Chapter 5
Uncertainty, Vaccination, and the Duties of Liberal States

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5.1 Introduction

The highly contagious and fast-evolving COVID-19 virus prompted governments worldwide to take unprecedented emergent measures to contain the pandemic. However, many of these measures give rise to questions regarding the extent to which a liberal state may legitimately intervene in its people's personal decisions in a situation rife with uncertainty. One of the most notable and questionable interventions was the decision to suspend the AstraZeneca vaccine rollout.

The suspension was initially prompted by concerns about exposing people to an undue risk of developing a rare (but severe) cerebral venous thrombosis from the AstraZeneca vaccine. In response to reported cases of this type of thrombosis after receiving the AstraZeneca vaccine, the European Medicines Agencies launched an investigation, with many states suspending their AstraZeneca rollouts. Despite the European Medicines Agency's positive review on the safety of the AstraZeneca vaccine, some states maintained their suspension policy, citing that they had 'better alternatives' for their people (Danish Health Authority, 2021; van Dongen & van Mersbergen, 2021).

Most criticisms of this 'better alternative' account focus primarily on the risks and benefits the prioritisation of other vaccines might bring to society amid a highly time-sensitive battle against COVID-19. These criticisms acknowledge that the countries that suspended the AstraZeneca component of their vaccine rollout had secured more vaccines than they needed, and that these states thus could offer alternative vaccines that were considered safer and more effective. Nevertheless, the suspension may have still caused unnecessary deaths by creating logistical problems and delaying the vaccine rollout.

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Epistemic limitation and uncertainty further complicate the matter of prioritising certain vaccines over others. Due to the urgency of containing the unfolding pandemic, states have had to decide what to do with limited information. While all the vaccines authorised for emergency use have been rigorously tested, given that large-scale vaccination programmes only began in early 2021, it is likely that we will continue to see more rare symptoms identified as the vaccinated population grows (Remmel, 2021). It is also uncertain whether a vaccine that was more effective against the original strain of COVID-19 can continue to outperform other vaccines as new variants continue to emerge. During the composition of this chapter, the newly detected and heavily mutated Omicron variant concerns many medical experts because some of the mutations found in this variant could make the variant more resistant to existing vaccines (Torjesen, 2021).

This uncertainty over emergent effectiveness casts doubt on the legitimacy of the early prioritisation of certain vaccines based on relatively slim margins. In a highly uncertain situation like the COVID-19 pandemic, the epidemiological data changes constantly. An analysis supporting the early prioritisation of a particular vaccine, well supported by the available data at one point in time, may well be undermined as newer data becomes available. Therefore, during periods of uncertainty – periods we may well experience again in our lifetimes – focusing exclusively on risk-benefit analysis provides insufficient normative guidance for public health policymaking.

In this chapter, I use the case of vaccination to develop a duty-based critique. I argue that while a liberal state has a general duty to protect its people's health, the measures this duty can be used to justify are limited. It is especially so when a state tries to use the duty to protect to justify prioritising certain vaccines amidst a highly time-sensitive battle against a pandemic.

Vaccines rely on different technologies, and their mechanisms to trigger an immune response are also different. Because of these differences, each vaccine has different efficacy, side effects, cold-chain requirements, and so forth.[1] It is difficult, if not impossible, to draw a meaningful comparison and conclude which vaccine is ultimately superior. The incommensurability of different kinds of risk also challenges the view that a liberal state may legitimately decide which set of risks one ought to take. The problem of uncertainty also raises questions about whether a state may legitimately appeal to the duty to protect in order to justify vaccine suspension and prioritisation. I argue that when confronted with a highly uncertain situation such as combating a rapidly evolving pandemic, a liberal state must also uphold its duty to properly communicate the known and the unknown to the general public and to assist individuals in determining which risks they are willing to take for their well-being. We can call this duty the duty to facilitate risk-taking.

[1] For instance, the Pfizer-BioNTech vaccine must be stored in a specially designed refrigerator at an extremely low temperature (−80 °C to −60 °C) while the AstraZeneca vaccine can be stored in an ordinary refrigerator between 2 °C and 8 °C (National Health Service, 2021). For a quick comparison of the major COVID-19 vaccines, see Ketella (2021).

5.2 A Background: The Better Alternatives

COVID-19 vaccines rely on different technology platforms to trigger an immune response (Katella, 2021). There are at least nine different technology platforms under research and development (Le et al., 2020). Currently, the most widely used vaccines are based on the following technologies: messenger RNA (Pfizer-BioNTech, Moderna), adenovirus vector (AstraZeneca, Sputnik V, Johnson & Johnson), and inactive virus (SinoVac). In addition, several vaccines developed with other technologies like protein subunit, virus-like particles, and DNA have entered Phase II/III clinical trials as of late 2021.[2]

Because of these differences, the mechanism to activate immunity against COVID-19 varies from vaccine to vaccine. For instance, a messenger RNA-based vaccine builds up immunity by producing a coronavirus spike protein and using the protein to teach the body to identify and destroy the virus. Conversely, vaccines based on adenovirus vector technology use modified adenoviruses to trigger a systemic immune response.

The decision to prioritise certain vaccines over others was based mainly on considerations of efficacy against COVID-19. Since COVID-19 vaccines utilise different technologies, it should not be surprising that some vaccines are more effective at protecting people from contracting COVID-19. According to the information provided by the World Health Organisation, the Pfizer-BioNTech vaccines and the Moderna vaccines' efficacy against the original strain of COVID-19 are at the top, at 95% and 94%, respectively (Baden et al., 2021; Polack et al., 2020). Conversely, while still providing sufficient protection (60–70%), the efficacy against symptomatic COVID-19 of the Johnson & Johnson vaccine and the AstraZeneca vaccine is relatively low compared to the two messenger RNA vaccines (Sadoff et al., 2021; Voysey et al., 2021).

It is understandable that certain states decided not to resume the rollout of the AstraZeneca vaccine even after the European Medicines Agency's investigation showed that the benefits of receiving the AstraZeneca vaccine significantly outweighed the risk of developing cerebral venous thrombosis. The rationale behind the decision was that a state has a general duty to promote its people's well-being and protect them from undue health risks and other hazards (Daniels, 2017; United Nations, 1948). Therefore, if a state can afford a more effective vaccine against symptomatic COVID-19, it should provide that more effective vaccine.

This duty provides solid ground for governmental interventions in various affairs, including public health policy. For instance, most liberal states have strict regulations for the conduct of clinical trials. The interventions are morally justifiable because they promote the safety and integrity of the research. Moreover, the restrictions help reduce the epistemic cost a person might otherwise need to pay when

[2] For the latest information, see the COVID-19 vaccine tracker maintained by the London School of Hygiene and Tropical Medicine: https://vac-lshtm.shinyapps.io/ncov_vaccine_landscape/

deciding whether a clinical trial is worthy of their participation, or which new treatment they would like to receive.

In the case of COVID-19 vaccine development, while research teams received enormous financial and administrative support from the government sector, all vaccines were still subject to rigorous clinical trials. The support was primarily to reduce the financial risk of running numerous projects concurrently, and to accelerate the assessment process. The supported research project can still be terminated if the initial clinical results reveal serious safety issues or very low efficacy. For example, although MERCK received 38 million USD for COVID-19 vaccine research and development, the pharmaceutical giant still had to terminate its two vaccine research projects after the disappointing results of the Phase I clinical trials were revealed (MERCK, 2021). The review process helped protect people from undue harm that might be caused by ineffective vaccines.

5.3 Unfolding Vaccine Efficacy

However, I argue that the duty to protect cannot be used to justify the prioritisation of certain vaccines, where all candidates have been shown to be safe and effective. For example, initial vaccine efficacy results suggested that messenger RNA vaccines like the Pfizer-BioNTech vaccine and Moderna vaccines outperformed the AstraZeneca vaccine and the Johnson & Johnson vaccine by around 25%. However, a closer look at the design of these vaccines' clinical trials reveals that comparing the efficacy of different vaccines might not be as helpful as we hope (Ledford, 2021).

First, although the clinical trials shared a similar structure, they did not follow an identical design. Such discrepancies in trial design make a direct comparison of figures pointless. Take, for example, the Johnson & Johnson and Pfizer-BioNTech vaccines. At first glance, the Johnson & Johnson vaccine seems less effective than the Pfizer-BioNTech vaccine. Clinical trials showed that the Johnson & Johnson vaccine was only about 70% effective compared to the 95% effectiveness of the Pfizer-BioNTech vaccine. However, the two figures cannot be directly compared because the setup of the trials was different. In the case of the Johnson & Johnson vaccine, the stated efficacy was against symptomatic COVID-19 15 days after the first dose. As for the Pfizer-BioNTech vaccine, the 95% efficacy was about the effectiveness against symptomatic COVID-19 7 days after the second dose.

Second, the trials took place at different places and times. This is relevant in the context of a fast-evolving pandemic situation, as COVID-19's prevalence changed significantly in different places at different times. Conducting a clinical trial at a time and place with a relatively low prevalence of COVID-19 means that many participants might not be exposed to the virus at all. This can inflate the efficacy result. For example, the Pfizer-BioNTech and Moderna vaccines trials were conducted around the same time – when COVID-19 cases per capita were relatively low (around 20–40 cases per 100 k in the United States). However, when the Johnson & Johnson vaccine was trialled, Covid-19 cases per capita had grown to 40–80 cases

per 100 k in the United States. Furthermore, most of the trials were conducted primarily in South Africa and Brazil, where the COVID-19 case rates were higher. The relatively higher prevalence might have impacted the results of Johnson & Johnson vaccine's efficacy against sympotematic COVID-19.

Third, the dominant variants presented in the clinical trials were also different. The more infectious Beta variant was identified in South Africa (where the Johnson & Johnson vaccine was being tested) shortly after the trial began. Something similar occurred in Brazil. After Johnson & Johnson's trial took place in late 2020, the more contagious Zeta variant quickly became the dominant variant in the country. These changes were reflected in the clinical trials. For example, 67% of the infected cases from Johnson & Johnson's trial in South Africa were the Beta variant. In contrast, most of the infections in the Pfizer-BioNTech trial were with the original, less infectious, variant.[3]

Due to these factors, clinical trial results are best understood as a snapshot of how effective the vaccine under study was at a particular time in a particular region. Had the Johnson & Johnson vaccine been tested earlier and against the original strain only, it may have demonstrated similar, or even better, effectiveness than the Phizer vaccine – or not. Effectiveness figures cannot, therefore, be meaningfully compared.

Furthermore, even if effectiveness could be meaningfully compared, prioritising certain vaccines over others at the expense of suspsending part of the vaccine programme can cause more harm than good if the goal of vaccination is not to eliminate COVID-19 but to reduce serious consequences of disease. In an interview with VOX, Dr Amesh Adalja at the Johns Hopkins University Center for Health Security pointed out that

> The goal of a vaccine programme for COVID-19 is not necessarily to get to 'COVID zero', but it's to tame this virus, to defang it, to remove its ability to cause serious disease, hospitalisation, and death. (Vox, 2021)

In other words, if we shift our focus to how effective a vaccine is at preventing severe symptoms and hospitialisations, then the data currently available to us shows that the Johnson & Johnson and the AstraZeneca vaccines are as good as the Pfizer-BioNTech and Moderna vaccines (de Gier et al., 2021).

5.4 Uncertainties, Risks, and Incommensurability

Theoretically speaking, the problems highlighted in Sect. 5.3 could be addressed by requiring all vaccine research teams to perform clinical trials simultaneously, with the same demographic makeup, at the same location. Once all of these factors are

[3] For a comparison between the time periods and the dominant variants presented in Pfizer-BioNTech's and Johnson & Johnson's clinical trials, see Vox, 2021.

controlled, it would then become possible to compare the efficacy of different vaccines and prioritise certain vaccines.

Indeed, we could improve protocols for conducting clinical trials during a pandemic. However, even if we could control these factors without delaying vaccine development, unknowns would remain. Take the Pfizer-BioNTech and Moderna vaccines as an example. Puranik et al. (2021) found that even though the two vaccines were based on the same technology (i.e. messenger RNA) and performed similarly in early trials, it is still challenging, if not impossible, to predict their efficacy against new variants. Puranik et al. observed that the Pfizer-BioNTech vaccine's efficacy against symptomatic COVID-19 dropped significantly to 42% six months after the research was initiated in January 2021 in the United States. While the Pfizer-BioNTech vaccine's efficacy declined significantly, the Moderna vaccine remained highly effective against symptomatic COVID-19 (76%). This information could not have been available when rollouts started.

New data gathered in the UK also shows that vaccines that provide better short-term protection do not necessarily outperform other vaccines in the long run. For example, Pouwels et al. (2021) found that the efficacy of the Pfizer-BioNTech vaccine dropped faster than that of the AstraZeneca vaccine. The trend suggests that after 20 weeks of inoculation with the second dose, the Pfizer-BioNTech vaccine becomes less effective than the AstraZeneca vaccine at providing protection against symptomatic COVID-19. Currently, scientists still don't know why Pfizer-BioNTech's efficacy declines so quickly (a 22% decline in 90 days).

Experts also anticipate that long-term safety issues may arise later. Previous research on an Ad5-based HIV vaccine found that the vaccine not only failed to protect against HIV, it actually increased the vaccine recipient's chances of contracting the virus. Some scientists warn that COVID-19 vaccines using similar technology, such as CanSino Biologics' Convidecia and Gamaleya's Sputnik V, might also increase the risk of contracting HIV in the long run (Kim et al., 2021). During the composition of this chapter, the European Medicines Agency is investigating the risk of developing a rare inflammatory condition called multi-system inflammatory syndrome from receiving the Pfizer-BioNTech vaccine and the risk of developing venous thromboembolism from receiving the Johnson and Johnson vaccine (Reuters, 2021). While out understanding of the vaccines continuously increase, it is still too early to tell whether there will be long-term safety issues.

It is also uncertain which vaccine will be the most effective against newer variants. For instance, a Canadian research team found that at 14 days after the first vaccine dose, the Pfizer-BioNTech vaccine was 2% more effective against the symptomatic COVID-19 of the Alpha variant than the AstraZeneca vaccine, but that the AstraZeneca vaccine was 12% more effective against the symptomatic COVID-19 of the Delta variant than the Pfizer-BioNTech vaccine (Nasreen et al.,

2021).[4] This research suggests that an initially successful vaccine might not outperform other vaccines in terms of its efficacy against all variants. Given that the COVID-19 is still mutating, rather than providing 'better alternatives', tyring to prioritise certain vaccines over others might be more akin to putting all the eggs into one basket.

The cases presented here show that attempts to prioritise certain vaccines over others cannot be epistemically justified. Options that seem superior may turn out to be inferior as our understanding of the vaccine increases and as the disease context changes. For instance, Israel decided to revise its exclusivly messenger RNA vaccine programme and add the adenovirus vector-based AstraZeneca vaccine to its vaccine pool in late 2021, even though this vaccine was considered 'inferior' by some states in early 2021 (Tercatin, 2021). Israel's response highlights that even when decisions are made following incomplete but best-available data, it is important that flexibility to revisit those decisions be maintained.

Yet, even if there is sufficient scientific evidence supporting the claim that a specific vaccine is better, this does not mean that a liberal state may thus prioritise the vaccine at the expense of suspending part of a vaccine rollout. It is frequently overlooked in the discussion of the 'better alternatives' argument that each available option is associated with various risks and benefits that might not be commensurable (Chang, 1997). Appealling to the duty to protect people from a certain risk at the expense of exposing that to a different set of risks provides little justification for the suspension and prioritization (Huang, 2021).

No matter which vaccine a person decides to take (or not take), they will have to bear the risk of unwanted side effects and, sometimes, symptoms that are not expected by medical experts. This is part of why the idea of a compulsory COVID-19 vaccination programme remains highly controversial. More rare but severe symptoms may emerge later in the future. Although this is thought to be unlikely, we cannot know for sure. Remaining unvaccinated also exposes one to a different set of risks. The first quarter of 2021 saw a resurgence of confirmed cases of COVID-19, with more than 10 million new cases reported to the World Health Organization (2021) in the first two weeks of April 2021.

The delay caused by vaccine rollout suspensions meant that many people could not take immediate and statistically effective action to reduce their risk of contracting COVID-19. From this perspective, the suspension or deliberate delay of a vaccine rollout forces people to bear risks they do not want to bear. The risks a person will have to take when they decide to undergo a vaccination are categorically

[4] This research was based on the data collected during December 2020 to May 2021 in Ontario, Canada. Many data points, such as the Moderna and AstraZeneca vaccines' effectiveness against symptomatic COVID-19 7 days after the second dose, were not presented in the research, likely because Canada only began its vaccination programme in December 2020 As a result, while the data used by this research indicated that the Pfizer-BioNTech vaccine performed less well than the AstraZeneca vaccine under certain circumstances, it is too early to draw a definitive conclusion. Nevertheless, my point holds: that an initially successful vaccine might not outperform other vaccines in terms of its efficacy against all variants. Indeed, as I write, there is a scramble to determine the effectiveness of various vaccines against the newly emerged Omicron variant, and similar issues will arise for future variants.

different to those one will need to bear when remaining unvaccinated. Hence, it is problematic if a person is only allowed to take the risks of remaining unvaccinated but not the risks associated with (presumed to be) less effective vaccines.

The fact that many countries still have not introduced compulsory measles vaccination despite overwhelming scientific proof of its efficacy and safety shows that sometimes vaccine efficacy and safety are not the only ethical consideration we need to take into account. Smoking presents a useful related example. There is substantial evidence that smoking increases the health risks of developing several severe diseases, such as lung cancer and coronary heart disease (National Health Service, 2018). It is estimated that smoking causes more than 480,000 deaths each year in the United States alone (US Department of Health and Human Services, 2014). However, most countries only regulate tobacco use in public spaces such as hospitals, schools, and libraries. Very few, if any, have introduced a categorical ban on tobacco.

The rationale behind the regulations is closely aligned to John Stuart Mill's (2003) Harm Principle. According to this Principle, the only occasion where a government can justifiably exercise its power over any member of society, against their will, is to prevent harm to unconsenting others. If a smoker is only to increase their own health risks, they are entitled to do so. Yet, smoking in public spaces might increase the health risks of others against their will. Therefore, it is justifiable for the state to restrict the smoker's freedom to smoke in public spaces.

The ethical foundation of vaccine prioritisation and the suspension becomes shaky once we compare this approach to vaccination with other health-related policies. So long as the risk of harm is limited to the decision-maker, the government should not intervene in a person's decision. Currently, COVID-19 continues to cause an enormous number of deaths each day. Taking away a person's opportunity to be vaccinated with a vaccine that is available and clinically shown to be safe and effective is to force them to remain exposed to the risks of contracting COVID-19. This damages the person's ability to act upon their decision and fails to pay due respect to their right to decide which risks they deem worth taking (Huang, 2021).

5.5 Duty to Facilitate Risk-Taking

One might argue that suggesting that there is a right to take risks is absurd because it implies a duty to facilitate risk-taking. A Millian liberal might concede that a liberal state has a negative duty not to interfere with risky behaviour so long as the behaviour does not directly negatively impact other people's. Yet, positively supporting risk-taking is another matter. If the right violated by certain liberal states were the right to take risks, then the way the states violate this particular right is by refusing to proactively provide their people with vaccines deemed to be inferior. Following this rationale, it seems that anyone interested in having a psychedelic experience or using hard drugs likewise has a right to demand the state facilitate their engagement with these substances.

Indeed, the duty to facilitate risk-taking might sound strange at first. Yet, the fact that most liberal states do not forbid their citizens from smoking or travelling to malaria-endemic regions suggests otherwise. Information printed on cigarette packages in some countries, like statements that smoking increases the risk of developing lung cancer, can be seen as a soft deterrent. However, such a message is also a piece of information aiming to help individuals decide whether the risk is worth taking. The same applies to anti-malaria drugs. Malaria is a severe infectious disease that can cause symptoms such as seizures and comas, and in some cases, death (Caraballo & King, 2014). There's no doubt that malaria poses a severe health threat to healthy individuals. Hence, it is understandable that many countries *advise against* unnecessary travel to malaria-endemic regions. But instead of dictating that no one should take the risk of contracting malaria, most liberal states *help* their citizens decide whether to take the risk, and how to mitigate the risk, by providing detailed travel information and anti-malaria drug information.

The duty to facilitate risk-taking is not a duty to help people take whatever risks they deem worth taking. The primary consideration here is to facilitate good decision making and to respect value pluralism. The reason a liberal state has a duty to provide malaria-relevant information to its people is not that exposing oneself to malaria is worth pursuing in and of itself, but that it is reasonable for one to value the experience of travelling to a malaria-endemic region.

The idea of reasonableness may help us distinguish between the cases of abusing hard drugs and receiving a less effective vaccine. The cases I presented in Sect. 5.4 show that even if we only consider relevant scientific facts, there is nevertheless much room for reasonable disagreement (Ismaili M'hamdi, 2021; Scanlon, 1998). For instance, many public health experts argue that reducing hospitalisation should be prioritised, whereas some politicians believe offering individual vaccine recipients better protection against COVID-19 is more critical. While the goals posited by the two views are very different, this does not mean that one of the two views must be wrong. Sometimes, differences in priority only show that people have different conceptions of the good and prioritise different values.

In the COVID-19 context, several considerations can be reasonably prioritised. One may prioritise convenience over efficacy and opt for the Johnson & Johnson vaccine (where it is readily available). One may prioritise gaining immunity as quickly as possible, opting for the first available vaccine that can provide sufficient protection. One may prioritise gaining immunity against COVID-19 over the concern of developing rare but severe symptoms like cerebral venous thrombosis (and be happy to take the AstraZeneca vaccine). Conversely, one may prioritise avoiding a vaccine with known but rare risks in favour of waiting for a vaccine that has fewer known risks, as did people who chose to avoid AstraZeneca and wait for other vaccines to become available to them. Likewise, people who decide to receive COVID-19 vaccination prioritise gaining immunity against COVID-19 over the risk of developing known rare short term complications, and over the possible risk of unknown health issues from vaccination. These prioritisations are all reasonable and open to disagreement.

Yet this is not to say that all disagreement is reasonable. Consider the concern that COVID-19 vaccines are not safe because they were developed and deployed very quickly relative to standard pharmaceutical development timelines. The concern is not entirely ill-founded. Given that most vaccine development takes more than a decade to enter the clinical trial phase (Hanney et al., 2020), it is understandable that some might think that the COVID-19 vaccine development must not have gone through all the necessary scrutiny. However, this concern can be easily clarified once one is adequately informed of the details of Operation Warp Speed (e.g. the financial support that allowed parallel research and development on multiple vaccine candidates and the administrative support that accelerated the review process of clinical trials).[5] Similarly, whether or not drinking bleach can prevent COVID-19 is not open to reasonable disagreement. It simply doesn't work.[6]

It is important to recognise that life is never risk-free. In the context of the COVID-19 pandemic, no matter which vaccine one eventually decides to take, one has to accept the risk of unwanted side effects, including the possibility of side effects unforeseen at the time of vaccination. This is another reason why compulsory COVID-19 vaccination remains highly controversial. Since we only have limited knowledge of COVID-19 and the available vaccines, implementing a compulsory programme will force people to take risks they might not be willing to take. From a right-to-take-risks angle, suspending part of a vaccine rollout to wait for a more preferred vaccine is equally problematic, as waiting for a different vaccine (or choosing to avoid vaccination) likewise carries risk. Currently, COVID-19 continues to cause an enormous number of deaths each day, with greater numbers of people facing severe illness and ongoing "Long COVID" symptoms. Depriving people of the opportunity to be vaccinated as soon as an effective vaccine is available forces them to continue to be exposed to the risks of contracting COVID-19.

[5] Financial constraints are part of the reason why vaccine developments usually take more than a decade. To reduce financial risk, a research team usually only works on one candidate at one time. Only after the team found that the candidate couldn't achieve the desirable results or meet the safety requirements, can the team move on the next candidate. Were it be possible to work on different candidates at the same time, it would not have taken so long for the research team to find the vaccine candidate that is both safe and effective (Hanney et al., 2020). Programmes like the Operation Warp Speed contributed significantly in terms of relieving vaccine developers of financial risk and made it possible for the developers to work on multiple vaccine candidates at the same time. Without financial support, MERCK probably would not have been able to afford to take the risk of starting two vaccine research projects at the same time. However, such risk-taking was important to ensuring that safe and effective vaccines would be found quickly. For more information on the Operation Warp Speed, see Slaoui and Hepburn (2020).

[6] There is much dangerous misinformation circulating on the internet. One example was the claim, debunked by the French government, that snorting cocaine helps protect people from contracting COVID-19 because the snorting can sterilize one's nostrils (Gregory, 2020). Chemical substances like methylene chloride and chloride dioxide were also falsely marketed as COVID-19 disinfectants (Dlouhy, 2020).

5.6 Fostering Trust by Facilitating Risk-Taking

Another reason for taking the duty to facilitate risk-taking seriously in times of uncertainty is to foster trust. While our knowledge of the COVID-19 virus and the short-term efficacy of different vaccines against different variants continues to grow, there are still many unknowns. It is hard to predict if there will be new variants that are more infectious or more deadly. In addition, the long-term efficacy of different vaccines can only be revealed with time. These uncertainties need to be appropriately communicated.

Regrettably, most liberal states failed to communicate the knowns and the unknowns to their citizens appropriately. The desire to increase vaccine coverage as quickly as possible led many states to focus on conveying messages regarding the effectiveness and safety of the vaccines, while obscuring the admittedly small health risks associated with vaccination. Understandably, some people became hesitant after they learned about cerebral venous thrombosis. However, the vaccine rollout suspensions didn't offer any meaningful clarification, they simply added to the confusion. It's not surprising that after the decision to suspend the AstraZeneca vaccine's use, vaccine hesitancy rose in European countries by 9% (Ahrendt et al., 2021; Ellyatt, 2021). The suspensions 'confirmed' people's suspicions that vaccines were not as safe as the states had claimed, and that there might be information not properly revealed to the general public.

The issue here is that, while states may not have set out to overpromise on vaccines, the optimistic tones they adopted makes it appear as if they did. The failure to properly address people's concerns further weakened already fragile trust – if a vaccine that was promoted as safe and effective turned out to be not as safe and effective as promised, this left open the possibility that other vaccines might likewise be less safe than currently claimed. This distrust could have been mitigate by acknowledging that while the clinical trials were conducted in a very rigorous manner, there remained a possibility of rare but severe symptoms showing up after the commencement of large-scale vaccine rollouts. Take the risk of developing cerebral venous thrombosis as an example. A liberal state could help its people decide whether it is worth taking the risk of developing cerebral venous thrombosis from receiving an AstraZeneca vaccine by providing the information that the risk of developing cerebral venous thrombosis from COVID-19 is roughly eight-times higher than from receiving the vaccine (Taquet et al., 2021).

5.7 Conclusion

In this chapter, I developed a duty-based critique of COVID-19 vaccination policies. This is not to disregard the importance of risk-benefit analysis. Fighting against a public health crisis like the COVID-19 pandemic requires input from the latest epidemiological data and careful analysis of the risks and benefits of each available

option. However, given epistemic limitations and the incommensurability of different risks and benefits, a consequentialist risk-benefit framework is not always helpful. In situations of uncertainty, a duty-based framework may offer more stable normative guidance that will not be easily undermined by constantly changing epidemiological data. Devising counter-Covid-19 strategies based on this approach upholds vital liberal principles and reduces the likelihood of creating confusion for the general public.

A liberal state does have a general duty to promote people's well-being and safeguard its people's lives from undue health risks. However, as we are currently in a situation where no one knows which vaccine will be the most effective against newer variants, will have the fewest long-term side effects, or will provide the longest-lasting protection, it is doubtful that a liberal state may legitimately decide which of the available options is *best* on its people's behalf. Moreover, even if these uncertainties are clarified, it is still morally unacceptable for a liberal state to prioritise certain vaccines at the expense of suspending part of the vaccine rollout.

A liberal state should acknowledge uncertainties, communicate to the public the known risks and benefits of each currently available option, and assist the public in taking what risks they deem best for their well-being.[7]

References

Ahrendt, D., Mascherini, M., Nivakoski, S., & Sándor, E. (2021). *Living, working and covid-19*. Retrieved from https://www.eurofound.europa.eu/publications/report/2020/living-working-and-covid-19 https://doi.org/10.2806/76802.

Baden, L. R., El Sahly, H. M., Essink, B., Kotloff, K., Frey, S., Novak, R., … Group, C. S. (2021). Efficacy and safety of the mrna-1273 sars-cov-2 vaccine. *New England Journal of Medicine, 384*(5), 403–416. https://doi.org/10.1056/NEJMoa2035389

Caraballo, H., & King, K. (2014). Emergency department management of mosquito-borne illness: Malaria, dengue, and west nile virus. *Emergency Medicine Practice, 16*(5), 1–23.

Chang, R. (1997). *Incommensurability, incomparability and practical reason*. Harvard University Press.

Daniels, N. (2017). *Justice and access to health care*. The Stanford Encyclopedia of Philosophy. Retrieved from https://plato.stanford.edu/archives/win2017/entries/justice-healthcareaccess/

Danish Health Authority. (2021). *Denmark continues its vaccine rollout without the covid-19 vaccine from astrazeneca*. Retrieved from https://www.sst.dk/en/English/news/2021/Denmark-continues-its-vaccine-rollout-without-the-COVID-19-vaccine-from-AstraZeneca

de Gier, B., Kooijman, M., Kemmeren, J., de Keizer, N., Dongelmans, D., van Iersel, S. C. J. L., … van den Hof, S. (2021). Covid-19 vaccine effectiveness against hospitalizations and icu admissions in the Netherlands, april–august 2021. *medRxiv*. https://doi.org/10.1101/2021.09.15.21263613

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Dlouhy, J. (2020, June 11). Epa tells amazon, ebay to stop shipping unproven covid goods. *Bloomberg*. Retrieved from https://news.bloomberglaw.com/coronavirus/epa-orders-amazon-ebay-to-stop-shipping-unproven-covid-products

Ellyatt, H. (2021). The damage is done': Europe's caution over astrazeneca vaccine could have far-reaching consequences. *CNBC*. Retrieved from https://www.cnbc.com/2021/03/16/europes-suspension-of-astrazenecas-covid-vaccine-is-damaging.html

Gregory, A. (2020). France tells citizens cocaine cannot protect against coronavirus. *The Independent*. Retrieved from https://www.independent.co.uk/news/world/europe/coronavirus-cocaine-france-government-warning-conspiracy-theories-disinformation-smurfs-a9389146.html

Hanney, S. R., Wooding, S., Sussex, J., & Grant, J. (2020). From covid-19 research to vaccine application: Why might it take 17 months not 17 years and what are the wider lessons? *Health Research Policy Systems, 18*(1), 61. https://doi.org/10.1186/s12961-020-00571-3

Huang, P.-H. (2021). Covid-19 vaccination and the right to take risks. *Journal of Medical Ethics*. https://doi.org/10.1136/medethics-2021-107545

Ismaili M'hamdi, H. (2021). Neutrality and perfectionism in public health. *American Journal of Bioethics, 21*(9), 31–42. https://doi.org/10.1080/15265161.2021.1907479

Katella, K. (2021). *Comparing the covid-19 vaccines: How are they different?* Retrieved from https://www.yalemedicine.org/news/covid-19-vaccine-comparison

Ketella, K. (2021). Comparing the covid-19 vaccines: How are they different? *Yale Medicine.* Retrieved from https://www.yalemedicine.org/news/covid-19-vaccine-comparison

Kim, J. H., Hotez, P., Batista, C., Ergonul, O., Figueroa, J. P., Gilbert, S., … Bottazzi, M. E. (2021). Operation warp speed: Implications for global vaccine security. *The Lancet Global Health, 9*(7), e1017–e1021. https://doi.org/10.1016/s2214-109x(21)00140-6

Le, T. T., Cramer, J. P., Chen, R., & Mayhew, S. (2020). Evolution of the covid-19 vaccine development landscape. *Nature Reviews Drug Discovery, 19*(10), 667–668. https://doi.org/10.1038/d41573-020-00151-8

Ledford, H. (2021). Why covid vaccines are so difficult to compare. *Nature, 591*(7848), 16–17.

MERCK. (2021). *Merck discontinues development of sars-cov- 2/covid-19 vaccine candidates; continues development of two investigational therapeutic candidates* [Press release].

Mill, J. S. (2003). In M. Warnock (Ed.), *Utilitarianism and on liberty: Including mill's 'essay on bentham' and selections from the writings of jeremy bentham and john austin* (Second ed.). Blackwell Publishing.

Nasreen, S., He, S., Chung, H., Brown, K. A., Gubbay, J. B., Buchan, S. A., … Kwong, J. C. (2021). Effectiveness of covid-19 vaccines against variants of concern, Canada. *Medrxiv*. https://doi.org/10.1101/2021.06.28.21259420

National Health Service. (2018). *What are the health risks of smoking?* Retrieved from https://www.nhs.uk/common-health-questions/lifestyle/what-are-the-health-risks-of-smoking/

National Health Service. (2021). *Storage requirements for each covid-19 vaccine*. Retrieved from https://www.sps.nhs.uk/articles/storage-requirements-for-each-covid-19-vaccine/

Polack, F. P., Thomas, S. J., Kitchin, N., Absalon, J., Gurtman, A., Lockhart, S., … Group, C. C. T. (2020). Safety and efficacy of the bnt162b2 mrna covid-19 vaccine. *New England Journal of Medicine, 383*(27), 2603–2615. https://doi.org/10.1056/NEJMoa2034577

Pouwels, K. B., Pritchard, E., Matthews, P. C., Stoesser, N., Eyre, D. W., Vihta, K. D., … Walker, A. S. (2021). Effect of delta variant on viral burden and vaccine effectiveness against new sars-cov-2 infections in the UK. *Nature Medicine, 27*(12), 2127–2135. https://doi.org/10.1038/s41591-021-01548-7

Puranik, A., Lenehan, P. J., Silvert, E., Niesen, M. J. M., Corchado-Garcia, J., O'Horo, J. C., … Soundararajan, V. (2021). Comparison of two highly-effective mrna vaccines for covid-19 during periods of alpha and delta variant prevalence. *medRxiv*. https://doi.org/10.1101/2021.08.06.21261707

Remmel, A. (2021). Why is it so hard to investigate the rare side effects of covid vaccines? *Nature*. https://doi.org/10.1038/d41586-021-00880-9

Reuters. (2021). *Eu reviewing risk of rare inflammation after covid-19 vaccinations*. Retrieved from https://www.reuters.com/business/healthcare-pharmaceuticals/eu-reviewing-cases-rare-body-inflammation-after-covid-19-shots-2021-09-03/

Sadoff, J., Le Gars, M., Shukarev, G., Heerwegh, D., Truyers, C., de Groot, A. M., … Schuitemaker, H. (2021). Interim results of a phase 1-2a trial of ad26.Cov2.S covid-19 vaccine. *New England Jolurnal of Medicine, 384*(19), 1824–1835. https://doi.org/10.1056/NEJMoa2034201

Scanlon, T. (1998). *What we owe to each other*. Harvard University Press.

Slaoui, M., & Hepburn, M. (2020). Developing sage and effective covid vaccines – Operation warp speed's strategy and approach. *New England Journal of Medicine, 383*(18), 1701–1703.

Taquet, M., Husain, M., Geddes, J. R., Luciano, S., & Harrison, P. J. (2021). Cerebral venous thrombosis: A retrospective cohort study of 513,284 confirmed covid-19 cases and a comparison with 489,871 people receiving a covid-19 mrna vaccine. *EClinicalMedicine, 39*, 101061. https://doi.org/10.1016/j.eclinm.2021.101061

Tercatin, R. (2021). *Covid: Israel to give astrazeneca vaccine to those affected by pfizer*. Retrieved from https://www.jpost.com/health-and-wellness/coronavirus/covid-israel-to-give-astrazeneca-vaccine-to-those-affected-by-pfizer-682346

Torjesen, I. (2021). Covid-19: Omicron may be more transmissible than other variants and partly resistant to existing vaccines, scientists fear. *BMJ, 375,* n2943. https://doi.org/10.1136/bmj.n2943

United Nations. (1948). Universal declaration of human rights. *UN General Assembly, 302*(2), 14–25.

US Department of Health and Human Services. (2014). *The health consequences of smoking—50 years of progress: A report of the surgeon general*. US Department of Health and Human Services.

van Dongen, A., & van Mersbergen, C. (2021, April 24). Rivm-vaccinatiebaas: 'Miljoenen doses astrazeneca die na half mei komen, zijn niet meer nodig'. *Algemeen Dagblad*. Retrieved from https://www.ad.nl/binnenland/rivm-vaccinatiebaas-miljoenen-doses-astrazeneca-die-na-half-mei-komen-zijn-niet-meer-nodig~a03948a0/

Vox (Producer). (2021). *Why you can't compare covid-19 vaccines*. Retrieved from https://www.youtube.com/watch?v=K3odScka55A

Voysey, M., Clemens, S. A. C., Madhi, S. A., Weckx, L. Y., Folegatti, P. M., Aley, P. K., … Zuidewind, P. (2021). Safety and efficacy of the chadox1 ncov-19 vaccine (azd1222) against sars-cov-2: An interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK. *The Lancet, 397*(10269), 99–111. https://doi.org/10.1016/s0140-6736(20)32661-1

World Health Organization. (2021). *Who coronavirus (covid-19) dashboard*. Retrieved from https://covid19.who.int/