Health policy 133 (2023) 104841

Contents lists available at ScienceDirect

Health policy

journal homepage: www.elsevier.com/locate/healthpol

Towards a less voluntary vaccination policy in the Netherlands? Findings from an expert interview study

Rogier C. Simons [a,*], Marieke A.R. Bak [b], Johan Legemaate [a], Corrette Ploem [a]

[a] Section of Health Law, Department of Ethics, Law & Humanities, Amsterdam UMC, University of Amsterdam, Amsterdam, the Netherlands
[b] Section of Ethics of Care, Department of Ethics, Law & Humanities, Amsterdam UMC, University of Amsterdam, Amsterdam, the Netherlands

ARTICLE INFO

Keywords:
COVID-19
Vaccination
Interventions
Policy-making
Legislation
Ethics

ABSTRACT

Background: The Netherlands traditionally favours a voluntary approach to vaccination. However, during the COVID-19 pandemic multiple European countries drastically altered their vaccination policies, which fuelled societal and political debate about the need to make the Dutch vaccination policy less voluntary, particularly by utilising pressure or coercion.
Aim: To provide insight in expert's views on main normative issues concerning a less voluntary vaccination policy (for adults). Our study adds to the existing debate by addressing this topic from a multidisciplinary viewpoint.
Methods: We conducted 16 semi-structured interviews with legal, medical and ethical experts on the Dutch vaccination policy, between November 2021 and January 2022. We analysed interview transcripts through inductive coding.
Results: Most experts believe a less voluntary vaccination policy is of added value under certain circumstances, as exemplified by the outbreak of COVID-19. For such a policy, a legislative approach might be most effective. However, different views exist on the desirability of a less voluntary approach. Main arguments in favour are based on epidemiological circumstances and a duty towards the collective health interest, whilst arguments against are based on the questionable necessity and adverse effectiveness of such policy.
Conclusions: If implemented, a less voluntary vaccination policy should be context-specific and take into account proportionality and subsidiarity. It is recommendable for governments to embed such policy (a priori) in flexible legislation.

1. Introduction

In April 2021, the Grand Chamber of the European Court of Human Rights ruled that mandatory vaccination for well-known children's diseases was all together compatible with the right to private life ex article 8 of the European Convention on Human Rights in the landmark case *Vavřička and Others v. the Czech Republic* [1]. According to the Court, member states enjoy a wide degree of discretion in determining whether the protection of both individual and public health require mandatory vaccination. Simultaneously, the Court accentuates that a mandatory vaccination policy needs to be in accordance with the law and can only be utilised if this is necessary in a democratic society, for instance to protect (public) health. The legitimacy of mandatory vaccination thus greatly depends on the question whether the mandatory vaccination scheme is proportionate. In particular, the Court emphasises the importance of the safety and effectiveness of vaccines. Hence, the judgement led to questions regarding the possibilities for mandatory COVID-19 vaccination in Europe [2–4].

In the Netherlands there is currently no law that mandates vaccination for the general population. However, the Public Health Act (Wpg) does contain some provisions with regard to the structure and organisation of the National Immunisation Programme (NIP). The NIP is set up to protect children against 12 infectious diseases, including diphtheria, measles, rubella and poliomyelitis [5]. When a newborn reaches the age of four weeks, the parents receive an invitation to take part in the NIP. When parents do not wish to have their children vaccinated however, this has no consequences. This voluntary approach, without the use of pressure and coercion, characterises the Dutch vaccination policy [6].

* Corresponding author at: Section of Health Law, Department of Ethics, Law & Humanities, Amsterdam UMC, Location VUmc, F-wing Faculty of Medicine, De Boelelaan 1089a, 1081HV Amsterdam, the Netherlands.
E-mail address: r.c.simons@amsterdamumc.nl (R.C. Simons).

https://doi.org/10.1016/j.healthpol.2023.104841
Received 17 January 2023; Received in revised form 21 April 2023; Accepted 22 May 2023
Available online 22 May 2023

Annually, the National Institute for Public Health (RIVM) presents a report on the vaccination coverage of the NIP. The latest report, over the year 2021, shows a slight decrease of the vaccination coverage between 1% to 2,7% depending on the disease [7]. According to the report, the vaccination coverage was slightly lower in 2021 than the year earlier. The Netherlands has been confronted with descending trends in the vaccination rate before. In 2018 for instance, the WHO recommended target percentage of 95% for measles vaccination was not reached for the third year in a row [8]. This led to scientific and societal debates on the possibility and desirability of introducing a less voluntary vaccination policy for childhood diseases [9–11]. Similar discussions have taken place for certain professions, such as healthcare workers [12,13]. The outbreak of the coronavirus – and the subsequent development of a vaccine – has strongly intensified the debate regarding a less voluntary vaccination policy for adults [14,15].

Previous research in the Netherlands predominantly focused on the theoretical and legal possibilities of utilising less voluntary interventions in the vaccination policy [10,11]. However, no research has been conducted wherein a group of experts from different backgrounds addresses this subject normatively. According to a recent report from the Royal Netherlands Academy of Arts and Sciences (KNAW), the pandemic stressed the importance of involving ethical and legal questions concerning the desirability and feasibility of interventions within a national vaccination policy [16]. Main aim of our study was therefore to address the ethical and legal ('normative') aspects of a less voluntary vaccination policy, particularly regarding interventions in the context of pressure and coercion, by exploring the views of Dutch medical, legal and ethical experts in the field of public health and vaccination policy(-making). Although our study principally focuses on (the assessment of) the Dutch vaccination policy, our results are of relevance for other countries dealing with similar questions. Despite the fact that the interviews were conducted during the COVID-19 pandemic, the study explicitly focuses on and includes discussion on other vaccinations as well.

2. Materials and methods

2.1. Selecting a theoretical framework

We conducted 16 semi-structured interviews with Dutch medical, legal and ethical experts in public health and vaccination policy (-making). For formulating questions and categorising codes, we used an advisory report from the Health Council of the Netherlands concerning the ethical and legal aspects of COVID-19 vaccination, as theoretical framework [17]. The report contains a Dutch interpretation of the Nuffield Council on Bioethics 'intervention ladder' [18] and describes the variety of policy interventions regarding COVID-19 vaccination coverage along the continuum between advice and coercion (Fig. 1). Hence, when we discuss a less voluntary vaccination policy, we refer to greater levels of interventions, particularly regarding interventions in the context of pressure and coercion. Although primarily

Intervention ladder	Example COVID-19 vaccination	Concepts along continuum
No freedom of choice	Forced vaccination against COVID-19.	Coercion
Severely restrict freedom of choice	*Direct* mandatory vaccination, by using a legal sanction, such as a fine or *indirect* mandatory vaccination, by denying access to essential (public) spaces or services without proof of vaccination.	Strong pressure
Restrict freedom of choice	No access to non-essential (public) spaces or services without proof of vaccination or relaxation of and/or alternate measures for certain groups.	
Discourage	Use negative financial stimuli, such as an increase of the health insurance premium or an increase of the (income) tax or discourage psychologically by generating feelings of guilt for unvaccinated people.	
Stimulate	Use financial stimuli, such as a present, a sum of money or a discount on the health insurance premium or use psychological stimuli, such as flattery for vaccinated people.	Weak pressure
Adjust default option	Provide unavoidable vaccination locations and moments, such as a joint vaccination moment at work or during working hours.	Hard nudges
Expand choice	Provide low-threshold vaccination locations, such as train stations and malls or text (message) people with a reminder for a vaccination appointment.	Soft nudges
Provide information	Provide reasonable arguments and encourage people to reflect their thoughts, with the aim of persuading them.	Persuasion
	Use communication with transparent, reliable and scientifically substantiated information, with the aim of enabling people to make an informed decision.	Advice

Fig. 1. Examples of interventions regarding COVID-19 vaccination and concepts along the continuum between advice and coercion; translated version derived from the Dutch Health Council [17].

focused on COVID-19, the terminology of interventions and concepts along the continuum between advice and coercion can also be used for other vaccinations.

2.2. Experts

We approached 24 experts in the fields of (health) law, (medical) ethics and medical virology/epidemiology, due to their presence in the debate concerning the use of pressure and coercion in vaccination policy. Some experts were invited via snowball sampling. Of the 24 invited experts, a total of 16 experts – comprised of six legal, five medical and five ethical experts – took part in the study. Beforehand, experts were provided with a list of questions that would be discussed during the interview. Three main themes were discussed with interviewees: the use of current and potential interventions in the COVID-19 vaccination policy, arguments in favour and against a less voluntary vaccination policy, and the regulatory aspects of such a policy. Interviews were conducted between November 2021 and January 2022. Due to Covid-19 restrictions, most interviews ($n = 15$) were conducted by video-calls via Microsoft Teams/Zoom (VoIP). A single interview ($n = 1$) took place via telephone due to preferences of the expert. The interviews, with few exceptions, lasted between 60 and 75 min and were conducted by one researcher (RP). For this study, ethical approval of an ethics committee was not required according to Dutch law. Experts consented to participation in the study and recording of the interviews, under the commitment of strict confidentiality and anonymisation regarding the reporting of their answers in scientific publications.

2.3. Analysis of interviews

One researcher transcribed the interviews verbatim and coding was done in MAXQDA2022. The content of the interviews provided the codes. We used the conventional content analysis method [19] to inductively analyse collected data into overarching themes and sub-themes. Two researchers analysed the first interviews separately through open coding, whereafter analyses were compared. One researcher carried out the following analyses, which were reviewed by the other. Data saturation had occurred after 15 interviews.

3. Results

Interviewed experts shared their views and concerns about the national vaccination policy (NIP) and, more specifically, the COVID-19 vaccination policy. However, views on which interventions are required to increase vaccination coverage and how less voluntary policies should be embedded, differed. Hereafter, we firstly present experts' reflections on interventions to increase COVID-19 vaccination coverage (Section 3.1). Secondly, we address arguments in favour of and against a less voluntary vaccination policy (Section 3.2). Lastly, we discuss the regulatory aspects of a less voluntary vaccination policy, such as the use of legislation, and other conditions and requirements for such policy (Section 3.3).

3.1. Experts reflecting on interventions to increase COVID-19 vaccination coverage

Experts discussed several (ascending) levels of the intervention ladder (Fig. 1). With regard to interventions that fall under the least restrictive level of the intervention ladder: 'provide information', multiple experts felt that the utilisation of these interventions was inadequate and inefficient. With regard to *advice* for example, experts accentuated the lack of effective (targeted) communication and information regarding COVID-19 vaccination, whereas comprehensible and transparent information about the benefits and risks of vaccination is important to make an informed decision about vaccination. Regarding *persuasion*, experts noted that more time should have been invested in consultations and one-in-one conversations with people to address existing doubts about vaccination. In line with this, experts felt that the COVID-19 vaccination information campaign was not well-focused on certain target groups, such as ethnic minorities and people who had doubts about vaccination, who were not sufficiently reached. The majority of experts felt that interventions in the sphere of providing information had not been exhausted at all. One medical expert explained:

> "*The first step is information; giving people the right information and subsequently helping them with making a choice. Merely talking about the use of pressure and coercion suggests that we have fully exhausted that [first] option, but that is simply untrue.*'' – *R12*

Experts also reflected on the use of the interventions in the sphere of *nudging*, ('expanding choice' and 'adjusting the default option'). Some experts felt that the COVID-19 vaccination policy could have been rolled out faster and in more vaccination locations, like places of worship, malls and stadiums, as exemplified by the United Kingdom [20]. Other experts mentioned the lack of interventions in the sphere of *weak pressure* ('stimulate'), such as positive financial stimuli, although some experts regarded such interventions ethically questionable. When experts reflected on stronger interventions in the sphere of *pressure* ('discourage' or '(severely) restrict freedom of choice), they most frequently mentioned the use of a 'Coronavirus entry pass' (CEP) wherein an individuals' vaccination, recovery or test status was laid down – also referred to as '3G-system' (Table 1). Certain companies, events and other facilities required the showing of the CEP before entrance. An argument that experts often brought up in support of this 3G-system, was that choices, i.e., vaccine hesitancy, should have consequences. Other arguments in support were amongst others: the temporary or crisis-linked character of the 3G-system and the possibility to keep participating in society following vaccine refusal – i.e., the possibility to present a negative test or recovery status. However, during the conduction of the interviews, the Dutch government considered to introduce a '2G-system' (Table 1), by removing the possibility to present a negative test instead of a recovery or vaccination status in the CEP. Whilst experts supporting the use of a 2G-system generally used similar argumentation as described above, opposing experts disputed the effectivity and proportionality of the intervention, arguing that a 2G-system would exclude (groups of) people because there would not be a

Table 1
Definitions and detailed explanations of commonly used terms related to the use of the Coronavirus entry pass (CEP).

Commonly used term	Detailed explanation
Coronavirus entry pass	During the outbreak of COVID-19, the 'Coronavirus entry pass' (CEP) has been used in the Netherlands, similar to the European Digital COVID-19 Certificate (or: 'DCC'), to give access to certain facilities/locations. The CEP proves that an individual: has been vaccinated against COVID-19; or has received a negative test result; or has recovered from COVID-19.
CEP-variants	There are different variants in which the CEP can be used. In the Netherlands, these were referred to as the '1G'-, '2G'-, and '3G'-system, derived from the Dutch words for tested (*getest)*, vaccinated (*gevaccineerd*) and recovered (*genezen*). Although both the use of the 1G- and 2G-system have been debated in the Netherlands, only the 3G-system has been put to practice for a certain period of time.
1G-system	Access to certain (essential) facilities/locations, by means of a CEP, is merely allowed if someone has received a negative test result.
2G-system	Access to certain (essential) facilities/locations, by means of a CEP, is allowed if someone has been vaccinated against COVID-19 or has recovered from COVID-19.
3G-system	Access to certain (essential) facilities/locations, by means of a CEP, is allowed if someone has been vaccinated against COVID-19, has recovered from COVID-19 or has received a negative test result.

reasonable alternative for vaccination anymore.

3.2. Arguments in favour and against a less voluntary vaccination policy

We have accommodated the arguments *in favour* of a less voluntary vaccination policy into three main categories: epidemiological circumstances, collective responsibility and professional duty. However, multiple experts argued that responses depend on the type of disease that was discussed and had different views on specific conditions, such as the proportionality, subsidiarity and effectivity of less voluntary vaccination interventions. Also, some experts mentioned that it was rather difficult to generally speak of a less voluntary vaccination policy, due to the lack of clear boundaries between interventions, e.g., pressure and coercion, on the intervention ladder. This problem has also been acknowledged by the Dutch Health Council [17].

Most of the experts referred to *epidemiological circumstances* necessitating a less voluntary vaccination policy. Examples are amongst others: the outbreak of a novel infectious disease for which vaccines become available, such as COVID-19, and the outbreak of a common infectious disease caused by a declining vaccination coverage, such as measles outbreaks in recent years [21]. Experts referred to these situations as 'disaster cases' or 'health risk scenarios', due to the risks that are posed by such circumstances, both to the health of (vulnerable) individuals, such as immunocompromised patients or people with a medical contraindication, as well as to public health in general. An example that experts often referred to was the use of the CEP, more specifically the 3G-system (Table 1), during the COVID-19 pandemic. Although the CEP infringed upon certain fundamental rights – such as the right to privacy ex article 8 ECHR – experts argued that the interest and protection of public health necessitated a more invasive policy. According to multiple experts, the (proven) effectiveness of this intervention in other European countries, the probable persuasive effect to people who had doubts about vaccination and the fact that people can still participate in society without being vaccinated, contributed to the added value of this policy. Some experts in fact stated that similar policies can used for other vaccine preventable diseases.

> "*I am in favour of legal interventions in the sphere of pressure, such as imposing conditions to access certain places. If we reach the point that the vaccination coverage for measles declines any further, I see a possibility of mandating vaccinations for children to access (pre)school.*'' – R3

The second argument experts used in favour of a less voluntary vaccination policy is founded on the principle of *collective responsibility*. Experts frequently referred to a moral obligation of individuals towards society in the form of a contribution to the collective health interest. By doing so, the chances of achieving 'herd immunity' [22] – indirect protection from infection resulting from a situation in which a sufficiently large proportion of the population has become immune – are maximised, whilst simultaneously minimising the risks of endangering the lives of other, more vulnerable, individuals. Some ethical experts referred to the harm principle of John Stuart Mill, holding that individual freedoms may only be limited to prevent harm to others. However, one expert noted that COVID-19 has complexed the discussion, because vaccination does not provide 'sterilising immunity', i.e., elimination of a pathogen before it replicates in the host [23].

> "*At the moment that vaccines provide sufficient sterilising immunity – meaning that once you are vaccinated, you are not able to infect others, such as is the case for measles – then I find the use* 3G *or* 2G *well defendable, because then being vaccinated does not cause risk for other individuals.*'' – R8

A third argument in favour of a less voluntary vaccination policy is based on the *professional duty* of employees in 'high-risk' professions, such as health care workers (HCWs). In these professions employees have a higher risk of getting infected with vaccine-preventable diseases and, once infected, also endanger the health of other (vulnerable) individuals. Thus, multiple experts argued that vaccination mandates for HCWs can be necessary. Some ethical experts also argued that not-vaccinating is at odds with the principle of providing 'good care' and that HCWs, compared to other individuals, have a strong moral obligation to get a vaccination, because it is not only an important safety measure for their own health, but also for that of their patients [12]. In that sense it can be regarded an element of 'good medical-professional conduct'. The professional duty argument is however not limited to HCWs, some experts argued that similar reasoning can be used for personnel of educational institutions, for instance.

The arguments *against* a less voluntary vaccination policy can be categorised in two main themes: doubts about the necessity and the adverse effectiveness of such policy.

First, experts questioned the *necessity* of a less voluntary vaccination policy. Particularly, many experts doubted the necessity of less voluntary vaccination approaches in certain contexts, such as the COVID-19 pandemic, because they deemed it unlikely that less voluntary vaccination interventions would e.g., increase vaccination coverage in a more effective manner than alternative, more voluntary, vaccination interventions. Besides, experts recalled the fact that the Netherlands 'traditionally' has had a high vaccination coverage against almost all vaccine-preventable diseases. In the past, this has been achieved without the use of pressure or coercion, but rather with effective communication and information policies. Nonetheless, there has always been a small group of people that does not choose to be vaccinated – of which experts said that even the imposition of fines would possibly not lead to a change of mind.

Second, multiple experts shared concerns on the possible *adverse effectiveness*, or negative societal impact, of a less voluntary vaccination policy. Many experts referred to COVID-19, stating that increased polarisation, aggression, and misinformation can be results of using less voluntary vaccination interventions. In line with this, experts were concerned with the negative impact a less voluntary vaccination policy could have on the NIP and future vaccination policies. A medical expert argued:

> "*If I look at the current polarisation, I would very much doubt if that [a less voluntary vaccination policy] is 'the way to go'. I would be afraid of the 'contamination' almost, that the polisarisation of this discussion [COVID-19 vaccination] impacts the regular vaccination coverage for children [NIP] and then we would have a more serious problem.*'' – R2

3.3. Regulatory aspects of a less voluntary vaccination policy

The added value of legislation increases with the utilisation of interventions in the sphere of pressure and coercion. Legislation would be needed to stipulate what the consequences are of vaccine refusal, such as the use of fines or denial of access to certain (essential) services or places. Besides, legislation could be instrumental in defining exemptions for vaccine mandates, e.g., for people with a medical contra-indication and religious or philosophical beliefs. Some experts argued that mandatory vaccination policies can be legally embedded, without actually having to be enforced. Such a policy is referred to as a '*a priori* mandatory vaccination', whereby legally embedded threshold values (e.g., vaccination coverage) for certain infectious diseases, of which outbreaks cause threat to public threats, result in automatic enforcement of (temporary) mandatory vaccination whenever the vaccination coverage drops under that threshold value. An ethical expert explained:

> "*I have in the past pleaded that whenever the vaccination coverage for measles reaches under a certain threshold value, then automatically the measure of excluding children from nurseries goes into effect. So that you actually make legislation in advance so that you know that whenever a certain threshold value is reached, you know what the consequences are.*'' – R8

Additionally, experts argued that the outbreak of COVID-19 has

shown that the Dutch Public Health Act is deprecated and not well-equipped to protect against the outbreak of infectious diseases. Particularly, experts criticised the use of 'emergency legislation' – i.e., temporary novel chapters to the Public Health Act – during the COVID-19 pandemic because it was subject to numerous alterations during the pandemic, thus lacked clarity and legal certainty. Nonetheless, the majority of experts mentioned that vaccination legislation containing pressure or coercion requires a legitimate aim and needs to meet the principles of proportionality and subsidiarity, as well as be (practically) feasible. However, as can be seen in Fig. 1, a less voluntary vaccination policy does not necessarily entail legislation. This corresponds with the opinion of multiple experts stating that vaccination legislation containing pressure or coercion will not automatically solve the problem of vaccine hesitancy, nor outbreaks of infectious diseases. A legal expert mentioned that such legislation might in fact cause more problems than it aims to solve, because laws are written on a high level of abstraction, hence being rather 'general'; this whilst each infectious disease has its own specific character.

4. Discussion

Although the Netherlands traditionally favors a voluntary approach towards vaccination, due to the COVID-19 pandemic this policy suddenly became less self-evident; the pandemic led to less voluntary vaccination interventions, such as the use of the CEP to increase vaccination coverage. Our study was the first to interview medical, ethical and legal experts about the desirability of a less voluntary vaccination policy. In short, our findings revolve around two main themes: first, the desirability of a less voluntary vaccination policy; and second, the meaning of legislation in that regard.

4.1. Desirability of a less voluntary vaccination policy

Basically, aside from coercion, i.e., (physical) force, experts approve of less voluntary vaccination interventions as long as they are truly necessary to protect public health. At the same time, they stress that interventions, especially regarding information and communication, could have been used more effectively during the pandemic. While there is no clear consensus among experts on the desirability of a less voluntary vaccination policy – our findings shed light on the pros and cons of a such a policy. According to experts, key arguments in favour find their basis mostly in epidemiological circumstances, as well as an individual or professional duty towards the collective health interest, whilst key arguments against a less voluntary vaccination policy focus on the unwanted side effects of such policies, and the problem that it is not always clear why a less voluntary approach is necessary, which calls into question its legitimacy. Although these findings are consistent with pre-pandemic research findings concerning a less voluntary approach in Dutch vaccination policies [10,11,13], the sudden outbreak of COVID-19 revived the debate. Moreover, through the pandemic the debate's focus has shifted from children to adults.

An issue underlying the vaccination policy debate is the complex relationship between the individual and the collective interest. The Dutch Health Council sees it as an ethical-legal *dilemma*: the collective interest of vaccination positioned opposite to the individual interest of vaccination, which requires balancing [17]. This is also mirrored in our research results. Some experts deemed freedom of choice and the right to self-determination more important than employing less voluntary vaccination interventions [24,25]. This in contrast to other experts, who regarded public health and herd immunity as a public good to which everyone should contribute and that legitimates at least a certain level of coercion [26,27].

On the basis of our study, it also has become clear that experts had different views on whether less voluntary vaccination policies were proportionate, as well as on the need and effectiveness of certain policies. Experts did agree, however, that the necessity of less voluntary measures is context-dependant, differing per type of vaccination or severity of the infectious disease, for instance. The more serious the threat, they agreed, the more acceptable interventions become which are higher positioned on the intervention ladder. Various experts appealed to notions of collective responsibility or *solidarity*, i.e., the link between individual and collective well-being that binds societies together [28]. Solidarity is a complex concept that plays a role between individuals as well as at institutional and governmental level. Generally, policies cannot rely solely on interpersonal solidarity, because people might only sympathise with people who are similar to them and because private citizens may not know the needs of others; therefore, governments have to fulfil a responsibility in this regard, that is to provide support and different resources facilitating interpersonal solidarity [29]. This viewpoint is in line with our finding that solidarity should be effectively enhanced by providing information before less voluntary interventions are to be applied. After all, solidarity cannot merely be 'enforced' by governments but has to be embedded in public trust and support and should leave space for diverging societal opinions. The latter is specifically relevant given the fact that the Netherlands traditionally has a voluntary approach to vaccination and experts feared that a top-down change in this policy – especially during a public health crisis – would rather stimulate polarisation, than have a positive effect on the acceptance of vaccination policies or broader immunisation programmes like the NIP. Policymakers should therefore take the cultural aspects involved in vaccination into account and be aware that "cultures with a higher regard for individual freedoms and a lower regard for the protection of the common good may not be good candidates for compulsory vaccination'' [30]. However, in specific circumstances, experts did find less voluntary vaccination policies acceptable, mainly in relation to HCWs who work with vulnerable patients, provided conditions like necessity and effectiveness are met, particularly given HCWs professional duties of care. This is in line with literature on the vaccination of HCWs in the COVID-19 pandemic [12,31–33].

4.2. The role of legislation in a less voluntary vaccination policy

A less voluntary vaccination policy can be realised with or without the use of the instrument of legislation. Mandatory vaccination for instance, often finds its basis in legislation in contrast to more voluntary vaccination interventions [34,35]. Most experts agreed on the fact that the Dutch Public Health Act needs to be revised because the law is not sufficiently 'prepared' for public health emergencies, thus underlining the importance of public health preparedness of domestic legal frameworks [36]. The latter is also considered necessary in light of the principle of legality: any government act violating human rights should be based on the law [37]. This concurs with Graeme's and Hunter's argument that: "lack of clarity of law, or lack of clarity about legal rights and responsibilities, can seriously hinder or impede effective responses to public health emergencies'' [38]. Additionally, multiple experts argued that added value of vaccination legislation can be found in '*a priori* mandatory vaccination', i.e., referring to legally embedded threshold values (e.g., vaccination coverage) for certain infectious diseases, resulting in automatic enforcement of (temporary) mandatory vaccination when values reach below the threshold.

We believe that if legislation will be used for the realisation of a less voluntary vaccination policy, such specifications are of paramount importance. Hence, we argue that legislation – in spirit of the intervention ladder of the Dutch Health Council (Fig. 1) – should be able to adapt to specific circumstances and should be flexible rather than stringent. This can be realised, for instance, by permitting temporary instead of permanent use, and by constructing measures scaling up or down depending on the (local) epidemiological situation. However, finding the appropriate time for implementation is essential. In the midst of a pandemic, it is unlikely that such changes in policies – especially with polarised topics like vaccination – will have public support. In line with this, a possible disadvantage of legislation for polarised topics are

adverse effects, such as total abstinence or principled nonparticipation. These reflections underline the argument that governments should give "due consideration to improving legal preparedness at a domestic level *before* they are faced with a public health crisis. Making decisions under time constraints to implement appropriate frameworks in a time of emergency is risky'' [38,39].

4.3. Limitations

Our study has some limitations. Firstly, interviewees mainly reflected on less voluntary vaccination policies from their knowledge and experiences gained within the context of the Dutch vaccination policies and closely related debate; although our findings have relevance for the general discussion on this topic, they cannot be directly extrapolated to similar discussions in other countries. Secondly, although our research explicitly had a broader focus, interviewees frequently reflected on our questions in the context of COVID-19. When the interviews were conducted, the Netherlands was in the midst of the outbreak of the (then novel) SARS-CoV-2 Omicron variant, and the uncertainties accompanying this new virus strain may have coloured interviewees' responses. Thirdly, we only interviewed known experts on vaccinations; other relevant stakeholders, such as the general public, were not involved.

5. Concluding remarks

Despite our limitations, important lessons for arrangements of (future) vaccination policies in the Netherlands can be learned from our results. As was demonstrated by the combat of COVID-19, policymakers should, first of all, invest in utilising more voluntary interventions more effectively rather than moving reflexively to more freedom-restricting interventions. Nonetheless, public health emergencies in particular may necessitate a less voluntary vaccination policy because the protection of public health and of vulnerable individuals benefits from a collective approach, grounded in solidarity. A targeted, less voluntary vaccination policy, e.g., limited to certain professions, might be preferred over a general, less voluntary vaccination policy. Apart from that, less voluntary vaccination policies should be timely, context-specific and take into account the principles of proportionality and subsidiarity. If governments do opt for a less voluntary vaccination policy, they should embed such policy (a priori) in flexible legislation.

Authors' contributions

Rogier C. Simons, Marieke A.R. Bak, Johan Legemaate and Corrette Ploem contributed to the conceptualisation of the study. Rogier C. Simons selected the methodology, curated the data and performed the formal analysis, which was reviewed by Marieke A.R. Bak. Rogier C. Simons wrote the original draft of the manuscript, which was reviewed and edited by all authors in collaboration with Rogier C. Simons. All of the authors contributed to the revision of the manuscript, read and approved the submitted version. Supervision was carried out by Johan Legemaate and Corrette Ploem.

Declarations of Competing Interest

None.

Funding

None.

Acknowledgments

We would not have been able to create this manuscript without the valuable insights, opinions and ideas of the interviewed experts from the medical, ethical and legal field.

References

[1] European Court of Human Rights (Grand Chamber). Vavřička and others v. The Czech Republic. In: App. Nos. 47621/13, 3867/14, 73094/14, 19298/15, 19306/15, 43883/15; 2021. Available at, https://hudoc.echr.coe.int/fre?i=001-209039 [accessed 11.01.23].
[2] Alekseenko A. Implications for COVID-19 vaccination following the European court of human right's decision in Vavřička and oths v Czech. Med Law Int 2022;22(1):75–89. https://doi.org/10.1177/09685332221078417.
[3] Nilsson A. Is compulsory childhood vaccination compatible with the right to respect for private life? A comment on Vavřička and others v. The Czech Republic. Eur J Health Law 2021;28(3):323–40. https://doi.org/10.1163/15718093-bja10048.
[4] King J, Luiz Motta Ferraz O, Jones A. Mandatory COVID-19 vaccination and human rights. The Lancet 2022;399(10321):220–2. https://doi.org/10.1016/S0140-6736(21)02873-7.
[5] Rijksinstituut voor Volksgezondheid en Milieu. The national immunisation programme in the Netherlands. In: Surveillance and developments in 2019-2020. Nr. 2020/0077. RIVM; 2020. https://doi.org/10.21945/RIVM-2020-0077 [accessed 11.01.23].
[6] Leenen HJJ, Gevers JKM, Legemaate J, Ploem MC, van der Mersch MF, Plomp E, et al. Handboek gezondheidsrecht. Den Haag: Boom Juridisch; 2020. p. 591–4.
[7] Rijksinstituut voor Volksgezondheid en Milieu. Vaccination Coverage and annual report national immunisation programme in the Netherlands 2021. Nr. 2022-0017. Bilthoven: RIVM; 2022. https://doi.org/10.21945/RIVM-2022-0017 [accessed 11.01.23].
[8] Rijksinstituut voor Volksgezondheid en Milieu. Immunisation coverage and annual report national immunisation programme in the Netherlands 2018. Nr. 2019-0015. Bilthoven: RIVM; 2019. https://doi.org/10.21945/RIVM-2019-0015 [accessed 11.01.23].
[9] Pierik RHM. Past een vaccinatieplicht binnen het EVRM-regime? Tijdschrift voor Gezondheidsrecht 2019;43(4):8–25. https://doi.org/10.5553/TvGR/016508742019043004002.
[10] De Jong J, Kroneman M, Fermin A, Legemaate J, Widdershoven GAM, Hansen J, et al. Maatregelen om de vaccinatiegraad te verhogen. Utrecht: Nivel: Een verkenning; 2019. Available at, https://www.nivel.nl/sites/default/files/bestanden/1003621.pdf [accessed 11.01.23].
[11] Vermeij R, Biesheuvel-Vermeijden J, van Buuren J, Gesthuizen S, Jellesma G, Krom A, et al. Prikken voor elkaar – kinderopvang en vaccinatie: een zorg van overheid en maatschappij. Den Haag: Commissie Kinderopvang en Vaccinatie; 2019. Available at, https://www.maatschappelijkekinderopvang.nl/wp-content/uploads/2019/07/BMK_Prikken-voor-elkaar_Rapport-commissie-kinderopvang-en-vaccinatie_01-07-2019.pdf [accessed 11.01.23].
[12] Simons RC, Hendriks AC. Vaccineren van zorgmedewerkers: gezondheidsrechtelijke en grondrechtelijke aspecten. Tijdschrift voor Recht en Religie 2022;(2):133–57. https://doi.org/10.7590/ntkr_2022_009.
[13] Ecorys en PROOF. Verplichting griepvaccinatie bij zorgmedewerkers bij zorgwerkers wenselijk en mogelijk?. In: Eindrapportage. Den Haag: Ministerie van Volksgezondheid, Welzijn en Sport;; 2019. Available at, https://proofadviseurs.nl/wp-content/uploads/2020/10/verplichting-griepvaccinatie-bij-zorgwerkers-wenselijk-en-mogelijk2.pdf [accessed 08.12.22].
[14] Hendriks AC. Vaccineren: keuzevrijheid of plicht volgens het EHRM? Nederlands juristenblad 2021;1643(23):1887–8.
[15] Toebes BCA. Verplichte vaccinatie als serieuze handelingsoptie. Rechtsgeleerdheid Mag THEMIS 2020;(3):142–5.
[16] van Wetenschappen Koninklijke Nederlandse Akademie, van straks Met de kennis. De wetenschap goed voorbereid op pandemieën. Amsterdam: KNAW; 2022. Available at, https://storage.knaw.nl/2022-09/KNAW-Advies-Met-de-kennis-van-straks-De%20wetenschap-goed-voorbereid-op-pandemieen-260922.pdf [accessed 11.01.23].
[17] Gezondheidsraad. Ethische en juridische afwegingen COVID-19-vaccinatie. In: Nr. 2021/03. Den Haag: Gezondheidsraad; 2021. Available at, https://www.gezondheidsraad.nl/documenten/adviezen/2021/02/04/ethische-en-juridische-afwegingen-covid-19-vaccinatie [accessed 11.01.23].
[18] Nuffield Council on Bioethics. Public health: ethical issues. London: Cambridge Publishers Ltd; 2007. p. 41–2.
[19] Bryman A. Social research methods. London, England: Oxford University Press; 2012. p. 288–309.
[20] King J, Byrom N, et al. United Kingdom: legal response to Covid-19. In: King J, Ferraz OLM, et al., editors. The oxford compendium of national legal responses to Covid-19 [Internet]. Oxford University Press; 2021. https://doi.org/10.1093/law-occ19/e17.013.17.
[21] Pierik RHM. Mandatory vaccination: an unqualified defence. J Appl Philos 2018;35(2):381–98. https://doi.org/10.1111/japp.12215.
[22] Randolph HE, Barreiro LB. Herd immunity: understanding COVID-19. Immunity 2020;52:737–41. https://doi.org/10.1016/j.immuni.2020.04.012.
[23] Wahl I, Wardemann H. Sterilizing immunity: understanding COVID-19. Immunity 2022;55:1–5. https://doi.org/10.1016/j.immuni.2022.10.017.
[24] Caplan AL. Ethical issues surrounding forced, mandated, or coerced treatment. J Subst Abuse Treat 2006;31(2):117–20. https://doi.org/10.1016/j.jsat.2006.06.009.
[25] Durovic A, Widmer AF, Dangel M, Ulrich A, Battegay M, Tschudin-Sutter. Low rates of influenza vaccination uptake among healthcare workers: distinguishing barriers between occupational groups. Am J Infect Control 2020;48(10):1139–43. https://doi.org/10.1016/j.ajic.2020.02.004.

[26] Dawson A. Herd protection as a public good: vaccination and our obligations to others. In: Dawson A, Verweij M, editors. Ethics, prevention, and public health. Oxford: Clarendon Press; 2007. p. 160–78.
[27] Verweij M. Infectious disease control. In: Dawson A, Verweij M, editors. Ethics, prevention, and public health. Oxford: Clarendon Press; 2007. p. 100–17.
[28] Prainsack B, Buyx A. Solidarity in biomedicine and beyond, Vol. 33. Cambridge University Press; 2017.
[29] West-Oram P. Solidarity is for other people: identifying derelictions of solidarity in responses to COVID-19. J Med Ethics 2021;47(2):65–8. https://doi.org/10.1136/medethics-2020-106522.
[30] Salmon DA, Teret SP, MacIntyre CR, Salisbury D, Burgess MA, Halsey NA. Compulsory vaccination and conscientious or philosophical exemptions: past, present, and future. The Lancet 2006;367(9508):436–42. https://doi.org/10.1016/S0140-6736(06)68144-0.
[31] Giubilini A, Savulescu J, Pugh J, Wilkinson D. Vaccine mandates for healthcare workers beyond COVID-19. J Med Ethics 2022. https://doi.org/10.1136/medethics-2022-108229. Published online first: 30 May.
[32] Law C, Skapetis T, Rodricks R. A scoping review of ethical considerations of mandatory COVID-19 vaccination of healthcare workers. Asian Bioethics Rev 2022;14:397–408. https://doi.org/10.1007/s41649-022-00214-5.
[33] Gordon AL, Achterberg WP, van Delden JJM. Mandatory vaccination against COVID-19 for health and social care workers caring for older people. Age Ageing 2022;51(4):1–4. https://doi.org/10.1093/ageing/afac097.
[34] Lex-Atlas Covid-19. Legal, constitutional, and ethical principles for mandatory vaccination requirements for Covid-19. Available at: https://lexatlas-c19.org/vaccination-principles/#e-constructive-engagement-with-vaccine-hesitancy [accessed 11.01.23].
[35] Sabin Vaccine Institute. Legislative landscape review: legislative approaches to immunization across the European region. Rome: Sabine Vaccine Institute; 2018. Available at, https://www.sabin.org/resources/legislative-approaches-to-immunization-across-the-european-region/ [accessed 11.01.23].
[36] Tumelty M-E, Donnelly M, Farrell A-M, Ó Néill C. COVID-19 vaccination and legal preparedness: lessons from Ireland. Eur J Health Law 2022;29(2):240–59. https://doi.org/10.1163/15718093-bja10064.
[37] Dute JCJ. De aanpak van de COVID-19-epidemie: een juridische tussenbalans. Tijdschrift voor Gezondheidsrecht 2020;44(5):477–86. https://doi.org/10.5553/TvGR/016508742020044005002.
[38] Lauri GT, Hunter KG. Mapping, assessing and improving legal preparedness for pandemic flu in the United Kingdom. Med Law Int 2009;10:101–37. https://doi.org/10.1177/096853320901000202.
[39] Murphy T, Whitty N. Is human rights prepared? Risk, rights and public health emergencies'. Med Law Rev 2009;17(2):219–44. https://doi.org/10.1093/medlaw/fwp007.