter: one, should one vaccinate themselves or their child, and, if so, two, how much can others (the community or government) do to make sure they are vaccinated. Since the latter relies on the answer of the former, we must examine arguments for and against it first. This question seems to be solely about a person's individual obligation to themselves and paternal obligation to their child, but it must be considered if their decisions affect those around them and their child. The concept of herd immunity, the rate of resistance to a certain communicable disease in a population needed for effective protection from it throughout the population, make vaccination a communal issue. One does not only have to worry about them and their own, one



must judge their choice against the good of the community. The herd immunity rate of a highly infectious disease like measles can be around 96-99% (Rubió, 2012). Since herd immunity is for the benefit of everyone in a community and can only be achieved by a community, it is a communal obligation for it to be maintained.

Individual obligations require an individual to perform or forbids them from performing a certain action. In example, individuals have an individual obligation to not murder without sufficient and proper reason. This is something that everyone must adhere to in order to fulfill the obligation for themselves. A communal obligation requires the community as a whole perform or forbids the community from performing a certain action. In example, a certain community may have the communal obligation to raise its children properly. It is unimportant what the community defines as “properly” here. What is important is that this communal obligation does not dictate that any specific individual do any specific thing for the children. If the children, by the community’s definition, are not raised properly, then the blame falls on the whole of the community but not necessarily any individual. The issue here arises that the communal obligation could only be fulfilled by the actions of individuals, but it is not necessarily wrong for any individual to not perform these actions. If a child is constantly attended to by the whole community, it would become spoiled and dependent. Therefore, it is sometimes permissible (possibly even an obligation) for an individual to not aid a child at certain times so that it may be independent.

The fulfilment of the communal obligation to maintain herd immunity is further confused by the inability of the people that need it the most, immunocompromised individuals, are the ones that cannot fulfill it (Giubilini, 2019). Most vaccines themselves should provide immunity from their respective disease for the individual that receives it. This leaves only the ones that cannot receive them the most at need for herd immunity to be maintained. Immunocompromised individuals cannot receive live attenuated vaccines (LAV) because this type of vaccine uses a weakened form of the pathogen to build an immune response to the similar full-strength form. With a healthy immune system, the body can easily fight off the disease, but with a weakened immune system, there is a chance the body cannot fight even the weakened pathogen fast enough to prevent infection. LAV are used to create immunity to many of the most communicable diseases, such as mumps, measles, and chickenpox. So called “free-riders” that benefit from herd immunity but do not contribute even though they can create holes in the community (Hendrix, et al., 2016). Their barely perceptible non-contribution has huge impact when many people neglect vaccination together. A majority of recent measles cases in the outbreaks studied by Calderón Rodríguez Nelly Patricia, et al. (2019) were found to be unvaccinated, providing evidence that without herd immunity, those are the people that should be most concerned. Since the level of immunity needed for herd immunity with these diseases is relatively high, it is necessary for almost anyone that can be vaccinated to be vaccinated to protect those that have a lessened ability to protect themselves.

If an immunocompromised individual falls ill with the measles, whose fault is it? Can those around the individual that were eligible for and refused vaccination be blamed for their sickness? Not necessarily. It should first be noted that the discussion of blame is only about those that can be and are not vaccinated. If someone is incapable of receiving or has received vaccination, as long as they take proper precautions when they are sick, they are not blameworthy if the disease spreads from them. A person that refuses vaccination may be at some fault for acting recklessly and not taking the proper measures to protect themselves, but more salient, others that cannot receive such protection. Assigning the entire blame for the sickness of an immunocompromised person on a single unvaccinated person would amount to only moral luck (Jamrozik, et al, 2016). If the infection resulted from a chain of unnecessarily unvaccinated people, it is mere coincidence that the one individual is responsible for directly infecting the final person. Any of the others in the chain could have done the same by chance and the outcome would have been equally as bad. Can we blame everyone in that chain? They are all responsible for their risky decision to not be vaccinated, so some blame could be assigned to each. But the amount of blame may be practically undecidable. If someone in the chain stayed home when they contracted the disease, they should receive less blame than a person that visits chemotherapy patients while knowingly sick. While this assigning of blame may be theoretically possible, there is definitely no actionable way to decide who is ultimately to blame and in what amounts. Maybe no one is to blame. Herd immunity is a communal obligation after all. It is everyone's

responsibility to uphold it, so any blame of failure is to the community. This does not seem satisfactory either because there is obviously someone that has done wrong by taking an unnecessary risk. While this short discussion of the issue of blame is by no means exhaustive if the potential distributions of blame, it exhibits the issue as nontrivial.

While the benefits of vaccination are usually focused on, vaccine injury exists. Like any medical procedure, there are certain risks to vaccination. Certain vaccinations can cause symptoms such as a low-grade fever. These mild symptoms are not serious but may be concerning to the parent of a small child. There is also always the possibility of an allergic reaction to vaccine, especially for younger children that have not yet been vaccinated. These side-effects are easily treated if they become too serious, but those against vaccines are more worried about those that cannot be treated. In some studies, the flu vaccine has been linked to a development of Guillain-Barré Syndrome (GBS), an autoimmune disorder that causes a person's immune system to attack nerve cells, possibly causing permanent nerve damage or paralysis. The odds of contracting it according to these studies is one to two in a million. Even with low odds, some would choose to decline flu vaccination to avoid this for themselves or their children. However, without the flu vaccination, the odds of contracting flu for the unvaccinated and those around them increases, which can (and too often does) cause death or even GBS itself. In this case, the difference between developing GBS from the flu vaccine or the flu is action versus inaction.

It is a common bias to perceive a negative outcome resulting from one's inaction as less wrong or at least less one's fault than the same negative outcome resulting from one taking an action. Either way, the negative outcome still happens and happens because of the decision of the individual. This is the difference between pushing over a vase and allowing it to fall. Either way the vase breaks. What changes is the degree to which the one that decided to act or not is to be blamed for the negative outcome. First, examining the case of directly pushing the vase, the actor is obviously completely to blame for the vase's breaking. They decided to do it and did it. The second case cannot be considered so straight forward since the one that must decide did not direct cause the situation that caused the vase to fall. There are other, possibly unknown, factors that led to the situation. At least something else is partially to blame as it caused the vase to fall. This transference of at least part of the responsibility to something other than the one that did not act is how inaction may be less wrong. This is obviously a low risk scenario but a similar bias toward inaction can be shown for far more serious wrongs.

Vaccine hesitant individuals are oft characterized as acting out of fear or some misunderstanding of medical science. While this is sometimes the case as people naturally reject what they fear or do not fully understand, this is not all cases. The stigma against hesitance to accept vaccination science, even as a slight deviation from schedule in order to have time to further research, discourages individual research. Emphasis is on the majority being vaccinated even if they do not fully understand how or why it works, but individual informed

consent is a requirement. Some will be satisfied by the doctor's word (this presents its own problems of blind faith in authority) and others will need a deeper knowledge to feel comfortable with this medical procedure. If a choice is to be given, reasonably informed decision should be encouraged even if it initially begins with hesitancy. When people research the topic for themselves some may come to a logical conclusion to delay or refuse vaccines. The conclusion is logical in the sense that it is derived from a standard ethic, but logical does not imply the conclusion is sound. No matter the correctness of reasoning, understanding an argument reveals how to refute it. It is not convincing to just repeat facts when presented with opposing opinions. Forming a basic understanding of potential arguments will inform more adaptable strategies.

One way to show how one could come to a logical ethical conclusion to refuse vaccines is through the ethics of care. Care ethics add value to interpersonal relationships. Where other systems may consider the wellbeing of the whole community at all times as the main goal, care ethics says to attend to the wellbeing of those that depend on you first. Usually, these people that are dependent are those closest to that individual: family, friends, coworker. The emphasis on emotional connectedness is in contrast to many ethical arguments for herd immunity that are impartial and impersonal. Parents have an obligation to their dependent children to protect them. The medical professional insisting on vaccination has no such dependence relation. Therefore, the parent is in a position to decide.

The ethics of care can, if taken more broadly, be used to argue for vaccines as well. Individuals are obligated to act rightly for those that depend on them. This dependence exists for their children, but it is also present in their relation to immunocompromised individuals that they do not necessarily know. These strangers do not have an emotional relationship to the individual, making the decision slightly impersonal. The individual, however, to care for those that are dependent on this decision, should comply with vaccination. This argument is strengthened and even more in line with the previous one if the considered individual has a immunocompromised person close to them for who they must care.

### **Scientific Rejection**

Any acceptance of vaccination hinges on the acceptance of the medical research that supports their efficacy and safety. Without these facts, or at least weaker versions of them, there is no way to convince someone that they should be vaccinated. From their point of knowledge, they are avoiding unnecessary risk if they believe vaccines are ineffective or avoiding excessive risk if they believe vaccines are dangerous. These decisions are logical from this viewpoint. But the scientific consensus must be taken into account. It is folly to take the word of the many as law, but it is usually a good starting point. The fact that the scientific consensus is in favor of vaccines does not mean that they work, but it and the studies done to produce this consensus can lead toward the conclusion of their efficacy. What many ultimately distrust is the medical establishment (or “Big

Pharma”) to be genuine about the true nature and extent of the risks vaccination poses. The following two examples exemplify this distrust.

Claims of vaccines causing a rise in autism can be traced back to a 1998 study done by Andrew Wakefield. His study found a link between the MMR vaccine and digestive tract issues, which was claimed to then cause neurological damage. The study was later retracted by the publisher and Andrew Wakefield was stripped of his medical license. Unlike much scientific literature, the paper was widely publicized. Though not stated in the paper, in speech Wakefield further extended the implications of his paper, claiming that the vaccine led to the development of Autism Spectrum Disorder. This conclusion could be drawn from the paper with a certain reading of it due to hedging by Wakefield (Kolodziejcki, 2014). Developing major distrust in the public, claims of vaccines causing similar developmental damage can be traced back to this publication. Andrew Wakefield himself, even without a medical license, has continued to fight against vaccines, recently being involved in the production of *Vaxxed: From Cover-up to Catastrophe* and *Vaxxed II: The People’s Truth*, both films that seek to expose the medical establishment for withholding critical evidence about the true safety of vaccines. In “Vaccines and Autism: A Tale of Shifting Hypotheses,” Gerber and Offit (2009) examine 14 separate studies that fail to find a link between vaccines and autism. They find that there is a sufficient amount of scientific evidence to refute Mr. Wakefield’s findings.

In 1986, the US Congress passed the National Childhood Vaccine Injury Act to create the National Vaccine Injury Compensation Program (VICP) in



response to concerns about the DPT vaccine. This law created a system by which parents of children that they believe were injured by childhood vaccines could seek financial compensation. The VICP that reviews the cases operates under a no-fault policy, protecting vaccine manufacturing from have to pay out compensation or legal fees and all plaintiff legal fees are paid. The VICP also reviews cases looking for if the evidence points to the injury being more likely than not from the vaccine in question. From October 1988 to April 2020, the VICP has seen 21,757 cases and has provided compensation, whether through judgment by the VICP or some negotiated settlement, to 7,211 cases. The US government has also created the Vaccine Adverse Event Reporting System (VAERS) in 1990 in response to the same act to track claims of vaccine injury within the US. Anyone may report an adverse reaction following vaccination to VAERS. The system is a way to collect data on vaccines that could reveal previously unknown reactions to old vaccines or raise concern about the safety of a new one. The implementation of both these programs was deemed necessary to allow vaccine manufacturers to continue producing need quantities of vaccines without having to worry about the immense legal costs of vaccine injury suits. If they were made to cover it themselves, it was feared that the financial burden would dissuade them from continued manufacturing.

Thimerosal's presence in important vaccinations such as the diphtheria and whooping cough vaccines started to cause concern. These vaccines, and particularly the mercury in thimerosal, we believed to be causing adverse effects. One of these effects was believed to be autism which is notable as it is separate

from the claims of Andrew Wakefield as the MMR vaccine does not contain thimerosal. In 2001, a risk assessment was released by the FDA that concluded that “revealed no evidence of harm caused by doses of thimerosal in vaccines, except for local hypersensitivity reactions” (Ball, et al., 2001). However, in the same year, thimerosal content was either eliminated or reduced in all United States produces vaccine (except for the influenza vaccine) that were recommended for children 6 years old and younger. The medical establishment takes public concern seriously. There was no apparent risk to the presence of thimerosal, but action was taken to ease public worries and removing mercury in any form from human exposure will not be a bad idea.

This exhibits that vaccine hesitancy and refusal is not exclusive to the realm of fearful or undereducated people. The highly educated are not excepted. Because this group is not homogenous, a variety of ways to persuade the vaccine hesitant to comply is necessary, otherwise, large sections of people will be missed. Parents that refuse vaccines are generally exhibit a desire to find information about vaccines before deciding or their family and have a distrust for the medical establishment in general (Gullion, et al., 2008). These parents do not lack information, maybe not even understanding the scientific literature, but a sense that the medical community is there for exclusively their benefit.

A common conspiracy around the medical community is their financial ties to the health of the population they supposedly serve overshadow that service. In a dry, capitalistic mindset, it would be in the best interest of medication manufacturers, doctors, hospitals, nurses, et cetera if the population remained

perpetually ill, and thus perpetually reliant on the cures they offered. It follows that the best financial decision is not relying on fallible nature to disease the people but to cause the disease themselves. Then vaccines, conspiracy theorists say, are the perfect device to deliver such illnesses. The medical establishment wants everyone to be vaccinated, making it semi-mandatory for school children, adding new ones, making the vast majority be early in life. These tales are, of course, not true. Disproving these claims, however, would rely on the science done by those that are accused of being corrupt. The conspiracy is fueled by its own distrust making it unfalsifiable.

### **Mandating Vaccination**

Regardless of some people's objections to the science of vaccination efficacy, the scientific consensus is currently in favor of them. Thus, governments around the world act on this consensus in order to the best of their ability and knowledge protect the health and wellbeing of their citizens. If citizen that could voluntarily sought to be vaccinated, no reason for government intervention would exist. But since this is not the case, governments must put into place certain mandates for vaccination to be certain of the necessary level of compliance. Where freedom of the individual to make their own choices is valued, these mandates are limited in the ways and amounts they may illicit the desired behavior. The mandates must be somewhere between forcible vaccination of every eligible individual and merely suggesting vaccination. While this range excludes forcing all to be vaccinated, it includes many coercion techniques. Such techniques are central to convincing those opposed to vaccines to comply to

government mandates despite their fundamental opposition. While these techniques may increase herd immunity, they may decrease the freedom of opposed citizens in unethical ways.

In 1901-02, cities in Massachusetts instated coercive vaccination laws. These laws were intended to limit the spread and lethality of smallpox (Walloch, 2015). Citizens were required to be vaccinated and have their children vaccinated barring any medical issues. Noncompliance was punished with a \$5 fine (which is about \$150 dollars in 2020 adjusted for inflation) or jail time. Neither of these punishments, however, exempt anyone from refusing vaccination without medical reason. These laws technically allowed individuals the right to refuse medical treatment, but the government in essence gave them no choice. So called "virus squads" including police were sent out to forcibly vaccinate the homeless and poor and immigrant workers. Campaigns through lower class neighborhoods were accompanied by police, removing any air of compliance being voluntary. One could refuse the fine and have a trial, many people complying before their trial or given little time to present their case before judgment against them was announced. Massachusetts governments, while trying to prevent outbreak of a deadly disease, took their citizens' right to refuse unwanted medical procedures, violating their personal autonomy.

The concept of individual personal autonomy is another key to vaccine hesitancy. People do not usually like being told what to do, especially if they do not want to do it. So, there is already resistance to mandating something like vaccines. Personal autonomy says that to some extent individuals cannot be

forced to take or not take actions. Obvious exceptions to this right include acts like murder and assault, acts that directly harm others. These can be justly outlawed and punished without infringing on the personal autonomy of the actor. For vaccines, this returns to the issue of whether individuals are obligated to maintain herd immunity. In the case of murder, it is a demonstrable fact that the act directly harms others and thus is bad for the community. A less direct or potentially unlikely harm to others is created when one is not vaccinated. Because of herd immunity's nature as a communal obligation it is hard to blame people or exhibit that they will harm people by refusing, as they might not if proper herd immunity exists.

Mandating vaccines because of potential harm looks a lot like arresting someone that has the potential to do harm before the harm is done. However, the latter is a thoughtcrime, while the going against the former is an action with physical consequences. One cannot and should not be arrested for simple thinking of harming someone or seeming suspicious. Nothing was done, no physical potential for harm has been created. Refusing vaccination is a non-action with consequences. Thinking about harming causes no harm but neglecting to negate harm is harming. Vaccines prevent disease and refusal allows the spread of it.

An appeal to the communal obligation of herd immunity may not even be needed in order to conclude that that vaccination should be compulsory. Personal safety is the most immediate benefit of vaccines and the focus of hesitancy. Vaccines usually protect the individual from disease with a minimal

risk of adverse effects. In light of these potential immediate risks, it can seem as if a relatively small chance of injury from future disease is traded for a similar chance of immediate injury. A similar risk assessment is done legally with the mandating of seat belts. It has been shown that wearing seat belts greatly reduces the risk of injury and death in car accidents. While seat belts prevent or minimize injury from many common situations, seat belts by design restrict movement and can thus trap passengers in situation in which they would otherwise be able to escape, such as submerging underwater (Giubilini & Savulescu, 2017). This life-saving technology causes its own unique injuries. These situations are small in comparison to those that prevent injury. Therefore, US state governments (except New Hampshire) have mandated seat belts in some form in order to save lives. The government saw that there was a threat to personal safety that could be reduced by making the choice of individuals compulsory. The initial reaction to these laws was expectedly negative (Morelock, et al., 1985). But as the practice was normalized, it is now considered by the majority to be necessary to wear a seat belt and for the government to protect personal safety in this way.

In the case of parents refusing vaccination for their children, the autonomy being respected is slightly different. Rather than a person making a decision for themselves, they have the right to make a decision for their child, paternal autonomy. A parent as the caretaker of their children can raise it how they see fit as long as it is not harmful to anyone, especially the child. Johan Bester (2018) argues that the child has a competing right to be vaccinated. In a just society, a

child would be given the right for that society to protect it from disease as best as it can. That child should be given the most opportunity to not have to experience preventable diseases. Personal autonomy when applied to childhood vaccination does not protect the best interest of the child, only providing it for the parent. Children are owed immunity, so they should be vaccinated. If they cannot be vaccinated, they are owed that everyone else be.

Limits on herd immunity exist. Once the population has been vaccinated to a certain coverage level, further individual immunity adds less and less to the overall population immunity. It should be noted, however, that vaccination will provide powerful immunity of the individual even at peak herd immunity. The limitations of herd immunity only affect the collective obligation to vaccinate to protect those that cannot. After a certain point, the risk of contracting or spreading the disease is lower than the risk of vaccine injury. An argument can then reasonably be made that no one should be vaccinated after this point. If the purpose of vaccines is to protect people, it would not make sense to continue administering them when harm is more likely than protection. Policy-wise, it would be a hard game to play to police the numbers. One person gets the vaccine, the next does not, the quota reached until the immune population percentage is increased by death or birth. It is not an impossible feat, but because of the rarity of vaccine injuries, it would not be a worthwhile endeavor.

### **Just Coercion**

If government's do not mandate vaccination, other methods must be used that push people past vaccine hesitancy. Alternative methods aim to convince

people effectively while still providing a choice but presenting vaccination as the best option. Australia implemented coercive legislation called “No Jab, No Pay/Play” that sought to convince the vaccine hesitant by removing tax incentives from families with NME and disallowing their children to be admitted to childcare facilities. This program did increase the vaccination rate improving Australia’s herd immunity, but because of their already high compliance rate, this most likely had a negligible effect on immunity. Despite the penalties, these policies still allow for families to philosophically object to vaccination, and so does not force compliance. These penalties, however, could have disproportionately impact underprivileged families that previously relied on these tax incentives and childcare for them to survive (Haire, et al., 2018). These families do not avoid vaccination because of philosophical disagreement but are unable to properly comply with the vaccination schedule due to the cost of receiving medical services or having no way to take their children to receive them. While those able to compensate for the reduced income and childcare may continue as they always have and some may just comply, some will be penalized simply for being poor.

This issue with the coercion methods in Australia is the same for all negative financial coercion. For the coercion to be convincing, the financial penalties incurred must be enough as to be noticeable to a major of people. This, unfortunately, means that the most affected will be the ones with the least resources. The concern that these people may not have sufficient access to medical resources in order to comply is still present, but a more general concern



is with the choice presented. With these policies, a low-income single parent family must decide between going against their best judgment if they are against vaccines and, say, childcare so that the parent can work. Having the child completely vaccinated is the goal, but there is no real choice in this situation. The parent must be able to work to provide for their child. The financial disincentive does not merely discourage vaccine hesitancy as it is meant to do. In this case, it forces it out through threat of further poverty.

A positive financial incentive program would be just about as effective at increasing vaccination rates in the lowest and highest income populations. Those that lack access of medical care will still be unable to be vaccine, even for a financial gain. Those that have enough money to ignore the incentives and stick to their ideals will not even notice. Those in the middle, who can access medical care and would be positively impacted by the extra money, are who is going to be persuaded by this coercion. This is the same group that would be able and would want to comply with the negative financial coercion as well. As far as judging between the two, both provide at least some boost to herd immunity, but lack the reach to improve it in low income communities that simply need more access to comply. The herd immunity in higher income community is likewise unaffected. This lack of reach to the entire population results in still having pockets of dangerously low herd immunity. The positive incentive scheme is at least not harming anyone, making it only unfair compared to unjust negative financial incentives.

Coercion through incentives does not have to be exclusively financial. In their 2017 paper, R. Silverman and L. Riley discuss incentives programs that sway social acceptance of an action or refusal of it. This, again, can be positive or negative. Such positive programs would seek to inform and convince that the public that a certain decision would be favorable. With vaccines, this would look like a campaign to share the effectiveness of vaccines and their essentialness to a modern world without much risk of vaccine-preventable diseases. It would be a way to uplift the decision the government wants people to make so they feel empowered, normalizing the practice in the population. Negative social incentive would entail denormalizing unwanted behavior. These campaigns would focus on why refusing vaccination is undesirable, not only for the individual but those around them that could be affected by the decision. This incentive program itself creates no obligation to vaccinate. What is being taken from people that refuse vaccination is a “psychic tax” in the form of rejection by the majority. As the message is spread, it will disrupt tightly knit community built around vaccine hesitancy where delaying or refusing vaccination is the norm and embolden those for vaccinations to speak more often against resistance, just as campaigns against smoking have done in the past.

Overuse of denormalization campaigns can limit their efficacy. While meaning to discourage an action and encourage the population to reinforce the discouragement, overexposure can normalize the denormalization. Those against vaccination will see the propaganda as making them an “other” to feared and attacked. This will further push them away from further medical advice. This

sort of stigmatizing attitude already exists in some groups such as pro-vaccine Australians. A study found that the majority believe people in or around vaccine refusal movements are anything from charlatans to illogical idiots (Rozbroj et al., 2019). Outright rejection of vaccine hesitant individuals as worth of being able to argue in a logical way creates a divide that cannot be breached by words. Treating those that disagree as less than will only serve to strengthen their devotion to the way they have chosen.

Whatever type of coercion method is used to convince the populace to vaccinate, it should ideally be just. Just coercion allows for a genuine choice. It maintains the freedom inherently given to individuals while presenting vaccination as the best possible choice. Negative and positive financial coercion have similar problems: they highly affect the underprivileged and have almost no effect on the wealthy. Losing or gaining a couple thousand dollars means everything to a retail worker but nothing to a millionaire. Though these negative methods as seen in Australia can improve the vaccination rate, they disproportionately affect those that had no other real choice than compliance. A positive financial coercion method would provide additional resources to those that comply with the regulations. This, sadly, has the same unintended coverage issues as the negative methods. The underprivileged with limited access will still be unable to comply and receive the incentives. This does not necessarily make positive financial incentives unjust; it only makes them unfair because of already present injustice in the access to medical treatment. Thus, negative financial coercion is unjust and positive financial coercion is at least unfair.

An easy example of just coercion is proper public health education. Almost anyone could be vaccine hesitant if they did not know what they were. The doctor is an anxiety-inducing place for many and adding a needle to the mix will cause some to faint. To minimize this aversion, knowing exactly what is happening is key. People must understand the importance of eligible, healthy individuals being vaccinated for the rest of the population that cannot be. People need to be taught the scientific facts about vaccines so the emotions from the thought of having their child cry after the shot do not affect and significantly outweigh the obligation they have to protect that child. Simple education is always just coercion. Presenting facts forces individuals only to do what they think should be done. However, this is not always how it is presented or at least not how it is perceived. In a Canadian study of discussions between people for and against vaccines, it was found that both sides felt they were over pressured by medical professional (Massé, & Désy, 2014). Some that had been vaccinated told that they were convinced by the guilt of potentially harming the elderly or the children in their family. Some against vaccines were overwhelmed by the potential guilt if they agreed to have their children vaccinated and an injury occurred. Whether the pressure in these situations was the result of the medical professionals pushing too hard or the individuals' guilt is unclear. What can be gathered from this is the fact that there is such thing as unjust education. Education is meant to nudge people to conclusions with knowledge, but it becomes unjust when it turns to a shove until the individual yields.

## **Influenza Vaccines**

The influenza vaccine is a particularly interesting case for vaccination. Vaccines for diseases such as measles and chickenpox only need to be administered a set amount of times before immunity is achieved. Compliance is only needed at a certain point and never again. With the flu vaccine, compliance is constantly needed because it must be given every year to keep up immunity and develop immunity to the strains predicted to be most common that year. Its annual nature presents unique challenges such as the need for campaigns to not only target those that are vaccine hesitant, but everyone, especially at-risk populations. The flu is a deadly seasonal threat, even though its severity is not usually public focus.

A major concern is the effectiveness of the vaccine. The prevalence of the various strains of flu each season is variable, thus the vaccine must account for this. To prepare enough of the vaccine for the entire population, projections of the rates of strain must be made before the flu season even starts. When these projections are accurate, the vaccine effectiveness that season will be high, but it can easily drop as it did in the 2018-19 season to 29% effectiveness (Flannery, et al., 2019). The quantitative lack in effectiveness raises possible concern with the balancing of risks versus benefits. With such a low and variable percentage, there seems to be little benefit to get the vaccine because it might not even work, so it is not a priority for even those that are for vaccines. While individual receptiveness to the vaccine is variable, but the benefit of the population as a

whole receiving it is non-zero, showing a decrease in flu-related pediatric (Ferdinands, et al., 2014) and geriatric (Rondy, et al., 2017) hospitalization.

Medical professionals, however, are not infallible. They can just as easily be hesitant toward vaccines. A Brazilian study of medical students and physicians found that the almost all had a registry of previous vaccination and could name the vaccine they had last received, a good indicator for their overall positive attitude toward vaccines. But oddly 15.4% of the physicians and 47.2% of the students had not received their influenza vaccination in 2015. A majority cited a “lack of interest” as the reason (Mizuta, et al., 2019). Even though these physicians were not against the flu vaccine, a personal lack of interest in receiving it would translate to a lack of interest in suggesting it and administering it to at-risk populations. Requiring medical professionals to receive the flu vaccine in order to practice would fix under-coverage, but in turn would potentially violate their right to personal autonomy as patients in this situation (Murana, 2014).

At-risk populations should be the focus of flu vaccination and overall protection. Children and the elderly are the main populations publicly known to be at-risk, but pregnant people are one too. Flu infection can not only be dangerous to the individual, more easily hospitalizing them, but can also be dangerous to the child, resulting in miscarriage, stillbirth, or birth complications. There is no need for pregnant people to rely on herd immunity as they are allowed, and even recommended by the World Health Organization, to receive the vaccine (“Vaccines against influenza WHO position paper,” 2012). Despite

this fact and the vaccine's importance, uptake is relatively low. In the worst of places, such as Italy, the coverage rate is as low as 2%. In a study of Italian pregnant women, 96.1% did not receive a flu vaccination for that season (Prospero et al 2018). This high number was worsened by the lack of information given to these women by medical professionals. When specifically dealing with at-risk populations, especially a population with so much else to worry about health-wise, it is the responsibility of medical professionals to suggest vaccination and inform them about the risks present without it.

### **Future Considerations**

In order to protect herd immunity and protect the immunocompromised, new strategies need to be implemented to discourage and eliminate vaccine hesitancy wherever possible. Changes in legal policy, medical practice, and public perception are needed to most effectively combat it. The following are outlines of suggested courses of action. These are not fully realized but are indicative of the changes that are needed.

If NME are to exist in the US, there must be more stringent universal processes. One of the most basic is implementing a professional education requirement before acquiring both religious and philosophical objections. This will most likely not convince those that are firmly against vaccines to change their minds, but it will allow those that are underinformed or just uncomfortable with vaccination to have an individually dedicated session to discuss their insecurities about vaccines. Mandatory education should be a bare minimum to be exempted from mandatory vaccination. Where philosophical exemptions exist and some

larger requirement than filling out paperwork is not present, vaccines for public school children are no better than a mere suggestion. This suggestion, however, is at least helpful in having the majority of children that are can be vaccinated.

Alternatives could even be considered for those with NME. Immunity is what matters when it comes to allowing children into public schools. Vaccines are one way to gain immunity, and by far the safest, but they are not the only way. Pox parties are an old school way to make children immune to chickenpox. They are gathering where parents bring their children around a child with chickenpox so that they will become infected. Since when you are infected and recover, you will not get it again, intentional infection could replace vaccination (Jamrozik, 2018). Using such methods should be permitted if parents are allowed to opt out of vaccination. As long as it is done properly, it will bring more harm to a child than a vaccine but will at least prevent them from contracting a more serious form of the disease. Self-isolation would be a requirement after attending a pox party because the individual is the person that signed up to have their child infected, not everyone with which the child comes into contact. Not allowing such alternative methods of immunity building while allowing NME does not show a commitment to herd immunity and public safety, but a commitment the paradigm of vaccination.

Recommended resources for information on vaccines are for vaccines, usually medical articles or from the CDC or other health organizations. This leaves folks that want to examine that other side of vaccine argument for whatever reason little choice but just to Google “arguments against vaccination.”



The information they find is not immediately invalid because they found it on the internet. The internet allows ordinary people access to a vast repository of specific and helpful information, and it would be a waste not to utilize it. But it is a platform that anyone can use. It is quite easy to create a website to disseminate completely false information that looks just as professional as the CDC website. A person needs no qualifications to post on the internet, so the research done may be lacking. Individual research is good for popular education and individual decision making and needs to be encouraged so that the information found by those curious to find it is not less than good (Dube & Gagnon, 2018). Of course, it is expected that medical professional will lean much more toward spreading information for vaccines. Librarians, however, are in charge of curating the best information on all topics for the public. Unfortunately, for vaccines this directive to provide the “best” information is usually interpreted as solely providing information in favor of vaccines (Bossaller, 2014). This one-sided showcase can push people away in two way. They see only one side being presented as a form of controlling the information provided to the public as a way to control their decision. Then, if they want to find information on alternative treatments, they are left to decide for themselves what the best of those sources are. It is not expected that the two sides be equally represented. This would imply that each have an equal amount of scientific evidence for efficacy. What should be expected is the introduction of books on alternative treatments into public collections curated by librarians to facilitate discussion about vaccines with well researched resources.

The parents of a child are the ones that decide whether to submit them to vaccination or not. Parents should not be expected to be experts in medicine. The decision would seem to be better left to the community of medical professionals that have extensively researched the subject. Medical professionals are seeking to protect this singular child, just as the parent wants to do, as well as help protect the entire community. But despite their best intentions, medical professionals do not and cannot have the deep connection to the child as an individual that a parent can. The lens they see the decision of vaccination through casts the same importance to each individual and their decision. That individual's decision helps decide whether the whole of the population is protected. This focus of medical professionals on herd immunity is perceived as impersonal to vaccine hesitant people. They seem to not want this child vaccinated in particular, deeming it individually necessary, but meeting some grand quota of vaccines trying to inoculate as many people as possible. Parents tend to not be persuaded by appeals to herd immunity. Their concern is with their child which they have direct responsibility for.

This predisposition away from arguments to parents' communal obligation must be accounted for in patient interactions about vaccines. Focusing on how the vaccine will affect them and their child will aid more in helping them make their decision. Feared vaccine injuries discussed earlier (ASD, GBS) are individual in nature. What is feared by parents is not that the vaccine will have a negative impact on those around their child, but severely and permanently affect their child. The discussion must play out as a conversation about the existence

and extent of risks to the child and about the immense benefits the child, and at the same time the community, will receive. This method of education has been shown to improve vaccine uptake (Madlon-Kay & Smith, 2017). It is not a debate to prove the superiority of the scientific method or medical knowledge. It is an empathetic conversation between a parent deeply concerned for their child's safety and a medical professional that is deeply concerned for the safety of all.

A method used to not so much convince as trick parents into having their children vaccinated is presumptive vaccination. Medical professionals will, instead of bringing up vaccination and deliberately having a conversation about if the parent wants to comply or not, presume vaccination as the default. Phrases like "it's time for some shots" do not invite decision from the parent. (Williamson & Glaab, 2018) Though the parent may submit to the vaccination then, afterward, they will know they were pushed and become further skeptical of vaccines and the medical community as a whole. This method abuses the authority that doctors are innately given in our society. They are meant to be smarter than everyone else so their opinion on medicine is respected, if not the default, for the rest of the population. Repeated abuse of this power is not only wrong but will avert parents away from seeking medical care. Alternatively, being able to recognize and redirect particular biases of parents, such as a predisposition to "natural" methods or against taking potentially harmful actions to prevent other harmful situations serves the same purpose but does not exploit the parent (Dubov & Phung, 2015).

## **Conclusion**

Vaccine hesitancy is not simply a lack of information or misinformation. It is a process of individual scientific research, complex decision making for not only themselves but their children and other loved ones. Sometimes there is an emotional component, from the stress of decision making or the pressure of a medical professional. It can be cultural, vaccine hesitancy breeding vaccine hesitancy in casual conversation between parents or normalization of it through Facebook groups. Vaccine hesitancy is not a single issue. Having to use a single word to describe so many different causes and outcomes does not do justice to any of them. Understanding these people as people with the same faculties for reason and empathy is only a baseline for beginning to know how to change their minds. No one change will convince everyone to comply just as not everyone has a common issue which makes them hesitant.

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